2012

# Digest 176

Global Specialist in Energy Management



Power Management



Process & Machines Management



IT/Server Room Management



Building Management



Security Management

Schneider Electric

# The only good watt is a negawatt.

**Transmission** Point of use Mining Generation 100 energy units 33 energy units

Due to intrinsic inefficiencies, 33 units of energy consumed at the point of use require 100 units of primary energy.

### What's a negawatt? The one you didn't use.

### Energy saved is money saved.

Yes, the smart grid is coming and we are actively implementing intelligence and innovations to help make it a reality. But we need a solution that will save energy and drive efficiency today as we are building the smarter grids of tomorrow.

### Introducing EcoStruxure: Active Energy Management Architecture from Power Plant to Plug™.

Right now, EcoStruxure<sup>™</sup> solutions from Schneider Electric<sup>™</sup> can reduce your energy use by up to 30% while cutting capital and operational costs. End-use efficiency is where our focus needs to be! The percentage of revenue spent on energy by companies could reach 30% by 2020. And there is an urgent need to reduce CO<sub>2</sub> emissions, especially as energy demand escalates. Energy management is the key - the fastest and most effective solution to curb greenhouse gas emissions while improving business performance. In fact, by 2030, energy efficiency and behavior change will offset more CO<sub>2</sub> than all the new wind, solar, and other alternative energy generation methods combined.\*

### Eco 1 truxure







### EcoStruxure solutions cut energy costs today.

As energy prices continue to climb, every unit of energy you save matters. One unit saved at the point of use means three units of primary energy not consumed. Today, only EcoStruxure Active Energy Management architecture can deliver up to 30% energy savings across your buildings, industrial plants, and data centers. You deserve an Efficient Enterprise™!



### Get smarter about energy

Download this White Paper, "Growing a Green Corporation," a \$199 value, for FREE.

Visit www.SEreply.com Key Code b653v



### How to Use Digest 176

Welcome to the first full color version of the Schneider Electric Digest!

Digest 176 is organized into 29 product sections listed at the right, with color-coded tabs to help you quickly find major product categories. We've added two new sections: Section 28 Universal Enclosures, and Section 29 Advanced Products, with new product offerings that include: Electric Vehicle Charging Stations, Efficient Homes, and Residential Solar Power Solutions.

To aid navigation, a detailed Table of Contents is provided for each section, as well as two indexes in the back of the book: an alphabetical listing and an alphanumeric listing.

The first 32 pages of this Digest highlight a winning lineup of Schneider Electric products, services, and solutions, followed by a two page listing of What's New in each product section.

For the most up-to-date Product Information, visit:

www.schneider-electric.us

#### **Customer Services**

#### **Customer Literature Center**

To obtain literature for product or application needs, contact the Schneider Electric Customer Literature Center. When requesting additional technical catalog information, refer to the catalog section listed at the top of the Digest pages.

1-800-392-8781

### **Customer Training**

Schneider Electric offers performance-based training for Square D™ and Telemecanique™ products. Whether you have purchased equipment to modernize an operation, or are equipping a new site with the most advanced automation solutions, distribution and power equipment, we have the training to meet your needs.

For more information, select Customer Training from the Support and Resources area:

> www.schneider-electric.us 1-866-507-0894

### Have questions? Need technical support or onsite service?

Now there's one toll-free number to get all the information you need.

1-888-778-2733

The Customer Care Center (CCC) is a single point of contact where qualified personnel answer your customer service and technical support questions. Serving all Schneider Electric authorized distributors and customers anywhere in the United States.

Schneider Electric Services provides you with power, automation and control, and energy management services to support the lifecycle of your system, process or installation. Our solutions help you get the most out of your investment and keep your facility at peak operational performance. Any brand. Any industry. Any time.

### **Schneider Mobile**



Access a mobile-friendly version of our website, from the web browser on your mobile device. We have developed a specially formatted version of our most popular web content, including the Digest, for mobile devices.

A mobile version of Schneider Electric's MYSE for distributors is also available



mobile.schneider-electric.us

### **Energy Efficiency**



### Leading the way in Energy Efficiency:

Schneider Electric provides integrated solutions for residential market, buildings, industry and infrastructure, and data centers. Now, you can build a long lasting energy strategy for a growing performance while preserving the environment.

### **SolutionOne**



An internet based tool that will allow communications with multiple product configurators within Schneider Electric North America to create a "Customer Solution" project bill of material.

### Questions?

Send an email to: SolutionOne@Schneider-Electric.com

### Seismic Qualification and Capabilities

### Seismic Equipment Ratings

Schneider Electric self certifies seismic equipment ratings to meet the most stringent requirements.

Please contact your local field sales engineer for assistance.

### **Selective Coordination**

#### NEC Requirements for Selective Coordination

Schneider Electric is providing our customers with valuable selective coordination solutions. Contact your local sales office to learn more.

### Product Index Section Listing

1	Load Centers
2	Metering Equipment
3	Safety Switches
4	Power Monitoring and Control
5	Lighting Control and Integrated Home Systems
6	Surge Protective Devices
7	Miniature and Molded Case Circuit Breakers
8	Operator Mechanisms and Disconnect Switches
9	Panelboards
10	Integrated Power and Control Solutions (IPaCS) Equipment
11	Switchboards and Switchgear
12	Busway
13	Wire Management
14	Transformers
15	Medical Products
16	NEMA Contactors and Starters
17	Motor Control Centers
18	IEC Contactors and Starters
19	Push Buttons and Operator Interface
20	Electronic Sensors and Machine Cabling
21	Limit Switches
22	Pressure, Vacuum, and Float Switches
23	Relays and Timers
24	Terminal Blocks
25	Machine Safeguarding Products
26	AC Drives and Soft Starts
27	Automation Products
28	Enclosures
29	Advanced Products
	Product Locator Index

# Schneider Electric brands that deliver the solutions you demand.

# Square D power solutions – ready for the future.



Stamped steel version of the enclosed safety switch with the Detroit Fuse and Manufacturing Company's new trademark – the capital "D" in a square (circa 1915). Square D™ by Schneider Electric brand NEMA power and control solutions have been trusted over 100 years for performance, reliability, and energy saving design. From residential load centers and metering products to commercial panelboards, energy conserving transformers and safety switches, Square D brand products provide you with quality solutions for distributing and monitoring electrical power. It's more than an electrical system. It's the backbone of today's energy demanding homes and businesses.



by Schneider Electric

## Taking lighting technology to a new level.

Juno™ by Schneider Electric is a leading manufacturer of energy-efficient commercial and residential lighting solutions and advanced system controls. Since 1976, we have been serving customers throughout North America, including electrical distributors, lighting showrooms, contractors, architects, engineers, lighting designers, and commercial establishments, offering them high-quality, innovative products, designed and engineered in the United States. The Juno Lighting Group product family includes over 50,000 items for commercial and residential construction, and includes a rapidly expanding line of eco-friendly LED fixtures for outdoor, recessed, track, decorative, and under cabinet applications.





# Delivering the best image quality in video security.

Pelco™ by Schneider Electric is a world leader in the design, development, and manufacture of video and security systems ideal for any industry. From megapixel cameras to video management and recording to display, Pelco solutions deliver the best image quality in video security.







# Committed to data center critical power and cooling.

APC by Schneider Electric™ is a global leader in critical power and cooling, providing industry leading hardware, software, and services designed to ensure availability and higher energy efficiency across the residential, business network, data center, and manufacturing environments. The position of APC on the cutting edge of Data Center thought leadership for over two decades has changed the way the world designs, installs, operates, and maintains data centers. APC has unparalleled commitment to innovation and the world's leading R&D investment (more than \$90 million annually) dedicated to critical power and cooling issues.





# PowerPact with Micrologic molded case circuit breakers

Direct access to energy management



### PowerPact<sup>™</sup> with Micrologic 15-3000 A

New-generation circuit breakers with industry leading performance and protection.

- > Smart A meter in every breaker
- Safe Combines safety and performance with Micrologic™ reliability
- > Simple Easy to select, install, and use



Increased energy availability



Safety and protection



Energy measurement and control



by Schneider Electric

# TeSys

## Motor starters and IEC contactors



# TeSys<sup>™</sup> U self-protected combination motor starters

Used in a single combination, two power bases and five separate control modules cover all motor control applications from 0.15 A through 32 A; 1/4 hp to 20 hp at 480 V



- NEMA® rated for motor control
- UL 508 Type E certified
- 65 kA SCCR rating at 480 V
- · Incredible energy savings!
  - » 75 percent less than traditional NEMA motor starters
  - » 50 percent less then traditional IEC



### TeSys D IEC contactors

The best-selling line of contactors and starters in the world, offering high reliability with long mechanical and electrical life. Available in 11 contactor ratings from 9 A up to 150 full-load amps for inductive loads and up to 200 A resistive loads.

- Component high-fault short circuit current ratings (available mid-2012):
  - » 9 A to 32 A: 65 kA
- » 40 A to 150 A: 100 kA
- Energy efficient
  - » 50 percent less than traditional NEMA motor starters
- · Dual mounting options: panel and DIN-rail

- IP20 finger-safe screw connections terminals
- Wiring connection flexibility, including spring, ring tongue, slip-on, and screw clamp terminals
- Everlink® termination technology (on 40-65 A products)
- Easy-to-install accessories are common for entire line





# **Engineering Services**

Schneider Electric Engineering Services offers power system design and upgrade, as well as studies and assessments to promote safety and to help ensure reliable and continuous power.



With over 40 years of experience and over 100 professional engineers strategically located throughout the U.S., the Engineering Services team has the knowledge and experience to get the job done.

## Power system design and upgrade projects

- Turnkey Solutions, including Solar and Brownfield Projects
- Electrical Design for Relay Upgrades
- Design for Generator and Synchronous Motor Exciter Packages
- Grounding System Evaluation and Design

## Power system studies and assessments

- Power System Assessments and Code Audits
- Arc Flash Analysis
- Circuit Loading Study
- Harmonics Assessment
- Power Factor Analysis
- Power Quality Analysis
- Short Circuit Study
- Time-current Coordination Study

## **Industrial Repair Services**

Schneider Electric Industrial Repair Services is the leader in industrial electronic repair management, repairing over 120,000 different products from more than 2,500 manufacturers.



With over 30 years of industry experience and over 70 highly-trained technicians, the Industrial Repair Services team provides dependable, cost-effective repairs.

### Testing and repair services

- PLCs
- I/O Modules
- AC and DC Drives
- Stepper Drives
- Servo Motors and Amplifiers
- HMI/Operator Interfaces
- Clutch Controls
- Power Supplies
- Counters and Timers
- Machine-specific Controls



### And more!

- Certified, Remanufactured Electronics for sale or exchange
- Engineered Replacement Boards
- Integrated Manufacturing Service Solutions (IMSS)
- Schneider Electric<sup>™</sup> Automation Product Upgrades



## **Electrical Distribution Services**



Schneider Electric offers a broad range of electrical distribution services to support the life cycle of any manufacturer's equipment.

Whether you are concerned with providing a safe workplace, increasing electrical reliability, boosting productivity, or reducing operating costs, you can count on our nationwide network of professional engineers and qualified service representatives to address your specific requirements.

Our full-range of electrical distribution services include:



### Engineering Services

The power system engineering team from Schneider Electric™ has the knowledge and experience to help facilities manage their energy and solve complex power system issues that may involve equipment, automation, the electrical system, or the utility.

Our engineering services include:

- Power System Assessment and Design Services
- Power Quality Correction
- Power System Analysis including Arc Flash Studies (NFPA 70E Compliance)



### New Installation Services

Reduce risk and help ensure reliable installation and equipment performance.

Our new equipment services include:

- Start-up and Commissioning
- Turnkey Solutions
- Extended Warranty
- Customer Training

### Modernization and Upgrade

Modernization solutions from Schneider Electric Services will upgrade your existing switchgear or motor control centers to current technology. These engineered solutions are available for most major brands and are designed to minimize downtime, improve reliability, and extend the life of your equipment.

Our modernization and upgrade solutions include:

- Direct Replacement and Retrofill Solutions for LV and MV Switchgear
- Direct Replacement Units for LV Motor Control Centers
- Circuit Breaker Reconditioning



### Want to extend the life of your existing switchgear?

Register to download our FREE white paper to discover the right solution for your application!

Visit **www.SEreply.com** and enter key code **b653v**.

emergency services



24 hours a day



7 days a week



### Maintenance and Testing

If your power system isn't performing, your facility isn't performing. To help ensure the reliable operation of your electrical equipment, periodic maintenance, cleaning, and lubrication is needed. Failure to do so could result in costly downtime.

Our maintenance and testing services include:

- Preventive Maintenance
- Maintenance Record Services
- Service Agreements



### Is your maintenance program meeting your expectations?

Register to download our FREE White Paper "Understanding Maintenance Contracts and Requirements for Low Voltage Power Distribution Equipment." Visit www.SEreply.com and enter key code **b653v**.



### Substation Solutions

Schneider Electric sets the standard in quality for the electric industry and serves utilities with highlyreliable products and services.

Our substation solutions include:

- Design and Construction Services to 765 kV
- PowerSub<sup>™</sup> MV Vacuum Substation Breakers
- Substation Service & Repair



### **Custom Solutions**

Do you have unique product requirements or complex power issues? Regardless of the application or location, our engineering, manufacturing, field service, and project management teams can evaluate your situation and propose a cost-effective solution that minimizes downtime or lead-times.

Our custom solutions include:

- Special Application Switchgear
- Solar Power Systems
- Turnkey Installations



### Additional Schneider Electric service teams include:

### **Automation and Control Services**

Our services support the latest innovations in industrial automation. In addition, they ensure our legacy products function at modern performance levels.

### **Building Lifecycle and Energy Services**

Our focused approach integrates multiple systems to achieve enterprisewide facilities management that uses less energy, tightens security, speeds response times, and maintains optimal occupant comfort while reducing overall operating costs.

### **Critical Power & Cooling Services**

Whether you are planning, building, or operating a data center, we have the expertise and services to support you through the many phases of the data center lifecycle and keep your mission-critical applications operating at optimum performance.

### **Energy Sustainability Consultation Services**

Our energy experts work on-site with knowledgeable plant personnel to develop a long-term "Energy Action Plan" that serves as the blueprint for ongoing energy savings.

### **Power Monitoring Services**

Our power monitoring services increase the reliability and efficiency of your installation by providing detailed reporting, testing, and analysis capabilities for your systems and related components.

### **Projects and Engineering Center**

Our Projects and Engineering Center provides full-service contract and project management capabilities to assist with complex or high-risk projects, resulting in a streamlined, reliable project solution.

For more information call 1-888-778-2733 or visit www.schneider-electric.us/go/services



# Your building's energy: See it, manage it, and save it with our life cycle services.

### Why spend tomorrow what you can save today?

#### How much did you spend on your building's energy today?

As regulations tighten and rates rise, businesses are learning that wasted energy is wasted money. Fortunately, the right partner will show you how much energy your building consumes, and more importantly, where energy — and money — can be saved.

### Our energy services deliver immediate value to your business.

Efficiency improvements reduce the total cost of energy per square foot over the life cycle of your facility. And only we provide the expertise of a Certified Energy Architect, scalable EcoStruxure Active Energy Management™ architecture, and much more that can deliver energy savings of up to 30%, starting today.

### 30% energy savings is just the beginning.

As The Global Specialist in Energy Management™, we are the only provider of comprehensive services and open system architecture that guarantee compatibility among the energy management domains of Power, IT Room, Process & Machine, Building, and Security, allowing businesses to scale up the savings and efficiency from the building to the enterprise level.

It is no wonder that about 75% of *Fortune* 500 companies choose Schneider Electric™ to meet their energy needs. With a savings opportunity like this, future-ready companies know that efficiency initiatives they couldn't afford to implement in the past are projects they can't afford to put off another day.

Schneider Electric is your ideal energy manager, energy expert, and green partner with specialized services for these facilities and more:



#### Healthcare

Provide superior patient care while controlling costs, eliminating waste, and doing more with less.



#### Hotels

Maximize guest delight while reducing OpEx, improving your carbon footprint, and offering a safe hotel stay.



#### Retail

Reduce costs and keep customers safe and comfortable while complying with environmental efforts and regulations.



### Office Buildings

Provide a flexible and productive atmosphere while retaining long-term income and asset value under tightening environmental regulations.



### Education

Make buildings and campuses safe and efficient while providing a greener, more productive learning environment.



#### Life Sciences

Create a sustainable business while meeting regulations, reducing time to market, and enhancing the security of employees and assets.



Download this **FREE** white paper today for insight on improving facility performance and finding permanent savings

Visit www.SEreply.com Key Code b653v



# 30%\* off your building's energy bill is just the beginning.

Imagine what we could do for the rest of your enterprise.

Managing complex building environments while meeting your energy efficiency targets is no small task. Our EcoStruxure™ energy management architecture achieves this elegantly through intelligent integration of building systems on a single IP platform.

### The savings go far beyond buildings.

Today, only EcoStruxure energy management architecture by Schneider Electric™ delivers up to 30% energy savings, uniting energy-intensive systems like HVAC, access control, video security management, and lighting control across your entire enterprise. Saving up to 30% of a building's energy is a great beginning, and thanks to EcoStruxure energy management architecture, the savings don't have to end there.



Learn about saving energy from the experts!

Download this white paper, a \$200 value, for FREE!

Visit www.SEreply.com Key Code b653v Call 800-274-5551



Active Energy Management
Architecture from Power Plant to Pluq™



#### **Data centers**

From the rack to the row to the room to the building, energy use and availability of these interconnected environments are closely monitored and adjusted in real time.



### **Industrial plants**

Open standard protocols allow for system-wide management of automated processes with minimized downtime, increased throughput, and maximized energy efficiency.



#### **Buildings**

Intelligent integration of security, power, lighting, electrical distribution, fire safety, HVAC, IT, and telecommunications across the enterprise allows for reduced training, operating, maintenance, and energy costs.



# There's more than the "tip of the iceberg"

Typically, we think of them as huge peaks rising above the water. In reality, the majority of an iceberg is actually under the water, out of view. Utility savings at most facilities can be thought of in much the same way.

Think of your utility bills as being the peak, easy to see every month. By simply installing different light bulbs or a PowerLogic<sup>™</sup> power monitoring system, you can realize 1 – 4 percent savings — but that's just the "tip of the iceberg" in terms of your potential savings.

The majority of savings, using Schneider Electric™ energy solutions, can be derived by looking beyond a utility bill — or below the surface. An additional 2 – 5 percent can be saved through better equipment utilization and energy monitoring tools. Another 10 percent can be found by improving power system reliability, and the savings that derive can be utilized towards the capital purchase with a performance contract.

At Schneider Electric, we pride ourselves on reliable Square D™ by Schneider Electric products, innovative solutions, expert engineering services, and our ability to provide single-source power management solutions. It's not just a concept to us, it's a legacy and a promise. We are the Energy Management specialists, striving to help you Make the Most of Your Energy™. For more information contact your representative or go to www.schneider-electric.com.

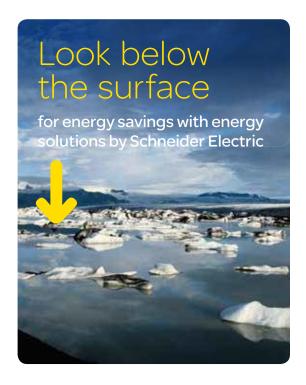
Square D PowerLogic systems offer end-to-end advanced solutions for a high return on investment in achieved energy savings.

### Commercial/retail centers

- Attract high-quality, long-term tenants
- Implement in a nationwide chain or one site
- Allocate costs according to actual energy used







### Medical complexes

- Experience outstanding quality and reliability
- Verify utility bills and eliminate errors
- Improve power system uptime

### Education campuses

- Reduce expenses
- Provide environmental leadership
- Gain insights into how to reduce energy use in common areas

### Upgrade payback

Average payback period and ROI of single-technology projects

Technology	Average Payback Period	Average ROI
Meters and Monitors	.5	200%
Lighting	2.2	45%
Controls	2.3	43%
Motors and Drives	2.4	42%
HVAC	3.6	28%
Onsite Power	4.3	23%
Building Automation	5.9	17%

### Three dimensions of energy and power management savings

### Reduce energy costs ] -

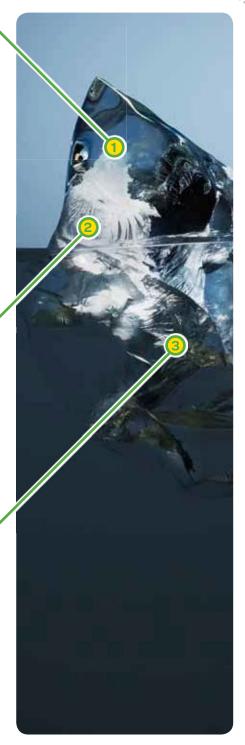
- Access automatic meter reading from revenue, piped utility pulses, and sub-metering
- Verify and reconcile utility bills to catch errors
- Reveal energy inefficiencies and waste
- Allocate or sub-bill energy costs
- Optimize procurement through forecasting, load aggregation, and rate analysis
- Implement power factor correction, lighting control, and fact-based reduction strategies
- · Reduce demand through load scheduling, load control, or generator control
- Respond to utility curtailment signals
- Make smart energy efficiency decisions by combining your experience with ours for Total Energy Control strategies that result in an actionable energy plan with quick payback

### Optimize equipment utilization

- Maximize use of existing equipment capacity to defer capital expenses
- Benchmark, profile, and compare the performance of facilities or processes
- Document emergency power system testing results
- Prolong equipment life by identifying transformer and other equipment stresses
- Balance loads on substations, panelboards, and other power equipment
- Perform proactive equipment maintenance and equipment monitoring of transformers, MCCs, switchgear, switchboards, circuit breaker status, protective equipment, capacitors, generators, panelboards, PDU, UPS, and other piped utilities

### [Improve reliability and uptime]

- Get early warning and remote alarm notification of impending problems
- Isolate problem sources quickly using real-time, historical, and event data
- Pinpoint root cause with precise GPS time and event sequence recording
- Verify reliable equipment operation and identify vulnerabilities
- Diagnose transients, disturbances, power quality, and harmonics
- Determine appropriate corrective measures based on accurate data
- Automate power system throw over and load preservation schemes
- Leverage Energy Solutions' Engineering Services as your single source energy and power management solution provider — product, implementation, consulting, assessment, and support services



# Our energy expertise will help sustain America's bright future.





## Together, we will meet your facility's energy management challenges of today and tomorrow.

### Your energy expert and green partner

Our experience with government facilities and campuses allows you to realize customized, integrated solutions with up to 30% energy savings, starting today.

Schneider Electric™ specializes in these critical domains of government facilities:

- > Power Management: Experience efficient power use, reliable power supply, low equipment failure rates, and minimized downtime with our proven solutions.
- > IT Room Management: Optimize data center availability and efficiency through monitoring, automation, planning, and implementation.
- > Building Management: Leverage existing investments to achieve reduced energy costs, improved comfort, and increased productivity with our integrated building systems.
- > Process and Machine Management: Eliminate downtime and optimize your systems' performance with our specialized solutions.
- > Security Management: Reduce risks with our integrated security solutions that create the most secure environment possible.

### EcoStruxure: Active Energy Management Architecture from Power Plant to Plug™

EcoStruxure architecture, our approach to integration, saves CapEx and OpEx over your facility's life cycle, from streamlined procurement through long-term maintenance and support. This innovation optimizes energy measurement, management, reliability, efficiency, and security across your entire enterprise.



Visit our NEW Government Knowledge Portal for FREE white papers, like this one: "Enacting a Life Cycle Approach in Federal Facilities."

Go to www.SEreply.com • Key Code b653v • Call 866-822-4636

### The global specialist in energy management™

Schneider Electric has a proven, 100-year long record of supporting government facilities and helps make them more secure, productive, and sustainable. We take the lessons of the past century to help you meet your responsibilities to mandates, missions, and taxpayers throughout the next one.

We combine the expertise of brands you know and trust to make your energy safe, reliable, efficient, productive, and green.









Make the most of your energy ™





## 

New integrated machine building solution features single software, proven architectures, and design experts.

Machines today need to be faster, more flexible, and must be able to solve more complex automation functions than ever before. As a machine builder you must constantly look at innovative ways to build more energy-efficient machines, reduce development costs, and get your machines to market much faster.

Our new MachineStruxure $^{\text{\tiny{M}}}$  solution is designed to answer these challenges and to help you take complexity out of the business through use of:

- ➤ Flexible Machine Control: SoMachine™ is a single software suite that runs on multiple hardware control platforms to achieve 100 percent machine flexibility: HMI, motion, drive, and logic controllers. With SoMachine, you need only one software, one cable, and one download to design, commission, and service your machines from a single point.
- > Tested, Validated Architectures and Functions: Build a strong automation platform through the use of our ready-to-use, proven, and fully transparent automation architectures and application function libraries implemented with FDT/DTM technology. Our architectures are predefined and dedicated to your specific needs for optimum results.
- > Co-engineering Services: Design the optimal solutions for your customers with innovative help from our experts! We implement the latest technological evolutions and provide a unique hands-on industry application knowledge that helps you stay ahead of the competition.



"SoMachine offers optimal flexibility when implemented on a standard machine, and it has huge potential in terms of system implementation."

Fabrizio Ghiro, software designer and machine developer at Costa Levigatrici in Italy

Make the most of your energy<sup>™</sup>



Download our "On the road to green machines" White Paper today — it's FREE and available right now!

Visit www.SEreply.com Key Code h903v



# A lighting control solution for every need...

Powerlink intelligent panelboards, Relay Panels, C-Bus network lighting control, and Occupancy Sensors from Schneider Electric create one of the most comprehensive energy-saving offers in the industry. They combine automated and web-enabled control with occupancy-based solutions and dimming capabilities.



Powerlink Intelligent Lighting Panel







### Powerlink

It takes more than just energy-efficient lighting to significantly reduce your energy costs. Powerlink™ lighting control systems reduce energy costs as much as 30 percent by automatically turning off lighting during unoccupied periods. Retrofit is also easy with Powerlink lighting control systems, with payback periods often less than two years. Compared with other energy savings technologies, a Powerlink control system can provide both a lower initial capital outlay and greater energy savings.

- Eliminate unnecessary energy consumption by switching lights off during non-occupied periods
- Reduce demand by shedding lights during peak demand periods
- Improve productivity by controlling and monitoring panels from remote locations
- Reduce potential lost time and liability by receiving instant alerts to important occurrences with remote email alarming
- Gain important insights into lighting system performance with integral metering

### Relay panel

The Lighting Control Relay Panel family offers both standalone and integrated customized solutions that combines ease of use, versatility, and durability. Each system offers an energy saving solution as unique as your needs.

- LPS Standalone panel
- LPB panel with BACnet capabilities
- LPL LonWorks console-operated panel

Three solutions that adapt to your particular configuration needs.

### C-Bus

C-Bus™ Network Lighting and Whole Home Controls provide a vast array of capabilities, scalable for virtually any size job, from a single room to an entire network. Eliminate wall clutter with programmable multi-function touch screens and keypads. Dim lights, control lighting scenes, HVAC, and audio, while integrating with third party devices using the same touch screen or keypad.

### Occupancy sensors

Occupancy sensors help building owners achieve energy savings and energy code compliance with sensors that are easy to select, install, and commission. Automatically turn lights on/off based on occupancy. Use sensors for Daylight Harvesting to adjust light levels based on natural lighting in areas with large windows or skylights. Use either passive infrared (PIR), ultrasonic, or dual-technology models for ultimate detection capability.

### Service and support

Reliable lighting control systems deserve reliable support to match. With Schneider Electric™ lighting controls, you can always count on our Schneider Electric field sales engineers and factorytrained experts for help when you need it — before, during, or after installation. Whether that means local support, troubleshooting, or on-site commissioning.

From smaller residential lighting control installations, to entire facility-wide control, Schneider Electric Lighting and Whole Home Controls has the precise solution to meet vour needs.



>>> For more information visit www.SEreply.com and enter key code b653v.

# Diversify your offer with the EcoXpert certification program.



Developed specifically for electrical contractors to grow their business and increase revenue. The Schneider Electric EcoXpert™ program helps you to **advise, sell,** and **install** a broad range of pre-engineered energy solutions across commercial, industrial, and high-end residential applications.

### Program benefits:

- Accreditation: gain knowledge and skills to improve your professional recognition and marketability
- Specialized training: access to ongoing technical, installation, and best practices curriculum courses
- Marketing collateral: enhance your ability to market your business with customizable materials
- Communication strategies: includes: how to sell, who to speak to, key
  questions to ask, and much more
- Technical expertise: 24/7 access to tools that help facilitate site assessments and ROI estimates
- Pre-engineered solutions: ability to sell a broad range of energy efficient and renewable energy solutions



### **Certification Paths:**

Energy Efficiency



Lighting and Lighting Controls



Power Distribution



Secure Powe



HVAC Control



Energy Monitoring Renewable Energy



Electric Vehicle Charging



Solar



### Get started!

Become our energy partner today, visit: www.SEreply.com and enter key code e595v.

# Driving energy efficient solutions from Power Plant to Plug™.

Schneider Electric<sup>™</sup> is committed to developing energy efficient solutions that support sustainable development, and our electric vehicle (EV) chargers are no exception. EVlink<sup>™</sup> charging solutions promote a greener, more economical transportation option while helping to reduce the world's global footprint. Schneider Electric offers a wide range of EVlink charging stations that allow users to recharge where they live, work, and play.

### The total package from one provider

- **Compatibility:** UL listed and SAE J1772 compliance ensures compatibility with any plug-in hybrid or electric vehicle entering the market.
- **Support:** Installation and maintenance provided by certified EcoXpert<sup>™</sup> contractors, who have been trained to install EVlink solutions and are able to offer an extended warranty option.
- **Efficiency:** Smart-grid connectivity allows for maximum energy management capabilities, assisting with energy control and efficiency.
- **User friendly:** Status indicator lights identify when the charger is ready to charge, if the vehicle is charging, or if the charger requires attention.
- **Safety:** An integral ground fault interrupter set at 5mA provides protection if a fault is detected from a power outage or lost connectivity. Automatic recovery and restart functionality ensures charging will resume following a power loss or ground fault detection.



# Learn more about the global impact of EVs

Visit www.SEreply.com and enter key code b653v.





Get FREE business, marketing, training, and product resources developed exclusively for electrical contractors.

Now more than ever, you need real-world solutions to grow your business and meet customer needs. You need a partner who can help you tap into market-leading business, marketing, and electrical industry expertise to enhance your operations.

The Schneider Electric Advantage gives you access to:



### **Marketing tools**

Market your business and improve customer relations with new tools including radio scripts, customizable collateral, and promotional items.



### **Training and education**

Get ahead with a broad range of educational courses designed specifically for electrical contractors through web-based curriculum and instructor-led training.



### **Product information**

Find the latest product, service, and solution information for Schneider Electric™ brands including troubleshooting, technical documents, and online tools.

Access our **FREE online training** when you register for

The Schneider Electric

Advantage



Visit: advantage.schneider-electric.us/

Make the most of your energy<sup>™</sup>



# Building a smarter grid with reliable, efficient energy

How Schneider Electric smart grid-ready products and solutions help balance your grid equation

The electricity market is changing. And every day, end-users' expectations increase in terms of reliability and quality, and they gain greater awareness of energy's environmental impact.

It's an evolution. But as our reliance on electricity grows globally, the ways in which we produce, distribute, and use energy must also evolve. The solution will not only involve smarter demand, but also smarter supply — and as such, a smarter grid is at the heart of the issue.

As The Global Specialist in Energy Management,™ **Schneider Electric™ is smart grid-ready**, enabling the products and solutions that support and connect the five key domains of a smarter grid:

- Flexible distribution
- Smart generation
- Demand-side management
- Efficient Home<sup>™</sup> (including electric vehicles)
- Efficient Enterprise<sup>™</sup> (buildings, industrial facilities, and data centers)

Our vision isn't just to connect our customers to the smart grid — but also to connect them with each other, facilitating smarter interactions and leading to increased energy management capabilities.



### Our smart grid solutions include:

#### HV/MV Substations

- » Substation automation and protection systems compliant with IEC 61850
- » Gas-insulated switchgear
- » Station breakers from 15 kV to 38 kV
- » Capacitor banks and control
- » Power quality and grid revenue metering
- » Phasor measurement units

### Feeder Automation

- » Volt/Var management
- » Automated load break switches
- » Reclosers and sectionalizers
- » Communicating faulted circuit indicators
- » Private license and public mesh network radios

### Renewable Energy Connectivity

- » Switchgear
- » Protection and control
- » Power quality and revenue metering
- » Harmonic filtering
- » Grid-tie substations
- » Turnkey project design and management
- » Smart solar inverters for residential through utility scale projects
- » Pre-fabricated inverter and transformer stations
- » Remote SCADA software

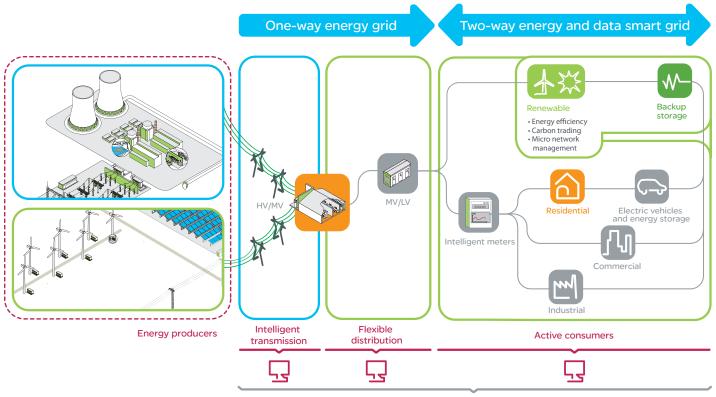
### Electric vehicle load management

- » Smart charging stations for residential and commercial applications
- » Charging station infrastructure management software and services
- » Communications and integration with other systems

### Demand Response Consulting

### **Energy Management Services**

- » Power system assessments
- » Equipment upgrades and retrofits
- » Maintenance and testing
- » Asset management
- » Design services
- » Project management



Communication and software at all levels of the smart grid



### **HV/MV** substations

Complete grid-connection turnkey project management including design, engineering, installation, and maintenance to increase service continuity through trouble-free and reliable operations.

### **Demand response programs**

Energy auditing services and consultation to assess the best load reduction strategy, including estimating the financial opportunity of Demand Response activities. Comprehensive offer including energy meters and software tools for control, metering, and data management.

### Renewable energy connectivity

Solar and Wind solutions compliant with local regulations enabling uninterrupted connectivity of intermittent sources through end-to-end electrical operation (conversion, transformers, MV network, grid connection, control, supervision, monitoring, and security). Packaged solutions allow for maximum return on investment, driving the cost of renewable energy to grid parity.

### SCADA distribution management systems

Efficient solutions for underground and overhead network management through status updates, complex switching assistance, multitasking control, monitoring functions, and network evolution planning.

### **Feeder automation**

Flexible, scalable, and simple solutions to reduce outage duration and operate distribution networks more efficiently.

### **Energy management services**

Prevention- and prediction-focused asset productivity management based on maintenance and retrofitting solutions, system assessments, and uptime audits as well as network planning and demand response consulting.



### Welcome to the 2020 home.

It might have been built in 1925, but it's the most contemporary home in the neighborhood. Thanks to the Wiser™ energy management system from Schneider Electric™, any home can be brought into the Twenty-First Century.

The addition of a Wiser energy management system not only improves a home's energy efficiency, but adds up to significant savings on utility bills that can even offset the cost of other remodeling upgrades. The Wiser system helps homes use less power and lower utility bills by employing user-friendly technology that's easy for homeowners to understand, manage, and control, even remotely, anytime from anywhere. The Wiser systems' smart thermostat, in-home display, and energy dashboard provide real-time energy information to homeowners, alerting them when a home's energy usage is high, so adjustments can be made accordingly, saving them from paying higher rates during peak demand times.

The great news is that any home, no matter its age or architectural style, can be retrofitted and benefit from the Wiser energy management system. Just knowing a home is environmentally friendly and energy efficient is not only a major attraction to today's homeowners, but adds great equity in a home.

The Wiser energy management system enables innovative energy conservation that helps homeowners use less power while significantly



lowering utility bills.

Control your HVAC system-based on the pricing you program into Wiser EMS' smart thermostat. The backlit feature visibly displays real-time energy output and costs incurred, then alerts you with unique color-coded warning screens when energy output is high and needs to be adjusted.



Find out just how **simple and cost effective** installing the Wiser energy management system can be, and how it will continue to significantly impact energy bills in the years ahead.

Visit www.SEreply.com and enter key code j566v for more information.





## A home is more than rooms of a house.

It is a refuge, a place of comfort designed to provide an environment where memories can be made, relationships built, lives nurtured, and dreams realized. Additionally, a home is an investment vehicle where the returns are counted as appreciation in value, but also in the monthly energy savings you generate. At Schneider Electric<sup>™</sup> we help you create quality, efficient, and productive homes with smart, next generation residential energy technology that takes a home to an unprecedented level.

Adding energy efficient solutions through installing Juno™ by Schneider Electric LED fixtures, reliable Square D™ by Schneider Electric power distribution products, advanced APC by Schneider Electric™ power protection devices, state-of-the art solar inverters, or electric vehicle charging stations, couldn't be easier and comes without sacrificing comfort or convenience.

Our active energy monitoring technology empowers you to minimize wasted energy and take control of your home's energy usage and output without sacrificing comfort or convenience. From the home office to the bedroom, from the kitchen to the home theater and garage, Schneider Electric transforms every room of a house into the type of efficient, model environment homeowners seek today.



Learn about the complete residential solutions of Schneider Floatier in the complete residential solutions of Schneider Electric, visit www.SEreply.com and enter key code **j562v** for more information.

### Looking to upgrade a residential service while saving time and effort?



Make your life easier with the Square D Service Upgrade Load Centers. Its inventive design makes challenging flush-mount service upgrade jobs faster, easier, and cleaner.

The uniquely designed load center endplate features four removable end plates with four feed-through points, which allow the enclosure to be positioned in the wall in as little as five minutes. The lengthier cover and door eliminate any need for drywall repairs.

Thanks Schneider Electric! The Square D Service Upgrade Load Center is a fantastic product! It makes my life easier and reduces installation time!

Residential Wireman West Side Electric, Portland, Oregon Member of IBEW Local 48





### Smart intelligent designs

Make your designs smart from the very beginning of conception, to the final design.

### **Design solutions**

The task of designing has never been more difficult — new codes, standards, and evolving technology, such as Building Information Management (BIM), all impact a building's design, speed, and efficiency. With teams of on-staff professional engineers and regulatory experts, Schneider Electric<sup>™</sup> provides the support you need to accomplish your projects on-time, with intelligence included.

### **Energy management solutions**

As The Global Specialist in Energy Management™, Schneider Electric focuses heavily on solutions and strategies around sustainable design and energy management. Codes and standards such as NEC® 2011 and ASHRAE 90.1 are under continuous maintenance, as well as the constant evolution of federal and state energy regulations. Our energy experts can help you stay up-to-date. Today project designs require more focus on energy efficiency. Schneider Electric can provide the insight to help your next design exceed its energy goals.

### Safety solutions

Safety is a critical component of any design, and safety regulations must be kept in order to maintain maximum protection against dangerous hazards. Our experts can provide the design information and recommendations you need to understand the dangers of arc flash and how to mitigate risks while complying with current guidelines. Your designs need to be safe and reliable in order to protect and save lives for years to come. Get Schneider Electric involved early in the design process to insure ongoing safety is built-in.



Evaluating system through-fault protection designs? Register to download our "LV Transformer Throughfault Protection" White Paper.

Visit www.SEreply.com and enter key code b653v.



### New web site

Schneider Electric is committed to providing consulting engineers access to comprehensive engineering information that can help you throughout your design process. The consulting engineer website of Schneider Electric is built for you.

### Easy access to:

- Design/application guides
- Product specifications
- Technical white papers
- Codes and standards
- Product data bulletins
- Calculators and online tools

Make the most of your energy<sup>™</sup>





# Square D Integrated Power and Control Solutions (IPaCS)

### Innovative solutions that save space, labor and time

For over 30 years, Square D by Schneider Electric™ IPaCS™ business has been providing integrated electrical solutions for retail construction, commercial, and industrial projects.

The Square D IPaCS family combines electrical distribution equipment, building controls and automation into a single factory-assembled and prewired enclosure. These innovative solutions save valuable floor space, shorten construction cycle times, and reduce installation and material handling costs.

### Why specify solutions from Square D IPaCS?

### Minimize space requirements.

Electrical panels and transformers are stacked in a modular line-up, which saves valuable floor and wall space.

#### Reduce contractor labor risks.

Because the contractor is swapping a variable cost (labor) for a fixed cost (product), their risk on the overall project is reduced.

### Reduce material handling.

Fewer items to receive, inventory, and move around the jobsite because components are factory-installed and pre-wired into a single lineup or enclosure.

### Save design time.

For designs with multiple locations, standardized designs can be created to provide consistency between sites.

### Shorten construction cycle times.

Pre-assembled construction means less time required on-site to install, reducing the overall construction cycle.

### Single point of responsibility.

Third-party controls/components can be installed, wired, and tested in IPaCS integrated equipment at the factory to assure it works like it's supposed to when it gets to the jobsite.





Integrated power center with third-party controls

## Solutions available from Square D IPaCS

### Modular Panel System (MPS)

Tailored to customer specifications and typically includes panels, lighting control, and equipment spaces.

### Integrated Power Center (IPC™)

For more complex applications, including HVAC controls, lighting controls, power quality and power conditioning products, TVSS, building management systems, and power metering/monitoring solutions, as well as electrical distribution equipment.

### Integrated Power Center 2 (IPC2™)

Features include those found in the IPC and are provided in a free-standing enclosure that can be front and rear aligned when transformers are included. IPC2 is seismically qualified. Enclosure options include NEMA® 1, NEMA 1 with driphood and NEMA 3R.

### Standby Power Connection Solutions (SPQ)

Provides the ability to quickly connect to a portable standby power generator. Suitable for N-3R (outdoor) installations.



MPS



IPC2



IPC2 transformer



SPQ



## Are you overlooking an enormous market?

With the demand for energy skyrocketing, customers will require more sustainable energy solutions. Schneider Electric™ EVlink™ charging stations were developed with this key factor in mind, providing a greener, more economical transportation option while helping to reduce the world's global footprint. EVlink electric vehicle (EV) charging solutions are designed to meet the needs of any customer, while providing the safety you demand from a partner you trust.

- All charging stations are designed and manufactured in-house by Schneider Electric
- UL listed and SAE J1772 compliant to ensure compatibility with any EV entering the market today
- An integral ground fault interrupter set at 5 mA provides superior protection to users if a fault is detected

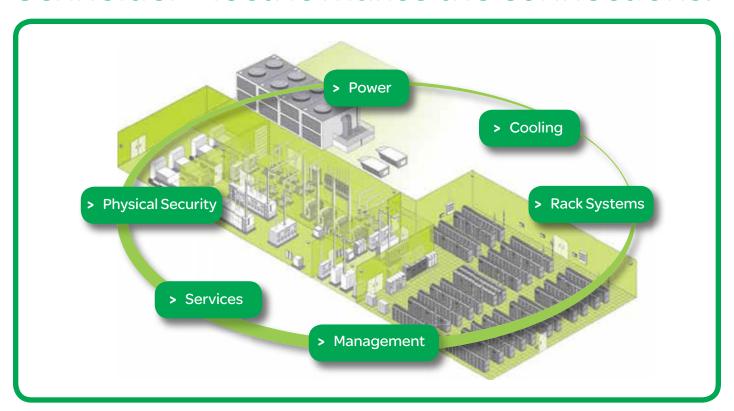


EVs are now a part of everyday transportation. Download a **FREE** EV fact sheet to learn how you can get involved today. Visit **www.SEreply.com** and enter key code **b653v**.

Make the most of your energy<sup>™</sup>



### Schneider Electric makes the connections.



# Maximum efficiency and availability from rack to row to room to building

### Making the connection between IT and facilities

With today's technology challenges, Schneider Electric<sup>™</sup> understands that data centers must be viewed as interconnected environments — from rack to row to room to building. We call this integration the data center physical infrastructure or DCPI. The only clear path to the highest availability and maximum efficiency, DCPI comprises power, cooling, physical security, and rack systems and is monitored and managed via software solutions and professional services.

### Making the connection between efficiency and availability

Today, maximized energy efficiency and guaranteed availability must work hand in hand. So Schneider Electric offers integrated cooling strategies across the DCPI. This hybrid approach delivers true energy savings — but never at the expense of availability. And we further optimize availability and efficiency with an integrated software platform that enables end-to-end monitoring and management of all DCPI domains. This holistic solution provides visibility and interoperability across the DCPI.

### Making the connection with key industry partners

Data centers can't be built without constant communication and coordination with vendors and other key players. Only Schneider Electric has the consulting and services network, personal relationships, and real-world experience to give you the single point of contact you need to take your integrated data center from envisioned to online.

### Integrated architectures for Active Energy Management<sup>™</sup>

- > Power The power domain connects it all from generators to UPSs to PDUs – for cross-vendor interoperability.
- Cooling Our highly efficient integrated solutions combine chillers, perimeter cooling, hot aisle containment, and row-based options to maximize efficiency and guarantee availability.
- > Physical Security Our single-pane view includes access control and surveillance across one or multiple facilities.
- Rack Systems Interconnected, any-IT, vendorcompatible rack enclosures, accessories, and air containment solutions support HD processing needs.
- > Services The professional services of Schneider Electric provide provide one point of contact for data center planning, building, and operation.
- Management Our exclusive integrated software architecture removes management "silos" for greater energy awareness and efficiency and higher availability across the entire DCPI.



### Download the FREE White Paper,

"Tackling Today's Data Center Energy Efficiency Challenges."

Visit www.SEreply.com and enter key code j754v Call 888-778-2733







### Visit Schneider Electric Center of Excellence

Want to know more? Be our quest at one of Schneider Electric Centers of Excellence located on the East Coast, West Coast, and in the Midwest. For more information, contact your local Schneider Electric representative or Square D<sup>™</sup> by Schneider Electric distributor and ask to schedule a visit.

## Seeing is believing

When you're trying to solve a business or engineering challenge, you need a team of industry experts with extensive knowledge of your industry, as well as the willingness to go anywhere, work with any supplier, to find the most cost-effective, complete solution for you.

As The Global Specialist in Energy Management<sup>™</sup> and sustainable manufacturing, we're always coming up with new ways to help businesses work better, faster, more efficiently, and profitably.

That's why we have developed the Schneider Electric™ Centers of Excellence and Innovation Centers. To simplify your understanding of the broadest range of power, control, automation, safety, security, and energy management solutions, and how they can benefit your business.

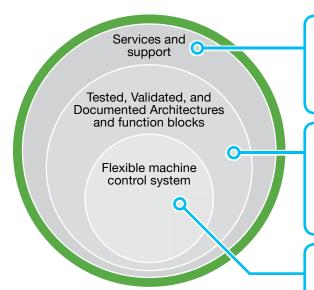
These facilities give you the ability to see and touch live demonstrations of the innovative solutions for both OEM manufacturers and industrial facilities. You also get access to the multi-disciplined teams that can configure and customize your solutions to meet your specific needs and further minimize your future risk. These experts have access to fully-equipped laboratories, numerous technical experts and the resources of the global Schneider Electric organization all with the sole purpose of demonstrating to you the commitment of Schneider Electric to delivering best-in-class solutions to your business challenges.



## MachineStruxure solutions

Automation solutions for industrial machines that can save you up to 50% of design and implementation time.

MachineStruxure™ helps you design integrated, energy-efficient, and cost-effective machines, while maximizing performance and reducing design time and time to market. Based on Tested, Validated, and Documented Architectures (TVDA), MachineStruxure incorporates flexible and scalable hardware platforms with SoMachine,™ a comprehensive single software suite with application function block libraries. Plus, our hardware control platforms optimize control through embedded intelligence in drives, HMI, motion, and logic controllers.



### Stay one step ahead.

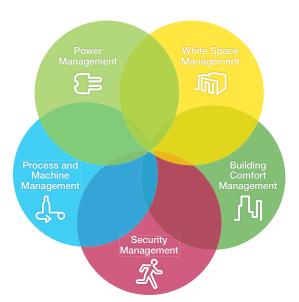
However complex your machine, you can rely on our team of dedicated experts and our international presence to assist you and achieve excellence at every stage of the machine's lifecycle.

### Save up to 50% of design and implementation time.

Use the solid base of Tested, Validated, and Documented Architectures and function blocks to quickly build your automation solutions. Optimized cost, footprint, and performance — all you need to do is adapt them to your applications.

### 100% flexibility and optimization of your machines.

Our different machine control platforms include embedded intelligence. Now you can integrate control that is perfectly suited for your machine requirements. By utilizing SoMachine software, you can move from one application to another capitalizing on your developments.



## MachineStruxure, one of the mainstays of EcoStruxure

EcoStruxure™ is a system based on Active Energy Management™ architectures, from an electrical power plant to a single electrical socket. EcoStruxure enables you to benefit from intelligent and simplified energy management systems, to reduce your investment and operational costs, and reduce waste resulting in energy savings up to 30%.

Learn more about MachineStruxure, visit www.SEreply.com and enter key code j546v.

## Plantstruxture solutions

As the foundation of the Schneider Electric™ EcoStruxure Active Energy Management™ architecture for industrial customers, the PlantStruxure™ collaborative automation solution enables the achievement of both energy and productivity objectives.

This scalable solution delivers a single environment to measure energy use, process data, asset utilization, and machine performance by:

- Reducing engineering, operations, and maintenance costs
- Maximizing plant and production efficiency
- Improving production quality
- Protecting people, plant assets, and the environment
- Supporting production and business decisions



### What makes PlantStruxure unique?

### Scalable for changing times

From tens of I/O to hundreds of thousands, the scalability of our system means that you can start out small and grow as your requirements change.

### Flexible because your process is unique

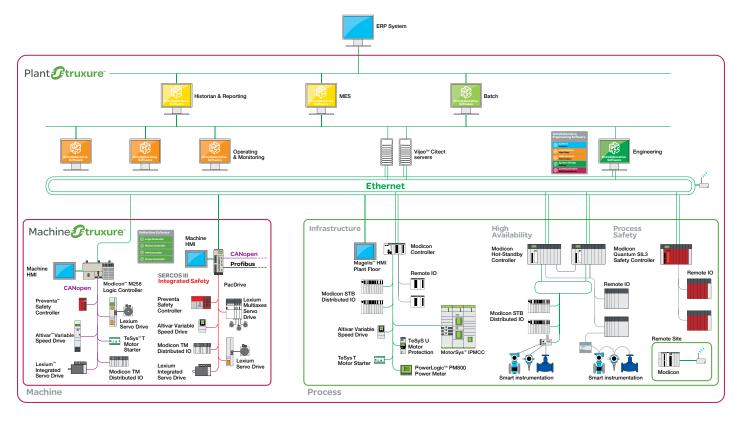
Our system supports the architectures that you need for your application. Single site, multiple sites, distributed control, local control, discrete, process, safety, and batch all within one system.

### Integrated to reduce risk

The entire system, from the manufacturing execution system (MES) to component devices to functionality, are designed to work together with your chosen technology partners.

### Collaborative to increase efficiency

Our system is open to exchange information with other plant and business software, and fosters an environment of collaboration by delivering the process information you need in the way that you like to see it.







## Simplify your machine designs

with Schneider Electric 2-D and 3-D CAD library.

Schneider Electric<sup>™</sup> has simplified the design and development of your machines and applications by publishing a growing list of 2-D and 3-D CAD files for your use. With a broad line of power, control and automation products, Schneider Electric 3-D Library is the perfect place to find detailed product models and specifications.

Built with compatibility to your design tools in mind, the 2-D and 3-D CAD library allows you to simply pick your format, download the file, and insert it into your design. The catalog delivers advanced 2-D and 3-D viewing technology that enables users to pan, zoom, and rotate.





Learn more about 2D and 3D CAD library, visit www.SEreply.com and enter key code j564v.

# Automation & Control Excellence (ACE)

### Need help developing a solution and improving the performance of your facility?

Your Local Schneider Electric<sup>™</sup> ACE Distributor is there to provide the answers and deliver the solutions you need. This exclusive group of Schneider Electric distributors has distinguished themselves as Schneider Electric best source of service and support for the unique challenges of the automation and control markets. They specialize in offering:

### The right inventory - when and where you need it

ACE distributors have a wider array of available automation and control inventory on their shelves in your local market. They are your fastest and best source for Schneider Electric products to meet your automation and control needs.

### Unparalleled technical capability

ACE distributors set the standard for Automation & Control Excellence. They offer decades of experience working with leading-edge automation and control solutions.

### A thorough understanding of your business

You can count on our ACE distributors to keep pulse of advancing technology and best practices. ACE distributors have access to Schneider Electric vast array of product, segment, and solution specialists who assist them in understanding which products and solutions are tailored to your business.



### **Become an ACE distributor**

The ACE program provides its members with a number of exclusive joint market development activities, including local trade shows, sales support tools and resources, marketing programs, and advertising campaigns to help you reach out to customers and prospects in your local market.

Becoming an automation and control expert requires a significant investment in training and resources by knowledgeable personnel. The Automation & Control Excellence program not only promotes development of these capabilities, but also provides a number of resources to make it simple.

For more information on becoming an Automation & Control Excellence Distributor, visit www.schneider-electric.us/go/ACE or email se-ace@schneider-electric.com.



Register to win a free trip to the Innovation Center in Raleigh, NC. Visit www.SEreply.com and enter key code j565v.



## Tested, validated, documented architectures

### Improving your machine and business performance.

Our new MachineStruxure™ solution is designed to help you achieve faster, lower risk, and more energyefficient and cost-effective designs and installations through the use of proven and innovative tested, validated, documented architectures that shorten time to market. MachineStruxure incorporates flexible and scalable hardware platforms and a comprehensive software suite with application function libraries.



### Increase machine performance and innovation

 Speed up machine concept to design and adapt them to your needs using our best-in-class product offer, predefined machine architectures and application function blocks.

### Reduce total cost of ownership

 Using our international offers, experience, presence, and international post sales support.

### Shorten time to market

- Save up to 50 percent in control system design and installation time with tested, validated, and documented architectures, ready-to-use function blocks, predefined CAD panel designs and wiring diagrams, fully-documented system user guides.
- Select the control solution to meet your machine requirements with our flexible and scalable machine control platform.
- Choose the appropriate controller with embedded intelligence in drives, HMI displays, motion and logic control products.
- Simplify and speed up control system programming and commissioning with an easy-to-use, single software suite, providing one tool, one connection, one project file and one download with complete openness and transparency.

### Performance automation tested, validated, documented architecture

An excellent solution using simple controls architecture dedicated to machines requiring performance and robustness. This architecture combines the new Modicon™ M258 logic controller, SoMachine<sup>™</sup> software, Altivar<sup>™</sup> 312 variable speed drive, TeSys™ U motor starters, Lexium™ 32 servo drive, and a Magelis™ XBTGT/GK/GH display unit, with traditional hardwired cabling.

### Compact/Hardwired/Logic Controller/Modicon™ M258

- Circuit breaker PowerPact™
- Switch mode power supply Phaseo™ ABL 8
- Modular circuit breaker Compact Multi 9™
- 4 Motion controller Modicon LMC058
- Servo drive Lexium 32
- 6 Stepper drive Lexium SD328
- 7 Machine safety Preventa™ XPS
- 8 Variable speed drive Altivar 32
- Variable speed drive Altivar 71

- 1 Display unit Magelis XBTGT/GK/GH
- Tower light Harmony™ XVM
- 13 Push buttons and switches Harmony XB4/5
- Emergency stop Harmony XALK
- Servo motor BSH
- 6 Stepper motor BRS 3
- Sensors OsiSense™ XC/XS/XU/XM/XX
- 18 Integrated drive Lexium ILE
- 19 Integrated drive Lexium ILA
- 20 Enclosure Himel™



### **OEM Technology and Solutions Center**

### Complete Development and Support Services Throughout Your Project Lifecycle

Machines today are characterized by a growing need to perform faster and have greater flexibility to solve more complex automation challenges than ever before. In addition, engineering costs have an increasingly important impact across the lifecycle of the machine, from concept and design to installation, maintenance, and service. The ability to reduce the time to market and the total cost of the machine, while achieving innovation and increased performance, is a machine builder's continuous challenge.

What's more, we take it one step further with our OEM Technology and Solutions Center — removing the complexity of machine building by offering start-to-finish project lifecycle expertise, including project management, electrical panel design, application co-design, joint marketing, testing, training, and services resources.



**OEM Technology and Solutions Center** 

At Schneider Electric, we are more than a component supplier. We are your partner for a full range of technical and support solutions.

### **OEM Knowledge Base - Dedicated support for your success**

Providing expert project management skills to you and your company is one of the OEM Technology and Solutions Center's greatest values. We're totally committed to our mission of giving you a leg up over the competition and saving you time and budget by utilizing our comprehensive project management services to ensure your project's successful execution. We are your solutions partners throughout the entire project lifecycle, providing a single point of contact, while developing and managing customized solutions, and providing clear communication and project reporting. Whether it's recommending productivity-boosting, efficient designs and innovative solutions, or assisting with conversions or codes and standards issues, our multi-disciplined teams are prepared to meet your specific needs.



**Dedicated support for** your success

### **Engineered Panel Solutions**

Expand your engineering services without the additional cost through the OEM Technology and Solutions Center. This includes Schneider Electric Engineered Panel Solutions business line that provides original equipment panel design and manufacturing process services for application-based solutions. We serve as an extension of your engineering arm without the overhead costs, thereby freeing up your engineering resources and allowing you to focus on your market offering. We offer application consulting, turn-key engineered solutions, specialized enclosure manufacturing, and turn-key motor control machine solutions.

### **Solutions Testing and Training Center**

Learn how to simply and easily build and commission flexible machines that reduce costs and time to market — all by the time you complete training. We offer basic and advanced training classes, hands-on testing, and demonstration offered through the OEM Technology and Solutions Center. We also offer ondemand training, schedule at your request and customized to your specific machine and application needs.



**OEM Solutions Testing** and Training Center



Learn more about the OEM Technology and Solutions Center, visit www.SEreply.com and enter key code j554v.



Section 1: Load Centers	Micrologic Electronic Trip Units for PowerPact H-, J-, and
Main Backup Power Solutions and Manual Transfer	L-frame Circuit Breakers
Accessories	Micrologic Trip Unit Accessories for Powerpact H-, J-, and
Meter Mains, 100–200	L-frame Circuit Breakers
Enclosed Solar Ready CSED Devices	Ocalian O Ocamba Mashaniana and Discount
Coation 0: Matering Equipment	Section 8: Operator Mechanisms and Disconnect
Section 2: Metering Equipment	Switches
1 Phase Main Devices       2-10         3 Phase Main Devices       2-12	MD Motor Disconnect Switches 8-7
3 Flidse Maili Devices	30–60 A Compact LK Nonfusible IEC Style Disconnect Switch 8-8
Section 3: Safety Switches	100–400 A LK Nonfusible IEC Style Disconnect Switch 8-8
	GS Fusible IEC Style Disconnect Switches
Special Application Enclosures	3 in. Handle Assembly 8-19
Motor Disconnect and Receptacle Switches	PowerPact D&L, MG and NSJ cable mechs
1000 Vdc Photovoltaic Heavy Duty Disconnect Switch	(bottom half of the table) 8-22
Section 4: Power Monitoring and Control	Ocation O. Donalka and
Power Monitoring Software	Section 9: Panelboards
Remote Energy Management	NQ 14-inch-wide Merchandised Panelboards9-8
PowerLogic <sup>™</sup> Metering	Coation 10: IDaCC Equipment
DM6200 Panel Meter	Section 10: IPaCS Equipment
PM1200 Multifunctional Power Meter	Standby Power Quick-Connect (SPQ) Tap Boxes
	Submetering Integrated Power Center
Arc Flash Protection and Mitigation System Vamp 221	Coation 11. Contabbaseds 9 Contabases
vamp 2214-20, 4-27	Section 11: Switchboards & Switchgear
Section 5: Lighting Control and Home Integrated	DVCAS Switchgear for Wind Farm Applications
	Power-Zone <sup>™</sup> Model III Package Unit Substations
Systems	Types EOX and VOX Vacuum Substation Circuit Breakers
Mark II Black and White and Spectrum Color Touch Screen	Automatic Circuit Recloser
Mark II Black and White and Spectrum Color	Load Break Switch/Sectionalizer
Touch Screen (Desktop Model)5-7	ADVC Controller
C-Bus™ Keypads, Touch Screens and Accessories	
Spectrum Touch Screen	Section 12: Busway
Wiser™ Home Controller	PowerPact H-, J-, and M-Frame Plug-in Units
8-Channel Low Voltage Relay5-14	with Electronic Trip
Occupancy Sensors	PowerPact P-Frame Plug-in Units
Fluorescent High Bay Sensors	
UL 924 Emergency Control Device	Section 14: Transformers
	NEMA Premium Transformers
Section 6: Surge Protective Devices	Transformer Enclosures
EMA Surge Protective Devices (SPDs)	1201–15,000 V Indoor Transformers
(25 new catalog numbers and new options)6-2	
Options for L-L Enhanced SPDs and EBA SPDs	Section 15: Medical Products
Replacement Modules for EMA SPDs	Iso-Gard™ Series 6 Line Isolation Monitor—UL Recognized 15-4
(15 new catalog numbers)	Iso-Gard IG2000P Remote Alarm Indicator
Type 1 SPD option for I-Line Branch Units	Iso-Gard IGR and IGRD Nurses' Station
Surgelogic <sup>™</sup> OEM / Assembler Kits (15 new catalog numbers) 6-6	Indicators/Alarm Annunciators
SDSA3650 600 V 3-phase, 3-wire, Delta SPD	Iso-Gard IGT Dual Clock/Timer
HWA Surge Protective Devices (SPDs)	Iso-Gard IGT1550 Remote Control
(9 new catalog numbers)	
SDSA1175T Surge Protective Device (SPD)	Section 16: NEMA Contactors & Starters
Flush Mount Kit for XR and HWA Surge Protective Devices 6-7	TeSys™ T Motor Management System
XR Nipple Mounted Surge Protective Devices (SPDs)	(NEMA Sizes 1–6)
Whole House SPDs (NEMA 1 Basic, NEMA 3R Basic)	(
	Section 17: Motor Control Centers
HEPD80 Home Electronics Protective Device and Replacement Kit6-8	Intelligent Motor Control Center—Model 6 iMCC
neplacement Nit0-6	<b>3</b>
Section 7: Circuit Breakers	Section 18: IEC Contactors and Starters
PowerPact™ H-Frame Circuit Breakers—now available with	TeSys™ F1700, F2100 Contactors
Micrologic™ Electronic Trip Units	Mechanical Interlock and Power Connection Kit for
PowerPact J-Frame Circuit Breakers—now available with	TeSys D Reversing Contactors
	TeSys D Overload Relay Mounting Kits
Micrologic Electronic Trip Units	Motor Protector Circuit Breakers
New R Interrupting for PowerPact H and	10 00
J-Frame rating	Section 19: Push Buttons and Operator Interface
400 A PowerPact L-Frame Circuit Breakers with	22 mm Push Buttons
Micrologic Electronic Trip Units	XB5R Plastic and XB4R Metal Wireless,
PowerPact L-Frame Motor Circuit Protectors	Batteryless Push Buttons
PowerPact L-Frame Automatic Switches	XB5S Biometric Switches
Masterpact™ NW DC Circuit Breakers	Double and Triple-Headed Push Buttons
Accessories for L-frame	XB4 Two Button/Three Button Push Buttons,
(mixed in with other accessories)	Momentary
	womenay 19-23

### New and Enhanced Products in Digest 176 (cont'd)

ZB4 Two Head/Three Head Operators,	Section 27: Automation Products
Momentary 19-27 thru 19-28	HMI
ZB4 Two Button with Clear Pilot Light, Momentary	Magelis™ STO/STU Small HMI
XB5 Two Button/Three Button, Momentary	Magelis XBT GH Handheld HMI
ZB5 Two Head/Three Head Operator	Magelis Smart+ iPC Industrial PC (without moving parts) 27-4
ZB5 Two Button with Clear Pilot Light, Momentary	Distributed I/O
30 mm Push Buttons	Modicon <sup>™</sup> TM5 Expansion Modules and Distributed I/O 27-5
Momentary Action, Metal Mushroom Head	Modicon TM7 Expansion Modules and Distributed I/O 27-5
Push Button Operators	OEM Controller/Machine Solutions
Two-Position, Push-Pull Action Metal Mushroom Head	Modicon M168 Programmable Logic Controller
Push Button Operators	Modicon 238 Logic Controller
Non-Illuminated Turn-to-Release Mushroom Operators 19-68	Modicon 258 Logic Controller
Non-Illuminated Multifunction Turn-to-Release	Modicon LMC058 Motion Controller
Mushroom Operators	Altivar IMC Integrated Controller Card (for Altivar 61 and
Control Stations and Enclosures	Altivar 71 Variable Speed Drives)
Guarded Enclosures (Empty)	Magelis XBT GC HMI Controller
Assembled Guarded Enclosures	SoMachine Software Suite
Tower Lights and Beacons	
Rotating Mirror Beacons	Section 28: Enclosures
XVC Pre-Assembled and Pre-Wired	All new section featuring:
Tower Lights	Spacial.pro Software
XVS Sirens and Electronic Alarms	ProClima Software
	Spacial.ref and Thalassa.ref Software
Section 20: Electronic Sensors & Machine Cabling	Spacial™ Steel Enclosures
XU•M Metal Body Photoelectric Sensors	Thalassa™ Polyester Enclosures
XUVR / XUVA Optical Fork Photoelectric Sensors	ClimaSys™ Thermal Management System
XS Inductive Proximity Sensors	·
XT Capacitive Proximity Sensors	Section 29: Advanced Products
	All new section featuring:
Section 21: Limit Switches	EVlink™ Electric Vehicle Charging Stations (Overview)
Osisense™ XCKM and XCKL limit switches, classic,	Indoor Charging Stations (Residential Applications) 29-3
metal, variable composition	Outdoor Charging Stations
Osisense™ XCKJ limit switches, standard, industrial	Wiser™ Energy Efficiency Solutions (Overview)
format, EN 50041, metal, fixed or plug-in body 21-24 thru 21-25	In-Home Display (IHD)
9007C limit switches, heavy duty industrial, plug-in	Programmable Communicating Thermostats (PCT) 29-6
body, metal, adaptable subassemblies 21-30 thru 21-31	Smart Plug 29-7
	Load Control Relays
Section 22: Pressure, Vacuum, Temp, and Float	Large Load Control
Switches	Ethernet Gateway
XMLK Pressure Transmitters	Conext™ Series Grid Tie Solar Inverters
Section 26: AC Drives & Soft Starts	
Altivar™ 212	
S-Flex <sup>™</sup> 212 Enclosed Drive Controller	

# Back to Product Index Section Listing

# **Section 1**

# **Load Centers**



QO Plug-On Circuit Breakers, Page 1-2



QO Load Center, Page 1-5



HOM 1P, Page 1-14



Homeline Load Center, Page 1-15



Combination Service Entrance Devices, Page 1-19

Q	O™ Miniature Circuit Breakers	1-2					
	QO Plug-On Circuit Breakers	1-2					
	Accessories	1-4					
Q	O Load Centers	1-5					
	Indoor, 1Ø, Main Lugs	1-5					
	Indoor, 1Ø Main Circuit Breaker	1-6					
	Rainproof 1Ø, Main Lugs, Main Circuit Breaker	1-7					
_	3Ø, Main Lugs, Main Circuit Breaker	1-8					
New!	Backup Power Solutions and Manual Transfer Accessories	1-9					
	Special Applications	1-10					
	QO Load Center Accessories	1-11					
Н	omeline™ Circuit Breakers	1-14					
Н	omeline Load Centers	1-15					
	Indoor, 1Ø, Main Lugs, Main Circuit Breaker	1-15					
	Rainproof, 1Ø, Main Lugs, Main Circuit Breakers	1-16					
Q	O and Homeline Load Centers	1-17					
	Load Center Value Packs	1-11					
	Load Center Mounted Surge Protection Devices	1-12					
	QO and Homeline Accessories	1-12					
	Indoor Load Centers, Dimensions, Knockouts	1-17					
	Rainproof, Dimensions, Knockouts, Bolt-on Hubs	1-18					
C	ombination Service Entrance Devices (CSED)	1-19					
New!	Meter Mains, 100—200 A	1-19					
	All-In-Ones, 100—225 A	1-20					
	Meter Mains and All-In-Ones, 300—400 A	1-21					
	Circuit Breakers, Accessories, Hubs	1-22					
	Dimensions	1-23					
y) So	olar Ready CSED	1-24					
Eı	Solar Ready CSED  Enclosed Devices						
Se	ervicepak™ Power Outlet Panels	1-26					
Q	O™ Load Centers	1-27					
New!	QO Plug-on Neutral CAFI Load Centers	1-27					



New!

Amperes Rating ■

10 A

15 A

20 A

25 A

30 A

35 A

40 A

10 k AIR

29.10

29.10

29.10

29.10

29.10

29.10

29.10

Common Trip

\$ Price

67.00

67.00

67.00

67.00

67.00

67.00

67.00

Cat. No.

QO210

QO215\*

QO220\*

QO225\*

QO230\*

QO235\*

QO240\*

\$ Price

248.00

248.00

248.00

248.00

248.00

248.00

248.00

Class 730, 731, 733 / Refer to Catalog: 0730CT9801

Cat. No.

QO310

QO315\*

QO320\*

QO325\*

QO330\*

QO335\*

QO340\*

Square D brand QO miniature circuit breakers are plug-on products for use in QO load centers, NQOD and NQ panelboards, NQOD and NQ OEM interiors or Speed-D<sup>™</sup> switchboard distribution panels. Bolt-on QOB circuit breakers are for use in NQOD and NQ panelboards or interiors. ▲
The Square D exclusive Qwik-Open mechanism, with a trip reaction within 1/60th of a second, is standard on all 1P 15 A and 20 A QO circuit breakers.

Cat. No.

QQ215H

Q0220H

Q0225H

QO230H

QO240H

200.00

200.00

200.00

200.00

200.00



Cat. No.

QO110

QO115<sup>\*</sup>▼

QO120<sup>★</sup>▼

QO125\*

QO130\*

QO135 \*

QO140 \*



1 Space Required



QOT 1P Tandem 1 Space Required



QQ 2P 2 Spaces Required

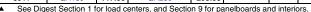


QO2200 2P 200 A 4 Spaces Required



3 Spaces Required

40 A	QO140 ^	29.10	QO240^	67.00	QO240H	200.00	QO340^	248.00
45 A	QO145 *	29.10	QO245*	67.00	_	_	QO345*	248.00
50 A	QO150 *	29.10	QO250*	67.00	QO250H	200.00	QO350*	248.00
60 A	QO160 *	29.10	QO260*	67.00	QO260H	200.00	QO360*	248.00
70 A	QO170 *	67.00	QO270*	134.00	QO270H	224.00	QO370*	315.00
80 A	_	_	QO280*	189.00	QO280H	315.00	QO380*	366.00
90 A	_	_	QO290*	189.00	QO290H	315.00	QO390*	366.00
100 A	_	_	QO2100*	189.00	QO2100H	315.00	QO3100*	366.00
110 A	_	_	QO2110*	428.00	_	_	_	_
125 A	_	_	QO2125*	428.00	_	_	_	_
150 A	_	_	QO2150 <sup>*</sup> △•	491.00	_	_	_	_
175 A	_	_	QO2175*∆⊖	491.00	_	_	_	_
200 A	_	_	QO2200 <sup>*</sup> △⊖	491.00	_	_	_	
Molded Case S	witch 60 A max	<. <del>-</del> 240	_		QO200	70.00	QO300	248.00
Vac		0.40			40200	. 0.00	40000	0.00
Molded Case S Vac	witch 100 A ma	ax.–240	_	_	QO2000*	200.00	QO3000*	366.00
22 k AIR*								
15 A	QO115VH ▼	63.00	QO215VH <sup>□</sup>	146.00	_	_	QO315VH <sup>D</sup>	371.00
20 A	QO120VH ▼	63.00	QO220VH <sup>D</sup>	146.00	_	_	QO320VH <sup>D</sup>	371.00
25 A	QO125VH	73.00	QO225VH <sup>D</sup>	146.00	_	_	QO325VH <sup>D</sup>	371.00
30 A	QO130VH	73.00	QO230VH□	146.00	_	_	QO330VH <sup>□</sup>	371.00
40 A	QO140VH	73.00	QO240VH <sup>□</sup>	146.00	_	_	QO340VH <sup>D</sup>	371.00
50 A	QO150VH	73.00	QO250VH <sup>□</sup>	146.00	_	_	QO350VH <sup>II</sup>	371.00
60 A	QO160VH	73.00	QO260VH <sup>D</sup>	146.00	_	_	QO360VH <sup>D</sup>	371.00
70 A	QO170VH	112.00	QO270VH <sup>□</sup>	224.00	_	_	QO370VH <sup>II</sup>	477.00
80 A	_	_	QO280VH <sup>II</sup>	315.00	_	_	QO380VH <sup>D</sup>	530.00
90 A		_	QO290VH <sup>-</sup>	315.00	_	_	QO390VH <sup>-</sup>	530.00
				0.0.00				
100 A	_	_	QO2100VH <sup>□♦</sup>	315.00	_	_	QO3100VH <sup>D</sup>	530.00
110 A	_	_	QO2110VH <sup>□♦</sup>	1034.00	_	_	_	_
125 A	_	_	QO2125VH <sup>□◊</sup>	1034.00	_	_	_	_
150 A	_	_	QO2150VH△□ •	1061.00	_	_	_	-
175 A	_	_	QO2175VH△□ •	1061.00	_	_	_	_
200 A	_	_	QO2200VH△□•	1061.00	_	_	_	_
42 k AIR*								
40 A	_	_	QOH240 *	317.00	_	_	_	_
45 A	l –	_	QOH245 *	317.00	_	_	_	_
50 A	_	_	QOH250 <sup>★</sup>	317.00	_	_	_	_
60 A	l _	_	QOH260*	317.00	_	l _	_	_
70 A			QOH270	528.00	_			l
-	_	_			_	_	_	_
80 A	_	_	QOH280	651.00	_	_	_	_
90 A	_	_	QOH290	651.00	_	_	_	-
100 A	_	_	QOH2100	651.00	_	_	_	_
110 A	_	_	QOH2110*	1389.00	_	-	_	-
125 A	_	_	QOH2125	1389.00	_	-	_	-
65 k AIR*	·							·
15 A	QH115▼	117.00	QH215	293.00		_	QH315*	507.00
20 A	QH120▼	117.00	QH220	293.00	_	_	QH320	507.00
25 A	QH125*	117.00	QH225*	293.00	_	_	QH325*	507.00
30 A	QH130	117.00	QH230	293.00	_	_	QH330	507.00
						1		



- 10–30 A circuit breakers are suitable for use with 60oC or 75oC conductors. 35–125 A circuit breakers are suitable for use with 75oC conductors.
- UL Listed 5 k AIR on corner grounded Delta systems.
- UL Listed as HACR type for use with air conditioning, heating and refrigeration equipment haing motor group combinations and marked for use with HACR type circuit breakers.
- UL Listed as SWD (switching duty) rated. Suitable for switching 120 Vac fluorescent lighting loads. Requires four spaces (1 AWG–300 kcmil Al/Cu.) Suitable for switching 120 Vac fluorescent lighting loads.
- UL Listed for use ahead of QO, QO-GFI, QO-EPD, QOT, QO-AFI, and QO-PL 10 k AIR circuit breakers to permit their application at 22 kA fault level.
- 100 A maximum branch mounted opposite.
- Order only. Contact your local Field Office.
- Includes two circuit breakers (one QO2030 and one QO3020) and handle tie QOTHT.
- Not suitable for use in 3Ø panels. Use only in 1Ø panel rated 150 A or greater.

Table 1.2:	QO/QOB	Ring	<b>Terminal</b>
(20% \$ Price Adder)	-Factory-inst	alled on	ly

Ampere Rating	Poles	Suffix
10–30 A	1, 2, 3	5237
35-60 A	1,2	5238
35-50 A	3	5238
70–110 A	2	5273
60-100 A	3	5273

Table 1.3:	Wire Sizes	;■
Circuit Breaker Type	Ampere Rating	Wire Size (AWG/kcmil)
	10-30 A	14-8 Al/Cu
QO 1P	10-30 A	(2) 14-10 Cu
	35-70 A	8-2 Al/Cu
	10–30 A	14-8 Al/Cu
00	10–30 A	(2) 14-10 Cu
QO 2P	35–70 A	8-2 Al/Cu
	80-125 A	4-2/0 Al/Cu
	150–200 A	4-300 Al/Cu
QO	10–30 A	14–8 Al/Cu, (2) 14-10 Cu
3P	35-70 A	8-2 Al/Cu
	80-125 A	4-2/0 Al/Cu
QOB-VH	110–150 A	4–300 Al/Cu
QOT	15–20 A	12-8 Al 14-8 Cu
QO-AFI, QO-GFI	15–30 A	12-8 Al 14-8 Cu
or QO-EPD	40, 50, 60 A	12-4 Al 14-6 Cu
QO-PL	10–60 A	12-2 Al 14-2 Cu
		<del>-</del>

**Table 1.4: QOT Tandem Circuit Rreakers** 

Dicarcis						
Ampere Rating■	Cat. No.*	\$ Price				
1P-120/240 Vac						
15 A and 15 A	QOT1515	58.00				
15 A and 20 A	QOT1520	58.00				
20 A and 20 A	QOT2020	58.00				
2P—120/240 Vac Common Trip						

Order two QOT1515 or QOT2020 circuit breakers and handle tie QOTHT for common switching of center two

#### Replacement Tandem **Table 1.5: Circuit Breakers**

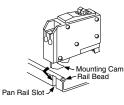
For use in Old Style Non-Class CTL

QO Load Centers—	-IUK AIN					
Ampere Rating■	Cat. No.*	\$ Price				
1P—120/240 Vac—1 Space Required						
15 A and 15 A	QO1515	73.00				
15 A and 20 A	QO1520	73.00				
20 A and 20 A	QO2020	73.00				
20 A and 30 A	QO2030	73.00				
30 A and 20 A	QO3020	73.00				
Two 1P Individual Trip—120/240 Vac—2 Spaces Required						
15 A and 15 A 15 A and 20 A	Order Two QO1515 or QO2020 circles breakers and handle tie QOTHT					

QO20303020V

20 A and 30 A 30 A and 20 A **QOT Tandem** 

15 A and 20 A 20 A and 20 A



Current limiting QOT tandem circuit breakers have a mounting cam as shown. Installation into a QO load center can only be made in those positions having a positions having a mounting pan rail slot. Meets Paragraph 408.15 of the NEC® UL Listed as Class CTL

134.00







QQ-CAFI

QO-DF

QO-GFI

QO-GFI

QO-K Key Operated

# **QO™ Miniature Circuit Breakers**

### ------

# Class 685, 690, 730, 912, 950 / Refer to Catalog: 0730CT9801

### **QO Arc-Fault Circuit Breaker**

QO arc-fault circuit breakers provide protection for Series and Parallel Type Arcing as required by the NEC and local code adoption, and comply with UL1699.

Table 1.6: QO Arc Fault Circuit Breakers▲

		1P 120 \	/ac	1P 120 Vac 22 k AIR		
Circuit Breaker Type	Ampere	10 k A	IR			
Circuit Breaker Type	Rating	1 Space Re	quired	1 Space Required		
		Cat. No.	\$ Price	Cat. No.	\$ Price	
Combination Arc-fault	15	QO115CAFI	282.00	QO115VHCAFI	534.00	
Interrupter (Pigtail Neutral)	20	QO120CAFI	282.00	QO120VHCAFI	534.00	
Plug-On Neutral	15	QO115PCAFI	282.00	QO115VHPCAFI	534.00	
Combination Arc-fault Interrupter	20	QO120PCAFI	282.00	QO120VHPCAFI	534.00	

NOTE: QO Dual Function (Combination Arc Fault and Ground Fault Circuit Interrupter) breakers are on page 1-27.

#### QO-GFI

Qwik-Gard<sup>™</sup> circuit breakers provide overload and short circuit protection, combined with Class A ground fault protection. Class A denotes a ground fault circuit interrupter that will trip when a fault current to ground is 6 mA or more, for people protection. Do not connect to more than 250 feet of load conductor for the total one-way run to prevent nuisance tripping.

Table 1.7: QO-GFI Circuit Breakers New!

	010 1.7.	-	x0 a o					
•	Qwik-Gard Circuit Breakers With Ground Fault Circuit Interrupter							
Rating		1P 1	20 Vac		2P Common Trip 120/240 Vac		3P Common Trip 208Y/120 Vac	
e B	10 k Al	R	22 k AIR		10 k AIF	}	10 k AIR	
Ampere	1 Space Required		1 Space Required		2 Spaces Required		3 Spaces Required	
٩	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15	QO115GFI	233.	QO115VHGFI	482.	QO215GFI	413.	QO315GFI	791.
20	QO120GFI	233.	QO120VHGFI	482.	QO220GFI	413.	QO320GFI	791.
25	QO125GFI	233.	QO125VHGFI	482.	QO225GFI	413.	_	_
30	QO130GFI	233.	QO130VHGFI	482.	QO230GFI	413.	QO330GFI	791.
40	_	_	_	_	QO240GFI	413.	QO340GFI	791.
50	_	_	_	_	QO250GFI	413.	QO350GFI	791.
60	_	_	_	_	QO260GFI★	413.	_	_

# QO-EPD/EPE

QO-EPD/EPE circuit breakers provide overload and short circuit protection combined with Class B ground fault protection. They are designed to provide ground fault protection of equipment at a 30 mA level (EPD) or 100 mA level (EPE). They are not designed to protect people from electrical shock.

Table 1.8: OO-EPD Circuit Breakers New!

Ta	Table 1.8: QO-EPD Circuit Breakers							
Rating♦	1P 120 Vac		2P Common Trip 120/240 Vac		3P Common Trip 240 Vac			
ati	10 k All	R	10 k AIR			10 k	AIR	
Ampere F			2 Spaces Rec	uired	3 S	paces	Required	
Ami	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15	QO115EPD	410.	QO215EPD	660.	QO315EPD▼	1077.	QO315EPE▼	1077.
20	QO120EPD	410.	QO220EPD	660.	QO320EPD▼	1077.	QO320EPE▼	1077.
25	QO125EPD	410.	QO225EPD	660.	_	_	_	_
30	QO130EPD	410.	QO230EPD	660.	QO330EPD▼	1077.	QO330EPE▼	1077.
40	_	_	QO240EPD	660.	QO340EPD▼	1077.	QO340EPE▼	1077.
50	_	_	QO250EPD	660.	QO350EPD▼	1077.	QO350EPE▼	1077.
60	_	_	QO260EPD★	660.	_	_	_	_

### QO-SWN

Switch Neutral Common Trip 2008 NEC® 514.11

### Table 1.9: QO-SWN Circuit Breakers

	2 Wire 1	I20 Vac	3 Wire 120/240 Vac 10 k AIR		
Ampere	10 k	AIR			
Rating ◆	2 Spaces	Required	3 Spaces Required		
	Cat. No.	\$ Price	Cat. No.	\$ Price	
10	QO210SWN	95.00	QO310SWN	143.00	
15	QO215SWN	95.00	QO315SWN	143.00	
20	QO220SWN	95.00	QO320SWN	143.00	
25	QO225SWN	95.00	QO325SWN	143.00	
30	QO230SWN	95.00	QO330SWN	143.00	
40	QO240SWN	95.00	QO340SWN	143.00	
50	QO250SWN	95.00	QO350SWN	143.00	

#### QO-HID

HID circuit breakers are for use on circuits feeding fluorescent and high intensity discharge (HID) lighting systems such as mercury vapor, metal halide, or high pressure sodium. These circuit breakers are physically interchangeable with QO circuit breakers.

Table 1.10: QO-HID Circuit Breakers

	1P 120/24	0 Vac	120/240		240 Vac		
Ampere Rating •	10 k A	IR	10 k A	IIR .	10 k AIR		
naung▼	1 Space Re	quired	2 Spaces R	equired	3 Spaces Required		
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	
15	QO115HID	38.10	QO215HID	87.00	QO315HID	300.00	
20	QO120HID	38.10	QO220HID	87.00	QO320HID	300.00	
25	QO125HID	38.10	QO225HID	87.00	QO325HID	300.00	
30	QO130HID	38.10	QO230HID	87.00	QO330HID	300.00	
40	QO140HID	38.10	QO240HID	87.00	_	_	
50	QO150HID	38.10	QO250HID	87.00		_	

#### QO-K

Key operated QO circuit breakers are available in single-pole construction and can be mounted in any single-pole space which will accept a standard QO. These circuit breakers can be turned ON or OFF or to RESET with a special key (catalog number QOK10) included with the circuit breaker. These circuit breakers are UL Listed and available as shown in the table.

Table 1.11: QO-K Circuit Breakers

120 Vac—10 I	AIR (1 Space Required)	to the second
Ampere Rating <b>♦</b>	Cat. No.	\$ Price
10	QO110K	164.00
15	QO115K	164.00
20	QO120K	164.00
25	QO125K	164.00
30	QO130K	164.00

## QO-HM

High magnetic trip circuit breakers are recommended for applications where high initial inrush may occur and for individual dimmer applications.

Table 1.12: QO-HM Circuit Breakers

	120 Vac—10 k AIR	
Ampere	1P	
Ampere Rating <b>♦</b>	Cat. No	\$ Price
15 A	QO115HM▲	30.60
20 A	QO120HM▲	30.60

# Non-automatic (Standard) Miniature Switches

Miniature non-automatic switches have the same physical packaging as miniature circuit breakers, but open only when the handle is switched to the OFF position.

Non-automatic switches provide no overcurrent protection or short circuit protection. They must not be used on systems that have an available fault current greater than the values listed in the table.

Non-automatic switches are UL Listed per UL 1087 and are CSA certified.

Table 1.13: QO Non-Automatic Miniature Switches, 240 Vac 10 kA

Ampere	2	P.	3P				
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price			
60	QO200	70.00	QO300	248.00			
100	QO2000	200.00	QO3000	366.00			

- UL Listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.
- UL Listed as SWD (switching duty) rated. Suitable for switching 120 Vac fluorescent lighting loads.
- 10–30 A circuit breakers are suitable for use with 60°C or 75°C conductors. 35–60 A circuit breakers are suitable for use with 75°C conductors.
- ★ Suitable only for feeding 240 Vac and 208 Vac two-wire loads. Does not contain load neutral connection.
- See note in Instruction Bulletin when using in an enclosure with a QO403 or QON prefix.

Interrupting Hatings	Page 7-2
Accessories	.Page 7-12
Dimensions	.Page 7-54



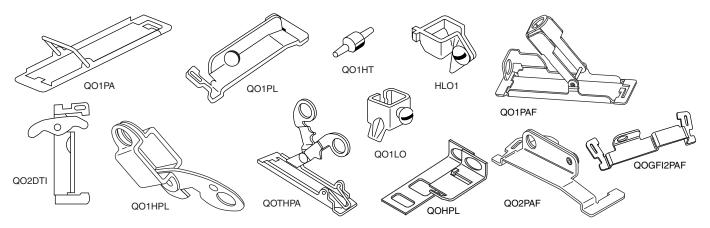
With Shunt Trip

**LOAD CENTERS** 

#### Accessories for use with QO and QOB Miniature Circuit Breakers Table 1.14:

	Description	Cat. No.	\$ Price	Schedule
Handle Attachments				
Handle Tie	Converts any two adjacent 120/240 Vac 1P QO circuit breakers to independent trip 2P	QO1HT	3.80	DE2E
	Converts any two adjacent 120/240 Vac1P side-by-side QOT circuit breakers to independent trip 2P	QOTHT	3.80	DE2E
Handle Clamp	Clamp for holding QO 1P handle in ON or OFF position	QO1LO	3.80	DE2E
	Clamp for holding QO or Q1 either 1P, 2P or 3P circuit breaker handles in ON or OFF position	HLO1	9.90	DE2E
	For padlocking 1P QO circuit breaker in ON or OFF position			
	Loose attachment	QOHPL	9.90	DE2E
	Fixed attachment	QO1PA	10.70	DE2E
Handle Padlock Attachment for	For padlocking 1P side-by-side QOT circuit breaker in ON or OFF position	QOTHPA	11.10	DE2E
Padlocking in ON or OFF position	For padlocking 2P QO-GFI circuit breakers in either ON or OFF position, fixed attachment.	GFI2PA	9.20	DE2A
	For 2P and 3P QO and Q1 standard circuit breakers which require padlocking in either ON or OFF position.			
	Loose attachment	QO1HPL	10.70	DE2E
	Fixed attachment	QO1PL	10.70	DE2E
	For padlocking 1P QO circuit breaker in OFF position only, fixed attachment.	QO1PAF	43.50	DE2E
Handle Padlock Attachment for	For padlocking 2P and 3P QO circuit breakers in OFF position only, fixed attachment.	QO2PAF	25.80	DE2E
Padlocking in OFF position	For padlocking 1P QO-GFI, QO-AFI and QO-EPD circuit breakers in OFF position only, fixed attachment.	QOGFI1PAF	51.00	DE2E
	For padlocking 2P QO-GFI and QO-EPD circuit breakers in OFF position only, fixed attachment.	QOGFI2PAF	38.40	DE2E
Ring Terminal	Ring terminals are available as a factory-installed option.	See page 7-10	+20% Price Adder	DE2A
Sub-feed Lugs	60 A 2P plug-on – 2 spaces required (6–2 Al/Cu)	QO60SL	47.10	DE2A
	125 A 2P plug-on – 2 spaces required (12–2/0 Al/Cu)	QO2125SL	137.00	DE2A
	225 A 2P plug-on – 4 spaces required (4–300 Al/Cu)	QO2225SL▲	308.00	DE2A
	125 A 3P plug-on – 3 spaces required (12–2/0 Al/Cu)	QO3125SL	137.00	DE3
Mechanical Interlock Attachment	For interlocking the handles of two 2P or one 2P and one 1P QO and Q1 circuit breakers mounted side-by-side so that only one circuit breaker can be ON at a time (Not QOU)	QO2DTI	24.90	DE2E
With Retaining Kit	QO2DTI mechanical interlock attachment with retaining kits for securing two adjacent back-fed circuit breakers in dual power supply applications. Can be used with (2) 2Ps or (1) 2P and (1) 1P QO circuit breakers in QO	QO2DTIM	63.00	DE2E

Not suitable for use in 3Ø panels. Use only in 1Ø panel rated 150 A or greater.



# Factory-Installed Accessories for use with QO and QOB Miniature Circuit Breakers

Factory-installed electrical accessories take up an additional pole space on QO, QO-GFI, QO-EPD, QO-SWN and QOU circuit breakers. All AC electrical accessories shown below are rated for 50/60 Hz. Accessories are not available for QOB-VH (2P 150 A and 3P 110–150 A) circuit breakers or QO, QOU molded case switches. QO circuit breakers will accept only one accessory per circuit breaker. Undervoltage trip is not available on miniature circuit breakers. Factory-installed accessories are not available for QO-AFI or QO-CAFI Arc Fault Circuit Breakers or on QO2150, QO2175, or QO2200 circuit breakers.

Table 1.15: **Factory-Installed Accessories** 

Accessory	Description	Rated Voltage	Coil Burden	Cat. No. Suffix	\$ Price Adder	Accessory	Description	Contact Comb.	Max. Voltage		Cat. No. Suffix	\$ Price Adder
Shunt Trip	Trips the circuit breaker from a remote location by means of a trip coil energized from a separate circuit. A 120 Vac shunt trip will operate at 55% or more of rated voltage. All other shunt trips will operate at 75% or more of rated voltage.  Application	12 Vac/Vdc 24 Vac/Vdc	60 VA 168 VA	-1042	189.00	Auxiliary Switches	Monitors circuit breaker contact status and provides a remote signal indicating the circuit breaker contacts are OPEN or CLOSED.  Application  Auxiliary switch terminals accept (2) 14–12 AWG Cu leads.  Leads (EH): Yellow for "A", Blue for "B", Striped common 18 AWG Cu.	1A 1B	120 Vac 120 Vac	5 A 5 A	-1200 -1201	132.00 132.00
	For use with momentary or maintained push button.     Not available on QO-GFI, QO-EPD.     Shunt trip terminals accept (2) 0.14– 0.12 AWG Cu.	120 Vac 208 Vac 240 Vax	72 VA 228 VA 288 VA	-1021	189.00	Alarm Switches	Used with control circuits and is actuated only when the circuit breaker has tripped. Standard construction includes a normally-open contact.  Application  Leads: Alarm switch terminals accept (2) 14–12 AWG Cu leads.		120 Vac	5 A	-2100	132.00

# 1Ø3W-120/240 Vac-UL Listed

Main Lugs (Accepts Only QO Plug-On Circuit Breakers.) Table 1.16:

	Mains	Spaces	Max. 1P	Max. Tandem	\$ Price (Interior,	Load Center Box and Interior			Cover with Do ler Separately)		Main W AWG		Equipment ( Kit (Order S		Box No. See Page
	Rating	Оразов	Circuits▲	Circuit Breakers	Box and Cover)			Flush	Surface	\$ Price					1-17
						Cat. No.	\$ Price	Cat. No.	Cat. No.	1	Al	Cu	Cat. No.	\$ Price	
						Short Circuit Current Rating									
	30 A	2	2	0	41.70	QO2L30S◆★	41.70		luded—Without		12–10		PK3GTA1	11.40	1
	70 A	2	4	2	69.00	QO24L70F/S▼△	69.00		luded—Without		12–3	14–4	PK4GTA	10.80	2
		6	12	6	87.00	QO612L100F/S▼□	87.00		luded—Without				PK7GTA	11.70	4
		6	12	6	90.00	QO612L100DF/S▼□	90.00		cluded—With D				PK7GTA	11.70	4
	100 A	8	16	8	131.00	QO816L100F/S▼□	131.00		luded—Without		_		PK7GTA	11.70	4
		8	16	8	143.00	QO816L100DF/S▼□	143.00		cluded—With D		8-	-1	DICTOTA	44 =0	
		6	12	6	111.00	QO612L100DFCU/SCU▼□◊	111.00		cluded—With D				PK7GTA	11.70	4
	405.4	8	16	8	174.00	QO816L100DFCU/SCU▼□♦	174.00		cluded—With D		10.0/0	44.0/0	PK7GTA	11.70	4
	125 A	4	8	·	93.00	QO148L125GF/S▼☆	93.00		luded—Without			14–2/0	PK7G		21
	Conver					65 kA Short Circuit Current Ra					ain Circ	uit Brea			
		12	12	0	196.70	QO112L125G	159.00	QOC16UF	QOC16US	37.70			PK9G		6
		12	24	12	235.70	QO11224L125G	198.00	QOC16UF	QOC16US	37.70			PK150		6
		16	16	0	255.70	QO116L125G	218.00	QOC24UF	QOC24US	37.70			PK120		7
	125 A	16	24	8	300.70	QO11624L125G	263.00	QOC24UF	QOC24US	37.70	6-	2/0	PK150		7
	-	20	20	0	271.70	QO120L125G	234.00	QOC24UF	QOC24US	37.70	-		PK150		7
Ň		20	24	4	370.70	QO12024L125G	333.00	QOC24UF	QOC24US	37.70			PK150		7
D		24	24	0	381.70	QO124L125G	344.00	QOC24UF	QOC24US	37.70			PK150		7
0		32	32	0	434.60	QO132L125G	395.00	QOC32UF	Use Flush	39.60			PK23GTA, L	K100AN*	8
Ř	Conver					65 kA Short Circuit Current Ra	. •			_	Bus■∇	7			
		20	30	10	419.00	QO12030L150G	332.00	QOC30UF	QOC30US	87.00			PK23GTA, L		9
	150 A	24	24	0	431.00	QO124L150G	344.00	QOC30UF	QOC30US	87.00	6–2	250	PK150		9
		30	30	0	437.00	QO130L150G	350.00	QOC30UF	QOC30US	87.00			PK23GTA, L		9
		12	12	0	353.00	QO112L200G	266.00	QOC30UF	QOC30US	87.00			PK150		9
		24	36	12	819.00	QO12436L200TFT●	732.00	QOC40UF	QOC40US	87.00			PK23GTA, L		10
		30	30	0	494.00	QO130L200G	407.00	QOC30UF	QOC30US	87.00			PK23GTA, L		9
	200 A	30	40	10	554.00	QO13040L200G	467.00	QOC30UF	QOC30US	87.00	6–2	250	PK23GTA, L		9
		40	40	0	746.00	QO140L200G	659.00	QOC40UF	QOC40US	87.00			PK23GTA, L		10
		40	60	20	944.00	QO14060L200G	857.00	QOC40UF	QOC40US	87.00			(2) PK15		10
		42	52	10	921.00	QO14252L200G	810.00	QOC42UF	QOC42US	111.00			(2) PK15		11
	225 A	42	42	0	828.00	QO142L225G	717.00	QOC42UF	QOC42US	111.00	6–3	300	PK23GTA, L	K100AN*	11
	Fixed M	lains—Fa	ctory-Insta	lled Main Lu	gs—65 kA	Short Circuit Current Rating									
		30	30	0	1641.00	QONQ30LS400 (Int)	1080.00	NC50NQVF	NC50NQVS	486.00			PK27GTA®	33.80	15
	400 A			-		MH50 (box) •	75.00				(1) 1/0 or (2) 1	)-750 /0.200	or		
		42	42	0	1746.00	QONQ42LS400 (Int) ♦ MH50 (box)	1185.00 75.00	NC50NQVF	NC50NQVS	486.00	01 (2) 1	/0-300	PK15GTA6	53.00	15
			000 4		l	Out a life a high a M. D. 115O a a Ta			l	l					

Above listings through 200 A mains rating meet Federal Specification W-P-115C as Type 1, Class 2.

A Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.

- WL short circuit current rating depends on lowest interrupting rating of circuit breaker installed. Will not accept QO-EPD or Qwik-Gard™ QO-GFI or QO-AFI circuit breakers. Mains rated 25 A when Al wire is used.
- Order F for flush device or S for surface device.
- Use 10 AWG maximum size wire for GFI and AFI circuit breakers.
- 70 A Max. branch circuit breaker and 70 A max. back fed main circuit breaker.
- CU indicates copper bus.
- UL Listed 5000 A short circuit current rating for corner grounded Delta systems. Use QO-H circuit breakers only.
- Supplied with feed-thru lugs.
- Factory-included.
- Interior only, order box separately.
  PK27GTA includes a 6–2/0 AWG Al/Cu lug.
- PE1A Discount Schedule.





QO120L125G

QO816L100F or S without cover

# 1Ø, Field-Installed Main Circuit Breaker Kits

**Use with Convertible Main Load Centers Only** 



QOM1 Frame Size 50-125 Amperes



QOM2 Frame Size 100-225 Amperes

© 2012 Schneider Flectric

All Rights Reserved

	QO	M1 Frame Size				QOM2 Frame Size †					
Main Circuit	Convertible	Main Circuit   S Price	Lua Wire Size ‡	Main Circuit	Convertible	22 k AIF	₹ ♦	Lug Wire Size ‡			
Breaker Rating	Load Center Mains Rating	\$ Price	AWG/kcmil	Breaker Rating <b></b>	Load Center Mains Rating	Main Circuit Breaker	\$ Price	AWG/kcmil			
50 A	100-125	QOM50VH	140.00		100 A	150-225	QOM2100VH	468.00			
60 A	100-125	QOM60VH	140.00		125 A	150-225	QOM2125VH	468.00			
70 A	100-125	QOM70VH	140.00		150 A	150-225	QOM2150VH	468.00	4–300 Al or Cu		
80 A	100-125	QOM80VH	201.00	12–2/0 Al or Cu	175 A	200-225	QOM2175VH	468.00	4–300 Al of Cu		
90 A	100-125	QOM90VH	201.00	12-2/0 Al or Cu	200 A	200-225	QOM2200VH	468.00			
100 A	100-125	QOM100VH	201.00		225 A	225	QOM2225VH	468.00			
110 A	125	125 QOM110VH <b>468.0</b>			_	_	_	_	_		
125 A	125	QOM125VH	468.00		_	_	_	_			

- Do not exceed the load center mains rating.
- 22 k AIR main circuit breaker UL Listed for use ahead of QO, QOT and QO-PL 10 k AIR branch circuit breakers to permit their application on systems with up to 22 kA available fault current.
- Wire range listed for QOM circuit breaker kits is the wire range of that circuit breaker. To find out maximum wire size permitted in a particular load center per UL, see pages 1-5 through 1-11 under Main Wire Size.
- Add suffix 1021 for 120, 208 or 240 Vac shunt trip.

# 1Ø3W—120/240 Vac—UL Listed

#### Main Circuit Breaker (Accepts Only QO Plug-On Circuit Breakers.) Table 1.18:

	Mains	Spaces	Max. Single	Max. Tandem	\$ Price (Interior,	Load Cente Box and Inter		(Ord	Cover with Door er Separately)		Main Wire Size	Equipm Ground B (Order Sepa	ar Kit	Box No. See
	Rating		Pole Circuits▲	Circuit Breakers	Box and Cover)	Cat. No.	\$ Price	Flush Cat. No.	Surface Cat. No.	\$ Price	AWG/kcmil Al or Cu	Cat. No.	\$ Price	Page 1-17
	Convertib	le to Mai	n Lugs (see		ower Ampe	reaker, 22 kA Short C rage Main Circuit Br								
		12	12	0	339.70	QO112M100	302.00	QOC12UF	QOC12US	37.70		PK9GTA	13.40	5
		16	16	0	379.70	QO116M100	342.00	QOC20U100F	QOC20U100S	37.70	6–1	PK12GTA	15.80	6
	100 A	20	20	0	433.70	QO120M100	396.00	QOC20U100F	QOC20U100S	37.70		PK15GTA	17.10	6
		24	24	0	553.70	QO124M100	516.00	QOC24UF	QOC24US	37.70	6–2/0	PK15GTA	17.10	7
		32	32	0	726.70	QO132M100	689.00	QOC32UF	Use Flush	37.70	0 2/0	PK18GTA	18.80	8
	125 A	24	24	0	819.70	QO124M125	782.00	QOC24UF	QOC24US	37.70	6–2/0	PK15GTA	17.10	7
		32	32	0	1041.60		1002.00	QOC32UF	Use Flush	39.60	0 2,0	PK18GTA	18.80	8
	Convertib	ole to Mai in Circuit	n Lugs (see t Breaker Fr	below) or Loranne Size—C	ower Ampe Copper Bus		eaker (See	page 1-5) ■						
		20	30	10	821.00		734.00	QOC30UF	QOC30US	87.00		PK18GTA	18.80	9
	150 A	24	24	0	849.00	QO124M150	762.00	QOC30UF	QOC30US	87.00	4-250	PK15GTA	17.10	9
1	10071	30	30	0	854.00	QO130M150	767.00	QOC30UF	QOC30US	87.00	. 200	PK18GTA	18.80	9
N D		32	32	0	969.00	QO132M150	882.00	QOC40UF	QOC40US	87.00		PK18GTA	18.80	10
0		20	40	20	821.00	QO12040M200	734.00	QOC30UF	QOC30US	87.00		PK23GTA	21.30	9
o l		24	24	0	866.00	QO124M200	779.00	QOC30UF	QOC30US	87.00		PK15GTA	17.10	9
R		24	36	12	1287.00	QO12436M200TFT >	1200.00	QOC40UF	QOC40US	87.00	4 050	PK23GTA and LK100AN□		10
	200 A	30	30	0	879.00	QO130M200	792.00	QOC30UF	QOC30US	87.00	4–250	PK18GTA	18.80	9
	200 A	30	40	10	957.00	QO13040M200	870.00	QOC30UF	QOC30US	87.00		PK23GTA	21.30	9
		40	40	0	1121.00	QO140M200	1034.00	QOC40UF	QOC40US	87.00		PK23GTA	21.30	10
		40	60	20	1431.00	QO14060M200	1344.00	QOC40UF	QOC40US	87.00		PK23GTA	21.30	10
		42	42	0	1220.00	QO142M200	1109.00	QOC42UF	QOC42US	111.00		PK23GTA	21.30	11
		42	52	10	1382.00	QO14252M200	1271.00	QOC42UF	QOC42US	111.00	4–300	PK23GTA	21.30	11
	225 A	40	40	0	1196.00	QO140M225	1085.00	QOC42UF	QOC42US	111.00		PK23GTA	21.30	11
		42	42	0	1253.00	QO142M225	1142.00	QOC42UF	QOC42US	111.00		PK23GTA	21.30	11
	Fixed Mai	ns—Fact	ory-installe	d LAL Main (	Circuit Brea	aker, 42 kA Short Cir	cuit Currer	nt Rating ♦						
	300 A	42	42	0	4909.00	QONQ42MS300 (int)★	4243.00	NC62NQVF	NC62NQVS	591.00	(1) 4-500			16
	300 A	44	42		4909.00	MH62 (box)△	75.00	NOOZNQVE	INCOZINGVS	391.00	or (2) 4-3/0	PK27GTA▼	33.80	10
	400.4	40	40		4000 55	QONQ42MS400	4243.00	NOOSNOVE	NOOONOVIC	=04.5=	(1) 4–500	or PK15GTA6	53.00	40
	400 A	42	42	0	4909.00	(int)★ MH62 (box)△	75.00	NC62NQVF	NC62NQVS	591.00	or (2) 4–250			16

Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.
- 22 k AIR main circuit breaker UL Listed for use ahead of QO, QOT and QO-PL 10 k AIR branch circuit breakers to permit their application on systems with up to 22 kA available fault current.
- UL short circuit current rating depends on lowest interrupting rating of circuit breakers installed. Also, UL Listed 5000 A short circuit current for corner grounded Delta systems. Use QO-H circuit breakers only.
- Interior only, order box separately. PK27GTA includes a 6–2/0 Al/Cu lug.
- PE1A Discount Schedule.
- Factory included. Supplied with feed-thru lugs.

QO140M200

# 1Ø, Field-Installed Main Lugs Kits

## **Use with Convertible Main Load Centers Only**

Main Lugs Rating☆	Use on Convertible Load Center with Mains Rating	Cat. No.	\$ Price	Lug Wire Size⊽ AWG/kcmil Al or Cu
125 A	100–125 A	QOL125€	44.10	6-2/0
225 A	150-225 A	QOL225€	104.00	6–300

- Do not exceed the load center mains rating.
- Wire range listed for QOL lug kits is the wire range of that lug. To find out maximum wire size permitted in a particular load center per UL, see pages 1-5 through 1-11 under main wire size.
- If main circuit breaker knockout has been removed from the load center's trim, order appropriate filler plate from







QOL125

QOL225

by Schneider Electric www.schneider-electric.us

# 1Ø3W-120/240 Vac-UL Listed

#### Table 1.20: Main Lugs (Accepts Only QO Plug-On Circuit Breakers.)

**QO<sup>™</sup> Load Centers** 

	Mains Rating	Spaces	Max. Single Pole Circuits ▲	Max. Tandem Circuit	\$ Price (Interior, Box and	Load Center Box and Interior		Wire	ain Size /kcmil	Equipment Ground Bar Kit (Order Separately)		Box No. See Page 1-18
			Olicuits—	Breakers	Cover)	Cat. No.	\$ Price	Al	Cu	Cat. No.	\$ Price	rage 1-10
	Non-Me	etallic E	nclosure									
	Fixed Ma	ins—Facto	ory-installed Main	Lugs—10 kA	<b>Short Circuit</b>	Current Rating						
	60 A	2	4	2	102.00	QO24L60NRNM	102.00	14–4	14-4	Factory-installed	_	1NM
	Metalli	e Enclos	sure									
	Fixed Ma	ins—Facto	ory-installed Main	Lugs—10 kA	<b>Short Circuit</b>	Current Rating						
	40 A	2	2	0	113.00	QO2L40RB■	113.00	12–6	14–6	PK3GTA1	11.40	1R
	70 A	2	4	2	131.00	QO24L70RB■	131.00	12–3	14–4	PK4GTA	10.80	1R
		6	12	6	143.00	QO612L100RB◆	143.00			PK7GTA	11.70	2R
		6	12	6	158.00	QO612L100TRB◆	158.00			Factory-installed	_	2R
	100 A	8	16	8	231.00	QO816L100RB ◆	231.00	8-	-1	PK7GTA	11.70	2R
_		6	12	6	174.00	QO612L100RBCU • *	174.00			PK7GTA	11.70	2R
R A		8	16	8	279.00	QO816L100RBCU◆*	279.00			PK7GTA	11.70	2R
1	125 A	4	8	4	152.00	QO148L125GRB*	152.00	12–2/0	14–2/0	PK7GTA Factory-include	ded	15R
N P			—Factory-installe Size—Convertib			Circuit Current▼△□ Copper Bus						
R		12	12	0	285.00	QO112L125GRB	285.00			PK9GTA Factory-included	_	3R
Ŏ	125 A	12	24	12	365.00	QO11224L125GRB	365.00		2/0	PK15GTA Factory-included	_	3R
F	125 A	16	24	8	435.00	QO11624L125GRB	435.00	0-	2/0	PK15GTA Factory-included	_	4R
		24	24	0	522.00	QO124L125GRB	522.00			PK15GTA Factory-included	_	4R
			-Factory-installe			Circuit Current▼△□						
	150 A	30	30	l 0	587.00	QO130L150GRB	587.00	4-	250	PK23GTA, LK100AN Factory	-included	6R
		12	12	0	480.00	Q0112L200GRB	480.00			PK9GTA Factory-included		5R
		30	30	0	666.00	QO130L200GRB	666.00			PK23GTA, LK100AN Factory		6R
	000 4	30	40	10	714.00	QO13040L200GRB	714.00	4	050	PK23GTA, LK100AN Factory		6R
	200 A	40	40	0	971.00	QO140L200GRB	971.00	4-1	250	PK23GTA, LK100AN Factory	-included	7R
		40	60	20	1262.00	QO14060L200GRB	1262.00			(2) PK15GTA, (1) LK100AN Fact	ory-included	7R
		42	52	10	1194.00	QO14252L200GRB	1194.00			(2) PK15GTA, (1) LK100AN Fact	ory-included	8R
	225 A	42	42	0	1310.00	QO142L225GRB	1310.00	4-	300	PK23GTA, LK100AN Factory	-included	8R

#### Table 1.21: Main Circuit Breaker (Accepts Only QO Plug-On Circuit Breakers.)

	Mains Rating	Spaces	Max. Single Pole Circuits ▲	Max. Tandem Circuit	\$ Price (Interior, Box and	Load Center Box and Interior		Main Wire Size AWG/kcmil	Equipme Ground Ba (Order Sepa	r Kit	Box No. See Page 1-18
			Circuits A	Breakers	Cover)	Cat. No.	\$ Price	Al or Cu	Cat. No.	\$ Price	Page 1-16
	Convertible t	o Main Lugs (		or Lower Amp		hort Circuit Current Rating ircuit Breaker (see page 1-5) ◊ □					
		12	12	0	461.00	QO112M100RB	461.00		PK9GTA	13.40	3R
	100 A	16	16	0	504.00	QO116M100RB	504.00	6-2/0	PK12GTA	15.80	4R
		20	20	0	552.00	QO120M100RB	552.00		PK15GTA	17.10	4R
	125 A	24	24	0	954.00	QO124M125RB	954.00	6-2/0	PK15GTA	17.10	4R
3	Convertible t	o Main Lugs ( Circuit Breake	see page 1-6) or Frame Size—	or Lower Amp Copper Bus	erage Main C	hort Circuit Current Rating ircuit Breaker (see page 1-5) ◊ □					
Ā	150 A	20	30	10	953.00	QO12030M150RB	953.00	4-250	PK18GTA	18.80	5R
1		30	30	0	1122.00	QO130M150RB	1122.00		PK18GTA	18.80	6R
•		20	40	20 0	954.00	QO12040M200RB QO130M200RB	954.00 1154.00		PK23GTA PK18GTA	21.30 18.80	5R 6R
3		30 30	30 40	_	1154.00 1179.00	QO130M200RB QO13040M200GRB	1179.00		PK23GTA	21.30	6R
3	200 A	30 40	40 40	10 0	1397.00	QO140M200GRB	1397.00	4-250	PK23GTA	21.30	он 7В
•	200 A	40	60	20	1815.00	QO14060M200RB	1815.00	4-250	PK15GTA	17.10	7R 7R
		40	42	0	1469.00	QO14080WI200RB	1469.00		PK23GTA	21.30	8R
		42	52	10	1718.00	QO14252M200RB	1718.00		PK15GTA	17.10	8R
	225 A	42	42	0	1631.00		1631.00	4–300	PK23GTA	21.30	8R
	Convertible t	o Main Lugs (		or Lower Amp	erage Main C	ort Circuit Current Rating ircuit Breaker (see page 1-5) hg ◊				,	
	125 A	6	12	6	620.00	QO1612M125FTRB☆	620.00	4-2/0	PK12GTA	15.80	3R
	150 A	8	16	8	863.00	QO1816M150FTRB☆	863.00	4–250	PK15GTA-L	35.00	6R
	200 A	8	16	8	863.00	QO1816M200FTRB☆	863.00	4–250	PK15GTA-L	35.00	6R

### Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.
- Use 10 AWG maximum size wire for AFI and GFI circuit breaker. 70 A max. branch circuit breaker and 70 A max. back fed main circuit breaker.
- Copper bus.
- UL short circuit current rating depends on lowest interrupting rating of circuit breakers installed.

  UL Listed 5000 A short circuit current rating for corner grounded Delta systems. Use QO-H circuit breakers only. Side hinge door device; allow 1-1/4 in. on left side for door to open.
- 22 k AIR main circuit breaker UL Listed for use ahead of QO, QOT, QO-GFI, QO-AFI, QO-EPD and QOPL 10 k AIR branch circuit breakers to permit their application on systems up to 22 kA available fault current.
- QO1612M125FTRB provided with QOM1 frame main circuit breaker. QO1816M150FTRB and QO1816M200FTRB provided with QOM2 frame main circuit breaker.

### 3Ø4W-208Y/120 Vac, 3Ø4W-240/120 Vac Delta and 3Ø3W-240 Vac Delta-UL Listed

#### Main Lugs and Main Breakers (Accepts Only QO Plug-On Circuit Breakers) Table 1.22:

	Mains	Max. Number of 1P QO	\$ Price (Interior,	Load Cen Box and Int			or Cover with Do order Separately)	or	Wire	ain Size /kcmil	Equipme Ground Ba (Order Sepa	ır Kit	Box No. See
	Rating	circuit breakers	Box and Cover)	Cat. No.	\$ Price	Flush Cat. No.	Surface Cat. No.	\$ Price	Al	Cu	Cat. No.	\$ Price▽	Pages 1-17, 1-18
	Fixed Ma	ains—Facto	ry-installed I	Main Lugs—Copper	Bus—65 kA S	hort Circuit Cu	rrent Rating ▲						
	60 A	3	107.00	QO403L60NF/S	107.00	Cover Included	d With Load Cente	r (No Door)	_	10–6	PK4GTA	7.20	13
		12	369.70	QO312L125G◊	332.00	QOC16UF	QOC16US	37.70☆			Factory-incl.□	_	6
	125 A	20	508.70	QO320L125G◊	471.00	QOC24UF	QOC24US	37.70☆	6-2/0	6-2/0	Factory-incl.□	_	7
		24	577.70	QO324L125G ◊	540.00	QOC24UF	QOC24US	37.70☆			Factory-incl.□	_	7
	000 4	18	530.00	QO318L200G◊	443.00	QOC30UF	QOC30US	87.00☆	0.050	0.050	Factory-incl.△	_	9
ı	200 A	30	707.00	QO330L200G ◊	620.00	QOC30UF	QOC30US	87.00☆	6–250	6–250	Factory-incl.△	_	9
	225 A	42	953.00	QO342L225G◊	842.00	QOC42UF	QOC42US	111.00☆	6–300	6–300	Factory-incl.△	_	11
	Converti	ble Mains-	Factory-inst	alled QDL Main Circ	uit Breaker—0	Copper Bus—2	5 kA Short Circu	it Current Ra	ting ■				
	100 A	27	1058.00	QO327M100 ◆	971.00	QOC30UF	QOC30US	87.00☆	4-2/0	4-2/0	PK15GTA	17.10	9
	125 A	30	1931.00	QO330MQ125★◊	1839.00	QOC342MQF	QOC342MQS	92.00	4–300	4–300	PK18GTA	18.80	12
	150 A	30	1931.00	QO330MQ150★♦	1839.00	QOC342MQF	QOC342MQS	92.00	4 200	4 000	PK18GTA	18.80	12
	150 A	42	2119.00	QO342MQ150★◊	2027.00	QOC342MQF	QOC342MQS	92.00	4–300	4–300	PK23GTA	21.30	12
	000 4	30	1931.00	QO330MQ200★◊	1839.00	QOC342MQF	QOC342MQS	92.00	4 200	4 000	PK18GTA	18.80	12
	200 A	42	2119.00	QO342MQ200★♦	2027.00	QOC342MQF	QOC342MQS	92.00	4–300	4–300	PK23GTA	21.30	12
	225 A	42	2119.00	QO342MQ225★◊	2027.00	QOC342MQF	QOC342MQS	92.00	4–300	4–300	PK23GTA	21.30	12

	Fixed Ma	ains—Facto	ry-installed I	Main Lugs—Copper	Bus—65 kA S	hort Circuit Current Rating ▲ ▼					
	60 A	3	177.00	QO403L60NRB	177.00		_	10–6	PK4GTA	10.80	10R
	125 A	12	485.00	QO312L125GRB	485.00		6–2/0	6–2/0	Factory Incl.□	_	3R
R	125 A	20	629.00	QO320L125GRB	629.00	Cover Included	6-2/0	6-2/0	Factory Incl.□	_	4R
Ä	200 A	18	618.00	QO318L200GRB	618.00	Cover included	6–250	6–250	Factory Incl.△	_	6R
1.	200 A	30	839.00	QO330L200GRB	839.00		0-230	0-230	Factory Incl.△	_	6R
N	225 A	42	1494.00	QO342L225GRB	1494.00		6–300	6–300	Factory Incl.△	_	8R
R	Converti	ible Mains—	-Factory-inst	alled QDL Main Circ	uit Breaker—0	Copper Bus—25 kA Short Circuit Current Ra	ating ■ ▼				
0	100 A	27	1185.00	QO327M100RB◆	1185.00		4-2/0	4-2/0	PK15GTA	17.10	6R
۱ř۱	125 A	30	2147.00	QO330MQ125RB★	2147.00		4-300	4–300	PK18GTA	18.80	14R
	150 A	30	2147.00	QO330MQ150RB★	2147.00	Cover Included	4–300	4–300	PK18GTA	18.80	14R
	200 A	30	2147.00	QO330MQ200RB★	2147.00	Cover included	4–300	4–300 4–300		18.80	14R
	200 A	42	2333.00	QO342MQ200RB★	2333.00		+ 300	+ 300	PK23GTA	21.30	14R
	225 A	42	2333.00	QO342MQ225RB★	2333.00		4-300	4–300	PK23GTA	21.30	14R

Above listings through 200 A mains rating meet Federal Specification W-P-115C as Type 1, Class 2.

- UL short circuit current rating depends on lowest interrupting rating of circuit breaker installed.
  25 kA short circuit current rating SSCR maximum with Square D Type QDL main circuit breaker, or 22 kA SCCR maximum with back-fed Type QO-VH main circuit breaker, feeding QO 10 k AIR branch circuit breakers.
- Includes factory-installed back fed QO3100VH main circuit breaker.
- 65 kA Short Circuit Current Rating maximum with field-installed Square D type QGL 65 k AIR minimum main circuit breaker feeding QO and Q1 10 k AIR minimum branch circuit breakers. Side hinge door device allow 1-1/4 in. on left side for door to open.
- PK23GTA and LK100AN.
- PK15GTA.
- For Certification to IEC 60439-1 contact the local Square D sales office; otherwise panels are **NOT** CE marked. (For use on 415Y/240 Vac 3-phase 4-wire, 3,000 Short Circuit Current Rating when QODX...branch circuit breakers are used and 10,000 Short Circuit Current Rating when QO...VS branch circuit breakers are used). DE3A Discount Schedule
- DE2 Discount Schedule







QO312L125G

#### Table 1.23: 3Ø, Main Circuit Breakers

Field-installed alternate main circuit breakers for QO 3Ø main circuit breaker load centers rated 70-225 A. Do not exceed the load center main rating.

Amperage	25 k AIR	65 k AIR	100 k AIR⊋
Amperage	25 K AIN	05 K AIN	100 K AIN
70 A	QDL32070	QGL32070	QJL32070
80 A	QDL32080	QGL32080	QJL32080
90 A	QDL32090	QGL32090	QJL32090
100 A	QDL32100	QGL32100	QJL32100
110 A	QDL32110	QGL32110	QJL32110
125 A	QDL32125	QGL32125	QJL32125
150 A	QDL32150	QGL32150	QJL32150
175 A	QDL32175	QGL32175	QJL32175
200 A	QDL32200	QGL32200	QJL32200
225 A	QDL32225	QGL32225	QJL32225
\$ Price (DE2)	1784.00	2442.00	2796.00

When these 3P circuit breakers are used as the main circuit breaker of a 3Ø load center, the maximum AIR rating is 65 kA at 240 Vac and 100 kA at 208 Vac.

#### Table 1.24: 3Ø, Main Lugs Kits

Field-installed main lugs for convertible 3Ø main circuit breaker load centers.

Main Lugs Amperage Rating	Cat. No.	\$ Price	Lug Wire Size AWG/kcmil
125 A	QOL3125	67.00	6-2/0 Cu/Al
225 A	QOL3225	158.00	6-300 Cu/Al

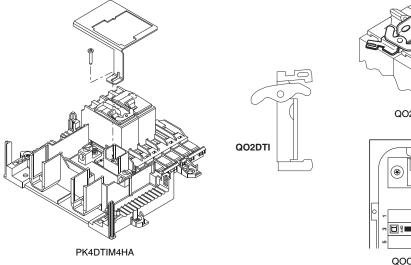
# 1Ø3W-120/240 Vac-UL Listed

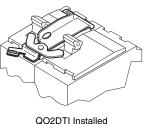
#### Table 1.25: Backup Power Solutions (Accept Only QO Plug-On Circuit Breakers.)

		Spaces	Max. Single Pole Circuits ▲	Max. Tandem Circuit Breakers	Load Center Box, Interior and Cover	r	Equipment Groundir (Order Separat	ng Bar Kit ely)	Ma Wire AWG/I	Size	Box No. See Page
	(A) <sup>-</sup>		Circuits A	Diedkeis	Cat. No.	\$ Price	Cat. No.	\$ Price	Al	Cu	1-17, 1-18
	General	tor Pane	els—Manual T	ransfer for Sub-Feed	Applications NEMA 1 (Indoor)						
1.					nterlock—10 kA Short Circuit Current R	3					
N D	30	4	8	4	QO48M30DSGP	563.00			14–8	14–8	4
O O R	60	4	8	4	QO48M60DSGP	563.00	PK7GTA	11.70	8–2	8–2	4
	General	tor Pane	els—Manual T	ransfer with Generato	r Power Inlet Plug for Sub-Feed App	olications NEM	MA 3R (Outdoor)				
R	Factory-l	Installed	Main Circuit Br	eakers with Mechanical I	nterlock—10 kA Short Circuit Current R	ating					
A		4	8	4	QO1DM10020TRBR	848.00					2R
Ι'nΙ		4	8	4	QO1DM10030TRBR	848.00					2R
N P R O O F	100	4	8	4	QO1DM10050TRBR	1148.00	Factory-Installed		_	8–2	2R
	General	tor Pane	el—Automatic	Transfer Switch (Con	tact your local Square D Field Sales	office for mo	re information.) ■				
П	Factory-	or Field-	Installed Main	Circuit Breaker—22 kA S	hort Circuit Current Rating						
N	150	38	42	42	QO13842MX150	1349.00	PK23GTA	21.30	4–250	4–250	12
000	200	38	42	42	QO13842MX200	1499.00	PK23GTA	21.30	4–250	4–250	12
0	225	38	42	42	QO13842MX225	1649.00	PK23GTA	21.30	4–250	4–250	12
Ř	225	38	42	42	QO13842UX225 ◆	1199.00		21.00	4–250	4–250	12
Ш					QOC38MXUF (Cover)	149.00	_				
11	150	14	28	28	QO11428MX150FTRB★▼	1349.00	PK23GTA	21.30	4–250	4–250	7R
3R	200	14	28	28	QO11428MX200FTRB★▼	1499.00	PK23GTA	21.30	4–250	4–250	7R
Ш		14	28	28	QO11428UX200FTRB◆★▼	1199.00	PK23GTA	21.30	4–250	4–250	7R
QO	Load Ce	enter Ma	ınual Power T	ransfer Accessories					Cat. No.	\$ Price	Schedule
				only one circuit breaker				<u> </u>	QO2DTI	24.90	DE2E
				power supply application	erlock attachment with retaining kits for s s. Can be used with (2) 2P or (1) 2P and	(1) 1P QO circu	it breakers in QO816L100	load centers.	QO2DTIM	63.00	DE2E
Ма	nual Trar	secures two 2P circuit breakers to right side of interior when used as back-fed mains, a QO2DTI Kit included for bup power supply applications. For 1Ø 100–125 ampere convertible main load centers. Series S01 and S02.							PK4DTIM4LA	102.00	DE3A
	Secures two 2P circuit breakers to right side of interior when used as back-fed mains, a QO2DTI Kit included for bacup power supply applications. For 10/2 150–225 ampere convertible main load centers. Series S01 and S02.						)2.	PK4DTIM4HA	102.00	DE3A	
	Secures two 2P circuit breakers to left side of interior when used as back-fed mains, a QO2DTI Kit included for back- power supply applications. For 1Ø 100–125 ampere convertible main load centers. Series S01 and S02.							PK4DTIM4LAL	102.00	DE3A	
	For use on "G" and "S" Series NEMA 1 and "G", "S1" and "S2" Series NEMA 3R load centers. Interlocks a QOM1 2 main circuit breaker of a load center (100–125 A) with a QO 2P (15–125 A) branch circuit breaker. Includes a retaining					a retaining kit.	QOCRBGK1	105.00	DE3A		
	Generator Circuit Breaker For use on "G" and "S" Series NEMA 1 and "G" and "S1" Series NEMA 3R load centers. Interlocks a QOM2 2P main circuit breaker of a load center (150–225 A) with a QO 2P (15–125 A) branch circuit breaker. Includes a retaining kit.					etaining kit.	QOCGK2	105.00	DE3A		
				with a QO 2P (15-125 A	IEMA 3R load centers. Interlocks a QON  b) branch circuit breaker. Includes a reta		it breaker of a load center	(150–225 A)	QORBGK2	105.00	DE3A

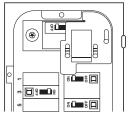
- Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.
- One main circuit breaker is included with panel. NEMA 1 indoor device requires cover ordered separately. Alternate source main circuit breaker (QO 125 A max.) ordered separately. Automatic Transfer Switch and Generator for secondary power source are ordered through a Kohler authorized dealer or contractor.
- Universal mains No factory-installed main circuit breaker or main lugs. QOM2 frame size, field-install 22 k AIR. Main circuit breaker or main lugs (see pages 1-5 or 1-6). Supplied with feed-thru lugs.

  Device is rated NEMA 3R and can be used for indoor or outdoor applications.





QO2DTI Installed



QOCGK2 Installed

BQUARE D

# 1Ø2W-120Vac-1Ø3W-120/240 Vac-UL Listed

#### QO Special Application (Accepts Only QO Plug-On Circuit Breakers.) Table 1.26:

	Mains Rating	Short Circuit Current	Spaces	Max. 1P Circuits ▲	Max. Tandem Circuit	Load Center Box, Interior, and		Equipment Grou (Order Sepa		Main W AWG/	ire Size kcmil	Box No. See
		Rating		Circuits A	Breakers	Cat. No.	\$ Price	Cat. No.	\$ Price	Al	Cu	Page 1-17
	Manufacture 1Ø2W 120 V		gs Only—C	SA Certified								
	30 A♦	10 kA	2	2	0	QO2L30TTS★	51.00	Factory-ins	hallet	12–10	14–10	1
	50 A	10 kA	2	4	2	QO24L50TTS▼	78.00	1 actory-ins	talied	_	14–6	2
	1Ø2W 120 V	ac—Main Ciı	cuit Breake	r—CSA Certi	fied							
	30 A	10 kA	3	5	2	QO35FM30TTF/S	83.00	Factory-ins	talled	4	7	3
	1Ø3W 120/2	40 Vac—Mai	n Lugs Only	-CSA Certif	ied							
	70 A	10 kA	2	4	2	QO24L70TS▼	78.00			12-3	14–4	2
			6	12	6	QO612L100TF/S	86.00					4
	100 A	10 kA	6	12	6	QO612L100DTF/S□	101.00	Factory Installe		4-	1	4
	100 A	IU KA	8	16	8	QO816L100TF/S□	137.00	motano	u .	4-	-1	4
			8	16	8	QO816L100DTF/S□	159.00					4
	<b>Load Center</b>	with Cover:	1Ø3W 120/2	40 Vac—UL	Listed Complet	e QO Load Center—Box, Int	erior and Combir	nation Cover in Or	Cover in One Package			
	Convertible	Mains—Fact	ory-Installed	d Main Lugs	☆—QOM1 Main	Frame Size—Convertible to	Main Circuit Bre	aker (See page 1-	5)—Copper I	Bus		
		65 kA	12	12	0	QO112L125GC	188.00	PK12GTA	Incl.	6–:	2/0	6
1	125 A	65 kA	12	24	12	QO11224L125GC	249.00	PK15GTA	Incl.	6–	2/0	6
N D		65 kA	20	20	0	QO120L125GC	284.00	PK15GTA	Incl.	6-3	2/0	7
0	Convertible	Mains—Fact	ory-Installed	Main Lugs	<b>☆—QOM2 Mair</b>	Frame Size—Convertible to	Main Circuit Bre	eaker (See page 1-	5)—Copper	Bus		
O R	150 A	65 kA	30	30	0	QO130L150TC	452.00	PK23GTA, LK100A	N Installed	6–2	250	9
n	200 A	65 kA	30	40	10	QO13040L200GC	575.00	PK23GTA, LK100A	N Incl.	6–2	250	9
	Convertible	Mains—Fact	ory-Installed	Main Circui	t Breaker—							
	QOM1 Main	Frame Size-	-Convertible	e to Main Lug	s (See page 1-	6) or Lower Amperage Main	Circuit Breaker (\$	See page 1-5)—Co	pper Bus ▽			
		22 kA	12	12	0	QO112M100C	351.00	PK9GTA	13.40	4-	1/0	5
	100 A	22 kA	12	20	8	QO11220M100C	413.00	PK15GTA	17.10	4-	1/0	5
	100 A	22 kA	16	16	0	QO116M100C	395.00	PK12GTA	15.80	4–		6
		22 kA	20	20	0	QO120M100C	446.00	PK15GTA	17.10	4–		6
	125 A	22 kA	32	32	0	QO132M125C	1041.00	PK18GTA	18.80	6–3	2/0	8
	Convertible QOM2 Main					6) or Lower Amperage Main	Circuit Breaker (	See page 1-5)—Co	pper Bus ▽			
		22 kA	20	30	10	QO12030M150C	843.00	PK18GTA	18.80	4–2	250	9
	150 A	22 kA	30	30	0	QO130M150C	870.00	PK18GTA	18.80	4–2	250	9
	-	22 kA	20	40	20	QO12040M200C	843.00	PK23GTA	21.30	4–2	250	9
	000 4	22 kA	30	30	0	QO130M200C	896.00	PK18GTA	18.80	4–2	250	9
	200 A	22 kA	30	40	10	QO13040M200C	974.00	PK23GTA	21.30	4–2	250	9
		22 kA	40	40	0	QO140M200C	1137.00	PK23GTA	21.30	4–2	250	10

Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers. Order F for flush device or S for surface device.

- Mains rating 25 A when Al wire is used.
  Will not accept Qwik-Gard<sup>™</sup> QO-GFI or QO-AFI circuit breaker.
  Use 10 AWG maximum size wire for GFI and AFI circuit breakers.
- Main circuit breaker is a field-installed standard QO single pole circuit breaker. Order separately from page 1-2.
- 70 A max. branch circuit breaker and 70 A max. back fed main circuit breaker.
- UL short circuit current rating depends on lowest interrupting rating of circuit breaker installed.
- UL Listed 5000 A short circuit current rating for corner grounded Delta systems. Use QO-H circuit breakers only.

  22 k AIR main circuit breaker UL Listed for use ahead of QO, QOT and QO-PL 10 k AIR branch circuit breakers to permit their application on systems with up to 22,000 A available fault current.

#### Table 1.27: Service Upgrade Load Centers: 1Ø3W 120/240Vac—UL Listed Load Center with Removable End Walls

	Convertible Mains—Factory-Installed Main Breaker—22KA QOM2 Main Frame Size—Convertible to Main Lugs (See page1-6) or Lower Amperage Main Circuit Breaker (See page 1-5)▽															
I	Mai		Spaces	Max. 1P	Max. Tandem	\$ Price (Interior,	Load Center Box and Interio		Extra Long (Order	Cover with Separately		Main W AWG		Equipment Kit (Order S		Box No. See Page
Ö	Rat	ing	Spaces	Circuits▲	Circuit Breakers	Box and Cover)	Cat. No.	\$ Price	Flush Cat. No.	Surface Cat. No.	\$ Price	AI	Cu	Cat. No	\$ Price	1–17
l B		000 4	30	40	10	959.00	HOM3040M200CEP●	959.00	HOMC30UFL	ı	111.00	4.0	150	PK23GTA	21.30	10
	New!	200 A	40	40	0	1,137.00	QO140M200EP♦	1137.00	QOC40UFL	1	111.00	4-2	:50	PK23GTA	21.30	10

- Ships with standard length cover Blank Endwall Plates (4) Available Order: EWPLATE \$36.00
- Copper Bus, order cover separately QOC40UF/S or QOC40UFL

# **Auxiliary Gutter**

UL Listed for use with standard 1Ø and 3Ø load centers for riser applications . For auxiliary gutter-load center compatibility, see catalog number 1100CT0501

Cat. No.	\$ Price	Cover	Conduit Riser Size	Width	Height	Depth
SDAG26	338.00	Flush	1-3/4, 2, 2-1/2 or •3	13.50	26.12	3.75

- One tap kit required for each riser wire.
- When used with B300 bolt-on hubs.

#### Table 1.29: Tap Kits 120/240 Vac—UL Listed for use with Auxiliary Gutter SDAG26

Cat. No.	S Price	Use with Auxiliary	Riser Wire		Tap Off Wire			
Cat. No.	\$ Price	Gutter Cat. No.	Lug Type	Al/Cu Wire Size	Lug Type	Al/Cu Wire Size		
SDGT30020	81.00	SDAG26	Mechanical (Included)	(2) 6 AWG-300 kcmil	Mechanical (Included)	(1) 6-2/0 AWG		
SDGT300300	120.00	SDAG26	Mechanical (Included)	(2) 6 AWG-300 kcmil	Mechanical (Included)	(1) 6 AWG-300 kcmil		
SDGT300C10C	49.70	SDAG26	Anderson VCEL030516H1 (Not included)	(2) 4 AWG-300 kcmil	Anderson VCEL02114S1 (Not Included)	(1) 8–1/0 AWG		
SDGT300C300C	70.00	SDAG26	Anderson VCEL030516H1 (Not included)	(2) 4 AWG-300 kcmil	Anderson VCEL030516H1 (Not included)	(1) 4 AWG-300 kcmil		
QOGL20 Grounding Terminals	40.70	SDAG26	Mechanical (Included)	(2) 6-2/0 AWG	_	_		

Class 1130, 1170 / Refer to Catalog 1100CT0501

# 1Ø3W-120/240 Vac-UL Listed

Table 1.30: Value Packs Contains Complete Load Center (Box, Interior and Cover) with Selected Branch Circuit Breaker

	Mains Rating	Spaces	Max. 1P Circuits ♦	Max. Tandem Circuit		Load Center Box, Interior, Cover and Branch Circuit Breakers		Equipm Ground E (Order Sep	ar Kit	Main Wire Size AWG/kcmil	Box No. See Pages
		S	Circuits	Breakers	Cat. No.	Included Load Center/Circuit Breakers	\$ Price	Cat. No.	\$ Price	Al/Cu	1-17, 1-18
						QO—Copper Bus					
					d Main Circuit	t Breaker, propriate to Main Lugs (See page 1-6) or QOM Main Circuit Breaker (See	page 1-5)				
	100 A	32	32	0	QOVP2	(1) QO132M100C, (5) QO120	839.00	PK18GTA	18.80	4-2/0	8
	000 4	30	40	10	QOVP1	(1) QO13040M200C, (5) QO120	1103.00	PK23GTA	21.30	4.050	9
	200 A	30	40	10	QOVP10	(1) QO13040M200C, (10) QO120	1328.00	PK23GTA	21.30	4–250	9
					On Circuit Bre	eakers)					
					d Main Lugs,	appropriate QOM 22 kA Short Circuit Current Rating Main Circuit Break	or (Coo noa	o 1 16\			
1	125 A	12	24	12	HOMVPL2	(1) HOM1224L125TC. (5) HOM120	353.00	Included		6–2/0	6
N D	200 A	30	40	10		(1) HOM3040L200TC, (6) HOM115, (6) HOM120, (1) HOM230, (1) HOM250	962.00	Included		4–250	10
0					d Main Circuit		002.00	Hioladoa		. 200	
OR						propriate to Main Lugs or Main Circuit Breaker (See page 1-16)					
''	100 A	20	20	0	HOMVP4	(1) HOM20M100C, (5) HOM115	528.00	PK15GTA	17.10	4–2/0	7
	100 A	20	20	0	HOMVP5	(1) HOM20M100C, (5) HOM120	528.00	PK15GTA	17.10		7
	150 A	30	30	0		(1) HOM30M150C, (5) HOM120, (1) HOM230	983.00	PK23GTA	21.30	4–250	10
		20	40	20		(1) HOM2040M200TC, (5) HOM120, (1) HOM230	965.00	Included	_		9
		30	40	10	HOMVP1	(1) HOM3040M200TC, (5) HOM120, (1) HOM230	1083.00	Included	_		10
	200 A	30	40	10	HOMVP2	(1) HOM3040M200TC, (5) HOM115, (1) HOM230	1083.00	Included	_	4-250	10
	20071	30	40	10	HOMVP9	(1) HOM3040M200TC, (6) HOM115, (6) HOM120, (1) HOM230, (1) HOM250	1328.00	Included	_	. 200	10
		30	40	10	HOMVP14	(1) HOM3040M200TC, (12) HOM120, (1) HOM230, (1) HOM250	1328.00	Included	_		10
		40	40	0	HOMVP15	(1) HOM40M200C, (10) HOM120	1346.00	PK23GTA	21.30		12
R					On Circuit Bre						
A					d Main Circuit	t Breaker, Main Lugs or Lower Amperage QOM2 Main Circuit Breaker (See page 1-	16)				
Ň	22 KA 3	I	ircuit Curr	enii naiing C	onvertible to	Main Lugs of Lower Amperage QOM2 Main Circuit Breaker (See page 1-	· 10)				1
P R											
0	200 A	20	40	20	HOMVPRB1	(1) HOM2040M200RB, (6) HOM115, (6) HOM120, (1) HOM230, (1) HOM250	1253.00	PK23GTA	21.30	4–250	6R
F											<u> </u>

### **QO Riser Panels**

#### Table 1.31: Offset Interior for Wide Gutter—30 A Maximum Branch Circuit Breaker on left side of interior▲■ (Accepts Only QO Plug-On Circuit Breakers)

	Mains Rating Space		Max. Single Pole	Max. Tandem Circuit	Load Center Box a	nd Interior	Load Cente	er Cover	Ground	oment I Bar Kit eparately)	Main Wire Size AWG/kom	nil	Box No. See
	, and the second se		Circuits •	Breakers	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Al	Cu	Page 1-17
				alled Main Lugs, ng Convertible to QC	OM1 22 kA Short Circ	uit Current R	ating Main Circu	it Breaker (S	ee page 1-5) wl	nen used with C	OC cover belo	ow—Co	opper Bus
	125 A	12	24	12	QO11224L125WG	338.00	QOC20UFWG	53.00	PK15GTA	17.10	6–2/0		14
I I	123 A	20	30	10	QO12030L125WG	465.00	QOC20UFWG	53.00	PK15GTA	17.10	0-2/0	ſ	14
000				alled Main Lugs, ng Convertible to QC	OM2 22 kA Short Circ	uit Current R	ating Main Circu	it Breaker (S	ee page 1-5) wi	hen used with C	OC cover belo	ow—Co	opper Bus
OR	200 A	30	40	10	QO13040L200WG	701.00	QOC30UFWG	102.00	PK23GTA	21.30	4–250		23
					reaker, 22 kA Short C page 1-5) when use				Lugs (See page	1-6)			
	200 A	24	24	0	QO124M200WG125★	683.00	QOC30UFWG	102.00	PK23GTA	21.30	4–250		23

Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- UL short circuit current rating depends on lowest interrupting rating of circuit breaker installed.
  UL Listed 5000 A short circuit current rating for corner grounded Delta systems. Use QO-H circuit breakers only.
- Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.
- Comes with 125 A main circuit breaker factory installed

### Panelboard-style Covers for Riser Panels

Mono-Flat™ Front available for riser panels as an alternative to standard load center cover listed above. Provides a low-profile, aesthetically pleasing solution for high-traffic areas in upscale multi-family applications. Deadfront included. Lock kit not provided. Cover NQC30FWG CANNOT be used when panel has been converted to a main circuit breaker panel. ▼

Mains Rating of Load Center	Cat. No.	\$ Price
125 A	NQC20FWG	117.00
200 A	NQC30FWG	180.00

Order catalog number PK4FL for field-installed lock kit.

# Class 1130 / Refer to Catalog 1100CT0501

#### Table 1.32: **QO Load Center Accessories**

	Description	Cat. No.	\$ Price	Schedule
	Secures circuit breaker to interior when used as a back-fed main. For QO612L100F/S, RB, QO612L100DF/S, QO816L100F/S, RB, QO816L100DF/S and QO148L125GF/S, GRB load centers	PK2MB	7.20	DE3A
	Secures 3P circuit breaker without accessories to left side of interior when used as a back-fed main. For 3Ø load centers	PK3MB	14.70	DE3A
Retaining Kit for Breakers	Secures circuit breaker to interior when used as a back-fed main for 2P QO 150-200 A circuit breakers	PK5RK	14.70	DE3A
Used as Back-fed Mains	Secures ONE circuit breaker with or without electrical accessories to right side of interior when used as a back-fed main For 1Ø 100–125 ampere convertible main load centers. Series S01 and S02	PK4MB2LA	14.70	DE3A
	Secures ONE circuit breaker with or without electrical accessories to right side of interior when used as a back-fed main For 1Ø 150–225 ampere convertible main load centers. Series S01 and S02	PK4MB2HA	14.70	DE3A
Cover Sealing Strap	er Sealing Strap Provides means of sealing trim mounting screws on QO load center covers		3.60	DE3A
Replacement Cover Directory Label 1 through 42 numbered universal replacement directory label for load center covers		LSDL	0.54	DE5
Circuit Identification Stickers	Circuit identification stickers for use on cover directory labels to identify branch circuits	PSDS	0.75	DE5

QO Load Center Manual Power Transfer Accessories						
	For interlocking the handles of two 2P or one 2P and one 1P QO and Q1 circuit breakers mounted side-by-side so that only one circuit breaker can be "ON" at a time.	QO2DTI	24.90	DE2E		
	QO2DTI mechanical interlock attachment with retaining kits for securing two adjacent back-fed circuit breakers in dual power supply applications. Can be used with (2) 2P or (1) 2P and (1) 1P QO circuit breakers in QO816L100 load centers.	QO2DTIM	63.00	DE2E		
Manual Transfer Equipment Kit	Secures two 2P circuit breakers to right side of interior when used as back-fed mains, a QO2DTI Kit included for back- up power supply applications. For 10 100–125 ampere convertible main load centers. Series S01 and S02.	PK4DTIM4LA	102.00	DE3A		
	Secures two 2P circuit breakers to right side of interior when used as back-fed mains, a QO2DTI Kit included for back- up power supply applications. For 10 150–225 ampere convertible main load centers. Series S01 and S02.	PK4DTIM4HA	102.00	DE3A		
	Secures two 2P circuit breakers to left side of interior when used as back-fed mains, a QO2DTI Kit included for back-up power supply applications. For 1Ø 100–125 ampere convertible main load centers. Series S01 and S02.	PK4DTIM4LAL	102.00	DE3A		
	For use on "G" and "S" Series NEMA 1 and "G", "S1" and "S2" Series NEMA 3R load centers. Interlocks a QOM1 2P main circuit breaker of a load center (100–125 A) with a QO 2P (15–125 A) branch circuit breaker. Includes a retaining kit.	QOCRBGK1	105.00	DE3A		
Generator Circuit Breaker Interlock Kit	For use on "G" and "S" Series NEMA 1 and "G" and "S1" Series NEMA 3R load centers. Interlocks a QOM2 2P main circuit breaker of a load center (150–225 A) with a QO 2P (15–125 A) branch circuit breaker. Includes a retaining kit.	QOCGK2	105.00	DE3A		
	For use on "S2" Series NEMA 3R load centers. Interlocks a QOM2 2P main circuit breaker of a load center (150–225 A) with a QO 2P (15–125 A) branch circuit breaker. Includes a retaining kit.	QORBGK2	105.00	DE3A		
	For interlocking the handles of two 2P or one 2P and one 1P QO and Q1 circuit breakers mounted side-by-side so that only one circuit breaker can be "ON" at a time.	QO2DTI	24.90	DE2E		

#### **Load Center and CSED Surge Protection Devices** Table 1.33:

•	For use on 1Ø3W, 150 Vac maximum	SDSA1175	92.00	DE1B
Surge Arresters	For use on 3Ø4W, 650 Vac maximum	SDSA3650	248.00	DE1B
Surge Arresters	QO Surgebreaker <sub>C</sub> UL <sub>US</sub> Listed Secondary Surge Arrester 150 Vac line-to-ground maximum	QO2175SB	159.00	DE1B
	Homeline Surgebreaker CUL <sub>US</sub> Listed Secondary Surge Arrester 150 Vac line-to-ground maximum	HOM2175SB	159.00	DE1B
Surge Arrester Mounting Kit  UL Listed for mounting SDSA1175 surge arrester into ground bar mounting holes on 10 convertible main circuit breaker load centers		QOSAMK	11.40	DE3A



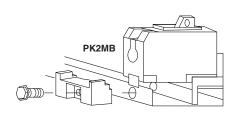
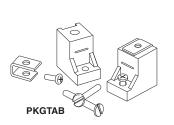


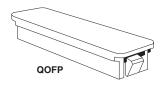


Table 1.34: QO Load Center Accessories

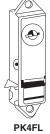
	Cat. No.	\$ Price	Schedule		
	Fills opening in covers if twistout is removed in error		QOFP	3.60	DE3A
	Fills main circuit breaker opening in convertible load center covers100-125 A		QOM1FP	20.30	DE3A
Filler Plates	Fills main circuit breaker opening in convertible load center covers150-225 A		QOM2FP	20.30	DE3A
	Fills main circuit breaker opening in 3Ø load center covers (S01 and S02 Series)		KFP	20.30	DE3A
	Fills main circuit breaker opening in "Q" style 3Ø load center covers (S03 Series)		Q2FP	20.30	DE3A
	Use with QO612L100DF/S, QO612L100DFCU/SCU, QO612L100DTF/S, QO816L100DF QO816L100DFCU/SCU, QO816L100DTF/S, QO48M30DSGP, or QO48M60DSGP	/S,	PK8FL▲	98.00	DE3A
Door Lock Kits	Use with convertible mains, 1Ø and 3Ø 100–225 A, and fixed mains, 3Ø 125–225 A indoor load centers		PK6FL	93.00	DE3A
	Use with 300 and 400 ampere indoor load centers		PK4FL	90.00	PE1A
	Field-installed for 12– 2 Al or 14–4 Cu AWG wire		LK70AN	10.10	DE3A
	Field-installed for 6–2/0 Al/Cu AWG wire		LK100AN	10.80	DE3A
Neutral / Ground Lugs	Field-installed for 14–2/0 Al/Cu AWG wire		LK125AN	22.10	DE3A
ricatiar, arouna Eugo	Field-installed for 2–3/0 Al/Cu AWG wire		LK150AN	32.40	DE3A
	Field-installed for 4 AWG to 300 kcmil Al/Cu wire. Use in Series S, 150–225 A QO or HOM load center		LK225AN	33.20	DE3A
	Standard PK15GTA with a 1–4/0 Al/Cu Lug		PK15GTAL	35.00	DE3A
Ground Bar Kits	Standard PK18GTA with a 1–4/0 Al/Cu Lug		PK18GTAL	37.80	DE3A
GIOUIIU Dai Kits	Standard PK23GTA with a 1-4/0 Al/Cu Lug		PK23GTAL	40.70	DE3A
	Insulator Kit for PK7GTA through PK27GTA		PKGTAB	43.80	DE3A
Handle Padlock Attachment	For padlocking main circuit breakers in convertible load centers OFF	50-125 A	QOM1PA	11.00	DE2E
Handle Fadioux Attachment	For padiocking main circuit breakers in convertible load centers OFF 100–225 A		QOM2PA	11.00	DE2E

QO403L60NF/S does not have provisions for a field-installed lock.









PK6FL and PK8FL

Table 1.35: Homeline Load Center Accessories

		Cat. No.	\$ Price	Schedule	
Handle Padlock Attachment	For padlocking main circuit breakers in convertible load center, "OFF"	50-125 A	QOM1PA	11.00	DE2E
Handie Padiock Attachment	For padiocking main circuit breakers in convertible load center, OFF	100–225 A	QOM2PA	11.00	DE2E
	Fills opening in covers if twistout is removed in error		HOMFP	3.20	DE3C
Filler Plates	Fills main circuit breaker opening in convertible load centers	100-125 A	QOM1FP	20.30	DE3A
	This main circuit breaker opening in convenible load centers	150-225 A	QOM2FP	20.30	DE3A
	Field-installed for 14–2 AWG Al or 14–4 AWG Cu wire		LK70AN	10.10	DE3B
Neutral Lugs	Field-installed for 6–2/0 AWG Al/Cu wire		LK100AN	10.80	DE3B
Neutral Lugs	Field-installed for 14–2/0 AWG Al/Cu wire		LK125AN	22.10	DE3B
	Field-installed for 4 AWG-300 kcmil Al/Cu wire. Use in Series S, 150-225 A QO or HOM	/I load center	LK225AN	33.20	DE3A
	Secures circuit breaker to interior when used as a back-fed main. For HOM612L100F/S, RB and HOM48L125GC, GRB load centers		HOM1RK	6.50	DE3C
Retaining Kit for Breakers	Secures ONE circuit breaker right side of interior when used as a back-fed main For 100–125 A convertible main load centers, Series S01 and S02		HOM4RK2LA	14.70	DE3C
Used as Back-fed Mains	Secures ONE circuit breaker right side of interior when used as a back-fed main For 150–225 A convertible main load centers, Series S01 and S02		HOM4RK2HA	14.70	DE3C
	Secures circuit breaker to interior when used as a back-fed main For 2P 150–200 A circuit breakers		HOM5RK	14.70	DE3C
Door Lock Kit Use with convertible indoor load center covers (Series S-1)				93.00	DE3A
Replacement Cover Directory Label	Replacement Cover Directory Label 1 through 42 numbered universal replacement directory label for load center covers				DE5
Circuit Identification Stickers	Circuit identification stickers for use on cover directory labels to identify branch circuits		PSDS	0.75	DE5
	For use on "S" Series NEMA 1 and NEMA 3R load centers. Interlocks a QOM1 2P mair circuit breaker of a load center (100–125 A) with a Homeline 2P (15–125 A) branch circuit		HOMCRBGK1	105.00	DE3D
Generator Circuit Breaker Interlock Kit	For use on "S" Series NEMA 1 and "S1" Series NEMA 3R load centers. Interlocks a QOM of a load center (150–225 A) with a Homeline 2P (15–125 A) branch circuit breaker	2 2P main circuit breaker	HOMCGK2	105.00	DE3D
	For use on "S2" and "S3" Series NEMA 3R QOM2 load centers. Interlocks a QOM2 2P load center (150–225 A) with a Homeline 2P (15–125 A) branch circuit breaker	main circuit breaker of a	HOMRBGK2	105.00	DE3D

Class 1170 / Refer to Catalog 1100CT0501



HOM 1P 1 Space Required



HOM 2P 2 Spaces Required



HOMT 1P 1 Space Required



HOM2200BB Branch Circuit Breaker 4 Spaces Required



HOMT Quad Circuit Breaker 2 Spaces Required



HOM 1P CAFI



HOM 1P DF



HOM 1P GFI (With Ground Fault Circuit Interrupter) 1 Space Required



HOM 2P GFI (With Ground Fault Circuit Interrupter) 2 Spaces Required

The Square D Homeline circuit breakers are in a 1 in. wide format for 1-pole circuit breakers. They are designed to plug into Homeline load centers.

Table 1.36: HOM

Ampere	AIR	1P—120/24	0 Vac	2P-120/240 Vac Co	mmon Trip
Rating	AIR	Cat. No.	\$ Price	Cat. No.	\$ Price
15 A	10 kA	HOM115 ▲ ■	26.30	HOM215 ■	60.00
20 A	10 kA	HOM120 ▲ ■	26.30	HOM220 ■	60.00
25 A	10 kA	HOM125 ■	26.30	HOM225 ■	60.00
30 A	10 kA	HOM130 ■	26.30	HOM230 ■	60.00
35 A	10 kA	_	_	HOM235 ■	60.00
40 A	10 kA	HOM140 ■	26.30	HOM240 ■	60.00
45 A	10 kA	_	_	HOM245 ■	60.00
50 A	10 kA	HOM150 ■	26.30	HOM250 ■	60.00
60 A	10 kA	_	_	HOM260 ■	60.00
70 A	10 kA	_	_	HOM270 ■	123.00
80 A	10 kA	_	_	HOM280 ■	168.00
90 A	10 kA	_	_	HOM290 ■	168.00
100 A	10 kA	_	_	HOM2100 ■	168.00
110 A	10 kA	_	_	HOM2110 ■	369.00
125 A	10 kA	_	_	HOM2125 ■	369.00
150 A	10 kA	_	_	HOM2150BB ■ ◆	428.00
175 A	10 kA	_	_	HOM2175BB ■ ◆	428.00
200 A	10 kA	_	_	HOM2200BB ■ ◆	428.00

Table 1.37: HOM-HM

High magnetic trip circuit breakers are recommended for applications where high initial inrush current may occur.

ı	A	1P—120/240	Vac	2Ps
Amperes	Cat. No.	\$ Price	<u> </u>	
	15 A	HOM115HM■	27.60	_
	20 A	HOM120HM■	27.60	_

Table 1.38: HOM-CAFI

Homeline Combination Arc Fault Circuit Interrupters—Provide overload and short circuit protection, plus arc fault protection in accordance with the NEC and UL1699.

Circuit Breaker Type	Ampere Rating	Poles 120 Vac	Cat. No.	\$ Price
Combination Arc-fault	15 A	1	HOM115CAFI■	267.00
Circuit interrupter	20 A	1	HOM120CAFI■	267.00

Table 1.39: HOM-DF

Homeline Combination Arc Fault and Ground Fault Circuit Interrupters (Dual Function)—Provide overload and short circuit protection, plus arc fault and ground fault protection in a single device in accordance with the NEC, UL1699 and UL943.

Circuit Breaker Type	Ampere Rating	Poles 120 Vac	Cat. No.	\$ Price
Combination Arc-fault and Ground	15 A	1	HOM115DF	312.00
Fault Circuit interrupter	20 A	1	HOM120DF	312.00

Table 1.40: HOM-GFI

HOM-GFI circuit breakers provide overload and short circuit protection, combined with Class A ground fault protection. Class A denotes a ground fault circuit interrupter that will trip when a fault current to ground is 6 milliamperes or more.

Ampere		1P—120 Vac		2P—120/2 Commor		
Rating	AIR			2 Spaces Required		
		Cat. No.	\$ Price	Cat. No.	\$ Price	
15 A	10 kA	HOM115GFI	212.00	HOM215GFI	413.00	
20 A	10 kA	HOM120GFI	212.00	HOM220GFI	413.00	
30 A	10 kA	_	_	HOM230GFI	413.00	
40 A	10 kA	_	_	HOM240GFI	413.00	
50 A	10 kA	_	_	HOM250GFI	413.00	

Table 1.41: HOM-EPD—10 k AIR

Homeline Equipment Protection Device—Circuit Breakers with 30 mA Equipment Ground Fault Protection (UL Listed)

Amperes	1P—120 \	Vac	2P—120/240 Vac Common Trip		
	Cat. No.	\$ Price	Cat. No.	\$ Price	
15 A	HOM115EPD	374.00	HOM215EPD	660.00	
20 A	HOM120EPD	374.00	HOM220EPD	660.00	
25 A	_	_	HOM225EPD	660.00	
30 A	_	_	HOM230EPD	660.00	
40 A	_	_	HOM240EPD	660.00	
50 A	_	_	HOM250EPD	660.00	

### Table 1.42: HOMT Tandem Circuit Breakers

AIR	1P Tandem—120/240 Vac Required)	(One Space	
	Cat. No.	\$ Price	
10 kA	HOMT1515 ■	52.00	
10 kA	HOMT1520 ■	52.00	
10 kA	HOMT2020 ■	52.00	
10 kA	HOMT3015 ■	52.00	
10 kA	HOMT3020 ■	52.00	
	10 kA 10 kA 10 kA 10 kA	AIR Required)  Cat. No.  10 kA HOMT1515 ■ 10 kA HOMT1520 ■ 10 kA HOMT2020 ■ 10 kA HOMT3015 ■ 10 kA HOMT3020 ■	

- ▲ UL Listed as SWD (switching duty) rated. Suitable for switching 120 Vac fluorescent lighting loads.
- UL Listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.

Table 1.43: HOMT Quad Tandem Circuit Breakers

Ampere	Rating ★	AIR	2P Tandem—120/240 Vac (1 Required)	Two Spaces
1P	2P		Cat. No.	\$ Price
(2) 15 A	15 A	10 kA	HOMT1515215 ■	120.00
(2) 15 A	20 A	10 kA	HOMT1515220 ■	120.00
(2) 15 A	25 A	10 kA	HOMT1515225 ■	120.00
(2) 15 A	30 A	10 kA	HOMT1515230 ■	120.00
(2) 15 A	40 A	10 kA	HOMT1515240 ■	120.00
(2) 15 A	50 A	10 kA	HOMT1515250 ■	120.00
(2) 20 A	20 A	10 kA	HOMT2020220 ■	120.00
(2) 20 A	25 A	10 kA	HOMT2020225 ■	120.00
(2) 20 A	30 A	10 kA	HOMT2020230 ■	120.00
(2) 20 A	40 A	10 kA	HOMT2020240 ■	120.00
(2) 20 A	50 A	10 kA	HOMT2020250 ■	120.00

Note: Typical catalog number (e.g. HOMT 1515230) represents two 1P, outer poles (two 15 A 1P CBs) and one 2P inner circuit breaker with common trip (one 30 A 2P CB).

Table 1.44: Circuit Breaker Wire Sizes▼

Bussley Type	Ampere	Wire Size (AWG/kcmil)				
Breaker Type	Rating	Aluminum	Copper			
ном	15–30 A	14–8 AWG	14–8 AWG or (2) 14–10 AWG			
1P	40–50 A	8–2 AWG	8–2 AWG			
	15–30 A	14–8 AWG	14–8 AWG or (2) 14–10 AWG			
HOM 2P	35–70 A	8–2 AWG	8–2 AWG			
2F	80-125 A	4-2/0 AWG	4-2/0 AWG			
	150-200 A	4 AWG-300 kcmil	4 AWG-300 kcmil			
HOMT and Quad	15–30 A	14–8 AWG	14–8 AWG			
Quad Only	40–50 A	6-12 AWG	6-14 AWG			
HOM-GFI - 1P	15–20 A	14-10 AWG	14-10 AWG			
HOM-GFI - 2P	15-50 A	12-4 AWG	14–6 AWG			

Table 1.45: Accessories

Description		Cat. No.	\$ Price
Handle Attachments			
Handle Tie: Converts any two adjacent 12 single HOM circuit breakers to independer		HOM1HT□	3.50
Handle Tie: Converts any two adjacent 12 1P side-by-side HOMT circuit breakers to i trip 2P		HOMTHT□	3.80
Handle Clamp: Clamp for holding HOM 1F the ON or OFF position	handle in	QO1LO\$	3.80
Handle Blocking Device: Attaches to standa circuit breakers for holding the handle in th position		HOM2HBD□	10.70
Handle Padlock Attachment: For padlockir Standard HOM breakers in the ON or OFF		HOM1PA	9.90
Handle Padlock Attachment: For	15-70 A	HOM2PALA□	9.90
padlocking 2P Standard HOM circuit	80-125 A	HOM2PAHA□	9.90
breakers in ON or OFF position	150-200 A	HOM2PAVHA□	50.00
		HOMQPA	9.90
	50-125 A	QOM1PA△♦	11.00
	100–225 A	QOM2PA△♦	11.00
Sub-Feed Lugs			
125 A 2P plug-on—2 spaces required		HOML2125	47.60
225 A 2P plug-on—4 spaces required		HOML2225◆	296.00
breakers in ON or OFF position  Handle Padlock Attachment: For padlockir poles of Homeline Quad breakers in the OH Handle Padlock Attachment: For padlocking main circuit breakers in convertible load center in OFF position Sub-Feed Lugs	150–200 A ng center FF position. 50–125 A 100–225 A	HOM2PAVHA□ HOMQPA QOM1PA△♦ QOM2PA△♦ HOML2125 HOML2225◆	50 9 11 11 47 296

- Requires four spaces (1 AWG–300 kcmil Al/Cu). Use only in 10 panel rated 150 A or greater.
- 15-20 A tandem or quad tandem circuit breakers are suitable for use with 60°C or 75°C conductors. 25-50 A tandem or quad tandem circuit breakers are suitable for use with 75°C conductors only.
- 15–30 A circuit breakers are suitable for use with 60°C or 75°C conductors. 40–125 A circuit breakers are suitable for use with 75°C conductors.
- conductors.

  △ 50–125 A QOM1 frame size; 100–225 A QOM2 frame size.
- □ DE3C Discount Schedule
- ♦ DE2E Discount Schedule



# 1Ø3W—120/240 Vac—UL Listed

Table 1.46: Convertible Main Load Centers (Accepts Only HOM Plug-On Circuit Breakers.)

Mains	Spaces	Max. Single	Max. Tandem	Load Center Box, Interior and Co	over ■		/ire Size /kcmil	Equipment Grou (Order Sepa		Box No. See	
Rating	Spaces	Pole Circuits A	Circuit Breakers	Cat. No.	\$ Price (DE3C)	Al	Cu	Cat. No.	\$ Price (DE3A)	Page 1	
Main Lugs- Factory-installe	-10 kA Short ed Fixed Main	Circuit Curren Lugs	t Rating Order	HOM Circuit Breakers (See	page 1-14)						
70 A	2	4	2	HOM24L70F/S <sup>★♦</sup>	59.00	12–3	14–4	PK3GTA1	11.40	2	
100 A	6	12	6	HOM612L100F/S <sup>♦</sup> ▼	78.00		<u>-1</u>	PK7GTA	11.70	4	
125 A	4	8	4	HOM48L125GC	86.00	12–2/0	14–2/0	PK7GTA Factor	y-included	21	
Convertible Ma				. (0							
QOM1 Main Fra				ker (See page 1-16)	400.00			DIGITA	4=40		
	8 8	16 16	8 8	HOM816L125C	132.00 150.00			PK15GTA Factory-installed	17.10	6	
	12	12	0	HOM816L125TC HOM12L125C	174.00			PK15GTA	17.10	6	
	12	24	12	HOM1224L125TC	204.00			Factory-installed		6	
125 A	16	24	8	HOM1624L125C	260.00	6-	-2/0	PK15GTA	17.10	8	
	20	20	0	HOM20L125C	237.00			PK15GTA	17.10	8	
	20	24	4	HOM2024L125TC	288.00			Factory-installed	_	8	
	24	24	0	HOM24L125TC	344.00			Factory-installed	_	8	
Convertible Ma				ker (See page 1-16)							
QOM2 Maiii i ia	30	30	0	HOM30L150C	375.00	1_	250	PK23GTA	21.30	10	
150 A	30	30	0	HOM30L150TC	396.00		250	Factory-installed		10	
	16	32	16	HOM1632L200TC	357.00			and and an arrangement		- 10	
200 A	16	32	16	HOM1632L200TCFT∆	575.00	4-	250	Factory-installed	_	10	
	20	40	20	HOM2040L200TC	417.00			-		9	
	30	30	0	HOM30L200C	420.00			PK23GTA	21.30	10	
	30	30	0	HOM30L200TC	464.00			Factory-installed	_	10	
	30	40	10	HOM3040L200TC	479.00			Factory-installed		10	
200 A	40	40	0	HOM40L200C	618.00	4–	250	PK23GTA	21.30	12	
	40 40	40 60	0 20	HOM40L200TC HOM4060L200TC	671.00 839.00			Factory-installed	_	12 12	
	40	52	10	HOM4252L200TC	804.00			Factory-installed Factory-installed	_	12	
225 A	42	42	0	HOM42L225C	732.00	6-	250	PK23GTA	21.30	12	
Convertible Ma QOM1 Main Fra				er Amperage Main Circuit B	reaker (See pag	ge 1-16)					
	8	16	8	HOM816M100C	315.00		-1	PK15GTA	17.10	5	
	8	16	8	HOM816M100TC	333.00		-1 -1	Factory-installed		5	
100 A	12 12	12 24	0 12	HOM12M100C	294.00 384.00		-2/0 -2/0	PK15GTA	17.10	6	
100 A	20	20	0	HOM1224M100TC HOM20M100C	396.00		-2/0 1	Factory-installed PK15GTA	17.10	7	
	24	24	0	HOM24M100C	513.00		-1 -2/0	PK15GTA	17.10	8	
	30	30	0	HOM30M100C	672.00		-2/0	PK23GTA	21.30	10	
	12	24	12	HOM1224M125C	606.00			PK15GTA	17.10	6	
125 A	12	24	12	HOM1224M125TC	620.00	6	-2/0	Factory-installed	_	6	
125 A	24	24	0	HOM24M125C	710.00	0-	-2/0	PK15GTA	17.10	8	
	30	30	0	HOM30M125C	812.00			PK23GTA	21.30	10	
Convertible Ma QOM2 Main Fra				r rer Amperage Main Circuit B	reaker (See pag	ge 1-16)					
	16			HOM1632M150TC	636.00			Factory-installed	_	9	
150 A	10	32	16	HOWITO32WIT3UTC							
	20	32 30	16 10	HOM2030M150TC	750.00	4-	250	Factory-installed	_		
	-	-	-			4-	250	Factory-installed PK23GTA	— 21.30	9	
	20 30 12	30 30 24	10 0 12	HOM2030M150TC HOM30M150C HOM1224M200TC	750.00 776.00 572.00	4-	250	PK23GTA Factory-installed	21.30 —	9 10 9	
	20 30 12 16	30 30 24 32	10 0 12 16	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC	750.00 776.00 572.00 675.00	4-	250	PK23GTA Factory-installed Factory-installed	_	9 10 9	
	20 30 12 16 20	30 30 24 32 40	10 0 12 16 20	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C	750.00 776.00 572.00 675.00 711.00	4–	250	PK23GTA Factory-installed Factory-installed PK23GTA		9 10 9 9 9	
	20 30 12 16 20 20	30 30 24 32 40 40	10 0 12 16 20 20	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC	750.00 776.00 572.00 675.00 711.00 764.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed	  	9 10 9 9 9 9	
200 A	20 30 12 16 20 20 30	30 30 24 32 40 40 30	10 0 12 16 20 20	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00		250	PK23GTA  Factory-installed Factory-installed PK23GTA  Factory-installed PK23GTA	_	9 10 9 9 9 9	
	20 30 12 16 20 20 30 30	30 30 24 32 40 40 30 40	10 0 12 16 20 20	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200TC HOM3040M200TC	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00			PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed	  	9 10 9 9 9 9 9 10	
	20 30 12 16 20 20 30	30 30 24 32 40 40 30	10 0 12 16 20 20 0 10	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00			PK23GTA  Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed FACTORY-installed		9 10 9 9 9 9 10 10	
	20 30 12 16 20 20 30 30 40	30 30 24 32 40 40 30 40 40	10 0 12 16 20 20 0 10	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200C HOM3040M200TC HOM3040M200TC HOM40M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00			PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA		9 10 9 9 9 10 10 12	
200 A	20 30 12 16 20 20 30 30 40 40 42 42	30 30 24 32 40 40 30 40 40 60 42 52	10 0 12 16 20 20 0 10 0 20 0 10	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200C HOM3040M200TC HOM40M200TC HOM40M200C HOM4060M200C HOM4060M200C HOM4252M200C HOM4252M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1094.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA FACTORY-installed PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 — 21.30 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12	
	20 30 12 16 20 20 30 30 40 40 42	30 30 24 32 40 40 40 40 40 60 42	10 0 12 16 20 20 0 10 0 20 0	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200TC HOM30M200C HOM3040M200TC HOM3040M200TC HOM40M200TC HOM40M200C HOM40M200C HOM40M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1094.00	4-		PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 — 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12	
200 A 225 A	20 30 12 16 20 20 30 30 40 40 42 42 42	30 30 24 32 40 40 30 40 40 60 42 52	10 0 12 16 20 20 0 10 0 20 0 10	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M220TC HOM2040M200TC HOM2040M200TC HOM30M200C HOM3040M200TC HOM40M200TC HOM40M200TC HOM40M200C HOM4060M200C HOM4252M200C HOM4252M200C HOM4252M200C	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1094.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA FACTORY-installed PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 — 21.30 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12	
200 A 225 A <b>Universal M</b>	20 30 12 16 20 20 30 30 40 40 42 42 42 42 1ains—No F.	30 30 24 32 40 40 30 40 40 60 42 52 42 actory-installed	10 0 12 16 20 20 0 10 0 20 0 10 0 20 0 4 Main Circuit E	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200C HOM3040M200TC HOM3040M200TC HOM40M200C HOM40M200C HOM40M200C HOM40M200C HOM42M200C HOM4252M200C HOM4252M200C HOM42M225C  3reaker or Main Lugs or Main Lugs (See page 1-1	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1094.00 1313.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 — 21.30 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12 12	
200 A 225 A <b>Universal M</b> QOM2 Main Fra	20 30 12 16 20 20 30 30 40 40 42 42 42 142	30 30 24 32 40 40 30 40 40 60 42 52 42 actory-installed id-install Main	10 0 12 16 20 20 0 10 0 20 0 10 0 10 0 20 Corotic Figure 10	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200C HOM3040M200TC HOM3040M200TC HOM40M200C HOM40M200C HOM4060M200C HOM4252M200C HOM4252M200C HOM4252M200C HOM4252M200C HOM42M205C  Breaker or Main Lugs or Main Lugs (See page 1-1	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1394.00 1313.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA FACTORY-installed PK23GTA PK23GTA PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 21.30 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12 12	
200 A 225 A <b>Universal M</b>	20 30 12 16 20 20 30 30 40 40 42 42 42 42 1ains—No F.	30 30 24 32 40 40 30 40 40 60 42 52 42 actory-installed	10 0 12 16 20 20 0 10 0 20 0 10 0 20 0 4 Main Circuit E	HOM2030M150TC HOM30M150C HOM1224M200TC HOM1632M200TC HOM2040M200C HOM2040M200C HOM3040M200TC HOM3040M200TC HOM40M200C HOM40M200C HOM40M200C HOM40M200C HOM42M200C HOM4252M200C HOM4252M200C HOM42M225C  3reaker or Main Lugs or Main Lugs (See page 1-1	750.00 776.00 572.00 675.00 711.00 764.00 798.00 891.00 1019.00 1367.00 1094.00 1313.00	4-	250	PK23GTA Factory-installed Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA Factory-installed PK23GTA PK23GTA PK23GTA PK23GTA PK23GTA	21.30 — 21.30 — 21.30 — 21.30 21.30 21.30	9 10 9 9 9 9 10 10 12 12 12 12	

Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- Maximum single pole branch circuits utilizing HOM and/or HOMT circuit breakers.
- C at end of catalog number indicates combination flush/surface cover included with device.

  F/S at end of catalog number indicates to order F for flush device or S for surface device. The cover does not have a door.

  HOM-GFI and HOM-AFI branch circuit breakers are limited to number 10 maximum wire.
- $70~\mbox{A}$  maximum branch circuit breaker, 100 A maximum back feed main circuit breaker. Supplied with feed-thru lugs.

**LOAD CENTERS** 

### 1Ø3W-120/240 Vac-UL Listed

Table 1.47: Convertible Main Load Centers (Accepts Only HOM Plug-On Circuit Breakers.)

-installe A DA 5 A tible Mai	2   6   4   4   12   12   20   30   30   40	4 12 8 ory-installed Ma 16 12 24 20	hort Circuit Currer  2 6 4 ain Lugs ♦, QOM1 8 0 12 0 ain Lugs ♦, QOM2 0 20 0	Cat. No. (DE3C)  Int Rating  HOM24L70RB  HOM612L100RB△  HOM48L125GRB  I Main Frame Size—Conve  HOM816L125RB  HOM12L125RB  HOM1224L125RB  HOM20L125RB  2 Main Frame Size—Conve  HOM2L00RB	248.00 234.00 278.00 383.00	6–2	14–2/0 (See Below	PK4GTA PK7GTA Factory  PK15GTA PK15GTA PK15GTA PK15GTA PK15GTA	10.80 11.70 7-included 17.10 17.10 17.10	1R 2R 15R 3R 3R 3R
-installe A D A 5 A tible Mai	2   6   4   4   12   12   20   30   30   40	4 12 8 Pry-installed Mark 12 24 20 Pry-installed Mark 12 40 30 40	hort Circuit Currer  2 6 4 ain Lugs ♦, QOM1 8 0 12 0 ain Lugs ♦, QOM2 0 20 0	HOM24L70RB■ HOM612L100RB△ HOM48L125GRB I Main Frame Size—Conve HOM816L125RB HOM12L125RB HOM12L4L125RB HOM20L125RB 2 Main Frame Size—Conve	129.00 137.00 rtible to Main Cir 248.00 234.00 278.00 383.00 rtible to Main Ci	8- 12-2/0   rcuit Breaker	1 14–2/0 (See Below 2/0	PK7GTA PK7GTA Factory  PK15GTA PK15GTA PK15GTA PK15GTA	11.70 /-included 17.10 17.10 17.10	2R 15R 3R 3R 3R
OA 5 A tible Mai 5 A	6 4 4 ins with Factor 12 20 ins with Factor 20 30 30 40	12 8 ory-installed M: 16 12 24 20 ory-installed M: 12 40 30 40	6 4 ain Lugs •, QOM1 8 0 12 0 ain Lugs •, QOM 20 0	HOM612L100RBA HOM48L125GRB I Main Frame Size—Conve HOM816L125RB HOM12L125RB HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve	129.00 137.00 rtible to Main Cir 248.00 234.00 278.00 383.00 rtible to Main Ci	8- 12-2/0   rcuit Breaker	1 14–2/0 (See Below 2/0	PK7GTA PK7GTA Factory  PK15GTA PK15GTA PK15GTA PK15GTA	11.70 /-included 17.10 17.10 17.10	2R 15R 3R 3R 3R
5 A tible Mai	4 ins with Factor 8 12 12 20 ins with Factor 12 20 30 30 40	8  ory-installed Market  16 12 24 20  ory-installed Market  12 40 30 40	4 ain Lugs •, QOM1 8 0 12 0 ain Lugs •, QOM2 0 20 0	HOM48L125GRB  I Main Frame Size—Conve HOM816L125RB HOM12L125RB HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve	137.00 rtible to Main Cir 248.00 234.00 278.00 383.00 rtible to Main Ci	12-2/0   rcuit Breaker	14–2/0 (See Below	PK7GTA Factory  PK15GTA PK15GTA PK15GTA	/-included 17.10 17.10 17.10	15R 3R 3R 3R
tible Mai	12   20     12   20     30   30   40	ory-installed Market	ain Lugs ◆, QOM1  8 0 12 0 ain Lugs ◆, QOM2 0 20 0	Main Frame Size—Conve HOM816L125RB HOM12L125RB HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve HOM12L200RB	248.00 234.00 278.00 383.00 rtible to Main Ci	cuit Breaker	(See Below 2/0	PK15GTA PK15GTA PK15GTA PK15GTA	17.10 17.10 17.10	3R 3R 3R
5 A tible Ma	8 12 12 20 ins with Factor 12 20 30 30 40	16 12 24 20 <b>cry-installed M</b> 12 40 30 40	8 0 12 0 ain Lugs ◆, QOM2 0 20 0	HOM816L125RB HOM12L125RB HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve	248.00 234.00 278.00 383.00 rtible to Main Ci	6–2	2/0	PK15GTA PK15GTA PK15GTA	17.10 17.10	3R 3R
tible Mai	12 12 20 ins with Factor 12 20 30 30 40	12 24 20 <b>ory-installed M</b> 12 40 30 40	0 12 0 ain Lugs ◆, QOM2 0 20 0	HOM12L125RB HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve HOM12L200RB	234.00 278.00 383.00 rtible to Main Ci			PK15GTA PK15GTA	17.10 17.10	3R 3R
tible Mai	12 20 ins with Factor 12 20 30 30 40	24 20 ory-installed Ma 12 40 30 40	12 0 ain Lugs ◆, QOM2 0 20 0	HOM1224L125RB HOM20L125RB 2 Main Frame Size—Conve HOM12L200RB	278.00 383.00 rtible to Main Ci			PK15GTA	17.10	3R
tible Mai	20 ins with Factor 12 20 30 30 40	20 ory-installed Ma 12 40 30 40	0 ain Lugs ◆, QOM2 0 20 0	HOM20L125RB  2 Main Frame Size—Conve HOM12L200RB	383.00 rtible to Main Ci				-	
	12 20 30 30 40	12 40 30 40	ain Lugs ◆, QOM2 0 20 0	2 Main Frame Size—Conve HOM12L200RB	rtible to Main Ci	rcuit Breaker	<b>6</b> 5 1	PK15GTA	17 10	40
	12 20 30 30 40	12 40 30 40	0 20 0	HOM12L200RB		rcuit Breakeı	(O D I	11(10(1))	17.10	4R
) A	20 30 30 40	40 30 40	20 0		423.00		(See Below	)		
DΑ	30 30 40	30 40	0	HOM2040L200BB				PK23GTA	21.30	5R
DΑ	30 40	40	· ·		560.00			PK23GTA	21.30	6R
Α	40	-		HOM30L200RB	587.00	4 050		PK23GTA	21.30	7R
		40	10	HOM3040L200RB	759.00	4–2	50	_	_	_
			0	HOM40L200RB	911.00			PK23GTA	21.30	14R
	40	60	20	HOM4060L200RB	1139.00			PK23GTA	21.30	14R
	42	52	10	HOM4252L200RB	1092.00			PK23GTA	21.30	14R
Circui	t Breaker-	-22 kA Short (	Circuit Current Ra	ting						
tible Mai	ins with Facto	ory-Installed Ma	ain Circuit Breake	r, QOM1 Main Frame Size-	-Convertible to	Main Lugs o	Lower Amp	erage Main Circuit E	Breaker (See Be	low)★
	8	16	8	HOM816M100RB	429.00	6-	1	PK15GTA	17.10	3R
ΟA	12	12	0	HOM12M100RB	416.00			PK15GTA	17.10	3R
<i>,</i> ,	20	20	0	HOM20M100RB	531.00	6–2	2/0	PK15GTA	17.10	4R
	24	24	0	HOM24M100RB	606.00			PK15GTA	17.10	6R
5 A	8	16	8	HOM816M125RB	716.00	6–2	2/0	PK15GTA	17.10	3R
, , , , , , , , , , , , , , , , , , ,	24	24	0	HOM24M125RB	858.00	0.2	.,0	PK15GTA	17.10	6R
tible Mai	ins with Facto	ory-installed Ma	ain Circuit Breake	r, QOM2 Main Frame Size-	-Convertible to	Main Lugs o	Lower Am	oerage Main Circuit E	Breaker (See Be	elow)
ΟA	30	30	0	HOM30M150RB	978.00	4–2	50	PK23GTA	21.30	7R
	20	40	20	HOM2040M200RB	872.00			PK23GTA	21.30	6R
	30	30	0	HOM30M200RB	1004.00			PK23GTA	21.30	7R
DΑ	30	40	10	HOM3040M200RB	1152.00	4.5	50	PK23GTA	21.30	7R
7.7	40	40	0	HOM40M200RB	1277.00	4-2	50	PK23GTA	21.30	14R
	40	60	20	HOM4060M200RB	1596.00				14.20	14R
										14R
5 A	-		-			4-2	50		-	7R
	42	42	0	HOM42M225RB	1323.00			PK23GTA	21.30	14R
					eaker (See Belov	v) <b>+</b>				
		16	8	HOM816M150FTRB	785.00	4-2	50	PK15GTAL	35.00	6R
	8	16	8	HOM816M200FTRB	785.00	4–2	50	PK15GTAL	35.00	6R
/lain Fra	8								,	
Main Fra OA OA▼ al Main	8 with Feed-thi									
	A ible Ma lain Fra	A 40 40 42 A 16 42 ble Mains with Factuain Frame Size—Co	A	A	A	A 40 40 0 0 HOM40M200RB 1277.00 40 60 20 HOM4060M200RB 1596.00 42 52 10 HOM4060M200RB 1532.00 A 16 24 8 HOM1624M225RB 1182.00 HOM42M225RB 1323.00 ble Mains with Factory-installed Main Circuit Breaker with Feed-thru Lugs, ain Frame Size—Convertible to Main Lugs or Lower Amperage Main Circuit Breaker (See Below A 8 16 8 HOM816M150FTRB 785.00	A	A	A	A

Above listings through 200 A mains rating meet Federal Specification W-P-115c as Type 1, Class 2.

- Maximum single pole branch circuits utilizing HOM and/or HOMT circuit breakers. HOM-GFI and HOM-AFI branch circuit breakers are limited to number 10 maximum wire. Side hinge door device allow 1-1/4 in. on left side for door to open.
- 22 k AIR main circuit breaker UL Listed for use ahead of HOM and HOMT 10 k AIR branch circuit breakers to permit their application on systems with up to 22 kA available fault current. Rated 200 A when using copper wire. Reference NEC® Table 310.15(B)(6) when using AI wire.

### 70 A maximum branch circuit breaker, 100 A maximum back feed main circuit breaker,

## 1Ø, Field-Installed Mains Kits

#### For Convertible Load Centers Only Table 1.48:



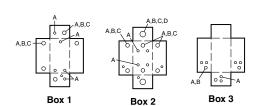


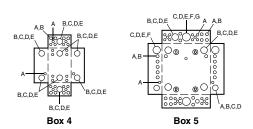
QQL225

	. To Control and Control Control											
Field-Installed Main Type	Frame Size	Main □ Ampere Rating	Use on Convertible Load Center with Mains Rating	Cat. No.	\$ Price (DE3A)	Lug Wire Size ▽ AWG/kcmil						
Main Luga A		125 A	100–125 A	QOL125	44.10	6-2/0 Al or Cu						
Main Lugs ◊	_	225 A	150-225 A	QOL225	104.00	6-300 Al or Cu						
		50 A	100-125 A	QOM50VH	140.00							
		60 A	100-125 A	QOM60VH	140.00							
		70 A	100-125 A	QOM70VH	140.00							
	QOM1	80 A	100–125 A	QOM80VH	201.00	12-2/0 Al or Cu						
	QOIVIT	90 A	100-125 A	QOM90VH	201.00	12-2/0 AI 0I Cu						
		100 A	100-125 A	QOM100VH	201.00							
Main Circuit		110 A	125 A	QOM110VH	468.00							
Breaker ☆		125 A	125 A	QOM125VH	468.00							
		100 A	150-225 A	QOM2100VH	468.00							
		125 A	150-225 A	QOM2125VH	468.00							
	001400	150 A	150-225 A	QOM2150VH	468.00	4 000 41 0						
	QOM2€	175 A	200–225 A	QOM2175VH	468.00	4–300 Al or Cu						
		200 A	200–225 A	QOM2200VH	468.00							
		225 A	225 A	QOM2225VH	468.00							

- Do not exceed the load center mains rating.
- If main circuit breaker knockout has been removed from the load center's trim, order appropriate filler plate from page 1-13.
- 22 k AIR main circuit breaker UL Listed for use ahead of HOM and HOMT 10 k AIR branch circuit breakers to permit their application on systems with up to 22 kA available fault current. Wire range listed for main device kits is the wire range of that device. To find out maximum wire size permitted in a particular load center per UL, see pages 1-5 through 1-11 under Main Wire Size. ☆
- Add suffix 1021 for 120, 208, 240 Vac shunt trip.







# **Indoor Knockout Information and Enclosure Dimensions**

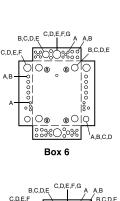
Table 1.49: Enclosure Dimensions

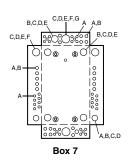
	Difficultions											
Box	٧	V	H	4	D							
No.	in.	mm	in.	mm	in.	mm						
1	3.81	97	6.72	171	3.00	76						
2	4.81	122	9.30	236	3.19	81						
3	4.81	122	9.30	236	3.19	81						
4	8.88	226	12.57	319	3.80	97						
5	14.25	362	14.92	379	3.75	95						
6	14.25	362	17.92	455	3.75	95						
7	14.25	362	20.92	531	3.75	95						
8	14.25	362	26.04	661	3.75	95						
9	14.25	362	29.86	758	3.75	95						
10	14.25	362	33.78	858	3.75	95						
11	14.25	362	37.98	965	3.75	95						
12	14.25	362	39.37	1000	3.75	95						

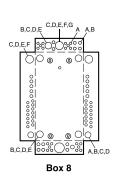
Dimensions											
Вох	٧	٧	H	1		)					
No.	in.	mm	in.	mm	in.	mm					
13	5.88	149	13.12	333	3.38	86					
14	14.25	362	20.92	531	3.75	95					
15	20.00	508	50.00	1270	5.75	146					
 16	20.00	508	62.00	1727	5.75	146					
17	20.00	508	53.00	1346	5.75	146					
18	5.88	149	16.12	409	3.38	86					
 19	7.56	192	23.12	587	4.25	108					
20	9.62	244	26.12	663	4.75	121					
21	8.88	226	14.80	376	3.80	97					
 22	8.55	217	23.92	608	3.95	100					
23	14.25	362	29.86	758	3.75	95					

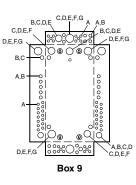
Table 1.50: Knockout Information

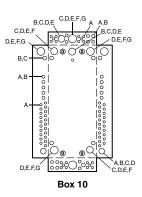
	Knockouts										
Symbol	Α	В	С	D	Е	F	G	Н	-1		
Conduit Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2		

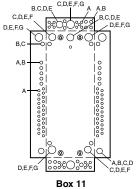


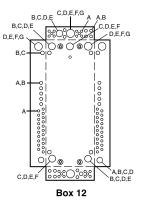


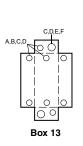


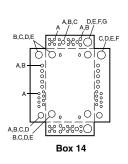


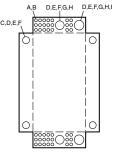




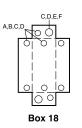


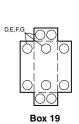


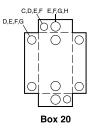


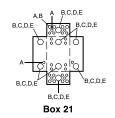


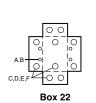
Box 15, 16, 17

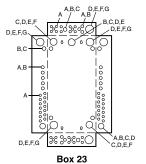




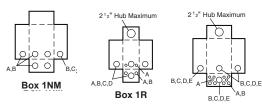


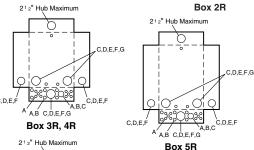


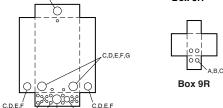


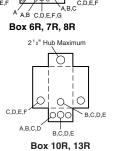


© 2012 Schneider Electric All Rights Reserved











Box 12R

212" Hub Maximum

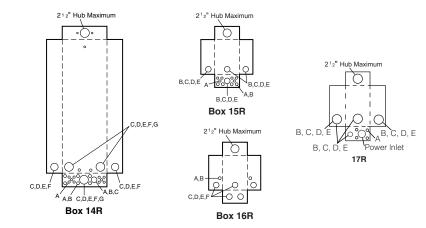
Table 1.51: Enclosure Dimensions

Difficultions											
Box No.	١	V	H	1		)					
DOX NO.	in.	mm	in.	mm	in.	mm					
1NM	6.52	166	8.79	223	3.90	99					
1R <b>▲</b>	4.88	124	9.38	238	4.00	102					
2R	8.88	226	12.65	321	4.27	108					
3R	14.75	375	18.92	481	4.52	115					
4R	14.75	375	22.06	560	4.52	115					
5R	14.75	375	26.04	661	4.52	115					
6R	14.75	375	29.86	758	4.52	115					
7R	14.75	375	33.78	858	4.52	115					
8R	14.75	375	37.98	965	4.52	115					
9R	4.56	116	6.50	165	3.88	99					
10R	6.92	176	13.18	335	4.12	105					
11R	7.56	192	23.24	590	4.75	121					
12R	9.62	244	26.24	666	5.50	140					
13R	6.92	176	16.18	411	4.12	105					
14R	14.75	375	39.37	1000	4.52	115					
15R	8.88	226	14.80	376	4.27	108					
16R	8.55	217	24.75	629	4.16	106					
17R	8.88	226	12.65	321	4.27	108					

HOME250SPA and QO260NATR top endwall has no hub opening.

Table 1.52: Knockout Information

Knockouts									
Symbol	Α	В	С	D	E	F	G	Н	
Conduit Size	1/2 in.	3/4 in.	1 in.	1-1/4 in.	1-1/2 in.	2 in.	2-1/2 in.	3 in.	





"RB" Hub

### **Bolt-On Hubs**

Square D equipment with "R" or "RB" suffix, designated NEMA 3R rainproof construction, utilizes bolt-on hubs listed below. "RB" devices will accept 3/4 in. through 2-1/2 in. bolt-on hubs without the use of reducers. Off-center conduit thread openings and elongated mounting holes provide quick and easy adjustment to eliminate costly conduit offsets and bends. Catalog suffix "R" devices require 3 in. through 4 in. field cut opening. Hubs are suitable for use with conduit having ANSI standard taper pipe thread.

Table 1.53: Bolt-On Hubs UL Listed for "RB" Devices■

Conduit Size	3/4 in.	1 in.	1-1/4 in.	1-1/2 in.	2 in.	2-1/2 in.
Hub Cat. No.	B075	B100	B125	B150	B200	B250
\$ Price	33.30	33.30	33.30	33.30	61.35	102.00

 Closing cap (Cat. No. BCAP) is provided factory-installed on each device having "RB" suffix. Price if ordered separately; \$2.50

### Table 1.54: Bolt-On Hubs UL Listed for Mounting in Field-Cut Opening

Conduit Size	3 in.	3-1/2 in.	4 in.	Designed for mounting in field cut opening.
Hub Cat. No.	B300 B350			Includes gasket and four mounting bolts and nuts.
\$ Price	186.00	300.00	368.00	



by Schneider Electric www.schneider-electric.us

Table 1.55:



Meets Federal Spec. W-P-115c as Type 1, Class 2, UL Listed, suitable only for use as service equipment, 120/240 Vac, 1Ø3W, NEMA 3R enclosure

	0_	<i>σ</i>		vice	Circuit t Rating			s	ervice Disconnect	(s)		Circuit E	nter and Bi Freakers (C Pages 1-2,	Order	Hub Type	Line Side	Service Ground	Weigh Each
	Ampere Rating	Bypass Type	(Type	of Feed)	을 표	Cat. No.	\$ Price		Typo			Max. Qu	antity		(Order	Main Lugs	Lug AWG/	(Lbs)
	₽.R.	P. L.			Short C Current			2P Circuits	Type (Order separately	Ampere Rating	sə		1P	Ampere Rating	separately from	AWG/ kcmil	kcmil	and Palle
			UL	UL and	ខ្លួ			(Max.)	from page 1-22 except as noted)	(Max.)	Spaces	Circuits	Tandems	(Max.)	page 1-17)	(Al/Cu)	(Al/Cu)	Qty.
Г	Surfac	e Mount On	dv	EUSERC							S							
	125 A	None	OH/UG	1 —	10 kA	C125RB	368.00	1	QOM1-VH	125 A	I —	_	_	_	В	4-1/0	8–1/0	15, 5
™_		110110	OH/UG	_	22 kA	CM200S	1022.00	1	QOM2-VH	200 A	_	_	_	_	A	4–250	(2) 8–2/0	26, 2
8	200 A	None	OH/UG	_	22 kA	C2M200S	1083.00	1	QOM2-VH	200 A	_	_	_	_	Α	4–250	(2) 8–2/0	27, 2
	20071	140110						1	QO-VH	50 A	_		_					
	Surfac	e Mount On	OH/UG		10 kA	C4L200S	1143.00	2	QO	100 A	_				Α	4–250	(2) 8–2/0	27, 2
	125 A	None	OH/UG	OH/UG	10 kA	SC8L125S	846.00	4	НОМ	125 A ■	I —	_	_	_	Α	6–2/0	6–2/0	31, 2
2	200 A	None	OH/UG	OH/UG	10 kA	SC12L200S	1419.00	6	HOM	200 A ≎	_				A–L	4–250	8–2/0	40, 1
N.		ush Mount		LOUGUO	1401.4	00014055		1 4	LIOM	1404	ı				A D000	0.0/0	0.00	107.0
ž	125 A	None None	OH/UG OH★/UG	OH/UG OH★/UG	10 kA	SC8L125F SC12L200F	846.00 1419.00	4 6	HOM HOM	110 A 200 A▽	_				A or B300 A–L	6–2/0 4–250	6–2/0 8–2/0	37, 2 47, 1
<u>_</u> e	:	None		OH★/UG		SC816F200F ▼	1187.00	1	QOM2200VH▲	200 AV	8	16	8	200 A▽	A-L A-L	4-250	8–2/0	51,
me	Surfac	e Mount—S	supplied v			ugs and provisions for	Branch (	Circuit B	reakers									
욷	450.1	NI-	011716	OH/UG	22 kA	SC816F150S ▼	1187.00	1	QOM2150VH▲	150 A	8	16	8	150 A •	A–L	4–250	8–2/0	40, 1
1	150 A	None	OH/UG	UG	10 kA	SC816D150C▼ △ SU816D150C▼ △	1250.00	1	HOM2150▲ HOM	150 A 50 A	8	16	8	100 A*	A or A–L	6-300	8-1/0	48,
1				OH/UG	22 kA	SC816F200S ▼	1187.00	1	QOM2200VH▲	200 A	8	16	8	200 A�	A–L	4–250	8–2/0	40,
1	200 A	None	OH/UG			SC816D200C▼△	1250.00	1	HOM2200▲	200 A	8		8					
L			ļ	UG	10 kA	SU816D200C ▼△	1250.00	1	HOM	50 A	ľ	16	٥	100 A*	A or A–L	6–300	8–1/0	48,
	Surfac	e Mount On	ıly	,														
	-	None Lever			22 kA 10 kA	RC200S□ RCM200SL□★	1022.00 1950.00	1	QOM2-VH QOM2-VH	200 A 200 A	-				A A	6–350 6–350	(2)8–2/0 8-1/0	26, i
	-	None				RC2M200SD	1083.00	1	QOM2-VH	200 A	1				A	6-350	(2)8–2/0	27,
	000 4	Horn	011/10		22 kA	RC2M200SH□	1136.00	i	QO-VH	50 A					A	6–350	(2)8–2/0	27,
	200 A	Lever	OH/UG	_	10 kA	RC2M200SL□☆	2090.00	1	QOM2-VH	200 A	]_	_	_	_	Α	6-350	8-1/0	60 /
	-							1	QO-VH	50 A							8-1/0	
	-	None None	_		22 kA 22 kA	QC12L200S <b>□</b> □☆ QC12L200C□	1562.00 1562.00	6	QO-VH QO-VH	200 A 200 A⊽	1				A A	6–350 6–350	8–2/0 12-2/0	43, 2
	Surfac		ily, Suppl	ied with F		nru Lugs and provisions				200 A V					Α	0 330	12-2/0	40, 1
g		Horn	OH/UG	-	22 kA	QC816F100SH <b>□</b> ▼□☆	1356.00	1	QOM2100VH▲	100 A	8	16	8	100	Α	6-350	8–2/0	43, 2
в	100 A	Horn	OH/UG	_	22 kA	QC816F100CH▼□☆	1356.00	1	QOM2100VH▲	100 A	8	16	8	100	Α	6–350	12-2/0	40,
	125 A	None None	OH/UG OH/UG		22 kA 22 kA	QC816F125S▼□☆ QC816F125C▼□	1304.00 1304.00	1	QOM2125VH▲ QOM2125VH▲	125 A 125 A	8	16 16	8 8	100	A	6-350 6-350	8–2/0 12-2/0	43, 40.
	123 A	Horn	OH/UG		22 kA	QC816F125SH <b>□</b> ▼□☆	1356.00	1	QOM2125VH▲	125 A	8	16	8	100	Ä	6–350	8–2/0	43,
	-	None	OH/UG		22 kA	OC816F150S□▼□☆□	1304.00	1	QOM2150VH▲	150 A	8	16	8	150 A⊕	A	6-350	8-2/0	43,
	150 A	None Horn	OH/UG OH/UG	_	22 kA 22 kA	QC816F150C▼□ QC816F150SH□▼□☆	1304.00 1356.00	1	QOM2150VH▲ QOM2150VH▲	150 A 150 A	8	16 16	<u>8</u> 8	150 A ♀ 150 A ♀	A	6-350 6-350	12-2/0 8–2/0	40,
		Lever	OH/UG	_	22 kA	QC816F150SL <b>♦</b> ☆□	2690.00	1	QOM2150-VH▲	200 A	8	16	8	150 A	A	6–350	8-2/0	74 /
	-	None	OH/UG		22 kA	OC816F200S□▼□☆	1356.00	1	QOM2200VH▲	200 A	8	16	8	200 A⊽	Α	6-350	8–2/0	43,
	200 A	Horn Horn	OH/UG OH/UG	_	22 kA 22 kA	QC816F200SH □ ▼ □ ★ QC816F200CH ▼ □	1356.00 1356.00	1	QOM2200VH▲ QOM2200VH▲	200 A 200 A	8	16 16	8	200 A▽	A A	6–350 6–350	12-2/0	40,
_	-	Lever	OH/UG	_	22 kA	QC816F200SL◆☆□	2690.00	1	QOM2200-VH▲	200 A	8	16	8	200 A	A	6–350	8–2/0	74 /
Г	Surfac	e Mount On	ıly															
	125 A	None	OH/UG	_	10 kA	RC8L125S <b>○</b>	846.00	4	HOM	125 A■	-	_	_	_	Α	6-2/0	6-2/0	27,
	200 A	None	OH/UG	_	10 kA	RC12L200S□□☆	1419.00	6	НОМ	200 A▽	_	_	_	_	Α	6–350	8–2/0	43,
	200 A	None	OH/UG	_	22 kA	QC12L200C□	1419.00	6	НОМ	200 A▽	_	_	_	_	Α	6–350	12-2/0	40,
	Surfac	e Mount On	ıly, Suppl	ied with F	eed-Th	nru Lugs and provisions	s for Bran	nch Circ										
	100 A	Horn	OH/UG	-	22 kA	RC816F100SH <b>□</b> ▼□☆	1227.00	1	QOM2100VH▲	100 A	8	16	8	100 A			8-2/0	43,
1	100 A	Horn	OH/UG	_	22 kA	RC816F100CH▼□☆	1227.00	1	QOM2100VH▲	100 A	8	16	8	100 A			12-2/0	40, 2
e	125 A	Horn	OH/UG	_	22 kA	RC816F125SH□▼□☆ RC816F125CH▼□	1227.00	1	QOM2125VH▲	125 A	8	16	8	100 A			8–2/0	43,
Homeline	125 A	Horn None	OH/UG		22 kA 22 kA		1227.00		QOM2125VH▲ QOM2150VH▲	125 A 150 A	8	16 16	8	100 A 150 A ♀			12-2/0 8–2/0	40, 2
15		None	OH/UG		22 kA	RC816F150C▼□	1187.00	1	QOM2150VH▲	150 A	8	16	8	150 A ♀			12-2/0	40,
ĬŤ	150 A	Horn Horn	OH/UG OH/UG		22 kA 22 kA	RC816F150SH□▼□☆ RC816F150CH▼□☆	1227.00	1	QOM2150VH▲ QOM2150VH▲	150 A 150 A	8	16 16	8	150 A <b>♀</b>	Α	6–350	8–2/0 12-2/0	43,
Ť		Lever	OH/UG	_	22 kA	RC816F150CH▼□×	2690.00	1	QOM2150VH▲	200 A	8	16	8	150 A			8-2/0	72 /
Ĭ		None	OH/UG		22 kA	RC816F200S <b>■</b> ▼□☆	1227.00		QOM2200VH▲	200 A	8	16	8	200 A∇			8-2/0	43,
Ĭ	<u> </u>	None	OH/UG OH/UG		22 kA 22 kA		1227.00	1 1	QOM2200VH▲ QOM2200VH▲	200 A 200 A	8	16 16	- 8 8	200 A▽ 200 A▽			12-2/0 8–2/0	40,
Ĭ			/	. —	حد ۱۸۸			1	QOM2200VH▲	200 A	8	16	8	200 A∇			12-2/0	40,
Ĭ	200 A	Horn		_	22 kA	RC816F200CH▼□☆	1227.00											, .
Ĭ	200 A		OH/UG OH/UG	_	22 kA 22 kA	RC816F200CH▼□☆ RC816F200SL◆☆□	1227.00 2690.00	1	QOM2200-VH▲	200 A	8	16	8	200 A			8-2/0	72 /
Ĩ	200 A	Horn Horn	OH/UG	_ _ _			2690.00								A or B300	6–300	8-2/0 6-1/0	72 / 48,

- 125 A Homeline  $^{\text{TM}}$  2P circuit breaker can be installed in top position only. All other positions are limited to 100 A max.
- UL short circuit current rating is equal to the lowest interrupting rating of any circuit breaker installed.
- Suitable for OH service with addition of tunnel kit SCTK20. Order separately. Supplied with load side feed-thru lugs, for 4 AWG–250 kcmil (Al/Cu) conductors. Convertible to semiflush with SC200F flange kit (order separately).
- Device supplied with barrel lock provisions factory-installed.
- 5th jaw factory-installed.

- Use only 15–100 A and 150 A circuit breakers.

  A 100 A circuit breaker can be installed in bottom position only, all other positions are limited to 70 A max.

  Use only 15–110 A and 150–200 A breakers.

  Use only 15–110 A and 150 A breakers.

- 0 Knockout provided in cover for use with barrel lock kit SCBRLLOCK (see Accessories, page 1-22).
- Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBS, see accessories p 1-22, check with local utility for approval.
- Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBL, see accessories p 1-22, check with local utility for approval.

**Meter Mains and All-In-Ones** 

- Ring or ringless type meter socket designs available
- UL Listed, suitable only for use as service equipment
- Meets EUSERC standards

# Rainproof, All-In-Ones **Class 4120**



- Service disconnect(s) are supplied factory-installed, except where noted
- Semiflush-reverse design available, supplied with load center (indoor access)
- Supplied with 100% branch neutrals, all unused terminals may be used for equipment grounding wires.
- Meets Federal Specification W-P-115c as Type 1, Class 2

Table 1.56: **All-In-One Combination Service Entrance Devices** 

Service   Service   Circuit Breake   C	ers 등	6–2/0 4–250	Service Ground Lug AWG/ kcmil (Al/Cu)	Weight Each (Lbs) and Pallet Qty.
Surface Mount Only	100 A A A A A A A A A A A A A A A A A A	6–2/0 4–250	kcmil (Al/Cu)	and Pallet
Surface Mount Only	100 A A A A A A A A A A A A A A A A A A	6–2/0 4–250	kcmil (Al/Cu)	Pallet
Surface Mount Only	100 A A A A A A A A A A A A A A A A A A	6–2/0 4–250	(Al/Cu)	
100 A None OH/UG 10 kA SC1624M100S 744.00 1 HOM2100 100 A 16 24 8 125 A None OH/UG 10 kA SC1624M125S 1518.00 1 HOM2125 125 A 16 24 8 200 A None OH/UG 22 kA SC2040M200S 1671.00 1 QOM2200VH 200 A 20 40 20 200 A None OH/UG∆ 10 kA SC2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20  Semiflush Mount Only 100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8 125 A None	125 A A A A A A A A A A A A A A A A A A A	4–250	6–2/0	
125 A None OH/UG 10 kA SC1624M125S 1518.00 1 HOM2125 125 A 16 24 8 200 A None OH/UG 22 kA SC2040M200S 1671.00 1 QOM2200VH 200 A 20 40 20 200 A None OH/UG∆ 10 kA SC2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20  Semiflush Mount Only 100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8 125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8	125 A A A A A A A A A A A A A A A A A A A	4–250	6-2/0	
200 A None OH/UG 22 kA SC2040M200S 1671.00 1 QOM2200VH 200 A 20 40 20 200 A None OH/UG∆ 10 kA SC2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 Semiflush Mount Only  100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8 125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8	125 A▲ 200 A♀ A-L 100 A A or A	4–250	6-2/0	32, 24
200 A None OH/UG△ 10 kA SC2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 Semiflush Mount Only  100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8 125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8	100 A A or A			32, 24
200 A None UG 10 kA SU2040M200C ■ 1799.00 1 HOM2200 200 A 20 40 20 Semiflush Mount Only  100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8  125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8		-L 6–300	6-2/0	45, 10
Semiflush Mount Only   100 A   None   OH/UG   10 kA   SC1624M100F   744.00   1   HOM2100   100 A   16   24   8   125 A   None   OH/UG   10 kA   SC1624M125F   1518.00   1   HOM2125   125 A   16   24   8	100 A A or A		8-1/0	47, 18
100 A None OH/UG 10 kA SC1624M100F 744.00 1 HOM2100 100 A 16 24 8  125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8		-L 6–300	8-1/0	47, 18
125 A None OH/UG 10 kA SC1624M125F 1518.00 1 HOM2125 125 A 16 24 8				
125 A   None	100 A A or	0.00	0.0/0	44.00
125 A None	110 A B300	6–2/0	6–2/0	44, 20
125 A   OH♦/UG   22 kA   SC2040M125F   1671.00   1   QOM2125VH   125 A   20   40   20	110 A			
B F OH → /UG 22 kA SC2040M200F 1671.00 1 QOM2200VH 200 A 20 40 20	200 A⊕ A-L	4–250	8–2/0	51, 10
SC2636M200FPV* 2244.00 1 QOM2200VH 200 A 26 36 10	100 A			
SC2040M200F   1671.00   1   QOM2200VH   200 A   20   40   20	200 A			
SC3040M225F   2280.00   1   QOM2225VH   225 A   30   40   10	200 A A-L	4–250	8–2/0	56, 10
225 A None OH▼/UG 22 kA SC2636M225FPV★ 2520.00 1 QOM2225VH 225 A 26 36 10	100 A			
Surface Mount Only	10071		ļ.	
100 A   None   OH∆   10 kA   SO1020M100S   443.00   1   HOM2100   100 A   10   20   10	80 A A	6–1	8–4	20, 42
				<del></del>
200 A None OH△ 22 kA SO2040M200S 1161.00 1 QOM2200VH 200 A 20 40 20   SC3040M200S 2010.00 1 QOM2200VH 200 A 30 40 10	200 A A	6–350 4–250	8–2/0	43, 21
200 A None OH/UG 22 kA	200 A A-L		8–2/0	50, 10
SC40M200S   2432.00   1   QOM2200VH   200 A   40   40   0	200 A	4–250	8–2/0	52, 10
REVERSE All-In-One—Semiflush Mount with Service Disconnect (outdoor access) and Load Center (indoor access)				
200 A None UG 10 kA SU3040M200R 2223.00 1 QOM2200VH 200 A 30 40 10	200 A⊕ A or	6–300	12-1/0	60, 15
225 A None UG 10 kA SU3040M225R 2646.00 1 QOM2225VH 225 A	B300	)		,
Surface Mount Only				
100 A None OH/UGA 10 kA RC1624M100S 744.00 1 HOM2100 100 A 16 24 8	100 A	6–2/0	6–2/0	32, 24
125 A Notice OFFOGIA 10 KA RC1624M125S 1518.00 1 HOM2125 125 A 10 24 8	125 A▲	6-2/0	6-2/0	32, 24
125 A Hom OH/UG△ 22 kA RC2040M125SH★□ 1601.00 1 QOM2125VH 125 A 20 40 20	125 A			43, 21
125 A Hom OH/UG△ 22 kA RC2040M125CH□♦ 1601.00 1 QOM2125VH 125 A 20 40 20	125 A			40, 21
© Hom OH/UG△ 22 kA RC2040M150SH★□ 1713.00 1 QOM2150VH 150 A 20 40 20	150 A			43, 21
150 A   Hom   OH/UG△   22 kA   RC2040M150CH□ ♦ 1713.00   1   QOM2150VH   150 A   20   40   20	150 A			40, 21
Hom OH/UG∆ 22 kA   HC2040M150SH ≠ D   1713.00   1   QOM2150VH   150 A   20   40   20	150 A A			76 / 12
None OH/UG△ 22 kA RC2040M200S*□ 1713.00 1 QOM2200VH 200 A 20 40 20	200 A	6-350	8-2/0	43, 21
None OH/UG△ 22 kA RC2040M200C□ 1713.00 1 QOM2200VH 200 A 20 40 20	200 A			40, 21
200 A   Hom   OH/UG∆   22 kA   RC2040M200SH*□   1713.00   1   QOM2200VH   200 A   20   40   20	200 A			43, 21
200 A   1011   1010   22 kA   RC2040M200CH   1713.00   1	200 A			40, 21
Lever OH/UG 22 kA RC3040M200SL	200 A			76 / 12
None OH/UGA 22 kA RC2040M200SGP <b>2602.00</b> 1 QOM2200VH 200 A 20 40 20	200 A			48 / 21
Surface Mount Only				
150 A Hom OH/UG△ 22 kA QC2442M150SH*□ 1905.00 1 QOM2150VH 150 A 24 42 18	150 A			43, 21
None OH/UG∆ 22 kA QC2442M200S*□ 1905.00 1 QOM2200VH 200 A 24 42 18	200 A			43, 21
8 None OH/UG△ 22 kA QC2442M200C□ 1905.00 1 QOM2200VH 200 A 24 42 18	200 A			40, 21
200 A Hom OH/UG△ 22 kA QC2442M200SH*□ 1905.00 1 QOM2200VH 200 A 24 42 18	200 A A	6-350	8–2/0	43, 21
Hom OH/UG△ 22 kA QC2442M200CH□ ◊ 1905.00 1 QOM2200VH 200 A 24 42 18	200 A			40, 21
200 A Hom OH/UGA 22 kA QC3040M200SH* 2120.00 1 QCM2200VH 200 A 30 40 10	200 A			40, 21
■ 125 A Homeline To Provisions factors and the installed in top position only. All other □ Device supplied with barrel lock provisions factors.			I	40,∠1

- 125 A Homeline  $^{\text{TM}}$  2P circuit breaker can be installed in top position only. All other positions are limited to 100 A max.
- positions are ilmitted to Too A max.

  Convertible to semifitath with SC200F flange kit (order separately).

  Suitable for OH service with addition of tunnel kit (SCTK20). Order separately.
- For use with Photovoltaic Systems. Provisions for field-installed CT. If required by adopted code, order retaining kit PK2SCPV separately. See page 1-22.
- Suitable for OH service with addition of tunnel kit (SCTK30). Order separately.
- Device does not meet EUSERC Specifications.

- Device supplied with barrel lock provisions factory-installed.

- 5th jaw factory-installed.
  Use only 15–100 A and 150 A circuit breakers.
  Use only 15–100 A and 150–200 A circuit breakers.
  Use only 15–110 A and 150–200 A circuit breakers.
- Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBS, see accessories p 1-22, check with local utility for approval.

  Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBL, see accessories p 1-22, check with local utility for approval.

**Combination Service Entrance Devices** 

#### 300-400 A Devices

### Meter Mains and All-in-Ones

- Ring or ringless type meter socket designs available
- UL Listed, suitable only for use as service equipment
- Meets EUSERC standards where indicated.

- Service disconnects are supplied factory-installed, except where noted
- Supplied with 100% branch neutrals; all unused terminals may be used for equipment grounding wires
- Meets Federal Specification W-P-115c as Type 1, Class 2

#### Table 1.57: **Meter Mains**

Meets Federal Specification W-P-115c as Type 1, Class 2, UL Listed, suitable only for use as service equipment, 120/240 Vac, 1Ø3W, NEMA 3R Enclosure

		Ampere Rating	Bypass Type		ervice Type Feed)	Short Circuit Current Rating	Cat. No.	List \$ Price		Service Disconnect(s	;) ▲	Circuit Brea (Order Sepa		enter and Branch cuit Breakers ler Separately s 1-2, 1-3, 1-14)		Hub Type (Order Separately page 1-22)	Line Side Main Lugs	Service Ground Lug AWG/	Weight Each (Lbs)
		P. P.	By	UL	UL and EUSERC	Shor		\$ Price	2P Circuits (Max.)	Type (Order separately from page 1-22 except as noted)	Ampere Rating (Max.)	Spaces	Circuits	1P Tandems	Ampere Rating (Max.)	Hub Ty Separatel	AWG/ kcmil (AI/Cu)	kcmil (Al/Cu)	and Pallet Qty.
		Surfac	ce and Ser	niflus	h Mount	-													
							CU12L400CN ◆	3810.00	1	QDL22200 ★	200 A	_		_	_				
		400 A	None	UG	UG	25 kA	CU12L400FN ◆	4007.00	1	QDL, QGL, QJL▼	200 A	_	_	_	_	A-L	(2) Studs	4-250	98, 4
								4007.00	4	QO, QO-VH or QOH	125 A ◊	_	_						
e			Class 320				CU12L400CB ♦ ●	3986.00	1	QDL22200 ★	200 A	_	_						
ž		400 A	Manual Bypass	UG	_	25 kA	CU12L400FB ♦ •	4182.00	1	QDL, QGL, QJL▼	200 A	_	_			A–L	(2) Studs	4–250	98, 4
Ring Type	ŀ		,,						4	QO, QO-VH or QOH	125 A ◊	_	_						
-	ŀ	400 A	None	UG	UG	25 kA	CU816D400CN ◆☆	3975.00	1	QDL22200 ★	200 A	8	16	8	200 A	A–L	(2) Studs	4–250	98, 4
		400 A	Class 320 Manual Bypass	UG	_	25 kA	CU816D400CB ◆☆●	4151.00	1	QDL22200 ★	200 A	8	16	8	200 A	A–L	(2) Studs	4–250	98, 4
		400 A	Class 320 Manual Bypass	UG	_	65 kA <b>▲</b>	CUM400CB ♦ ●	8688.00	1	DGP36400E20LH★	400 A	_	2 Δ	ı	200 A	A–L	(2) Studs	4–250	115, 4
			Class						1	QDL22200 ★	200 A	_	-	_	_				
	™ OO	400 A	320	UG	_	25 kA	QU12L400SL □●	3810.00	1	QDL, QGL, QJL▼	200 A	_	_	_	_	A-L	(2) Studs	4-250	98, 4
	О		Lever						4	QO, QO-VH or QOH�	125 A ◊	_	_		_				
		Surfac	e Mount (	Only, S	Supplied	with Fe	ed-Thru Lugs and Prov	isions for	Branch	Circuit Breakers									
		400 A	*	UG	_	25 kA	QU816D400SL☆□● QU816D400CK☆●	4065.00	1	QDL22200 ★ QDL, QGL, QJL▼	200 A 200 A	8	16	8	200 A	A–L	(2) Studs	4–250	98, 4
Ringless Type		Surfac	ce and Ser	niflus	h Mount					,,									
SS	J				1		·		1	QDL22200 ★	200 A	l_		_	_				
lgle		400 A		UG	l _	25 kA	QU12L400CL□∇●	3810.00	1	QDL. QGL. QJL▼	200 A	_	_			A–L	(2) Studs	4–250	98, 4
훒			Class 320				QU12L400FL□∇ <b>♀</b>	4007.00	4	QO. QO-VH or QOH	125 A ◊	_		_	_		, ,, 2.2.30		, -
	j		Lever				QU816D400CL□∇☆♀	4065.00	1	QDL22200★	200 A						(2) 2: (		
		400 A		G		25 kA	QU816D400FL□▽☆♀	4262.00	1	QDL, QGL, QJL▼	200 A	8	16	8	200 A	A–L	(2) Studs	4–250	98, 4
		400 A	Class 320 Lever	UG	_	65 kA▲	QUM400CL□⊖	10000.00	1	DGP36400E20LH★	400 A	_	2 △	_	200 A	A–L	(2) Studs	4–250	120, 4
		400 A	K-4 Bolt- None	UG	_	65kA▲	QUM400CK♦♀	11175.00	1	DGP36400E20LH★	400 A	_	2 Δ		200 A	A–L	(2) Studs	4–250	123, 4

#### Table 1.58: **All-in-One Combination Service Entrance Devices**

		Surfac	e and Ser	niflust	n Mount														
ø		300 A	Class 320	UG	_	25 kA	SU3040D300CB ♦ ∇ •	6600.00	1	QDL22200 ★	200 A	30	40	10	200 A	A–L	(2) Studs	4–250	100, 4
Type		300 A	Manual	od		23 KA	SU3040D300FB ♦∇●	6797.00	1	QDL, QGL, QJL▼	100 A	30	40	10	200 A	A-L	(Z) Sidus	4-230	100, 4
Ring	M	400 A	None	UG	UG	25 kA	SU3040D400CN ◆∇	7050.00	1	QDL22200 ★	200 A	30	40	10	200 A	A–L	(2) Studs	4–250	100, 4
~	eline	400 A	None	od	od	23 KA	SU3040D400FN ♦ ▽	7247.00	1	QDL, QGL, QJL▼	200 A	30	40	10	200 A	A-L	(Z) Sidus	4-230	100, 4
	me	400 A	Class 320	UG	_	25 kA	SU3040D400CB♦∇●	7167.00	1	QDL22200 ★	200 A	30	40	10	200 A	A–L	(2) Studs	4–250	100. 4
	Й	400 A	Manual	UG		25 KA	SU3040D400FB ♦∇●	7364.00	1	QDL, QGL, QJL▼	200 A	30	40	10	200 A	A-L	(Z) Sidus	4-250	100, 4
ις.		400 A	Class 320	UG	_	25 kA	RU3040D400CL □∇●	6993.00	1	QDL22200 ★	200 A	30	40	10	200 A	A–L	(2) Studs	4–250	100, 4
<u>se</u>		400 A	Lever	UG		25 KA	RU3040D400FL □∇●	7190.00	1	QDL, QGL, QJL▼	200 A	30	40	10	200 A	A-L	(Z) Sidus	4-250	100, 4
Ringless		400 A	K-4 Bolt-	UG	_	25 kA	RU3040D400CK ∇ •	6993.00	1	QDL22200 ★	200 A	30	40	10	200 A	A–L	(2) Studs	4–250	100, 4
تا		400 A	on	UG		23 KA	RU3040D400FK ∇ •	7190.00	1	QDL, QGL, QJL▼	200 A	30	40	10	200 A	A-L	(Z) Sidus	4-250	100, 4

- UL short circuit current rating is equal to the lowest interrupting rating of any circuit
- For 400 A device with suffix CB, CK, CL, or CN, surface-mount convertible to semiflush with FK400 flange kit (order kit separately). Devices with suffix FB, FL, FN or FK are semiflush only, with the top endwall factory-installed and flanges factory-included.
- For use only on 120/240 Vac 1Ø3W system (4-jaw meter socket).
- Service disconnect supplied factory-installed.

  Additional service disconnect for field-installation: order prefix QBL at 10 kA, QDL at 25 kA, QGL at 65 kA, or QJL at 100 kA. Order separately. For complete circuit breaker catalog number, see Section 7.
- Option for field installation of two Q-frame, 200 A max. 2-pole branch circuit breakers used as mains for two downstream load centers. Purchase installation kit BMK2Q400 and two Q-frame circuit breakers separately. Order QBL prefix at 10 kA, QDL prefix at 25 kA, or QGL prefix at 65 kA. Fifth jaw factory-installed.
- QO panel is rated 200 A maximum.
- Supplied with load side feed-thru lugs for 6 AWG-250 kcmil (Al/Cu) conductors.

  Knockout provided in cover for use with barrel lock kit SCBRLLOCK (see Accessories, page 1-
- Device configuration is not included in EUSERC standards. Consult applicable utility for acceptance.
- Device with suffix L has Class 320 lever bypass and device with suffix K has a K-4 bolt-on, no
- bypass.

  Order two pole circuit breakers for field installation: order catalog designation QO for 10 kA, QO-VH for 22 kA or QOH for 42 kA short circuit current rating. See page 1-22 or 1-2.

Table 1.59: Circuit Breakers for use with Meter Mains and All-In-One Devices



Ampere	Type: HC	OM, 1P	Type: HO	M, 2P	Type: C	10, 1P	Type:	QO, 2P	Type: QO-	-VH, 1P	Type: QO-	·VH, 2P
Rating ▲	Cat. No. (DE3D)	\$ Price	Cat. No. (DE3D)	\$ Price	Cat. No. (DE2A)	\$ Price						
10	_	_	_	_	QO110	29.10	_	_	-	_	_	_
15	HOM115	26.30	_	_	QO115	29.10	_	_	QO115VH	63.00	_	_
20	HOM120	26.30	_	_	QO120	29.10	_	_	QO120VH	63.00	_	_
25	HOM125	26.30	_	_	QO125	29.10	_	_	QO125VH	73.00	_	_
30	HOM130	26.30	HOM230	60.00	QO130	29.10	QO230	67.00	QO130VH	73.00	QO230VH	146.00
35	_	_	HOM235	60.00	QO135	29.10	QO235	67.00	_	_	_	_
40	HOM140	26.30	HOM240	60.00	QO140	29.10	QO240	67.00	_	_	QO240VH	146.00
45	_	_	HOM245	60.00	QO145	29.10	QO245	67.00	1	_	_	
50	HOM150	26.30	HOM250	60.00	QO150	29.10	QO250	67.00	1	_	QO250VH	146.00
60	_	_	HOM260	60.00	QO160	29.10	QO260	67.00	_	_	QO260VH	146.00
70	_	_	HOM270	123.00	QO170	67.00	QO270	134.00	_	_	QO270VH	224.00
80	_	_	HOM280	168.00	_	_	QO280	189.00	_	_	QO280VH	315.00
90	_	_	HOM290	168.00	_	_	QO290	189.00	_	_	QO290VH	315.00
100	_	_	HOM2100	168.00	_	_	QO2100	189.00	1	_	Q02100VH	315.00
110	_	_	HOM2110	369.00	_	_	QO2110	428.00	1	_	Q02110VH	1034.00
125	_	_	HOM2125	369.00	_	_	QO2125	428.00	_	_	QO2125VH	1034.00
150	_	_	HOM2150BB	428.00	_	_	QO2150	491.00	_	_	QO2150VH	1061.00
175	_	_	HOM2175BB	428.00	_	_	QO2175	491.00	_	_	Q02175VH	1061.00
200	_	_	HOM2200BB	428.00	_	_	QO2200	491.00		_	QO2200VH	1061.00

Ampere	Type: QOI	M1-VH, 2P	Type: QON	/12-VH, 2P	Type: Q	DL, 2P♦
Rating	Cat. No. (DE3D)	\$ Price	Cat. No. (DE3D)	\$ Price	Cat. No. (DE2A)	\$ Price
50	QOM50VH■	140.00	<del>_</del>	_	_	_
60	QOM60VH	140.00	_	_	_	_
70	QOM70VH	140.00	_	_	QDL22070	1143.00
80	QOM80VH	201.00	<del>_</del>	_	QDL22080	1143.00
90	QOM90VH	201.00	<del>_</del>	_	QDL22090	1143.00
100	QOM100VH	201.00	QOM2100VH	468.00	QDL22100	1143.00
110	QOM110VH	468.00	<del>_</del>	_	QDL22110	1143.00
125	QOM125VH	468.00	QOM2125VH	468.00	QDL22125	1143.00
150	_	_	QOM2150VH	468.00	QDL22150	1143.00
175	_	_	QOM2175VH	468.00	QDL22175	1143.00
200	_	_	QOM2200VH	468.00	QDL22200	1143.00
225	_	_	QOM2225VH	468.00	Ī	_

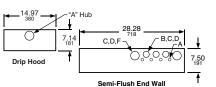
- Do not exceed mains rating of device
  Reference National Electrical Code Article 230-79.
  For additional interrupting rating circuit breakers, order circuit breaker prefix QBL at 10 kA, QGL at 65 kA or QJL at 100 kA.

#### Table 1.60: Accessories, Hubs and Closing Plates

Accessories			
Accessories			
Description	Cat. No.	\$ Price	Disc. Sch.
Generator Kit: Interlocks main service disconnect and generator circuit breaker (order separately). For :			
<ul> <li>Homeline<sup>™</sup> CSED Devices RC816F-, RC2040M-, SO2040M-</li> </ul>	RCGK2	245.00	DE4
QO CSED Devices QC816F-, QC2442M-	QCGK3	245.00	DE4
Backfed inverter circuit breaker retaining kit for SC2636M200FPV and SC2636M225FPV	PK2SCPV	47.40	DE4
Fifth Jaw Kit for: Meter Main Types: C, RC, SC, QC All-In-One Types: SC, SU (100–225 A), QC, RC, SO	5J	18.30	DE4
Bypass (Horn Type) for Ringless Type Meter Mains and All-In-Ones (100–200 A) (except for RC8L125S, RC1624M100S and RC1624M125S—use RCHB).	MMHB	16.70	DE4
Lexan Meter Socket Cover Plate for:			
Ring and Ringless Type Meter Mains	29007	10.10	DE4
Ring and Ringless Type All-In-Ones			
Meter Socket Sealing Rings for Ring Type Meter Mains and All-In Ones:			
Snap Type Aluminum (Std.)	2920910001	7.95	DE5
Screw Type Aluminum	29008W	20.10	DE4
Snap Type Stainless Steel	ARP00026	16.70	DE4
Anti-Inversion Kit . For use ONLY on 400 A Meter Mains and All-In-Ones with lever bypass.	MMLRK	12.00	DE4
Trim Kit for 2 in. X 6 in. stud wall, used with Reverse All-In-Ones, SU3040M200R, and SU3040M225R	SU2X6TRIM	266.00	DE4
Barrel Lock Kit (Barrel Lock not included), supplied with bracket and mounting screw, refer to listings for where used.	SCBRLLOCK	53.00	DE4
Semiflush Flange Kit for: Meter Mains: SC816D150/200C and RC816D200CH All-In-Ones: SC2040M200C	SC200F	31.80	DE4
Semiflush Flange Kit for ring- and ringless-type Meter Mains and All-In-Ones (400 A Only)	FK400	197.00	DE4
Ringless Type Utility Cover for RU3040D400CL/FL, QU12L400CL/FL, and QU816D400CL/FL. Includes one piece meter socket and pull box cover with handles and closing plate.	R400L	266.00	DE4
Lug Kit includes (4) lugs, for use with 2 AWG–600 kcmil AVCu conductors. Lugs are for standard 2-Hole mounting. Meter Main and All-In-One units supplied with (2) studs per phase and neutral will accept one lug per phase and neutral. Not for use on 400 A devices with "K" suffix.	CMELK4	137.00	DE4
Branch Circuit Breaker Field Installation Kit for two Q-Frame Circuit Breakers (QBL, QDL, or QGL, order separately). For CUM400CB, QUM400CL or QUM400CK - includes (2) mounting pans, (4) wires.	BMK2Q400	153.00	DE4
Overhead Feed Trough for 400 A ring- and ringless-type Meter Mains and All-In-Ones.	OCK400	567.00	DE4
Touch-Up Paint (ASA49 Gray)	PK49SP	39.00	DE1
Ground Bar Kit, Meter Mains and All-In-Ones QC, RC, and SC (100-225 A)	PK15GTA	17.10	DE3A
Filler Plate for: Meter Main Types: QC, CU All-In-One Types: QC	QOFP	3.60	DE3A
Filler Plate for: Meter Main Types: RC, SC All-In-One Types: SC, RC, SU	HOMFP	3.20	DE3A
Neutral Lug (6-2/0 AWG) Meter Main Types: RC, SC, QC All-In-One Types: SC, SU, QC, RC	LK100AN	10.80	DE3A
Overhead Barrier Tunnel Kit for Ringless & Horn Bypass in RC/QC Devices	OHBS	86.00	DE4
Overhead Barrier Tunnel Kit for Lever Bypass RC/QC Devices	OHBL	94.00	DE4

Hubs and Closi	ng Plates			
Hub Series	Conduit Size (inches)	Cat. No.	\$ Price	Disc. Sch.
Closing Plate for "	A" Hub opening	ACP	13.40	DE4
	1.00	A100	33.90	DE4
	1.25	A125	33.90	DE4
Α	1.50	A150	33.90	DE4
	2.00	A200	47.90	DE4
	2.50	A250	61.00	DE4
Adapter plate to a Hubs on "A-L" size	allow use of "A" e hub openings	AAP	33.80	DE4
Closing Plate f open		ACPL	18.30	DE4
	2.00	A200L★	83.00	DE4
	2.50	A250L	87.00	DE4
A-L	3.00	A300L	111.00	DE4
	3.50	A350L	114.00	DE4
	4.00	A400L	119.00	DE4
Closing Plate for "	B" Hub opening	BCAP	3.80	DE1A
	0.75	B075	33.30	DE1A
	1.00	B100	33.30	DE1A
В	1.25	B125	33.30	DE1A
В	1.50	B150	33.30	DE1A
	2.00	B200	61.35	DE1A
	2.50	B250	102.00	DE1A
B300	3.00	B300	186.00	DE1A

Supplied with AAP adapter plate and "A" hub.



Driphood supplied factory-installed and is required for surface mount installation.

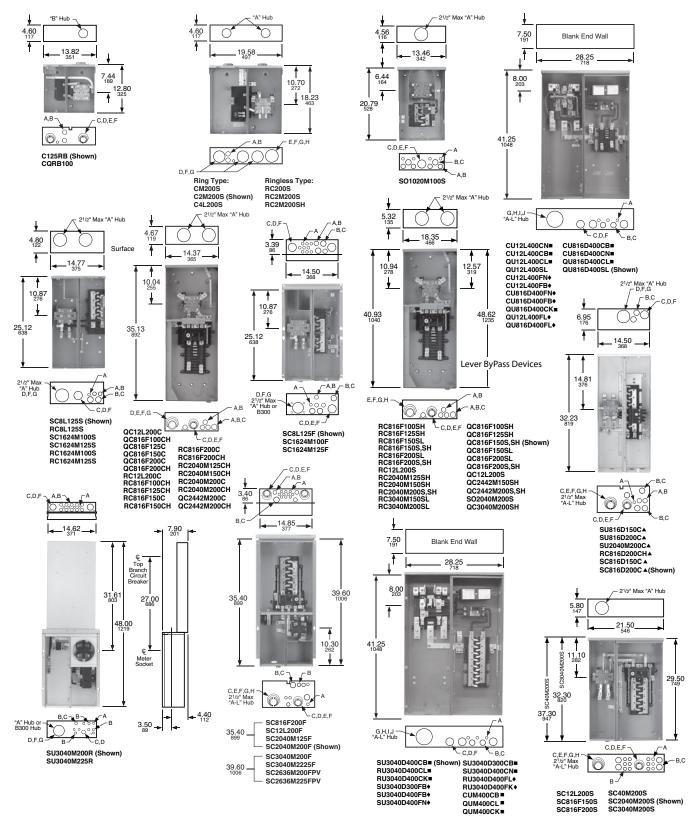
For semi-flush installation, remove driphood and install flange kit SC200F (order separately).

Unit supplied with blank top endwall (factory-installed) for surface mount installation. For semi-flush installation, install flange kit FK400 (order separately). Kit includes replacement top endwall (with knockouts) and flanges.

Unit supplied with semi-flush top endwall factory installed and semi-flush flanges factory included.

**Knockouts** 

	Symbol	A	В	С	D	E	F	G	н	1	J
-	Conduit Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4



**LOAD CENTERS** 

SQUARE D by Schneider Electric www.schneider-electric.us

# SC/SU SOLAR READY **CSED Devices Coming** Soon—See On-Line **Digest Updates for Availability**

### **Meter Mains and All-In-Ones**

- Ringless Meter Sockets with barrel lock provisions factory installed except for Cat. No. SO2040M200SS which is a Ring Style meter socket with no provisions for barrel lock to secure the meter cover.
- UL Listed, suitable only for use as service equipment
- Service disconnect(s) are supplied factory-installed, except where noted
- Supplied with 100% branch neutrals, all unused terminals may be used for equipment grounding wires.
- Meets Federal Specification W-P-115c as Type 1, Class 2
- Solar Ready kit SR69064A fits All Devices Below, order from Table 1.70
- All devices have a 3" KO in the bottom endwall.
- Provisions for Field Installed CTs All Devices

Table 1.62: All-In-One Combination Service Entrance Devices

	a e	Ø	ø	Short Circuit Current Rating				Service Disconnect(s	)		Cir (Ord Page	enter and E cuit Breake der Separat s 1-2, 1-3, 1	ers ely	Hub Type (Order Separately page 1-18)	Line Side Main	Service Ground
	Ampere Rating	Bypass Type	Service Type	호흡	Cat. No.	List \$ Price				٨	lax. C	Quantity	X.	pe ( y pa	Luas	Lug AWG/
	Α̈́	®	Se	hor		<b>4.1.133</b>				οχ		1P	Ma (Ma	ate)	AWG/ kcmil	kcmil (Al/Cu)
				ഗദ			2P Circuits (Max.)	Type (Factory Installed except where noted)	Ampere Rating	Spaces	Circuits	Tandems	Ampere Rating (Max.)	Separ	(Al/Cu)	(Al/Cu)
Meter	Mains	>														
	Surfac	ce Mount C	nly													
	Surfac	ce Mount—	Supplied w	ith Feed-1	hru Lugs and Provisions f	or Branch	Circuit Br	eakers								
ဓ္ဓ	150 A	None	OH/UG	22 kA	QC816F150SS■△	1408.00	1	QOM2150VH	150 A	8	16	8	150 A			
σ	150 A	Lever	OH/UG	22 kA	QC816F150SLS■□	2905.00	1	QOM2150VH	150 A	8	16	8	150 A	Α	350	8–2/0
	200 A	None	OH/UG	22 kA	QC816F200SS■△	1408.00	1	QOM2200VH	200 A	8	16	8	200 A	,,	000	0 20
	20071	Lever	OH/UG	22 kA	QC816F200SLS■□	2905.00	1	QOM2200VH	200 A	8	16	8	200 A			
	Surfac				hru Lugs and provisions f		Circuit Br						_			
ē	150 A	None	OH/UG	22 kA	RC816F150SS■△	1270.00	1	QOM2150VH	150 A	8	16	8	150 A	Α	6-350	8–2/0
Homeline		Lever	OH/UG	22 kA	RC816F150SLS■□	2878.00	1	QOM2150VH	150 A		16	8	150 A	Α	6-350	8–2/0
Ę P		None	OH/UG	22 kA	RC816F200SS■△	1270.00	1	QOM2200VH	200 A	8	16	8	200 A	Α	6-350	8–2/0
_	200 A	Horn	OH/UG	22 kA	RC816F200SHS■★△	1313.00	1	QOM2200VH	200 A	8	16	8	200 A	Α	6-350	8–2/0
		Lever	OH/UG	22 kA	RC816F200SLS■□	2878.00	1	QOM2200VH	200 A		16	8	200 A	Α	6-350	8–2/0
All-in-			Service Ent	trance De	vices♦											
	Surfac	ce Mount O	nly													
QO	200 A	None	OH/UG	22 kA	QC2442M200SS△	2057.00	1	QOM2200VH	200 A	24	42	18	200 A	Α	6-350	8–2/0
	20071	Horn	OH/UG	22 kA	QC2442M200SHS★△	2057.00	1	QOM2200VH	200 A	24	42	18	200 A	Α	6-350	8–2/0
	150 A	Horn	OH/UG	22 kA	RC2040M150SHS★△	1833.00	1	QOM2150VH	150 A	20	40	20	150 A	Α	6-350	8–2/0
g.	10071	Lever	OH/UG	22 kA	RC3040M150SLS□	2226.00	1	QOM2150VH	150 A	30	40	10	150 A	Α	6-350	8–2/0
Homeline		None	OH/UG	22 kA	RC2040M200SS∆	1833.00	1	QOM2200VH	200 A	20	40	20	200 A	Α	6-350	8–2/0
E O	200 A	Horn	OH/UG	22 kA	RC2040M200SHS★△	1833.00	1	QOM2200VH	200 A	20	40	20	200 A	Α	6-350	8–2/0
I		None	OH	22 kA	SO2040M200SS∆	1242.00	1	QOM2200VH	200 A	20	40	20	200 A	Α	6-350	8–2/0
		Lever	OH/UG	22 kA	RC3040M200SLS□	2226.00	1	QOM2200VH	200 A	30	40	10	200 A	Α	6-350	8–2/0
* Kit is	to be in	stalled between	een meter so	cket and N	lain Disconnect. May be used	with Solar F	PV, Wind,		01/-11 14 #4.11							

fuel generators, and other power generation sources up to 80% of Mains Rating Maximum 160 A.

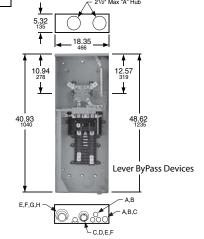
- Order two pole OO, QO-VH or QOH circuit breakers separately from page 1-22 or 1-2. The short circuit current rating is equal to the lowest interrupting rating of any circuit breaker installed.
- Supplied with load side feed-thru lugs, for 4AWG-250 kcmil Al/Cu conductors.
- Ring style device. Barrel lock provisions not provided.

  Device supplied with horn bypass and 5th jaw factory installed
- Order two pole Homeline circuit breakers separately from page 1-22.
- Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBS. See accessories p 1-22, check with local utility for approval.

- Suitable for load wires to exit top endwall with addition of Tunnel Kit OHBL. See accessories p 1-22, check with local utility for approval. Solar Ready Kit Part Number SR69064A \* (This Kit Fits All Solar Ready Devices) List Price: \$78.00

#### Table 1.63: Knockouts

Symbol	Α	В	С	D	E	F	G	Н	1	J
Conduit Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4



RC816F150SS RC816F200SS RC816F200SHS QC816F150SS QC816F200SS ÖC816F200SS RC2040M150SHS RC2040M200SS RC2040M200SS RC2040M200SS QC2442M200SS QC2442M200SHS QC816F150SLS RC816F150SLS RC3040M150SLS QC816F200SLS RC3040M200SLS



by Schneider Electric
www.schneider-electric.us

### 1Ø3W-120/240 Vac-240 Vac-UL Listed

Table 1.64: Enclosed Molded Case Switch, Switch Included,
Does NOT provide overcurrent protection

0	4	Ampere	General Pu	ırpose	Rainpro	Box. No.	
Sen	vice	Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	See Page 1-17
			QO260NATS		QO200TR	161.00	2, 9R♦
240 Vac	// G	60 A▲■			QO200TRNM	191.00	1NM
	(B				QO260NATR	168.00	1R
120/240 Vac	      <b>s</b>	100 A★	QO2000NS	276.00	QO2000NRB	338.00	13, 10R

Table 1.65: Housing Bracket

Description	Cat. No.	\$ Price
Bracket used with QO200TR for stucco, aluminum and vinyl siding. Order quantity multiples of 10.	PKHB	6.30



QO200TRNM



QO3100BNF With Cover Removed



PKHB Housing Bracket

# Table 1.66: Enclosed GFCI Circuit Breakers, GFCI Circuit Breaker Included—10 kA Short Circuit Current Rating

	O-miles	Ampere	Type 3R—Rai	inproof	Circuit Breaker	Box. No.
	Service	Rating	Cat. No.	\$ Price	Included	See Page 1-17
· -	120/240 Vac	50 A	QOE250GFINM HOME250SPA	528.00 473.00	QO250GFI HOM250GFI	1NM (Non- metallic) 1R (Metallic)

# Table 1.67: 2-Pole Circuit Circuit Breaker Enclosures—22 kA Short Circuit Current Rating

Not for use with one pole QO or QOVH breakers. Circuit breakers not included. Order QO<sup>™</sup>, QOVH, QO-GFI, QO-AFI, QO-EPD and QO-PL circuit breakers separately from pages 1-2 and 1-3. Accepts QO circuit breakers with factory-installed accessories. Order equipment ground bar PKOGTA2, if required.

0		Ampere	General Purp	ose ▼	Rainpro	Box. No.	
Ser	rvice	Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	See Page 1-17
120/240 Vac		100 A 125 A	QO2100BNF/S QO2125BNF/S	83.00 108.00	QO2100BNRB QO2125BNRB	135.00 158.00	13, 10R 18, 13R
240 Vac		100 A	QO3100BNF/S	149.00	QO3100BNRB	207.00	13, 10R

Table 1.68: 60A Max. Circuit Breaker Enclosures—10 kA Short Circuit Current Rating

Circuit breaker not included. Order separately from page 1-2. Will not accept QO-GFI circuit breaker nor QO circuit breakers with factory-installed accessories.

240 Vac	_	I	QO2TR	95.00	9R <b>♦</b>
---------	---	---	-------	-------	-------------

Table 1.69: Q Frame Enclosures and Q Frame Circuit Breakers

		Encl	osure Only □						Circuit Brea	aker (Orde	r Separately)			
Service	Type 1—General	Purpose ▼	Type 3R—Rai	nproof	Box No.	Ampere	10 k A	IR	25 k A	.IR	65 k A	IR .	100 k A	IR
	Cat. No.	\$ Price	Cat. No.	\$ Price	See Page 1-17	See Fage   Bating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
						70 A	QBL22070	474.00	QDL22070	1143.00	QGL22070	1521.00	QJL22070	1890.00
1 1 🖶						80 A	QBL22080	474.00	QDL22080	1143.00	QGL22080	1521.00	QJL22080	1890.00
						90 A	QBL22090	474.00	QDL22090	1143.00	QGL22090	1521.00	QJL22090	1890.00
ſſΨ						100 A	QBL22100	474.00	QDL22100	1143.00	QGL22100	1521.00	QJL22100	1890.00
2P 240 Vac	Q22200NS ♦	176.00	Q22200NRB\$	380.00	19, 11R	110 A	QBL22110	474.00	QDL22110	1143.00	QGL22110	1521.00	QJL22110	1890.00
Maximum	or Q23225NF/S	218.00	or Q23225NRB	417.00	20, 12R	125 A	QBL22125	474.00	QDL22125	1143.00	QGL22125	1521.00	QJL22125	1890.00
					,	150 A	QBL22150	474.00	QDL22150	1143.00	QGL22150	1521.00	QJL22150	1890.00
						175 A	QBL22175	474.00	QDL22175	1143.00	QGL22175	1521.00	QJL22175	1890.00
						200 A	QBL22200	474.00	QDL22200	1143.00	QGL22200	1521.00	QJL22200	1890.00
						225 A	QBL22225	474.00	QDL22225	1143.00	QGL22225	1521.00	QJL22225	1890.00
						70 A	QBL32070	1248.00	QDL32070	1784.00	QGL32070	2442.00	QJL32070∇	2796.00
						80 A	QBL32080	1248.00	QDL32080	1784.00	QGL32080	2442.00	QJL32080∇	2796.00
						90 A	QBL32090	1248.00	QDL32090	1784.00	QGL32090	2442.00	QJL32090∇	2796.00
111 백						100 A	QBL32100	1248.00	QDL32100	1784.00	QGL32100	2442.00	QJL32100∇	2796.00
3P 240 Vac	Q23225NF/S	218.00	Q23225NRB	278.00	20, 12R	110 A	QBL32110	1248.00	QDL32110	1784.00	QGL32110	2442.00	QJL32110∇	2796.00
	QLOLLOI 11 70	210.00	QLOLLOIVID	270.00	20, 1211	125 A	QBL32125	1248.00	QDL32125	1784.00	QGL32125	2442.00	QJL32125∇	2796.00
						150 A	QBL32150	1248.00	QDL32150	1784.00		2442.00	QJL32150∇	2796.00
				l		175 A	QBL32175	1248.00	QDL32175	1784.00	QGL32175	2442.00	QJL32175∇	2796.00
						200 A	QBL32200	1248.00	QDL32200	1784.00	QGL32200	2442.00	QJL32200∇	2796.00
						225 A	QBL32225	1248.00	QDL32225	1784.00	QGL32225	2442.00	QJL32225∇	2796.00

Table 1.70: QOM2 Enclosures and QOM2 Circuit Breakers



QOM22225NS With Cover Removed



With Cover Removed



Q23225NF

(Order Q-Frame circuit breaker separately)

**Enclosure Only**△

- ◆ Top endwall has no hub opening.★ Maximum 20 hp 240 Vac.
- ▼ Order F for flush, S for surface.
   △ Equipment ground bar kit PKOGTA2
- factory-included.

  Factory-installed groundable neutral assembly includes (2) ground lugs and (2) neutral lugs.
  Equipment ground kit PKOGTA2 also included.
- 225 A QOM2225VH 468.00

  ♦ Accepts 200 A max. 2P Q Frame circuit breakers.

  ★ Add suffix 1021 for 120, 208 or 240 Vac shunt

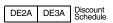
100 A

125 A

150 A

- DE3A Discount Schedule

22, 16R



22 k AIR

QOM2100VH 468.00

QOM2125VH 468.00

OOM2150VH 468.00

\$ Price

Cat. No. €

175 A QOM2175VH **468.00** 

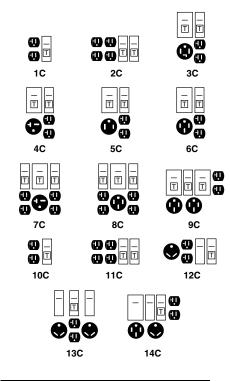
200 A QOM2200VH **468.00** 

TI SQUARE D

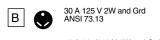
by Schneider Electric www.schneider-electric.us

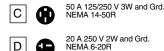
# Servicepak<sup>™</sup> Power **Outlet Panels**

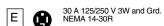
(For Dimensions/Drawings go to Supplemental Digest, hardcopy or on-line version.)

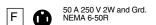


Α	<b>3</b>	20 A 125 V 2W a NEMA 5-20R	nd Gro	









All non-pedestal devices have provisions to fieldinstall a Type "B" hub on the bottom endwall for bottom feed from a conduit riser. Order Type "B" bolt-on hub (B250 Max.) and two mounting screws (Cat. No. 8002505501) and two hex nuts (Cat. No. 2340102000).

### For Construction Sites

- Provide temporary power at construction sites.
- Each receptacle protected by QO-GFI circuit breaker in compliance with NEC® requirements.
- Each enclosure is rainproof.
- 10 kA short circuit current rating.
- UL Listed as suitable for use as temporary site service equipment.
- Provided with neutral bonding provisions.
- Boxes have provisions for type "B" hubs to be field-installed.

#### **Construction Site Panels** Table 1.71:

Power Outlet	Service	Mains Ampere	Circuit Breaker (Included)			epta clud	cles ed)		Cat. No. ♦	\$ Price		ire Size G ★
Configuration		Rating	(included)	Α	С	D	Ε	F			Cu	Al
1C	1Ø2W	40 A	(1) QO120GFI	1					PAK10C1	441.00	14–6	12-6
2C	1Ø2W	40 A	(2) QO120GFI	2					PAK11C ▼	818.00	14–6	12-6
2C	1Ø2W	40 A	(2) QO120GFI	2					PAK11C1	818.00	14–6	12-6
3C	1Ø3W	70 A	(1) QO120GFI (1) QO230GFI	1			1		PAK31CGFI	974.00	8–1	8–1
4C	1Ø3W	70 A	(1) QO120GFI (1) QO220GFI	1		1			PAK36C1GFI	974.00	8–1	8–1
5C	1Ø3W	70 A	(1) QO120GFI (1) QO250GFI	1				1	PAK51CGFI	974.00	8–1	8–1
6C	1Ø3W	70 A	(1) QO120GFI (1) QO250GFI	1	1				PAK55CGFI	974.00	8–1	8–1
7C	1Ø3W	70 A	(2) QO120GFI (1) QO220GFI	2		1			PAK72CGFI	1323.00	8–1	8–1
8C	1Ø3W	70 A	(2) QO120GFI (1) QO250GFI	2	1				PAK76CGFI	1323.00	8–1	8–1
9C	1Ø3W	100 A	(1) QO120GFI (2) QO250GFI	1	2				PAK1004CGFI	1581.00	14–1	12–1

# For Recreational Vehicle Parks

- Provide electrical power to individual recreational vehicle park sites.
- Each receptacle protected by appropriate GFI or Standard QO<sup>™</sup> circuit breaker.
- All receptacles and circuit breakers included.
- 10 kA short circuit current rating.
- UL Listed.
- All enclosures are rainproof.
- No neutral bonding provisions.
- Loop-feed provisions.

#### Table 1.72: **Recreational Vehicle Park Panels**

Power Outlet	Sarvica	Mains	Circuit Breaker		ceptad				Main Wire Size AWG/kcmil △		
Configuration		Ampere Rating	(Included)	(inc	cluded	1) =	Cat. No.	\$ Price	Phase an	d Neutral	
		· ····································		Α	В	С			Cu	Al	
Underground	or Overl	head Loo	p-Feed Terminals	-No	n-Ped	desta	♦ 🗆				
11C	1Ø2W	40 A	(2) QO120GFI	2			PAK11CTG	795.00			
12C	1Ø2W	50 A	(1) QO120GFI (1) QO130	1	1		PAK41CTG ♦	564.00	14–6	12–6	
			(2) QO130							12–1	
14C	1Ø3W		(1) QO120GFI (1) QO250 (1) QO130	1	1	1	PAK75CTG (Not Loop Feed) ◊	669.00	14–1	12–1	
Pedestal Mou	nted-U	ndergrou	ind Loop-Feed Te	rmina	als☆⊽	7					
11C	1Ø2W	40 A	(2) QO120GFI	2			PAK11PG	1035.00			
12C	1Ø2W	50 A	(1) QO120GFI (1) QO130	1	1		PAK41PG ◊	852.00			
13C	1Ø2W	75 A	(1) QO120GFI (2) QO130	1	2		PAK61PG ◊	914.00	(2)6–250	(2)6–250	
14C	1Ø3W	100 A	(1) QO120GFI (1) QO250 (1) QO130	1	1	1	PAK75PG ◊	1007.00			

- (1Ø2W 120 Vac) (1Ø3W 120/240 Vac)
  20 A receptacles protected by 20 A GFI circuit breaker.
  Devices have a bolt-on factory-installed closing cap. Order type "B" bolt-on hub separately from page 1-18.
  Equipment ground terminal suitable for (2) 14 or 12 AWG Cu or (2) 12 or 10 AWG AI.
- Receptacles in this device are in bottom endwall and are accessible with outer door padlocked. "Order Only" from Lexington—Minimum order quantity is 50 devices.

- Two wires each per phase, neutral, and equipment ground—for loop feed (except PAK75CTG). Equipment ground terminal suitable for (2) 14–12 AWG Cu or (2) 12–10 Al. GFI circuit breaker can be substituted for standard 30 A circuit breaker. For 30 ampere receptacles add \$140.00 per circuit breaker. Add suffix "FI" to catalog number. Example: PAK41CTGFI.
- Stabilizer foot available for use in unstable ground, order HNPSF \$27.50 list.
- Equipment ground terminals suitable for (2) 10-2/0 AWG Cu or (2) 6-2/0 AWG AI.



QO154M200P

New!)

QO Plug-on Neutral Load Centers and CAFI Breakers connect are engineered for a quick Plug-on Neutral connection on every unit.

Table 1.73: QO Plug-on Neutral CAFI Load Center (accepts QO Circuit Breakers only)

	Mains Rating	Spaces	Max. 1P	Max. Tandem Breakers	\$ Price (Interior, Box &	Load Center Bo Interior	ox and		Cover with E er Separately		Main Wire Size AWG/kcmil	Equipn Ground E (Order Sep If Price	Bar Kit parately	Box No. See Page
			Circuits	Dieakeis	Cover)	Cat. No.	\$ Price	Flush Cat. No.	Surface Cat No.	\$ Price	Al/Cu	Cat. No.	\$ Price	1-17
						n Lugs — 65 kA S in Circuit Breaker	hort Circ	uit Current I	Rating — Co	opper Bi	us			
	125 A	24	24	0	572.00	QO124L125PG	534.00	QOC24UF	QOC24US	37.70	6-2/0	PK150	TA AT	7
						n Lugs — 65 kA S in Circuit Breaker	hort Circ	uit Current I	Rating — Co	opper Bi	us			
	200 A	30	30	0	684.00	QO130L200PG	597.00	QOC30UF	QOC30US	87.00	6-250	PK23GTA, L	K100AN	9
1	225 A	42	42	0	1018.00	QO142L225PG	907.00	QOC42UF	QOC42US	111.00	6–300	(2) PK15		11
N D		54	54	0	1356.00	QO154L225PG		QOC54UF	_	179.00		PK23GTA, L	K100AN	12
ō						n Circuit Breaker						S		
O R						onvertible to Main	. •							
''	100 A	24	24	0	743.70	QO124M100P		QOC24UF			6–2/0	PK15GTA	17.10	7
		Main Ci	rcuit Bre	aker Fram	e Size, Co	n Circuit Breaker onvertible to Main	Lugs or	Lower Ampe	erage Main (	Circuit E	reaker			
		30	30	0	1069.00	QO130M200P	982.00		QOC30US			PK18GTA	18.80	9
	200 A	42	42	0	1410.00	QO142M200P	1299.00		QOC42US		4-250	PK23GTA	21.30	11
		54 60	54 60	0	1720.00	QO154M200P QO160M200PC▲	1541.00		_	179.00 267.00		PK23GTA PK23GTA	21.30 21.30	12 24
+	C					n Lugs — 65 kA S						FNZSGIA	21.30	24
						onvertible to Main					ar Included			
	125 A	24	24	0		QO124L125PGRB		_	_	_	6–2/0	PK150	TA a	4R
	Conve	ertible Ma	ains — Fa	ctory-Inst	talled Mai	n Luas — 65 kA S	hort Circ	uit Current I	Rating — Cı	u Bus	l .	l .		
	QOM2	Main Ci	rcuit Brea	aker Fram	e Size, Co	onvertible to Main	Circuit B	reaker — Ed	quipment G	round B	ar Included			
0	200 A	30	30	0	856.00	QO130L200PGRB	856.00	_	_	_	6-250	PK23GTA, L	K100AN	6R
ũ	225 A	42	42	0	1500.00	QO142L225PGRB	1500.00	_	_	_	6–300	(2) PK15	GTA	8R
000	Conve	ertible to	Main Lug		low) or Lo	n Circuit Breaer – ower Amperage M					Copper Bus			
R	100 A	24	24	0	1144.00	QO124M100PGRB	1144.00		_	_	6-2/0	PK15GTA	17.10	4R
	Conve	ertible to	Main Lug		low) or Lo	n Circuit Breaer – ower Amperage M					opper Bus			
	150 A	30	30	0	1344.00	QO130M150PRB	1344.00			_		PK18GTA	18.80	6R
	200 A	30	30	0	1344.00	QO130M200PRB				_	4–250	PK18GTA	21.30	6R
	200 A	42	42	0		QO142M200PRB	1659.00	_	_	_		PK23GTA	21.30	8R

Door kit available separately Order QOCDK66 \$237.00.

All OUTDOOR devices are available FACTORY ORDER only.

# Table 1.74: QO Arc Fault Circuit Breakers

		1P 120 \	/ac	1P 120 Vac 22 k AIR			
Circuit Breaker	Ampere	10 k Al	R				
Type	Rating	1 Space Re	quired	1 Space Required			
		Cat. No.	\$ Price	Cat. No.	\$ Price		
Combination Arc-fault	15	QO115CAFI	282.00	QO115VHCAFI	534.00		
Interrupter (Pigtail Neutral)	20	QO120CAFI	282.00	QO120VHCAFI	534.00		
Plug-On Neutral	15	QO115PCAFI	282.00	QO115VHPCAFI	534.00		
Combination Arc-fault Interrupter	20	QO120PCAFI	282.00	QO120VHPCAFI	534.00		

## New!) QO-Dual Function Circuit Breaker

QO Combination Arc Fault and Ground Fault Circuit Interrupters (Dual Function) provide overload and short circuit protection, plus arc fault and ground fault protection in accordance with the NEC, UL1699 and UL943.

Table 1.75: QO-Dual Function Arc Fault Circuit Breakers

		1P 120	Vac	1P 120 Vac			
Circuit Breaker Type	Ampere Rating	10 k A	IR .	22 k AIR			
Circuit Breaker Type		1 Space Re	equired	1 Space Req	Space Required		
		Cat. No.	\$ Price	Cat. No.	\$ Price		
Combination Arc-fault and	15	QO115DF	326.00	QO115VHDF	578.00		
Ground Fault Circuit Interrupter (Pigtail Neutral)	20	QO120DF	326.00	QO120VHDF	578.00		
Plug-On Neutral Combination	15	QO115PDF	326.00	QO115VHPDF	578.00		
Arc-fault and Ground Fault Circuit Interrupter	20	QO120PDF	326.00	QO120VHPDF	578.00		





2-2

2-3

2-4

2-5

2-6

2-7

2-8

2-9

2-10

2-11

2-12

2-13

2-14

2-15

2-16





Individual Meter Socket Page 2-2



MP Meter-Pak Metering Equipment Page 2-5



EZ Meter-Pak Metering Equipment Page 2-8



© 2012 Schneider Electric All Rights Reserved



**Meter Sockets** 

Dimensions

**Dimensions** 

Ring and Ringless Type Individual Meter Sockets

MP Meter-Pak<sup>™</sup> Meter Centers

Tenant Circuit Breakers and Accessories

Indoor/Rainproof EZM General Information

Tenant Circuit Breakers and EZM Accessories

Ring and Ringless Devices

**EZ Meter-Pak Meter Centers** 

Selection Information

1 Phase Branch Devices

3 Phase Branch Devices

3 Phase Main Devices

New!) 1 Phase Main Devices

Dimensions

Horizontal Ganged, Test Block Bypass Sockets and Accessories

3 Phase Branch Devices and Main Devices with Busway Taps

Class 4131 / Refer to Catalog 4100CT0701

by Schneider Electric

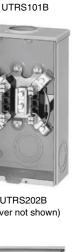
www.schneider-electric.us

Available single or three phase, 600 Vac max., with and without horn or lever bypass, overhead and underground service feed.

- 10 kA short circuit current rating (or higher with utility approval).
- UL Listed, NEMA 3R enclosure.
- Units supplied with bonded neutral.
- Units supplied with hub opening in top endwall require the use of a bolt-on hub, or closing plate.
- Units supplied with solid top are for underground feed only.
- Accessories, refer to page 2-3.

This metering is generally utility specific. Always check with local utility company before installing. Contact your nearest Field Sales Office for additional catalog numbers, if required by utility.

**Table 2.1: Individual Meter Sockets** 



UTRS202B (cover not shown)

METERING EQUIPMENT



UTH5203T (cover not shown)



URTRS213B

2-2

					Lug \	Wire Range (Al/C	u)	Enc	losure Informat	ion	
Ampere	Jaw	Service	Cat. No.▲	\$ Price	Line, Load,	Marine	01		Top Endwa	II Conf.	Box No. see
Rating∇	Qty.	Туре	<b>O</b> di: 110.=	ψ11.00	and Neutral (AWG/kcmil)	Wire Binding	Gnd. (AWG)	Material	Hub Opening■	Closing Plate ■	page 2-4
Ringless	Туре	1Ø3W 60	0 Vac Max., Without E	Bypass or	Jaw Release						
125	4	UG	UTZRS101A★	123.00	8–2/0	1/2 in. Hex	14–2	Steel	Solid Top★	_	1R
125	4	OH	UTRS101B	123.00	8-2/0	Slotted	14–2	Steel	Series A	ACP	1R
125	4	OH	UATRS101B	137.00	8-2/0	Slotted	14–2	Aluminum	Series A	ACPA	1R
125	4	OH	URS101BCPL	135.00	8–2/0	Slotted	14–2	Steel	Series A	ACP	1R
125	5	OH/UG	1003880A▼	161.00	8–2/0	Slotted	14–2	Steel	Series A	ACP	1R
200	4	OH	UTRS202B	177.00	8-250	1/2 in. Hex	14–2	Steel	Series A	ACP	3R
200	4	OH	UATRS202B	195.00	8-250	1/2 in. Hex	14–2	Aluminum	Series A	ACPA	3R
200	4	UG	UTRS213A★	212.00	1/0-350	1/2 in. Hex	14–2	Steel	Solid Top★	_	5R
200	4	OH/UG	UTRS213B▼	212.00	1/0-350	1/2 in. Hex	14–2	Steel	Series A	ACP	5R
200	4	OH/UG	UATRS213B▼	225.00	1/0-350	1/2 in. Hex	14–2	Aluminum	Series A	ACPA	5R
200	4	OH/UG	U92197CCCPL□	240.00	1/0-350	1/2 in. Hex	14–2	Steel	(2)Series A	(2)ACP□	7R
Ringless	Туре	1Ø3W 60	0 Vac Max., With Hori	n Bypass,	Without Jaw F	lelease					
125	4	OH/UG	UHTRS101B	161.00	8–2/0	Slotted	14–2	Steel	Series A	ACP	1R
125	5	OH	UGHTRS101L◆	161.00	8–2/0	Slotted	14–2	Steel	A125 ♦	_	1R
125	4	OH	URS101BDQ♦	138.00	8–2/0	1/2 in. Hex	None	Steel	Series A	ACP	1R
125	5	OH/UG	UGHTRS111C△	207.00	8–2/0	Slotted	14–2	Steel	Series A	ACP △	4R
200	4	OH/UG	UBHMRS212B▼	210.00	8-250	1/2 in. Hex	None	Steel	Series A	ACP	4R
200	4	OH	UHTRS202B	206.00	8-250	1/2 in. Hex	14–2	Steel	Series A	ACP	3R
200	4	OH/UG	UHTRS212B▼	206.00	8-250	1/2 in. Hex	14–2	Steel	Series A	ACP	4R
200	4	OH/UG	UHTRS213B▼	213.00	1/0-350	1/2 in. Hex	14–2	Steel	Series A	ACP	5R
200	4	UG	UHTRS223A★	272.00	1/0-350	1/2 in. Hex	14–2	Steel	Solid Top★	_	2R
200	4	UG	URS212ADQ★♦	203.00	8–250	1/2 in. Hex	None	Steel	Solid Top★	_	4R
Ringless	Туре	, 1Ø3W 60	0 Vac Max., With Leve	er Bypass	and Jaw Relea	ise					
200	4	OH	UTH4203T	465.00	6-350	1/2 in. Hex	14–2	Steel	Series A-L	ACPL	8R
200	4	OH/UG	UTH4213T▼	479.00	6–350	1/2 in. Hex	14–2	Steel	Series A-L	ACPL	9R
200	5	ОН	UTH5203T	494.00	6-350	1/2 in. Hex	14–2	Steel	Series A-L	ACPL	8R
200	5	OH/UG	UTH5213T▼	564.00	6-350	1/2 in. Hex	14–2	Steel	Series A-L	ACPL	9R
320	4	OH/UG	UTH4330T <b>▼</b> ☆	749.00	Studs Only	3/8 in. dia. studs	14–1/0	Steel	Series A-L	ACPL	11R
Ringless	Туре	3Ø4W 60	0 Vac Max., With Leve	er Bypass	and Jaw Relea	ise					
200	7	OH/UG	UTH7213T▼	666.00	6-350	1/2 in. Hex	14–2	Steel	Series A-L	ACPL	9R
320	7	OH	UTH7300T☆	830.00	Studs Only	3/8 in. dia. studs	14-1/0	Steel	Series A-L	ACPL	10R
Ringless	Туре	3Ø4W 60	0 Vac Max., Bolt-On S	ocket Wit	hout Bypass						
400	7	OH/UG	UK7T <b>▼</b> ☆	2423.00	Studs Only	1/2 in.–20 dia. studs	1/2 in.–20 dia. studs	Steel	Series A-L	ACPL	12R
400	7	OH/UG	UAK7T▼☆	2678.00	Studs Only	1/2 in20 dia. studs	1/2 in.–20 dia. studs	Aluminum	Series A-L	ACPLA	12R
Ring Typ	oe, 1Ø3	3W 600 Va	c Max., Without Bypa	ss or Jaw	Release						
125	4	OH/UG	URTRS101B▼	123.00	8–2/0	Slotted	14–2	Steel	Series A	ACP	1R
200	4	OH/UG	URTRS213B▼	212.00	1/0-350	1/2 in. Hex	14–2	Steel	Series A	ACP	5R

- Device requires approval from the serving utility, consult your nearest Schneider Electric sales office.
- Order appropriate bolt-on hub or closing plate separately and install on TOP endwall. Device supplied with 1-1/4 in. bolt-on hub (Cat.No. A125) mounted on TOP endwall.
- Device supplied with solid top endwall (without hub opening). When unit is installed for underground feed, the appropriate closing plate must be ordered separately and installed over hub opening in TOP endwall of
- Device supplied with closing plate ACP mounted on TOP endwall. Device supplied with two closing plates ACP mounted in TOP endwall.

- Contains "Duquesne Light Co." approved label.
- Order lugs separately, refer to accessories, page 2-3. Rating is continuous.

Horizontal Ganged, Test Block Bypass Sockets and Accessories



UT2R1121B

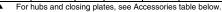
### **Horizontal Ganged Meter Sockets**

- 1Ø, 600 Vac max., main lugs only, 2 through 6 meter positions, with and without horn or lever bypass, end or center feed, overhead and underground service feeds.
- 10 kA short circuit current rating (or higher with utility approval).
- UL Listed, NEMA 3R enclosure.
- Supplied with ground lugs.
- Supplied with hub opening in top endwall, requires the use of a bolt-on hub, or closing plate.

This metering is generally utility specific. Always check with local utility company before installing. Contact your nearest Field Sales Office for additional catalog numbers, if required by utility.

**Table 2.2:** Ringless Type, 1Ø3W, 600 Vac Max., Without Bypass or Jaw Release

	Branch Ratings						Main Lugs	Branch Lugs	Top En	ıdwall▲											
Amperes <b>♦</b>	No. of Positions	Socket Jaw Qty.■	Service Type	Mains Rating (A)	Cat. No.	\$ Price	Phase and Neutral Al/Cu (AWG/kcmil)	Phase and Neutral Al/Cu (AWG)	Hub Type (Order Separately)	Closing Plate (Order Separately)	Box No. See Page 2-4										
	2			200	UT2R1121B	453.00	6-250		ĺ		13R										
	3			205	UT3R1121B	560.00	6-250				13R1										
100 A	4	4	OH/UG	OH/UG	OH/UG	205	UT4R1131B	660.00	6-350	8-2/0	Series A	ACP	14R								
	5			250	UT5R1131B	908.00	6-350				15R										
	6			300	UT6R1131B	1157.00	6-350				16R										
	2			205	UT2R2122B	647.00	6–250		Series A	ACP	17R										
	4			ľ						1								360 UT4R2352T 1106.00 1/0–500	Series A-L	ACPL	18R
200 A	5	4	OH/UG	500	UT5R2392TU	1383.00	1/0-500 or	8–250	Series A-L	ACPL	19R										
200 A	5	-	OI I/OG	300	01311239210	1303.00	(2)1/0-350	0-230	Gelles A-L	ACFL	1911										
	6			620		1/0-500 or		Series A-L	ACPL	20R											
	·					1548.00	(2)1/0-350		Series A-L	AOFL	2011										



- Fifth jaw kit available to convert 4-jaw socket to a 5-jaw socket. See Accessories table below.
- Rating is continuous.

# Meter Mains with Test Block Bypass (Meets EUSERC Requirements)

Ring Type, 1Ø3W and 3Ø4W, Meter Main with Test Block Bypass (Meets EUSERC Requirements) Supplied with bondable neutral, suitable for use as service equipment. Suitable for overhead or underground service. UL Listed File E6294.

System (Incoming) and Service (Outgoing)	Meter Socket Type	Ampere Rating (Max.)	Short Circuit Current Rating		\$ Price	Main Circuit Breaker Type (Order Separately)★
120/240 Vac 1Ø3W	5-Jaw	225 A	100 kA max.	EMT1225CB	4095.00	2P Type QB, QD, QG, QJ, QO▼, QO-VH▼ or QOH▼
208Y/120 Vac 3Ø4W□ or 240/120 Vac 3Ø4W Delta	7-Jaw	225 A	65 kA max.	EMT3225CB	5355.00	3P Type QB, QD, QG or QJ

- Refer to page 2-15 to select main circuit breaker.
- Requires use of EZM125QOA adapter (order separately), when using QO (40 A–125 A, 2-pole) 10 kA max. SCCR, QO-VH (40 A–60 A, 2-pole) 22 kA max. SCCR, or QOH (40 A–60 A, 2-pole) 42 kA max. SCCR. Refer to page 2-15 for pricing.
- Refer to page 2-4 for box dimensions.
- 100 kA max.

#### **Table 2.4: EMT Terminal Wire Size ◊**

Line Phase Lug	Line Neutral Lug	Service Ground Lug	Equipment Ground Lug	Load Neutral Lug
6 AWG-300 kcmil Al/Cu	6 AWG-350 kcmil Al/Cu	4 AWG-300 kcmil Al/Cu	6 AWG-300 kcmil Al/Cu	4 AWG-300 kcmil Al/Cu

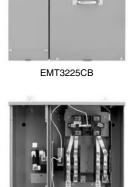
Refer to circuit breaker listings for usable load lug wire sizes.

# **Meter Socket Accessories**

**Table 2.5: Meter Socket Accessories** 

Accessor	у	Description	Cat. No.	\$ Price
Fifth-Jaw Kit		Converts a 4-jaw meter socket to a 5-jaw meter socket. For use on meter sockets supplied without lever bypass or jaw release only.	A5J	14.90
		For Series A (steel)	ACP	13.40
Closing Plates		For Series A (aluminum)	ACPA	11.90
(to seal hub openings)		For Series A-L (steel)	ACPL	18.30
		For Series A-L (aluminum)	ACPLA	16.50
		1.00 inch	A100	33.90
		1.25 inch	A125	33.90
	Series A	1.50 inch	A150	33.90
		2.00 inch	A200	47.90
Hubs		2.50 inch	A250	61.00
(listed by conduit size)		2.00 inch	A200L	83.00
(noted by conduit size)		2.50 inch	A250L	87.00
	Series A-L	3.00 inch	A300L	111.00
		3.50 inch	A350L	114.00
		4.00 inch	A400L	119.00
	Series B	3.00 inch	B300☆	186.00
Adapter Plate		To allow the use of a Series A Hub on a device that is setup for a series A-L Hub.	AAP	33.80
		For use on meter sockets supplied with Line, Load, and Neutral Studs only. Be sure to order enough lugs for each device (a typical 1Ø device requires 6 lugs).		
Lug Kits		Includes one, two-barrel lug (6-250 kcmil)	ARP00118	38.10
-ugo		Includes one, single barrel lug (4-600 kcmil)	ARP00129	55.00
		Includes three, two-barrel lugs (6-350 kcmil)	ARP00427	135.00
		Snap-on Aluminum (Standard)	2920910001	8.00
Sealing Ring		Snap-on Stainless Steel (Non-standard)	ARP00026	16.70
		Screw Type Aluminum (Non-standard)	29008W	20.10

DE1A Discount.



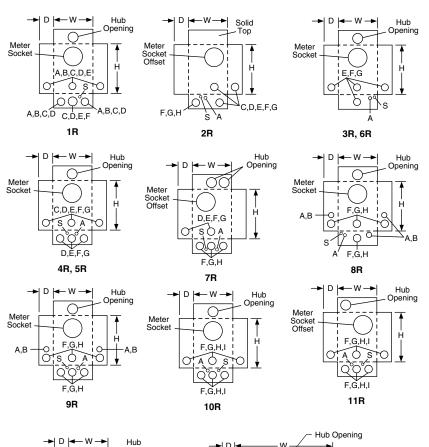
EMT1225CB Without Covers METERING EQUIPMENT

**Table 2.6:** 

20R









**Enclosure Dimensions** 

▲Refer to page 2-3 for closing plates and hubs

**Knockout Information Table 2.7:** 

Main

Lugs

19R and 20R

F,G,H

(19R, 20R)

C.D.E.F.G

(19R, 20R)

63.00

	Knockouts												
Symbol	S	Α	В	С	D	Е	F	G	Н	1	J		
Conduit Size (in.)	5/16 ■	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4		

5.38

(2) Series A-L

C,D,E,F,G

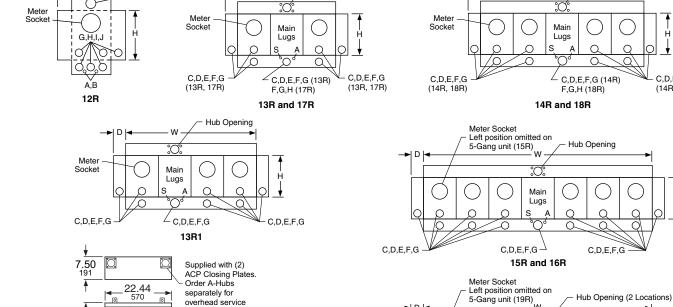
(14R, 18R)

Ĥ

**Hub Opening** 

■Knockout for grounding conductor.

14.12



EMT1225CB and EMT3225CB

000

C,D,E (3 Locations) E,F,G,H (8 Locations)

30.00

Opening

C.D.E.F.G

(19R, 20R)



MP44125

### **Ring and Ringless Type Devices**

- Consult local utility for approval before installation.
- 120/240 Vac 1Ø3W.
- Main lugs only—two to six meter sockets.
- Enclosures are indoor/rainproof NEMA 3R construction.
- Suitable only for use as service equipment.
- Swingable mounting feet supplied at bottom of device.
- Factory-installed mechanical lugs, alternate lugs and NEMA/EUSERC lug landing kits available.
- Surface mount, convertible to semi-flush with field installed flange kit.
- Ring type devices supplied with 4-jaw meter sockets (5th jaw kits available, order separately).
- Ringless type devices supplied with 5-jaw meter sockets, available with and without horn or lever bypass.
- Provisions for mounting 2-pole circuit breaker for each meter socket position (order circuit breakers separately).
- Mounting channel supplied, except for box 1R (125 A, 2-position).
- Combination overhead/underground feed.

**Table 2.8:** Ring Type MP Meter-Pak Metering Equipment with 125 A (42 kA Maximum SCCR) or 200 A (22 kA Maximum SCCR) Meter Socket Positions

Amperes per Pole	No. of Poles	Factory-Installed Main Lug Ampacity (See page 2-6 for alternate lugs)	Main Bus Ampacity (A)	Cat. No.	\$ Price	Line Lug Wire Size Al/Cu AWG/kcmil	Circuit Breaker Type (2P)	Hub Prov.▲	Semi-Flush Flange Kit	Wt Lbs	Box No.
	2	200	200	MP22125 ■	977.00	(1) 4-250		A/B300	MPSF12	46	1R
	3	300	300	MP33125 ◆	1187.00	(1) 1/0–600 or (2) 1/0–250		A-L	MPSF14	95	2R
125	4	400	400	MP44125 ◆	1730.00	(1) 1/0–600 or (2) 1/0–250	QO, QO-VH,	A-L	MPSF14	97	2R
	5	400 AI 500 Cu	500	MP55125 ◆	2079.00	(1) 1/0–600 or (2) 1/0–250	QOH	(4) A-L	MPSF16	130	3R
	6	400 AI 500 Cu	600	MP66125 ◆	2415.00	(1) 1/0–600 or (2) 1/0–250		(4) A-L	MPSF16	132	3R
	2	400	400	MP42200 ◆	1274.00	(1) 1/0–600 or (2) 1/0–250			MPSF23	99	4R
000	3	400	400	MP43200 ◆	2151.00	(1) 1/0–600 or (2) 1/0–250	QOM2-MM.	(0.4.1	MPSF23	99	4R
200	4	400	600	MP64200 ◆	2814.00	(1) 1/0–600 or (2) 1/0–250	QOM2-MVH	(4) A-L	MPSF24	135	5R
	5	600 Al, 750 Cu	800	MP85200 ◆	3377.00	(2) 3/0-500			MPSF26	173	6R
	6	600 Al, 750 Cu	800	MP86200 ◆	4040.00	(2) 3/0-500			MPSF26	173	6R

- For A and A-L Hubs see page 2-3, for B Hubs see page 3-9.
- Meets EUSERC standards.
- Meets EUSERC standards with addition of lug landing kit, MMSK2.

Table 2.9: Ringless Type MP Meter-Pak Metering Equipment with 125 A (42 kAMaximum SCCR) or 200 A Type MPR, MPH (22 kA Maximum SCCR) or 225 A Type MPL (100 kA Maximum SCCR) Meter Socket Positions

Amperes Per Pos.	No. of Pos.	Factory-Installed Main Lugs Ampacity (See page 2-6 for alternate lugs)	Main Bus Ampacity	No. Bypass Cat. No.	\$ Price	Horn Bypass Cat. No.	\$ Price	Lever Bypass Cat. No.	\$ Price	Line Lug Wire Size Al/Cu AWG/kcmil	Circuit Breaker Type (2P) (See page 2-6)	Hub Prov. ★	Semi-Flush Flange Kit	Wt Lbs	Box No.	
	2	200	200	MPR22125	995.00	MPH22125	1002.00	_	_	(1) 4-250		A/B300	MPSF12	46	1R	
	3	300	300	MPR33125	1220.00	MPH33125	1253.00	_	_	(1) 1/0–600 or (2) 1/0–250	QO, QO-VH, QOH		A-L	MPSF14	95	2R
125	4	400	400	MPR44125	1781.00	MPH44125	1830.00	_	_	(1) 1/0–600 or (2) 1/0–250		A-L	MPSF14	97	2R	
	5	400 Al 500 Cu	500	MPR55125	2246.00	MPH55125	2330.00	_	_	(1) 1/0–600 or (2) 1/0–250		(O) A I	MPSF16	130	3R	
	6	400 AI 500 Cu	600	MPR66125	2615.00	MPH66125	2715.00	_	_	(1) 1/0–600 or (2) 1/0–250		(2) A-L	MPSF16	132	3R	
	2	400	400	MPR42200	1290.00	MPH42200	1299.00			(4) 4/9 000	001401414		MPSF23	99	4R	
200	3	400	400	MPR43200	2186.00	MPH43200	2219.00	_	_	(1) 1/0–600 or (2) 1/0–250	QOM2-MM,	QOM2-MM, QOM2-MVH		MPSF23	99	4R
	4	400	600	MPR64200	2865.00	MPH64200	2916.00			(2) 1/0 200	QOIVIZ MIVIT		MPSF24	135	5R	
	2	350	350		_		-	MPL32225	1739.00		QBP-TM,	[	N/A	105	7R	
	3	400	500		_		_	MPL53225	2741.00	(1) 1/0–600 or	QDP-TM, QGP-TM or	(2) A-L	N/A	147	8R	
225	4	400	600	_	_	_	_	MPL64225	3656.00	(2) 1/0–250	QJ-TM QO▼, QO-VH▼ or QOH▼	(=, : : =	N/A	200	9R	
000	5	600 Al, 750 Cu	800	MPR85200	3545.00	MPH85200	3627.00	_	_	(2) 3/0-500	QOM2-MM,	ĺ	MPSF26	173	6R	
200	6	600 Al, 750 Cu	800	MPR86200	4241.00	MPH86200	4341.00	_	_	(2) 3/0-500	QOM2-MVH	ĺ	MPSF26	173	6R	

UL Listed short circuit current rating depends on lowest interrupting rating of circuit breaker installed.

For A and A-L Hubs see page 2-3, for B Hubs see page 3-9. Requires use of EZM125QOA adapter (order separately). Refer to oage 2-15 for pricing.

Class 4141 / Refer to Catalog 4100CT0701

QO2100VH 2P, Plug-on Type Circuit Breaker



ODP22200TM 2P. Bolt-on Type Circuit Breaker



QOM2200MVH

### **Tenant Circuit Breakers**

UL Listed Short Circuit Current Rating depends on lowest interrupting rating of circuit breaker installed. (Refer to the table on the bottom of page 2-9 for Square D certified ratings for downstream panelboards and load centers.)

**Tenant Circuit Breakers** Table 2.10:

Amperes	10 k AIR 120/240 Vac	\$ Price (DE2A)	22 k AIR 120/240 Vac	\$ Price (DE2A)	42 k AIR 120/240 Vac	\$ Price (DE2A)	100 k AIR 120/240 Vac	\$ Price (DE2A)
For use in	125 A Max. Type MP,	MPR and MPH	Meter-Pak Metering E	quipment				
40	QO240	67.00	QO240VH▲	146.00	QOH240	317.00	_	_
50	QO250	67.00	QO250VH▲	146.00	QOH250▲	317.00	_	_
60	QO260	67.00	QO260VH	146.00	QOH260▲	317.00	=	_
70	QO270	134.00	Q0270VH	224.00	QOH270▲	528.00	_	_
80	QO280	189.00	QO280VH	315.00	QOH280▲	651.00	_	_
90	QO290	189.00	QO290VH	315.00	QOH290	651.00	_	_
100	QO2100	189.00	QO2100VH	315.00	QOH2100	651.00	_	_
125	QO2125	428.00	QO2125VH	1034.00	QOH2125	1389.00	_	_
For use in 2	200 A Max. Type MP,	MPR and MPH	Meter-Pak Metering E	quipment				
100	QOM2100MM	474.00	QOM2100MVH	1143.00	_	1 – 1	_	_
125	QOM2125MM	474.00	QOM2125MVH	1143.00	_		_	_
150	QOM2150MM	474.00	QOM2150MVH	1143.00	_		_	_
175	QOM2175MM	474.00	QOM2175MVH	1143.00	_		_	_
200	QOM2200MM	474.00	QOM2200MVH	1143.00	_	_	=	_
Amperes	10 k AIR 120/240 Vac	\$ Price (DE2A)	25 k AIR 120/240 Vac	\$ Price (DE2A)	65 k AIR 120/240 Vac	\$ Price (DE2A)	100 k AIR 120/240 Vac	\$ Price (DE2A)
For use in 2	225 A MPL Lever Byp	ass Meter-Pak	Metering Equipment					
40	QO240■	67.00	QO240VH▲ ♦ ■	146.00	QOH240■★	317.00	_	I –
50	QO250■	67.00	QO250VH▲ ♦ ■	146.00	QOH250■★▲	317.00	_	_
60	QO260■	67.00	QO260VH▲◆■	146.00	QOH260■★▲	317.00	_	_
70	QBP22070TM	474.00	QDP22070TM	1143.00	QGP22070TM	1521.00	QJP22070TM	1890.00
80	QBP22080TM	474.00	QDP22080TM	1143.00	QGP22080TM	1521.00	QJP22080TM	1890.00
90	QBP22090TM	474.00	QDP22090TM	1143.00	QGP22090TM	1521.00	QJP22090TM	1890.00
100	QBP22100TM	474.00	QDP22100TM	1143.00	QGP22100TM	1521.00	QJP22100TM	1890.00
110	QBP22110TM	474.00	QDP22110TM	1143.00	QGP22110TM	1521.00	QJP22110TM	1890.00
125	QBP22125TM	474.00	QDP22125TM	1143.00	QGP22125TM	1521.00	QJP22125TM	1890.00
150	QBP22150TM	474.00	QDP22150TM	1143.00	QGP22150TM	1521.00	QJP22150TM	1890.00
175	QBP22175TM	474.00	QDP22175TM	1143.00	QGP22175TM	1521.00	QJP22175TM	1890.00
200	QBP22200TM	474.00	QDP22200TM	1143.00	QGP22200TM	1521.00	QJP22200TM	1890.00
225	QBP22225TM	474.00	QDP22225TM	1143.00	QGP22225TM	1521.00	QJP22225TM	1890.00

- Order only. Not stocked in PDS. Order Point: Lincoln.
- Requires use of EZM125QOA adapter (order separately). Refer to page 2-15 for pricing. QO-VH tenant circuit breakers are rated 22 kAIR at 120/240 Vac.
- QOH tenant circuit breakers are rated 42 k AIR at 120/240 Vac.

### **Accessories**

**Accessories** Table 2.11:

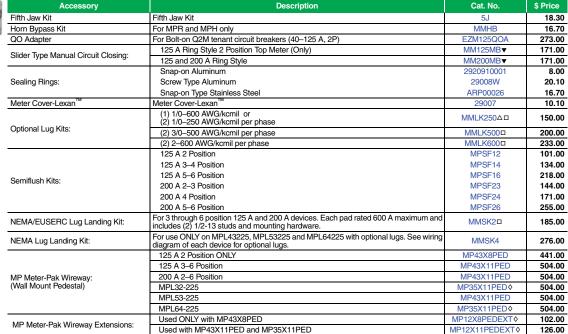


METERING EQUIPMEN



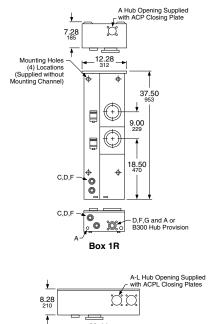


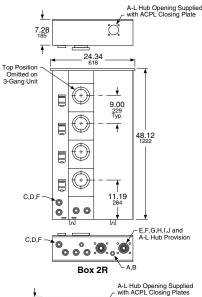
MMLK500

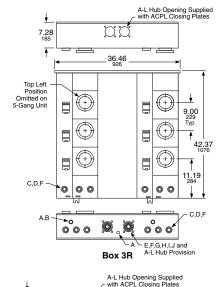


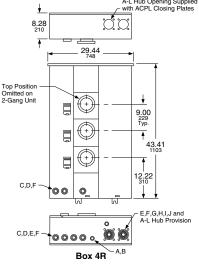
- The meter center short circuit current rating is 10 kA when manual circuit closing is used. Not rated for continuous duty. Standard lug for 3 through 6 position 125 A and 2 through 4 position 200 A devices.
- Cannot be installed on 2 position 125 A device.
- Order only. Not stocked in PDS. Order point: Lexington.

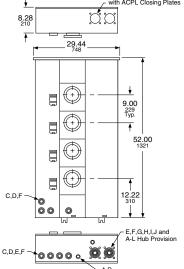
### **Dimensions and Knockouts**

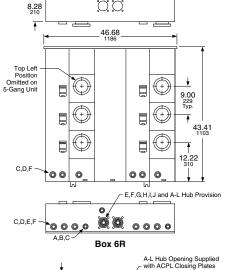


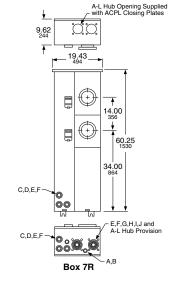


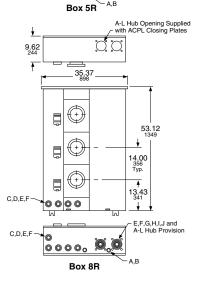












<u>*</u>			/ WILL	ACFEC	losing Flates
9.62 244			ď II		
<u>+</u>		Ш		l	
· .	•	35.3	7	1	
1	_			ļ	<u> </u>
		<b>(</b>			
		<b>(</b>		67 17	.37
		$\bigoplus$		14.00 356 Typ.	
C,D,E,F				Typ.  13.43 341	
	Ш	2 0			Ľ
C,D,E,F	0	000		– E,F,G A-L H	,H,I,J and ub Provision
		Box 9	9R	- A,B	

Knockouts											
Symbol	Α	В	С	D	Е	F	G	Н	1	J	
Conduit Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	

240 Vac Maximum, for use on AC systems, suitable for use as Service Equipment.

**Utility Company Requirements** Review local utility requirements to ensure that metering equipment meets their standards.

EZ Meter-Pak meter center enclosures meet NEC wire bending requirements, and are designed for wall mounting only (not suitable for floor mounting). All unmetered conductor compartments may be sealed by the utility company.

EZ Meter-Pak meter centers have UL Listed short circuit current ratings up to 100 kA at 240 Vac when properly applied. For three-tier series ratings refer to Data Bulletin 4100DB0301 and Instruction Bulletin 80043-303-22

Suitable incoming services for an EZM main device and available outgoing feeder(s) to downstream panelboards from EZM branch section(s)-

Incoming Service to Main Device 120/240 Vac, 1Ø3W

Available outgoing feeder(s) to downstream panelboards:

120/240 Vac. 1Ø3W (4-jaw ring type meter sockets, two-pole circuit breakers) (5-jaw ringless meter sockets, two-pole circuit breakers).

Incoming Service to Main Device 240/120 Vac, 3Ø4W

Available outgoing feeder(s) to downstream panelboards:

- 120/240 Vac. 1Ø3W (Fed from transformer's "A-Phase" and "C-Phase" only.) NOTE: Connection to High-Leg "B-Phase" not permitted for this service (4-jaw ring type meter sockets, two-pole circuit breakers) (5-jaw ringless meter sockets, two-pole circuit breakers) Standard 3Ø IN/1Ø OUT branch units are not suitable for **use on this Delta System.** Special branch units are available for this System by adding suffix: "CA" to catalog number (Typical Examples: EZM313125CA EZM313125XCA, EZM313125CUXCA, EZM314225CA, EZM314225XCA, EZM314225CUXCA, EZM315225CA, EZM314225CUCA, etc.).
- 240/120 Vac, 3Ø4W Delta (7-jaw meter sockets, three-pole circuit breakers)

### Incoming Service to Main Device 208Y/120 Vac. 3Ø4W

Available outgoing feeder(s) to downstream panelboards:

- 120/208 Vac, 1Ø3W (5-jaw meter sockets, two-pole circuit breakers)
- 208Y/120 Vac, 3Ø4W (7-jaw meter sockets, three-pole circuit breakers)

### **Main Devices**

- 400, 600 and 800 A main disconnects may be end mounted with branch units having 800 A or 1200 A continuous horizontal cross bus.
- 1000 and 1200 A main disconnect or terminal box must be center mounted when used with branch devices with main bus rated 800 A continuous.
- 1600 A main disconnect or terminal box must be center mounted.
- 2000 A main disconnect must be center mounted and requires use of branch units having 1200 A continuous horizontal cross bus.
- 400, 800 and 1200 A Type EZM-TBU terminal boxes supplied with lug landings to meet EUSERC requirements.

Main Circuit Breaker ratings: 400, 600, 800, 1000, 1200, 1600 and 2000 A

Main Fusible Switch ratings: 400, 600, 800, and 1200 A (1Ø3W only)

Main Lugs Terminal Box ratings: 225, 400, 600, 800, 1200, 1600, and 2000 A

#### Branch Units

125 A and 225 A residential branch units are available in ring type or ringless type construction and are supplied with 800 A continuous aluminum horizontal cross bus as standard (Example: EZM314125). For optional 1200 A continuous copper horizontal cross bus with aluminum vertical connectors, add suffix "X" to catalog number (Example: EZM314125X). For optional 1200 A continuous all-copper bussing, add suffix "CUX" to catalog number (Example: EZM314125CUX). NOTE: 5-gang 225 A EZM, EZMR and EZMH residential branch units are supplied with 1200 A continuous Cross Bus as standard, do not add suffix "X" or "CUX" to these units (Examples: EZMR315225 or EZMR315225CU). Plug-in style residential meter sockets are available as ring type **EZM** without bypass, ringless type **EZMR** without bypass, and ringless type **EZMH** with horn bypass.

Tenant circuit breakers must be ordered separately for these branch units. 125 A max. units make use of Type QO, QO-VH or QO-H two-pole tenant circuit breakers (40-125 A). 225 A max. units make use of Type QDP-TM, QBP-TM, QGP-TM and QJP-TM two-pole tenant circuit breakers (70-225 A), and may also make use of two-pole Type QO (40-125 A at 10 kA max.), two-pole Type QO-VH (40-60 A at 100 kA max.), or two-pole Type QO-H (40-60 A at 100 kA max.) tenant circuit breakers.

225 A commercial branch units are available in ring type or ringless type construction and are supplied with 1200 A copper horizontal cross bus with aluminum vertical connectors as standard (Example: EZML314225). For optional 1200 A continuous all-copper bussing, add suffix "CU" to catalog number (Example: EZML314225CU). Plugin style commercial meter sockets are available as ring type **EZMT** with test block bypass (meets EUSERC requirements), ringless type **EZMR** without bypass, and ringless type **EZML** with lever bypass.

225 A max. units make use of type QDP-TM, QBP-TM, QGP-TM and QJP-TM two-pole or three-pole tenant circuit breakers (70-225 A), and may also make use of two-pole type QO (40-125 A at 10 kA max.), two-pole type QO-VH (40-60 A at 100 kA max.), or two-pole type QO-H (40-60 A at 100 kA max.) tenant circuit breakers.

Note: QO. QO-VH and QO-H tenant circuit breakers used in 225 A branch units require the use of adapter **EZM125QOA** (purchased separately). Refer to page 2-15 for pricing

- 400 A branch units are available in ringless type construction only, and are supplied with 1200 A continuous all-copper bussing as standard (Example: EZML332400). These branch units are supplied with factory-installed type DJM tenant circuit breakers that have a field adjustable ampere rating trip setting from 160 A min. to 400 A max. A tamper-evident seal kit is available where needed, order seal kit 29375 (refer to NEC 240-6 [c]). 400 A branch units are available as Type **EZML** with plug-in style lever bypass type meter sockets, or Type EZMK with bolt-on style with manual bypass type meter sockets.
- Units having 800 A continuous horizontal cross bus WILL CONNECT with units having 1200 A continuous horizontal cross bus.
- Single phase units (three bus bars in horizontal cross bus) WILL NOT CONNECT with three phase units (four bus bars in horizontal cross bus).

For Load Center Three-Tiered Series Ratings used downstream from Metering Equipment, refer to Data Bulletins: 4100DB0301 and 2700DB9901.



## EZ Meter-Pak<sup>™</sup> Meter Centers

# **Selection Information**

Class 4141 / Refer to Catalog 4100CT0701

- Review local utility requirements to ensure that metering equipment meets their standards.
- Check local utility to determine available fault current at the meter center.
- Using the SCCR table:
  - Select meter center configuration, main lugs only (Six Disconnect Rule), or remote main, main circuit breaker, or main fusible switch.
  - Read down to select SCCR equal to, or greater than desired rating.
    - Read across to select branch unit tenant circuit breaker type.
  - Continue reading across to select EZM main device type.

#### Table 2.12: UL Listed Meter Center Short Circuit Current Ratings (SCCR)

Tenant circuit breakers of same frame size having higher AIR values may replace tenant circuit breakers as listed in tables below and maintain the series rating.

	Short Circuit	er AIH values may replace tenant circuit breakers as il EZM Meter Cen	iter Overcurrent Protection Devices
Figures	Short Circuit Current Rating (240 Vac Maximum)▲■	EZM Branch Unit Tenant Circuit Breaker Types Available (Branch Unit Amperes max., Number of Poles, Tenant Circuit Breaker Amperes Rating Range)	EZM Main Device with Integral Mounted Main, Remote Mounted Main or without an Upstream Mounted Main (Six Disconnect Rule)
┌ EZM Branch Units ┐ Load	EZ Meter-Pak (	Six Disconnect Rule Applications)—See Figure 1	
Service Centers (Main Lugs)	10 kA	QO ( <b>125 A</b> , 2P, 40–125 A) QO ( <b>225 A</b> , 2P, 40–125 A)★ QB ( <b>225 A</b> , 2P or 3P, 70–225 A)	
T ransformer	22 kA	QO-VH ( <b>125 A</b> , 2P, 40–125 A) QO-VH ( <b>225 A</b> , 2P, 40–60 A)★	
EZM Main Lugs	25 kA	QD (225 A, 2P or 3P, 70–225 A)	400–2000 A Main Lugs Terminal Box (Tenant Circuit Breakers used as Service Disconnects—6 maximum)
Terminal Box	42 kA	QOH ( <b>125 A</b> , 2P, 40–125 A) QOH ( <b>225 A</b> , 2P, 40–60 A)★	(Contain Ground Broad as as as 700 Broad mode of maximum)
Figure 1	65 kA	QG (225 A, 2P or 3P, 70–225 A)	
	100 kA	QJ ( <b>225 A</b> , 2P or 3P, 70–225 A) ◆ DJM ( <b>400 A</b> , 2P or 3P, 160–400 A) ▼ ◆	
	EZ Meter-Pak 2	25–2000 A Main Lugs Terminal Box Applications Prote	ected by Remote Main—See Figure 2
	10 kA	QO (125 A, 2P, 40–125 A) QO (225 A, 2P, 40–125 A)★ QB (225 A 2P or 3P, 70–225 A) DJM (400 A, 2P or 3P 160–400 A)▼	Must be protected by an upstream disconnecting means rated 10 k AIR minimum
	22 kA	QO-VH ( <b>125 A</b> , 2P, 40–125 A) QO-VH ( <b>225 A</b> , 2P, 40–60 A)★ DJM ( <b>400 A</b> , 2P or 3P, 160–400 A)▼	Must be protected by an upstream disconnecting means rated 22 k AIR minimum
EZM Main Lugs Terminal Box	25 kA	QD ( <b>225 A</b> 2P or 3P, 70–225 A) DJM ( <b>400 A</b> , 2P or 3P, 160–400 A)▼	Must be protected by an upstream disconnecting means rated 25 k AIR minimum
EZM Branch Units	42 kA	QOH (125 A, 2P, 40–125 A) QOH (225 A, 2P, 40–60 A)★ DJM (400 A, 2P or 3P, 160–400 A)▼	Must be protected by an upstream disconnecting means rated 42 k AIR minimum
	42 1/4	QO-VH ( <b>125 A</b> , 2P, 40–125 A) QO-VH ( <b>225 A</b> , 2P, 40–60 A)* QD ( <b>225 A</b> 2P or 3P, 70–225 A)	Must be protected by a Square D circuit breaker Type LA (400 A max.) or MA (1000 A max.) Rated 42 k AIR minimum
Transformer  Transformer  Transformer  Transformer  Transformer  Circuit  Breakers  (Main Lugs)		QG ( <b>225 A</b> 2P or 3P, 70–225 A) DJM ( <b>400 A</b> , 2P or 3P, 160–400 A)▼	Must be protected by an upstream disconnecting means rated 65 k AIR minimum
Upstream Disconnection Means and Overcurrent Protection as required  Figure 2	65 kA	QO-VH (125 A, 2P, 40–125 A) QO-VH (225 A, 2P, 40–60 A)★ QD (225 A 2P or 3P, 70–225 A) DJM (400 A, 2P or 3P, 160-400 A)▼	Must be protected by a Square D circuit breaker Type LH (400 A max.), MG (800 A max.), MH (1000 A max.), PG (1200 A max.) or RG (2000 A max.) rated 65 k AIR minimum.
		QJ ( <b>225 A</b> 2P or 3P, 70–225 A ) ♦ DJM ( <b>400 A</b> 2P or 3P, 160–400 A) ▼ ♦	Must be protected by an upstream disconnecting means rated 100 k AIR minimum
	100 kA	QO-VH ( <b>125 A</b> , 2P, 40–125 A) QO-VH ( <b>225 A</b> , 2P, 40–60 A) ★	Must be protected by an upstream disconnection means with Class R (600 A Max.); Class J (600 A Max.); Class T6 (800 A Max.); Class T3 (1200 A Max.) or Class L (1200 A Max.).
		OD ( <b>225 A</b> 2P only, 70–225 A) DJM (400 A, 2P or 3P, 160-400 A)▼ QD ( <b>225 A</b> 3P only, 70–225 A)◆	Must be protected by an upstream disconnection means with Class R (600 A Max.); Class J (600 A Max); Class T6 (800 A Max.); Class T3 (1200 A Max.) or Class L (1200 A Max.) tuses or by a Square D circuit breaker Type MJ (800 A Max.); PJ (1200 A Max.); or RJ (2000 A Max.) rated 100 k AIR minimum.
	EZ Meter-Pak-	-Main Circuit Breaker Applications—See Figure 3	
	10 kA	OO (125 A, 2P, 40–125 A) OO (225 A, 2P, 40–125 A)★ OB (225 A 2P or 3P, 70–225 A) OO-VH (125 A, 2P, 40–125 A)	400-2000 A EZM Main Device with Type LH (400 A Max.); MH (1000 A Max.); PG
	65 kA	QO-VH ( <b>225 A</b> , 2P, 40–60 A) ★ QD ( <b>225 A</b> 2P or 3P, 70–225 A) DJM ( <b>400 A</b> , 2P or 3P, 160–400 A)▼	or PJ (1200 A Max.); RG or RJ (2000 A Max.)
EZM Circuit Breaker Main or EZM Main Fusible Switch EZM Branch Units	100 kA	QO-VH (125 A, 2P, 40–125 A) QO-VH (225 A, 2P, 40–60 A)★ QD (225 A 2P only, 70–225 A) QD (225 A 3P only, 70–225 A)↓ DJM (400 A, 2P or 3P, 160–400 A)▼	1000 A Main Device with catalog number suffix "CBU" supplied with Type MHF circuit breaker.
		QD ( <b>225 A</b> 2P only, 70–225 A) QD ( <b>225 A</b> 3P only, 70–225 A) ♦ DJM ( <b>400 A</b> 2P or 3P, 160–400 A) ▼	1200–2000 A EZM Main Device with Type PJ (1200 A Max.) or RJ (2000 A Max.)
Transformer	EZ Meter-Pak-	-Main Fusible Switch Applications—See Figure 3	
Tenant Load Circuit Centers Breakers (Main Lugs) △	10 kA	QO ( <b>125 A</b> , 2P, 40–125 A) QO ( <b>225 A</b> , 2P, 40–125 A)★ QB ( <b>225 A</b> 2P or 3P, 70–225 A)	400–1200 A EZM Main Device (1Ø or 3Ø) with Class T (300 Vac) fuses installed.
Figure 3	100 kA	QO-VH (125 A, 2P, 40–125 A) QO-VH (225 A, 2P, 40–60 A)★ QD (225 A 2P, only, 70–225 A) QD (225 A 3P only, 70–225 A)↓ DJM (400 A, 2P or 3P, 160–400 A)▼	400–1200 A EZM Main Device (1Ø or 3Ø) with Class T (300 Vac) fuses installed.

- Meter center short circuit current rating is equal to the lowest short circuit current rating given in table for any circuit breaker installed in any meter panelboard in the meter center.
- Short circuit current rating is measured at the LINE SIDE terminals of the integral mounted or remote mounted main providing overcurrent protection for the EZM metering equipment lineup. 3P only tenant circuit breaker(s) are limited to: 100 kA Max. at 208Y/120 Vac or 65 kA Max at 240/120 Vac. Requires use of EZM125QOA adapter (order separately). Refer to page 2-15 for pricing.
- Supplied with factory-installed circuit breaker(s), with an adjustable trip range of 160-400 A.
- For three-tier series ratings refer to Data Bulletin 4100DB0301 and Instruction Bulletin 80043-303-22.

# 1Ø 3W 120/240 Vac EZ Meter-Pak Meter Centers—1Ø, Indoor/Rainproof, UL Listed

#### 1200 A Main CB/Fusible Switch Devices come Standard with 2-STEP Removable **Service Entrance Endwalls**

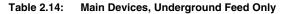
Select EZM meter center short circuit current rating from Table 2.12 on page 2-9. Using this table as a reference, make the following selections:

- Select EZM 1Ø main device from Table 2.13 or 2.14, below, with an equal or higher short circuit rating than the application.
- 2. Select EZM 1Ø branch units from Tables 2.15, 2.16 or 2.17.
- Select proper 2P type QO, QO-VH, QOH, QBP-TM, QDP-TM, QGP-TM or QJP-TM branch circuit breakers for use as tenant mains in branch unit from Table 2.24, page 2-15.
- Select accessories as required from Table 2.25, page 2-15.
- Dimensions; page 2-16.

#### Select Main Devices—NEMA 3R Construction

#### Main Devices, Overhead/Underground Feed Table 2.13:

Ampere Rating	Horizontal Cross Bus Rating and Bus Bar Material		Cat. I	No.△		Width (in.)	Factory-Installed Line Side Lug (Conductors per Phase and Neutral) Wire Size (AWG/kcmil)
Main Circ	cuit Breaker (1Ø In	coming and 1Ø Outgo	oing)				
		65 kA	\$ Price	100kA	\$ Price		
400	400 A AI	EZM1400CB▲	6180.00	_	_	18.66	(1) 1–600 or (2) 1–250
600	600 A AI	EZM1600CB▲	8573.00	_	_	18.66	(3) 3/0-500
800	800 A AI	EZM1800CB▲	11364.00	_	_	18.66	(3) 3/0-500
1000	1000 A AI	EZM11000CB▲	15767.00	_	_	18.66	(3) 3/0-500
1200	1200 A Cu	EZM11200GCBT■▽	20366.00	EZM11200JCBT■▽	23563.00	23.69	(4) 3/0-500
1600	1200 A Al/Cu	EZM11600GCBC♦■	29904.00	EZM11600JCBC ◆ ■	34650.00	30.19	(6) 1/0-750 or (12) 1/0-250
2000	1200 A Al/Cu	_	_	EZM12000CB ◆	54518.00	30.19	(6) 1/0-750 or (12) 1/0-250
Main Fus	sible Switches (1Ø	Incoming and 1Ø Out	going) Require	s 300 Vac Class T Fus	ses (Order Sepa	arately)	
400	400 A AI	_	_	EZM1400FS	3989.00	18.66	(1) 1–600 or (2) 1–250
600	600 A AI	_	_	EZM1600FS	6978.00	18.66	(3) 3/0–500
800	800 A AI	_	_	EZM1800FS	8972.00	18.66	(3) 3/0–500
1200	1200 A Cu	_	_	EZM11200FST▽	11564.00	23.69	(4) 3/0-500
Main Lug	Terminal Boxes (	1Ø Incoming and 1Ø	Outgoing)				
225	800 A AI	_	_	EZM1225TB★	798.00	11.66	(1) 4–300
400	800 A AI	_	_	EZM1400TB□	915.00	17.15	(2) 3/0-500
600	800 A AI	_	_	EZM1600TB□	998.00	17.15	(2) 1/0-750 or (4) 1/0-300
800	800 A AI	_	_	EZM1800TB□	1236.00	18.66	(4) 3/0-500
800	800 A Cu	_	_	EZM1800TBCU♦□	1658.00	24.08	(4) 3/0–500
1600	1200 A Al/Cu	_	_	EZM11600TB ♦ ♦ □	3588.00	22.48	(6) 1/0-750 or (12) 1/0-300
2000	1200 A Cu			EZM12000TB□	9600.00	30.19	6 (Order Lugs Separately)



Ampere Rating	Horizontal Cross Bus Rating and Bus Bar Material		Cat.	No.		Width (in.)	Factory-installed Lug Landings for use with Crimp-Type Lugs (2-Hole Mounting) Qty. per Phase and Neutral, except non-EUSERC 1200A device. ▼			
Main Cir	Main Circuit Breakers (1∅ Incoming and 1∅ Outgoing)▼									
		65 kA	\$ Price							
400	400 A AI	EZM1400CBU▲	6380.00	_	_	20.46	1 (Order Lugs Separately)			
600	600 A AI	EZM1600CBU▲	9171.00	_	_	26.19	2 (Order Lugs Separately)			
800	800 A AI	EZM1800CBU▲	11762.00	_	_	26.19	2 (Order Lugs Separately)			
1000	1000 A Al/Cu	_	_	EZM11000CBU♦	16547.00	34.19	3 (Order Lugs Separately)			
1200	1200 A Cu	EZM11200GCBU☆△■	17590.00	EZM11200JCBU☆Δ■	20372.00	23.69	(4) 3/0-500			
1200	1200 A Cu	EZM11200GCBE■	18550.00	EZM11200JCBE■	21332.00	32.39	3 (Order Lugs Separately)			
1600	1200 A Al/Cu	EZM11600GCBU♦△■	31658.00	EZM11600JCBU♦△■	36404.00	30.19	6 (Order Lugs Separately)			
2000	1200 A Al/Cu	_	_	EZM12000CBU△♦	52755.00	30.19	6 (Order Lugs Separately)			
Main Fus	sible Switches (1Ø	Incoming and 1Ø Out	going)▼ Requi	res 300 Vac Class T F	uses (Order Se	parately)				
400	400 A AI	_	_	EZM1400FSU	6180.00	20.46	1 (Order Lugs Separately)			
600	600 A AI	_	_	EZM1600FSU	9369.00	20.46	2 (Order Lugs Separately)			
800	800 A AI	_	_	EZM1800FSU	11564.00	20.46	2 (Order Lugs Separately)			
1200	1200 A Cu	_	_	EZM11200FSB☆	13194.00	23.69	(4) 3/0-500			
1200	1200 A Cu	_	_	EZM11200FSE	14154.00	32.39	3 (Order Lugs Separately)			
Main Lug	g Terminal Boxes (	1Ø Incoming and 1Ø 0	Outgoing)							
400	800 A AI	_	_	EZM1400TBU□	1544.00	17.16	1 (Order Lugs Separately)			
800	800 A AI	_	_	EZM1800TBU□	1827.00	25.16	2 (Order Lugs Separately)			
1200	1200 A Al/Cu	_	_	F7M11200TBUI	3725.00	33 16	3 (Order Lugs Separately)			

- Available by special order with main circuit breaker supplied with other standard ampere ratings, consult local Field Office (allow 6 weeks for delivery). Ampere rating of the circuit breaker supplied with this device can be changed to a LOWER value in the field by changing the setting on the circuit breaker. Supplied with copper horizontal bus bars and aluminum vertical bus bars.
- 225 A terminal box supplied with isolated neutral that cannot be bonded Not suitable for use on the LINE side of service equipment.
- For mechanical lugs (3/0 AWG-600 kcmil) order kit CMELK4, Price \$91.00. Kit includes 4 lugs only. Multiple kits may be required, consult factory. For crimp-type lugs refer to Anderson Electrical Connector Products Catalog AEC-40R.
- Does not meet EUSERC Standards.
- Terminal box is suitable for use on LINE or LOAD side of service equipment. Supplied with isolated neutral and provided with neutral bonding kit for use as required. Refer to page 2-9 for appropriate short circuit current ratings. Feed-thru lug kit available, see Accessories, page 2-15.
- For field installed Lug Landing Kit Order catalog number EZM1200ULL, List Price \$460.00, order lugs separately.
- Top feed only.



EZM1800CB

METERING EQUIPMENT



EZM1800CBU



# www.schneider-electric.us

# **Branch Devices—NEMA 3R Construction**

#### Branch Units-1Ø Incoming and 1Ø Outgoing

System Type	Width (in.)	Number of Meter Sockets	Horizontal Cross Bus Rating and Bus Bar Material	without Bypass▲		Ringless Type 5-Jaw Meter Socket without Bypass		Ringless Type 5-Jaw Meter Socket with Horn Bypass	
		Sockers	Dus Dai Material	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
125 A Maximum (Or	der Type	QO, QO-VI	H or QOH Circuit I	Breakers Separately)	-				
		_	800 A AI	EZM113125◆	1436.00	EZMR113125 ♦	1436.00	EZMH113125◆	1755.00
		3	1200 A Cu	EZM113125CUX	2282.00	EZMR113125CUX	2282.00	EZMH113125CUX	2282.00
1Ø3W		4	800 A AI	EZM114125♦	1914.00	EZMR114125♦	1914.00	EZMH114125♦	2153.00
120/240 Vac	12.25		1200 A Cu	EZM114125CUX	3043.00	EZMR114125CUX	3043.00	EZMH114125CUX	3043.00
2P Branch		5	800 A AI	EZM115125◆	2354.00	EZMR115125◆	2354.00	EZMH115125◆	2910.00
Circuit Breakers			1200 A Cu	EZM115125CUX	3742.00	EZMR115125CUX	3742.00	EZMH115125CUX	3742.00
		6	800 A AI	EZM116125◆	2792.00	EZMR116125◆	2792.00	EZMH116125◆	3549.00
		0	1200 A Cu	EZM116125CUX	4438.00	EZMR116125CUX	4438.00	EZMH116125CUX	4438.00
225 A Maximum Bra	nch Units	s (Order Ty	pe QBP-TM, QDP	-TM, QGP-TM or QJF	-TM Circu	it Breakers Separate	ely) ★		
		_	800 A AI	EZM112225♦	2273.00	EZMR112225 ♦	2273.00	EZMH112225♦	2474.00
		2	1200 A Cu	EZM112225CUX	3615.00	EZMR112225CUX	3615.00	EZMH112225CUX	3615.00
1Ø3W		3	800 A AI	EZM113225 ♦	2792.00	EZMR113225◆	2792.00	EZMH113225◆	3069.00
120/240 Vac	17.38	3	1200 A Cu	EZM113225CUX	4438.00	EZMR113225CUX	4438.00	EZMH113225CUX	4438.00
2P Branch Circuit Breakers	17.38	4	800 A AI	EZM114225♦	3588.00	EZMR114225♦	3588.00	EZMH114225♦	4028.00
		4	1200 A Cu	EZM114225CUX	5705.00	EZMR114225CUX	5705.00	EZMH114225CUX	5705.00
		5	1200 A Al/Cu	EZM115225	4715.00	EZMR115225	4715.00	EZMH115225	4715.00
			1200 A Cu	EZM115225CU	7090.00	EZMR115225CU	7090.00	EZMH115225CU	7090.00

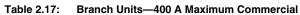
- Snap-on aluminum sealing rings supplied as standard.
- Supplied with removable drip hood and equipped with an indoor top endwall with knockouts provided.
- For 1200 A main cross bus add suffix "X" to catalog number (Example: EZM314125X). Add 3% adder to list per device. Allow 6 weeks for delivery. Type QO, QO-VH and QOH branch circuit breakers (40–60 A) may be installed with use of EZM125QOA adapter kits, refer to page 2-15.

#### Table 2.16: Branch Units—225 A Maximum Commercial (Order Type QBP-TM, QDP-TM, QGP-TM or QJP-TM Circuit Breakers Separately, see page 2-15)▼

System	Number of Meter Sockets	Horizontal Cross Bus Ratingand Bus Bar	Ringless Type 5- with Lever Bypas			Ring Type 5-Jaw Meter Socket with Test Block Bypass. Meets EUSERC Requirements		
Туре		Material	Cat. No.	Width (in.)	\$ Price	Cat. No.	Width (in.)	\$ Price
		1200 A Al/Cu	EZML111225		2453.00	EZMT111225△	22.42	3387.00
	1	1200 A Cu	EZML111225CU	19.44	3901.00	_	_	_
		1200 A Al/Cu	EZML111225D		2576.00	_	_	_
	2	1200 A Al/Cu	EZML112225		4466.00	EZMT112225△	22.42	6143.00
1Ø3W		1200 A Cu	EZML112225CU	19.44	7101.00	_	_	_
120/240 Vac		1200 A Al/Cu	EZML112225D		4689.00	_	_	_
2P Branch		1200 A Al/Cu	EZML113225		6579.00	EZMT113225△◊	22.42	9215.00
Circuit Breakers	3	1200 A Cu	EZML113225CU	19.44	10461.00	_	_	_
		1200 A Al/Cu	EZML113225D		6908.00	_	_	_
		1200 A Al/Cu	EZML114225		8813.00	_	_	
	4	1200 A Cu	EZML114225CU	19.44	14013.00	_	_	_
		1200 A Al/Cu	EZML114225D0		9254.00		_	



- Does not meet EUSERC 48 in. minimum / 75 in. maximum meter height requirements for outdoor installations. The bottom meter socket is 37 inches above ground when the device is mounted with the top meter socket at 75 inches above ground. EUSERC indoor requirements are 36 in. minimum / 75 in. maximum.



System Type	Number of Meter	Main Cross Bus Rating and Bus Bar	Ringless Type 5- with Lever Bypass Includes Factory-Insi Circuit Bi	Release.	Ringless Type K Bolt-on 4-Jaw Meter Socket with Manual Bypass. Includes Factory-Installed 400 A Type DJM Circuit Breaker ☆			
	Sockets	Material	Cat. No.	Width (in.)	\$ Price	Cat. No.	Width (in.)	\$ Price
1Ø3W 120/240 Vac	1	1200 A Cu	EZML111400	23.21	5981.00	EZMK111400	27.56	7424.00
2P Branch Circuit Breakers	2	1200 A Cu	EZML112400	23.21	11963.00	EZMK112400	27.56	14531.00

DJM circuit breaker has adjustable trip settings from 160–400 A. Use seal kit 29375, if required. DJM circuit breaker terminal lug kit 32508 factory-installed and accomodates (1) 2 AWG–500 kcmil Al or (1) 2 AWG–600 kcmil Cu per phase. Alternate lug kit 32510 for DJM circuit breaker is available, see Accessories, page 2-15. Additional field-installed DJ circuit breaker accessories are available, see page 7-35.



EZMH114125

EZML113225



EZMT111225

Supplied with Class 320 lever bypass meter socket. Utilizes anti-inversion clip kit MMLRK, if required, refer to page 2-15.

## 3Ø4W 208Y/120 Vac or 240/120 Vac Delta EZ Meter-Pak Meter Centers-3Ø Indoor/Rainproof, UL Listed

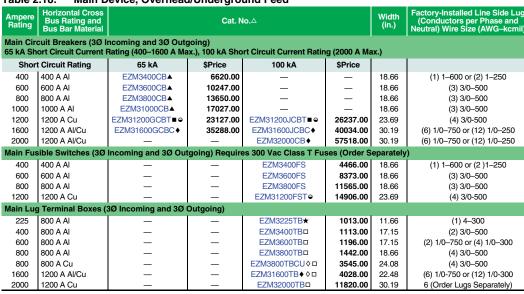
#### 1200 A Main CB/Fusible Switch Devices come Standard with 2-STEP Removable Service Entrance Endwalls

Select EZM meter center short circuit current rating from Table 2.12 on page 2-9. Using this table as a reference, make the following selections:

- 1. Select 3Ø EZM main device below with an equal or higher short circuit rating than the application from Tables 2.18 and 2.19.
- Select EZM 3Ø branch units from Tables 2.20, 2.21 and 2.22.
- Select proper 2P type QO, QO-VH, QOH, QBP-TM, QDP-TM, QGP-TM or QJP-TM or 3P QBP-TM, QDP-TM, QGP-TM or QJP-TM 3. branch circuit breakers for use as tenant mains in branch unit; from Table 2.24.
- 4. Select accessories as required, from Table 2.25.
- Dimensions, page 2-16.

#### Main Devices—NEMA 3R Construction

#### Table 2.18: Main Device, Overhead/Underground Feed





FZM31600CB

EZM3600FS



Ampere Rating Bus Rating and Bus Bar Material  Main Circuit Breakers (3Ø Incoming and 3Ø Outgoing)						Width (in.)	Factory-Installed Lug Landings For use with Crimp-Type Lugs (2-Hole Mounting) Qty, per Phase and Neutral, except non-EUSERC 1200A device.▼			
Main Cir	cuit Breakers (3Ø I	ncoming and 3Ø Outo	joing)							
Shor	t Circuit Rating	65 kA	\$ Price	100 kA	\$Price					
400	400 A AI	EZM3400CBU▲	7178.00	_	_	20.46	1 (Order Lugs Separately)			
600	600 A AI	EZM3600CBU▲	10806.00	_	_	26.19	2 (Order Lugs Separately)			
800	800 A AI	EZM3800CBU▲	14115.00	_	_	26.19	2 (Order Lugs Separately)			
1000	1000 A Al/Cu	_	_	EZM31000CBU◆	17943.00	34.19	3 (Order Lugs Separately)			
1200	1200 A Cu	EZM31200GCBU☆△■	20609.00	EZM31200JCBU☆△■	23363.00	23.69	(4) 3/0-500			
1200	1200 A Cu	EZM31200GCBE■	21569.00	EZM31200JCBE■	24323.00	32.39	3 (Order Lugs Separately)			
1600	1200 A Al/Cu	EZM31600GCBU♦△■	37170.00	EZM31600JCBU♦△■	41916.00	30.19	6 (Order Lugs Separately)			
2000	1200 A Al/Cu			EZM32000CBU♦△	57255.00	30.19	6 (Order Lugs Separately)			
Main Fu	sible Switches (3Ø	Incoming and 3Ø Out	going) Require	es 300 Vac Class T Fu	ses (Order S	eparately	)			
400	400 A AI	_	_	EZM3400FSU	6978.00	20.46	1 (Order Lugs Separately)			
600	600 A AI	_	_	EZM3600FSU	11364.00	26.19	2 (Order Lugs Separately)			
800	800 A AI	_	_	EZM3800FSU	15152.00	26.19	2 (Order Lugs Separately)			
1200	1200A Cu	_	_	EZM31200FSB☆△	17586.00	23.69	<ol><li>3 (Order Lugs Separately)</li></ol>			
1200	1200A Cu	_	_	EZM31200FSE	18546.00	32.39	3 (Order Lugs Separately)			
Main Lu	Main Lugs Terminal Boxes (3Ø Incoming and 3Ø Outgoing)									
400	400 A AI	_	_	EZM3400TBU□	1838.00	17.16	1 (Order Lugs Separately)			
800	800 A AI	_	_	EZM3800TBU□	2100.00	25.16	2 (Order Lugs Separately)			
1200	1200 A Cu	_		EZM31200TBU□	4463.00	33.16	3 (Order Lugs Separately)			

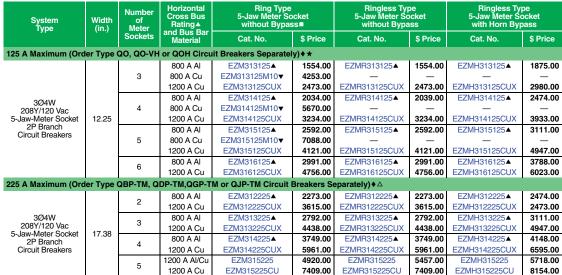
- Available by special order with main circuit breaker supplied with other standard ampere ratings, consult your nearest Field Sales Office (allow 6 weeks
- Ampere rating of the circuit breaker supplied with this device can be changed to a LOWER value in the field by changing the setting on the circuit breaker.
- Supplied with copper horizontal bus bars and aluminum vertical bus bars. 225 A terminal box supplied with isolated neutral that cannot be bonded.
- For mechanical lugs (3/0 AWG-600 kcmil) order kit CMELK4, Price \$91.00. Kit includes 4 lugs only. Multiple kits may be required, consult factory. For crimp-type lugs refer to Anderson Electrical Connector Products Catalog AEC-40R.
- Does not meet EUSERC requirements.
- Terminal box is suitable for use on LINE or LOAD side of service equipment. Supplied with isolated neutral and provided with neutral bonding kit for use as required. Refer to page 2-9 for appropriate short circuit current ratings.
- Feed-thru lug kit available, see Accessories, page 2-15.
- For field installed Lug Landing Kit order catalog number EZM1200ULL, List Price \$460.00, order lugs separately.
- Does not meet EUSERC requirements.
- Top feed only.

2-13

# www.schneider-electric.us

# **Branch Devices—NEMA 3R Construction**

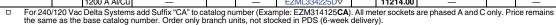




- For 1200 A main cross bus, add suffix "X" to catalog number. Example: EZMR313125X. Add 3% adder to list per device. Allow 6 weeks for delivery.
- Snap-On aluminum sealing rings supplied as standard.
- For 240/120 Vac Delta Systems add Suffix "CA" to catalog number (Example: EZM314125**CA**). All meter sockets are phased A and C only. Price remains the same as the base catalog number. Order only branch units, not stocked in PDS (6-week delivery).
- Supplied with removable drip hood and equipped with an indoor top endwall with knockouts provided. Distance between meter sockets as measured from centerline to centerline is 10 inches.
- 2P Type QO (40–125 A, 10 kA max. meter center SCCR) or QO-VH and QO-H (40–60 A, 100 kA max. meter center SCCR) may be installed using EZM125QOA adapter kit, refer to page 2-15.

#### Table 2.21: Branch Units—225 A Maximum Commercial





<sup>2</sup>P Type QO (40–125 A, 10 kA max. meter center SCCR) or QO-VH and QO-H (40–60 A, 100 kA max. meter center SCCR) may be installed using EZM125QOA adapter kit, refer to page 2-15. ٥

Supplied with removable drip hood and equipped with an indoor top endwall with knockouts provided.

Does not meet EUSERC 48 in. minlmum / 75 in. maximum meter height requirements for outdoor installations. The bottom meter socket is 37 inches above ground when the device is mounted with the top meter socket at 75 inches above ground. EUSERC indoor requirements are 36 in. minimum / 75 in. maximum.





EZML313225

EZMT311225

Without Cover

<sup>❖</sup> Supplied with bondable neutral, suitable for use as service equipment. Use main lugs terminal box type EZM-TBU for Six Disconnect Rule applications to feed this device. Supplied with copper horizontal bus bars and aluminum vertical bus bars.

# **Branch Devices—NEMA 3R Construction (Continued)**

#### **Branch Units—400 A Maximum Commercial**

System Type	Number of Meter Sockets	ter Cross Bus	Ringless Typ with Lever Bypass IncludesFac 400 A Type DJM	Release— led	Ringless Type K Bolt-on Meter Socket with Manual Bypass— Includes Factory-Installed 400 A Type DJM Circuit Breaker. ▲				
	Sockers		Cat. No.	Width (in.)	\$ Price	Cat. No.	Width (in.)	\$ Price	
3Ø Incoming and 1Ø Outgoing	3Ø Incoming and 1Ø Outgoing ◆								
3Ø4W	1	1200 A Cu	EZML311400	23.21	5981.00	EZMK311400	27.56	8924.00	
208Y/120 Vac 5-Jaw Meter Socket 2P Branch Circuit Breakers	2	1200 A Cu	EZML312400	23.21	11963.00	EZMK312400	27.56	17534.00	
3Ø Incoming and 3Ø Outgoing									
3Ø4W	1	1200 A Cu	EZML331400	23.21	6978.00	EZMK331400	27.56	10515.00	
240/120 Vac Delta or 208Y/120 Vac 7-Jaw Meter Socket 3P Branch Circuit Breakers	2	1200 A Cu	EZML332400	23.21	13956.00	EZMK332400	27.56	20715.00	

- DJM circuit breaker has adjustable trip settings from 160–400 A. If required, order seal kit, catalog number 29375. DJM circuit breaker terminal lug kit 32508 factory-installed and accomodates (1) 2 AWG–500 kcmil Al or (1) 2 AWG–600 kcmil Cu per phase. Alternate lug kit 32510 for DJM circuit breaker is available, see Accessories, page 2-15. Additional field-installed DB circuit breaker accessories are available, see page 7-35.

  Supplied with Class 320 lever bypass meter socket. Use anti-inversion clip kit, catalog number MMLRK, if required. Order from page 2-15.
- For 240/120 Vac Delta Systems add Suffix "CA" to catalog number (Example: EZML312400**CA**). All meter sockets are phased A and C only. Price remains the same as the base catalog number. "Order only" branch units, not stocked in PDS (4–6 week delivery). Order point Lexington.

# **EZM Main with Busway Tap**

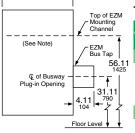
EZ Meter-Pak metering equipment is available for use in high rise applications for connection to 800–5000 A I-Line™ or I-Line II plug-in busway installed as a vertical riser. Three phase only EZM main devices in the form of a main circuit breaker or main fusible switch are available with an integral busway tap extending from the right or left side of the main device and phased to align with the busway for either neutral front or neutral back installations.

#### Busway Mains, 3Ø only (Indoor only) ordering instructions:

- Step 1: Determine height to center line of busway plug-in opening, check local utility requirements for minimum and maximum meter socket heights.
- Step 2: Determine side of EZM main section for busway tap to extend from (busway tap is an integral part of the main and extends to the left or right on the EZM device as viewed from the front).
- Step 3: Check phasing of busway riser to insure that it matches phasing of busway tap on main section (indicated as neutral front or neutral back as viewed from the front).
- Step 4: Select Cat. No. from tables below.

Neutral Front

Step 5: Busway main devices are build to order specials and require 4 to 6 weeks for delivery (order point Lexington).



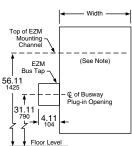
EZMK311400

Wall

Plan View Detail

METERING EQUIPMEN

FZM3800CBNFBTB



EZM3800FSNBBTL

#### Table 2.23: 1200 A EZM Mains with Busway Tap (Three Phase Only-Note positioning left or right below)

**Neutral Back** 

4	Buswa	y to Ri	ght of met	tering equipment lineup								
5	400	18.66		EZM3400CBNFBTR	EZM3400CBNBBTR	8886.00		EZM3400FSNBBTR	6732.00			
	600	18.66	600 A AI	EZM3600CBNFBTR	EZM3600CBNBBTR	12513.00	EZM3600FSNFBTR	EZM3600FSNBBTR	10640.00			
	800	18.66	800 A AI	EZM3800CBNFBTR	EZM3800CBNBBTR	15744.00	EZM3800FSNFBTR	EZM3800FSNBBTR	13830.00			
	1000	18.66	1000 A AI	EZM31000CBNFBTR□	EZM31000CBNBBTR□	19292.00	_	_				
	Buswa			ring equipment lineup								
	400	18.66		EZM3400CBNFBTL	EZM3400CBNBBTL	8886.00	EZM3400FSNFBTL	EZM3400FSNBBTL	6732.00			
	600	18.66		EZM3600CBNFBTL	EZM3600CBNBBTL	12513.00	EZM3600FSNFBTL	EZM3600FSNBBTL	10640.00			
	800	18.66	800 A AI	EZM3800CBNFBTL	EZM3800CBNBBTL	15744.00	EZM3800FSNFBTL	EZM3800FSNBBTL	13830.00			
	1000	18.66	1000 A AI	EZM31000CBNFBTL□	EZM31000CBNBBTL□	19292.00	_	_				
	Main Circuit Breaker with Busway Tap											
*	Buswa	y to Ri	ght of Met	ering Equipment Lineup								
ή	1200	23.36	1200 A Al/Cu	EZM31200GBNFTBR△□★	EZM31200GBNFBTR★△□	25394.00	EZM31200JBNFBTR♦△□	EZM31200JBNBBTR◊△□	29108.00			
	Buswa	y to Le	ft of Mete	ring Equipment Lineup								
1	1200	23.36	1200 A Al/Cu	EZM31200GBNFTBL△□★	EZM31200GBNFBTL★△□	25394.00	EZM31200JBNFBTL◊△□	EZM31200JBNBBTL◊△□	29108.00			
	Main F	usible	Switch wi	th Busway Tap								
	Buswa	y to Ri	ght of Met	ering Equipment Lineup								
	1200	23.36	1200 A Al/Cu	_	_	_	EZM31200FSNFBTR▼△□	EZM31200FSNBBTR▼△□	23480.00			
	Buswa	y to Le	ft of Meter	ring Equipment Lineup								
╝.	1200	23.36	1200 A Al/Cu	_	_	_	EZM31200FSNFBTL▼△□	EZM31200FSNBBTL▼△□	23480.00			
	<b>→</b> ⊦	lac a r	navimum 6	5 kA short circuit current ration	na							

- Has a 100 kA short circuit current rating. Requires Class T (300 Vac) fuses, order separately.
- Supplied with copper horizontal bus bars and aluminum vertical bus bars.
- Requires use of branch units supplied with 1200 A horizontal cross bus.
- Has a 100 kA short circuit current rating.
- Dimensions shown will position the centerline of top meter socket of a 125 A, 5-Gang or 6-Gang branch unit at 72" above floor level. Check with utility to meet local requirements.

Main Fusible Switch with Busway Tap

**Neutral Back** 

**Neutral Front** 

by Schneider Electric www.schneider-electric.us

**Tenant Circuit Breakers** Table 2.24:



QO2100VH 2P, Plug-on Type Circuit Breaker



QDP22200TM

	Ampere Rating	10 k AIR		22 k AIF	₹	42 k AIR		100 k Al	R
Poles		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
125 A Ma	x. EZM Branc	h Unit Tenant Circ	uit Breakers		<u>'</u>				
	40	QO240	67.00	QO240VH	146.00	QOH240	317.00	_	_
	50	QO250	67.00	QO250VH	146.00	QOH250	317.00	_	_
	60	QO260	67.00	QO260VH	146.00	QOH260	317.00	_	_
	70	QO270	134.00	QO270VH	224.00	QOH270	528.00	_	_
2	80	QO280	189.00	QO280VH	315.00	QOH280	651.00	_	_
	90	QO290	189.00	QO290VH	315.00	QOH290	651.00	_	_
	100	QO2100	189.00	QO2100VH	315.00	QOH2100	651.00	_	_
	110	QO2110	428.00	Q02110VH	1034.00	QOH2110	1389.00	_	_
	125	QO2125	428.00	QO2125VH	1034.00	QOH2125	1389.00	_	_
Deles	Ampere	40 1- 415	,	05 1- 415		05 1- 41		400  - 41	_

125	
Poles Rating 10 K AIH 25 K AIH 55 K AIH 100 K AIH	
· ·	_
	_
	_
40 QO240▲ 67.00 QO240VH■▲ 146.00 QOH240◆▲ 317.00 —	
50 QO250▲ 67.00 QO250VH■▲ 146.00 QOH250◆▲ 317.00 —	_
60 QO260▲ 67.00 QO260VH■▲ 146.00 QOH260◆▲ 317.00 —	_
70 QBP22070TM 474.00 QDP22070TM 1143.00 QGP22070TM 1521.00 QJP22070TM	1890.00
80 QBP22080TM 474.00 QDP22080TM 1143.00 QGP22080TM 1521.00 QJP22080TM	1890.00
90 QBP22090TM 474.00 QDP22090TM 1143.00 QGP22090TM 1521.00 QJP22090TM	1890.00
2 100 QBP22100TM 474.00 QDP22100TM 1143.00 QGP22100TM 1521.00 QJP22100TM	1890.00
110 QBP22110TM <b>474.00</b> QDP22110TM <b>1143.00</b> QGP22110TM <b>1521.00</b> QJP22110TM	1890.00
125 QBP22125TM 474.00 QDP22125TM 1143.00 QGP22125TM 1521.00 QJP22125TM	1890.00
150 QBP22150TM 474.00 QDP22150TM 1143.00 QGP22150TM 1521.00 QJP22150TM	1890.00
175 QBP22175TM 474.00 QDP22175TM 1143.00 QGP22175TM 1521.00 QJP22175TM	1890.00
200 QBP22200TM 474.00 QDP22200TM 1143.00 QGP22200TM 1521.00 QJP22200TM	1890.00
225 QBP22225TM 474.00 QDP22225TM 1143.00 QGP22225TM 1521.00 QJP22225TM	1890.00
70 QBP32070TM <b>1248.00</b> QDP32070TM <b>1784.00</b> QGP32070TM <b>2442.00</b> QJP32070TM★	2796.00
80 QBP32080TM   <b>1248.00</b> QDP32080TM   <b>1784.00</b> QGP32080TM   <b>2442.00</b> QJP32080TM★	2796.00
90 QBP32090TM <b>1248.00</b> QDP32090TM <b>1784.00</b> QGP32090TM <b>2442.00</b> QJP32090TM★	2796.00
100 QBP32100TM   1248.00 QDP32100TM   1784.00 QGP32100TM   2442.00 QJP32100TM★	2796.00
3 110 QBP32110TM 1248.00 QDP32110TM 1784.00 QGP32110TM 2442.00 QJP32110TM★	2796.00
3   125   QBP32125TM   <b>1248.00</b>   QDP32125TM   <b>1784.00</b>   QGP32125TM   <b>2442.00</b>   QJP32125TM★	2796.00
150 QBP32150TM   1248.00 QDP32150TM   1784.00 QGP32150TM   2442.00 QJP32150TM★	2796.00
175 QBP32175TM 1248.00 QDP32175TM 1784.00 QGP32175TM 2442.00 QJP32175TM★	2796.00
200 QBP32200TM <b>1248.00</b> QDP32200TM <b>1784.00</b> QGP32200TM <b>2442.00</b> QJP32200TM★	2796.00
225 QBP32225TM 1248.00 QDP32225TM 1784.00 QGP32225TM 2442.00 QJP32225TM★	2796.00

- Must use EZM125QOA adapter.
- QO-VH tenant circuit breaker is rated 22 k AIR max.
- QOH tenant circuit breaker is rated 42 k AIR max.
- 3-pole QJP tenant circuit breaker is rated 65 k AIR max. at 240/120 Vac, 3Ø4W High Leg Delta, or 100 k AIR max. at 208Y/120 Vac, 3Ø4W.

#### **Accessories**

Table 2.25: **Accessories** 

Accessory	Description	Cat. No.	\$ Price
1200 A Bus Extension (Indoor/ Outdoor Cu bus)	103W Bus Extension (6 in.wide) 103W Bus Extension (12 in.wide) 304W Bus Extension (6 in. wide) 304W Bus Extension (12 in. wide)	EZM1EXT6 EZM1EXT EZM3EXT6 EZM3EXT	767.00 767.00 966.00 966.00
1200 A Bussed Corner Sections (Indoor Cu bus only)	103W Inside Corner (14.75 in. wide) 103W Outside Corner (6.20 in. wide) 304W Inside Corner (14.75 in. wide) 304W Outside Corner (6.20 in. wide)	EZM1CORNER EZM1ELBOW EZM3CORNER EZM3ELBOW	1788.00
1200 A Transition Sections— Old to New (10.7 in. wide Cu bus)	Add right of old style 1Ø EZM lineup Add right of old style 3Ø EZM lineup Add left of old style 1Ø EZM lineup Add left of old style 3Ø EZM lineup	EZM1TRANR EZM3TRANR EZM1TRANL EZM3TRANL	237.00 252.00 315.00 332.00
Mounting Channel	72" long	EZM72MC	63.00
Secondary Surge Arrester Mounting kit	For use with 1 or 2-SDSA1175 or 1-SDSA3650 (order surge arrester separately)	MMSAMK▼	80.00
Stud Kit for EZM-TB 400–600 A terminal box	Includes (2) 1/2 in13 studs per pad and mounting hardware. Four pads per kit.	EZMSK2	246.00
Al/Cu Lug Kits	(1) 1/0-600 kcmil or (2) 1/0-250 kcmil per lug	MMLK250	150.00
(Each kit includes	(2) 3/0–500 kcmil per lug	MMLK500	200.00
three, 2-barrel lugs.)	(2) 2–600 kcmil per lug	MMLK600	233.00
Feed -Thru for EZM-TBCU 800 A Terminal Box	(4) 750 kcmil Al/Cu lugs per phase and neutral. Al wire 600 A max. Cu wire 800 A max.	EZM600FTLK3	480.00
Feed-Thru for EZM-TB 1600 A Terminal Box	(24) additional lugs, 600 kcmil Al/Cu, (6) per phase and neutral.	EZM1600FTLK3	915.00
Fifth jaw Kit	1 per kit	5J ∆	18.30
Horn Bypass Kit	Use with Type EZMR 1Ø meter socket only	MMHB	16.70
Slider Type Manual Circuit Closer	For (1) 125–225 A ring-type socket only—indoor/outdoor	MM200MB□♦	171.00
Anti-inversion Clip	Rejects 100 A and 200 A watt-hour meters in Class 320 meter sockets in Type EZML branch units.	MMLRK	12.00
QO Adapter for bolt- on Q-frame tenant circuit breakers	For 2P Type QO (40–125 A, 10 kA max. meter center SCCR) or QO-VH and QOH (40–60 A, 100 kA max. meter center SCCR)	EZM125QOA	273.00
DJM Circuit Breaker Alternate Lug (DE2)	Kit includes (3) 2-barrel lugs for (2) 2/0 AWG-350 kcmil AL/Cu or (2) 2/0 AWG-500 kcmil AL per lug.	32510	_
DJM Circuit Breaker Seal Kit	Tamper-evident kit to seal DJM trip dial cover, (1) per circuit breaker, if required. Meets NEC 240-6 [c]	29375	_
Meter Socket Closing Plates	Lexan Closing Plate—EZM, EZMR, EZMH, EZMT Metal Closing plate—EZMR, EZMH, EZML	29007 RSG4	10.10 122.00

**Table 2.25:** Accessories (continued)

Accessory	Description	Cat. No.	\$ Price
Sealing Rings	Snap-on (Stainless Steel) Screw-Type (Aluminum) Latch-Type (Aluminum)-standard	ARP00026 29008W 2920910001	16.70 20.10 8.00
Barrel Lock Kit	For use on ringless EZM or MP branch unit covers, includes 6 each of head protectors, lock nuts and sealing caps. (Barrel lock not included.)	MMBLC	66.00
Tenant Circuit Breaker Filler Plates	125 A Branches—2P Type QO (2 per opening) 225 A Branches—2P and 3P Q-Frame	QOFP EZMPCP	3.60 26.00

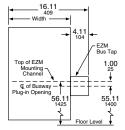
- Consult your nearest Schneider Electric sales office for details.
- All sockets include 5th Jaw factory-installed except EZM11\_\_ devices.
- Meter center short circuit current rating is 10,000 RMS symmetrical amperes with manual circuit closers installed (bypass is not designed for use as continuous duty).
- For use on ring type meter sockets only.

### **Busway Transition Section**

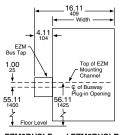
EZM busway transition section provides no overcurrent protection for the downstream EZM branch units. Tenant main circuit breakers in these branch units must be selected as "fully rated" equipment. (Examples: QO for 10 kA, QO-VH for 22 kA or QOH for 42 kA.)

**EZM Busway Transition Sections (3Ø only)** Table 2.26:

Ampere Rating	I-Line <sup>™</sup> Busway location	Neutral Front	Neutral Back	Width (in.)	\$ Price
1200	RIGHT of EZM Transition Section	EZM3BUSRF	EZM3BUSRB	12.00	2625.00
1200	LEFT of EZM Transition Section	EZM3BUSLF	EZM3BUSLB	12.00	2625.00



EZM3BUSRF and EZM3BUSRB



EZM3BUSLF and EZM3BUSLB

MC (Mounting Channel)

MC (Mounting Channel)

Main Device

**Branch Device** 

Н

#### **Dimensions**

**Table 2.27:** Main Devices Dimensions (in.)

Cat. No.	Height	Width	Depth	MC	Cat. No.	Height	Width	Depth	МС
EZM11000CB	53.97	18.66	11.50	34.30	EZM1ELBOW (indoor only) ▲	19.50	14.52	8.01	11.85 ■
EZM11000CBU	70.05	34.19	18.33	46.99	EZM31000CB	53.97	18.66	11.50	34.30
EZM11200G/JCBT	46.90	23.69	13.69	13.75	EZM31000CBU	70.05	34.19	18.33	46.99
EZM11200G/JCBE	66.20	32.39	13.69	50.09	EZM31200G/JCBT	46.90	23.69	13.69	13.75
EZM11200FST	46.90	23.69	13.69	13.75	EZM31200G/JCBE	66.20	32.39	13.69	50.09
EZM11200FSE	66.20	32.39	13.69	50.09	EZM31200TBU	44.71	33.16	11.68	31.17
EZM11200G/JCBU	65.30	23.69	13.69	49.11	EZM31200G/JCBU	65.30	23.69	13.69	49.11
EZM11200FSB	65.30	23.69	13.69	49.11	EZM31200FSB	65.30	23.69	13.69	49.11
EZM11200TBU	44.71	33.16	11.68	31.17	EZM31200FST	46.90	23.69	13.69	13.75
EZM11600G/JCBC	68.70	30.19	18.33	38.13	EZM31200FSE	66.20	32.39	13.69	50.09
EZM11600G/JCBU	68.70	30.19	18.33	49.12	EZM31600G/JCBC	68.70	30.19	18.33	38.13
EZM11600TB	55.09	22.48	13.00	27.92	EZM31600G/JCBU	68.70	30.19	18.33	49.12
EZM12000CB	68.70	30.19	18.33	44.25	EZM31600TB	55.09	22.48	13.00	27.92
EZM12000CBU	68.70	30.19	18.33	44.25	EZM32000CB	68.70	30.19	18.33	44.25
EZM12000TB	71.09	30.19	21.46	37.62	EZM32000CBU	68.70	30.19	18.33	44.25
EZM1225TB	21.81	11.66	6.37	13.00 ■	EZM32000TB	71.09	30.19	21.46	37.62
EZM1400CB	53.97	18.66	11.50	34.30	EZM3225TB	21.81	11.66	6.37	13.00 ■
EZM1400CBU	69.03	20.46	11.50	49.37	EZM3400CB	53.97	18.66	11.50	34.30
EZM1400FS	53.97	18.66	11.50	34.30	EZM3400CBU	69.03	20.46	11.50	49.37
EZM1400FSU	69.03	20.46	11.50	49.37	EZM3400FS	53.97	18.66	11.50	34.30
EZM1400TB	30.46	17.15	7.09	16.29	EZM3400FSU	69.03	20.46	11.50	49.37
EZM1400TBU	35.71	17.16	8.00	27.17	EZM3400TB	30.46	17.15	7.09	16.29
EZM1600CB	53.97	18.66	11.50	34.30	EZM3400TBU	35.71	17.16	8.00	27.17
EZM1600CBU	69.03	20.46	11.50	49.37	EZM3600CB	53.97	18.66	11.50	34.30
EZM1600FS	53.97	18.66	11.50	34.30	EZM3600CBU	69.03	26.19	11.65	49.37
EZM1600FSU	69.03	20.46	11.50	49.37	EZM3600FS	53.97	18.66	11.50	34.30
EZM1600TB	30.46	17.15	7.09	16.29	EZM3600FSU	69.03	26.19	11.65	49.37
EZM1800CB	53.97	18.66	11.50	34.30	EZM3600TB	30.46	17.15	7.09	16.29
EZM1800CBU	69.03	20.46	11.50	49.37	EZM3800CB	53.97	18.66	11.50	34.30
EZM1800FS	53.97	18.66	11.50	34.30	EZM3800CBU	69.03	26.19	11.65	49.37
EZM1800FSU	69.03	20.46	11.50	49.37	EZM3800FS	53.97	18.66	11.50	34.30
EZM1800TB	53.97	18.66	11.50	34.30	EZM3800FSU	69.03	26.19	11.65	49.37
EZM1800TBCU	51.76	22.48	7.09	28.01	EZM3800TB	53.97	18.66	11.50	34.30
EZM1800TBU	39.96	25.16	11.68	31.17	EZM3800TBCU	51.76	22.48	7.09	28.01
EZM1EXT	19.34	11.66	6.37	11.85 ■	EZM3800TBU	39.96	25.16	11.68	31.17
EZM1EXT6	19.34	6.00	6.37	11.85 ■	EZM3EXT	19.34	11.66	6.37	11.85 ■
EZM1CORNER (indoor only) ◆	19.50	14.40	8.02	11.85 ■	EZM3EXT6	19.34	6.00	6.37	11.85 ■
					EZM3CORNER (indoor only)	19.50	14.40	8.02	11.85 ■

- Each leg of elbow section measures 6.17 in. corner of wall to start of next enclosure.

  Device supplied without mounting channel, secure to wall by use of swingable mounting feet.

  Each leg of this corner section measures 14.72 in. from wall to start of next enclosure.

Table 2.28: Branch Device	Table 2.28: Branch Device Dimensions (in.)★												
Cat. No.	Height	Width	Depth	MC	Тор	Bottom	Cat. No.	Height	Width	Depth	MC	Тор	Bottom
Single Phase													
EZM112225 [X, CUX]	43.41	17.38	8.09	32.34	22.18	12.23	EZML111400	44.55	23.21	9.44	37.81	24.02	21.53
EZM113125 [X, CUX]	42.37	12.25	7.09	31.30	13.18	11.19	EZML112225 [CU]	39.06	19.44	9.44	25.51	11.67	13.39
EZM113225 [X, CUX]	43.41	17.38	8.09	32.34	13.18	12.23	EZML112225D	39.06	19.44	9.44	25.51	11.67	13.39
EZM114125 [X, CUX] EZM114225 [X, CUX]	48.12 52.00	12.25 17.38	7.09 8.09	31.30 32.34	9.93 12.77	11.19 12.23	EZML112400 EZML113225 [CU]	69.61 53.06	23.21 19.44	9.44 9.44	37.81 39.51	20.64 11.67	21.53 13.39
EZM114225 [X, COX] EZM115125 [X, CUX]	57.12	12.25	7.09	31.30	9.93	11.19	EZML113225 [CO]	53.06	19.44	9.44	39.51	11.67	13.39
EZM115225 [CU]	61.00	17.38	8.09	32.35	12.77	12.23	EZML114225 [CU]	67.06	19.44	9.44	39.51	11.67	13.39
EZM116125 [X, ČUX]	66.12	12.25	7.09	40.30	9.93	11.19	EZML114225D	67.06	19.44	9.44	39.51	11.67	13.39
EZMH112225 [X, CUX]	43.41	17.38	8.09	32.34	22.18	12.23	EZMR112225 [X, CUX]	43.41	17.38	8.09	32.34	22.18	12.23
EZMH113125 [X, CUX]	42.37	12.25	7.09	31.30	13.18	11.19	EZMR113125 [X, CUX]	42.37	12.25	7.09	31.30	13.18	11.19
EZMH113225 [X, CUX] EZMH114125 [X, CUX]	43.41 48.12	17.38 12.25	8.09 7.09	32.34 31.30	13.18 9.93	12.23 11.19	EZMR113225 [X, CUX] EZMR114125 [X, CUX]	43.41 48.12	17.38 12.25	8.09 7.09	32.34 31.30	13.18 9.93	12.23 11.19
EZMH11425 [X, CUX]	52.00	17.38	8.09	32.34	12.77	12.23	EZMR114125 [X, CUX]	52.00	17.38	8.09	32.34	12.77	12.23
EZMH115125 [X, CUX]	57.12	12.25	7.09	31.30	9.93	11.19	EZMR115125 [X, CUX]	57.12	12.25	7.09	31.30	9.93	11.19
EZMH115225 [CU]	61.00	17.38	8.09	32.35	12.77	12.23	EZMR115225 [CU]	61.00	17.38	8.09	32.35	12.77	12.23
EZMH116125 [X, CUX]	66.12	12.25	7.09	40.30	9.93	11.19	EZMR116125 [X, CUX]	66.12	12.25	7.09	40.30	9.93	11.19
EZMK111400	45.55	27.56	9.74	37.81	24.51	21.04	EZMT111225	25.45	22.42	9.38	16.19	4.67	20.45
EZMK112400	72.99 39.06	27.56 19.44	9.74 9.44	37.81 25.51	22.26 25.67	21.04 13.39	EZMT112225 EZMT113225	60.56 79.56	22.42 22.42	9.38 9.38	43.63 48.25	12.67	28.89 28.89
EZML111225 [CU] EZML111225D	39.06	19.44	9.44	25.51 25.51	25.67	13.39	EZM1113225	79.50	22.42	9.38	46.25	12.67	28.89
Three Phase	00.00	10.44	0.44	20.01	20.07	10.00							
EZM312225 [X, CUX, CA, XCA, CUXCA]	43,41	17.38	8.09	32.34	22.18	12.23	EZML314225 [CU, CA, CUCA]	67.06	19.44	9.44	39.51	11.67	13.39
EZM313125 [X, CUX, CA, XCA, CUXCA]	42.37	12.25	7.09	31.30	13.18	11.19	EZML314225D [CA]	67.06	19.44	9.44	39.51	11.67	13.39
EZM313125M10	42.37	12.25	7.09	24.29	10.18	12.19	EZML331225 [CU]	39.06	19.44	9.44	25.51	25.67	13.39
EZM313225 [X, CUX, CA, XCA, CUXCA]		17.38 12.25	8.09 7.09	32.34 31.30	13.18 9.93	12.23	EZML331225D EZML331400	39.06 45.55	19.44 23.21	9.44	25.51 37.81	25.67 24.02	13.39
EZM314125 [X, CUX, CA, XCA, CUXCA] EZM314125M10	48.12 52.12	12.25	7.09	34.29	9.93	11.19 12.19	EZML331400 EZML332225 [CU]	39.06	19.44	9.44 9.44	35.51	11.67	21.53 13.39
EZM314225 [X, CUX, CA, XCA, CUXCA]		17.38	8.09	32.34	12.77	12.23	EZML332225D	39.06	19.44	9.44	35.51	11.67	13.39
EZM315125 [X, CUX, CA, XCA, CUXCA]	57.12	12.25	7.09	31.30	9.93	11.19	EZML332400 [CU]	69.61	23.21	9.44	37.82	20.64	21.53
EZM315125M10	62.12	12.25	7.09	34.29	9.93	12.19	EZML333225 [CU]	53.06	19.44	9.44	39.51	11.67	13.39
EZM315225 [CU, CA, CUCA]	61.00	17.38	8.09	32.35	12.77	12.23	EZML333225D	53.06	19.44	9.44	39.51	11.67	13.39
EZM316125 [X, CUX, CA, XCA, CUXCA] EZMH312225 [X, CUX, CA, XCA]	66.12 43.41	12.25 17.38	7.09 8.09	40.30 32.34	9.93 22.18	11.19 12.23	EZML334225 [CU] EZML334225D	67.06 67.06	19.44 19.44	9.44 9.44	39.51 39.51	11.67 11.67	13.39 13.39
EZMH313125 [X, CUX, CA, XCA]	42.37	12.25	7.09	31.30	13.18	11.19	EZMR312225 [X, CUX, CA, XCA]	43.41	17.38	8.09	32.34	22.18	12.23
EZMH313225 [X, CUX, CA, XCA]	43.41	17.38	8.09	32.34	13.18	12.23	EZMR313125 [X, CUX, CA, XCA]	42.37	12.25	8.09	31.30	13.18	11.19
EZMH314125 [X, CUX, CA, XCA]	48.12	12.25	7.09	31.30	9.93	11.19	EZMR313225 [X, CUX, CA, XCA]	43.41	17.38	8.09	32.34	13.18	12.23
EZMH314225 [X, CUX, CA, XCA]	52.00	17.38	8.09	32.34	12.77	12.23	EZMR314125 [X, CUX, CA, XCA]	48.12	12.25	7.09	31.30	9.93	11.19
EZMH315125 [X, CUX, CA, XCA] EZMH315225 [CU, CA, CUCA]	57.12 61.00	12.25 17.38	7.09 8.09	31.30 32.35	9.93 12.77	11.19 12.23	EZMR314225 [X, CUX, CA, XCA] EZMR315125 [X, CUX, CA, XCA]	52.00 57.12	17.38 12.25	8.09 7.09	32.34 31.30	12.77 9.93	12.23 11.19
EZMH316125 [X, CUX, CA, XCA]	66.12	12.25	7.09	40.30	9.93	11.19	EZMR315225 [CU, CA, CUXCA]	61.00	17.38	8.09	32.35	12.77	12.23
EZMK311400 [CA]	45.55	27.56	9.74	30.60	24.51	21.04	EZMR316125 [X, CUX, CA, XCA]	66.12	12.25	7.09	40.30	9.93	11.19
EZMK312400 [CA]	72.99	27.56	9.74	37.81	22.26	21.04	EZMR332225 [CU]	39.06	19.44	9.44	25.51	11.67	13.39
EZMK331400	45.55	27.56	9.74	30.60	24.51	21.04	EZMR333225 [CU]	53.06	19.44	9.44	39.51	11.67	13.39
EZMK332400	72.99	27.56	9.74	37.81	22.26	21.04	EZMR334225 [CU]	67.06	19.44	9.44	39.51	11.67	13.39
EZML311400 [CA] EZML311225 [CU, CA, CUCA]	45.55 39.06	23.21 19.44	9.44 9.44	37.81 25.51	24.02 25.67	21.53 13.39	EZMT311225 [CA] EZMT312225 [CA]	25.45 60.56	22.42 22.42	9.38 9.38	16.19 43.63	4.67 12.67	20.45 28.89
EZML312225 [CU, CA, CUCA]	39.06	19.44	9.44	25.51	11.67	13.39	EZMT313225 [CA]	79.56	22.42	9.38	48.25	12.67	28.89
EZML312225D [CA]	39.06	19.44	9.44	25.51	11.67	13.39	EZMT331225	25.12	22.42	9.38	16.19	4.67	20.45
EZML312400 [CA]	69.61	23.21	9.44	37.82	20.64	21.53	EZMT332225	60.56	22.42	9.38	43.63	12.67	28.89
EZML313225 [CU, CA, CUCA]	53.06	19.44	9.44	39.51	11.67	13.39	EZMT333225	79.56	22.42	9.38	48.25	12.67	28.89
EZML313225D [CA]	53.06	19.44	9.44	39.51	11.67	13.39	★ Standard branch units are available	DIE WITHOU	ı sumx a	udea.			



# **Section 3**

# **Safety Switches**



Light Duty, p. 3-2



General Duty, p. 3-2



Heavy Duty, p. 3-4



Stainless Steel Heavy Duty, p. 3-7

# **Light Duty**

	Fusible	3-2
	Application Data and Dimensions	3-3
	Standards:	
	<ul> <li>UL 98 Enclosed and Dead Front Switches.</li> <li>UL Listed under File E2875.</li> <li>NEMA Standards Publication KS1. Enclosed Switches.</li> </ul>	
	General Duty	
	Fusible and Non-Fusible	3-2
	Application Data and Dimensions	3-3
	Standards:	
	<ul> <li>UL 98 Enclosed and Dead Front Switches.</li> <li>UL Listed under File E2875.</li> <li>NEMA Standards Publication KS1. Enclosed Switches.</li> </ul>	
	Heavy Duty	
	Fusible	3-4
	Non-Fusible	3-6
New!	Special Application Enclosures	3-7
New!	Motor Disconnect and Receptacle Switches	3-8
	Accessories	3-11
	Application Data and Dimensions	3-13
	Standards:	
	<ul> <li>UL 98 Enclosed and Dead Front Switches.</li> <li>UL Listed under files E2875, E154828, E233505 and E317818.</li> <li>UL 508 Industrial Control Equipment, file E 164864.</li> <li>NEMA Standards Publication KS1 Enclosed Switches (UL98 Switches Only).</li> </ul>	
	Double Throw	
	Fusible and Non-Fusible	3-15
	Accessories	3-18
	Standards:	
	UL 98 Enclosed and Dead Front Switches.	

	0 Vdc Photovoltaic Heavy Duty connect Switch	3-22
Α	application Data and Dimensions	3-19
•	UL Listed under files E2875 (unless otherwise noted).	
0	otalidatus.	

#### Standards:

- UL 98 Enclosed and Dead Front Switches
  UL Listed under file E343347
  IEC 60947 1 Electrical
  IEC 60947 3 Mechanical
  NEMA standard. Publication KS-1 Enclosed Switches
  IP 63 and NEMA 3 Enclosure





L221N



D223N

UL Listed Short Circuit Withstand Rating									
Switch Type	Fuse Class	Short Circuit Rating							
	Plug	10 kA							
	Н	10 kA							
Fusible	K	10 kA							
rusible	J	100 kA							
	R	100 kA							
	Т	100 kA							
	Н	10 kA							
	K	10 kA							
Non- Fusible▲	J	100 kA							
i usible=	R	100 kA■							
	Т	100 kA							

The UL Listed short-circuit rote of Listed short-circuit current rating for Square D general duty, not fusible switches is based on the switch being used in conjunction with fuses. Evaluation of non-twikle switches in fusible switches in conjunction with molded case circuit breakers above 10,000 amps has not been performed. For applications requiring greater protection, consider using a heavy duty safety switch. Refer to UL Listed Maximum Short Circuit Current Ratings—AC only—on page 3-6. If a UL Listed short-circuit current rating is required, this nonfusible switches in short-circuit current rating is required, this non-fusible switch must be replaced with a Square D general duty fusible safety switch equipped with the appropriate class and size fusing. Consult the wiring diagram of the switch to verify the UL Listed short-circuit current ratino. circuit current rating. 50 kA for 60 A non-fusible

#### Light Duty—Visible Blades 10 kA Short Circuit Current Rating

The Square D light duty enclosed switch is ideal for home applications in disconnecting power to workshops, hobby rooms, furnaces, and garages.

Class 3130 / Refer to Catalog 3100CT0901

**Table 3.1: Fusible** 

System	A	Fuse	NEMA 1 I	ndoor	Horsepov	ver Ratings	Custom	0	0	System	Q		0	0	0	0	0	Amperes	Fuee	NEMA 1 I	ndoor	Horsepow	er Ratings
System	Amperes		Cat. No.	\$ Price	Std.	Max.	System	Amperes	ruse	Cat. No.	\$ Price	Std.	Max.										
2 Wire (1 Bla	ade and F	useholde	r, 1 Neutral)-	-120 Vac			3 Wire (2 Blad	les and Fu	seholde	rs, 1 Neutral)-	-120/240	Vac											
	30	Plua	L111N	\$54.00	1/2	2	9 9 9	30	Plug	L211N	72.00	1-1/2▲	3▲										
	30	riug	LITIN	\$54.00	1/2	2		30	Cart.	L221N	98.00	1-1/2▲	3▲										

For single phase hp rating, use two switching poles.

#### General Duty—Up To 100 kA Short Circuit Current Rating With Proper Current Limiting Fusing

General duty safety switches are designed for residential and commercial applications where durability and economy are prime considerations. Typical loads are lighting, air conditioning, and appliances. They are suitable for use as service equipment when equipped with a factory- or field-installed neutral assembly or a field-installed service grounding kit, (see Table 3.6) as applicable.

General duty safety switches are UL Listed, File E2875, and meet or exceed the NEMA Standard KS1.

**Fusible Table 3.2:** 

			NEI		NEMA		Class R F			Horsepowe	r Ratings	
System	Amperes	Fuse	Cat. No.	oor \$ Price	Rainp Cat. No.	s Price	Field-Ins	s Price		st Acting ne Fuses)	Max. (Dua Time-Dela	
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	1Ø	3Ø	1Ø	3Ø
2 Wire (1 E	Blade and	Fusehold	der, 1 Neut	ral)—120 Va	ac							
0 0	30	Plug	l	Jse Light Du	ty Device for th	nis Applicatio	n (see below	)	_	_	_	
	30	Cart.		Use thre	ee-wire device	s for this app	olication.		_	_	_	_
3 Wire (2 E	Blades and	d Fuseho	Iders, 1 Ne	utral)—120	/240 Vac (Plu	ıg), 240 Vad	(Cart.) Max	imum				
	30	Plug	D211N	90.00	D211NRB	177.00	_	_	1-1/2	_	3	_
የየየ	30	Cart.	D221N	122.00	D221NRB	188.00	DRK30	25.65	1-1/2	3 ♦	3	7-1/2♦
4 7	60	Cart.	D222N	206.00	D222NRB	326.00	RFK03H	25.50	3	7-1/2♦	10	15♦
꾸구구	100	Cart.	D223N	426.00	D223NRB	480.00	RFK10	47.70	7-1/2	15 ♦	15	30♦
999	200	Cart.	D224N▼	884.00	D224NRB▼	1200.00	HRK1020	47.70	15	25 ♦	_	60♦
	400	Cart.	D225N	2555.00	D225NR	3459.00	DRK40	111.00	_	_	_	_
	600□	Cart.	D226N	5109.00	D226NR	6569.00	DRK600	111.00	_	_	_	_
4 Wire (3 E	Blades and	d Fuseho	lders, 1 Ne	utral)—240	Vac Maximu	m		•				
	30	Cart.	D321N	188.00	D321NRB	293.00	DRK30	25.65	1-1/2	3	3	7-1/2
9999	60	Cart.	D322N	326.00	D322NRB	441.00	RFK03H	25.50	3	7-1/2★	10	15★
	100	Cart.	D323N	564.00	D323NRB	816.00	RFK10	47.70	7-1/2	15★	15	30★
ا کے کے لا	200	Cart.	D324N▼	1202.00	D324NRB▼	1461.00	HRK1020	47.70	15	25★	_	60★
1111	400	Cart.	D325N	3113.00	D325NR	3893.00	DRK40	111.00	_	50	_	125
	400△	Class T	D325NT	2994.00	D325NTR	3741.00	_	_	_	50	_	_
	600□	Cart.	D326N	5823.00	D326NR	7877.00	DRK600	111.00	_	75	_	150
	600△	Class T	D326NT	5598.00	D326NTR	7569.00	_	_	_	75	_	_
	800△	Class T	T327N	9722.00	T327NR	12438.00		_		100	_	

- Bolt-on hubs-Refer to page 3-10.
- When installed, this kit rejects all but Class R fuses.
- For corner grounded delta systems only. Use switching poles for ungrounded conductors. See data bulletin 2700DB0202 for additional information.
- If corner grounded delta, use outer switching poles for ungrounded conductors.
- For 200% neutral, order (1) additional neutral kit SN20A and (1) neutral jumper kit SN20NI.
- Class T 400-800 A general duty safety switches use 300 Vac Class T fuses and are UL Listed for use on systems with up to 100 kA available fault current.
  - Order Class J fuse kit: GDJK600 for Class J fuses.

**Table 3.3:** Non-Fusible

Custom	A	NEMA 1 Indoor	r	NEMA 3R Rainp	roof ◊	Horsepower Ratings (Max.)			
System	Amperes	Cat. No.	\$ Price	Cat. No.	\$ Price	1Ø	3Ø		
2 Wire (2 Blades)—240 Vac Maximum									
	30	<del>-</del>	_	DU221RB	177.00	3	_		
Q Q	60	_	_	DU222RB	353.00	10	_		
١,١,	60	QO260NATS☆▽	161.00	QO200TR☆▽●	161.00	10	_		
(/	100	QO2000NS☆▽	276.00	QO2000NRB☆♀	338.00	20	_		
99	200	Use 3P Switch	_	Use 3P Switch	_	_	_		
	400교	Use 3P Switch	_	Use 3P Switch	_	_	_		
	600	Use 3P Switch	_	Use 3P Switch	_	_	_		
3 Wire (3 Blades)	—240 Vac M	aximum							
	30	DU321	155.00	DU321RB	293.00	3	7-1/2		
የየየ	60	DU322	206.00	DU322RB	443.00	10	15		
1/1/1/	100	DU323*	477.00	DU323RB*	816.00	15	30		
( ( (	200	DU324 <b>♦</b>	884.00	DU324RB ♦	1461.00	15	60◑		
999	400团	DU325	2198.00		_	_	125		
	600	DU326 <b>●</b>	4191.00	_	_	_	150		

- Bolt-on hubs—Refer to page 3-10.
  Enclosed molded case switch—Refer to page 1-24.
- Includes factory-installed grounding kit.

  Not service entrance rated—Refer to page 1-19 for more information.
- If a neutral assembly is required, order and field-install SN0610 If a neutral assembly is required, order and field install a SN20A Neutral Assembly Kit. For a 200% neutral application, order and field install (2) SN20A Neutral Assembly Kits and (1) SN20N Neutral Jumper Kit.
- If a neutral assembly is required, order part number D600SN. Available for field-installation
- For single phase hp rating, use two switching poles.
- To accept J class fuses, move fuse bases to the embossed guide inside of the switch.



www.schneider-electric.us

Table 3.4: Terminal Lug Data ▲

Amperes	Conductors Per Phase	Wire Range Wire Bending Space Per NEC Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil
30	1	12-6 (Al) or 14-6 (Cu)	12-6 (Al) or 14-6 (Cu)
60	1	10-3 (Al) or 14-3 (Cu)	10-2 (Al) or 14-2 (Cu)
100	1	12-1 (Al) or 14-1 (Cu)	12-1/0 (Al) or 14-1/0 (Cu)
200	1	6 -250 (Al/Cu)	6-300 (Al/Cu)
400 NEMA 1	1 or 2	1/0 –600 (Al/Cu) or 1/0 –300 (Al/Cu)	(1) 1/0 –750 (Al/Cu) or (2) 1/0 –300 (Al/Cu)
400 NEMA 3R	2	1/0-250 (Al/Cu)	(1) 1 –600 (Al/Cu) or (2) 1/0 –250 (Al/Cu)
600	2	4-500 (Al/Cu)	4-600 (Al/Cu)
800	3	3/0 -500 (Al/Cu)	3/0 -500 (Al/Cu)

<sup>■ 30–100</sup> A switches suitable for 60°C or 75°C conductors. 200–800 A switches suitable for 75°C conductors.

**NOTE:** Field-installed lug kits are located in the Supplemental Digest page 2.2.

#### Field-Installed Fuse Puller Kits

Kit consists of three fuse pullers as required for a 3P, fusible, 60 and 100 A general duty switch. Kits can be installed in 60 and 100 A Series F switches.

Table 3.5: Fuse Puller Kits

Description	Cat. No.	\$ Price
Series F 60 A Fuse Puller Kit	FPK03	30.00
Series F 100 A Fuse Puller Kit	FPK0610	42.60

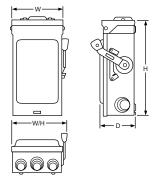


Table 3.6: Field-Installed Service Grounding Kits

Amperes	Cat. No.	\$ Price	Wire Size (AWG)			
			(2) 12 Cu or			
30	PK3GTA1	11.40	(2) 10 Al or			
			(1) 4 Al/Cu Max.			
			(2) 12 Cu or			
60▲	PK3GTA1	11.40	(2) 10 Al or			
			(1) 4 Al/Cu Max.			
			(2) 12 Cu or			
60■	GTK03	11.40	(2) 10 Al or			
			(1) 4 Al/Cu Max.			
100	GTK0610	18.90	(2) 1/0 Al/Cu Max.			
200	PKOGTA2	55.00	(2) 2/0 Al/Cu Max.			
400	PKOGTA2	55.00	(2) 2/0 Al/Cu Max.			
600	(Two Required)	55.00	Per Lug			
800	PKOGTA3	123.00	(6) 3/0 Al/Cu Max.			

- Series E switch only.
- Series F switch only.

#### Field-Installed Electrical Interlock Kits

Electrical interlocks for Series F 100–200 A general duty safety switches and Series F 60 A fusible general duty safety switches are available in kit form for field installation. Each kit contains instructions for proper field mounting. A pivot arm operates from switch mechanism, breaking the control circuit before the main switch blades break. Switches with electrical interlocks installed are UL Listed.

Table 3.7: Electrical Interlock Kit

Switch's Amperes Rating	Series	Electrical Interlock Kit Cat. No.▲	\$ Price
60	F■	EIK031 or EIK032	218.00
100–200	F	EIK1 or EIK2	311.00

- Electrical interlock kit catalog numbers with -1 suffix indicates one normally open and one normally closed contact; -2 indicates two normally open and two normally closed contacts.
   Kits are UL Listed.
- Fusible series.

Table 3.8: Approximate Dimensions

Cat. No.	Series	H		W		W/H		D	Std.	
Cat. No.	Series	in.	mm	in.	mm	in.	mm	in.	mm	Pack
L111N	E2	7.63	194	5.00	127	6.13	156	4.00	102	1
L211N	E2	7.63	194	5.00	127	6.13	156	4.00	102	1
L221N	E2	7.63	194	5.00	127	6.13	156	4.00	102	1
D211N◆	E3	9.25	235	6.75	171	7.25	184	3.63	92	5
D211NRB ♦	E2	9.63	245	7.25	184	7.75	197	3.75	95	5
D221N◆	E3	9.25	235	6.75	171	7.25	184	3.63	92	5
D221NRB ♦	E3	9.63	245	7.25	184	7.75	197	3.75	95	5
D222N	F1	14.63	372	6.50	165	7.45	189	4.88	124	1
D222NRB	F1	14.88	378	6.63	168	7.45	189	4.88	124	1
D223N	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
D223NRB	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
D224N	F1	29.00	737	17.25	438	19.00	483	8.25	210	1
D224NRB	F1	29.25	743	17.25	438	19.00	483	8.25	210	1
D225N	E3	45.12	1146	24.00	610	24.88	632	8.88	226	1
D225NR	E1	30.63	778	21.38	543	22.25	565	10.13	257	1
D226N ◆	E3	49.13	1248	24.00	610	24.88	632	8.88	226	1
D226NR ♦	E1	49.13	1248	24.75	629	25.13	638	8.88	226	1
D321N ◆	E3	9.25	235	6.75	171	7.25	184	3.63	92	5
D321NRB ♦	E3	9.63	245	7.25	184	7.75	197	3.75	95	5
D322N	F1	14.63	372	6.50	165	7.45	189	4.88	124	1
D322NRB	F1	14.88	378	6.63	168	7.45	189	4.88	124	1
D323N	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
D323NRB	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
D324N	F1	29.00	737	17.25	438	19.00	483	8.25	210	1
D324NRB	F1	29.25	743	17.25	438	19.00	483	8.25	210	1
D325N◆	E3	45.12	1146	24.00	610	24.88	632	8.88	226	1
D325NT◆	E3	45.12	1146	24.00	610	24.88	632	8.88	226	1
D325NR◆	E1	30.63	778	21.38	543	22.25	565	10.13	257	1

	D325NT ♦	E3	45.12	1146	24.00	610	24.88	632	8.88	226	1
	D325NR◆	E1	30.63	778	21.38	543	22.25	565	10.13	257	1
-	◆ 30–100 A switches suitable for 60°C or 75°C conductors 200–800 A switches suitable for 75°C conductors										

	Cat. No.	Series					****		_		otu.
	Cat. NO.	Series	in.	mm	in.	mm	in.	mm	in.	mm	Pack
	D325NTR◆	E1	30.63	778	21.38	543	22.25	565	10.13	257	1
	D326N ◆	E3	49.13	1248	24.00	610	24.88	632	8.88	226	1
	D326NT ◆	E3	49.13	1248	24.00	610	24.88	632	8.88	226	1
	D326NR ◆	E1	49.13	1248	24.75	629	25.13	638	8.88	226	1
	D326NTR♦	E1	49.13	1246	24.75	629	25.13	638	8.88	226	1
	DU221RB♦	E2	9.63	245	7.25	184	7.75	197	3.75	95	5
	DU222RB♦	E1	9.63	245	7.25	184	7.75	197	3.75	95	5
	DU321 ♦	E2	9.25	235	6.75	171	7.25	184	3.63	92	5
	DU321RB♦	E2	9.63	245	7.25	184	7.75	197	3.75	95	5
	DU322◆	E1	9.25	235	6.75	171	7.25	184	3.63	92	5
	DU322RB♦	E1	9.63	245	7.25	184	7.75	197	3.75	95	5
	DU323	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
	DU323RB	F3	17.50	445	8.50	216	10.50	267	6.50	165	1
	DU324	F1	29.00	737	17.25	438	19.00	483	8.25	210	1
	DU324RB	F1	29.25	743	17.25	438	19.00	483	8.25	210	1
	DU325 ♦	E3	45.12	1146	24.00	610	24.88	632	8.88	226	1
	DU326 ♦	E3	49.13	1248	24.00	610	24.88	632	8.88	226	1
	QO200TR♦	G3	6.50	165	4.63	118	_	—	3.88	99	5
	QO260NATS ♦	E2	9.25	235	4.88	124	_	_	3.25	83	1
_	QO2000NRB ♦	E1	14.00	356	7.75	197	_	—	4.50	114	1
	QO2000NS ♦	E1	13.38	340	6.13	156	_	_	3.50	89	1
	T327N ◆	E1	49.13	1248	24.00	610	24.88	632	8.88	226	1
	T327NR ♦	E1	49.13	1248	24.75	629	25.13	638	8.88	226	1



NEMA 1

NEMA 3R NEMA 4, 4X and 5 NEMA 12

Stainless Steel

Visible blade heavy duty safety switches are designed for application where maximum performance and continuity of service are required. All heavy duty safety switches feature quick-make, quick-break operating mechanism, a dual cover interlock and a color coded indicator handle. They are suitable for use as service equipment when equipped with a field- or factory-installed neutral assembly or equipment grounding kit, unless a 600Y/347 V or 480 Y/277 V, 1000 A or greater, solidly grounded WYE system is used, per NEC 215-10. Heavy duty safety switches are UL Listed (except as noted), File E2875 and 154828 and meet or exceed the NEMA Standard KS1. For UL Listed that significantly retired to the control of t short circuit current ratings, see page 3-6.

Table 3.9	24	0 Volt—	-Single	Throw Fu	sible											
						NEMA 4,	4X, 5, ▲			NEM	۸		Horse	power	Ratings	
				NEM <i>A</i>		304 Stainles 316 stainl			IA 12K Vith	12, 3R			240 \	/ac		
System	Amperes		MA 1 loor	Rainp (Bolt-on page 3	Hubs,	page 3-7) E Watertight, Resistant (\ Hubs, page	Oust tight, Corrosion Watertight	Kno (Watert	ckouts ight Hubs, e 3-10)	Witho Knocko (Watertigh page 3	out outs t Hubs,	(Usi A One Ti	Std. ng Fast cting, me Fuses)	Max. (Using Dual Element, Time Delay Fuses)		250 Vdc <b>♦</b>
		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	1Ø	3Ø	1Ø	3Ø	
2-Wire (2 BI	ades and	Fuseholde	ers)—240 \	/ac, 250 Vdc												
	30					H221DS	1947.00	H221A	504.00	H221AWK	473.00	1-1/2	3★	3	7-1/2★	5
0.0	30		Lleo throo	-wire devices		_	_	_	_	H2212AWK▼	588.00	1-1/2	_	3	_	5
Y Y	60			re applications		H222DS	2337.00	_	_	H222AWK	647.00	3	7-1/2★	10	15 ★	10
9 <u>9</u> 555	100					H223DS	5094.00	H223A	1008.00	H223AWK	948.00	7-1/2	15 ★	15	30 ★	20
ኔኔ	200	H225	2729.00	H225R	3884.00	H224DS	6960.00	H224A	1737.00	H224AWK	1643.00	15	25 ★	_	60 ★	40
	400 600	H225	5424.00	H226R	7281.00	H225DS H226DS	14481.00 20772.00	_	_	H225AWK H226AWK	4163.00 6543.00	_	— 75 ★	_	200 ★	50 50
	800	H227	8459.00	H227RA	11483.00	H220D3	20/72.00	_	_	H227AWK	10325.00	<u>—</u> 50	/5 <b>x</b>	<del></del>	200 <b>x</b>	50
	1200	H228	11682.00	H228RA	15486.00	_				H228AWK	15815.00	50	_	50		50
3-Wire (2 BI				ral)—240 Va					<u> </u>	TILLO/ WIT	1001010					
	30	H221N	236.00	H221NRB	447.00							1-1/2	3 ★	3	7-1/2 ★	5
	60	H222N	471.00	H222NRB	842.00				wire devices,			3	7-1/2★	10	15 ★	10
	100	H223N	716.00	H223NRB	1086.00				id neutral asse ely See page 3			7-1/2	15 ★	15	30 ★	20
	200	H224N	1289.00	H224NRB	1562.00		0.0	aci ocpaiai	ory occ page c			15	25 ★	_	60 ★	40
Įλλ	400	H225N	3092.00	H225NR	4245.00	H225NDS	14787.00	_	_	H225NAWK	4304.00	_	50 ★	_	125 ★	50
0 0 0	600	H226N	5819.00	H226NR	7677.00	H226NDS	21081.00	_	_	H226NAWK	6936.00	_	75 ★	_	200 ★	50
	800	H227N	10067.00	H227NR△	12216.00	_	_	_	_	H227NAWK	12338.00	50	_	50	_	50
	1200	H228N	12422.00	H228NR△	16665.00	_		_	_	H228NAWK	17184.00	50		50		50
3-Wire (3 BI		Fuseholde	ers)—240 \	/ac, 250 Vdc												
	30					H321DS	2049.00	H321A	639.00	H321AWK	639.00	1-1/2	3	3	7-1/2	5
የየየ	60 100			wire devices ire application	e	H322DS H323DS	2532.00 5346.00	H322A H323A	914.00 1412.00	H322AWK H323AWK	864.00 1331.00	3 7-1/2	7-1/2 15	10 15	15 30	10 20
$\zeta^{-}\zeta^{-}\zeta$	200		i oi unee-w	ire application	3	H324DS	7496.00	H324A	2040.00	H324AWK	1926.00	15	25	- 15	60	40
9 9 9 5 5 5 5 5 5	400	H325	3425.00	H325R	3975.00	H325DS	14961.00	11024A	2040.00	H325AWK	4253.00	_	50	_	125	50
000	600	H326	6170.00	H326R	8286.00	H326DS	21399.00	_	_	H326AWK	7365.00	_	75	_	200	50
	800	H327	11456.00	H327R△	14849.00	_	_	_	_	H327AWK	14528.00	50	100	50	250	50
	1200	H328	14517.00	H328R△	18728.00	_	_	_	_	H328AWK	17450.00	50	100	50	250	50
4-Wire (3 BI	ades and	Fuseholde	ers, 1 Neut	ral)—240 Va	c, 250 Vdc											
	30	H321N	314.00	H321NRB	555.00							1-1/2	3	3	7-1/2	5
0 0 0 0	60	H322N	528.00	H322NRB	891.00		Field		<ul> <li>wire devices,</li> <li>id neutral asse</li> </ul>	mblica		3	7-1/2	10	15	10
	100	H323N	842.00	H323NRB	1278.00				ely. See page 3			7-1/2	15	15	30	20
□	200	H324N	1451.00	H324NRB	1748.00							15	25	_	60	40
1333	400	H325N	3788.00	H325NR	4322.00	H325NDS	15321.00	_	_	H325NAWK	4635.00	_	50	_	125	50
	600	H326N	6519.00	H326NR	8622.00	H326NDS	21759.00	_	_	H326NAWK	7757.00	_	75	_	200	50
	800 1200	H327N H328N	12189.00 15314.00	H327NR△ H328NR△	15563.00 19709.00	_	_	_	_	H327NAWK H328NAWK	15879.00 20015.00	50 50	100 100	50 50	250 250	50 50
4-Wire (4 BI		Fuseholde		HOZONNA	19709.00					HOZONAVIK	20015.00	50	100	50	250	50
4-wire (4 Bi	ades and	usenoide	515)													
9 9 9 9	60															
\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-	100															
ح ح ح ح	200						Us	e 600 Vac o	devices. See pa	age 3-5.						
9999	400															
	600															
A Comm	loto rotina	in NIENAA C	200 4 4	/ E and 10 E	A NIENAN OI	2 applications		ain agrass f		advisal!				_		

- Complete rating is NEMA 3, 3R, 4, 4X, 5 and 12. For NEMA 3R applications, remove drain screw from bottom endwall.
- Also suitable for NEMA 3R application by removing drain screw from bottom endwall.
- For switching dc, use two outside switching poles.

  For corner grounded delta systems only and with neutral assembly installed. Use switching poles for ungrounded conductors. 60 ampere switch with 30 ampere fuse spacing and clips. Must use 60 A enclosure accessories including electrical interlocks.
- Suitable for NEMA 5 applications with drain screw installed.

Accessories: pages 3-10 through	3-12
Dimensions: NEMA 1 and 3R page	3-13
Dimensions: NEMA 4, 4X and 5 Stainless and NEMA 12 page	3-14

www.schneider-electric.us

Table 3.10: 600 Volts—Single Throw Fusible

													Horsepower			
						NEMA 4, 4						480	Vac	600	Vac Vac	
System	Amperes	local.	MA 1 door	NEM/ Rainp (Bolt-on page	roof Hubs,	304 Stainles (for 316 stain page 3-7) Du Watertight, C Resista (Watertight Hubs	lless, see ust tight, corrosion ant	NEMA With Kno (Watertigh page 3	ckouts It Hubs,	NEMA 12, 3R ■ Without Knockouts (Watertight Hubs, page 3-10)		Std. (Using Fast Acting, One Time Fuses)	Max. (Using Dual Element, Time Delay Fuses)	Std. (Using Fast Acting, One Time Fuses)	Max. (Using Dual Element, Time Delay Fuses)	dc★
		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	3Ø	3Ø	3Ø	3Ø	250 600
2-Wire (2	Blades	and Fu	isehold	ers)—600	) Vac, 6	00 Vdc										
9 9	30 60 100 200						wire devices applications						=			
	400 600 800 1200	H265 H266 H267 H268	4206.00 6653.00 10365.00 14570.00	H265R H266R H267R△ H268R△	5424.00 10686.00 16385.00 17991.00	H265DS H266DS	14961.00 21399.00 —			H265AWK H266AWK H267AWK H268AWK	5025.00 7341.00 15276.00 18044.00	100 <b>♦</b> 150 <b>♦</b>	250 <b>♦</b> 400 <b>♦</b>	_ _ _	  -  -	50 50 50 50 50 50 50 50
3-Wire (3	Blades					00 Vdc★	ı							l		
	30 30 60 100 200 400 600 800 1200	H361 H361-2Δ H362 H363 H364 H365 H366 H367 H368	528.00 617.00 638.00 1188.00 1707.00 4551.00 7649.00 13319.00 17507.00	H362RB H363RB H364RB H365R H366R H367R A	899.00 1049.00 1055.00 1644.00 2259.00 5532.00 10899.00 16500.00 20009.00	H361DS H362DS H363DS H364DS H365DS H366DS	2520.00 — 2771.00 5493.00 7685.00 15321.00 21084.00 —	H361A H361-2A ▼ H362A H363A H364A — —	1014.00 1035.00 1047.00 1626.00 2544.00 — — —	H361AWK H3612AWK ▼ H362AWK H363AWK H364AWK H366AWK H366AWK H367AWK H368AWK	956.00 977.00 984.00 1539.00 2400.00 5462.00 9203.00 16352.00 19706.00	5 15 25 50 100 150 200 200	15 15 30 60 125 250 400 500 500	7-1/2 7-1/2 15 30 60 125 200 250 250	20 20 50 75 150 350 500 500	5 15 — 15 — 30 — 50 40 50 50 50 50 50 50 50 50 50
4-Wire (3 l	Blades	and Fu	ısehold	ers, 1 Ne	utral)—	600 Vac, 60	0 Vdc★									
9 9 9 N 5 5 5	30 60 100 200 400 600 800 1200	H361N H362N H363N H364N H365N H366N H367N H368N	710.00 1278.00 1869.00 4898.00 8019.00 14043.00 18114.00	H361NRB H362NRB H363NRB H364NRB H365NR H366NR H367NRA H368NRA		H364NDS H365NDS H366NDS		devices field Order separa H364NA — — —			2558.00 5823.00 9600.00 17253.00 20820.00	5 15 25 50 100 150 200	15 30 60 125 250 400 500	7-1/2 15 30 60 125 200 250 250	20 50 75 150 350 500 500	- 15 - 30 - 50 40 50 50 50 50 50 50 50
4-Wire (4	Blades	and Fu	ısehold	ers)—600	) Vac, 6	00 Vdc□						2Ø	2Ø	2Ø	2Ø	
	30 60 100 200 400 600	H461 H462 H463 H464 H465 H466	914.00 1065.00 1778.00 2957.00 6210.00 10104.00		111111	H461DS H462DS H463DS H464DS	2937.00 3069.00 8345.00 12596.00 —		11111	H461AWK H462AWK H463AWK H464AWK H465AWK	1115.00 1257.00 1932.00 3222.00 6807.00	7-1/2 15 25 50 <b>100</b> <b>150</b>	20 40 50 — <b>250</b> 400	10 20 30 50 <b>125</b> <b>200</b>	25 50 75 — <b>350</b> <b>500</b>	5 15 10 30 20 30 40 50 <b>50 50</b> <b>50 50</b>
6-Wire (6			1	. ,	) Vac □						1	3Ø	3Ø	3Ø	3Ø	
	200	_	_	_	_	H663DS H664DS	25964.00 35393.00	_	_	H663AWK H664AWK	5112.00 12222.00	25 For ap capability, u			75 notor disco k. Refer to p	

- Complete rating is NEMA 3, 3R, 4, 4X, 5 and 12.

  Also suitable for NEMA 3R application by removing drain screw from bottom endwall.
- For corner grounded delta systems only and with neutral assembly installed. Use switching poles for ungrounded conductors.
- For switching dc use two outside switching poles.
- 60 A switch with 30 A fuse spacing and clips. Must use 60 A enclosure accessories including electrical interlocks
- Suitable for NEMA 5 applications with drain screw installed.
- Not suitable for use as service equipment.

#### Class H Fuse Provisions:

Fusible Square D 30 through 600 A heavy duty safety switches accept Class H fuses as standard. With Class H fuses installed, the switch is UL Listed for use on systems with up to 10 kA available fault current.

#### Class R Fuse Provisions:

Fusible Square D 30-600 A heavy duty safety switches will accept Class R fuses as standard. A field-installed rejection kit is available which, when installed, rejects all but Class R fuses. With the installation of the rejection kit and Class R fuses, the switch is UL Listed for use on systems with up to 200 kA available fault current. See Class R fuse kits on page 3-10.

#### **Class J Fuse Provisions:**

Provisions for installing Class J fuses are included in 30 through 400 A 600 Volt, and 100 through 400 A 240 Volt, fusible heavy duty safety switches. Conversion to Class J fuse spacing requires relocating the load side fuse base assembly from the standard Class H fuse location to an alternate position as marked in the enclosure. With Class J fuses installed, the switch is UL Listed for use on systems with up to 200 kA available fault current. Switches rated 600 A, 240 or 600 Volt, require the addition of an adapter kit, H600J at \$456. One kit per 3P switch.

#### Class L Fuse Provisions:

Fusible 800 A and 1200 A safety switches use Class L bolt-in fuses and are rated for use on systems with up to 200 kA at 600 Vac maximum. 1200 A świtches accept class L fuses from 601-1200 A, 800 A switches accept class L fuses from 601-800 A.

Accessories:	pages 3-10 through 3-12
Dimensions: NEMA 1 and 3R	page 3-13
Dimensions: NEMA 4 4X and 5	nage 3-14

Class R Fuse



Table 3.11: 600 Volt-Single Throw Non-Fusible

		NEŅ		NEMA Rainpr		NEMA 4, 4 304 Stainles (for 316 stain page 3	ss Steel less, see	NEMA 1 With Knocko		NEMA 12, Withou Knocko	it			rsepow (Ma	er Rat ax.)	ings	
System	Amperes	Ind	oor	(Bolt-on Hubs,			atértight esistant	(Watertight page 3-	Hubs,	(Watertight	(Watertight Hubs, page 3-10)			480	600		ic+
		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	1Ø 3	Ø 1	Ø 3Ø	1Ø 3	Ø 250	600
2-Wire (2 Bl	ades)—60	0 Vac, 600	Vdc														
Ĭ- <u>Ĭ</u> -	30 60 100 200		Use three-wire devices for two-wire applications.										-	-   - -   - -   -		-   - -   -	_ _ _
[ [	400	HU265	2750.00	HU265R	3764.00	HU265DS	12812.00	_	_	HU265AWK	3212.00	-1-	- -	-   —	- -	- 50	50
	600	HU266	4896.00	HU266R	7533.00	HU266DS	18455.00	_	_	HU266AWK	5408.00	- -	- -	-  -	- -	- 50	50
	800	HU267	7467.00	HU267R★	12884.00	_	_	_	_	HU267AWK	12957.00	50 -	- 5	-	50 -	-   -	50
	1200	HU268	10226.00	HU268R★	17393.00	_			<u> </u>	HU268AWK	17522.00	50 -	<b>-</b> 5	0  —	- -	<b>–</b> 50	50
3-Wire (3 Bl			_														
	30	HU361	279.00		488.00	HU361DS	2120.00	HU361A	689.00	HU361AWK	647.00		10 7-			30 5	-
	30	HU361EI▼	638.00		846.00	HU361DSEI▼	2480.00	HU361AEI▼	1047.00	HU361AWKEI▼	1007.00	-	10 7-		- 1	30 5	-
000	30 60	HU3612△ HU362	369.00 488.00	HU3612RB△ HU362RB	638.00 876.00	HU362DS	2520.00	HU3612AA HU362A	710.00 875.00	HU3612AWK△ HU362AWK	666.00 833.00	-	10 7- 20 2			30 5 60 10	-
<u> </u>	60	HU362	488.00	HU362HB	876.00	HU362DSEI▼	2972.00	HU362A	8/5.00	HU36ZAVVK	633.00	-	20 2			60 10	
9 9 9	100	HU363	783.00	HU363RB	1226.00	HU363DS	5102.00	HU363A	1265.00	HU363AWK	1194.00	-	40 4			00 20	
	200	HU364	1209.00	HU364RB	1485.00	HU364DS	6960.00	HU364A	1697.00	HU364AWK	1604.00	-	60 5	-		50 40	
	400	HU365	2804.00	HU365R	3840.00	HU365DS	14294.00	_	_	HU365AWK	4023.00	-	25 -			50 50	
	600	HU366	4992.00	HU366R	7683.00	HU366DS	19062.00	_	_	HU366AWK	6711.00		00 -		1 -	00 50	50
	800	HU367	9978.00	HU367R★	13050.00	_	_	_	_	HU367AWK	13097.00	50 2	50 5	0 500	50 5	00 50	50
	1200	HU368	13421.00	HU368R★	17867.00	_	_	_	_	HU368AWK	17940.00	50 2	50 5	0 500	50 5	00 50	50
4-Wire (4 Bl	ades)—60	0 Vac, 600	Vdc ▽									2Ø 3	Ø 2	Ø 3Ø	2Ø 3	Ø	
	30	HU461□	827.00	l –	_	HU461DS	2586.00	_	l –	HU461AWK◊	915.00	10	10 2	0 20	25	30 10≴	15☆
9 9 9 9	60	HU462□	914.00	_	_	HU462DS	3027.00	_	_	HU462AWK	1008.00	20	20 4			60 10	30
	100	HU463□	1647.00	_	_	HU463DS	7401.00	_	_	HU463AWK	1791.00		40 5	-		75 20	30
9999	200	HU464□	2399.00	_	_	HU464DS	11244.00	_	_	HU464AWK	2832.00		60 5			50 40	
	400	HU465	5201.00	_	_	_	_	_	_	HU465AWK	5672.00		25 -			50 50	
	600	HU466	9072.00	_		_				_			00 –	- 400		<b>00</b> 50	50
6-Wire (6 Bl		0 Vac ▽										3		3Ø		Ø	
000000	30	_	_	_	_	HU661DS	11903.00	_	_	HU661AWK⊖	3357.00		10 -			30 —	I —
<u>                                    </u>	60	_	_	_	_	HU662DS	13254.00	_	_	HU662AWK €	3884.00		20 -	- 50		60 —	1-
111111	100	_	_	_	_	HU663DS	20643.00	_	_	HU663AWK €	4793.00		40 -	- 75		75 —	-
	200	-	_	_	_	HU664DS	28316.00			HU664AWK ●	10538.00	-	60 -	- 125	1-11	50 —	$\perp =$

- Complete rating is NEMA 3, 3R, 4, 4X, 5 and 12.
  Also suitable for NEMA 3R application by removing drain screw from bottom endwall.
- For switching dc, use two outside switching poles.
- Suitable for NEMA 5 applications with drain screw installed.
  Switches with EI suffix are stocked with factory-installed electrical interlocks with one normally-open and one normally-closed contact.
- Use 60 A enclosure accessories, including electrical interlocks.
- No knockouts are provided.
- Requires 60 A accessories. See page 3-14 for series rating.
- HU461AWK (Series F6) is rated 5 hp@250 Vdc, 10 hp@600 Vdc.
- Not suitable for use as service equipment. One enclosure for NEMA 1, 3, 3R or 12 applications. UL Listed.

#### **UL Listed Maximum Short Circuit Current Ratings—AC only**

NOTE: Consult the wiring diagram of the switch to verify the UL Listed short circuit current rating.

Table 3.12: **Fusible Safety Switches** 

For the short circuit current rating, refer to the table below.

Heavy Duty Safety Switch Type	UL Listed Fuse Class	UL Listed Short Circuit Current Ratings
Fusible	H, K	10 kA
Fusible	R, J, L	200 kA*

On 600 V, 200 A switches, 100,000 A max. on corner grounded delta when protected by Class J or R fuses.

#### Non-Fusible Safety Switches

Any brand of circuit breaker or fuse not exceeding the ampere rating of the switch may be used in conjunction with an non-fusible safety switch when there is up to 10 kA short circuit current available (see table below).

Above 10 kA—When applied on systems with greater than 10 kA short circuit current available, the UL Listed short circuit current rating for Square D non-fusible switches is based upon the switch being used in conjunction with fuses or Square D circuit breakers or Mag-Gard motor circuit protectors.

Table 3.13: Non-Fusible Safety Switches

Heavy Duty	Switch Rating	Fuse or Circuit	3-Phase					
Safety Switch Type	(A) <b>♦</b>	Breaker Type	240 Vac	480 Vac	600 Vac			
		Any brand circuit breaker		Up to 10 kA				
	All	H, K						
		R,T,J.L	200 kA	200 kA	200 kA			
Non-Fusible	30-100	ΗO	65 kA	35 kA	35 kA			
Switches	30-100	FA	14 kA	14 kA	14 kA			
	30-100	FH	18 kA	18 kA	18 kA			
	200	H, J ≎	65 kA	35 kA	35 kA			
	400	LA	22 kA	22 kA	22 kA			
	400	LH	25 kA	25 kA	25 kA			

- Applies to NEMA 1, 3R, 4X stainless, 12 switches.
- Ampere rating of fuse or circuit breaker not to exceed switch ampere rating.
- All H and J circuit breakers are acceptable, but will only support the noted Short Circuit Current Ratings.





H361SS

H363DF

H361DX

# 316 Grade Stainless Steel—NEMA 3, 3R, 4, 4X, 5, 12

Type 316 stainless steel enclosure safety switches offer superior corrosion resistance to a wider range of chemicals than Type 304 stainless switches. Type 316 better resists chloride and is often used in marine, waste treatment and transportation applications. Use watertight hubs from page 3-10. Equipment grounding lugs are supplied as standard. (For Type 304 stainless switches see pages 3-4–3-6.)

Table 3.14: 3P 600 Vac, 600 Vdc

**Heavy Duty Safety** 

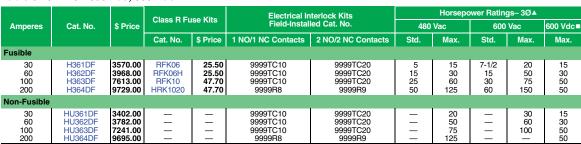
**Switches** 

				Horse	power Ratings	-3Ø▲	
Amperes	Cat. No	\$ Price	4	80 Vac	60	0 Vac	600 Vdc■
			Std.	Max.	Std.	Max.	Max.
Fusible							
30 60 100 200 400 600	H361SS H362SS H363SS H364SS H365SS H365SS	3444.00 3792.00 7562.00 10592.00 21622.00 30528.00	5 15 25 50 100 150	15 30 60 125 250 400	7-1/2 15 30 60 125 200	20 50 75 150 350 500	15 30 50 50 50 50
Non-Fusible							
30 60 100 200 400 600	HU361SS HU36SSS HU363SS HU364SS HU366SS HU366SS	2898.00 3444.00 7029.00 9623.00 17758.00 26306.00	_ _ _ _ _	20 50 75 125 250 400		30 60 100 150 350 500	15 30 50 50 50 50

#### Fiberglass Reinforced Polyester Enclosures—NEMA 4X

Fiberglass reinforced polyester enclosures are watertight, corrosion resistant, and impervious to windblown dust, rain, and splashing liquid. The molded fiberglass is extremely stable in a wide range of operating temperatures and can withstand heavy impact. Switches are furnished with hubs (page 3-14) and equipment grounding lugs. UL Listed.

3P 600 Vac, 600 Vdc Table 3.15:



#### Krydon' Enclosures—NEMA 4X

Krydon enclosures are compression molded of fiberglass reinforced polyester, specially formulated to withstand attack from almost any corrosive atmosphere found in the toughest industrial application. Switches are furnished with hubs (page 3-14) and equipment grounding lugs. UL Listed.

Table 3.16: 3P, 600 Vac, 600 Vdc

			Class R Fuse Kits		Electrical In		Horsep	ower Ratings– 3Ø▲			
Amperes	Cat. No.	\$ Price	Class R F	Field-Installed Cat. No.		led Cat. No.	480 Vac		600 Vac		600 Vdc■
			Cat. No.	\$ Price	1 NO/1 NC Contact 2 NO/2 NC Contacts		Std.	Max.	Std.	Max.	Max.
Fusible											
30 60 100	H361DX H362DX H363DX	4161.00 4626.00 8858.00	RFK06 RFK06H RFK10	25.50 25.50 47.70	9999TC10 9999TC10 9999TC10	9999TC20 9999TC20 9999TC20	5 15 25	15 30 60	7-1/2 15 30	20 50 75	15 30 50
Non-Fusible											
30 60 100	HU361DX HU362DX HU363DX	3960.00 4406.00 8438.00	_ _ _	_	9999TC10 9999TC10 9999TC10	9999TC20 9999TC20 9999TC20	=	20 50 75	=	30 60 100	15 30 50

#### NEMA 7 and 9

An enclosed automatic molded case switch for use in Divisions 1 and 2 of the following: Class I, Groups C and D; Class II, Groups E, F and G; or Class III, Hazardous Locations as defined in NEC<sup>™</sup> Article 500. Furnished with threaded conduit openings in both top and bottom endwall (page 3-14). Suitable for use as service equipment and listed as "Raintight" for outdoor applications. cULus Listed. Equipment grounding lugs supplied as standard.

Table 3.17: 3 Pole Molded Case Switch, 600 Vac, 250 Vdc Maximum, Short Circuit Current Rating 10 kA AIR

	Amnoroo	Enclosed Molded Ca	se Switch★	Solid Neutral Asseml	Hors	power Ratings—3Ø  480 Vac 600 Vac ■  30 50 30 50 60 75		
	Amperes	Cat. No.	\$ Price	Cat. No.	\$ Price	240 Vac	480 Vac	600 Vac■
le D	60 60	H60XFA H60XFA1212▼	2571.00 2886.00		143.00 143.00			
	100	H100XFA	3045.00	100SNA	143.00	30	60	75 75
New	100	H100XFA1212▼ H225XJG□	3287.00 6387.00		143.00 189.00		60 125	75 150
, 4000	225	H225XJGAA▼□	6701.00	225SNA	189.00	60	125	150

- Std.—Using fast acting one time fuses. Max.—Using dual element time delay fuses.
- For switching dc use two switching poles
- Electrical interlock not available. For auxiliary switches, refer to page 7-4 for catalog number suffix and price adder (e.g. H60XFA1212).

Discount Schedule

DE1

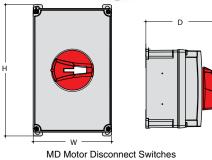
- Includes PKDB1, breather and drain kit, required for rainproof application—NEMA 7 only.
- Includes auxiliary contacts.
- For available options, contact customer service prior to placing an order.
- Not UL listed or CSA Certified due to wire bending space.



H<sub>6</sub>0XFA

when the switch is in the ON position.





MD Motor Disconnect Switch—Non Metallic NEMA 1, 3, 3R, 4, 4X and Table 3.18: 12 Enclosure ▲ ■ ♦

The MD motor disconnect switch is listed UL508 Suitable For Motor Control (UL File E164864). It is in a compact NEMA 4X enclosure suitable for use in NEMA Type 1, 3, 3R, 4, 4X and 12 applications. The MD's key benefits are an extremely small footprint, a more economically efficient NEMA 4X solution and a handle interlock preventing cover removal

		Maximu	m Horse Power	Ratings		Hoight		
Amperes	Cat. No.	1	hree Phase Va	\$ Price	Height (in.)	Width (in.)	Depth (in.)	
		220-240	440–480	600			(,	` ′
30	MD3304X	7.5	20	25	121.00	6.38	3.9	4.37
60	MD3604X	20	40	40	161.00	8.27	4.94	4.37

- See table 8.9 for accessories.
- Complies with OSHA lockout/tagout requirements—accepts up to three 8 mm padlocks.
- Suitable for NEMA 1, 3R, 4, 4X and 12 enclosure applications.

#### Table 3.19: **MD Motor Disconnect Accessories**

Cat. No.	Description	\$ Price
MDSAN20	2 Normally open auxiliary contact module	57.00
MDSAN11	1 normally open and 1 normally closed auxiliary contact module	27.00
MDS30P	30 Amp Add on power pole	35.00

SAFETY SWITCHES

# www.schneider-electric.us

#### **Interlocked Receptacle Switches**

Interlocked Receptacle Switches are furnished with a factory-installed three-phase four-wire Appleton Powertite™, Crouse-Hinds Style 2 Arktite™, or Hubbellock™ receptacle. The fourth wire is connected to the switch equipment grounding terminal and is not a neutral termination. Interlocking linkage between the receptacle and switch mechanism prevents insertion or removal of the plug while the switch is in the "ON" position or insertion of any plug other than specified. Grounding lugs are included.

#### **Appleton Powertite Receptacle**

- Devices are UL Listed and CSA Certified, suitable for use as service equipment.
- Receptacles are epoxy powder coated over copper-free cast aluminum and NEMA 3, 3R, 4, 4X and 12 rated. Appleton receptacles are UL Classified for use with the Crouse-Hinds plugs listed below.
- Short circuit rating: 10 kA when used in conjunction with Class H or K fuses; 200 kA when used in conjunction with Class R or J fuses.



- Receptacle UL Listed for use with "Appleton ACP or CPH" plugs; UL Classified for use with Crouse-Hinds "APJ" Arktite plugs listed on this page.
- Std.—Using fast acting one time fuses. Max.—Using dual element time delay fuses.
- For switching dc, use two switching poles.

#### **Crouse-Hinds Arktite Receptacle**

- UL Listed, suitable for use as service equipment.
- Short circuit ratings: 10 kA when used in conjunction with Class H or K fuses; 200 kA when used in conjunction with Class R or J fuses.

#### Table 3.20:

Amperes	NEMA 1		NEMA 3, 3R, 4, 4X, 304 Stainless Ste		NEMA 12, 3R Use with		h Plug			power s–3Ø★		
Amperes	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	480	Vac	600	Vac
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Std.	Max.	Std.	Max.
Fusible—3F	P, 600 Vac Max	ximum						•				
30	H361WC	2139.00	H361DSWC	6377.00	H361AWC	2355.00	APJ3485	1235.00	5	15	7-1/2	20
60	H362WC	2751.00	H362DSWC	7749.00	H362AWC	2846.00	APJ6485	1295.00	15	30	15	50
100	H363WC	6005.00	H363DSWC	14826.00	H363AWC	6087.00	APJ10487	1928.00	l —	60	_	75
Non-Fusible	e—3P, 600 Va	c Maximum										
30	HU361WC	1952.00	HU361DSWC	5888.00	HU361AWC	2136.00	APJ3485	1235.00	l —	20	_	30
60	HU362WC	2634.00	HU362DSWC	7374.00	HU362AWC	2678.00	APJ6485	1295.00	l —	50	_	60
100	HU363WC	5249.00	HU363DSWC	14025.00	HU363AWC	5444.00	APJ10487	1928.00	_	60	_	100
★ Std												

#### **Hubbellock Receptacle**

- UL Listed, suitable for use as service equipment.
- Short circuit rating: 10 kA.

Note: The Hubbellock receptacle switch utilizes the Square D interlocked plug SD12781 available only from Square D.

#### Table 2 21.

Table 3.21	•										
	NEN	/A 1	NEMA 12		Use with Plug		Horsepower Ratings—3∅▼				
Amperes	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	480	Vac	600	Vac	
	Cal. NO.	3 FIICE	Cal. NO.	\$ FIICE	Cat. NO.	3 FIICE	Std.	Max.	Std.	Max.	
Fusible—3P,	600 Vac Maxim	num									
60	H362WH	2351.00	H362AWH	2459.00	SD12781 △	609.00	15	30	15	50	
Non-Fusible-	-3P, 600 Vac №	laximum									
60	HU362WH	2237.00	HU362AWH	2310.00	SD12781△	609.00	_	50	_	60	

Std.—Using fast acting one time fuses. Max.—Using dual element time delay fuses. Hubbell plug is furnished with a Kellems grip for 1-1/2 in. to 1-21/64 in. cable diameter.

Accessories . . . . . . . . . . . . . . . . pages 3-10 through 3-12.



Interlocked Receptacle Switch with Appleton Powertite Receptacle



H362AWC Interlocked Receptacle Switch with Crouse-Hinds Arktite Receptacle



H362AWH Interlocked Receptacle Switch with Hubbell **Hubbellock Receptacle** 



#### Rainproof Bolt-On Hubs-for use on NEMA 3R Enclosure

Conduit Size	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	Closing Cap
Hub Cat. No.	B075	B100	B125	B150	B200	B250	B300	B350	B400	BCAP
\$ Price Each (DE1A)	33.30	33.30	33.30	33.30	61.00	102.00	186.00	300.00	368.00	3.80

Note: NEMA 3B rainproof enclosures with Cat. No. ending in BB have a bolt-on closing cap factory-installed. Order bolt-on hubs separately from table above. For more details see page 1-13. Hubs through size 2-12 can be directly installed on RB devices. Devices requiring threeinch or larger hubs must have holes cut in the field. Gaskets are provided on three-inch and larger hubs.

Note: All hubs are UL Listed for indoor and rainproof applications and suitable for use with conduit having ANSI standard taper pipe thread.

Watertight Hubs—for use on NFMA 4, 4X and 5 Stainless Steel and NFMA 12 Enclosures

			, -							
Conduit Trade Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4
Standard-Zinc Hub Cat. No.	H050	H075	H100	H125	H150	H200	H250	H300	H350	H400
Zinc \$ Price Each	31.10	45.00	47.10	54.00	83.00	120.00	138.00	177.00	282.00	381.00
Chrome Plated Hub Cat. No.	H050CP	H075CP	H100CP	H125CP	H150CP	H200CP	1	1	-	_
Chrome Plated \$ Price Each	40.70	56.00	64.00	67.00	96.00	137.00	_	_	_	_

#### **Electrical Interlock Kits**

Electrical interlocks for heavy duty 30-1200 A safety switches are available factory-installed or in kit form for field installation. Each kit contains instructions for proper field mounting. A pivot arm operates from switch mechanism, breaking the control circuit before the main switch blades break. Switches with electrical interlocks installed are UL Listed. For factory-installed electrical interlocks add EI (for one contact) or EI2 (for two contacts) suffix to catalog number. See Supplemental Digest page 2-3 for electrical interlock contact ratings.

Table 3.22: Electrical Interlock Kit

Switch's Amperes Rating	Series Number (See pages 3-13, 3-14)	Electrical Interlock Kit Cat. No. ■	\$ Price	Factory-Installed \$ Price
30	F1, F5–F7	EIK031	218.00	359.00
30	F3	EIK1 EIK2	311.00	452.00
60	F1-F3 F5-F7 (600 V)	EIK1 EIK2	311.00	452.00
60	F4 F5–F6 (240 V)	EIK031▼ EIK032▼	218.00	359.00
100–200	F2-F7	EIK1 EIK2	311.00	452.00
400–1200	E1-E4	EIK40601 EIK40602	533.00	674.00

- See page 3-7 for electrical interlocks on NEMA 4X fiberglass reinforced polyester and Krydon  $^{\rm M}$  .
- Electrical interlock kit catalog numbers with 1 suffix indicates one normally open and one normally closed contact; 2 indicates two normally open and two normally closed contacts. Kits are ULL isted
- HU461AWK uses EK3061 or EK3062.
- The following Series F5–F7 devices use EIK-1, 2: H3612, H3612A, H3612AWK, H3612RB, H461, H461DS, H461AWK, HU461, HU461DS, HU661DS, HU661AWK, H361AWA, H361AWA, H361AWA, H361AWA
- H362WA, HU362WA, H362WC, H362AWA, HU362AWA, H362AWC, HU362AWC, and H2212AWK use EIK1 or EIK2 electric interlock.
- Single-pole single-throw interlock kits are rated 1/2 hp @ 110 and 220 Vac.

#### **Class R Fuse Kits**

ω

When installed, this kit rejects all but Class R fuses. Kits are available for field installation. For factory installation, add "CLR" suffix to catalog number.

Table 3 23: Class R Fuse Kits—240 V (one kit per 3P switch)

Amperes	Series Number (See pages 3-13, 3-14)	Class R Fuse Kit Cat. No.	\$ Price	Factory-Installed \$ Price
30	F5-F7	RFK03L□	25.50	195.00
60	F1, F2, F3	RFK06	25.50	195.00
60	F4-F7	RFK03H	25.50	195.00
100	F2-F7	RFK10	47.70	231.00
200	F5-F6	HRK1020	47.70	231.00
400-600	E	HRK4060	111.00	360.00

H221-2AWK uses RFK06 Class R fuse kit.

#### Class R Fuse Kits-600 V (one kit per 3P switch) Table 3.24:

Amperes	Series Number (See pages 3-13, 3-14)	Class R Fuse Kit Cat. No.	\$ Price	Factory-Installed \$ Price
30♦	F1, F5-F7	RFK03H☆	25.50	293.00
30 ♦	F3	RFK06	25.50	293.00
60 ♦	F1–F7	RFK06H ☆	25.50	293.00
100 ♦	F2-F7	RFK10	47.70	231.00
200	F5-F6	HRK1020	47.70	231.00
400-600	E2-E4	HRK4060	111.00	360.00

- See page 3-7 for Class R Fuse Kits in NEMA 4X Fiberglass Reinforced Polyester and Krydon switches.
- The following Series F5–F7 devices use RFK06: H3612, H3612A, H3612AWK, H3612RB, H461, H461DS, H461AWK, H361AWA and H361AWC.

#### Internal Barrier Kits

Internal Barrier Kits provide an additional barrier that helps prevent accidental contact with live parts. Field-installed transparent barriers do not restrict visual inspection of the switch. Barriers provide IEC529 IP2X "finger safe" protection when door of enclosed disconnect switch is open. Convenient door allows use of test probes without accessing fuses and replacement of fuses without removing barrier. Barrier can also be used with the skirt kit to enclose a panel mounted Type 9422 disconnect.

Cat. No.	Description	Safety Switch Application (F Series Only)	9422 Type T Disconnect Application	\$ Price
SS03	Interior Barrier for 30 A	240 / 600 Vac – 30 A	NA	150.
	Safety Switch	240 Vac – 60 A		
0000	Interior Barrier for 60 A	COO \/aa CO A	600 Vac – 30 A	105
SS06	Safety Switch, 30 or 60 A 9422 Switch	600 Vac – 60 A	600 Vac - 60 A	165.
SS10	Interior Barrier for 100 A Safety Switch or 100 A 9422 Switch	240 / 600 Vac – 100 A	600 Vac - 100 A	195.
SS20	Interior Barrier for 200 A Safety Switch	240 / 600 Vac - 200 A	NA	225.
	Skirt Kit to Enclose 30 or		600 Vac - 30 A	
SS0306SK	60 A 9422 Switch (requires SS06)	NA	600 Vac - 60 A	225.
SS10SK	Skirt Kit to Enclose 100 A 9422 Switch (requires SS10)	NA	600 Vac - 100 A	255.

Requires arc shield on 240 V switches be changed to 600 V arc suppressor.

#### **Fuse Puller Kits**

Kit consists of three fuse pullers as required for a 3-pole fusible 240 V or 600 V heavy duty switch. Kits can be installed in switches manufactured after February, 1980. Fuse pullers supplied as standard equipment on NEMA 12, 12K, NEMA 4, 4X, 5 stainless steel, NEMA 4X fiberglass reinforced polyester and KRYDON switches through 100 A.

Amperes	Series Number	Fuse Puller Kit Cat. No.	\$ Price
30	F1, F5–F7	FPK03 <b>●</b>	30.00
30	F3	FPK0610	42.60
60	F1, F2, F3, F5–F7 (600 V)	FPK0610	42.60
60 <b>*</b>	F4 *, F5–F7 (240 V)	FPK03 *	30.00
100	F2-F7	FPK0610	

- 30 A 4- and 6-pole, H361-2 and H361-2RB Series F5 use FPK0610
- H362WA, H362WC, H362AWA, H362AWC, H362WH and H362AWH use FPK0610 fuse puller kit



#### **Heavy Duty Safety Switches**

Class 3110 / Refer to Catalog 3100CT0901

**Accessories and Special Features** 

#### Neutral Assemblies—Field-Installed Neutral Assemblies for Fusible and Non-Fusible 240 and 600 Volt Safety Switches

Amperes	Series Number (See pages 3-13, 3-14)	Standard Neutral Kit Cat. No.	Terminal Data AWG/kcmil	\$ Price	Optional Copper Only Neutral Kit Cat. No.	Terminal Data AWG/kcmil	\$ Price
30	F1, F5-F6	SN03▲	(3) 2 Max. Al/Cu	83.00	SN03C ▲	(3) 6 Max. Cu	102.00
60	F1–F3, F5–F6 (600 V)	SN0610	(2) 1/0 Max. Al/Cu (2) 6 Max. Al/Cu	107.00	SN0610C	(2) 1/0 Max. Cu (2) 6 Max. Cu	114.00
00	F4, F5–F6 (240 V)	SN03▲	(3) 2 Max. Al/Cu	83.00	SN03C▲	(3) 6 Max. Cu	102.00
100	F2-F6	SN0610	(2) 1/0 Max. Al/Cu (2) 6 Max. Al/Cu	107.00	SN0610C	(2) 1/0 Max. Cu (2) 6 Max. Cu	114.00
200■	F5–F6	SN20A	(2) 250 Max. Al/Cu (1) 1/0 Max. Al/Cu	200.00	SN20C	(2) 250 Max. Cu (1) 1/0 Max. Cu	246.00
400 and 600	E1–E4	H600SN	(4) 750 Max. Al/Cu (1) 300 Max. Al/Cu	327.00	H600SNC	(2) 600 Max. Cu (2) 350 Max. Cu (1) 250 Max. Cu	452.00
800	E2-E4	H800SNE4	(6) 750 Max. Al/Cu (2) 350 Max. Al/Cu	753.00	_	_	_
1200	E2-E4	H1200SNE4	(8) 750 Max. Al/Cu (2) 350 Max. Al/Cu	1034.00	_	_	_

Note: Neutrals cannot be installed in 4P, 6P, or 200 A NEMA 4X fiberglass reinforced polyester safety switches.

- The following Series F5–F6 devices use SN0610(C): H-361-2, H-361-2RB, H-361-2A and H-361-2AWK.
- For 200% neutral, order (2) neutral kits and (1) SN20NI neutral jumper kit. (2) 350 Max. Al/Cu.

#### Equipment Grounding Kits

Equipment grounding kits are field-installed and UL Listed in 30-1200 A heavy duty switches. For factory installation of equipment grounding kit, add suffix GL to standard Cat. No. (Example: H361GL). Price = Switch + Kit Price

#### Equipment Grounding Kits—Field- or Factory-Installed Equipment Grounding Kits-240 and 600 V

Amperes	Series Number (See pages 3-13, 3-14)	Standard Cat. No.	Terminal Data AWG/kcmil	\$ Price	Optional Copper Only Cat. No.	Terminal Data AWG/kcmil	\$ Price
30	F1, F5–F7	GTK03 ♦	(2) 12 Cu or (2) 10 Al or (1) 4 Max. Al/Cu	11.40	GTK03C ♦	(1) 6 Max. Cu	13.40
60★	F1–F3★, F5–F7 (600 V)	GTK0610★	(2) 1/0 Max. Al/Cu	18.90	GTK0610C★	(2) 4 Max. Cu	22.70
60	F4, F5–F6 (240 V)	GTK03	(2) 12 Cu or (2) 10 Al or (1) 4 Max. Al/Cu	11.40	GTK03C	(1) 6 Max. Cu	13.40
100	F2-F7	GTK0610	(2) 1/0 Max. Al/Cu	18.90	GTK0610C	(2) 4 Max. Cu	22.70
200	F5-F7	PKOGTA2	(2) 2/0 Max. Al/Cu	55.00	PKOGTC2	(2) 4 Max. Cu	58.00
400 and 600	E2-E4	PKOGTA2▼ (2 Required)	(2) 2/0 Max. Al/Cu	55.00	PKOGTC3	(3) 1/0 Max. Cu	107.00△
800	E2-E4	PKOGTA7	(4) 350 Max. Al/Cu	198.00 △	_	_	
1200	E2-E4	PKOGTA8	(8) 350 Max. Al/Cu	203.00△	_	_	_

- The following Series F5-F6 devices use GTK0610(C): H-361-2 and H-361-2RB.
- 4- and 6-pole 30 A F Series.
- Two required if grounding conductors are run in parallel.
- PE1A Discount Schedule
- Equipment Ground Kits are factory-installed standard in 30–200 A series F NEMA 4-4X-5 (stainless) and 12. Equipment Ground Kits are standard on all NEMA Types, Series F 30–200 A 4 and 6 pole switches.

#### Table 3.25: **Square D Gray Paint**

Description	Cat. No.	\$ Price
16 oz. Aerosol Paint Can, Square D Gray Paint	PK49SP	39.00 ea.

Note: Shipped in quantities of 6.

#### **Special Paint**

UL Listed heavy duty switches are available painted with special safety colors. To order safety colored switches add suffixes as noted in Table 3.26 to the standard switch commercial reference number.

All colors comply with OSHA Standard 1910.144 and ANSI Specification Z535.1 for marking physical hazards.

Table 3.26: **Safety Colors** 

Safety Color	Suffix
Black	SP0
Red	SP2
Orange	SP3
Yellow	SP4
Green	SP5
Blue	SP6
Purple	SP7
Gray	SP8
Gray ANSI 61	SP861▲
White	SP9

Standard Square D ANSI 49 grey paint, when selecting this suffix, switches will receive

A minimum quantity of 10 is required. Not available for NEMA Type 7/9 or stainless steel products.

#### Price Adder Each Switch

Quantity	\$ Price							
	30 A	60 A	100 A	200 A	400 A	600 A	800 A	1200 A
10	242.00	278.00	434.00	479.00	1137.00	2801.00	3501.00	4376.00

#### Lock-Off Guard Kits★

Available factory- or field-installed the lock-off guard works by covering the lockout/tagout opening whenever the switch is in the ON position. This prevents a padlock from being inadvertantly inserted into the switch lockplate. The device is designed to help prevent accidental misapplication of a lockout device. These kits are marked cURus (UL Component Recognized) for field or factory installation.

Amperes <b>♦</b>	Kit Cat. No.	Field-Installed \$ Price	Factory- Installed \$ Price	
30 A	LOGK1	44.30	146.00	
60 A 240 V	LOGKI	44.30	146.00	
60 A 600 V	LOGK2	45.00	177.00	
100 and 200 A	LOGKZ	45.00	177.00	

- For factory installation, add suffix "LOG" to the switch catalog number.
- For use with 30–200 Ampere Series F NEMA 1, 3R, 12 and 12K switches only.
- Factory install and kits are available for NEMA 1, 3R, 12 and 12K switch enclosures only.



### **Heavy Duty Safety Switches**

# Key Interlock Systems



Factory-installed only on heavy duty safety switches and double throw safety switches.

Interlocks are used to prevent the authorized operator from making an unauthorized operation. Not available on hazardous location devices (NEMA 7/9) or fiberglass reinforced polyester (NEMA 4X).

The key interlock system is a simple and easy method of applying individual key interlock units and assemblies to the above equipment so as to require operation in a predetermined sequence. UL Listed.

#### Quoting:

Contact Schneider Electric for catalog number, availability, and pricing prior to quoting a job.

Detailed information is required before an order can be processed. Please see Supplemental Digest Section 2 for further information.

Use these suffixes on switch catalog numbers:

- KI = 1 lock per switch
- KI2 = 1 lock with 2 cylinders (2 keys) per switch
- KIKI = 2 separate locks per switch

Table 3.27: Price Adder Per Lock ▲

Switch Type	\$ Price
30-1200 A Heavy Duty	2055.00
30-600 A Double Throw	1988.00

Prices do not apply when more than three devices are interlocked, as these schemes normally require more than one key assembly per device.

#### Lock-On Provisions

Lock-off provisions are standard on all heavy duty safety switches. Provision for one <sup>3</sup>8-inch hasp padlock is available factory-installed on NEMA 1, 3R, 4-4X-5 stainless steel and 12 switches. This modification will allow the switch to be locked in the "ON" position. UL Listed.

Table 3.28: Price Adder Per Each Switch

Safety Switch Rating	\$ Price
30-1200 A	155.00

## Cover Viewing Window

To order, add suffix SPLO to standard catalog number. Example: H364-SPLO



Optional cover viewing window is positioned over the blades to allow visual verification of "ON-OFF" status. Available on 30 through 1200 A heavy duty switches, all NEMA Types. (Not available on NEMA 4X fiberglass reinforced polyester, Krydon™ enclosures, or NEMA 7 and 9 devices.)

Factory-installed only: add "VW" suffix to the Cat. No. See table below for price adder.

Table 3.29: Price Adder Per Switch—UL Listed

Class	Amperes	2- and 3-Pole	4- and 6-Pole
Heavy Duty	30-100 A	38.00	75.00
Heavy Duty	400-1200 A	2297.00	_
Double Throw	30-100 A	255.00	510.00

#### Switch Lubricant

Field maintenance lubricant is available for servicing blade and jaw components in switches 600 V and below. Catalog number SWLUB (list price \$24.14) consists of one tube of BG20 High Performance Synthetic Grease manufactured by Dow Corning<sup>®</sup>. SWLUB is available in warehouse stock, shipped individually or in multiples of 12 units per carton.

#### **Accessories and Special Features**

Class 3110 / Refer to Catalog 3100CT0901



#### Copper Only Lug Kits

Heavy duty safety switches are supplied standard with Al lugs, which accept both Cu and Al wires. For field installation of copper-only lug kits, order kits below. For factory installation of copper only lugs, add suffix SLC to standard Cat. No. Note: 30 through 200 Amperes NEMA 12, 12K and stainless steel switches with factory-installed lugs bear the UL Marine Listed manifest for use on vessels over 65 feet long. 30 through 200 Amperes NEMA 12, 12K and stainless steel switches using field-installed copper only lug kits are UL Marine Listed, but do not bear the marine manifest.

Table 3.30: Kits-Wire size (pp 3-13)



			(1-1)
Amperes	Lug Kit Cat. No.■	Kit \$ Price	Factory-Installed Adder per Switch
30	CL0306F	69.00	224.00
60	CL0306F	69.00	224.00
100	CL10F	159.00	431.00
200	CL20F	264.00	717.00
400	CL40F	549.00	1490.00
600	CL60F	893.00	2426.00
800	_	_	_
1200	_	_	_

One kit includes all phase line/load lugs for a 3pole switch.

#### Double Lug Kits

200 A heavy duty F-series switches are supplied standard with lugs listed on page 3-13 (one wire per phase). For lugs that accept two wires per phase and neutral, order the following kith.

Amperes	Lug Kit <b>♦</b> Cat. No.	Kit \$ Price★	Lug wire range per phase and neutral AWG/kcmil	Switch wire range per phase and neutral AWG/kcmil
200	AL20DTF	159.00	(2) 6 -300 Cu/Al	(2) 6 -250 Cu/Al

Not UL Listed.

Versa-Crimp

★ Kit contains 3 lugs. For double lugs for line and load, order 2 kits.

Table 3.31: 800 and 1200 A Compression Lug Kits-

Field- Installed (See page 3-13 for 100–600 A Switches)
Series E4 800 and 1200 A safety switches are equipped as standard with mechanical lugs. Alternate compression lug kits are available for field installation and are UL Listed. Each kit consists of VCEL07512H1

Compression Lugs and lug landing connectors capable

of converting line and load side of one switch pole or neutral.

Order one field-installed kit per pole or neutral per table below.

Example: Three-pole three-wire requires three kits; three-pole, four-wire requires four kits.

Amperes	Lug Kit Cat. No.	\$ Price Per Pole or Neutral
800	H8LKE2	893.00
1200	H12LKE2	1109.00

Note: For terminal lug data, refer to table below.

Table 3.32: Factory-Installed

Series E4 800 and 1200 A safety switches are available with factory-installed VCEL-075-12H1 Versa-Crimp compression lug kits (above). For factory installation, add suffix LK to standard Cat. No. (Example: H367LK) and use price adder from table below based on system type.

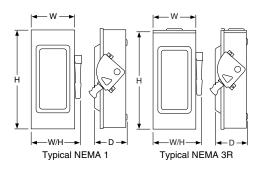
Amperes	System	Factory-Installed \$ Price Adder Per Switch
	2 Wire	2106.00
800	3 Wire	2972.00
	4 Wire	3839.00
'-	2 Wire	2591.00
1200	3 Wire	3696.00
	4 Wire	4806.00

Note: For terminal Lug data refer to table below.

Table 3.33: Terminal Lug Data—800 and 1200 A Compression Lugs

Amperes	Conductors Per Phase	Compression Lug (VCEL-075-12H1) Wire Range
	(3) Line	500–750 kcmil (Al)
800	and	or
	(3) Load	500 kcmil (Cu)
	(4) Line	500–750 kcmil (Al)
1200	and	or
	(4) Load	500 kcmil (Cu)

SAFETY SWITCHES



#### Terminal Lug Data (NEMA 1, 3R, 4, 4X, 5, 7, 9, 12)▲ Table 3.34:

Rating (A)	Conductors Per Phase and Neutral	Wire Range Wire Bending Space Per NEC Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil	Optional Versa-Crimp <sup>™</sup> Compression Lug Field-Installed■
	1	12-6 (Al) or 14-6 (Cu)	12-2 (AI)	
30♦	2	14–10 (Cu) solid or 14–10 (Cu) stranded	or 14–2 (Cu)	_
60★	1	14-3 (Al) or 14-3 (Cu)	12-2 (Al) or 14-2 (Cu)	
100	1	12-1/0 (AI) or 14-1/0 (Cu)	12-1/0 (Al) or 14-1/0 (Cu)	VCEL02114S1
200▼	1	6-250 (Al/Cu)	6-300 (Al/Cu)	VCEL030516H1
				VCEL07512H1
	1	1/0–750 (Al/Cu)△	1/0-750 (Al/Cu)	or
400	or	or	and	VCEL030516H1□
	2	1/0-300 (Al/Cu)	1/0-300 (Al/Cu)	and
				VCEL05012H1
600	2	3/0-500 (Al/Cu)	3/0-500 (Al/Cu)	VCEL05012H1
800	3	3/0-750 (Al/Cu)	3/0-750 (Al/Cu)	H8LKE2♦
1200	4	3/0-750 (Al/Cu)	3/0-750 (Al/Cu)	H12LKE2 ♦

- 30–100 A switches suitable for 60°C or 75°C conductors. 200–1200 A switches suitable for 75°C conductors.
- For NEMA 1 and 3R only.

- For NEMA 1 and 3H only.

  HU461AWK— 14–3 AWG (Al or Cu).

  H60XFA— 14–6 AWG (Cu).

  H225XKA— 4 AWG—300 kcmil (Cu).

  Max. wire range is (1) 600 kcmil or (2) 300 kcmil Al/Cu on NEMA 4X Stainless and NEMA 12.

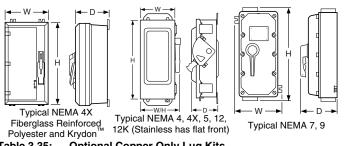
  Order two PK516KN mounting kits when installing VCEL030516H1 lugs.

  Only one kit is required on 2-Pole switches.

  See page 3-12, 800 and 1200 A compression lug kits for additional information. Δ

				Approxir	nate Dim	ensions				Approximate Dimensions									
Cat. No.		F	1	٧	v		)	w	/H	Cat. No.		ı	1	V	v		)	w	/H
	Series	in.	mm	in.	mm	in.	mm	in.	mm		Series	in.	mm	in.	mm	in.	mm	in.	mm
H221N	F5	14.60	371	6.50	165	4.88	124	7.55	192	H364, N	F5	29.00	737	17.13	435	8.25	210	18.50	470
H221NRB	F5	14.88	378	6.63	168	4.88	124	7.55	192	H364RB, NRB	F5	29.25	743	17.25	438	8.50	216	18.63	473
H222N	F5	14.60	371	6.50	165	4.88	124	7.55	192	H365, N	E4	50.25	1276	27.63	702	10.13	257	27.63	702
H222NRB	F5	14.88	378	6.63	168	4.88	124	7.55	192	H365R, NR	E5	50.31	1278	27.76	705	9.53	242	27.88	708
H223N	F5	21.25	540	8.50	216	6.38	162	10.50	267	H366, N	E4	50.25	1276	27.63	702	10.13	257	27.63	702
H223NRB	F5	21.25	540	8.50	216	6.38	162	10.50	267	H366NR, R	E5	50.31	1278	27.76	705	9.53	242	27.88	708
H224N	F5	29.00	737	17.13	435	8.25	210	18.50	470	H367, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H224NRB	F5	29.25	743	17.25	438	8.50	216	18.63	473	H367NR, R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H225, N	E4	50.25	1276	27.63	702	10.13	257	27.63	702	H368, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H225NR, R	E5	50.31	1278	27.76	705	9.53	242	27.88	708	H368NR, R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H226, N	E4	50.25	1276	27.63	702	10.13	257	27.63	702	H461	F5	20.50	521	14.75	375	6.85	174	16.13	410
H226NR, R	E5	50.31	1278	27.76	705	9.53	242	27.88	708	H462	F5	20.50	521	14.75	375	6.85	174	16.13	410
H227, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930	H463	F5	20.50	521	14.75	375	6.85	174	16.13	410
H227NR, R	E4	69.13	1756	36.62	930	17.75	451	36.62	930	H464	F5	29.00	737	23.25	591	8.75	222	24.88	632
H228, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930	H465	E4	50.25	1276	33.88	861	10.13	257	33.88	861
H228NR, R	E4	69.13	1756	36.62	930	17.75	451	36.62	930	H466	E4	50.25	1276	33.88	861	10.13	257	33.88	861
H265	E4	50.25	1276	27.63	702	10.13	257	27.63	702	HU265	E4	50.25	1276	27.63	702	10.13	257	27.63	702
H265R H266	E5 E4	50.31 50.25	1278 1276	27.76 27.63	705 702	9.53	242 257	27.88	708 702	HU265R HU266	E5 E4	50.31 50.25	1278 1276	27.76	705 702	9.53	242 257	27.88 27.63	708 702
H266R	E5		-	27.76	702	10.13	242	27.63	702	HU266R	E5		1278	27.63	702	10.13	242	27.88	-
H267	E4	50.31 69.13	1278 1756	36.62	930	9.53 17.75	451	27.88 36.62	930	HU267	E4	50.31 69.13	1756	27.76 36.62	930	9.53 17.75	451	36.62	708 930
H267R	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU267R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H268	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU268	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H268R	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU268R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H321N	F5	14.60	371	6.50	165	4.88	124	7.55	192	HU361	F5	14.60	371	6.50	165	4.88	124	7.55	192
H321NRB	F5	14.88	378	6.63	168	4.88	124	7.55	192	HU361RB	F5	14.88	378	6.63	168	4.88	124	7.55	192
H322N	F5	14.60	371	6.50	165	4.88	124	7.55	192	HU361WA	F6	18.19	462	9.00	229	6.81	173	10.50	267
H322NRB	F5	14.88	378	6.63	168	4.88	124	7.55	192	HU361WC	F6	18.19	462	9.00	229	6.81	173	10.50	267
H323N	F5	21.25	540	8.50	216	6.38	162	10.50	267	HU362	F5	17.50	445	9.00	229	6.38	162	10.50	267
H323NRB	F5	21.25	540	8.50	216	6.38	162	10.50	267	HU362RB	F5	17.50	445	9.00	229	6.38	162	10.50	267
H324N	F5	29.00	737	17.13	435	8.25	210	18.50	470	HU362WA	F6	18.19	462	9.00	229	6.81	173	10.50	267
H324NRB	F5	29.25	743	17.25	438	8.50	216	18.63	473	HU362WC	F6	16.75	425	9.00	229	7.00	178	10.50	267
H325, N	E4	50.25	1276	27.88	708	10.13	257	27.88	708	HU362WH	F5	18.19	462	9.00	229	6.81	173	10.50	267
H325R, NR	E5	50.31	1278	27.76	705	9.53	242	27.88	708	HU363	F5	21.25	540	8.50	216	6.38	162	10.50	267
H326, N	E4	50.25	1276	27.63	702	10.13	257	27.63	702	HU363RB	F5	21.25	540	8.50	216	6.38	162	10.50	267
H326R, NR	E5	50.31	1278	27.76	705	9.53	242	27.88	708	HU363WA	F6	21.85	462	9.00	229	6.81	173	10.50	267
H327, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU363WC	F6	21.85	555	9.00	229	6.81	173	10.50	267
H327R, NR	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU364	F5	29.00	737	17.13	435	8.25	210	18.50	470
H328, N	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU364RB	F5	29.25	743	17.25	438	8.50	216	18.63	473
H328R, NR	E4	69.13	1756	36.62	930	17.75	451	36.62	930	HU365	E4	50.25	1276	27.63	702	10.13	257	27.63	702
H361, N	F5	14.60	371	6.50	165	4.88	124	7.55	192	HU365R	E5	50.31	1278	27.76	705	9.53	242	27.88	708
H361-2	F5	17.50	445	9.00	229	6.38	162	10.50	267	HU366	E4	50.25	1276	27.63	702	10.13	257	27.63	702
H361NRB, RB	F5	14.88	378	6.63	168	4.88	124	7.55	192	HU366R	E5	50.31	1278	27.76	705	9.53	242	27.88	708
H361WA	F6	18.19	462	9.00	229	6.81	173	10.50	267	HU367	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H361WC	F6	18.19	462	9.00	229	6.81	173	10.50	267	HU367R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H362, N	F5	17.50	445	9.00	229	6.38	162	10.50	267	HU368	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H362NRB, RB	F5	17.50	445	9.00	229	6.38	162	10.50	267	HU368R	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H362WA	F6	18.19	462	9.00	229	6.81	173	10.50	267	HU461	F5	20.50	521	14.75	375	6.85	174	16.13	410
H362WC	F6	16.75	425	9.00	229	7.00	178	10.50	267	HU462	F5	20.50	521	14.75	375	6.85	174	16.13	410
H362WH	F5	18.19	462	9.00	229	6.81	173	10.50	267	HU463	F5	20.50	521	14.75	375	6.85	174	16.13	410
H363, N	F5	21.25	540	8.50	216	6.38	162	10.50	267	HU464	F5	29.00	737	23.25	591	8.75	222	24.88	632
H363NRB, RB	F5	21.25	540	8.50	216	6.38	162	10.50	267	HU465	E4	50.25	1276	33.88	861	10.13	257	33.88	861
H363WA	F6	21.85	462	9.00	229	6.81	173	10.50	267	HU466	E4	50.25	1276	33.88	861	10.13	257	33.88	861
H363WC	F6	21.85	555	9.00	229	6.81	173	10.50	267	J									

# NEMA Type 4, 4X, 5, 7, 9 and 12



#### Table 3.35: Optional Copper Only Lug Kits

(See page 3-12 for pricing. See page 3-13 for terminal lug data for the series switches listed in the dimension table below.)

	• •	
Amperes	Optional Lug Kit Cat. No.▲	Lug Wire Range Per Phase AWG/kcmil
30-60	CL0306F	(1) 14-8 Cu solid or 14-4 Cu strand
100	CL10F	(1) 14-8 Cu solid or 14-1/0 Cu strand
200	CL20F	(1) 6–250 Cu
400	CL40F	(1) 1–600 Cu plus (1) 6–250 Cu
600	CL60F	(2) 4–350 Cu

▲ One kit includes all phase line/load lugs for a 3-pole switch.

#### Table 3.36: **Conduit Provisions**

(NEMA 4X Fiberglass Reinforced Polyester and Krydon, NEMA 7 and 9.)

	Top and Bottom Endwall							
Amperes	NEMA 4X Fiberglass Reinforced Polyester and Krydon■	NEMA 7 and 9♦						
30	3/4 in.	_						
60	1-1/4 in.	3/4 in.						
100	2 in.	1-1/4 in.						
200	2-1/2 in.	2-1/2 in.						

- Hubs and hub drilling templates are provided for field-installation.
- Threaded conduit opening.

Cat. No.	Series			٧٧				VV/	-
		in.	mm	in.	mm	in.	mm	in.	mm
H60XFA	E1	15.93	405	9.87	251	6.96	177	9.87	251
H100XFA	E1	15.93	405	9.87	251	6.96	177	9.87	251
H221AWK, A	F6	14.60	371	6.63	168	4.96	125	7.55	192
H221DS	F6	14.93	379	7.22	183	5.11	130	8.67	220
H221-2AWK	F6	16.50	419	9.00	229	7.00	178	10.50	267
H222AWK, A H222DS H223AWK, A H223DS H224A,AWK	F6 F6 F6 F6	14.60 14.93 20.50 20.82 29.00	371 379 521 529 737	6.63 7.22 9.00 9.36 17.25	168 183 229 238 438	4.96 5.11 7.00 6.97 8.75	125 130 178 177 216	7.55 8.67 10.50 11.25 18.63	192 220 267 286 473
H224DS	F6	29.00	737	17.75	451	8.88	226	19.25	489
H225AWK, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H225NAWK, NDS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H225XJG	C2	22.56	573	10.88	276	7.75	197	10.88	276
H226AWK, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H226NAWK, NDS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H227AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H228AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H265AWK, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H266AWK, A, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H267AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H268AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H321AWK, A	F6	14.60	371	6.63	168	4.96	125	7.55	192
H321DS	F6	14.93	379	7.22	183	5.11	130	8.67	220
H322AWK, A	F6	14.60	371	6.63	168	4.96	125	7.55	192
H322DS H323AWK, A H323DS H324A,AWK H324DS	F6 F6 F6 F6	14.93 20.50 20.82 29.00 29.00	379 521 529 737 737	7.22 9.00 9.36 17.25 17.75	183 229 238 438 451	5.11 7.00 6.97 8.75 8.88	130 178 177 216 226	8.67 10.50 11.25 18.63 19.25	220 267 286 473 489
H325AWK, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H325NAWK, NDS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H326AWK, DS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H326NAWK, NDS	E4	46.25	1175	26.25	667	10.13	259	26.25	667
H327AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H328AWK, NAWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930
H361AWA	F7	16.50	419	9.00	229	7.00	178	10.50	267
H361AWC	F7	16.50	419	9.00	229	7.00	178	10.50	267
H361AWK, A	F6	14.60	371	6.63	168	4.96	125	7.55	192
H361DS	F6	14.93	379	7.22	183	5.11	130	8.67	220
H361DSWA	F7	16.87	428	8.92	227	5.11	130	10.81	275
H361DSWC	F7	16.87	428	8.92	227	5.11	130	10.79	274
H361DF	F1	16.50	419	11.00	279	8.80	224	11.00	279
H361DX	F1	19.40	493	11.40	290	8.60	218	11.40	290
H361SS	F6	14.93	379	7.22	183	5.11	130	8.67	220
H361-2AWK, A	F6	16.50	419	9.00	229	7.00	178	10.50	267
H362AWA	F7	16.50	419	9.00	229	7.00	178	10.50	267
H362AWC	F7	16.50	419	9.00	229	7.00	178	10.50	267
H362AWH	F6	16.50	419	9.00	229	7.00	178	10.50	267
H362AWK, A	F6	16.50	419	9.00	229	7.00	178	10.50	267
H362DS	F6	16.87	428	8.92	227	6.97	177	10.81	275

Cast No.   Series   H			Approximate Dimensions								
H362DSWA	Cat. No.	Series	Н		W		D		W/I	Н	
H982DSW  F1   16.87   428   8.92   227   5.11   130   10.79   274	HOCODOWA										
H3662NS	H362DSWC	F7	16.87	428	8.92	227	5.11	130	10.79	274	
H36SAWK P7 20.50 521 9.00 229 7.00 178 10.50 267 H36SAWK P6 20.50 521 9.00 229 7.00 178 10.50 267 H36SAWK P6 20.50 521 9.00 229 7.00 178 10.50 267 H36SAWK P6 20.82 529 9.36 238 6.97 177 11.25 286											
H36SAWK A F6 20.50 521 9.00 229 7.00 178 10.50 267 H36SAWK A F6 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F7 20.82 529 9.36 238 6.97 177 11.25 286 196SAWK A F8 20.00 737 17.25 438 8.75 216 18.63 473 174 174 175 18.63 175 175 175 175 175 175 175 175 175 175	H362SS				8.92		6.97				
H96SDSWM		F7		521	9.00	229	7.00				
H963DSWC											
H96SIDX F1 24.80 630 13.70 348 12.00 305 13.70 348 H36SIDX F1 25.25 641 11.40 290 860 218 11.40 290 H36SIDX F1 12.52 86	H363DSWA	F7	20.82	529	9.36	238	6.97	177	11.25	286	
H363AS				630							
H364AAWK											
H364NA,NAWK	H364A,AWK	F6	29.00	737	17.25	438	8.75	216	18.63	473	
H364DF E1 31.30 795 26.30 668 11.80 300 26.30 668 13684S											
HagsAWK, NDS   E4   46.25   1175   26.25   667   10.13   259   26.25   667     HagsABAWK, NDS   E4   46.25   1175   26.25   667   10.13   259   26.25   667     HagsABWK, NDS   E4   46.25   1175   26.25   667   10.13   259   26.25   667     HagsABWK, NDWK   E4   46.25   1175   26.25   667   10.13   259   26.25   667     HagsABWK, NAWK   E4   69.13   1756   36.62   390   17.75   451   36.62   390     HagsABWK, NAWK   E6   69.13   1756   36.62   390   17.75   451   36.62   390     HagsABWK, NAWK   E6   69.13   1756   36.62   390   17.75   451   36.62   390     HagsABWK, NAWK   E6   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   25.25   15.08   383   6.97   177   16.85   428     HagsABWK   E7   20.25   17.75   20.25   603   8.88   226   22.25   826     HagsABWK   E7   20.25   17.75   20.25   603   8.88   226   22.25   826     HagsABWK   E7   20.25   17.75   27.75   77.5   8.68   20.25   82.25     HagsABWK   E7   20.25   17.75   27.75   27.75   8.68   20.25   82.25     HagsABWK   E7   20.25   20.25   15.08   38.08   67.75   22.22   488   63.24     HagsABWK   E8   46.25   1175   26.25   667   10.13   25.99   26.25   667     HuzerAWW   E8   46.25   1175   26.25   667   10.13   25.99   26.25   667     HuzerAWW   E4   69.13   1756   36.62   390   17.75   41.51   36.62   390     HuzerAWW   E4   69.13   1756   36.62   390   17.75   41.51   36.62   390     HuzerAWW   E7   16.50   419   9.00   22.9   7.00   778   10.50   267     HuzerAWW   E7   16.50   419   9.00   22.9   7.00   778   10.50   267     HuzerAWW   E7   16.50   419   9.00   22.9   7.00   778   10.50   267     HuzerAWW   E7   16.50   419   9.00   22.9   7.0											
H366AWK, DS, SS H4 46.25   1175   26.25   667   10.13   259   26.25   667   H366AWK, NAWK	H365AWK, DS, SS	E4	46.25	1175	26.25	667	10.13	259	26.25	667	
H366AWK, NAWK	H365NAWK, NDS										
H368AWK, NAWK	H366NAWK, NDS, SS		46.25	1175	26.25	667	10.13	259	26.25	667	
H461DS F6 20.90 529 15.08 383 6.97 177 16.85 428 H462AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 H462DS F6 20.90 521 14.75 375 6.80 173 16.13 410 H462DS F6 20.90 521 14.75 375 6.80 173 16.13 410 H463DS F6 20.90 737 23.25 591 8.75 222 24.88 632 H464AWK F6 29.00 737 23.25 591 8.75 222 24.88 632 H464AWK F6 29.00 737 23.25 591 8.75 222 24.88 632 H465AWK E4 46.25 11.75 32.50 826 10.13 259 32.50 826 H663AWK F6 20.90 737 23.25 591 8.75 32.50 826 H663AWK F6 20.90 737 23.25 591 8.75 222 24.88 632 H663AWK F6 20.90 737 23.25 591 8.75 222 24.88 632 H663AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 641 H268AWK F6 20.90 737 23.75 603 8.88 226 25.25 667 H226AWK F6 46.25 11.75 26.25 667 10.13 259 26.25 667 H26AWK F6 20.90 737 23.75 603 8.88 226 25.25 667 H26AWK F6 20.90 737 23.75 803 8.89 226 25 667 H26AWK F6 20.90 737 23.75 803 8.89 226 25.66 67 H26AWK F6 20.90 737 23.75 803 8.89 226 25.66 67 H26AWK F6 20.90 737 23.75 803 8.89 226 25.66 67 H26AWK F6 20.90 737 23.75 803 80.90 77.75 451 36.62 930 H26AWK F6 20.90 80.90 77.75 451 36.62 930 H26AWK F6 20.90 80.90 77.75 451 36.62 930 H26AWK F6 20.90 80.90 80.90 80.90 77.75 451 36.62 930 H26AWK F6 20.90 80.90											
H462AWK F6 20.50 521 14.75 375 6.80 173 16.13 410   H462AWK F6 20.50 521 14.75 375 6.80 173 16.13 410   H463 DS F6 20.82 529 15.08 383 6.97 177 16.85 428   H464AWK F6 29.00 737 23.25 591 8.75 222 24.88 632   H464AWK F6 29.00 737 23.25 591 8.75 222 24.88 632   H466AWK F6 29.00 737 23.75 603 8.88 226 52.55 641   H465AWK F6 29.00 737 23.75 603 8.88 226 52.55 641   H465AWK F6 20.50 521 14.75 375 6.80 173 16.13 410   H663DS F6 20.82 529 15.08 383 6.97 177 16.85 428   H663DS F6 20.82 529 15.08 383 6.97 177 16.85 428   H664DS F6 20.50 521 14.75 375 6.90 173 16.13 410   H664DW F6 20.50 521 14.75 375 6.90 173 16.13 410   H286AWK F6 20.50 521 14.75 375 6.90 173 16.13 410   H286AWK F6 20.50 521 14.75 5 65 591 8.75 222 24.88 632   H664DS F6 20.00 737 23.25 591 8.75 222 24.88 632   H286AWK DS E4 46.25 11.75 26.25 667 10.13 259 26.25 667   H286AWK DS E4 46.25 11.75 26.25 667 10.13 259 26.25 667   H286AWK E4 69.13 17.56 36.62 390 17.75 451 36.62 930   H286AWK E4 69.13 17.56 36.62 390 17.75 451 36.62 930   H286AWK E7 16.50 419 9.00 229 7.00 178 10.50 267   H286AWK E7 16.50 419 9.00 229 7.00 178 10.50 267   H286AWK E7 16.50 419 9.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 9.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 279 8.80 12.5 75.5 192   H286AWK E7 16.60 419 10.00 279 8.80 224 11.10 10.79 274   H286AWK E7 16.60 419 10.00 279 8.80 224 11.10 10.79 274   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.50 267   H286AWK E7 16.60 419 10.00 229 7.00 178 10.5			20.50	521	14.75				16.13		
H4653MK	H462AWK	F6	20.50	521	14.75	375	6.80	173	16.13	410	
H463 DS			20.50	521	14.75						
H464DS		F6	20.82	529			6.97	177	16.85	428	
H663AWK	H464DS	F6	29.00	737	23.75	603	8.88	226	25.25	641	
H663DS											
H664DS	H663DS					383	6.97	177	16.85	428	
HU266AWK, DS	H664DS	F6	29.00	737	23.75	603	8.88	226	25.25	641	
HUZ67AWK											
HU361AWA			69.13		36.62	930	17.75	451	36.62	930	
HU361AWK A						229			10.50	267	
HU361DSWA F7 16.87 428 8.92 227 5.11 130 8.67 220 HU361DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU361DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU361DF F1 16.50 419 11.00 279 8.80 224 11.00 279 HU361SS F6 14.93 379 7.22 183 5.11 130 8.67 220 HU362AWA F7 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F7 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.50 267 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.81 275 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178											
HU361DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU361DK F1 19.40 493 11.40 290 8.60 218 11.140 290 HU361SS F6 14.93 379 7.22 183 5.11 130 8.67 220 HU362AWA F7 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWH F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWK F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWK F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.50 267 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F1 19.40 493 11.40 290 8.60 218 11.40 290 HU363AWK F7 12.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363BWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363DSWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363DSWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363DSWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363DSWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU364NK DS. SS E4 46.25 1175 26.25 667 10.13 259 26.50 667 HU364SWK F6 29.00 737 17.75 451 8.88 226 19.25 489 HU364SWK F6 29.00 737 17.75 451 8.88 226 19.25 489 HU364SWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU461DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU464DWK F6 20.00 737 23.25 591 5.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466DS F6 20.8	HU361DS	F6	14.93	379	7.22	183	5.11		8.67	220	
HU361DX	HU361DSWC	F7	16.87	428	8.92	227	5.11	130	10.79	274	
HU362AWA F7 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWA F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWH F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362AWH, A F6 16.50 419 9.00 229 7.00 178 10.50 267 HU362DSW F6 16.87 428 8.92 227 6.97 177 10.81 275 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 16.87 428 8.92 227 5.11 130 10.79 274 HU362DSWC F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F6 20.50 521 9.00 229 7.00 178 10.50 267 HU363AWA F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DSWC F7 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU363DF F1 24.80 630 13.70 348 12.00 305 13.70 348 HU363DF F1 25.25 641 11.40 290 8.60 218 11.40 290 HU363DS F6 20.82 529 9.36 238 6.97 177 11.25 286 HU364A,AWK F6 29.00 737 17.75 451 8.88 226 19.25 489 HU364A,WK F6 29.00 737 17.75 451 8.88 226 19.25 489 HU364AWK F6 29.00 737 17.75 451 8.88 226 19.25 489 HU364AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU364AWK F6 20.50 521 14.75 375 6.80 173 16.13 411 HU461DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU462DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU661DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU466AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU661DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU663DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.50 52								218			
HU362AWC	HU361SS						5.11				
HU362AWK, A	HU362AWC	F7	16.50	419	9.00	229	7.00	178	10.50	267	
HU362DSWA	HU362AWK, A	F6		419	9.00	229		178		267	
HU362DSWC											
HU362DX	HU362DSWC	F7	16.87	428	8.92	227	5.11	130	10.79	274	
HU363AWA											
HU363AWK											
HU363DS	HU363AWC	F7	20.50	521	9.00	229	7.00	178	10.50	267	
HU363DSWA											
HU363DF	HU363DSWA	F7 F7	20.82	529	9.36	238	6.97	177	11.25	286	
HU363SS	HU363DF	F1	24.80	630	13.70	348	12.00	305	13.70	348	
HU364DF	HU363SS	F6	20.82	529	9.36	238	6.97	177	11.25	286	
HU364DS F6 29.00 737 17.75 451 8.88 226 19.25 489 HU365AWK, DS, SS E4 46.25 1175 26.25 667 10.13 259 26.25 667 HU366AWK, DS, SS E4 46.25 1175 26.25 667 10.13 259 26.25 667 HU366AWK, DS, SS E4 46.25 1175 26.25 667 10.13 259 26.25 667 HU366AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E4 69.13 1756 36.62 930 17.75 451 36.62 930 HU361AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU363AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU363AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU364AWK E6 29.00 737 23.25 591 8.75 222 24.88 632 HU365AWK E4 46.25 1175 32.50 826 10.13 259 32.50 826 HU365AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU365AWK E6 20.50 521 14.75 375 6.80 173 16.13 410 HU361DS E6 29.00 737 23.25 591 8.75 222 24.88 632 HU3661AWK E6 20.50 521 14.75 375 6.80 173 16.13 410 HU361DS E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3661AWK E6 20.50 521 14.75 375 6.80 173 16.13 410 HU361DS E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3662AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85 428 HU3663AWK E6 20.82 529 15.08 383 6.97 177 16.85		E1							26.30		
HU365AWK, DS, SS	HU364DS	F6	29.00	737	17.75	451	8.88	226	19.25	489	
HU367AWK	HU365AWK, DS, SS	E4	46.25	1175	26.25	667	10.13	259	26.25	667	
HU368AWK											
HU461DS	HU368AWK	E4	69.13	1756	36.62	930	17.75	451	36.62	930	
HU462AWK F6 21.25 540 16.13 410 6.80 173 16.13 410 HU462DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU463AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU463DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU464AWK F6 29.00 737 23.75 591 8.75 222 24.88 632 HU464AWK E4 46.25 1175 32.50 826 10.13 259 32.50 826 HU4661AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU661DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU662AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU662DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU662AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 20.80 529 15.08 383 6.97 177 16.85 428 HU664AWK	HU461DS	F6	20.82	529	15.08	383	6.97	177	16.85	428	
HU463AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU463AWK F6 29.00 737 23.25 591 8.75 222 24.88 632 HU464AWK F6 29.00 737 23.25 591 8.75 222 24.88 632 HU464DS F6 29.00 737 23.25 591 8.75 222 24.88 632 HU465AWK F6 29.00 737 23.75 6.03 8.88 226 25.25 641 HU465AWK F6 20.50 521 14.75 37.5 6.80 173 16.13 410 HU661DS F6 20.50 521 14.75 37.5 6.80 173 16.13 410 HU662DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU662AWK F6 20.50 521 14.75 37.5 6.80 173 16.13 410 HU662DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.50 521 14.75 37.5 6.80 173 16.13 410 HU663DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.50 521 14.75 37.5 6.80 173 16.13 410 HU663DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU663AWK F6 20.82 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 29.00 737 23.25 591 8.75 222 24.88 632	HU462DS	F6	20.82	529	15.08	383	6.97	177	16.85	428	
HU464AWK   F6   29.00   737   23.25   591   8.75   222   24.88   632   HU464DS   F6   29.00   737   23.75   603   8.88   226   25.25   641   HU465AWK   E4   46.25   11.75   32.50   826   10.13   259   32.50   826   HU661AWK   F6   20.50   521   14.75   375   6.80   173   16.13   410   HU661DS   F6   20.82   529   15.08   383   6.97   177   16.85   428   42		F6		521	14.75	375	6.80	173	16.13		
HU465AWK         E4         46.25         1175         32.50         826         10.13         259         32.50         826           HU661AWK         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU661DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU662DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU663DS         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU663DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU664AWK         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU664AWK         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU664AWK         F6         29.00         737         23.25	HU464AWK	F6	29.00	737	23.25	591	8.75	222	24.88	632	
HU661AWK         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU661DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU662AWK         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU662DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU663DS         F6         20.82         529         15.08         383         6.97         173         16.13         410           HU663DS         F6         20.82         529         15.08         383         6.97         173         16.13         410           HU664AWK         F6         29.00         737         23.25         591         8.75         222         24.88         632		E4	46.25	1175	32.50	826	10.13	259	32.50	826	
HU662AWK         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU662DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU663AWK         F6         20.50         521         14.75         375         6.80         173         16.13         410           HU663DS         F6         20.82         529         15.08         383         6.97         177         16.85         428           HU664AWK         F6         29.00         737         23.25         591         8.75         222         24.88         632	HU661AWK	F6	20.50	521	14.75	375	6.80	173	16.13	410	
HU663AWK F6 20.50 521 14.75 375 6.80 173 16.13 410 HU663DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 29.00 737 23.25 591 8.75 222 24.88 632	HU662AWK	F6	20.50	521	14.75	375	6.80	173	16.13	410	
HU663DS F6 20.82 529 15.08 383 6.97 177 16.85 428 HU664AWK F6 29.00 737 23.25 591 8.75 222 24.88 632											
	HU663DS	F6	20.82	529	15.08	383	6.97	177	16.85	428	





#### 30-100 A Types DT, DTU (Series F)

- •Fusible (DT) and non-fusible (DTU) switches available
- •Manually-operated switch suitable for use in accordance with article 702 of the NEC, ANSI/NFPA 70
- Standards: UL 98, NEMA KS1, CSA, and NOM
- •Modular design—switch handle, lock-plate, switch mechanism; line and load bases are field replaceable
- •UL Listed short circuit current ratings up to 200 kA (using Class R, J, or T fuses—see table for rating)
- •Load make/break rated
- •Meets NEMA hp ratings
- Dual cover interlock
- •May be padlocked ON (I) or OFF (O)
- •Lock-off accepts up to three padlocks
- Side-opening door
- •Quick make / quick break mechanism
- •Meets NEMA requirements as heavy duty switch
- •Field-installed electrical interlock kits
- •Field-installed neutral assembly kits (2P and 3P switches)
- •UL Listed as suitable for use as service equipment
- Supplied as standard for switching one load between two power sources, and may be field-converted to switch on power source between two loads.



30-100 A DT, DTU (Series F) NEMA 1



82,000 Line NEMA 1

## 30 (Series T4), 200-600 A Types 82,000 and 200 A DTU (Series E, A)

- Non-fusible
- •Designed for manual transfer of loads from one supply to another
- •UL Listed switches are suitable for use in accordance with Article 702 of the National Electrical Code, ANSI / NFPA 70
- •All 82,000 and DTU double throw switches are continuous duty rated for their nameplate ampere rating
- The 82,000 and DTU (Series E, A) switches are load make/break rated
- •UL Listed as suitable for use as service equipment
- •Horsepower rated only as footnoted.

#### **Field-Installed Accessories:**

- -Neutral
- -Electrical Interlock
- —Grounding Terminals

Table 5.57. 24			low Salety S				NEMA 4,	<b>4</b>	NEMA	. 12				Ratings <b>▲</b>	•
System	Amperes	Current Series	NEMA	.1	NEMA 3F	₹	304 Stainles	ss Steel	Gaske	eted	,	240 Std.	Vac	Max.	250 Vdc ♦
			Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	1Ø	3Ø	1Ø	3Ø	200 1201
Fusible—2P, 240 Vac	250 Vdc											ı			
o o Line o Line Load	100	F	DT223	2379.00	DT223RB	3056.00	-	_	-	_	7.5	15 ★	15	30 ★	20
Fusible—3P, 240 Vac	:250 Vdc			l		I					1	I			l
o o Line	30 60	F F	DT321 DT322 DT323	1646.00 1970.00 3104.00	DT321RB DT322RB	2216.00 2612.00 3725.00	-		- -	_ _ _	1.5 ▼ 3 ▼ 7.5 ▼	3 ★ 7.5 ★	3 ▼ 10 ▼	7.5 ★ 15 ★ 30 ★	5 10 20
Non-Fusible—2P, 240	) Nac—250	Vdc								1					
o o Line	60 100	F F	DTU222 DTU223	962.00 1371.00	— DTU223RB	 1347.00	<u> </u>	_ _	<u> </u>			<u> </u>	10 15	- -	10 △ 20 △
9 9	30 200	T4 E	92251 □ 82254 <del>•</del>	585.00 1815.00	— DTU224NRB □ ◊ •	2177.00	_ _	_	— H82254	— 4671.00	 15	_	_	_	
<b>∞</b> -∞-,	_	_		_		_	_	_	_	_	15	_	_	_	_
O O Non-Fusible—3P, 240	400 0 Vac—250	A Vdc	82255 □	5850.00	82255R □	8715.00	<u> </u>	_	H82255 □	10335.00		_	_	_	
o o o Line	30 60 100	F F	DTU321 DTU322 DTU323	804.00 1119.00 1764.00	  DTU323RB	  1953.00	<u>-</u> -		= =	_ _ _	_ _ _	3* - -	5 ▼ 10 ▼ 15 ▼	10 ★ 15 ★ 30 ★	5 Δ 10 Δ 20 Δ
	30 200 200 400	T4 E E A	92351 □ 82354 □ DTU324N □ ◊ 82355 □	687.00 2564.00 2798.00 8040.00	 DTU324NRB □ ♦  82355R □	3005.00 — 13038.00	_ _ _		— H82354 □★ — H82355 □	5408.00 — 11715.00	_ _ _	 15 15	_ _ _	1 1	_ _ _
4 4 4	600	A	DTU326	12555.00	DTU326R	13890.00	_ _		- 102000 🗆			— 125		_	— 50
Non-Fusible—4P, 240	30 200 400 600	T4 E A A	92451 82454 <b>♀</b> 82455 DTU426	953.00 5184.00 11505.00 20355.00	82454R <b>•</b> 82455R DTU426R	 7517.00 16200.00 20595.00	— — — —	  -  -  -	— H82454 ∇ H82455 —	— 6779.00 15975.00 —	— — — —	— 15∇ — 125	_ _ _ _	 	— — — — 50

Refer to page 7-31 for additional motor application data. The starting current of motors or more than standard horsepower may require the use of fuses with appropriate time delay characteristics.

Std.—Using fast acting one time fuses. Max.—Using dual element time delay fuses.
For switching dc, use two switching poles.

If used on corner grounded delta systems, install neutral and use outer switching pole for ungrounded conductors.

Use outer switching poles.

- Maximum rating.
- 240 Vac only.

  Neutral included with device.
- Suitable for use as service equipment.

- Hp rating applies only to H82454. 250 V dc rated.

600 V Double Throw	page	3-17
Accessories		
Application Data	page	3-19
Dimensions: 30-100 A (Series F)	page	3-20
Dimensions: 20, 200, 600 A (Series E T4, A)	nago	2-21

600 V Double Throw Safety Switches Table 3.38:

Table 3.38: 600			w Safety										Horse	power F	Ratings	s A O		
System	Amperes	Current	NEM	A 1	NEMA	3R	NEMA 4 304 Stainle	,4X,5 ss Steel	NEMA 1 Gaskete	l2 ed	240	) Vac	48	0 Vac	600	Vac	Vdc	: <b>□</b>
Cyclem	Amperes	Series									std	max	std	max	std	max	250	600
Fusible 3P, 600 Vac—600	0 Vide		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	3Ø	3Ø	3Ø ■	3Ø■	3Ø	3Ø		
	l vac					I				I								
o o o Line	30 60 100	F F	DT361 DT362 DT363	2016.00 2111.00 3686.00	DT361RB DT362RB DT363RB	2678.00 3135.00 4427.00	- -	- - -	_ _ _	_ _ _		_ _ _	5 15 25	15 30 60	7.5 15 30	20 50 75	5 — —	15 30 50
Non-Fusible 3P, 600 Vac	:600 Vdc					ı			ı		1Ø ★	3Ø ■	1Ø ★	3Ø ■	1Ø ★	3Ø		
o o Line	30 60 100	FFF	DTU361 DTU362 DTU363	879.00 1254.00 2036.00	DTU361RB DTU362RB DTU363RB	1544.00 2045.00 3425.00	 DTU362DS DTU363DS		 DTU362AWK ☑ DTU363AWK ☑	— 3635.00 3894.00	5 10 20	10 20▼ 40♦	7.5 25 40	20 50 □ 75 ◊☆	10 30 40	30 60 □ 75 ◊	5 10 20	15 30 50
<u> </u>	220	-	2004457.0	2722.00	22244DB T/A	5000.00	22044D0FF+	11115 00	11000444574	7500.00				45.0				
<b>∞</b> -∞-∞-	200 400 600	E A A	82344∇	8213.00	82344RB ∇	13140.00	82344DS∇‡ 82345DS Φ —	15675.00	H82344 ★ ♥ ♦ H82345 ● DTU366AWK ● †	7503.00 12105.00 21675.00	_ _ _	_ _ 125		15 • — 250		 350	 50	_ _ _
Non-Fusible 4P, 600 Vac	600 Vdc										2Ø	3Ø	2Ø	3Ø	2Ø	3Ø		
Q Q Q Line	60 100	FF	DTU462 DTU463	3035.00 3851.00	Use NEMA 12	- -	DTU462DS DTU463DS		DTU462AWK ☑ DTU463AWK ☑	4184.00 6123.00	20 30	20 40	40 50	50 75	50 50	60 75	10 20	30 30
<u> </u>	220	-	20444.0	0140.00	20444D 6	2420.00	20444DC 4	15105.00	1100444 #57.0	74 40 00								_
○<-○<-○<- 	200 400 600	E A A	82444 • 82445 • DTU466 •	6143.00 12578.00 20355.00	82444R	8130.00 16800.00 23475.00	82444DS • — —	15105.00 — —	H82444 <b>*</b> ∇ <b>•</b> H82445 <b>•</b> —	7143.00 16845.00 —	_ _ _	_ _ 125		  250		 350	 50	_ _ _
Non-Fusible 6P, 600 Vac	:—600 Vdc									<u> </u>	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø		
o o o o o Line	60 100	FF							DTU662AWK ☑ DTU663AWK ☑	8474.00 12735.00		20 40		50 75		60 75	10 20	30 50

- Refer to page 7-31 for additional motor application data. The starting current of motors or more than standard horsepower may require the use of fuses with appropriate time delay characteristics. If used on corner grounded delta systems, install neutral and use outer switching pole for ungrounded conductors.

- For switching dc, use two switching poles.
  Use outer switching poles.
  Maximum Hp is 15 for corner grounded delta systems.
- Maximum Hp is 30 for corner grounded delta systems. Use 75°C #4 Cu or #2 Al conductors only.
- Use 75°C #1 Cu conductors only.

- Maximum Hp is 60 for corner grounded delta systems. 480 Vac maximum only, 250Vdc.
- Standard Hp rating.
- Not suitable for use as service equipment. 600 Vac max.
- 250 V dc rated
- Std.—Using fast acting one time fuses. Max.—Using dual element time delay fuses. (Non-fusible switches have max rating unless noted.) 0
- Complete rating on switch is NEMA 3R or 12. For 3R applications, remove drain screw from bottom endwall.
- Not UL Listed.

  Copper lugs not listed or available.

240 V Double Throw	
Accessoriespage 3-18	
Application Data	
Dimensions: 30–100 A (Series F) page 3-20	
Dimensions: 30, 200–600 A (Series F. T4, A)	

#### Table 3.38: **Neutral Assembly**

Switch	Field-Installed Standard Neutral Kit Cat. No.	Terminal Data AWG/kcmil	\$ Price	Field-Installed Copper only Neutral Kit Cat. No.		\$ Price
30-100 A Type DT, DTU (Series F) (2- and 3-pole switches only)	SN0310	14-1/0 Al/Cu	114.00	SN0310C	14-1/0 Cu	120.00
30 A (Series T4) (2- and 3-pole switches only)	<b>A</b>	<b>A</b>	908.00	_	Ī	
200 A Type 82000 and DTU (Series E) ■	<b>A</b>	<b>A</b>	1110.00	_	_	_
400 A Type 82000	DT400N	(1) 4–600kcmil o (2) 1/0–250kcmil	105.00	=	_	_
600 A Type DTU (Series A)	DT600NKD	250-500kcmil	452.00	_	_	_

- For Type 82,000 switches, neutral is available factory-installed on 2P and 3P double throw switches. Not UL Listed. To order, add suffix N to the standard catalog number and add the above price to the list price of the switch. For DTU switches, neutral is factory-installed in standard device and is UL Listed.
- Neutral assembly catalog number DT200N can be added to 4P Type 82000 switches in the field.

#### Table 3.39: Electrical Interlocks (For Electrical Interlock Contact Ratings, see Supplemental Digest page 2-4.)

Switch	Field-Installed Electrical Interlock Kit Cat. No. ◆	\$ Price	Factory-Installed \$ Price Adder Per Switch
30-100 A Type DT, DTU (Series F)	EIK1, EIK2 ★♦	311.00	
200 A Type 82000 and DTU (Series E) △		_	1113.00▼
400 A Type 82000	EK400DTU2	260.00	1533.00
600 A Type DTU (Series A)	DS200EK2D	438.00	_

- Electrical interlock kit catalog numbers with "1" suffix indicate one normally open and normally closed contact; "2" indicates two normally open and two normally closed contacts. See page 3-10 for electrical interlock ratings.
  30–100 A Type DT, DTU (Series F) switches contain (2) separate switching mechanisms. Each mechanism will accept an electrical interlock. Some applications may therefore require (2) electrical interlocks.
- 30–100 A Type DT, DTU (Series F) switches with factory-installed electrical interlocks installed are UL Listed and interlocks are furnished with 2 N.O. /2 N.C. contacts installed in both "ON" positions. To order, add suffix EI to standard catalog number.

  Electrical interlock EK400DTU2 can be added to 4-pole Type 82000 switches in the field.
- Type 82000 and DTU switches are available with electrical interlock factory-installed only. Not UL listed. Electrical interlocks are furnished with 2 N.O./N.C. contacts and are installed in both "ON" positions. To order, add suffix El to standard switch catalog number.
- Double throw switches 92251, 92351, and 92451 are not available with factory or field installed electrical interlocks.

#### Table 3.40: Service Grounding Kit (Required for service equipment use.)

Switch	Field-Installed Service Grounding Lug Kit Cat. No.	Terminal Data AWG/kcmil	\$ Price
30-100 A Type DT, DTU (Series F)	Included	Included	std.
30 A Type 92,000	DT30SG	(4) 14-4 Cu/Al	29.40
200 A Type 82000 and DTU (Series E)	DT100SG	(3) 14-1/0 Cu/Al	30.00
400 A Type 82000	PKOGTA2 (2 required)	(4) 10–2/0 Cu or (4) 6–2/0 Al	55.00
600 A Type 82000 (Series A)	DS468GKD	6–250kcmil	309.00

#### Table 3.41: Class R Fuse Kits

When installed, this kit rejects all but Class R fuses. Kits are available for field installation. For factory installation, add "CLR" suffix to catalog number.

Switch	Series Number	Class R Fuse Kit Cat. No.	\$ Price	Factory-Installed	\$ Price
Class R Fuse Kits-	-240 V (two kits per 3P switch	n)			
30 A 60 A 100 A	F5 F5 F5	RFK03 RFK06 RFK10	24.50 25.50 47.70		390.00 390.00 390.00
Class R Fuse Kits-	-600 V (two kits per 3P switch	1)			
30 A 60 A 100 A	F5 F5 F5	RFK06 RFK06H RFK10	25.50 25.50 47.70		390.00 390.00 390.00

#### Viewing Windows

See Table 3.29 for list price. Accessory available on 30-100 A DTU switches only.

#### **Key Interlock Systems**

For factory-installed key interlocks, refer to page 3-12.

#### **Phenolic Legend Plate**

"RB Hub"

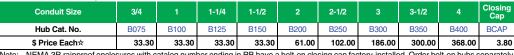
For factory-installed phenolic legend plates, refer to Supplemental Digest page 2.3.

#### Lock-On Provisions-UL Listed

Standard and feature on 30-100 A type DT and DTU (Series F), 82,000 (400 A only) and type 92,000 switches.

Feature available as facatory installed option for Type 82,000 (200 A only) and 200 A DTU (Series E) switches. Add the suffix SPLO to the catalog number and add \$410. to the switches list price.





NEMA 3R rainproof enclosures with catalog number ending in RB have a bolt-on closing cap factory-installed. Order bolt-on hubs separately from table above. For more details see page 1-13. Hubs through size 2-1/2 in. can be directly installed on RB devices. Devices requiring 3 in. or larger hubs must have holes cut in the field. Gaskets are provided on 3 in. and larger hubs.

Note: All hubs are UL Listed for indoor and rainproof applications and suitable for use with conduit having ANSI standard taper pipe thread.

See Discount Schedule

Table 3.43: Watertight Hubs—for use on NEMA 4, 4X and 5 Stainless Steel and NEMA 12 Enclosures 1-1/4 1-1/2 3-1/2 Conduit Trade Size 1/2 2-1/2 Standard-Zinc Hub Cat. No. H050 H075 H100 H125 H150 H200 H250 H300 H350 H400 381.00 Zinc \$ Price Each 31.10 45.00 47.10 54.00 83.00 120.00 138.00 177.00 282.00 Chrome Plated Hub Cat. No. H050CP H075CP H100CP H150CP 1200CP H125CP Chrome Plated \$ Price Each 40.70 56.00 64.00 67.00 137.00

***************************************	 	
240 V Double Throw	 page	3-16
600 V Double Throw	 page	3-17
Application Data	 page	3-19
Dimensions: 30-100 A (Series F)	 page	3-20
Dimensions: 30, 200-600 A (Series F, T4, A)	nage	3-21





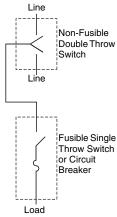
#### Situations Requiring **Fuses**

30-100 A Type DT (Series F):

Select DT switches from pages 3-16, 3-17, which have provisions for accepting fuses.

30 A, 200-600 A Type 82,000 (Series E, T4, A), all DTU devices:

Use the non-fusible double throw switches from pages 3-16, 3-17 in conjunction with standard fusible devices, and install them according to diagram 1 or 2, below.



#### Diagram 1

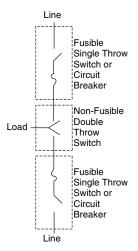


Diagram 2

#### Table 3.44: **UL Listed Short Circuit Current Ratings**

Switch Type Amperes		Voltage Rating	UL Listed Fuse Class	Short Circuit Current Rating (A)	
Type DT	30–100 A	240 V or	H, K	10,000	
(Series F)	30-100 A	600 V	R, J	200,000	
Type DTU	30–100 A	240 V or	H or K	10,000 ♦	
(Series F)	30-100 A	600 V	R, J or T	200,000	
DTU224NRB and DTU324NRB (Series E)	200 A	240 V	н, к	10,000 ♦	
DTU324N	200 A	240 V	H, K	10,000 ♦	
(Series E)	200 A	240 V	R, J	100,000	
		240 V	H, K	10,000 ♦	
Гуре 82,000	all	240 V	R, J	100,000 ★	
		600 V	H, K	10,000 ♦	
Ema DTII (A corios)	600 A	240 V or 600 V	H, K	10,000	
Type DTU (A series)	600 A	240 V 01 600 V	R, J, T	100,000	

- Rating applies to AC only. The UL Listed short circuit current rating for non-fusible switches is based on the switch being used in conjunction with the corresponding fuse type. Evaluation of non-fusible switches in conjunction with molded case circuit breakers has not been performed.

  The DTU361 and DTU361RB are also suitable for use on a circuit capable of delivering not more than (A) 18 kA, 600 Vac maximum when protected by Type FH circuit breaker rated 30 A maximum or (B) 14 kA, 600 Vac maximum when protected by Type FA circuit breaker rated 30 A maximum.
- Any brand of circuit breaker or fuse not exceeding the ampere rating of the switch may be used ahead of a non-fusible safety switch when there is up to 10 kA short circuit current available.

400 A 82,000 switch is only 10 kA.

Table 3.45: Terminal Lug Data for Type DT, DTU (Series F) Double Throw Safety Switches

	Wires	NE	MA 1, 3R, 4, 4X, 12		
Switch Type	per Phase	Wire Range Wire Bending Space Per NEC Table 373-6 AWG/kcmil	Standard Lug Wire Range AWG/kcmil	Optional Compression Lug Field-Installed	Optional Copper Only Lug
30–60 A Type DT, DTU (Series F)	1	12–2 Al or 14–2 Cu	12–2 Al or 14–2 Cu	C10-14, D8-14, or E6-14 ▼	See pages 3-12 and 3-14 for appropriate
100 A Type DT, DTU (Series F)	1	12–1/0 Al or 14–1/0 Cu	12–1/0 Al or 14–1/0 Cu	VCEL02114S1 △	Order two kits per switch.

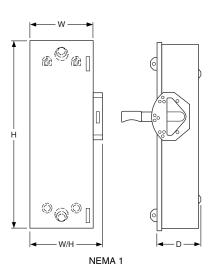
Thomas and Betts catalog numbers.
Hubbell Versa-Crimp<sup>™</sup> catalog numbers.

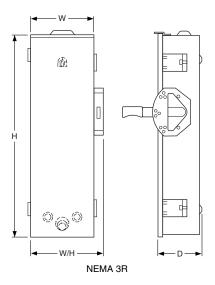
Terminal Lug Data for Types 82,000 and for A and E-Series DTU devices  $\ \square$ Table 3.46:

Amperes	Wires per Phase	Wire Range Wire Bending Space Per NEC Table 373-6 AWG/kcmil	Lug Wire Range AWG/kcmil	Optional Compression Lugs Field-Installed
30 A (Series T4) ♦	1	14–8 Al/Cu	12–2 Al or 14–2 Cu	_
200	1	6-300 Al/Cu	6-300 Al/Cu	VCEL030516H1 ☆
400	1 or 2	1/0–600 Al/Cu or 1/0–300 Al/Cu	1/0-600 Al/Cu	_
600	2	250-500 Al/Cu	250-500 Al/Cu	_
□ 200–600 A switches suitable fo	r 75°C conductors.			

- 200-600 A switches suitable for 75°C conductors. 30 A switches suitable for 60°C or 75°C conductors. Hubbell Versa-Crimp<sup>™</sup> catalog numbers.

240 V Double Throw	.page	3-16
600 V Double Throw	page	3-17
Accessories	.page	3-18
Dimensions: 30-100 A (Series F)	.page	3-20
Dimensions: 20, 200, 600 A (Corios E T4 A)	nogo	2 21





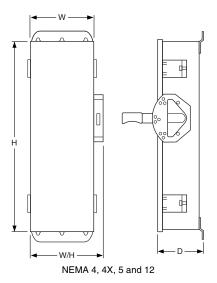


Table 3.47: 30–100 A Type DT, DTU (Series F)—Approximate Dimensions

Out No.		Н		W		W	/H	D		
Cat. No.	Series	in.	mm	in.	mm	in.	mm	in.	mm	
DT223	F5	38.00	965	9.88	251	11.13	283	6.75	171	
DT223RB	F5	38.00	965	6.87	174	8.12	206	6.60	168	
DT321	F5	38.00	965	10.25	260	11.50	292	6.75	171	
DT321RB	F5	38.00	965	10.25	260	11.80	300	6.60	168	
DT322	F5	38.00	965	10.25	260	11.50	292	6.75	171	
DT322RB	F5	38.00	965	10.25	260	11.80	300	6.60	168	
DT323	F5	38.00	965	9.88	251	11.13	283	6.75	171	
DT323RB	F5	38.00	965	6.87	174	8.12	206	6.60	168	
DT361	F5	38.00	965	10.25	260	11.50	292	6.75	171	
DT361RB	F5	38.00	965	10.25	260	11.80	300	6.60	168	
DT362	F5	38.00	965	10.25	260	11.50	292	6.75	171	
DT362RB	F5	38.00	965	10.25	260	11.80	300	6.60	168	
DT363	F5	38.00	965	9.88	251	11.13	283	6.75	171	
DT363RB	F5	38.00	965	6.87	174	8.12	206	6.60	168	
DTU222	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU223	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU223RB	F5	30.50	775	10.25	260	11.96	304	6.93	176	
DTU321	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU322	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU323	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU323RB	F5	30.50	775	10.25	260	11.96	304	6.93	176	
DTU361	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU361RB	F5	30.50	775	10.25	260	11.96	304	6.93	176	
DTU362	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU362AWK	F6	29.94	760	10.25	260	11.96	304	6.93	176	
DTU362DS	F6	30.26	769	10.25	260	11.50	292	7.12	181	
DTU362RB	F5	30.50	775	10.25	260	11.96	304	6.93	176	
DTU363	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU363AWK	F6	29.94	760	10.25	260	11.96	304	6.93	176	
DTU363DS	F6	30.26	769	10.25	260	11.50	292	7.12	181	
DTU363RB	F5	30.50	775	10.25	260	11.96	304	6.93	176	
DTU462	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU462AWK	F6	30.26	769	15.50	394	16.75	425	7.12	181	
DTU462DS	F6	30.26	769	15.50	394	16.75	425	7.12	181	
DTU463	F5	29.94	760	10.25	260	11.96	304	6.93	176	
DTU463AWK	F6	30.26	769	15.50	394	16.75	425	7.12	181	
DTU463DS	F6	30.26	769	15.50	394	16.75	425	7.12	181	
DTU662AWK	F6	30.26	769	15.50	394	16.75	425	7.12	181	
DTU663AWK	F6	30.26	769	15.50	394	16.75	425	7.12	181	

 240 V Double Throw
 page 3-16

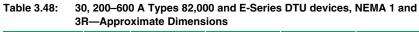
 600 V Double Throw
 page 3-17

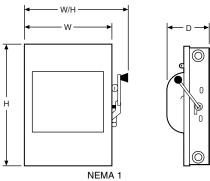
 Accessories
 page 3-18

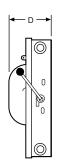
 Application Data
 page 3-19

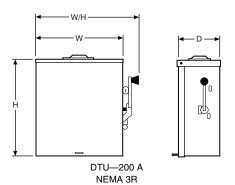
 Dimensions: 30, 200–600 A (Series E, T4, A)
 page 3-21











0.11		ŀ	1	1	V	W	/H	ı	0
Cat. No.	Series	in.	mm	in.	mm	in.	mm	in.	mm
DTU224NRB ▲	E1	32.50	826	20.63	524	24.00	610	10.63	270
82254 ▲	E1	30.88	784	15.75	400	19.63	499	9.75	248
82254NW ▲	E1	30.88	784	20.00	508	23.88	607	11.75	298
82344 ▲	E2	30.88	784	20.00	508	23.88	607	11.75	298
82344RB ▲	E1	32.50	826	20.63	524	24.00	610	10.63	270
82354	E1	30.88	784	20.00	508	23.88	607	11.75	298
92251	T4	10.00	254	8.00	203	9.75	248	4.75	121
82344DS	E1	30.88	784	20.00	508	23.88	607	11.75	298
DTU324N	E1	32.50	826	24.50	622	26.25	667	10.63	270
DTU324NRB	E1	32.50	826	24.50	622	26.25	667	10.63	270
H82344	E2	32.50	826	24.50	622	26.25	667	10.63	270
H82444 ▲	E2	32.50	826	30.21	767	33.61	854	10.63	270
H82454	E3	32.50	826	30.21	767	33.61	854	10.63	270
82454	E3	38.00	965	29.62	753	33.02	839	10.63	270
82444	E3	38.00	965	29.62	753	33.02	839	10.63	270
82454R ▲	E3	38.00	965	29.62	753	33.02	839	10.63	270
82444R	E3	38.00	965	29.62	753	33.02	839	10.63	270
H82254	E3	32.50	826	24.50	622	26.25	667	10.63	270
H82354	E3	32.50	826	24.50	622	26.25	667	10.63	270
82444DS ▲	E3	38.00	965	29.62	753	33.02	839	10.63	270
82255 ▲	A1	38.50	978	26.10	663	29.51	750	10.63	270
82255R	A1	39.00	991	26.62	676	30.02	763	10.63	270
82345▲	A1	38.50	978	26.10	663	29.51	750	10.63	270
82345DS▲	A1	39.00	991	26.62	676	30.02	763	10.63	270
82345R▲	A1	39.00	991	26.62	676	30.02	763	10.63	270
82355 ▲	A1	38.50	978	26.10	663	29.51	750	10.63	270
82355R ▲	A1	39.00	991	26.62	676	30.02	763	10.63	270
82445	A1	38.50	978	30.10	765	33.50	851	10.63	270
82445R	A1	39.00	991	30.21	767	33.61	854	10.63	270
82455 ▲ 82455R	A1 A1	38.50	978 991	30.10	765 767	33.50 33.61	851 854	10.63	270 270
62455H H82255	A1	39.00 39.00	991	30.21 26.62	676	30.02	763	10.63 10.63	270 270
H82345	A1	39.00	991	26.62	676	30.02	763 763	10.63	270
H82355	A1	39.00	991	26.62	676	30.02	763	10.63	270
H82445	A1	39.00	991	30.21	767	33.61	854	10.63	270
H82455	A1	39.00	991	30.21	767	33.61	854	10.63	270
DTU326	A1	63.31	1608	23.66	601	24.46	621	8.88	226
DTU426	A1	63.31	1608	27.00	686	27.80	706	8.88	226
DTU366	A1	63.31	1608	23.66	601	24.46	621	8.88	226
DTU466	A1	63.31	1608	27.00	686	27.80	706	8.88	226
DTU326R	A1	63.76	1619	23.66	601	24.46	621	8.88	226
DTU426R	A1	63.76	1619	27.00	686	27.80	706	8.88	226
DTU366R	A1	63.76	1619	23.66	601	24.46	621	8.88	226
DTU466R	A1	63.76	1619	27.00	686	27.80	706	8.88	226
DTU366AWK	A1	63.76	1619	23.66	601	24.46	621	8.88	226
A 250 V do roted									

250 V dc rated.

240 V Double Throw	page 3-16
600 V Double Throw	page 3-17
Accessories	.page 3-18
Application Data	. page 3-20
Dimensions: 30–100 A (Series F)	page 3-20



Put over 100 years of Schneider Electric's experience as a global specialist in energy management to work on your photovoltaic (PV) project. The Square D<sup>™</sup> 1000 Vdc disconnect switch is the perfect solution for your 1000 Vdc

#### **Extended Life Expectancy**

Exceeds IEC 60947-3 mechanical endurance requirements by factor of 18

Exceeds IEC 60947-1 electrical endurance requirements by factor of 10

Exceeds NEMA KS-1 mechanical endurance requirements by factor of 3.

#### Easy to Install

Preconfigured solar solution Familiar enclosed safety switch design Suitable for both grounded and ungrounded PV PV disconnect applications. It is compact and available in both a 100 and 200 amp non-fusible versions. IEC 60947-1 and 3 certified (file 136861) and UL 98 certified (file E343341)

#### **Designed for Harsh PV Environments**

NEMA Type 3 and IP63 enclosure

- Resists windblown dirt/dust
- Exceeds NEMA Type 1, 3R and 12

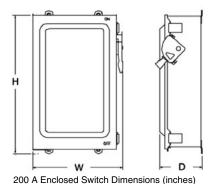
Operating range of -37°C to 50°C

Specially designed PV paint reduces solar gain up to 35% over standard grey enclosures

Table 3.49: 1000 Vdc Photovoltaic Heavy Duty Disconnect Switch Pricing and Accessories

					Factory Installed Accessories											
System	NI	and n oo		Single C	Electrical Interlock Single Contact Two Contact					Terminal Blocks (Copper) ♦		3 Wire Ground Lug★		Height (in.)	Width (in.)	Depth (in.)
	Amperes	Cat. No.	\$ Price	No. Suffix	\$ Price Adder	No. Suffix	\$ Price Adder		\$ Price Adder	No. Suffix	\$ Price Adder	No. Suffix	\$ Price Adder		(111.)	(111.)
3 Pole Grounded▼																
Three-Pole (Grounded System)	100	REHU393IP	1672.00	EI	452.00	El2	496.00	vw	150.00	TBC	409.00	GL	263.00	22.13	18.63	8.75
Connector Load  Terminal block Protective earth terminal	200	REHU394IP	2246.00	EI	452.00	El2	496.00	vw	175.00	TBC	409.00	GL	263.00	22.13	18.63	8.75
4 Pole Ungrounded									l.		I					
Four-Pole (Ungrounded System)	100	REHU493IP	2507.00	EI	452.00	El2	496.00	vw	150.00	ı	-	GL	263.00	29.00	18.63	8.75
Connector Protective earth terminal Protective earth terminal	200	REHU494IP	3965.00	EI	452.00	El2	496.00	vw	175.00	-	_	GL	263.00	29.00	18.63	8.75

- Order EIK1PV for single contact field-installed kit \$311.00
- Order EIK2PV for double contact field-installed kit \$355.00
- Accommodates (2) 250 max Cu or (1) 1/0 max Cu wiring; Order
- SN20CPV for field-installed kit \$246.00.
- Order REHGND KIT for field installable kit \$100.00.
- Terminal blocks standard with 3 pole switches; accommodates (2) 1/0 max Al/Cu or (2) 6 max Al/Cu wiring.



Schneider Electric gives the Photovoltaic market place the most comprehensive one stop shop for Residential and Light Commercial Photovoltaic Balance of System components. Schneider Electric's Inverters, and Square D brand DC and AC disconnect switches and Load Centers are ideal solutions to your Balance of Systems requirements. See the Balance of System solution chart below for your single phase PV system.

Table 3.50: PV Balance of System Solution Package—Grid Tie

System Voltage	Kilowatts	Amps	DC Disconnect	Inverter	AC Disconnect	Load Center Product
250 Vdc	2.8	30	HU361RB	878-2801	D221NRB	QO130M200
250 Vdc	3.3	60	HU362RB	878-3301	D222NRB	QO140M225
250 Vdc	3.3	100	HU363RB	878-3301	D223NRB	QONQ42MS400
600 Vdc	3.8	30	HU361RB	878-3801	D221NRB	QO130M200
600 Vdc	5.0	60	HU362RB	878-5001	D222NRB	QO140M225
600 Vdc	5.0	100	HU363RB	878-5001	D223NRB	QONQ42MS400

For internal 600 Vdc PV combiner box switches please see our offering of 9422 switches 600 Vdc UL98 listed in digest pages 8-14.

For our 600 Vdc PV switch offering please see digest pages 3-5-3-6.

SAFETY SWITCHES





Square D PV string combiner boxes are used to integrate multiple PV strings into one output circuit. Its tough exterior and safety features protect wiring from weather and overcurrent. The exterior coating ensures low operating temperatures and longer life of internal components. The specially engineered enclosure is designed to provide dust tight and rain tight protection; it meets or exceeds NEMA® 3R, 12, and 4 requirements. Traditional Square D visible blade switch architecture confirms disconnection, while touch-safe interior shielding protects against accidental contact with live components.

#### **Features**

#### **Flexible**

- Vertical, horizontal, and angled mounting options
- · Flexible installation with top, bottom, and side entry
- Substantial wire-bending space

#### **Robust**

- Dust tight and rain tight engineered enclosure for outdoor use
- UV-resistant white exterior coating to reduce solar gain by 35%
- Meets or exceeds NEMA 3R, 12, and 4 requirements

#### Safe

- Square D traditional visible blade switch architecture for confirmation of disconnect
- Touch-safe interior shielding guards against accidental contact with current-carrying components
- Seismic-certified 100–400 amp string combiner boxes for earthquake safety
- Optional integrated 2.5 kV surge arrestor to protect PV electronics from lightning strikes

#### Listings

- UL 1741
- Switches tested to UL98B
- CSA C22.2 Spec 107.1

Table 3.51: 600 Vdc Photovoltaic Combiner Boxes

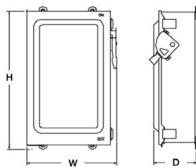
			PV Module Isc Rating				Wire Range (AWG/kcmil—Copper Only)						Outside Dimmensions				
Catalog Number▲	Number Input Circuits (Max.)	DC Output			List Price \$	Input	Output Circuit (+ and -)	Output Number of Conductors (+ or -)	Ground In	Ground Out	Height		Width		Depth		
		Current (Max.)				Circuit (+ and -)					in.	mm	in.	mm	in.	mm	
REHSC126100	12	100			838.00	#12-#6	#6-1/0	1		#6-2/0	20.78	528	14.50	368	6.13	156	
REHSC166200	16	200	10.4	10	1067.00	#12-#6	#6-300 MCM	1	#14–4 Or	#6-2/0	27.78	706	20.25	514	6.13	156	
REHSC246300	24	300	10.4	13	1378.00	#12-#6	1/0-300	2	2X #14-#12	#6-2/0	35.78	909	20.25	514	6.13	156	
REHSC326400	32	400			2226.00	#12-#6	1/0-300	2		#6-2/0	35.78	909	20.25	514	6.13	156	

<sup>▲</sup> For factory installed surge protection device add the suffix "S" to the catalog number.

Table 3.52: 600 Vdc Photovoltaic Combiner Boxes With Disconnects

Catalog Number▲						Wire Range (AWG/kcmil—Copper Only)					Outside Dimmensi				ions	
		Continuous DC Output	PV Module Isc Rating (Amps)		List Price \$	Input Circuit (+ and -)		Output Number of Conductors (+ or -)		Ground Out	Height		Width		Depth	
		Current (Max.)									in.	mm	in.	mm	in.	mm
REHSC126100DU	12	100			1438.00	#12-#6	#6-1/0	1		#6-2/0	31.00	787	19.00	483	9.00	229
REHSC166200DU	16	200	10.4	10	1899.00	#12-#6	#6-300 MCM	1	#14-4 Or	#6-2/0	31.00	787	25.00	635	9.00	229
REHSC246300DU	24	300	10.4	13	3035.00	#12-#6	1/0-300	2	2X #14-#12	#6-2/0	41.00	1041	25.00	635	10.50	267
REHSC326400DU	32	400			3883.00	#12-#6	1/0-300	2		#6-2/0	41.00	1041	25.00	635	10.50	267

<sup>▲</sup> For factory installed surge protection device add the suffix "S" to the catalog number.



Typical String Combination Box Dimensions

#### **Surge Protection Device**

The 600 Vdc Type 2 Surge Protection Device (SPD) is for medium risk PV applications. The SPD when installed in a Square D combiner box protects solar modules, power tracking and blocking diodes from physical damage resulting from lightning induced transients. The SPD device uses Metal Oxide Varistor (MOV)/Gas-Filled Spark Gap (GSP) protection circuits for longer life and no current leakage. The devices are UL1449 ed 2 compliant Low Voltage TVSS. The SP are available as factory installed by adding the suffix "S" to the combiner box catalog number or as kits a kit: REHTYPE2SP.

Table 3.53: 600 Vdc Type 2 Surge Protection Device

		Nominal					Q.,	List	Price \$
Catalog Number	Network Voltage	Discharge Current per 20 micro sec	Discharge Current per 20 micro sec	Operating Current	Operating Temperature; Celsius	Kit	Factory Installed		
REHTYPE2SP	600 Vdc	20kA	40kA	<0.1nA	-40 to +85	337.00	490.00		



by Schneider Electric
www.schneider-electric.us



# **Section 4**

# **Power Monitoring and Control**

# Remote Energy Management

ION-E software

4.335.

92.29







HDM4 Panel



Low Voltage Automatic Capacitor Bank





#### Active Harmonic Filter

1	

PowerLogic™ Energy and	<b>Power Management Systems</b>
------------------------	---------------------------------

	Introduction		4-2, 4-3
	Power Monitoring So	oftware	
🕤		PowerLogic ION Enterprise Software	4-4
New!		Remote Energy Management	4-4
		PowerLogic Scada	4-5
		PowerLogic ION EEM Enterprise Energy	4-6
		Management Software	
	PowerLogic Metering		
		ION8650	4-7
		ION7550/7650	4-7
		ION7350/7330/7300	4-8
		ION6200	4-8
		PowerLogic ION and Power and Energy Meter	4-9
,,,,,,		Selection	
New!		DM6200 Panel Meter	4-10
New!		PM1200 Multifunctional Power Meter	4-10
		Series 700 Power Meter	4-10
		Series 800 Power Meter	4-10
	Cultimatarina	Series 4000 Circuit Monitor	4-11
	Submetering	Tenant Metering Software	4-13
		PowerLogic E5600 Socket Meter	4-13
		High Density Meter Enclosures (HDM)	4-14
		Multi Circuit Energy Meters	4-14
		Energy Meter	4-15
		Enercept™ Meter	4-15
		Split Core Current Transformers	4-15
		Branch Circuit Power Meter	4-16
		Branch Current Monitor	4-16
		Multi-Circuit Meter	4-16
		Submeter Display	4-16
	Remote Energy Mar		4-17
		PowerLogic Energy Profiler Online	4-18
	Communications	Filtrament Ontonion	4.40
		Ethernet Gateways	4-19
	Familia a suita ai Camilia a	Web Page Generator	4-19
	Engineering Service	s Consulting & Analysis	4-20
		Industrial Energy Efficiency	4-20 4-20
		Power Monitoring Applications	4-21
		Power System Control Applications	4-21
		System Integration	4-21
		Factory Assembled Enclosures	4-22
		Technical Support	4-23
		Power Management University	4-23
_			_

### **Sepam Digital Protective Relays**

Series 80, 60, 40 & 20 Features	4-24
Series 80, 60, 40, 20 & 10 Applications	4-25

## **Arc Flash Protection and Mitigation Systems**

VAMP 221	4-2	26

# ReactiVar™ Reactive Power Compensation and **Harmonic Mitigation Solutions**

Reactive Power Compensation and Harmonic Mitigation Solutions	4-28
Low Voltage Fixed Capacitor	4-29
Low Voltage Automatic Capacitor Banks	4-31
LV Transient Free Reactive Compensation Banks	4-32
Medium Voltage Capacitors	4-33
Accusine™ PČS Active Harmonic Filter	4-34
Hybrid VAR Compensator (HVC)	4-36





#### Three dimensions of energy and power management savings

Volatile energy prices and stringent emissions standards have made it more challenging to control operational costs thus putting profits at risk. Square D PowerLogic™ energy and power management systems will help you make the most of your energy by:

#### Reducing Utility Costs & Increasing Energy Efficiency

Achieve significantly reduced direct consumption-related costs through improved efficiency, lower emissions and more accountability. And if you're a property manager, you can increase the accuracy of energy settlements that can help attract or retain tenants. By simply installing a PowerLogic<sup>™</sup> power monitoring system, our customers over the past twenty years have reported realizing a 2–4% savings in utility costs-but that's just the "tip of the iceberg" in terms of your potential savings.

#### **Optimizing Equipment Utilization**

Avoid or defer capital costs by better utilizing existing electrical infrastructure typically results in another 2–5% savings. By monitoring key points and collecting system loading information, engineering is able to make decisions on a plant's capacity to handle new production lines or to determine if additional distribution equipment is required for a building expansion.

#### Improving System Reliability & Safety

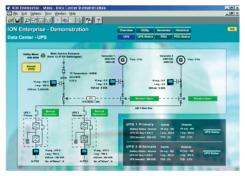
Typically, another 10% can be found by discovering power system reliability improvements with powerful PowerLogic™ metering that offers extremely accurate and high speed event capture information. Once detected, future power disturbances are often correctable and can help facilities avoid expensive and often hidden risks to productivity. As an added benefit, PowerLogic monitoring system information is accessible from the safety of your personal computer. This offers improved worker safety since it is not necessary to suit up in personal protective equipment to access energized equipment over the network.

PowerLogic<sup>™</sup> systems give you the power to achieve this kind of savings, resulting in a quick return on your investment. We pride ourselves on reliable products, innovative systems, expert engineering services, and our ability to provide single-source energy and power management solutions. It's not just a concept to us, it's a legacy and a promise-for companies that seek an edge in productivity. That's why leaders turn to Schneider Electric.

#### Table 4.1:

		Data Presentment & Management		Data Acquisition, Alarms & Monitoring			
		Enterprise	Online Energy Analysis	Supervisory Control & Data Acquisition	Power Monitoring System	Tenant Submetering	
		Data Centers; Industrial Buildings, Property Management, Utilities	Utilities	Water/Wastewater, Heavy Process Industry, Data Centers, Critical Power	Industrial, large commercial buildings, Military Bases, Healthcare	Commercial Buildings, Government Buildings Military Bases	
	For products see DIGEST section:	4–6	4–17	4–5	4–4 thru 4–12	4-13 thru 4-16	
	For services see DIGEST section:	4–20	4–20	4–21	4–21	4–22	
	Meter Application						
	Automatic Meter Reading			•	••••	••	
	Revenue Metering			•	••••	••	
	WAGES Utility Pulses				•••		
	Sub-billing	•••	•••			••••	
	Measurement & Verification	••••	••		•••		
	Cost Allocation & Utility Billing						
Reduce Energy	Energy Usage Analysis	••••	•••	•	••	•	
Costs & Energy	Procurement Optimization	••	•••	•	•		
Efficiency	Allocate Energy Costs	•			•		
	Interval Benchmarking & Profiling	••••	•••	•	••		
	Total Load Aggregation	••••					
	Energy Efficiency		,	1			
	Emissions Tracking		•••				
	Power Factor Correction	•	•		•••		
	Peak Demand Reduction	••		•••	•••		
	Demand Response & Curtailment		-	•••	•••		
	·		ļ				
	Improve Maintenance Practices	1	ı	ı	I	1	
	Commissioning & Troubleshooting			•••	••••		
	Equipment Monitoring: transformers, MCCs, switchgear, switchboards, circuit breaker status, protective equipment, capacitors, generators, panelboards, PDU, UPS, etc.			•••	••••		
	Facility Planning						
Optimize Equipment	Identify Equipment Capacity		1		•••		
Utilization	Determine Transformer Stress				•••		
	Equipment Asset Optimization	••		••	•••		
	Improve Efficiency		,	I.			
	Balance Circuit Loading		1				
	Balance Generator Usage				•••		
	Optimize Chiller & Mechanical Equipment				•		
	System Monitoring & Analysis	Į.	ļ.	l .			
	Transient Voltage Detection	İ	İ	ĺ			
					••••		
	Sag/Swell Disturbance Monitoring  Power Quality & Harmonic Analysis				••••		
Improve	Power Quality Compliance			_	***		
Safety		1000			100		
	Alarm & System Diagnositics	I	l	1	I	Ì	
	Electrical Distribution Alarm & Event Analysis	•		•••	••••		
	Waveform capture viewing				••••		
	Remote alarm notification			••••	•••		
	Total Energy Control Services		see section 4–20 for Engineering				
	D 101 : (0 1 0 1 1		Services			see section 4–20 for Engineering Services	
	Peak Shaving/Generator Control	and anotice 4 00 fee French	na Comile	••••	••	Engineering Services	
	Load Management/Shedding	see section 4–20 for Engineerii	ig Services	••••	••		
	WAGES				····		
Engineering	Advanced Reliability Services	1		1	ı	1	
Engineering Services	Auto Throw Over (ATO)			••••	••	see section 4–20 for Engineering Services	
	Emergency Power Supply System Test Reporting				••••		
	Sequence of Events Recording (1ms time/stamp)	see section 4–20 for Engineerii	na Services	••••	•••		
	GPS Time Stamping		3 22. 1.003	••••	•••		
	Power System Control			••••	•		
	Network Protection			••••	••		
	Consulting Services						
	Consulting Services System Studies (SC/TCC/Arc Flash)			ee section 4–20 for Engineerir	ng Services		







ION Enterprise Software

Remote Energy Management

#### PowerLogic ION Enterprise Software

PowerLogic ION Enterprise software is an all-in-one package for operational power system monitoring, analysis and control that helps you reduce energy-related costs. It offers control capabilities, comprehensive power quality and reliability analysis and helps reduce energy related costs. The software is a suite of applications that allows you to collect, process, analyze, store, and share data across your entire enterprise. PowerLogic ION Enterprise software is designed to give you the information and analysis tools you need to make sound decisions. Its cutting-edge flexibility and compatibility allow you to extend your energy management system at your own pace, adding newer components as they become available, without interrupting or impacting existing functions. PowerLogic ION Enterprise collects data through serial, wireless, modem or Ethernet links and can manage a single site or, through the Internet, connect a global network of devices.

Table 4.2: PowerLogic ION Enterprise Software Ordering Information

Description	Catalog No.	\$ Price
Core Software Products▲		
ION Enterprise Base software	IE60BASEENG	1079.00
ION Enterprise Device license (For 100+ devices, please call the factory for volume pricing)	IE60DLS	252.00
ION Enterprise Client license	IE60CL	1079.00
ION Enterprise Quantity 50 Pack Device licenses	IE60DLS50	10080.00
ION Enterprise v6.0 Device licenses	IE60DLUNLTD	24750.00
OPC Server support for ION Enterprise	IONEOPCV1	3055.00
SQL Server 2005 bundle option (CD and 1-CPU license)	IONESQL2005	3509.00
SQL Server 2005 additional CPU license	IONESQL2005CPU	2157.00
PQDIF Exporter for ION Enterprise	IONEPQDIFV1	3660.00
Upgrades to PowerLogic ION Enterprise 6.0		
ION Enterprise Base Upgrade from v5.5 or later	IE60BASEENGUPG	288.00
ION Enterprise Single Device License Upgrade	IE60DLSUPG	126.00
ION Enterprise Quantity 50 Pack Device Licenses Upgrade	IE60DLS50UPG	5040.00
ION Enterprise v6.0 Unlimited Device License Upgrade	IE60DLUNLTDUPG	12375.00
ION Enterprise Client license upgrade	IE60CLUPG	520.00
Related Items		
ION Enterprise Replacement CD	IONE60REPCD	215.00

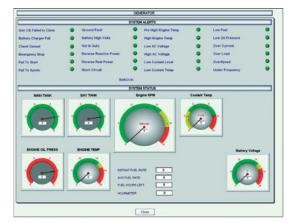
Every new system must be ordered with 1 IONE56-Base software and a minimum of 5 IONE56-DL device licenses.
 Software versions may have upgraded since release of this digest. Please check with your Schneider Electric Sales Rep or local distributor for latest ION Enterprise version.

## New!) Remote Energy Management Web-Hosted Service

Schneider Electric Remote Energy Management (REM) is a web-hosted service that easily turns energy usage data into actionable information, accessible via any standard web browser. With REM, users can easily identify energy waste, reduce energy consumption, save on utility bills, and measure, report on and implement energy and emission reduction initiatives...all easily made available through predefined reports and customizable dashboards

- Compare energy usage among similar facilities to establish benchmarks and identify poorly performing facilities.
- Normalize consumption against weather, production, hours of operation, sq footage, and occupancy.
- Measure the effectiveness of various energy efficiency efforts.
- View carbon emissions reports.
- Easily view all monitored sites around the globe on a single screen through the Enterprise Map View.
- Optimize equipment run hours and setting to avoid setting costly new demand peaks.
- Compare consumption data between different meters or a group of meters.
- Identify exceptional usage patterns.
- Track, report, and analyze information from all utility sources including water, gas, electric, and steam.
- Compare usage to utility bills to verify correct billing from the utility.
- Use "what if" analysis tools to make accurate assessments of what utility costs would be on different utility rates.

Contact your local Schneider Electric sales office for pricing and availability.

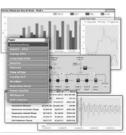


PowerLogic Scada Software

# PowerLogic SCADA

PowerLogic<sup>™</sup> SCADA software was created to meet the requirement for real-time monitoring and control of electrical distribution systems, including fast response times and high reliability through redundancy. PowerLogic SCADA is powered by Citect<sup>™</sup> SCADA technology but is specifically designed for electrical power systems applications. The complete PowerLogic supervisory control and data acquisition (SCADA) solution includes a dynamic graphical user interface, enhanced alarm management, one second response times for control operation and status, transparent redundancy, and reliable communications (through hardware components and network topology). The system also features Sequence of Events Recorder (SER) logs with time stamps of 1ms resolution. PowerLogic SCADA software includes a web-based client for remote viewing capability. The graphical user interface consists of animated objects which change according to status information. The flexible graphics editor includes both ANSI and IEC electrical symbols to facilitate easy one-line diagram creation. Real-time and historical trending is also supported.

For pricing information, please contact your local PowerLogic representative.



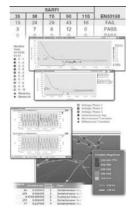
Personalized dashboards help management and operations personnel monitor all aspects of energy use and respond to opportunities or threats.



Produce aggregate billing, load profile, cost allocation, power quality, forecasting or budget reports to help inform stakeholders and track results against goals.



Use advanced billing functions to support energy procurement and manage load or generation assets in response to curtailment or pricing signals.



Monitor power quality risk factors, benchmark performance, determine impacts, validate contract compliance, isolate problem sources, and confirm your return-on-investment.

PowerLogic ION EEM is a complete enterprise energy management solution that unites business and energy strategies across your entire enterprise by unifying and extending the benefits of your existing energy-related data resources. Stakeholders from management to operations will be empowered by actionable energy intelligence to reveal opportunities, isolate problems and drive cost and risk reduction strategies.

PowerLogic ION EEM automatically acquires data from power monitoring and control systems, building and process automation systems, utility information systems, weather services, spot-market energy pricing feeds, and enterprise business applications, cleanses and warehouses it. Personalized, browser-based dashboards and innovative visualization and modeling tools then make the information available to whomever needs it, so you can accurately monitor, validate, predict and control energy-related expenses.



SQUARE D

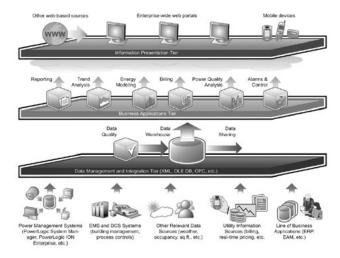
From operational cost reductions to procurement support through cost allocation, benchmarking and budgeting, key performance indicators and advanced analytics, PowerLogic ION EEM helps you manage energy in financial terms. It also helps you gain unique insight into the impacts of power quality on your business and all energy assets. From the service entrance to the boardroom, PowerLogic ION EEM software allows energy to be managed as a variable cost.

# **Key features**

- True enterprise-level software architecture: data quality assurance, data warehouse, web framework
- · Web portal: personalized dashboards, key performance indicators, charts, trends, real-time conditions
- Reporting: rich and customized content, support for complex data and graphics, scheduled distribution
- Trending: advanced visualization, dimensional analysis, prediction, statistical rollups
- Modeling: regression analysis, normalization, correlation, integration of all relevant drivers and contextual data
- Billing: built-in rate engine and rate wizard
- Power quality analysis: wide-area event monitoring, classification, filtering, correlation
- Alarms and events: triggering on complex conditions, notification, logging
- Integration: data acquisition systems, weather and pricing feeds, other enterprise applications (e.g. BAC, ERP)
- CO<sup>2</sup> Report

# Typical applications

- Manage all utilities (electricity, gas, water, etc.) and emissions through a single, unified interface
- Benchmark facility performance across an entire enterprise to identify energy inefficiencies
- Measure and verify savings from energy conservation projects or performance contracts
- Reduce operational costs, improve processes, and prolong asset life
- Meet corporate environmental stewardship goals or mandated impact targets
- Manage demand control schemes, load shedding, peak shaving, base loading or on-site generation
- Enable participation in real-time pricing and load curtailment programs
- Optimize procurement by forecasting and budgeting for energy needs and comparing utility rates
- Identify utility billing errors and validate contract compliance
- Allocate and recover utilities costs from tenants, departments, processes, etc.
- Maximize the use of existing infrastructure capacity and avoid overbuilding
- Identify and reduce risks to uptime



# Data presentation tier

Web portal delivers enterprise-wide access through personalized dashboards, reports, detailed analytics, and integration of views from third-party systems. Schedule information and report distribution to the people who need it, for use on their desktop or mobile devices.

# **Business applications tier**

Standard and optional modules tailor functionality to specific needs. Advanced analytics and reporting on every driver and relationship affecting energy cost and reliability.

# Data management tier

Integration of data from many sources: power monitoring and control systems (PowerLogic or third party), utility metering systems (water, air, gas etc.), Internet weather, real-time energy pricing feeds, manual input, energy assets (power distribution and reliability equipment, generators), line-of-business systems (BAC, DCS, ERP, EAM, accounting). Data quality module assures complete and reliable data from all inputs.

For price and ordering information, contact your local PowerLogic Sales Specialist or PowerLogic Inside Sales at 615-287-3535.

# ION8650/7550/7650 Power and Energy Meters

The web-enabled PowerLogic ION8650 is used to monitor electric distribution networks, service entrances and substations. It enables businesses to manage complex energy supply contracts that include power quality guarantees. Low-range current accuracy makes it ideal for independent power producers and cogeneration applications that require the accurate bi-directional measurement of energy. It is well suited to load curtailment, equipment monitoring and control and energy pulsing and totalization applications. Integrate it with PowerLogic ION EEM enterprise energy management software, PowerLogic ION Enterprise operations software or other energy management and SCADA systems.

# PowerLogic ION8650 Power and Energy Meter Features

PowerLogic<sup>™</sup>

## Feature set C includes:

- 9S, 35S, 36S socket and switchboard cases
- True RMS 3-phase voltage, current, power and meets stringent ANSI revenue metering standards including ANSI C12.20 0.2 and Class 2,
- Power quality: sag/swell, individual, even, odd, total harmonics to the 31st and symmetrical components
- 32MB log/event memory, min/max for any parameter, historical logs up to 64 channels, timestamp resolution to 0.001 seconds and GPS time synchronization
- Transformer/line loss compensation and Instrument transformer correction
- Communications: Ethernet, Serial, Modem, Internet and Ethernet to serial gateway and ION, DNP 3.0, Modbus RTU, Modbus TCP, MV-90 protocols, IEC 61850
- Dial-out capability when memory is near full
- Multi-user, multi-level security with control and customized access to sensitive data for up to 16 users
- Data push capability through SMTP (email)
- 65 setpoints math, logic, trig, log, linearization formulas

- Password protection and anti-tamper seal protection
- Built-in I/O: 4 KYZ digital outs and 3 form A digital ins, 4 KYZ digital outs and 1 form A digital out and 1 form A digital in, an optional external I/O expander provides additional I/O

# Feature set B adds the following to feature set C

- Harmonics-individual, total even, total odd up to the 63rd
- 64MB standard memory
- Historical logs up to 320 channels
- Modbus RTU Master on serial ports
- Cycle setpoint minimum response time

# ature set A adds the following to feature sets C and B:

- Waveform capture up to 1024 samples/cycle, PQ compliance monitoring, flicker to EN50160, IEC 61000-4-7/4-15 (also configurable to IEEE 519-1992, IEEE159, SEMI) CBEMA/ITIC
- Transient detection to 6517µs at 60Hz;
- Harmonics: magnitude, phase and inter-harmonics to the 50th
- 128MB standard memory
- Max 96 cycles of waveform logs and 800 channels of historical

#### Typical PowerLogic ION8650 Power and Energy Meter Ordering Configurations Table 4.3:

Description	Catalog No.	\$ Price
ION8650, feature set A, 9S socket base, 5 A nominal current inputs, 10MB memory, 127–177 Vac, 60 Hz, communications card with: 10BaseT, RS-232/485, RS-485, Optical port, 4 Digital Outputs, 3 Digital Inputs	S8650A0C0E6E0B0A	7077.00
ION8650, feature set A, 35S socket base, 5 A nominal current inputs, 10MB memory, 120–480 Vac, 60 Hz, communications card with: 10Base T, RS-232/485, RS-485, Optical port, 4 Digital Outputs, 3 Digital Inputs		
ION8650, feature set C, 9S socket base, 5 A nominal current inputs, 2MB memory, 120–277 Vac, 60 Hz, communications card with: RS-232/485, RS-485, Optical port, 4 Digital Outputs, 3 Digital Inputs		
ION8650, feature set C, 3SS socket base, 5 A nominal current inputs, 2MB memory, 120–277 Vac, 60 Hz, communications card with: RS-232/485, RS-485, Optical port, 4 Digital Outputs, 3 Digital Inputs	S8650C1C0E6A0B0A	2889.00

# PowerLogic ION7550 and ION7650 Power and Energy Meters

Used at key distribution points and sensitive loads, the web-enabled PowerLogic ION7550 and PowerLogic ION7650 meters combine a wealth of advanced features from power quality analysis capabilities, revenue accuracy and multiple communications options, through web compatibility, and control capabilities. Both are compatible with PowerLogic ION EEM enterprise energy management software, PowerLogic ION Enterprise operations software can be integrated with other energy management or building control systems through multiple communication channels and protocols.

The meters are ideal for compliance monitoring, disturbance analysis, cost allocation and billing, demand and power factor control and equipment monitoring and control. The meters have a high visibility, adjustable front panel display that can depict TOU, harmonics, event logs, phasers, and instantaneous power parameters. They meet stringent ANSI C12.20 0.2, Class 10 & 20 revenue metering standards.

# PowerLogic ION7550 and ION7650 Power and Energy Meter Features



# The PowerLogic ION7550 includes:

- 3.5" x 4.5" (87 x 112 mm) backlit LCD display
- True RMS 3-phase voltage, current, and power that meets stringent ANSI C12.20 0.2, Class 2, 10, & 20
- Power quality: sag/swell, harmonics individual, even, odd, total to the 63rd, waveform capture at 256 samples/cycle
- 5MB log/event memory (10MB optional), waveform logging up to 96 cycles, up to 800 channels historical, min/max, timestamp resolution to 0.001 seconds, GPS time synchronization and historical trends through front panel
- Communications: fiber, Ethernet, serial, internal modem, optical port, and a gateway functionality, ION, DNP 3.0, Modbus RTU master & slave, Modbus TCP, MV-90, and IEC 61850. IEC 61850 only available with 5MB memory and Ethernet options
- Dial-out capability when memory is near full
- Data push capability through SMTP (email)

- Multi-user, multi-level security with control and customized access to sensitive data for up to 16 users
- 65 configurable 1/2 cycle setpoints for single, multi-condition and dial out on alarm and math, logic, trig, log, linearization formulas
- Password protection and anti-tamper seal protection enhance meter security
- Extensive standard I/O includes: 8 digital inputs, 4 digital outputs and 3 onboard relays

# The ION7650 has all the features of the ION7550 and adds:

- Waveform capture up to 1024 samples/cycle
- Transient detection to 17µs at 60Hz
- Harmonics: magnitude, phase and inter-harmonics to the 40th Flicker to EN50160 and IEC 61000-4-7/4-15 (also configurable
- for IEEE 519-1992, IEEE159, SEMI), plus CBEMA/ITIC
- Symmetrical components
- Power quality measurements per IEC 61000-4-30 Class A, Ed. 2

#### **Table 4.4:** Typical PowerLogic ION7550/7650 Power and Energy Meter Ordering Configurations

Description	Catalog No.	\$ Price
Typical PowerLogic ION7550 Power and Energy Meter Ordering Configurations		
Integrated display, with 256 samples/cycle, 5 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port) plus Ethernet, standard I/O	S7550A0C0B6E0A0A	6318.00
Integrated display, with 256 samples/cycle, 5 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port), standard I/O	S7550A0C0B6A0A0A	5589.00
Typical PowerLogic ION7650 Power and Energy Meter Ordering Configurations		
Integrated display, with 1024 samples/cycle, 10 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port) plus Ethernet, standard I/O, EN50160 compliance monitoring	S7650B1C0B6E0A0E	9279.00
Integrated display, with 512 samples/cycle, 5 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port) plus Ethernet, standard I/O	S7650A0C0B6E0A0A	7869.00
Integrated display, with 512 samples/cycle, 5 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port) plus Ethernet and 56k modern, standard I/O	S7650A0C0B6C1A0A	8409.00
Integrated display, with 512 samples/cycle, 5 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port), standard I/O	S7650A0C0B6A0A0A	7140.00
Integrated display, with 1024 samples/cycle, 10 MB logging memory, 5 A inputs, standard power supply, standard comms. (1 RS232/RS485 port, 1 RS485, 1 Type 2 optical port) plus Ethernet, standard I/O	S7650B1C0B6E0A0A	9279.00
Note: Please refer to nowerlogic com for the most complete and un-to-date list of feature availability. Some features are ontional		

Note: Please refer to powerlogic.com for the most complete and up-to-date list of feature availability. Some features are optional

MONITORING AND



Used in diverse applications such as feeder monitoring and sub-metering, the PowerLogic ION7300 series meters are also suitable for high-accuracy power and energy metering, bill verification, cost allocation and billing, demand and power factor control, load studies, circuit optimization, equipment monitoring and control and preventative maintenance. They are ideal replacements for analog meters, with a multitude of power and energy measurements, analog and digital I/O, communication ports and industry-standard protocols. The ION7330 meter adds on-board data storage, emails of logged data and an optional modem. The ION7350 meter is further augmented by more sophisticated power quality analysis, alarms and a call-back-on-alarm feature. They are compatible with PowerLogic ION EEM enterprise energy management software, PowerLogic ION Enterprise operations software or can be integrated with other energy management or building control systems through multiple communication channels and protocols.

# PowerLogic ION7350, ION7330 and ION7300 Power and Energy Meter Features

# The PowerLogic ION7300 includes:

- Multiple form factors: transducer integrated and remote display models
- True RMS 3-phase voltage, current, and power that meets stringent ANSI C12.16, Class 10
- Power quality: harmonics-individual, even, odd, total to the 15th, maximum 32 samples/cycle
- Communications: 1 RS-485 port, 1 optional Ethernet port, 1 ANSI Type 2 infrared optical port, 1 PROFIBUS DP port (ION7300 only), onboard web server
- Supported protocols include: ION, Modbus RTU slave on serial, modem, I/R ports, Modbus TCP through
- Extensive standard I/O includes: 4 analog inputs, 4 analog outputs, 4 digital relay outputs
- Minimum/maximum recording

# The ION7330 adds the following features:

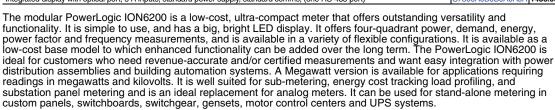
- Time of use multi-year scheduling, hourly activity profiles
- 4 digital inputs for status monitoring and pulse counting
- Communications: a second RS-485 port, internal modem, DNP 3.0 through serial, modem and I/R ports, EtherGate and ModemGate, data/alarms via e-mail and MV-90 on serial and Ethernet ports
- 12, one second setpoints for single, multi-condition alarms, plus math, logic, trig, log, and linearization formulas
- Non-volatile onboard memory capacity of 300kb, min/max logging, min/max logging, up to 32 channels of historical logs, timestamp resolution to 0.001 seconds

# The ION7350 includes the following additional features:

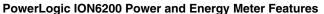
- Power Quality: sag/swell, individual, even, odd, total harmonics up to 31st, maximum 64 samples/cycle
- Up to 96 channels of logs and up to 48 cycles of waveform logs
- Alarm notifications via e-mail

#### **Table 4.5:** Typical PowerLogic ION7350/7330/7300 Power and Energy Ordering Configurations

Description	Catalog No.	\$ Price
Typical PowerLogic ION7350 Power and Energy Meter Ordering Configurations		
Integrated display with optical port, 5 A inputs, standard power supply, standard comms, (two RS-485 ports) plus 10BaseT Ethernet	S7350A0B0B0E0A0A	3567.00
Integrated display with optical port, 5 A inputs, standard power supply, standard comms, (two RS-485 ports)	S7350A0B0B0A0A0A	2906.00
Typical PowerLogic ION7330 Power and Energy Meter Ordering Configurations		
Integrated display with optical port, 5 A inputs, standard power supply, standard comms, (two RS-485 ports) plus 10BaseT Ethernet	S7330A0B0B0E0A0A	2800.00
Integrated display with optical port, 5 A inputs, standard power supply, standard comms, (two RS-485 ports)	S7330A0B0B0A0A0A	2159.00
Typical PowerLogic ION7300 Power and Energy Meter Ordering Configurations		
Integrated display with optical port, 5 A inputs, standard power supply, standard comms, (one RS-485 port)	S7300A0B0B0A0A0A	1436.00



The meter consists of a base unit with options card and a power supply pack, with a remote display being optional.



- Only two inches deep, and fits a standard ANSI four-inch switchboard cutout, or as a TRAN model with no display and can be fastened to a flat surface with a 4" (10cm) ANSI bolt pattern or mounted to a DIN rail. A remote display module (RMD) can be ordered for the TRAN and mounted through an ANSI 4" (10cm) and DIN 96 cutout.
- LED display with twelve 3/4" (19mm) high digits that display all basic power parameters
- Pulse Outputs: optional kWh, kVARh and/or kVAh pulsing
- Via two Form A outputs
- Communications: optional RS-485 port with Modbus RTU and ION compatible
- 64 samples per cycle true RMS
- 3-phase voltage and current inputs

The standard ION6200 is available with the following parameters:

Voltage L-N average and per phase, Voltage L-L average and per phase, Current average and per phase

# Option EP#1, includes the standard measurements and provides the following additional parameters:

14, kW/mW total, kWh/mWh total, kW/mW peak, Current demand average and per phase, Current peak demand average and per phase, Power factor total

# Optional Enhanced Package, includes the standard measurements and provides the following additional parameters:

kW/mW per phase, kVAR/mVAR total and per phase, kVA/mVA total and per phase, kWh/mWh and del/rec per phase, kVARh/mVARh total and del/rec per phase, kVAh/mVAh total and per phase, kW/mW demand, kVAR/mVAR demand and peak, kVA/mVA demand and peak, Power Factor per phase, Voltage THD per phase, Current THD per phase

#### Typical PowerLogic ION6200 Power and Energy Meter Ordering Configurations **Table 4.6:**

Description	Catalog No.	\$ Price
Integrated display, 10 A inputs, standard 100–240 Vac power supply, RS485 port (Modbus RTU), 2 pulse outputs, Enhanced Package #2	S6200A0A0B0A0B0R	1021.00
TRAN Model, with remote display, 10 A inputs, standard 100–240 Vac power supply, RS485 port (Modbus RTU), 2 pulse outputs, Enhanced Package #2	S6200R1A0B0A0B0R	1055.00
TRAN Model, (no display), 10 A inputs, standard 100–240 Vac power supply, RS485 port (Modbus RTU), 2 pulse outputs, Enhanced Package #2	S6200T1A0B0A0B0R	831.00
Note: Disconnected to the second seco		

Note: Please refer to powerlogic.com for the most complete and up-to-date list of feature availability. Some features are optional.





Table 4.7: PowerLogic ION Power and Energy Meter Selection

		ION8650		IONIZODO	IONIZEEO	IONIZODO	ION7330	IONIZOGO	IONESOO
Features■	A B C		ION7650	ION7550	ION7350	ION/330	ION7300	ION6200	
Inputs, outputs and control power									
3-phase / single-phase	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/•
Digital in and out / analog in and out	8,8 / 3,4	8,8 / 3,4	8,8/3,4	16,4 / 4,4	16,4 / 4,4	4,4 / 4,4	4,4 / 4,4	4,4 / 4,4	0,2/
Power supply options	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC
Power and energy measurements		1		1	ı	ı	ı	ı	l
V, I, F, PF									
Power, demand	•		•	•	•	•	•	•	•
Energy / time-of-use (energy per shift)	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/	•/
ANSI energy accuracy class (% of reading)	0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
Measurement Canada Approval	•				•	•	•	•	•
Loss compensation	•	•	•	•	•				
Power quality analysis									
Compliance monitoring (e.g. EN50160)									
Flicker measurement	•	•		•					
Transient disturbance capture	•			•					
Sag and swell monitoring	•	•	•	•	•	•			
Disturbance direction detection				•	•				
Harmonics measurement	63 rd	63 rd	31st	63 rd	63 rd	31st	15th	15th	THD
Waveform capture	•			•	•	•			
Data and event logging									
Trend / snapshot	•/•	•/•	•/•	•/•	•/•	•	•		
Min/max	•	•	•	•	•	•	•		
Events	•	•	•	•	•	•	•		
Timestamp resolution (seconds)	0.001	0.001	0.001	0.001	0.001	0.001	0.001		
GPS sync	•	•	•	•	•				
Setpoints, alarms and control					•				
Annunciation / call out on alarm	•/•	•/•	•/•	•/•	•/•	•/•	•/		
Trigger logging	•	•	•	•	•	•	•		
Trigger relay or digital output control	•	•	•	•	•	•	•		
Special features									
Custom programming: arithmetic, boolean, object-oriented	•				•	•	•		
Downloadable firmware	•	•	•	•	•	•	•	•	•
Communications									
Ethernet port / web / email	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•/•/	•//
Telephone modem port	•	•	•	•	•	•	•		
Infrared port	•	•	•	•	•	•	•	•	
RS485 / RS232 ports	•/•	•/•	•/•	•/•	•/•	•/	•/	•/	•/
Modbus / DNP / MV-90 protocols	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•	•//	•//
IEC 61850 protocol	•	•	•	•	•				

Specifications represent maximum capabilities with all options installed. Some options are not available concurrently. This is not a complete feature list, please refer to detailed product specifications.

www.powerlogic.com



DM6200 Panel Meter

PM1200 Multifunction Power Meter



PowerLogic DM6200 Panel Meter and PowerLogic PM1200 Multifunction Power Meter

The PowerLogic DM6200 digital panel meter and the PM1200 multifunction power meter provide all the basic features needed to monitor an electrical panel or circuit affordably. Rugged enough to withstand industrial and commercial environments, these meters will help save on energy and installation costs, are easy to use, and adapts to various circuit requirements onsite.

# DM6200 Features

- Measures basic measurements (V, A, Hz & PF).
- Used for equipment monitoring, preventative maintenance scheduling, monitoring load locally, and replacing multiple analog meters.
- Onsite configuration of CT and PT ratios and various other set points.
- Configurable analog bar for at-a-glance check of lad on feeders.
- Standard modbus output fo remote monitoring and data logging.

# Table 4.8:



- Measures basic measurements (V, A, Hz & PF) PLUS energy, power, demand, and THD.
- Used for energy and power monitoring, demand monitoring, load studies and circuit optimization, energy balancing and optimization, etc.

Description	Catalog No.	\$ Price
Basic V, A, F, PF meter w/display, Modbus RS 485 comm port	METSEDM6200	400.00
Power Meter w/display basic readings, THD, demand, Modbus RS 485 comm port	METSEPM1200	550.00



Series 700 Power Meter

# PowerLogic Series 700 Power Meter

The PowerLogic PM700 series power meters offer all of the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit extending only 50 mm behind the mounting surface (less than 2 inches).

With its large display, you can monitor all three phases and neutral at the same time. The anti-glare display features large 11 mm high characters and powerful backlighting for easy reading, even in extreme lighting conditions and viewing angles.

- Panel instrumentation (OEMs)
- Sub-billing and cost allocation

- Remote monitoring of an electrical installation
- Harmonic monitoring (THD)

# Power and current demand, THD and min/max reading in basic version

A high-performance solution for trouble-free monitoring of your electrical installation.

# Energy IEC 62053-22 Class 0.5S (PM750 Only) and IEC62053-21 Class 1 (PM710)

Suitable for sub-billing and cost-allocation applications.

# Alarms and Digital I/O

The PM750 adds alarming functionality (no RTC) and two digital inputs and one output.

# **Table 4.9:**

Description	Catalog No.	\$ Price
Series 700 Power Meters		
PM710 Class 1 (IEC62053-21) Power Meter with integrated display and RS-485 communications port	PM710	710.00
PM750 Class 0.5S (IEC 62053-22) Power Meter with integraded display, alarms (no RTC), (2) digital inputs, (1) digital output and RS-485 communications port	PM750	950.00

Series 800 Power Meter

# PowerLogic Series 800 Power Meters

The PowerLogic PM800 series Power Meter is a high-performance power-monitoring unit able to provide advanced power measurement capabilities in a compact 96x96 mm unit. Its large, easy to read display allows you to monitor all three phases and neutral simultaneously. With its easy to use intuitive interface and self guiding menus, the large anti-glare and back lit display makes this meter the easiest yet to navigate and use. The modular design allows for flexibility with an easy upgrade path to grow the meter's capabilities with the addition of Communication and I/O Modules.

- Monitor current, voltage, power and energy simultaneously
- Trending/Forecasting Curves functionality (PM850/870)
- 128 samples/cycle-zero blind metering
- Waveform capture (PM850), configurable waveform capture (PM870)
- Onboard logging (80k in PM820, 800k in PM850/PM870)
- Detection of sub-cycle sags/swells on both voltage and current (PM870 Only)
- V & I individual harmonics up to 31st (PM820) or up to the 63rd for the PM850 and
- Five input metering channels WAGES
- PQ Advanced Evaluation (EN50160, ITI/CBEMA, SEMI F-47) for the PM850 and PM870
- Type 12 Remote Display Compliant

- Complies with ANSI C37.90 for Surge Withstand Capability (SWC) and IEC 61000-4-12 for Surge Immunity
- Available with 2 standard Digital I/O
- Field installable Digital and Analog I/O
- THD measurement
- Meets ANSI 12.20 Class 0.2 and IEC 62053-22 Class 0.5S accuracy for active energy.
- Optional field installable Ethernet communications card with standard and custom web pages

© 2012 Schneider Electric

All Rights Reserved

**GPS Time Synchronization** 

# Table 4.10:

Description	Catalog No.	\$ Price
Series 800 Power Meters		
PM820 Power Meter with integrated display, THD, Alarming, 80 kb Logging	PM820	2390.00
PM850 Power Meter with integrated display, THD, Alarming, 800 kb Logging, Waveform Capture	PM850	3889.00
PM870 Power Meter with integrated display, THD, Alarming, 800 kb Logging, configurable Waveform Capture, Sag/Swell Detection	PM870	4799.00
PM820RD Power Meter with remote display, THD, Alarming, 80 kb Logging	PM820RD	2550.00
PM850RD Power Meter with remote display, THD, Alarming, 800 kb Logging, Waveform Capture	PM850RD	4058.00
PM870RD Power Meter with remote display, THD, Alarming, 800 kb Logging, configurable Wafeform Capture, Sag/Swell Detection	PM870RD	4958.00
PM820 Meter unit only without display	PM820U	2050.00
PM850 Meter unit only without display	PM850U	3529.00
PM870 Meter unit only without display	PM870U	4460.00
Series 800 Power Meter Accessories		
PM800 Display for integrated meter unit	PM8D	443.00
PM800 remote display and adapter with 12' cable	PM8RD	584.00
PM800 remote display adapter only	PM8RDA	428.00
PM800 Module, 2 digital outputs (relays), 6 digital inputs	PM8M26	635.00
PM800 Module, 2 digital out, 2 digital in, 2 analog out, 2 analog in	PM8M2222	856.00
PM800 Mounting adapter for CM2000	PM8MA	267.00
PM8ECC Ethernet Communications Card; provides a 10/100 Base Tx UTP port, an RS-485 Modbus serial master port, Ethernet-to-serial line gateway functionality, and an embedded web server that is fully compliant with Transparent Ready—Level 1 (TRe1) systems. The PM8ECC supports a private host PM8ECC MIB. Use of this MIB allows the reading of Basic Metering Data, Configuration and Status of ViOs and Configuration and ViOs and Configuration and ViOs and Configuration and ViOs and Configuration and ViOs and Configuration and ViOs an		1150.00

# www.powerlogic.com



CM4000T with VFD Display

# PowerLogic Series 4000 Circuit Monitor

The award winning, Web-enabled PowerLogic Series 4000 Circuit Monitor (CM4250) is the most advanced permanently mounted circuit monitor in the industry today. Designed for critical power and large energy users who cannot afford to be shut down, the CM4250 provides the ability to monitor, troubleshoot and preempt power quality problems. Transients (disturbances lasting less than one cycle) are particularly difficult to detect, due to their short duration. The CM4000T detects and captures oscillatory and impulsive transients (up to 10,000V peak, line-to-line at 5 MHz per channel) as short as one microsecond in duration. The CM4000T automatically performs a high-speed transient waveform capture and a longer disturbance capture to show the conditions surrounding an event. The CM4000T maintains a complete historical record of the number of transients per phase, along with the magnitude, duration and time of occurrence of each. It also performs a stress calculation to determine the circuits that have received the greatest stress from transient overvoltages.

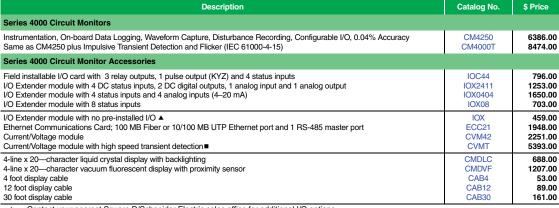
- Waveform capture with up to 512 samples/cycle
- Built-in Trending and Forecasting functionality allows you to forecast energy usage up to 4 days in advance
- Sag/Swell disturbance monitoring
- Two option card slots for field installable cards
- Optional field installable Ethernet communications card with standard and custom web pages
- Alarm Setpoint Learning feature allowing optimum threshold setting (patent pending)
- Multiple alarms including standard, digital, Boolean, high-speed, and disturbance alarms
- Waveshape alarm monitoring
- High speed transient voltage detection at 5 MHz per channel with field installable CVMT current/voltage module
- True RMS Metering through the 255th harmonic

- Extended waveform capture (up to 110 seconds)
- Field installable Digital/Analog I/O cards and flexible I/O extender modules
- Harmonic powerflows up to the 40th harmonic
- Standard KYZ pulse output
- Standard 32 MB of non-volatile memory
- Integrated power quality standards including EN50160, IEC 61000-4-15 (Flicker)
- Sequence of events recording using GPS synchronization technology
- Oscillatory transient detection and recording
- UL Listed, CSA Approved, CE Marking, NOM Approved, FCC compliant

# PowerLogic Series 4000 Circuit Monitor Optional Displays

- High visibility remote VF (vacuum fluorescence) display
- Displays metering data, min/max values, alarms, inputs
- Remote LC (liquid crystal) display with backlighting also available
- Optional user configurable display screens

#### Table 4.11: Series 4000 Circuit Monitors



- Contact your nearest Square D/Schneider Electric sales office for additional I/O options.
- CM4250 is field upgradeable to provide additional features of specified module.

#### Table 4.12: **SER Time Synchronization**

Description	Catalog No.	\$ Price
PowerLogic Satellite Time System, Circuit Monitor and SEPAM GPS Time Synchronization, 100 microsecond accuracy	STS3000	5348.00
Satellite Time Reference Module	STRM	2827.00
CyTime Sequence of Events Recorder, 24 Vdc power / 24 Vdc inputs, 32 inputs, web server	9788SER3200	2700.00
SER 3200 EZ connector for IRIG-B signal	9788EZCIRIGB	115.00
Smart Antenna Module	SAM	2292.00
Smart Antenna Module Interface Cable—200 FT	SAIF200	611.00
Power Supply, 24DC/50W, DIN-mountable	PS080	558.00



ECC21



IOC44 I/O Card

by Schneider Electric www.powerlogic.com

Table 4.13: PowerLogic Circuit Monitor and Power Meter Selection

Features	CM4000T	CM4250	PM870	PM850	PM820	PM750	PM710	PM1200	DM6200
Inputs, outputs and control power									
3-phase / single-phase	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/•
Digital in and out / analog in and out	24 / 4	24 / 4	18/8	18/8	18/8	3/			
Power supply options	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC
Power and energy measurements	<u>J</u>	<u>J</u>	<u>J</u>	<u>J</u>	<u>J</u>	<u>J</u>	<u>J</u>		
V, I, F, PF	•	•	•	•	•	•	•	•	•
Power, demand	•	•	•	•	•	•	•	•	
Energy / energy per shift (time-of-use)	•/•	•/•	•/•	•/•	•/•	•/	•/	•/	
Energy accuracy (%)	0.2	0.2	0.2	0.2	0.2	0.5	1.0	1.0	
Standards compliance to ANSI / IEC	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/	
Power quality analysis	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>l</u>		
Compliance monitoring (e.g. EN50160)	•	•	•	•					
Flicker measurement	•								
High-speed transient disturbance capture (200 ns)	•								
Transient disturbance capture	•	•	sag/swell						
Disturbance direction detection	•	•							
Sag/swell monitoring	•	•	•						
Harmonics measurement	•	•	•	•	•	THD	THD	•	
Uptime (number of 9's) calculation	•	•							
Waveform capture	•	•	•	•					
Waveshape alarm	•	•							
Data and event logging									
Trend / billing	•/	•/	•/•	•/•	/•				
Minimum and maximum	•	•	•	•	•	•	•		
Events / maintenance	•/•	•/•	•/	•/	•/	•/	•/		
Timestamp resolution (seconds)	0.001	0.001	1	1	1				
GPS sync	•	•	•	•	•				
Setpoints, alarms and control									
Annunciation / call out on alarm	•/•	•/•	•/	•/	•/	•/			
Trigger logging	•	•	•	•	•				
Trigger relay or digital ouput control	•	•	•	•	•				
Special features									
Custom programming: arithmetic, boolean	•	•							
Downloadable firmware	•	•	•	•	•	•	•		
Communications									
Ethernet port / web / email	•/•/•	•/•/•	•/•/•	•/•/•	•/•/•				
RS485 / RS232 ports	•/•	•/•	•/•	•/•	•/•	•/	•/	•	•
Modbus protocol	•	•	•	•	•	•	•	•	•



# PowerLogic Submetering

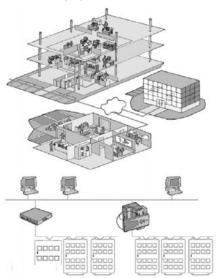
In today's increasingly competitive commercial property market, attracting and retaining high-quality, long-term tenants by offering exceptional value is the primary goal. Balancing these premium services and reliable infrastructure vs. the financial exposure to volatile utility costs is the challenge.

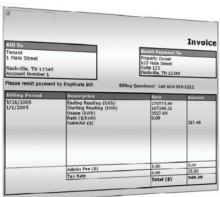
Minimizing energy costs requires information on how energy usage translates into money spent. PowerLogic energy sub-metering systems are specifically engineered to address the measurement, verification and billing needs of multi-tenant properties.

- Residential high-rise and low-rise
- Campuses
- Shopping centers
- Malls / food courts
- Offices
- Commercial buildings

PowerLogic energy management and metering systems are ideal for multi-tenant buildings providing:

- Metering & Verification tools to assure compliance to Energy Policy Act 2005
- Integrated approach from simple energy allocation requirements to high-end power quality
- Monitor energy usage and efficiency to accurately recover the costs while providing tenants with energy and a reliable infrastructure
- Implement energy efficiency initiatives essential to obtaining LEED certification





# DE DEGRES CONTROL DE C

PowerLogic E5600 Socket Meter

# PowerLogic E5600 Socket Meter

The E5600 is a cost effective socket meter that combines high accuracy, superior quality and wide-ranging capability in a device that is simple to install. The PowerLogic E5600 socket meter can help reduce electrical costs, increase property values and attract good tenants by providing the information needed to manage energy costs. Track and allocate costs by circuit or suite, accurately bill tenants for energy used, and verify energy conservation efforts. It is a foundational component for LEED and Energy Star certification as a part of green buildings. Green buildings enjoy higher tenant retention, higher tenant quality, and recognition by the community while typically allowing property managers to charge more for rent.

Unlike traditional sub-metering solutions, which must be manually read or may lack software for effective sub-billing or comprehensive energy management, the PowerLogic E5600 enables businesses to utilize their existing S-based socket infrastructure with a low-cost meter that is part of an end-to-end solution for tenant sub-metering.

- Real, reactive, and apparent energy values.
- Onboard interval data logging (load profiles).
- Revenue grade accuracy ANSI C12.20 0.2% / 0.5%.
- Automatic configuration of service type and voltage.
- Onboard diagnostics continually monitors for equipment failures, improper installation wiring, poor load conditions, poor power quality conditions and tampering.
- S-base meter socket compatible.

# Table 4.14:

Description	Catalog No.	\$ Price
Form 2S, Single-Phase, Class 200, S Based Meter	E5600020SQD	960.00
Form 9S, 3-Phase, Class 20, S Based Meter	E5600090SQD	1080.00
Form 12S, 3-Phase, Class 200, S Based Meter	E5600120SQD	1080.00
Form 16S, 3-Phase, Class 200, S Based Meter	E5600160SQD	1080.00
Form 36S, 3-Phase, Class 20, S Based Meter	E5600360SQD	1080.00
Form 45S, 3-Phase, Class 20, S Based Meter	E5600450SQD	1080.00
Optional USB Optical Communications Probe	OPTICALPROBEUSB	719.00

# **PowerLogic High Density Metering**

High Density Metering (HDM) is engineered to answer the metering and billing needs of multi-tenant properties:

# **Features and Benefits**

- HDM comes standard with the PowerLogic PM210, PM750, PM820 or ION6200 meters.
- Lockable, 16 gauge NEMA Type 1 enclosure provides tamper-resistant security.
- NEMA Type 3R also available. Please consult factory.
- Mounting channel and surface-mount flanges simplify installation.
- Factory installed cover plates are included to cover empty meter spaces.
- Factory installed wiring harness simplifies installation of additional meters and provides future system expansion.
- Each High Density Metering cabinet is provided with standard RS485 Modbus<sup>®</sup>, and optional Modbus Ethernet TCP communications are available. For wireless communications, please consult factory.
- Available in the following configurations: 208 Y/120 V wye; 240 V delta, 48 = 480 Y/277 V wye (PM210, PM750, and PM820), and with provided 2.5:1 CPT (control power transformer) 480 Y/277 V wye (6200); 480 V delta (6200, PM210, PM750 or PM820).
- CTs required. Must select separately.

#### **High Density Metering Cabinet** Table 4.15:

Category	Meter Series	Voltage	Phasing	Enclosure Size	# Meters	Enclosure Rating	Description
HDM	ION6200	12, 4T▲	3	1 or 4	1-4■	R♦ or 1	1 or 4 High Density Meter Enclosure with ION6200 meters; ideal for outdoor as well as indoor applications at all voltage levels including 600V delta and 347/600 V wye systems
HDM	PM210	12, 48, 4T▲	1 or 3	1, 4, 8, or 16	1-16■	1	8 or 16 High Density Meter Enclosure with PM210 meters; ideal for single or three phase indoor commercial building applications
HDM	PM750	12, 48, 4T▲	3	1, 4, 8 or 16	1-16■	1	8 or 16 High Density Meter Enclosure with PM750 meters; ideal for 3 phase indoor commercial building applications
HDM	PM820	12, 48, 4T▲	3	1, 4, 8 or 16	1-16■	1	8 or 16 High Density Meter Enclosure with PM750 meters; ideal for 3 phase indoor commercial building applications

- Voltage Ordering Notes:
  12 = 208 Y/120 V wye; 240 V delta. 48 = 480 Y/277 wye; (PM210/PM750)
  4T = with provided 2.5:1 CPT (control power transformer); 480 Y/277 wye (6200); 480 V delta (6200, PM210 or PM750)
  Meters Ordering Notes: Please indicate the number of meters to be pre-installed when placing your order. You may order any number of meters in the enclosure between one and the maximum number of meters each cabinet will hold.

  Please enter R as the last digit for Type 3R outdoor on 1 or 4 HDM enclosure with the 6200 series meter.

# **High Density Meter System includes:**

- Enclosure
- Power Meters, installed
- Installation bulletin for Enclosure
- Wall hanging bracket
- Installation bulletin for Meters

#### **Accessories and Options** Table 4.16:

Description	Catalog No.	\$ Price
Auxiliary Wiring Harness for installation of additional meters (includes connectors and shorting terminal blocks)	HDMPMHKIT27	221.00
Cover plate for empty meter base	HDMCVRPLT	5.90
Water and Gas Meters	Consult factory for	or details
50 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT050S1	51.00
100 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT100S1	51.00
125 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT125S1	73.00
150 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT150S1	62.00
200 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT200S1	62.00
250 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT250S1	62.00
400 Amp HDM Solid Core Current Transformer, 1.13" window size	HDMCT400S1	62.00
Power Meter with display, basic readings, Modbus RS485 communications port▲	PM210	550.00

To order all other loose meters, please visit metering sections within digest related to particular meter.

# **Multi Circuit Energy Meters**

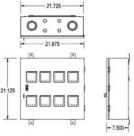
The PowerLogic EM4800 multi-circuit energy meter combines accurate electricity sub-metering with advanced communications technology. They are ideal for multi-tenant or departmental metering applications within office towers, condominiums, apartment buildings, shopping centers and other multipoint environments, metering up to 24 individual circuits from the same meter. The EM4800 series has an accuracy of Class 0.5% for power and energy. Each meter is available separately or as part of a Scquare D integrated power center (IPC) for use in building retrofits or new construction.

Table 4.17:

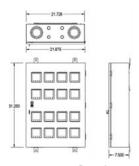
Description	Catalog No.	\$ Price
Energy measurement for 24 (1CT) or 12 (2CT) single-phase circuits or 8 (3CT) 3-phase circuits; Ethernet; modern; onboard interval logging; compatible with 80mA low-power CTs (solid-core)	METSQEM488016	3980.00
Energy measurement for 24 (1CT) or 12 (2CT) single-phase circuits or 8 (3CT) 3-phase circuits; Ethernet; modem; onboard interval logging; compatible with 333mV low-power CTs (solid-core or split-core)	METSQEM483316	3980.00
Energy measurement for 24 (1CT) or 12 (2CT) single-phase circuits or 8 (3CT) 3-phase circuits; Ethernet; modern; onboard interval logging; compatible with standard 5A CTs (solid-core or split-core)	METSQEM480516	5350.00
200 A current transformer (CT), 80 mA secondary, solid-core (1 CT)	METSECT802000	38.00
50 A .333 V Split Core Current Transformer with 0.75 in Window Size	ECT075050SC	90.00
100 A .333 V Split Core Current Transformer with 0.75 in Window Size	ECT075100SC	90.00
150 A .333 V Split Core Current Transformer with 0.75 in Window Size	ECT075150SC	90.00
200 A .333 V Split Core Current Transformer with 0.75 in Window Size	ECT075200SC	90.00
100 A .333 V Split Core Current Transformer with 1.25 in Window Size	ECT125100SC	141.00
150 A .333 V Split Core Current Transformer with 1.25 in Window Size	ECT125150SC	141.00
200 A .333 V Split Core Current Transformer with 1.25 in Window Size	ECT125200SC	141.00
400 A .333 V Split Core Current Transformer with 1.25 in Window Size	ECT125400SC	141.00
200 A .333 V Split Core Current Transformer with 2.00 in Window Size	ECT200200SC	171.00
400 A .333 V Split Core Current Transformer with 2.00 in Window Size	ECT200400SC	171.00
600 A .333 V Split Core Current Transformer with 2.00 in Window Size	ECT200600SC	171.00
600 A .333 V Split Core Current Transformer with 3 x 5 in Window Size	ECT300600SC	241.00
800 A .333 V Split Core Current Transformer with 3 x 5 in Window Size	ECT300800SC	241.00



High Density Metering factory assembled enclosure for multi-tenant properties



8 meter configuration



16 meter configuration



Discount Schedule



**Energy Meter** 

# **PowerLogic Energy Meter**

The Energy Meter is ideal for stand-alone and systems-based submetering applications. It is easy to install and provides exceptional metering accuracy. Available in Basic and Extended Range models. The Basic model is designed for metering of 120/240 and 208Y/120 volt services. The Extended Range model will meter 120/240 volt up to 480 volt Wye connected services. Extended Range meters come with pulse output and phase loss output not available on the Basic unit. Optional Modbus™ RS-485 serial communications are provided with the Energy Meter Comms Board, EMCB. Optional kW demand is also provided by the EMCB.

Meter up to 3 individual services with one Energy Meter. The Energy Meter will allow the addition of up to 3 sets of parallel CTs for metering multiple electric loads. Additional sets of CTs can be ordered separately. Please refer to the multiple CT application notes in the Energy Meter instruction bulletin for the proper installation procedures.

# **Energy Meter**

Table 4.18: Basic 120/240 V to 208Y/120 V

Catalog No.	Description	\$ Price
EMB1010	Basic 100 A, .518"x1.28" ID, 1 CT	426.00
EMB1021	Basic 200 A, 0.75" x 1.10" ID, 1 CT	440.00
EMB1032	Basic 300 A, .90"x1.90" ID, 1 CT	482.00
EMB2010	Basic 100 A, .518"x1.28" ID, 2 CTs	438.00
EMB2021	Basic 200 A, 0.75" x 1.10" ID, 2 CTs	464.00
EMB2032	Basic 300 A, .90"x1.90" ID, 2 CTs	480.00
EMB2043	Basic 400 A, 2.45"x2.89" ID, 2 CTs	505.00
EMB2083	Basic 800 A, 2.45"x2.89" ID, 2 CTs	517.00
EMB3010 EMB3021 EMB3032 EMB3043 EMB3083 EMB3084 EMB3164	Basic 100 A, .518"x1.28" ID, 3 CTs Basic 200 A, 0.75" x 1.10" ID, 3 CTs Basic 300 A, .90"x1.90" ID, 3 CTs Basic 400 A, .245"x2.89" ID, 3 CTs Basic 800 A, 2.45"x2.89" ID, 3 CTs Basic 800 A, 2.45"x5.50" ID, 3 CTs Basic 800 A, 2.45"x5.50" ID, 3 CTs Basic 1600 A, 2.45"x5.50" ID, 3 CTs	

Table 4.19: Additional CT Sets

Catalog No.	Description	\$ Price
EMCT010 EMCT021 EMCT032 EMCT043 EMCT083 EMCT084 EMCT164	100 A, .518" x 1.28" ID, 1 CT 200 A, 0.75" x 1.10" ID, 1 CT 300 A, .90" x 1.90" ID, 1 CT 400 A, 2.45" x 2.89" ID, 1 CT 800 A, 2.45" x 2.89" ID, 1 CT 800 A, 2.45" x 5.50" ID, 1 CT	92.00 99.00 106.00 106.00 123.00 130.00

Note: CT quantity and amperage must match meter model. Total of combined loads must not exceed rating of meter. All additional CTs shipped with 6 ft. white and black color-coded wire leads.

Table 4.20: Extended Range 120/240 V to 480Y/277 V

Catalog No.	Description	\$ Price
EME1021	Extended Range 100 A, .518"x1.28" ID, 1 CT Extended Range 200 A, 0.75" x 1.10" ID, 1 CT Extended Range 300 A, .90"x1.90" ID, 1 CT	471.00 483.00 518.00
EME2021 EME2032 EME2043	Extended Range 100 A, n.518"x1.28" ID, 2 CTs Extended Range 200 A, 0.75" x 1.10" ID, 2 CTs Extended Range 300 A, .90"x1.90" ID, 2 CTs Extended Range 400 A, 2.45"x2.89" ID, 2 CTs Extended Range 800 A, 2.45"x2.89" ID, 2 CTs	
EME3021 EME3032 EME3043 EME3083 EME3084	Extended Range 100 A, 518"x1.28" ID, 3 CTs Extended Range 200 A, 0.75" x 1.10" ID, 3 CTs Extended Range 300 A, 90"x1.90" ID, 3 CTs Extended Range 400 A, 2.45"x2.89" ID, 3 CTs Extended Range 800 A, 2.45"x2.89" ID, 3 CTs Extended Range 800 A, 2.45"x2.80" ID, 3 CTs Extended Range 800 A, 2.45"x5.50" ID, 3 CTs Extended Range 800 A, 2.45"x5.50" ID, 3 CTs Extended Range 1600 A, 2.45"x5.50" ID, 3 CTs	811.00 829.00 864.00 880.00 921.00 971.00

Table 4.21: Energy Meter Accessories

Catalog No.	Description	\$ Price
EMCB	Energy Meter Communication Board▲	267.00
EMFP1	Energy Meter Fuse Pack, Set of 1	47.00
EMFP2	Energy Meter Fuse Pack, Set of 2	94.00
EMFP3	Energy Meter Fuse Pack, Set of 3	142.00
EMBOND	Energy Meter Bonding Kit	117.00

Energy Meter communication board (EMCB) can be used with all models of the Energy Meter. Order one EMCB for each Energy Meter where either kW demand and/or communication is specified.

# PowerLogic Enercept™ Meter

The Enercept Meter is the ideal solution for submetering electric loads where space is at a premium. The compact design consists of three interconnected split-core CTs with the metering and communication electronics built into the CT housing. Simply snap on the CTs, connect the voltage inputs, the communication lines, and installation is complete. Both versions can be connected to either three-phase or single-phase circuits.

Enercept meters employ the Modbus<sup>™</sup> RTU 2-wire communication protocol, and can utilize the same communication network and PowerLogic System Manager<sup>™</sup> software as other PowerLogic devices. Data from the Enercept meters can be presented in tabular or graphical format, used for alarming and historical logging and trending, and to produce reports.

Optional Submeter display (SMD) acts as a stand-alone operator interface supporting up to 32 meters (63 with a repeater). In addition, the Submeter display (SMD) can act as a network adapter allowing Enercept meters to be incorporated into a network.

Table 4.22: Enercept Meter

Catalog No.	Description	\$ Price
3020B012■ 3020B032■	Basic 100 A, 1.25" x 1.51" ID Basic 300 A, 1.25" x 1.51" ID	776.00 800.00
3020B043■	Basic 400 A, 2.45" x 2.89" ID	823.00
3020B083■ 3020B084■	Basic 800 A, 2.45" x 2.89" ID Basic 800 A, 2.45" x 5.50" ID	847.00 869.00
3020B164■	Basic 1600 A, 2.45" x 5.50" ID	893.00
3020B244■	Basic 2400 A, 2.45" x 5.50" ID	916.00
3020E012	Enhanced 100 A, 1.25" x 1.51" ID	1035.00
3020E032	Enhanced 300 A, 1.25" x 1.51" ID	1066.00
3020E043	Enhanced 400 A, 2.45" x 2.89" ID	1097.00
3020E083	Enhanced 800 A, 2.45" x 2.89" ID	1128.00
3020E084	Enhanced 800 A, 2.45" x 5.50" ID	1159.00
3020E164	Enhanced 1600 A, 2.45" x 5.50" ID	1190.00
3020E244	Enhanced 2400 A, 2.45" x 5.50" ID	1221.00

See Handout / Instruction Bulletin for derating properties

# Table 4.23: Accessories

Catalog No.	Description	\$ Price
	Submeter display mounted in enclosure Open style submeter display, no enclosure	725.00 595.00
	2-Wire 232–485 Conv Enercept Mounting Brackets (Set of 3)	78.00 75.00
	24 Vdc Power Supply (for use with EDI or ENA)	157.00

Table 4.24: Enercept Metering Quantities

Basic■	Enhanced•
kWh, energy usage kW, real power	kWh, kW per phase and total, min kW, max kW, kWd, kVAR, kVA, PF per phase and total voltage- V, L-L, L-N per phase and avg. Current - A, per phase and average

# PowerLogic Split Core Current Transformers-Instrument Grade 5 Amp Split-Core Current Transformers

The 3090 SCCT series of split-core current transformers provide secondary amperage proportional to the primary (sensed) current. For use with Circuit Monitors, Power Meters, data loggers, chart recorders and other instruments the 3090 SCCT series provides a cost-effective means to transform electrical service amperages to a 0–5A level compatible with monitoring equipment.

Table 4.25:

Catalog No.	Description	\$ Price
3090SCCT022	Split Core CT—200 A (sz.2): 1.25" x 1.51	120.00
3090SCCT032	Split Core CT—300 A (sz.2): 1.25" x 1.51	120.00
3090SCCT043	Split Core CT—400 A (sz.3): 2.45" x 2.89	129.00
3090SCCT063	Split Core CT—600 A (sz.3): 2.45" x 2.89	129.00
3090SCCT083	Split Core CT—800 A (sz.3): 2.45" x 2.89	129.00
3090SCCT084	Split Core CT—800 A (sz.4): 2.45" x 5.05	137.00
3090SCCT124	Split Core CT—1200 A (sz.4): 2.45" x 5.50	160.00
3090SCCT164	Split Core CT—1200 A (sz.4): 2.45" x 5.50	165.00

Note: Max. Voltage without additional insulation 600 Vac. Do not apply 600 V Class current transformers to circuits having a phase-to-phase voltage greater than 600 V, unless adequate additional insulation is applied between the primary conductor and the current transformers. Square D assumes no responsibility for damage of equipment or personal injury caused by transformers operated on circuits above their published ratings.

SA Split-Core Current

Transformers

**Enercept Meter** 





**BCPM Solid Core CT** Power Meter

# **PowerLogic Branch Circuit Power Meter**

The Branch Circuit Power Meter (BCPM) is ideal for data center customers who are focused on eliminating costly downtime, managing existing capacity efficiently, and reducing energy cost. The BCPM helps data center managers by providing alarms that signify potential issues within the power system and supplying power and energy data down to the circuit level. This data can indicate areas wither over-used or under-used within the facility. It can also be used to effectively control energy cost.

The BCPM can monitor up to 84 circuits and fits any Power Distribution Unit (PDU) or Remote Power Panel (RPP) with minimal space requirements. It has a wide monitoring range allowing customers to monitor circuit current from 0.25 A to 100 A with high accuracy (3% for current 0.25 A to 2 A and 2% for current 2 A to 100 A. It can also measure power and energy readings at the circuit level as well as the incoming main. This eliminates the need for two different meters. The BCPM also has a flexible numbering scheme which allows customers to match that of the PDU or RPP and field configuration adds ease to either a new or restrict installation. a retrofit installation.

# **Key features:**

- Full PDU monitoring
- Flexible configuration
- Split core version for retrofit installations
- Wide monitoring range
- Low current monitoring Advanced alarming
- Cost effective communications
- Easily integrates into a PowerLogic system or other existing networks using Modbus  $^{\rm TM}$  communications

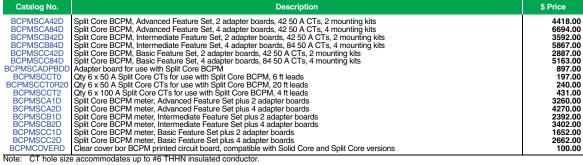
## Table 4.26:



**BCPM Split Core CT** Power Meter

Catalog No.	Description	\$ Price
BCPMA042D		3569.00
	Solid Core CT, 42 circuit meter, measures power and energy on the mains, current per circuit. Includes 2 CT strips, 21 CTs per strip, 3/4" CT spacing.	
		2331.00
		3569.00
	Solid Core CT, 42 circuit meter, measures power and energy on the mains, current per circuit. Includes 2 CT strips, 21 CTs per strip, 1" CT spacing.	
		2331.00
		5748.00
BCPMB084D	Solid Core CT, 84 circuit meter, measures power and energy on the mains, current per circuit. Includes 4 CT strips, 21 CTs per strip, 3/4" CT spacing. Solid Core CT, 84 circuit current meter. Includes 4 CT strips, 21 CTs per strip, 3/4" CT spacing.	4627.00
		5748.00
	Solid Core CT, 84 circuit meter, measures power and energy on the mains, current per circuit. Includes 4 CT strips, 21 CTs per strip, 1" CT spacing.	
BCPMC184D	Solid Core CT, 84 circuit current meter. Includes 4 CT strips, 21 CTs per strip, 1" CT spacing.	3495.00

# Table 4.27:



Note: CT hole size accommodates up to #6 THHN insulated conductor.

# PowerLogic Multi-Circuit Meter

Designed for OEM style placement in electrical distribution equipment the MCM8364 is configurable to meter 1 or 3 phases of up to eight individual loads, six loads if neutral monitoring is required. The MCM will monitor up to 10,000 amps per service using standard 5 Amp CTs. All of the metered circuits must share a common voltage source. The MCM8364 is a great solution for monitoring critical power distribution equipment and provides 24 different electrical metering quantities plus an additional nine Modbus register alarms.

With one RS-485 connection, the multi-circuit meter provides Modbus RTU communications output that communicates to each individual metered circuit. Up to 30 multi-circuit meters can be addressed on the same Modbus network. The multi-circuit meter can provide warnings to the central monitoring computer via its Modbus output using the MNode software provided or can be integrated into PowerLogic SMS software. The MCM also works with the submeter display as shown below.

# **Electrical Data:**

Energy Consumption (kWHr), Real Power (kW), Reactive Power (kVAR), Apparent Power (kVA), Power Factor Total, Voltage, L-L, avg. of 3 phases, Voltage, L-N, avg. of 3 phases, Current, average of 3 phases, Real Power (kW) phase A, B, & C, Power Factor, phase A, B,&C, Line to Line Voltage, phase A-B, B-C, A-C, Line to Neutral Voltage, phase A-N, B-N, C-N, Current, phase A, B, & C, Frequency (measured from phase A) (Hz).

# **Modbus Alarms:**

Over Voltage, Under Voltage, Over Current, Under Current, Over kVA, Under kVA, Phase Loss A, Phase Loss B, Phase Loss C

# Table 4.28:

Catalog No.	Description	\$ Price
MCM8364	Multi-Circuit Meter 8364	1863.00

# PowerLogic Submeter Display

The PowerLogic Submeter Display (SMD) is a comprehensive electrical submetering display that provides a view of electrical parameters from multiple metering products with one networked LCD. In addition to viewing system data on the display itself, you can also view data on a remote PC via a network connection. Touch pad buttons provide a convenient way to view downstream devices on the power-monitoring network. The display is RS-485 Modbus RTU compatible. It has additional RS-485 and RS-232 Modbus ports for networking to additional displays or to a master PC. The submeter display is compatible with the following metering devices: BCM, MCM, & Enercept<sup>TM</sup> meters.

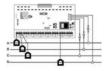
# Table 4.29:

Catalog No.	Description	\$ Price
SMD SMD OPN	Submeter display mounted in enclosure Open style submeter display, no enclosure	725.00 595.00

Discount



Typical BCPMSC panelboard installation



3-phase, 4-wire (with neutral current wiring)



POWER MONITORING AND

Submeter Display





PowerLogic<sup>™</sup>

Easily view information that is most important to you through a customizable dashboard



View your environmental impact from a single screen to track emission reduction initiatives



Easily save reports and export them to a personal web-page for easy tracking

# **Web Hosted Solutions**

Schneider Electric Remote Energy Management solutions are web-hosted, subscription based Software-As-A-Service (SaaS) offers. This means that all of our data is hosted at a secure Schneider Electric data center facility available for you to view from any webenabled device, 365 days per year, 24 hours per day, 7 days per week. No additional servers, PCs, software or IT personnel are needed when utilizing a remote hosted solution. All data is easily obtained through standard communications methods (Ethernet) from multiple device types and sources such as meters, existing systems, and building management systems (BMS).

A remote energy management solution allows you to easily:

# Identify energy waste

- View energy profiles to quickly identify energy waste in a single facility or across your enterprise
- Lower capital expenses with better utilization of current infrastructure (i.e. HVAC and Lighting)

# Reduce energy consumption

- Use historical comparisons to determine profiles of day-to-day, month-tomonth, and year-to-year energy consumption
- Compare energy usage around similar facilities to establish benchmarks and identify poor performing facilities
- Normalize facility consumption against weather, production, hours of operation, square footage, and occupancy to measure the true energy
- Measure the effectiveness of various energy efficiency and conservation efforts

# Save on utility bills

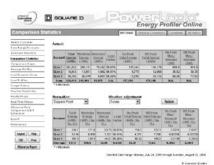
- Compare usage to utility bills to ensure the utility is billing correctly
- Optimize equipment run hours and setting to avoid setting new demand
- Make accurate assessment of what utility costs would be on different utility

# Measure, report on and implement energy and emission reduction initiatives

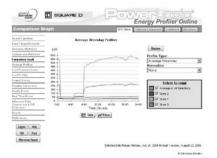
Utilize emissions reporting to determine the CO2 baseline, establish targets, and monitor improvements to help manage your carbon footprint



Bill estimates provide valuable information for budgeting and forecasting



Comparison statistics display



Typical comparison graph showing time of usage

# **PowerLogic Energy Profiler Online**

PowerLogic Energy Profiler Online (EPO) is a web-hosted service that is the industry's foremost load data visualization and analysis application. This flexible, easy to use system turns customer usage data into actionable information, freely accessible to all customers and internal users. For commercial and industrial energy customers, managing energy costs is the primary objective, but they can't control what they can't measure. EPO enables energy customers to take control of their costs by providing the information they need to understand how their organization uses energy. They can then take steps to reduce costs by implementing conservation measures, investing in more efficient equipment, or participating in new pricing or load curtailment programs.

For the utility, EPO provides an intuitive, easy-to-maintain tool for better understanding customer usage patterns and meeting customers' growing need for information. It also provides a convenient platform from which to administer real-time pricing (RTP) or load curtailment programs. EPO's instinctive online functionality gives first-time users an extremely short learning curve, while its powerful configuration options address the needs of more sophisticated users. The service is available to users at their convenience, 24/7, and regular updates ensure that customers get the most current information.

# Key features:

- Data access and analysis
- Automated reporting
- Estimated bills and rate comparisons
- Demand response and curtailment programs
- RTP programs
- Alarming
- Administration tool

# Applications:

- Energy load analysis
- Energy budgeting and bill forecasting
- Demand response and load curtailment program management
- Real-time pricing program management
- EPO's Real-Time Pricing module lets users see interval data for accounts with future pricing information, and multiply that data against a price stream.

For price & ordering information, contact your local PowerLogic Sales Specialist or PowerLogic Inside Sales at 615-287-3535.



EGX100 Ethernet Gateway



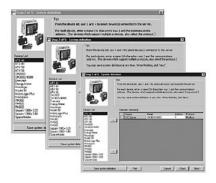
EGX100 lets the Administrator assign access to setup pages by user groups



Built in tabs provide easy DIN rail mounting solution.



EGX300 Ethernet Gateway offers you a "window" into your power equipment



# Communications for high-speed access to critical information

From a single building to a multi-site enterprise, PowerLogic Web-Enabled Network Components provide fast, reliable serial to Ethernet connectivity in the most demanding applications:

- Energy management
- Power distribution
- Building automation
- Factory automation

PowerLogic Ethernet Gateways are available in two models-EGX100 and provide direct connection to Ethernet-Modbus™/TCP networks to make energy and power monitoring information available over local and wide area networks.

- The EGX100 provides low-cost, reliable, Ethernet to serial-line connectivity in a compact, DIN-rail
  mounted package. Enabled by Power over Ethernet (PoE IEEE 802.3af), the EGX100 simplifies
  installation by eliminating the need for power supplies plus provides a Web-based interface for
  configuration and diagnostics.
- The EGX300 is an integrated gateway-server that is web based with 1 serial port and has the ability
  to connect to an additional 32 devices remotely through Ethernet, plus log/trend historical data
  allowing electrical distribution systems to be better managed by utilizing Ethernet and Internet
  technologies.

# Advantages

- Easy to install—easy DIN rail mounting solution.
- Easy to setup—No special software required. Configuration via Microsoft Internet Explorer or Hyperterminal.
- Easy to troubleshoot—Detailed diagnostics for communication ports through a
  Web interface.
- Easy to maintain—Field upgradable firmware lets you add new features while reducing costly downtime.
- Secure-Customizable, password-protected access to configuration.
- Cost-effective, high-speed communications—Use existing LAN infrastructure to reduce communications wiring and network management costs.
- Open platform provides broad connectivity—Modbus TCP/IP over Ethernet allows transparent access via intranet/internet. Each gateway supports up to 32 Modbus or PowerLogic protocol devices
- Subnet initiated communications—The gateway supports a slave mode for connecting a serial-line based system to Ethernet. For example, a building management system with a Modbus serial interface can route to 16 remote Modbus TCP/IP interfaces supporting up to 128 serial-line devices.
- Extended temperature range— -25 to 70°C enables operation in harsh environments.

# Table 4.30:

		EGX100	EGX300
Туре	Part No.	\$ P	rice
		950.00	1895.00
Control Power			
24 Vdc / 7W DIN mount power supply (SOLD SEPARATE) Power Over Ethernet Injector Kit (SOLD SEPARATE)	3090PS24 TCSEAV0100	157.00 185.00	157.00 185.00
Protocols			
Ethernet: HTTP, FTP, Modbus TCP/IP, SMTP, SNMP (MIB2), SNTP, TCP, UDP, ICMP, ARP		х	х
Serial: Modbus RTU, Modbus ASCII (EGX100 only), JBUS, PowerLogic (SY/MAX)		х	x
Ports			
Serial: RS485 Serial: RS232/485 configurable Ethernet UTP (10/100) Fiber (100 Mb)		1 1	1 1 1 1
Integral web server			
Web page generation tool Maintenance/diagnostics Gateway administration setup Comprehensive meter reading Interval logging/trends User defined custom pages		x x	x x x x 32 devices x
Historical Data Logging			
Interval data Transfer files on an interval and periodic scheduled basis Export to Excel via web query Export files by e-mail, FTP, or HTTP			x email x x

# PowerLogic WebPageGenerator

The PowerLogic WebPageGenerator (WPG) creates and downloads application specific web pages to PowerLogic Ethernet gateways (EGX300, ECC21, PM8ECC) with minimal user intervention. The user simply identifies the serial devices connected to the Ethernet gateway in this wizard-based software utility. The utility takes care of the rest. This utility is available for download from www.powerlogic.com.

SQUARE D by Schneider Electric www.powerlogic.com





# **Power System Engineering**

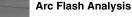
The Square D Power System Engineering team offers a wide range of engineering services to improve the safety, efficiency and reliability of your power distribution system. The team is comprised of registered professional engineers, safety trained and equipped, to perform a variety of engineering functions.

# **Power System Studies**

The Square D Power System Engineering Team provides expertise for a variety of electrical power system studies. Some of the more common system studies include...

- Short-circuit analysis
- Time-current coordination
- Motor starting/voltage drop
- Motor starting/torque-speed
- Safe motor re-energization

- Harmonic analysis
- Transient analysis
- Power factor correction analysis
- Other system specific analysis



Square D offers on-site services to perform arc flash analysis for a facility, complex, office, or campus. An Arc flash analysis is used to determine ...

- Flash Protection Boundary
- Incident Energy Value
- Hazard/Risk Category

Features of Square D arc flash analysis include...

- Appropriate Personal Protective Equipment (PPE)
- Low cost arc flash reduction methods
- Time current coordination analysis showing both existing and recommended over/current device settings
- Short-circuit study to ensure adequacy of equipment
- Onsite verification and documentation of equipment
- Arc flash labels (populated with the results of the arc flash analysis)
- Arc flash label affixation
- NFPA 70E—Safe Workplace Practices Training provided by OSHA authorized outreach instructors
- Recommendations and solutions to reduce potential arc flash hazards

# **Power Quality Studies**

Square D offers onsite power quality engineering studies and solutions to eliminate process disruptions, power system shutdowns, and equipment damage due to electrical power system disturbances. A power quality study is used to...

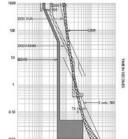
- Determine compliance with the IEEE 519-Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems guidelines
- Identify most cost-effective solution to power quality problems
- Solve process disruptions due to power disturbances
- Reduce economic effects of poor power quality
- Identify disturbances originating on electric utility system and improvements to reduce the number and severity

# **Power System Assessment**

Square D offers engineering services to meet a variety of power system needs ...

- Basic codes and standards compliance
- Protective coordination assessment
- Maintenance program review
- Recommendations for power system optimization
- Power quality troubleshooting and analysis
- Power factor and harmonics analysis

- Electrical safety hazards
- Short-circuit withstand overview
- Single-line documentation of power system
- Power monitoring recommendations
- Loading measurements



**Power System Improvement Projects** 

Square D offers engineering services for ...

- New equipment installation
- Existing equipment modification
- Ground Fault Schemes for multiple source distribution systems
- High Resistance Grounding (HRG) Conversion
- Automatic Transfer Control Schemes & Generator Operations

Square D professional engineers - safety trained and equipped - will listen to your concerns and goals, define the problem or enhancement, and engineer the solution that best satisfies your needs.

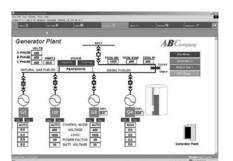
For additional information on power system engineering services and pricing, contact your nearest Square D/Schneider Electric office.

# **Industrial Energy Efficiency**

Schneider Electric Certified Energy Managers (CEM's) work on-site with knowledgeable plant personnel to develop a long-term, comprehensive, "Energy Action Plan", that serves as the blueprint for energy savings. Unlike performance contracts or one-time energy audits, the Total Energy Control Plan program offers a strategic partnership for energyintensive industrials who want to improve energy efficiency.

- Total Energy Control Comprehensive integration of all three areas affecting energy efficiency
  - Procurement (electricity and gas)
  - Demand management
  - Optimization of process and plant utilities
- Program deliverables:
  - Long-term Energy Action Plan
  - Energy efficiency projects
  - Ongoing accountability for results

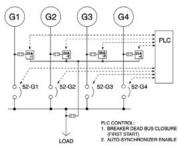




PowerLogic Engineers provide graphic solutions for realtime monitoring of power systems.



PowerLogic Engineers specialize in the design and setup of Emergency Power Supply Systems (EPSS).



PowerLogic Engineers design power control systems that meet your operational requirements.

# **Engineered Solutions**

Schneider Electric provides an engineered solution approach to your specific power system applications. Our total solutions for power monitoring and power system controls allow greater safety, reliability, and energy efficiency of your power systems. As a long standing industry leader in Power Monitoring and Control Systems, we understand your power system requirements and needs.

All of our Engineered Solutions are tailored to your specific system requirements. Schneider Electric is your total Solution provider.

# **Power Monitoring Applications**

# Increased Reliability and Energy Efficiency

Increased Reliability and Energy Efficiency are key results produced from our Power Monitoring Applications. Schneider Electric power monitoring applications provide detailed reporting, testing and analysis capabilities for your systems and related components.

- EPSS Emergency Power Supply Systems The PowerLogic EPSS Test Report provides information regarding the health and status of the emergency power supply system, including automatic transfer switches and generators.
- SER Sequence of Events Recording The PowerLogic Sequence of Events Recorder (SER)
   Module is a root-cause analysis tool for rapid response for problem resolution that is ideal for
   pinpointing the cause of a service disruption in very large complex power systems.
- WAGES Water, Air Gas, Electric, Steam PowerLogic energy and power management systems
  can provide instantaneous readings, alarm notifications, and graphical diagrams for monitoring
  electrical and piped utilities (Water, Air, Gas, Electric, Steam).
- APM Active Pager Module The PowerLogic Active Pager Module allows automatic paging to alphanumeric pagers, cell phones and PCs.

# **Power System Control Applications**

# Automated solutions for increased Reliability and Energy Efficiency

Schneider Electric engineers provide Power System Control Applications with automated solutions for addressing your system reliability and efficiency control needs. Our offer covers Automatic Throwover Schemes, Load Shedding/Peak Shaving, and Load Preservation.

- Automatic Throwover Systems Automatic selection of available utility or generator sources to maintain service continuity to connected loads.
- Load Shedding/Peak Shaving Control peak demand levels or ensure service continuity to critical
  load or operate breakers in accordance with user specified sequences and time delays such as
  bringing large motors online across several billing kw demand periods to avoid demand penalties.
- Load Preservation Fast acting sophisticated control systems designed to stabilize critical power systems to the greatest extend possible by monitoring frequency and power sources from utility plus generator capacity versus total circuit load.

# **System Integration**

# **System Design and Engineering**

Our Square D Engineering Services solution specialists can work with you to design or upgrade your existing system to best achieve your energy and power management objectives and informational needs. With expertise in electrical systems, communications, and automatic control systems, we can integrate, install, and commission your system for optimal performance.

- System Design and Bill of Material Recommendations
- Power Monitoring and Control
- WAGES (Water, Air, Gas, Electric, Steam)
- Enterprise web-based monitoring
- Specification development, drawings, documentation
- Enclosure panel design and build
- Metering Connection Verification/Testing
- Power distribution automation
- On-Site Installation Assistance, Component Configuration & Startup
- Turn-key project management
- Third Party Device and communication interfaces
- Configured Workstations, User Software Interfaces
- Interactive Graphic Design to mimic facility layout, one-lines, equipment status
- Custom Software, Reports & Applications Billing and Paging

For additional information, contact your nearest Square D / Schneider Electric office.



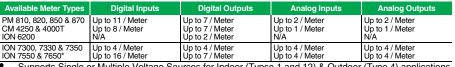


# Factory Assembled Equipment

Square D™ PowerLogic™ Factory Assembled Equipment offers a wide range of designs for metering, communications, and control applications to simplify retrofit installations. Our equipment is designed to order as a free-standing or wallmounted system. With PowerLogic™ Factory Assembled Equipment, you'll receive professionally crafted, factory tested, pre-wired equipment that will greatly improve the speed of your system startup. All backed by the Square D™ quality standard of excellence.

- Assemblies include meters & devices wired to terminal blocks, disconnects, and shorting blocks or test switches
- Tailored to any system voltage:
  - 208/120 V, 480/277 V & 600/347 V Wye
  - 240 V, 480 V & 600 V Delta
  - Utilization of PT's required for higher voltage levels
- Wall mountable and easy to install using concealed holes in the back of the enclosure.
- Complete with necessary documentation and mounting hardware for quick and easy installation
- Carbon steel construction, with industry standard ANSI 61 gray powder coat finish
- Equipped with concealed hinged door, and universal pad-lockable latch.
- Custom engraved nameplates available for all units.

#### Industrial Enclosure Types 1\*, 12, & 4, UL & CUL 508A Listed Table 4.31:



- Supports Single or Multiple Voltage Sources for Indoor (Typse 1 and 12) & Outdoor (Type 4) applications
- Available with 1-4 meters per panel. Serial & Ethernet Communications are options for all units
- EGX & ION RTU Communication Enclosures with 1-4 devices per panel also available



- Available for the following meter types: PM820 (with ethernet), and ION6200
- Supports Single Voltage Source only for Indoor (Type 1) applications.
- Available with 1-12 meters per panel. Serial Communications are standard for all units.
- No Digital or Analog I/O is available for this option



- Available for ION8600 only, with up to 3 Digital Inputs and 4 Digital Outputs and ION5600 2 Digital Inputs and 2 Digital Outputs.
- Supports Single Voltage Source only for Indoor & Outdoor (Type 3R) applications.
- Units are Ring Type with removable cover.
- Available with 1 meter per panel. Serial & Ethernet Communications options available.
- Supports Form 9S, 35S, 36S, 39S and 76S configurations for ION8600 and forms 9S and 36S for ION5600.
- Options available for remote mounted CTs
- Options available for integrated, bar type CTs
- Optional Test Switch.

# Additional engineered to order products are available for a wide variety of design solutions.

- Switchgear Transfer Control Panels
- Generator Control Panels
- Load Shed Control Panels
- Sequence of Events Recording (SER) Panels
- Control System Mimic Panels
- Lighting Control Interface Panels
- Programmable Logic Controller (PLC) Control Panels (Hot Standby, Relay Control, Data Concentration etc. ...)
- Emergency Power Supply Systems (EPSS) Control Panels
- Water, Air, Gas, Electrical, and Steam (WAGES) Monitoring Panels
- Input Status Monitoring & Alarming Panels
- Remote Annunciator Control Panels
- Remote Operator Control Panels
- Serial, Ethernet, and Cellular Wireless Systems
- Server Rack and Network Equipment (Servers, Switches, UPS's) for Energy Management Systems.
- Industrialized PC's, Touch Screens (Magelis), and Human Machine Interfaces (HMI's) with Custom System
- Designed to fit any environment Indoor (Type 1 & 12) & Outdoor (Type 3R & 4) applications

For additional information and pricing please contact your local PowerLogic sales specialist or PowerLogic Inside Sales Support at 615-287-3535. Equipment pricing and literature available for download on our website at www.powerlogic.com/products/enclosures.

# To better serve you please have the following information on hand when calling.

- Enclosure type (Indoor or Outdoor) and Environment details (Corrosive or Non-Corrosive)
- Power System Voltage Level and Type (Direct Current (DC) or Alternating Current (AC))
- Digital & Analog Input and Output requirements
- Device Type and Quantity per enclosure
- Ethernet and Serial Communication Requirements
- For Drawout Retrofits, need existing cradle type (i.e. GE, Westinghouse, etc.)



4-22

<del>す</del>

www.powerlogic.com

# **Technical Support**



There are several ways to receive top quality support on PowerLogic products:

# Priority Support: Excellent Service, Free Software Upgrades, Training Discounts & More!

- Latest PowerLogic SMS and ION software upgrades to ensure up-to-date systems
- Direct access to expertise for guick issue resolution
- More efficient PowerLogic SMS and ION system utilization
- Higher reliability
- Improved productivity and personal efficiency on the job

# **Priority Support: Tenant Metering**

Now the great support provided to SMS and ION systems is now available for Tenant Metering systems. Support includes ...

- Direct email (4-hr response time) and toll-free 800 number support for prompt response to urgent or non-urgent requests from highly trained support engineers.
- Hours of service 7:30am to 7pm US Central time
- PowerLogic<sup>™</sup> Tenant Metering software upgrades at no charge
- Proactive notification of software service packs and fixes
- Remote diagnostics support engineer can troubleshoot any issues of the TMS system remotely without the customer's help.

# Premium Support: Priority + Proactive System Checks + Sr. Technician Assigned to your site

Choose Premium Support when you need to . .

- Enhance your PowerLogic SMS and ION system's operation with single-sourced pro-active problem identification, solutions recommendations and change management skills
- Partner with technical experts who help coordinate support, provide hands-on assistance, and share knowledge and know-how with you
- Obtain personalized services tailored to your business environment and objectives
- Take advantage of remote software upgrade capabilities
- Anticipate and communicate necessary change

# **Additional Support Options:**

# 7x24 Support Option

- PowerLogic 7x24 support provides 1-hour phone response by senior support engineer during off-hours.
- Additionally, 4-hour response (max) for remote connection to customer system for advanced troubleshooting.

# **On-Site Maintenance Option**

On site maintenance includes pre-scheduled visits by PowerLogic system engineers who perform software upgrades, updates to custom graphic screens, device firmware upgrades, and system performance analysis and correction. Scope of work is determined by customer request.

# **Power Management University**

Our training centers offer a variety of training courses designed to improve your total energy management skills. Our instructor led courses are 70% hands-on, with each student having their own lab workstation. We have two main training centers located in Nashville, TN and Victoria, BC and offer training at a variety of Square D sites across the US and Canada.

# Table 4.32:

Course Description	New Course No.	US \$ Tuition
Webinars and Online		
Webinar Training (for any webinar) OnDemand Training (12 month access) OnDemand Training (6 month access)	3000PLUCWEB 3000PMUDEMAND12 3000PMUDEMAND6	500.0 1500.0 1000.0
PowerLogic SMS Systems (Factory and Regional Courses)		
PowerLogic SMS Fundamentals Bundle (includes 3000PMUDEMAND12) PowerLogic System I&T PowerLogic SMS Administrator Regional SMS Overview Regional SMS Overview Bundle (includes 3000PMUDEMAND12) Power Monitoring with SMS Power Monitoring with SMS Bundle (includes 3000PMUDEMAND12)	3000PLUC205 3000PLUC100 3000PLUC300 3000PLUC190 3000PLUC195 3000PLUC191 3000PLUC192	2750.0 2150.0 2150.0 1800.0 2400.0 1200.0 1800.0
PowerLogic ION Systems (Factory and Regional Courses)		
PowerLogic ION Enterprise Fundamentals Bundle (includes 3000PMUDEMAND12) PowerLogic ION Enterprise Programmer PowerLogic ION Enterprise Administrator Regional ION Overview 3 Day Regional ION Overview Bundle (includes 3000PMUDEMAND12) PowerLogic ION Designer Intro Regional ION Utility Meter Programmer Regional ION Administrator Overview	3000PMUFUNDCR 3000PMUPROG 3000PMUADMIN 3000PMUCIONN 3000PMUCIONCR 3000PMUCIPROG 3000PMUMTRPRG 3000PMUCADMIN	2750. 2150. 2150. 1800. 2400. 1200. 1200.
Custom Onsite Training		
Customer Onsite Training	3000PMUSITE	by Quo

All classes bundled with the 3000PMUDEMAND12 can be ordered without the bundle at a discounted price. Please call 615-287-3304 for more info.

# Remote eServices

Let expert Square D technicians ensure high-quality performance in your PowerLogic SMS and ION system by performing remote, online services through our secure WEB EX Portal. Services include ...

- Installations, upgrades, & software patches
- System device setup & configuration along with alarming & historical trending
- Graphical Screen Development
- · Remote, Online System Maintenance
  - Software Updates Patches & Upgrades
  - PC Checks Hard Disk Space, Network & DB Configurations, Viruses, etc.
  - PowerLogic or ION Software Checks -Communications, Data Logging, & Task Execution
  - E-mailing system scorecard & maintenance recommendations
- One-on-one training on system software features
- Power Quality (PQ) & Energy Usage Analysis

Series: 10, 20, 40/50, 60 and 80





# Series 20, 40, 60 and 80

The Sepam family of protective relays, Series 20, 40 and 80, are the newest generation of Sepam relay, a time tested product with a 29-year worldwide history. Modular relay design allows quick and easy future upgrades to communications, digital I/O, analog output or temperature acquisition. The 64x128 bit, graphic LCD display and keypad permit relay setting of Series 20 and 40 without a PC. Comprehensive self-testing provides assurance of readiness to protect. The Sepam family also has exceptional withstand to environmental electromagnetic disturbances. An optional 128x240 LCD display for the Series 80 relay can show an animated one-line with front panel control. The Sepam Relays and remote modules come with a 10 year warranty and conformal coating for harsh environment as standard.

# Sepam Series 60 and 80 Relay Features

- Standard footprint for enhanced protection of Mains/Feeders, Transformer, Motor, Generator, Capacitor, Bus Applications
- Differential protection of transformer or machine transformer units
- Differential protection of motors and generators
- Protection for mains and ties and important feeders including preprogrammed or customized ATS/ATO Schemes
- 42 programmable logic inputs and 23 relay outputs
- Increased accuracy metering capabilities, I, V, E, P, PF, THD, vector diagram
- Expanded logic equation capabilities (an option for Logipam PLC ladder logic)
- Setting Software (SF2841) with graphical assistance, optional mimic-based display
- Battery backup for historical and fault waveform data retention, 24–250 Vdc control power
- 2 independent RS485 (2 or 4 wire) communication ports: connection of each to port 1 or 2 S-LAN and/or E-LAN networks ModBus™, ModBus TCP/IP, IEC60870-5-103, DNP3 and IEC61850 communication protocol with GOOSE messaging.
- Software tools: Sepam parameter and protection setting and control function customization programming of specific functions (Logipam-Series 80) recovery and display of disturbance recording data local or remote operation via an E-LAN
- Synch-check option
- Includes all Series 20 and Series 40 features

# **Sepam Series 40 Relay Features**

- Compact standard footprint (< 4" deep) for enhanced protection of Mains/Feeders, Transformer, Motor, General Applications
- Directional overcurrent protection for dual mains and ties and closed loop feeders
- 10 programmable logic inputs and 8 relay outputs

- Current and voltage inputs I, V, E, P, PF
- Setting software with Boolean logic equation assistance for customized protections and ATS/ATO schemes
- CT/VT and Trip Circuit supervision
- Sixteen seconds of fault recording, last 5 trip reports, and last 200 time-tagged plarms
- Rear communication port connection to 1 or 2 S-LAN and/or E-LAN networks ModBus™, Modbus TCP/IP, IEC60870-5-103, DNP3 and IEC 61850 communication protocols TCP/IP redundancy RS 485 (2 or 4 wire) or fiber optic network
- Temperature data from 16 RTD's, Pt100, Ni100, or Ni120
- Includes all Series 20 features

# **Sepam Series 20 Relay Features**

- Backlit LCD graphic bitmap display
- Compact standard footprint (< 4" deep) for basic protection of Mains/Feeders, Transformer, Motor, Bus (Voltage) Applications
- Current or voltage inputs I, or V
- 10 programmable logic inputs and 8 relay outputs
- 16 inverse time overcurrent characteristic curves and customized protection curves (Series 80)
- Two 86 cycle records of fault recording, last trip fault values, and last 64 timetagged alarms retained
- Provides trip diagnostic information for analysis of faults
- Self-test diagnostic ensures correct operation of relay and integrity of protection
- Wide range of control power inputs
- Application specific design for Main/Feeder, Transformer, Motor, Bus (Voltage) zones
- Zone selective interlocking (ZSI) improved protection coordination as a cost effective alternate to Buss Differential (87B) application
- Rear communication port connection to 1 or 2 S-LAN and/or E-LAN networks ModBus, ModBus TCP/IP, IEC60870-5-103, DNP3 and IEC 61850 communication protocols TCP/IP redundancy RS 485 (2 or 4 wire) or fiber optic network.
- Temperature data from 8 RTD's, Pt100, Ni100 or Ni120.
- 1 programmable analog output, 0–1, 0–10 mA, 4–20 mA or 0–20 mA
- Modular architecture
- Breaker maintenance diagnostics
- Two groups of current protection settings (logic input selectable) with built in breaker failure (50BF) to allow reduced arc-flash hazard and PPE rating during maintenance operation

by Schneider Electric www.powerlogic.com

Three relay series with increasing protection capabilities for six types of applications to provide all possible protection configurations

Table 4.33: **Protection Configurations** 

	Series 20				Series 40				5	Series 60			Series 80				
Applications																	
Substations Transformers Motors Generators Busbars Capacitors	Current	Voltage	Frequency	Temperature	Current	Voltage	Frequency	Temperature	Current	Voltage	Frequency	Temperature	Current	Voltage	Frequency	Temperature	Rotation Speed
						+ direct	ional protec	tion		+ direct	tional protec	tion		+ (	directional p	rotection	
Protection Fun	nctions  26/63, 27/27S, 27D, 27R, 30, 37, 38/49T, 46, 48, 49RMS, 50/51, 50BF, 50G/51G, 50N/51N, 51LR, 59, 59N, 66, 68, 79, 81H, 81L, 81R, 86, 94/69, CPLU 50/51, CPLU 50N/51N				32C/40, 37, 30491, 40, 47, 46, 491NIS, 50/51, 50BF, 50G/51G, 50BF, 50G/51G, 50N/51N, 50F, 50G/51G, 50BF, 50G/51G, 50H, 50/27, 50/51, 50BF, 50G/51G, 50N/51N, 50H, 50G/51G, 50H, 50H, 50H, 50H, 50H, 50H, 50H, 50H				32Q/40, 37, 38/49T, 46, 47, 48, 49RMS, 50/51, 50BF, 50G/516, 50N/51N, 50V/51V, 51LR, 59, 59N, 60/60FL, 66, 67, 67N/67NC, 68, 79, 81H, 81L, 81R, 86,			7, 37P, 38/4 50/51, 50B 51LR, 59, 5 7, 67N/67N	Í, 50BF, 50G/51G, 50N/51N, , 59, 59N, 60/60FL, 64G, N/67NC, 68, 74, 78PS, 79,				
Characteristics																	
Logic	Inputs 0–10				In	puts 0-10			In	puts 0-28				Inputs 0-	-42		
input/outputs	Outputs 4–8				0	utputs 4–8			Οι	tputs 4–16				Outputs 5	5–23		
Temperature sensors			0–8		0–16			0–16			0–16						
			ırrent 3I + Io				rrent 3I + Io		Current 3I + Io					Current 2x 3			
Channels		Volt	age 3 V + V	0			age 3 V + Vo	)			age 3 V + Vo	)		١	/oltage 2x 3		
			LPCT▲				LPCT▲				LPCT▲				LPCT	<u> </u>	
	NA11	IEO	1–2	150 04050	NA15	IFO	1–2	150 04050	NA15	IFO	1–2	150 04050		4- dD	2–4	VIDO 150 040	
Communication Ports	IVIOGI	Bus, IEC	103, DNP3,	IEC 61850	IVIOGE		103, DNP3, edundancy	IEC 61850	Modi		103, DNP3, edundancy	IEC 61850	I.	noaBus,	Redunda	NP3, IEC 6185	50
						110	duridaricy				se Message	)			Goose Me		
-			Matrix■				Matrix■				Matrix■	-			Matrix		
Control	Wellix					Logic	equation edi	tor		Logic	equation edi	tor		L	ogic equation	n editor	
															Logipan	n∳	
Other									Front	t memory	cartridge w	th settings	Front memory cartridge with settings				
Other				-	Е	Backup 48	3 hours (cap	acitor)		Backup	lithium batte	ery★		Ba	ckup lithium	battery★	

- LPCT: low-power current transducer complying with standard IEC 60044-8.

  Control matrix for simple assignment of information from the protection, control and monitoring functions.

  Logipam ladder language (PC programming environment) to make full use of Sepam Series 80 functions.

  Standard lithium battery 1/2 AA format 3,6 V front face exchangeable.

#### Table 4.34: **ANSI Codes**

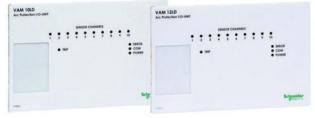
Code	Definition	Code	Definition
12	Overspeed (2 set points)	50N/51N	Ground fault
14	Underspeed (2 set points)	50V/51V	Voltage restrained overcurrent
21B	Underimpedance	51C	Capacitor bank unbalance
21FL	Fault Locator	51LR	Locked rotor
24	Overfluxing (V/Hz)	59	Overvoltage (L-L or L-N)
25	Synch-check	59	Overvoltage (L-L)
26/63	Thermostat / Buchholz	59N	Neutral voltage displacement
27/27S	Undervoltage (L-L/L-N)	60/60FL	CT/VT supervision
27D	Positive-sequence undervoltage	64G	100% stator earth fault
27R	Remanent undervoltage	64REF	Restricted earth fault
30	Annunciation	66	Starts per hour
32P	Directional real overpower	67	Directional phase overcurrent
32Q/40	Directional reactive overpower	67N/67NC	Directonal ground fault
37	Phase undercurrent	68	Logic discrimination / zone selective interlocking
37P	Directional active underpower	74	Circuit connnection supervision
38/49T	Temperature mounting	78PS	Pole slip
40	Field loss (underimpedance)	79	Recloser (4 cycles)
46	Unbalance/negative sequence	81H	Overfrequency
46BC	Broken conductor detection	81L	Underfrequency
47	Negative sequence overvoltage	81R	Rate of change of frequency (df/dt)
48	Excessive starting time	86	Latching / acknowledgement
49RMS	Thermal overload	87M	Machine differential
50/27	Inadvertent energization	87T	Two-winding transformer differential
50/51	Phase overcurrent	94/69	Circuit breaker / contactor control
50BF	Breaker failure	CLPU 50/51	Cold load pick-up with phase overcurrent protection
50G/51G	Ground sensitive	CLPU 50N/51N	Cold load pick-up with earth fault protection











# **VAMP 221 System Highlights**

- VAMP 221 is a flexible and easily adaptable arc flash protection system for the protection of electrical distribution systems.
- VAMP 221 significantly reduces damage to electrical power equipment in the event of an arc fault and through this the risk of
  potential personal injury, and production losses.
- VAMP 221 is a modular system consisting of central units, I/O units, arc sensors and contact multiplying relays. The system can be
  easily used from the simplest to the most complicated applications.
- The VAMP 221 arc flash protection system is suitable for both low and medium voltages in any metal enclosed, metal clad or arc
  resistant switchgear. It is applicable in any new or existing switchgear where an arch flash hazard exists and reduction of fault level
  is seen as beneficial.

# **System Features**

- Current light tripping criteria (optional of tripping by light only)
- Operating time 7 ms or less (electromechanical contact)
- Accurate location of arc fault utilizing point sensors
- Four selective protection zones per central unit
- Can be used as an alternative to bus differential and ZSI schemes
- Self supervision of the entire system
- Easy interconnect utilizing prefabricated (CAT6) cables
- Phase current measuring
- Ground fault current measuring
- Personal protector option
- Panel or rail mount I/O units
- Circuit breaker fail protection (50BF)







**VAMP 221** 

Point sensor VA1EH-x (pipe)

Installed typically in the tube or next to the comartment windo.



VA1DA-x

# Point sensor VA1DA-x (surface)

Compartment wall or mounting plate installation.



Arc SLm-x

Arc SLm-x

Used when a large number of compartments are to be monitored.



VA1DP

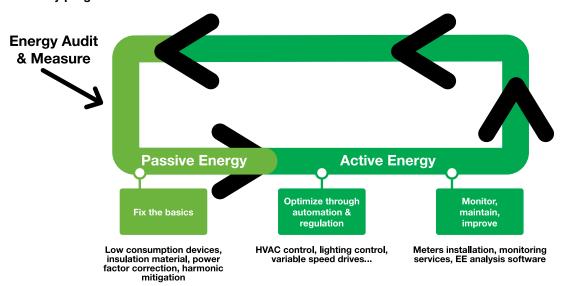
# Point sensor VA1DP

The snap-in connection to the VAMP arc flash protection system improves work safety.

# **Device Track Record**

- Schneider Electric's VAMP Range specializes in arc flash protection and mitigation relays for power system.
- Schneider Electric VAMP's arc flash fault protection functionality enhances the safety of both people and property and has made Schneider Electric VAMP a pioneer in the field of arc flash protection with more than 10,000 arc flash systems and units with over 150,000 arc detecting sensors inservice worldwide.
- All Schneider Electric VAMP products meet the latest international standards and regulations.
- Our success is based on competitive standard products, constant development by our designers possessing experience from arc flash relay generations.

How can reactive power compensation and harmonic mitigation solutions be part of your energy efficiency programs?



Power factor is a measure of how efficiently you are using electricity. In an electric power system, a load with low power factor draws more current than a load with a high power factor for the same amount of real power transferred. Utility customers with a low power factor could realize an increase or penalty in their electric bill. Over time, these penalties may reach into thousands of dollars, depending upon the utility's rate structure.

Harmonics may disrupt normal operation of other devices and increase operating costs. Symptoms of problematic harmonic levels include overheating of transformers, motors and cables, thermal tripping of protective devices, logic faults of digital devices and drives.

Harmonics can cause vibrations and noise in electrical machines (motors, transformers, reactors).

The life span of many devices can be reduced by elevated operating temperature.

Schneider Electric provides different solutions to meet different application requirements.

Table 4.35:

Product Description	LV	MV	Application	Product Features
ReactiVar Fixed Power Factor Capacitors	x	х	Power Factor correction	Suited for applications where the load does not change or where the capacitor is switched with the load, such as on the load side of a motor contactor.
ReactiVar Standard Automatic Power Factor Capacitor Banks (AV5000/MV5000)	х	х	Power Factor correction	Suited for centralized power factor correction in applications where plant loading is constantly changing, resulting in the need for varying amounts of reactive power. Designed for electrical networks with little or no harmonic content.
ReactiVar Anti-Resonant Automatic Power Factor Capacitor Banks (AV6000/MV6000)	х	х	Power Factor Correction and Harmonics Filtering	Suited for centralized power factor correction in applications containing harmonic energies that would otherwise damage standard fixed or automatic capacitor banks.
ReactiVar Harmonic Filtering Automatic Power Factor Capacitor Banks (AV7000/MV7000)	х	х	Power Factor Correction and Harmonics Filtering	Provides power factor correction as well as harmonic filtering with specific harmonic order (5th) in industrial networks.
ReactiVar Transient Free Reactive Compensation Systems (AT6000/AT7000)	х		Power Factor Correction and Harmonics Filtering	Enhanced technology utilizing solid state switching elements that replace standard electromechanical contactors. Provides quicker response to load fluctuations with transient free capacitor switching.
AccuSine™ (PCS) Active Harmonic Filter	Х	XA	Active Harmonic Filtering	Monitors a distorted electrical signal and determines the frequency and magnitude of harmonics in the signal. Cancels the harmonic content with the dynamic injection of opposing phase current in the distribution system or individual load.
ReactiVar Hybrid VAR Compensator (HVC)	X	XA	Reactive Power Compensation (Real-time)	Provides real-time reactive power compensation, and voltage support in networks with highly cyclical load profiles.

■ With transformer.

# **Low Voltage Fixed Capacitors**

ReacatiVar low voltage fixed capacitors are ideally suited for power factor correction applications where the load does not change or where the capacitor is switched with the load, such as on the load side of a motor starter. ReactiVar fixed capacitors are best suited for applications where there are no harmonic currents or voltages present.

### Features:

- Heavy edge, slope metallizations and wave-cut profile to ensure high inrush current capabilities.
- Special resistivity and profile metallization for better self-healing and enhanced life (up to 130,000 hours).
- Unique safety feature which disconnects the capacitors at the end of their useful life electrically.
- Less than 0.5w/kVAR losses, including discharage resistors.
- Constructed with a dry type metalized polypropylene capacitor element with no liquid dielectrics.
- Can be easily mounted inside panels or in a stand alone configuration.

Table 4.36: Unfused 208 V 3 phase/ 60Hz unit

kVAR rating	Regular duty Indoor	NEMA 1 unit	Rated Current (A)	Recommended copper wire size▲	Recommended circuit protection device rating ■			
@ 208 V	Catalog Number	\$ Price	@ 208 V	AWG	Fuse	Circuit breake		
2	PFCD1002	959.00	6.3	14	15	15		
5	PFCD1005	1187.00	13.6	10	30	20		
6	PFCD1006	1364.00	17.7	10	40	25		
7.5	PFCD1007	1538.00	20.9	8	45	30		
10	PFCD1010	1924.00	27.1	8	60	40		
13	PFCD1013	2376.00	35.4	6	75	50		
15	PFCD1015	2633.00	41.7	4	90	60		
17	PFCD1017	2957.00	48	4	100	70		
21	PFCD1021	3101.00	59.4	3	125	90		
25	PFCD1025	5330.00	68.8	2	150	100		
27	PFCD1027	5430.00	75.1	2	150	110		
30	PFCD1030	6243.00	83.4	1	175	125		
34	PFCD1033	7608.00	93.8	1/0	200	150		
37.5	PFCD1037	9251.00	104.3	2/0	225	150		
41	PFCD1040	9618.00	114.7	2/0	250	175		
45	PFCD1045	9984.00	125.1	3/0	250	175		
49	PFCD1048	10245.00	135.5	4/0	300	200		
53	PFCD1053	10505.00	147	4/0	300	225		
60	PFCD1060	11026.00	168.9	300 kcmil	350	250		
70	PFCD1070	11786.00	198.1	350 kcmil	450	300		
80	PFCD1080	12437.00	222	500 kcmil	450	350		

<sup>▲</sup> Conductor should be copper and rated 90 °C min. Refer to local electrical codes for proper wire size

Table 4.37: Unfused 240 V 3 phase/ 60Hz unit

kVAR rating	Regular duty Indoor	NEMA 1 unit		Recommended copper wire size ▲	Recommended circuit protection device rating ■			
@ 240 V	Catalog Number	\$ Price	@ 240 V	AWG	Fuse	Circuit breake		
3	PFCD2003	959	7.2	14	15	15		
6	PFCD2006	1187.00	15.6	10	35	25		
8	PFCD2008	1364.00	20.5	8	45	30		
10	PFCD2010	1538.00	24.1	8	50	35		
13	PFCD2013	1924.00	31.3	6	70	45		
15	PFCD2015	2117.00	36.1	6	75	50		
17.5	PFCD2017	2376.00	40.9	6	90	60		
20	PFCD2020	2633.00	48.1	4	100	70		
22.5	PFCD2023	2957.00	55.3	3	125	80		
25	PFCD2025	3101.00	61.4	3	125	90		
27.5	PFCD2028	4181.00	68.6	2	150	100		
30	PFCD2030	5045.00	72.2	2	150	100		
32.5	PFCD2033	5330.00	79.4	1	175	110		
37.5	PFCD2036	5430.00	86.6	1	175	125		
40	PFCD2040	6243.00	96.2	1/0	200	150		
45	PFCD2045	7608.00	108.3	2/0	225	150		
50	PFCD2050	9251.00	120.3	2/0	250	175		
60	PFCD2060	9984.00	144.4	4/0	300	200		
70	PFCD2070	10499.00	169.6	300 kcmil	350	250		
80	PFCD2080	11026.00	194.9	350 kcmil	400	300		
90	PFCD2090	11557.00	218.9	400 kcmil	450	300		
100	PFCD2100	12072.00	239.4	500 kcmil	500	350		

<sup>▲</sup> Conductor should be copper and rated 90 °C min. Refer to local electrical codes for proper wire size

Note: For fused unit, add suffix "F" to the existing part number. Consult Schneider Electric sales office for pricing.

Consult local electrical codes for proper sizing of molded case circuit breaker frame or disconnect switch rating
 Note: For fused unit, add suffix "F" to the existing part number. Consult Schneider Electric sales office for pricing.

Consult local electrical codes for proper sizing of molded case circuit breaker frame or disconnect switch rating



# **Low Voltage Fixed Capacitors**

Table 4.38: Unfused 480V 3 phase/ 60Hz unit

kVAR rating	Regular duty Indoo	r NEMA 1 unit	Rated Current (A)	Recommended copper wire size ▲	Recommended circuit protection device rating■			
@ 480 V	Catalog Number	\$ Price	@ 480 V	AWG	Fuse	Circuit breake		
6	PFCD4006	929.00	7.2	14	15	15		
8	PFCD4008	1022.00	10.2	12	20	15		
10	PFCD4010	1077.00	12	12	25	20		
12.5	PFCD4012	1215.00	15	10	30	25		
15	PFCD4015	1329.00	18	10	40	30		
17	PFCD4017	1374.00	19.8	8	40	30		
20	PFCD4020	1479.00	24	8	50	35		
25	PFCD4025	1655.00	30	6	60	45		
27.5	PFCD4027	1754.00	33	6	70	50		
30	PFCD4030	1851.00	36	6	75	50		
33	PFCD4033	1953.00	39.6	6	80	60		
35	PFCD4035	2102.00	42	4	90	60		
40	PFCD4040	2358.00	48	4	100	70		
45	PFCD4045	2519.00	54	4	110	75		
50	PFCD4050	2676.00	60	3	125	90		
60	PFCD4060	3975.00	72	2	150	100		
65	PFCD4065	4200.00	78	1	175	110		
70	PFCD4070	4280.00	84	1	175	125		
75	PFCD4075	4434.00	90	1/0	200	125		
80	PFCD4080	4695.00	96	1/0	200	150		
90	PFCD4090	5217.00	108	2/0	225	150		
100	PFCD4100	5738.00	120	2/0	250	175		
125	PFCD4125	7148.00	150	250	300	225		
150	PFCD4150	8556.00	180	300	400	250		
175	PFCD4175	9561.00	210	400	450	300		
200	PFCD4200	10565.00	240	500	500	350		

<sup>▲</sup> Conductor should be copper and rated 90 °C min. Refer to local electrical codes for proper wire size

Table 4.39: Unfused 600V 3 phase/ 60Hz unit

kVAR rating	Regular duty Indoor	NEMA 1 unit	iii haleu Curreiii (A)	Recommended copper wire size ▲	Recommended circuit protection device rating■			
600 V	Catalog Number	\$ Price	@ 600 V	AWG	Fuse	Circuit Breaker		
10	PFCD6010	1077.00	9.6	12	20	15		
15	PFCD6015	1329.00	14.4	10	30	20		
20	PFCD6020	1479.00	19.2	10	40	30		
23	PFCD6022	1550.00	22.1	8	50	35		
25	PFCD6025	1655.00	24	8	50	35		
27	PFCD6027	1754.00	26	8	50	40		
30	PFCD6030	1851.00	28.8	8	60	45		
35	PFCD6035	2102.00	33.6	6	70	50		
40	PFCD6040	2358.00	38.4	6	80	60		
45	PFCD6045	2519.00	43.2	4	90	60		
50	PFCD6050	2676.00	48	4	100	70		
60	PFCD6060	3975.00	57.6	3	125	80		
70	PFCD6070	4280.00	67.2	3	150	100		
75	PFCD6075	4434.00	72	2	150	100		
80	PFCD6080	4695.00	76.8	1	150	110		
90	PFCD6090	5217.00	86.4	1	175	125		
100	PFCD6100	5738.00	96	1/0	200	150		
125	PFCD6125	7148.00	120	3/0	250	175		
150	PFCD6150	8556.00	144	4/0	300	200		
175	PFCD6175	9561.00	168	300 kcmil	350	250		

Conductor should be copper and rated 90 °C min. Refer to local electrical codes for proper wire size

Application Note: Capacitors are low impedance path for the harmonic currents produced by variable frequency drives, motor soft starters, welders, computers, PLCs, robotics and other electronic equipment. These harmonic currents can cause the capacitor to overheat, and shorten its life. Furthermore, the resonant circuit formed by shunt capacitors coupled with system inductances (motors and transformers) can amplify harmonic currents and voltages in the electrical network. This amplification can cause nuisance fuse operation and/or damage to electrical equipment including capacitors and other electronic devices. If power factor correction is required in the network where harmonic is present, please contact your nearest Square D/Schneider Electric sales office for assistance.

Consult local electrical codes for proper sizing of molded case circuit breaker frame or disconnect switch rating
 Note: For fused unit, add suffix "F" to the existing part number. Consult Schneider Electric sales office for pricing.

Consult local electrical codes for proper sizing of molded case circuit breaker frame or disconnect switch rating
 Note: For fused unit, add suffix "F" to the existing part number. Consult Schneider Electric sales office for pricing.





The AV5000 is suitable for use where harmonic generating loads are less than 15% of the total connected load (AV5000 shown here).

# Low Voltage Standard Automatic Capacitor Banks

The AV5000 standard automatic power factor correction banks are designed for centralized power factor correction to supply varying amounts of reactive power required to compensate for changing load conditions. The AV5000 banks are ideally suited for facility electrical distribution systems with TDD (total harmonic current distortion) <= 5% and THD(V) (total harmonic voltage distortion) < = 5%. An advanced power factor controller measures plant power factor via a single remote CT. Plus, it switches capacitor modules in and out of service to maintain a user selected target power factor.

# **Main Features:**

ReactiVar™

- Modular construction; free standing QED switchboard enclosures (30wx36dx90h) and allow for easy future expansion
- Rugged design units are constructed with removable steel panels over heavy gauge steel frame
- Standard offering available up to 400 kVAR at 208 Vac, 1000 kVAR at 480 or 600 Vac
- Main lugs or main breaker section at your choice
- Dry capacitor element design eliminates risk of fluid leakage, environmental hazard and drip pans
- Capacitor rated contactors are designed specifically for the switching of capacitive currents and feature a patented capacitor precharge circuit that exceeds air-core reactor transient dampening
- Different power factor controller options provide a choice in functionality and control sophistication
- Backlit display on controller displays actual power factor (PF), alarms, number of steps energized and much more
- Available in NEMA 1 and NEMA 3R enclosures

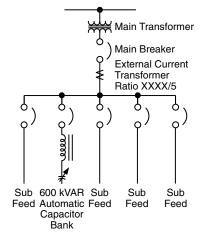
# Low Voltage Anti-Resonant and Filtering **Automatic Capacitor Banks**

ReactiVar AV6000 anti-resonant and AV7000 harmonic filtering automatic switched capacitor banks are specifically designed for networks containing harmonic energies which would otherwise damage standard fixed or automatic capacitor banks.

The problem: Harmonics are caused by non-linear loads such as variable frequency drives, motor soft starters, welders, uninterruptable power supplies, robotics, PLCs and other electronic devices. Harmonics are higher-than-60 Hz current and voltage components in the electrical distribution system. Capacitors are a low impedance path for these higher frequency components and thus will absorb these harmonic energies. Combinations of capacitors and system inductances (motors and transformers) can form series and parallel tuned circuits which can resonate at certain frequencies. The harmonics caused by non-linear loads can excite a standard capacitor bank into resonance. The resonance can magnify currents and voltages, causing system wide damage and equipment failure. This problem is growing in prevalence in today's distribution systems.



AV6000 Capacitor Bank



Single Line (Typical) Diagram 1

# The Solution:

# **Anti-Resonant Automatic Capacitor Banks**

The AV6000 anti-resonance capacitor bank's primary function is power factor correction. Iron core reactors are added in series with the capacitor modules. The 3 phase reactors are custom designed and manufactured under tight tolerance specifically for the AV6000. The reactors tune the bank below the first dominant harmonic (usually the 5th, or 300 Hz). Below the tuning point, the system appears capacitive and thus corrects power factor. Above the tuning point, the system appears Inductive and thus resonance is minimized. The AV6000 design has the added advantage of removing up to 50% of the 5th harmonic to reduce overall voltage distortion.

# **Harmonic Filtering Automatic Capacitor Banks**

Although the AV7000 looks identical to the AV6000, its primary function is harmonic mitigation, with power factor correction being a secondary benefit. The distinction between an AV6000 and an AV7000 is the tuning point. By definition, if the tuning point of the capacitor/reactor combination is within ±10% of the target harmonic it is intended to absorb, it is referred to as a filter. If the tuning point is outside the ±10% limit, it is referred to as an anti-resonant system. Schneider Electric power quality solution experts should be consulted prior to recommending AV7000 to customers

# Main Features:

- Standard offering available up to 480 kVAR at 208 V, 1200 kVAR at 480 or 600 Vac
- Capacitor modules are designed with higher than standard voltage and current ratings to provide long life on systems with high harmonic energies. Reactors are designed to operate at 115 °C rise over a maximum 40 °C ambient temperature.
- In addition to the standard features provided in the AV5000 systems, the reactors in the AV6000 and AV7000 have an embedded thermistor temperature detector. The stage will shut down and annunciate if the reactor is overheated, usually a result of excessive harmonic energies

# **Application Assistance:**

Schneider Electric power quality experts can provide engineering assistance for the application of capacitors in harmonic rich environments. Specialists can assess the likelihood of application problems and arrange for more detailed study if required. Solutions can include computer modeling and system simulation. Our application engineers can arrange for systems studies, provide custom engineering proposal, perform installation and commissioning, as required by the application. Please contact Schneider Electric power quality experts or email us at pgc@squared.com.

# **CT Selection Table**

The current transformer is located on a phase A bus or cable at the main service entrance as illustrated in Diagram 1.

CT catalog number: TRAI \*\*\* • SC → where \*\*\* is current rate code of bus/cable and ◆ • is window size code. Codes are listed in table 4.42.

e.g. TRAI1000SC07 is a CT for 1000 A bus with 7"x4" window.

# Table 4.40:

Current Rating	g of Bus/Cable	Windo	w Size
Amperes	Rating Code	7" x 4" Size Code	11" x 4" Size Code
300 400 500 600 750	0300 0400 0500 0600 0750	07 07 07 07 07	11 11 11 11 11
800 1000 1200 1500 1600	0800 1000 1200 1500 1600	07 07 07 07 07 07	11 11 11 11 11
2000 2500 3000 3500 4000	2000 2500 3000 3500 4000	07 07 07 07 07 07	11 11 11 11 11
5000 6000	5000 6000	N/A N/A	11 11

AT6000 Transient Free Capacitor Bank



# **Low Voltage Transient Free Reactive Compensation Capacitor Banks**

Square D™ ReactiVar Transient Free Reactive Compensation (TFRC) anti-resonant (AT/BT6000) systems and filtering system (AT/BT7000) are ideally suited for use on electrical systems where connected equipment is extremely sensitive to variations in the supply voltage.

**The problem:** Capacitor systems featuring electromechanical contactors could generate voltage transients on the electrical network when they switch capacitor stages on/off, even when current limiting or tuning reactors are employed. Transients can impair the operation of sensitive equipment, including programmable logic controllers, variable speed drives, computers and UPS systems. In sensitive networks such as hospitals, data processing centers, airports and many manufacturing environments, any transient, however slight, may not be acceptable.

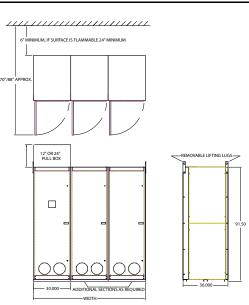
The solution: TFRC systems feature an advanced controller to precisely activate electronic switching elements to connect capacitor stages and avoid the creation of transients. Transient free switching also reduces wear on capacitors due to switching and will result in longer life for the overall capacitor system. With a response time of less than ten seconds to load changes, TFRC systems can reduce the kVAR or kVA demand quickly.

# **Main Features:**

- Standard offering up to 1350 kVAR at 480 Vac
- Transient free switching of capacitor steps
- · Electronic switching elements yield an unlimited number of switching operations
- Different power factor controller options provide a choice in functionality and control sophistication
- Backlit display on controller displays actual PF, alarms, number of steps energized and much more
   Heavy duty dry capacitor element design provides no risk of fluid leakage, no environmental
- Heavy duty dry capacitor element design provides no risk of fluid leakage, no environmenta pollution and no need for drip pans
- The reactors have an embedded thermistor temperature detector. The stage will shut down and annunciate if the reactor is overheated which is usually a result of excessive harmonic energies
- Units are constructed with removable heavy duty steel panels over heavy gauge steel frame.
- Available in NEMA 1 and NEMA 3R enclosures.

# Low Voltage Capacitor Bank General Specification:

Voltage 208, 240, 480, 600 Vac standard, other voltages available -5 °C to 40 °C Ambient temperature: Average temperature limit: <=40 °C within 24 hours, <35 °C over 1 year Elevation: <=1800 meter (6000 feet) Humidity: 0-95% non-condensing Overvoltage limit: 110% maximum (continuously) Dielectric withstand test level: 2.15 times rated voltage or 1000 V, whichever is higher for 10s Overcurrent limit: 135% maximum (continuously) Incoming Top (standard), bottom Main lug: Copper mechanical standard, compression optional Main breaker (BT): PowerPact™ with Micrologic™ trip unit. LI standard, LSI available Enclosure rating: NEMA 1 standard, N3R available Color ANSI 49 standard, ANSI 61, ANSI 70 optional CSA C22.2 No. 190, UL810 Standards



Typical low voltage capacitor bank dimension (reference only, subject to change without notice)



# www.reactivar.com



MVC systems are suitable for power factor correction of steady and harmonic-free motor loads.

# **ReactiVar Medium Voltage Fixed Capacitors**

The ReactiVar MVC fixed capacitors are ideally suited for power factor correction in applications where the load does not change or where the capacitor is switched with the load, such as the load side of a motor contactor. ReactiVar capacitor sizes are available up to 300 kVAR as individual units, and up to 900 kVAR in banks.

# **Main Features:**

- Standard rating up to 900 kVAR, 4800 V (for specials, consult factory)
- Extra low dielectric loss (<0.15w/kVAR), including discharge resistors
- Internally mounted discharge resistors
- Internally delta connected capacitor elements
- Built to applicable NEMA, IEEE, and IEC standards
- Available in indoor (Type 1/12) and outdoor (Type 3R) enclosures
- Painted ASA 70 gray

# **Application Note:**

Capacitors are low impedance path for the harmonic currents produced by variable frequency drives, motor soft starters, welders, computers, PLCs, robotics and other electronic equipment. These harmonic currents can cause the capacitor to overheat, and shorten its life. Furthermore, the resonant circuit formed by shunt capacitors coupled with system inductances (motors and transformers) can amplify harmonic currents and voltages in the electrical network. This amplification can cause nuisance fuse operation and/or damage to electrical equipment including capacitors and other electronic devices. If power factor correction is required in the network where harmonic is present, please contact your nearest Square D/Schneider Electric sales office for assistance.



MV5000 systems are suitable for use where harmonic generating loads are less than 15% of the total connected load.

MV6000 systems are suitable for use where harmonic generating loads are less than 50% of the total connected load.

MV7000 systems are suitable for use where harmonic generating loads exceed 50% of the total connected load.

MVHVC High-Speed compensation systems are designed for reactive power compensation of rapidly fluctuating loads

# **Medium Voltage Metal Enclosed Capacitor Systems**

The medium voltage capacitor systems are ideally suited for centralized power factor correction and/or harmonic filtering in applications. Various equipment topologies are available, from fixed stage to fully automatic—to cover project specific application, load characteristic and installation needs. ReactiVar brand covers metal enclosed systems built in North America (5/15 kV class). Global =S= Brand can be used for expanded voltage

# Main Features:

- Designed and built per applicable ANSI/NEMA/IEEE and/or IEC standards
- Standard metal enclosures available up to 20 mVAR, up to 34.5 kV, 50/60 Hz
- Steel or Aluminum based enclosure bays
- Externally or internally fused capacitors with excellent life due to high temperature withstand, small temperature rise, chemical stability, overvoltage and overcurrent withstand.
- Current limiting capacitor fuses with blown fuse pop-up indicators
- Inrush current limiting reactors or tuned (anti-resonant or filtered) iron core reactors
- Key interlocking system forces sequential operation of the controls.
- Fully rated three- or four-pole grounding switches
- Schneider Electric NRC12 Power factor controller provides user with friendly interface, superior performance, simplified installation and set-up procedure, and real time monitoring and protection features for the capacitor system.
- Available in Type 1 indoor and 3R outdoor enclosure types

# **High Voltage Reactive Power Compensation Systems**

The high voltage reactive power compensation systems are ideally suited for installation at utility distribution and transmission grids. Various equipment topologies are available to cover project specific utility application, and installation needs. Typically these compensation systems are open style, rack mounted, installed in utility substation areas.

# Main Features:

- Custom designed and built per requested applicable standards
- Systems rated up to 230 kV, 50/60 Hz
- Internally fused capacitors with excellent life due to high temperature withstand, small temperature rise, chemical stability, overvoltage and overcurrent withstand.
- Double wye ungrounded configuration with neutral CT protection
- Inrush current limiting or tuned (anti-resonant or filtered) air core, open style reactors

4-33

www.reactivar.com

AccuSine (PCS) Active Harmonic Filter (AHF) injects harmonic current to cancel harmonic current in the electrical distribution system. This reduced harmonic level results in improved electrical network reliability and reduced operating cost. AccuSine PCS is simple to size, install, set up and operate. In addition, AccuSine PCS eliminates the complex harmonic compliance limit calculations and removes nuisance harmonics from the electrical network.

# The problem:

Power electronic devices that have rapid and frequent load variations have become abundant today due to their many process control related and energy saving benefits. However, they also bring a few major drawbacks to electrical distribution systems; harmonics and rapid change of reactive power requirement. Harmonics may disrupt normal operation of other devices and increase operating costs. Symptoms of problematic harmonic levels include overheating of transformers, motors, drives, cables, thermal tripping of protective devices and logic faults of digital devices. In addition, the life span of many devices can be reduced by elevated operating temperature.

## The solution:

The AccuSine PCS AHF provides the simplest and most effective means to mitigate harmonics, to reduce process related voltage fluctuations. The AccuSine PCS AHF actively injects opposite harmonics current on the source side of the load and it:

- Decreases harmonic related overheating of cables, switchgear and transformers
- Reduces downtime caused by nuisance thermal tripping of protective devices
- Increases electrical network reliability and reduces operating costs
- Corrects to the 50th harmonic, reduce harmonics level to meet IEEE 519, IEC 61000 3-4, and UK G5/4-1 standards
- Compensates entire network or specific loads depending on installation point

# Standard features

- Real-time dynamic current injection for harmonic cancellation and VAR compensation (lead or lag power factor)
- Independent phase compensation
- Load balancing capability
- Parallel connection (up to 99 units) allows for easy retrofit and installation of multiple units for large
- Response to load fluctuations within 2 cycles
- Full color touch screen HMI (Human Machine Interface)
- NEMA 1, NEMA 12, IP30 AND IP54 enclosure
- Seismic rated per ICC IBC and ASCE 7
- UL, CE, ABS, and CSA certified

# **Accusine PCS Sizing**

For proper sizing of AccuSine units, contact the Schneider Electric sales office or e-mail pqc@squared.com. To expedite the product selection process, please have a single line diagram and/or details of the application including sizes of transformers, non-linear and linear loads, and any existing filters and capacitors.

Table 4.41: AccuSine PCS 208-480 V, 50/60 Hz

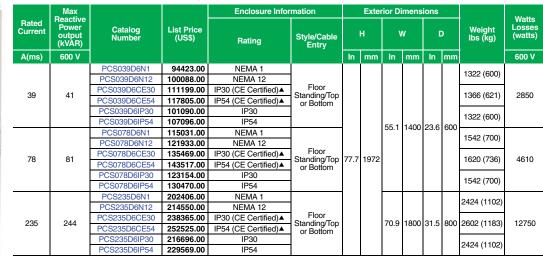
Rated					Enclo	sure Information		Ex	terior Di	mensio	ns			Watts Losses		
Current	Power	output	(kVAR)	Catalog Number	List Price (US\$)	Detien	Otala (Oalda Fatas		Н	٧	W		)	Weight (w		ts)
A(ms)	208 V	400 V	480 V		(/	Rating	Style/Cable Entry	ln	mm	ln	mm	In	mm	(3)	208/240 V	480 V
	18			PCS050D5N1	34904.00	NEMA 1	Wall Mount ▲ ■/Bottom	48	1219	20.7	526	18.5	470	250 (114)	900	1800
				PCS050D5N12	53738.00	NEMA 12	_							661 (300)		2250
50		34.6	41.6	PCS050D5CE30◆	59516.00	IP30 (CE Certified)				31.5	800			705 (320)		2250
30	N/A	04.0	41.0	PCS050D5CE54◆	62770.00	- (	Floor Standing/Top or Bottom	75	1905			23.8	605	7 00 (020)		2250
				PCS050D5IP30	54299.00	IP30								661 (300)		2250
				PCS050D5IP54	57553.00	IP54								, ,		2250
	36			PCS100D5N1	55131.00	NEMA 1	Wall Mount▲ ■/Bottom	64.9	1648	20.7	526	18.5	470	350 (159)	1500	3000
				PCS100D5N12	66777.00	NEMA 12								771 (350)		3750
100		69.2	83.1	PCS100D5CE30◆		IP30 (CE Certified)	Floor Standing/Top or Bottom	75	1905	31.5	.5 800			849 (386)		3750
100	N/A	00.2	00.1	PCS100D5CE54◆		- (						23.8	8 605	043 (000)		3750
				PCS100D5IP30	67479.00	IP30								771 (350)		3750
				PCS100D5IP54	71585.00	IP54								771 (000)		3750
	108			PCS300D5N1	110301.00	NEMA 1				31.5	800	19.6	497	775 (352)	4500	9000
				PCS300D5N12	132341.00	NEMA 12								1212 (550)		10000
300		207.8	2/0/	PCS300D5CE30◆	144502.00	IP30 (CE Certified)	Floor Standing/Top or Bottom	75	1905					1390 (632)		10000
500	0 N/A	207.8	243.4	PCS300D5CE54◆	161035.00	IP54 (CE Certified)	1 loor standing top or bottom	7.5	1303	39.4	1000	31.7	806	1000 (002)		10000
				PCS300D5IP30	133670.00	IP30								1212 (550)		10000
				PCS300D5IP54	142628.00	IP54								1212 (330)		10000

- Floor stand available. order Catalog Number FSPCS100D5N1
- Wall mounted units do not include a power disconnect. CE Certified units meet EMC Directive 89/336 EEC.

AccuSine™



Table 4.42: AccuSine PCS 600 V ■, 50/60 Hz



- CE Certified units meet EMC Directive 89/336 EEC
- Contact Schneider Electric sales office for other voltage models.

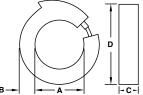


# **Round Split-Core Current Transformer (CT) Selection:**

Two remote current transformers (CT) are required for three phase loads. Three CT's are required for networks with line to neutral loads.

**Table 4.43:** Round Split-Core CT—UL Recognized



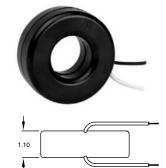


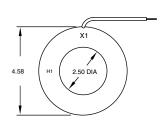
# **Round Solid-Core Current Transformer (AUX CT) Selection:**

For installations requiring parallel connection of multiple AccuSine units for increased capacity, additional auxiliary CT's may be required. Please contact Schneider Electric sales office for the correct AUX CT part number to use

**Table 4.44:** Round Solid-Core Auxiliary CT—UL Recognized

Ampacity	Catalog Number	Dimensions				Weight (lb)			Burden	
		ID		OD		weight (ib)		Accuracy Class	Capacity	Secondary Current
		in	mm	in	mm	lbs	kg		(VA)	
600	CT7RL6011	2.5	63	4.58	116	1.5	0.68	1	30	1
1000	CT7RL1021	2.5	63	4.58	116	1.5	0.68	1	35	1





POWER MONITORING AND CONTROL

100 kVAR

100 kVAR

PASSIVE

**HVC Topology (Typical)** 

100 kVAR

The Hybrid VAR Compensator (HVC) is ideally suited for industrial facilities with power quality or production problems caused by rapidly changing reactive power demands typically associating with highly cyclical loads such as welders, mining conveyors and heavy stamping machines.

## The problem:

Rapid reactive power changes demand timely reactive power (VAR) compensation. Lack of timely and adequate VAR compensation can lead to voltage fluctuations in the electrical distribution system, impacting equipment operation, as well as product quality.

Traditional capacitor systems have a minimum response time of five to thirty seconds for load fluctuations. As a result of this limitation, uncompensated reactive power demand by cyclical loads can produce voltage instability, cause flicker, increase losses, and result poor power factor which reduces the electric supply capacity. Problems can include:

- Poor weld quality or reduced weld line productivity (due to restrikes or interlock weld controls)
- Failure to start motor loads (due to voltage sag on startup)
- Undervoltage tripping of sensitive loads (Robots, PLCs, VFDs)
- Lighting flicker and/or HID lighting shutdown
- Overloaded distribution equipment (cyclical current pulses may exceed the rated current of the distribution equipment)
- Poor power factor and associated utility demand charges

## The Solution:

300 Ampere

ACTIVE

The Hybrid VAR Compensator is ideally suited for ultra fast reactive power compensation in many low and medium voltage distribution networks containing highly transient loads where conventional systems are not suitable.

The HVC employs a fixed or automatic capacitor bank to provide reactive power at all times, while AccuSine PFV adjusts the output to meet system reactive power requirement in timely manner. AccuSine PFV features a 100 microsecond response time to provide dynamic VAR injection to meet reactive power requirement within 1 cycle, reduce voltage sags created by inductive load switching, welding operation, etc.

# **Main Features:**

- Real-time reactive power compensation for transient or cyclical loads
- Infinite VAR resolution
- Independently compensates each phase
- Transient free compensation
- · Improves voltage stability, reduces flicker
- Constructed with 12 gauge steel frame

HVC systems can alleviate most of the problems created by cyclical loads that require large amount of reactive power for short duration. HVC system can be applied in the low voltage and medium voltage system from 480 V up to 33 kV.

# Unique, cost-effective construction:

The ReactiVar HVC is a custom engineered product designed for specific reactive power compensation requirements. It consists of both passive and active components. The passive component may consist of capacitors only or include tuned reactors. Depending on the application, the passive portion may include contactor or solid state switching device to permit some adjustment of the passive elements. The active component is provided by Schneider Electric's AccuSine PFV unit. HVC systems also can prevent resonance by including custom designed iron core reactors in series with each three phase capacitor module when required. The series reactor/capacitor combinations prevent resonance by turning the network below the first dominant harmonic (usually the 5th and 300 Hz). In doing so, HVC can also reduce harmonic voltage distortion, which further improves overall network conditions.

The HVC employs a fixed capacitor bank to inject leading reactive current (leading kVAR) into the network at all times, and an AccuSine PFV unit to precisely adjust the total output of the HVC according to the load reactive power demand profile. When load reactive demand is zero, the AccuSine PFV injects lagging reactive current to cancel the leading reactive current of the fixed capacitor bank such that the total output of the HVC is minimized. As the load kVAR demand increases, the AccuSine PVF adjusts its output such that the total output of the HVC precisely matches the load demand. If load demand increases above the fixed capacitor bank capability, then the AccuSine PFV injects leading reactive current. This continues until the full leading kVAR capacity of the AccuSine PFV is met. Thus, the HVC total output provides leading kVAR compensation to match load demand.

To optimize system design, Schneider Electric expert will normally need to take real-time measurements on the network site. Please contact Schneider Electric power quality experts or email us at pqc@squared.com.



# **Section 5**

# **Lighting Controls**



C-Bus Controls, page 5-4



Dual Tech Ceiling Mount, page 5-21



Powerlink Lighting Control Panelboards, page 5-24



Relay Panel Family, page 5-28

One Line Overview	5-2, 5-3
C-Bus™ Keypads, Touch Screens and Accessories	- ,
Neo Keypads	5-4
Saturn Keypads	5-5
DLT Keypads	5-5
Decorator Keypads	5-6
Touch Screens	5-7
Multi Room Audio	5-9
Hand Held Remote Controls	5-11
Thermostats	5-11
Sensors	5-12
Input Units	5-12
Relays	5-13
Dimmers	5-14
System Units	5-15
Enclosures	5-17
Area Lighting Panels	5-18
Software	5-19
Occupancy Sensors	
Wall Switch Occupancy Sensors	5-20
Ceiling Mount Occupancy Sensors	5-21
Wall Mount Occupancy Sensors	5-21
Fixture Mounted Sensors and Controls	5-22
Powerlink Integrated Control Systems	
Overview	5-23
Components	5-24
Device Power Supply	5-25
Device Router	5-25
Factory Assembled Panels	5-26
Powerlink Energy Management	5-27
Relay Panels	5-28

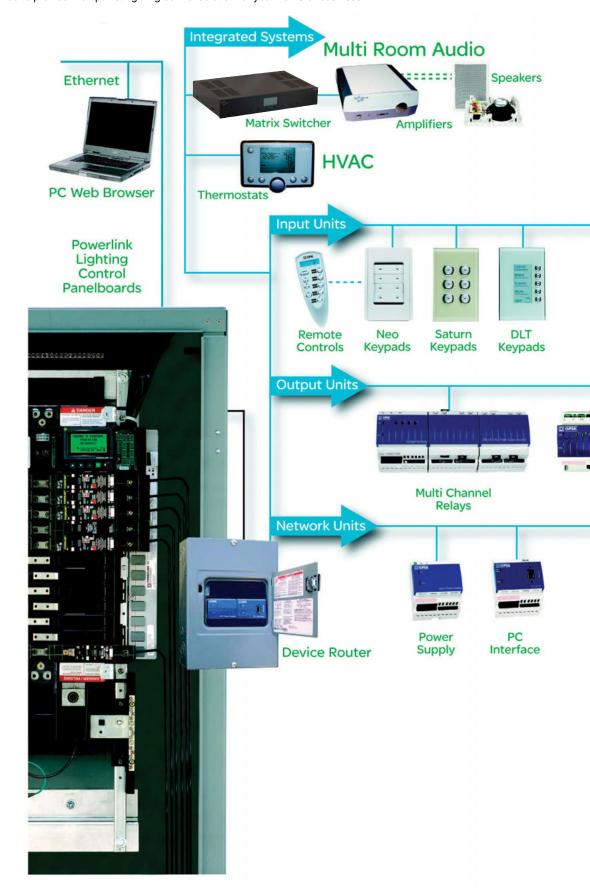
**Lighting Control Product Overview** 

**Cassia Energy Management System** 



5-30

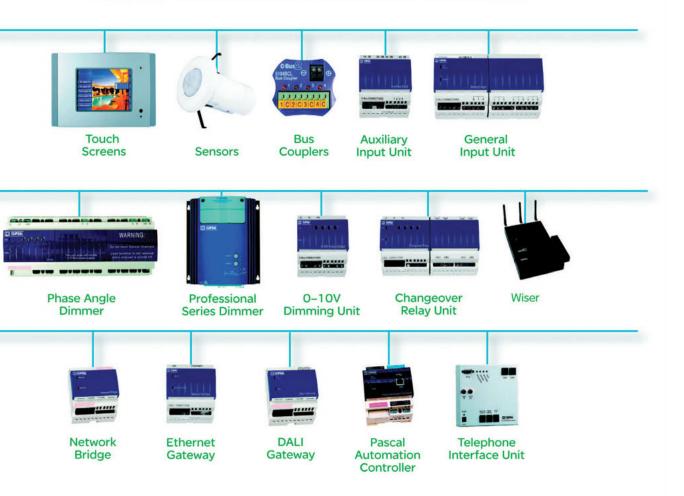
Schneider Electric Occupancy Sensors, Powerlink and C-Bus<sup>™</sup> control systems can be used independently or combined to provide the optimal lighting control solution for your home or business





**Overview** 







# Neo™ Keypads

Neo Keypads offer localized finger-tip control of lighting and other electrical devices. With over 1,000 custom color combinations available, these elegant keypads compliment any decor. Requires plaster mud ring or single gang box with minimum internal width of 2.05".

- Button configurations include multi-point switching and dimming, master ON/OFF switching, and scene settings
- Scene control includes up to forty group addresses per keypad. Larger scenes are possible by sharing memory among multiple keypads
- Independent timers available for each button
- Standard built-in infrared receiver permits keypad control at a distance with an optional infrared handheld remote
- Dual-color LED windows on each button can glow in cool blue, orange, or combinations of both, indicating when a controlled device
- Auto "fallback" can dim button LEDs at a set time after the last key press
- Locator LEDs can illuminate the top and bottom of the button area in cool blue, helping a user find the keypad in dim light or help the installer find the correct keypad when commissioning
- Clean-lined low-profile keypads are wall mounted without external fittings
- Optional button covers have ID windows, enabling quick identification of lighting scenes or controlled devices
- Distinctively designed multi-layer cover plate consists of button covers, an outer surround, and an inner surround
- Color schemes are easily customized and modified to suit personal taste or the décor

# Standard Neo Keypads

Includes keypad, button covers, inner and outer surrounds.

White: SLC505( )NLWE Cream: SLC505( )NLCM

Brushed Aluminum w/Slate: SLC505( )NLGB ( ) designates space for button configuration

#### Table 5.1: Standard Neo Keypad Assemblies

Catalog No.	Catalog Description	\$ Price
SLC5052NLGB	Neo, 2 button key input brushed aluminum	460.00
SLC5052NLWE	Neo, 2 button key input solid white	460.00
SLC5052NLCM	Neo, 2 button key input solid cream	460.00
SLC5054NLGB	Neo, 4 button key input brushed aluminum	500.00
SLC5054NLWE	Neo, 4 button key input solid white	500.00
SLC5054NLCM	Neo, 4 button key input solid cream	500.00
SLC5058NLGB	Neo, 8 button key input brushed aluminum	560.00
SLC5058NLWE	Neo, 8 button key input solid white	560.00
SLC5058NLCM	Neo. 8 button key input solid cream	560.00



2 Button Keypad Brushed Aluminum w/Slate: SLC505(2)NLGB Cream: SLC505(4)NLCM



4 Button Keypad



8 Button Keypad White: SLC505(8)NLWE

# **Custom Neo Keypad Assemblies**

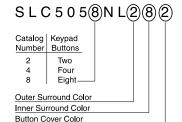
To order custom Neo Keypad assemblies indicate the number of buttons desired on the keypad and the color of each customizable component (inner surround, outer surround, and botton cover).

For example, in the diagram below, SLC505(8)NL(2)(8)(2) represents a Neo Keypad with eight buttons, a white (#2) outer surround, a brushed aluminum (#8) inner surround, and white (#2) button covers.

**Table 5.2:** Color Chart

Name	Color Number
Slate	1
White	2
Cream	3
Soft Gray	4
Desert Sand	5
Black	6
Brown	7
Brushed Aluminum▲	8
Gold▲	9

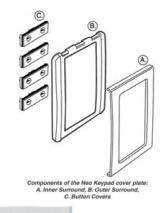
Only the inner surround is available in Brushed Aluminum and Gold.



**Neo Keypad Accessories Table 5.3:** 

Catalog No.	Catalog Description	\$ Price
SLC5050IS()	Neo, inner surround, (5pk)	152.00
SLC5050OS()	Neo, outer surround, (5pk)	46.00
SLC5052NRP()	Neo, button covers, 5052L, (5pk)	60.00
SLC5054NRP()	Neo, button covers, 5054L, (5pk)	60.00
SLC5058NRP()	Neo, button covers, 5058L, (5pk)	60.00
SLC5052NRI()	Neo, button covers, with ID window, (10pk)	82.00

Accessories have unique catalog numbers. To specify colors for them, (see Table 5.1) add the color number to the end of the catalog number (Table 5.3). For example, SLC5052NR2 is the catalog number for a white button cover.



DEN

Neo button cover with ID window





www.schneider-electric.us



Saturn 2 Button Keypad



Saturn 4 Button Keypad



Saturn 6 Button Keypad



Saturn Style Keypad



Neo Style Keypad

#### Saturn™ Keypads

C-Bus™

Saturn Keypads incorporate a unique glass cover plate that creates a distinctive appearance. By virtue of the variety of button configurations available, one compact Saturn keypad can take the place of many single operation switches, ON/OFF toggles, dimmers, and timers. Available in two-, four-, or six-button keypads, Saturn's modern style is complemented by orange and blue LEDs that can instantly show the status of controlled devices. Requires plaster mud ring or single gang box with minimum internal width of 2.05".

- Button configurations include multi-point switching and dimming, master ON/OFF switching, and scene settings
- Scene control includes up to forty group addresses per keypad. Larger scenes are possible by sharing memory among multiple keypads
- Independent timers available for each button
- Dual-color LED windows on each button can glow in cool blue, orange, or combinations of both, indicating when a controlled device is ON or OFF
- Auto "fallback" can dim button LEDs at a set time after the last button press
- Locator LED can illuminate the keypad, helping a user find it in dim light
- Clean-lined keypads are wall mounted without external fittings
- Low-profile design extends only 0.5 in. out from the wall
- Optional button covers with labels, enabling quick identification of lighting scenes or controlled devices

#### Saturn Keypads

Table 5.4: Complete Saturn Keypads

Catalog No.	Catalog Description	\$ Price
SLC5082NL()	Saturn Full Plate, 2 button	634.00
SLC5084NL()	Saturn Full Plate, 4 button	668.00
SLC5086NL()	Saturn Full Plate, 6 button	700.00

Note: Color codes are: White (WE), Black (BK), Mocha (BR), Cream (CM). The catalog number for a two-button keypad in mocha would be SLC5082NLBR

#### Table 5.5: Saturn Keypad Accessories

Catalog No.	Catalog Description	\$ Price
SLC5080LC8	Saturn Button Labels	74.00
SLC5082NLFSS	Saturn Cover Plate Stainless Steel, 2 button	96.00
SLC5084NLFSS	Saturn Cover Plate Stainless Steel, 4 button	112.00
SLC5086NLFSS	Saturn Cover Plate Stainless Steel, 6 button	128.00
SLC5082FGF	Saturn Cover Plate White, 2 button	96.00
SLC5084FGF	Saturn Cover Plate White, 4 button	112.00
SLC5086FGF	Saturn Cover Plate White, 6 button	128.00
SLC5082F30	Saturn Cover Plate Cream, 2 button	96.00
SLC5084F30	Saturn Cover Plate Cream, 4 button	112.00
SLC5086F30	Saturn Cover Plate Cream, 6 button	128.00
SLC5082F60	Saturn Cover Plate Black, 2 button	96.00
SLC5084F60	Saturn Cover Plate Black, 4 button	112.00
SLC5086F60	Saturn Cover Plate Black, 6 button	128.00
SLC5082F70	Saturn Cover Plate Brown, 2 button	96.00
SLC5084F70	Saturn Cover Plate Brown, 4 button	112.00
SLC5086F70	Saturn Cover Plate Brown, 6 button	128.00

Note: Color options for faceplates: Pure White (PW)

#### **DLT Keypads**

Saturn<sup>TM</sup> Dynamic Labeling Technology<sup>TM</sup> (DLT) Keypads combine a programmable keypad button, and easily customized labels on a backlit LCD screen that eliminates the need for custom labels. By virtue of the variety of button configurations available, one compact DLT keypad can take the place of many single-operation switches, ON/OFF toggles, dimmers, and timers. The five keypad buttons incorporate blue LEDs which complements the keypad's sleek lines while showing the status of controlled devices.

- Button configurations include multi-point switching and dimming, master ON/OFF switching, and scene settings
- Keypads have five physical buttons—four control buttons, and one scroll/page button—combined with two screens of labels, for a total of eight control buttons and two scroll/page buttons
- Scene control includes up to forty addresses per keypad. Larger scenes are possible by sharing memory among multiple keypads.
- Independent timers available for each button
- Button LEDs can be used as locator lights in the dark
- 64 x 128 pixel LCD screen with a white backlight
- Editable LCD labels, available for each button or control group, can display text, symbols, and graphics.
- Dynamic graphic displays, such as bar graphs, can be enabled or disabled
- Bitmaps can be downloaded for each group address or scene
- Low-profile design, wall mounted without external fittings



**Table 5.6:** Saturn and Neo Style DLT Keypads

Catalog No.	Catalog Description	\$ Price
SLC5085DLWE	Saturn DLT White	966.00
SLC5085DLBK	Saturn DLT Black	966.00
SLC5085DLCM	Saturn DLT Cream	966.00
SLC5085DLBR	Saturn DLT Mocha	966.00
SLC5055DLGB	Neo DLT Brushed Aluminum	898.00
SLC5055DLWE	Neo DLT White	898.00
SLC5055DLBK	Neo DLT Black	898.00
SLC5055DLSG	Neo DLT Soft Grey	898.00
SLC5055DLCM	Neo DLT Cream	898.00
SLC5055DLDS	Neo DLT Desert Sand	898.00

#### Table 5.7: **DLT Keypad Accessories**

Catalog No.	Catalog Description	\$ Price
SLC5085DLFSS	Saturn DLT cover plate, Stainless Steel	110.00
SLC5085DLFCM	Saturn DLT cover plate, Cream	110.00
SLC5085DLFBK	Saturn DLT cover plate, Black	110.00
SLC5085DLFBR	Saturn DLT cover plate, Mocha	110.00
SLC5085DLFWE	Saturn DLT cover plate, White	110.00
SLC5055DLFGB	Neo DLT cover plate, Brushed Aluminum and Slate	12.00
SLC5055DLFBR	Neo DLT cover plate, Brown	12.00
SLC5055DLFCM	Neo DLT cover plate, Cream	12.00
SLC5055DLFBK	Neo DLT cover plate, Black	12.00
SLC5055DLFSG	Neo DLT cover plate, Soft Gray	12.00
SLC5055DLFDS	Neo DLT cover plate, Desert Sand	12.00
SLC5055DLFWE	Neo DLT cover plate, White	12.00

Note: Color options for faceplates: Pure White (PW).

#### Neo™ Decorator Keypads

Neo Style Decorator Keypads provide the same features of a standard C-Bus keypad in a format designed to conserve horizontal wall space.

- Button configurations include multi-point switching, dimming, and scene control
- LED indicator reflects status of each button
- Built-in infrared receiver to allow operation from C-Bus handheld remote control
- Distinctive Neo styling designed to match standard Neo keypads and touchscreens
- Custom color combinations available on request
- Meets NEMA Standards WD-1, WD-6

#### Neo Decorator Keypad Assembly (order face plates separately) **Table 5.8:**

Catalog No.	Description	\$ Price
Neo Decorator 1 button keypad (X	(X) Designates Color. (order cover plate separately)	
SLC5051NLM(XX)	1 button decorator keypad	386.00
Neo Decorator 2 button keypad (o	rder cover plate separately)	
SLC5052NLM(XX)	2 button decorator keypad brushed aluminum	408.00
Neo Decorator 3 button keypad (o	rder cover plate separately)	
SLC5053NLM(XX)	3 button decorator keypad brushed aluminum	430.00
Neo Decorator 4 button keypad (o	rder cover plate separately)	·
SLC5054NLM(XX)	4 button decorator keypad brushed aluminum	452.00
Neo Decorator Blanking Plate (ord	der cover plate separately)	
SLC5850BP(XX)	Neo blanking plate	14.00
Note: Designate colors (XX) when	placing order for Neo style decorator keypads	·

Designate colors (xX), when placing order for Neo style decorator keypads.

GB – Brushed, WE – White, CM – Cream, SG – Soft Grey, DS – Desert Sand, BK – Black, BR – Brown, LA – Light Almond, VY – Ivory.



Saturn Style Decorator Keypads provide the same features of a standard C-Bus keypad in a format designed to conserve horizontal wall space.

- Button configurations include multi-point switching, dimming, and scene control
- LED indicator reflect status of each button
- Built-in infrared receiver to allow operation from C-Bus remote controllers
- Distinctive Saturn styling designed to match standard Saturn keypads and touchscreens
- Meets NEMA Standards WD-1, WD-6

#### Table 5.9: Saturn Decorator Keypad Assembly (order face plates separately)

	· · · · · · · · · · · · · · · · · · ·		
Catalog No.	Description	\$ Price	
Saturn Decorator 1	button keypad (XX) Designates Color. (order cover plate se	parately)	
SLC5081NLM(XX)	1 button deco Saturn keypad, White	526.00	
Saturn Decorator 2	button keypad (XX) Designates Color. (order cover plate se	parately)	
SLC5082NLM(XX)	2 button deco Saturn keypad, White	538.00	
Saturn Decorator 3	Saturn Decorator 3 button keypad (XX) Designates Color. (order cover plate separately)		
SLC5083NLM(XX)	3 button deco Saturn keypad, White	548.00	
Saturn Decorator 4	Saturn Decorator 4 button keypad (XX) Designates Color. (order cover plate separately)		
SLC5084NLM(XX)	4 button deco Saturn keypad, White	556.00	
Blanking Plates			
SLC5880BPPG(XX)	Saturn Blanking Plate	24.00	

Designate colors (XX), when placing order for Saturn style decorator keypads WE – White, PW – Pure White, CM – Cream, BK – Black, BR – Brown.



Neo Decorator Keypad



Saturn Decorator Keypad



C-Bus™

ww.schneider-electric.us



Neo Decorator Style Cover Plate



2 Gang Saturn Decorator Style Cover Plate



Mark II Black and White and Spectrum Color touch screen with Cream Saturn style cover plate



Mark II Black and White and Spectrum Color touch screen desktop model

#### **Neo and Saturn Style Decorator Face Plates**

C-Bus decorator style wall plates add a touch of flair to any décor. Available in either Neo or Saturn styling.

- Sleek, smooth contemporary architectural styling enhances fine decor
- Screwless design for easy placement
- Two piece kit allows easy retrofit
- Meets NEMA Standards WD-1, WD-6

#### Table 5.10: Neo Decorator Style Cover Plates (order keypad assemblies separately)

Catalog No.	Description	\$ Price
Neo Decorator Cover Plate 1 gang▲		
SLC5051GA(XX)	1 gang wallplate	14.00
Neo Decorator Cover Plate 2 gang▲		
SLC5052GA(XX)	2 gang wallplate	18.00
Neo Decorator Cover Plate 3 gang▲		
SLC5053GA(XX)	3 gang wallplate	22.00
Neo Decorator Cover Plate 4 gang▲		
SLC5054GA(XX)	4 gang wallplate	26.00

Cover plate assembly includes inner and outer surrounds. Wall plate ordering (Order keypads separately). Order numbers for the Neo decorator style wall plates indicate the gang number desired on the wall plate and the color of the wall plate itself. Color codes are: Slate (1), White (2), Cream (3), Soft gray (4), Desert sand (5), Black (6), Brown (7), Brushed aluminum (8), and Gold (9). For example, \$LC505(1)(Ag/(51) represents an order fo a Neo decorator style wall plate in one gang configuration, with a Desert sand outer surround and a slate inner surround.

Table 5.11: Saturn Decorator Style Cover Plates (order keypad assemblies separately)

Catalog No.	Description	\$ Price
Saturn Decorator Cover Plate 1 gang■		
SLC5081GAPG(XX)	1 gang wallplate	24.00
Saturn Decorator Cover Plate 2 gang■		
SLC5082GAPG(XX)	2 gang wallplate	28.00
Saturn Decorator Cover Plate 3 gang■		
SLC5083GAPG(XX)	3 gang wallplate	38.00
Saturn Decorator Cover Plate 4 gang■		
SLC5084GAPG(XX)	4 gang wallplate	45.00

 To specify color, add corresponding alpha codes. Black = BK, White = WE, Cream = CM, Mocha = BR. Example SLC5081GAPG(WE) = Saturn Decorator 1 gang, White

#### **Touch screens**

C-Bus Touch screens are unified wall-mounted panels for controlling lighting systems and accessories with the touch of a finger. They come in both monochromatic (Mark II) and color screen versions. Compact yet powerful, touch screens offer an attractive alternative to multiple single operation switches, ON/OFF toggles, dimmers, and timers which can clutter up even the nicest wall.

#### Mark II Black and White and Spectrum Color touch screen

- Control screens support multi-point switching and dimming, master ON/OFF switching, scheduling, and scenes with multiple loads.
- Preset scenes and functions automate the task of adjusting lighting levels to different lamps and fixtures.
- RS-232 port for third party device integration through the built in Logic Engine
- Standard real-time and astronomical clock permits time scheduling of lighting and other tasks
- Variable dimming fade rates can be configured according to load or lighting zone
- Locator option can be configured to help users find the screen in dim light
- Clean-lined low-profile touch screen can be wall-mounted without external fittings
- Infrared receiver for remote control
- Stores up to 250 scenes with 100 group addresses each. Scenes can be triggered directly from the touch screen or any other device on C-Bus

#### Mark II Black and White and Spectrum Color touch screen (desktop model)

- Screen swivels and pivots for optimal viewing
- Control screens support multi-point switching and dimming, master ON/OFF switching, scheduling, and scenes with multiple loads.
- Preset screens and functions automate the task of adjusting lighting levels to different lamps and fixtures.
- Standard real-time and astronomical clock permits time scheduling of lighting and other tasks
- Variable dimming fade rates can be configured according to load or lighting zone
   Locator option can be configured to help users find the screen in dim light
- Infrared receiver for remote control

# Backyana Sanasa Marana 
Color touchscreen in Neo style Brushed Aluminum and Slate



Wiser Home Controller

#### Table 5.12:

New!

Catalog No.	Catalog Description	\$ Price
Mark II B/W Touch Scr	een	
SLC5050CTL2xx SLC5080CTL2xx SLC5000CTL2SS	Mark II w/Neo Style Cover Plate Mark II w/Satum Style Cover Plate Mark II w/Satum Style Cover Plate	2439.00 2499.00 2499.00
Mark II Touch Screen	Desktop Model	
SLC5000CTD2xx	Mark II Desktop Touch Screen	1920.00
x = color code / WE-Wh	nite, BK-Black	
Spectrum Touch Scree	en	
SLC5000CTCL2 SLC5000CTCL2xx SLC5050CTCL2xx SLC5080CTCL2xx SLCBS5000CTCL2 SLCBB5000CTCL2	Spectrum Base Unit Only Spectrum w/non-stylized plastic Cover Plate Spectrum w/Neo Style Cover Plate Spectrum w/Saturn Style Cover Plate Spectrum w/Stainless Steel Cover Plate Spectrum w/Brass Cover Plate	2106.47 2374.45 2341.17 2386.69 2232.47 2265.22

xx = color code / GB – Brushed Aluminum and Slate ▲, WE – White, BK – Black, CM – Cream, BR – Mocha ■, PW – Pure White ■.			
Spectrum Desktop Model			
SLC5000CTCD2xx	Spectrum Desktop Touch Screen	2365.61	
xx = color code / WE–White, BK–Black			
Accessories			

Accessories		
Mark II / Spectrum Accessories		
SLC5000CT2WB SLC5080CT2Fxx SLC5000CT2FSS SLC5050CT2Fxx	Wall box for Mark II / Spectrum Touch Screen Replacement Cover Plate, Saturn style Replacement Cover Plate, Stainless Steel Replacement Cover Plate, Neo style	68.00 280.22 126.00 187.76
xx = color code / GB - Brushed Aluminum and Slate . WE - White, BK - Black, CM - Cream, BR - Mocha . PW - Pure White .		

- ▲ Neo only
- Saturn only

#### Color touch screen

- Built-in RJ-45 Ethernet and C-Bus network, RS-232, and USB terminals
- Touch sensitive 6.4 inch (640 x 480) color LCD panel
- Control screens support multi-point switching
- Standard real-time and astronomical clock permits time scheduling of lighting and other tasks
- Variable dimming fade rates can be configured according to load or lighting zone
- Locator option can be configured to help users find the screen in dim light
- Clean-lined low-profile touch screen can be wall-mounted without external fittings
- Infrared receiver for remote control

#### Table 5.13:

Catalog No.	Catalog Description	\$ Price
Color Touch Screen		
SLC5050CTCxx SLC5080CTC2xx	Color touch screen w/Neo style Cover Plate Color Touch Screen w/Saturn style Cover Plate	8480.00 8480.00
Color Touch Screen Ad	ccessories	
SLC5000CTCRM SLC5000CTCNA SLC5000CTCWB SLC5000CTCPS SLC5080CTCFxx SLC5050CTCFxx	Plasterboard Bracket for Color Touch Screen Nail Bracket for Color Touch Screen Wall box for Color Touch Screen Power supply for Color Touch Screen Replacement Cover Plate, Saturn style Replacement Cover Plate, Neo style	90.00 60.00 68.00 263.00 356.00 29.00

- ▲ Neo only.
- Saturn only

#### Wiser™ Home Controller

The Wiser Home Controller is the missing piece of the smart home puzzle, enhancing the capabilities and connectivity of the C-Bus network. Its easy-to-use graphical user interface (GUI) provides access to the home C-Bus network and all of your electrical, multimedia, and telecommunication needs. This same GUI can be installed across multiple control devices, such as mobile phones, TVs with Microsoft<sup>®</sup> Windows<sup>®</sup> Media<sup>®</sup> Center, personal computers, and web tablets, in addition to the C-Bus range of touch screens and keypads. No matter where you are, the Wiser Home Controller allows you to monitor and control your home environment locally or remotely over the internet.

#### **Features**

- Ethernet and Wi-Fi based controller for your C-Bus system
- Built-in Ethernet router and Wi-Fi access point
- Support for lighting, air-conditioning, multi-room audio, alarms, cameras, and other equipment
- Built-in scene, scheduling, and logic programming modules
- Allows remote reprogramming from outside the home/building by installers
- Common, intuitive interface for all devices
- Mobile phone and web-enabled device control

#### Table 5.14: Order Information

Description	Catalog Number	\$ Price
Wiser Home Controller	WHC-5918	1505.00



#### C-Bus Multi Room Audio

C-Bus™

Extend the capabilities of a C-Bus system by incorporating award winning multi-room audio into your next project. Multi-room audio augments a C-Bus lighting control system, providing high quality sound throughout a home or business.

C-Bus multi-room audio readily integrates with other C-Bus controls, providing a single source for audio and lighting from a single keypad or touch screen. Sound is distributed throughout the home through the Matrix Switcher and routed to local amplifiers.

A typical C-Bus Multi Room Audio system distributes up to four analog audio inputs, five if an Audio Distribution Unit is used, and one optical input. These inputs are distributed up to 8 zones, each consisting of one or more amplifier. Additionally, each amplifier is capable of accepting a local analog audio input, providing up to six stereo audio channels for each amplifier.





Matrix Switcher



Low Power Amplifier

#### **Matrix Switcher**

The C-Bus™ Audio Matrix Switcher provides a revolutionary means for distributing audio throughout a home. This Matrix Switcher provides up to eight zones of audio output from four source inputs. The C-Bus Matrix Switcher allows you to send streaming audio programs to the audio zones from a variety of sources, including a local area network (LAN), or a USB memory stick (Model: SLC5608842E). In addition, it will also allow connection of a portable music player directly to the Matrix Switcher's front audio panel. Audio sources can be selected from the front panel or by any C-Bus™ input device such as touch screens or keypads. The Matrix Switcher is ideally suited for multi-room audio and structured wiring systems. Keypads and other C-Bus™ devices connect to the Matrix Switcher via CAT-5 modular jacks. Outputs to remote and desktop amplifiers are made with low voltage wiring. In addition to the six source inputs, two mono broadcast annunciation inputs are provided for connection to intercoms or other systems. Broadcast annunciation input can be given priority over other source inputs and features fully adjustment volume and over-stepping mute features.

- Suitable for 19" Rack Mount with rack mount ears provided.
- Each Matrix Switcher can distribute digital audio to up to 8 MRA amplifiers. You can install up to 3 Matrix Switchers on a C-Bus network
- The Matrix Switcher can provide power for the attached amplifiers via the Digital Audio cables. You can connect an external power supply to an amplifier to increase its audio power output.
- The choice of the audio program for an amplifier can be made at the Matrix Switcher or in the audio zone. You can use C-Bus input
  devices to choose the source and to adjust volume, tone and muting.
- The Dual AM/FM tuners inside the Matrix Switcher can distribute preset station choices to any of the audio zones.
- Distributes streaming audio from several sources using the C-Bus Ripple software application running on a networked PC.
- You can connect up to 4 stereo analogue line-level inputs to the Matrix Switcher. If you need to add another source input, you can
  install an MRA Distribution Unit and power supply.
- Compatible with C-Bus devices



Desktop Amplifier

#### **Remote Amplifiers**

C-Bus Multi Room Amplifiers provide efficient, high fidelity audio to individual rooms. Available in either desktop or remote mount versions, these amplifiers are specifically designed to operate on the C-Bus network as an extension of a lighting control system, without third party gateways or custom integration. This means the ability to control amplifiers with the same keypad or touch screen used to control lighting levels.

When combined with the C-Bus Matrix Switcher, these amplifiers deliver excellent stereo sound. Connections are provided for up to two sets of 8 ohm speakers. Both desktop and remote amplifiers provide a local input connection for attaching to CD or mp3 players, etc. In addition, the desktop amplifier will accept remote commands via its infrared receiver. Infrared remote included.

- 10 Watt digital efficient stereo amplifier, 25 Watts when connected to local power supply (optional)
- Super quiet design
- On board 8 ohm loudspeaker connections
- Local source input RCA jack
- C-Bus connection (connects with CAT-5 cable)
- Volume control (desktop model)
- On-board IR receiver (desktop model)
- Stereo headphone connection (desktop model)
- Infrared remote included (desktop model only)



Audio Distribution Unit

#### **Audio Distribution Unit**

The C-Bus Audio Distribution Unit is an optional device that can be used in conjunction with the C-Bus Multi Room Audio System to further enhance C-Bus enabled audio product family.

The C-Bus Audio Distribution Unit distributes a single digitized stereo audio input source to multiple locations via amplifiers wired in a parallel format. Functions such as Volume, Bass, Treble and Balance can be adjusted from a C-Bus input device at any of the audio output locations. The C-Bus Audio Distribution Unit converts a single analog stereo audio input to a digital audio output. That output can then be connected to the Matrix Switcher as an additional input or to the C-Bus Desktop or Remote Amplifier as a stand-alone configuration.

- Distributes a single stereo audio source to C-Bus Audio Amplifiers via a digitized signal over Cat-5 cable
- Does not require any C-Bus programming (hardware only)
- One stereo analog audio source input (2 X RCA)
- One digital audio output
- Output can be looped between C-Bus Audio Amplifiers
- IR emitter port

#### Table 5.15: C-Bus Multi Room Audio Components



Indoor Ceiling Mount Speakers

Catalog No.	Catalog Description	\$ Price
SLC560110R	Low Power Amplifier, rack mountable	TBD
SLC5608842	Matrix Switcher w/4 stereo analog inputs, 2 internal AM/FM tuners, IR input and target connections. Up to 8 MRA Zones.	4599.00
SLC5608842E	Matrix Switcher w/4 stereo analog inputs, 2 internal AM/FM tuners, IR input and target connections. Audio streaming using a LAN or USB source. Up to 8 MRA Zones.	4274.10
SLC560125D	Desktop Amplifier	1908.15
SLC560125R	Remote Amplifier	1609.79
SLC560011	Audio Distribution Unit	790.41
SLC5600P24500S	Amp External Power Supply (only needed if Audio distribution unit is used to provide an additional digital input for the Matrix Switcher)	53.22
Accessories		
SLC5600P241250	Low Power Amplifier Power Supply	TBD
SLC560110E	Low Power Amplifier Enclosure (used for linking up to 4 amplifiers/enclosures together for mounting in a 19" rack)	TBD
SLC560110MB	Low Power Amplifier Wall Mounting Bracket	TBD
SLC5600P243750T	Audio Amplifier Power Supply	445.93
SLC560125MB	Remote Amplifier Mounting Bracket	42.24



C-Bus Audio Speakers are available as indoor or outdoor models and are designed to be used with home theater, multi-room, and outdoor audio applications.

The indoor speakers come in wall or ceiling mount versions that are installed with the front of the speaker flush with the mounting surface.

The indoor/outdoor speakers are available in black or white and can be placed on a shelf or hung on a surface by using the included bracket.

- Flush-mount\_shelf-mount\_and surface-mount models
- Indoor and outdoor models
- High-impact plastic components and powder coated metal grills produce a long-lasting unit suitable for indoor and outdoor use
- 8 ohm impedance
- Available with Kevlar™ (indoor units only) or polypropylene drivers (indoor and outdoor units) for high-quality sound in all
  applications
- All models are off the floor, saving floor space
- Indoor/Outdoor Speakers have a pre-installed, removable mounting bracket
- Indoor/Outdoor Speakers can be placed on a shelf or hung from a surface by their bracket (included)
- Tracing/painting template included



Catalog No.	Catalog Description	\$ Price
SLC5600IWP	In-Wall Polypropylene speakers	429.58
SLC5600IWK	In-Wall Kevlar speakers	560.00
SLC5600ICP	In-Ceiling Polypropylene speakers	408.53
SLC5600ICK	In-Ceiling Kevlar speakers	521.09
SLC5600ODPBK	Outdoor Black speakers	468.30
SLC5600ODPWE	Outdoor White speakers	468.30





Indoor/Outdoor Speakers

5-10

Class 1250





8 button remote control



C-Bus™

#### **Hand Held Remote Controls**

C-Bus remote controls are designed for use with C-Bus keypads, multi-sensors, and touch screens, available in both four and eight button versions, these remotes have a range up to 50 feet (line of sight).

The universal remote control unit allows a single remote control unit to replace various other remotes including VCRs, CD players, DVRs, and TVs. Up to sixteen remote control codes are supported.

#### Table 5.17: **Handheld Remote Controls**

Catalog No.	Catalog Description	\$ Price
SLC5084TX	Handheld infrared remote 4 button	200.00
SLC5088TX	Handheld infrared remote 8 button	400.00
SLC5030URC	Handheld universal remote control	440.00

4 Zone Thermostat

#### Single and 4 Zone Network Thermostats

C-Bus Thermostats are used to regulate the air temperature of zones by controlling heating-ventilation-air conditioning (HVAC) equipment. The air temperature is monitored by the unit's temperature sensor or optionally via an external C-Bus temperature sensor.

C-Bus single and programmable 4 Zone Thermostats may operate as stand alone devices, or be controlled via other C-Bus devices such as wall switches or touch screens.

Programmable 4 Zone Thermostats can schedule up to four set points during a day, and unique schedules can be programmed for each day of the week.

Both models include setback mode, (saves power by using a wider acceptable temperature range within which heating or cooling is not performed) and temperature guard, (ensures the temperature is maintained within a specified temperature range).

- Easy to read, large LCD display
- Control by keypads and other devices on the C-Bus network
- Available in black, white and stainless steel fascias
- Setback mode
- Temperature guard mode
- Internal Timer
- Daily schedule set points (4 Zone model)
- Display temperature in Celsius or Fahrenheit
- RWG interface (relay models only)
- Easily configured by using the Clipsal Toolkit software program



Single Zone Thermostat

#### Table 5.18: Single and 4 Zone Network Thermostats

Catalog No.	Catalog Description	\$ Price
SLC5070THBWE	Single Zone, White, no relay	649.00
SLC5070THPWE	4 Zone, White, no relay	799.00
SLC5070THBBK	Single Zone, Black, no relay	649.00
SLC5070THPBK	4 Zone, Black, no relay	799.00
SLC5070THBSS	Single Zone, Stainless, no relay	649.00
SLC5070THPSS	4 Zone, Stainless, no relay	799.00
SLC5070THBRWE	Single Zone w/relay, White	724.00
SLC5070THPRWE	4 Zone w/relay, White	899.00
SLC5070THBRBK	Single Zone w/relay, Black	724.00
SLC5070THPRBK	4 Zone w/relay, Black	899.00
SLC5070THBRSS	Single Zone w/relay, Stainless	724.00
SLC5070THPRSS	4 Zone w/relay, Stainless	899.00
SLC5031RDTSL	Remote Temperature Sensor	298.00





Light Level Sensor

360° Indoor PIR Sensor

#### **Light Level Sensor**

The C-Bus Light-Level Sensor measures ambient light levels and automatically issues ON, OFF, or ramp commands over a C-Bus network. The light-level sensor can control relays, dimmers, or remotely operated circuit breakers, changing their status according to pre-set ambient lighting targets. The C-Bus light-level sensor has a dynamic range between 5-150 foot candles, and compensates for noise and rapid light intensity fluctuations.

#### **Outdoor Light Level Sensor**

C-Bus Outdoor Light-Level Sensor measures ambient light levels and automatically issues ON/OFF or ramp commands over a C-Bus network to maintain outdoor lighting levels. Primarily designed for outdoor use, this light-level sensor is also suitable for indoor setting in which a water resistant casing is desirable.

The light-level sensor can control up to two C-Bus group addresses: one address controls ON/OFF switching of a lamp circuit according to a pre-determined ambient light level, while the other is used to continuously regulate the light-level output of any number of lampsl

The target light level, the margin, and other sensor options are easily configured by using the C-Bus Toolkit software.

- Outdoor use, wall- and ceiling-mounted low-profile unit
- Can maintain a constant illumination level of 5-150 footcandles
- Adjustable lumin setpoint
- Control of up two C-Bus group addresses
- Sensors receive data and power over a single C-Bus twisted-pair cable, so they do not require power packs or line-voltage connections
- 180° field of view

#### Table 5.19: C-Bus Light Level Sensor

Catalog No.	Catalog Description	\$ Price
SLC5031PE	Light level sensor, 0–150 Foot-candles, Indoor	208.00
SLC5031PEWP	Light Level Sensor, 5–150 Foot-candles, Outdoor	278.00

#### Occupancy Sensors

C-Bus occupancy sensors are available for both indoor and outdoor applications. All C-Bus sensors incorporate reliable passive infrared detection (PIR) circuits for occupancy detection along with integral light level sensors to prevent switching of lights if sufficient ambient light is present. Sensors feature programmable adjustments for sensitivity and time delay, walk test LED for commissioning and optical bandpass filtering with dual element detectors to minimize false triggering.

- 90° Indoor sensors are intended for wall or ceiling mounting. These sensors have a continuous detection field of 400 square feet and a 90° field of view.
- 360° Indoor sensors are intended for flush mounting in drop ceilings. They have a minor motion
  detection field of 800 square feet making them ideal for use in offices, copier rooms, closets, and
  restrooms where it can be mounted in the center of the detection area.
- 360° Multi-Sensors combine a passive infrared receiver (PIR) for occupancy sensing, a light-level sensor, and an infrared remote receiver into a small, highly versatile unit. The multi-sensor's 2.8 inch face diameter makes it unobtrusive and ideally suited for flush mounting on the ceiling with effective IR coverage up to 800 square feet. The built-in IR receiver accepts commands from an optional handheld remote controller, making the sensor ideal for classrooms and conference room areas.
- Outdoor PIR Motion Sensor combines reliable thermal-radiation-based control of lighting with rugged construction suitable for outdoor requirements. The unit's advanced circuits and flat multisegmented lens provide coverage of up to 3000 square feet in a 110° field of view.

Table 5.20: C-Bus Occupancy Sensors

Catalog No.	Catalog Description	\$ Price
SLC5750WPL	Occupancy sensor, multi, outdoor, 110 deg	283.00
SLC5751L	Occupancy sensor, PIR, indoor, 90 deg	227.00
SLC5753L	Occupancy sensor, PIR, indoor, 360 deg	213.00
SLC5753PEIRL	Occupancy sensor, multi, indoor, 360 deg	268.00

# Auxiliary Input Unit

C-Bus Four-Channel Auxiliary Input Units increase the versatility of the C-Bus network by facilitating remote access with any dry-contact switch mechanism. DIN-rail mounted for quick installation, the auxiliary unit can be configured with standard C-Bus control functions such as remote scene triggering, ON/OFF, toggle, dimmer, or timer.

- Provides four isolated inputs for external voltage-free mechanical switches
- Control options include remote scene triggering, ON/OFF, toggle, dimmer, or timer operations
- LEDs indicate operational status of each channel
- Standard built-in C-Bus network connectors: (2) RJ-45
- Non-volatile memory stores operating status for recovery from a power outage
- DIN style construction 4M wide: 3.4"(L) x 2.8"(W) x 2.6"(H)
- Compatible with all Clipsal devices and the Square D Powerlink™ NF3000G3C controller





Outdoor PIR Sensor

r 90° Indoor PIR Sensor



360° PIR Multi Sensor



Four-Channel Auxiliary Input unit





General Input unit



Four-Channel Bus Coupler



Changeover Relay

#### **General Input Unit**

Four-Channel General Input Units measure TTL digital and real-world analog quantities and generate messages about the measurements to the C-Bus network. By acting as an interface with various external sensors, the general input unit enables integration of the C-Bus network with a variety of system types, such as those for HVAC and for power monitoring. Configuration options include selectable input types, eight adjustable decision thresholds per channel, definable actions, selectable filtering, broadcast rates, and a separate hysteresis value per channel.

- Measures TTL digital quantities including voltage, current, or resistance from external sensors such as light level, pressure, and temperature
- Four channels of input, each with an adjustable hysteresis value, eight decision thresholds, and a software-selectable input value transformation in the form y =ax +b
- Input channels are compatible with a range of third-party sensors
- Control functions include load switching, dimming, trigger applications, enable control applications, and measurement applications
- Includes 120 V/24 Vdc power pack
- Dimensions: 5.67 in. (144mm) wide x 2.60 in. (66mm) deep x 3.35 in. (85mm) tall
- Compatible with all Clipsal devices and the Square D Powerlink NF3000G3C controller

#### **Bus Couplers**

Bus Couplers provide an interface between dry-contact mechanical switches and the C-Bus network. Available in two-and four-channel models, the bus coupler is small enough to be used in restricted spaces such as wall boxes with existing switches. Configuration options include standard control functions such as ON/OFF, toggle, dimmers, and timers.

- Provides two or four non-isolated inputs for external voltage-free mechanical switches. Two-channel units feature independent remote LED outputs
- Two-way removable terminal block for the C-Bus connection
- Receives data and power over a network, so it does not require power packs or line voltage connections
- Scene capabilities
- 2.2"(L) x 1.9"(W) x 0.7"(H)
- Compatible with all Clipsal devices and the Square D Powerlink NF3000G3C controller

#### Table 5.21: Input Units

Catalog No.	Catalog Description	\$ Price
SLCLE5504AUX	4 Channel auxiliary input unit	544.00
SLCE5504TGI	4 Channel general input unit	1194.00
SLC5102BCLEDL	2 Channel bus coupler	212.00
SLC5104BCL	4 Channel bus coupler	243.00

#### Relays

C-Bus Relay Units are intended for switching resistive, inductive, fluorescent and incandescent low-voltage loads. Relay units are designed to be mounted in suitable DIN style enclosures. Relay units feature:

- Local toggle buttons to allow individual channels to be toggled
- Remote ON and OFF facilities permitting all channels to be turned ON or OFF without C-Bus Network communications
- Two (2) Convenient built-in C-Bus network connectors (RJ-45)
- LED Indicators to show the status of the network and the unit
- Units available both with and without a 200ma power supply on-board.
- Compatible with all Clipsal devices and the Square D Powerlink™ NF3000G3C controller

#### **Changeover Relay**

C-Bus 2A Changeover Relays are designed to operate three-speed motors and two-way motor control devices. Some of their most common applications include operating motorized blinds, shutters, curtains and skylights (open/closed) where they provide a much simpler alternative to traditional and obtrusive relay interlocking systems.

- Four (4) isolated independently operating relay channels
- 120 Vac and 277 Vac units
- 2A motor rating
- Dimensions: 5.67 in. (144mm) wide x 2.60 in. (66mm) deep x 3.35 in. (85mm) tall

#### Table 5.22: Changeover Relays

Catalog No.	Catalog Description	\$ Price
SLC5504TRVFC	4 Channel Changeover Relay, 125 V, with power supply	1100.00
SLC5504TRVFCP	4 Channel Changeover Relay, 125 V, without power supply	1010.00
SLC5504HRVFC	4 Channel Changeover Relay, 277 V, with power supply	1100.00
SLC5504HRVFCP	4 Channel Changeover Relay, 277 V, without power supply	1010.00



4-Channel 10 A Relay



4-Channel 20 A Relay



8-Channel Low Voltage Relay



Phase Angle Dimmer with Power Supply

#### 10 Amp Relay

C-Bus 10A Relays feature a zero crossing magnetically latching relay designed for switching the harsh electrical loads associated with today's high efficiency lighting systems.

- Four (4) or twelve (12) independently operating voltage free relay contacts
- 120 Vac and 277 Vac units
- 10 A rating
- Dimensions: 5.67 in. (144 mm) wide x 2.60 in. (66 mm) deep x 3.35 in. (85 mm) tall

#### Table 5.23: 10 Amp Relay

Catalog No.	Catalog Description	\$ Price
SLC5512TRVF	12 Channel Relay, 120 V, 10 A with power supply	2168.00
SLC5512TRVFP	12 Channel Relay, 120 V, 10 A without power supply	1973.00
SLC5504TRVF	4 Channel Relay, 120 V,10 A with power supply	1043.00
SLC5504TRVFP	4 Channel Relay, 120 V, 10 A without power supply	843.00
SLC5512HRVF	12 Channel Relay, 277 V, 10 A with power supply	2168.00
SLC5512HRVFP	12 Channel Relay, 277 V, 10 A without power supply	1973.00
SLC5504HRVF	4 Channel Relay, 277 V,10 A with power supply	1043.00
SLC5504HRVFP	4 Channel Relay, 277 V, 10 A without power supply	843.00

#### 20 Amp Relay

C-Bus 20 A Relays feature a zero crossing magnetically latching relay designed for switching the harsh electrical loads associated with today's high efficiency lighting systems.

- Four (4) independently operating voltage free relay contacts
- 120 Vac and 277 Vac units
- 20 A rating
- Dimensions: 8.46 in. (215 mm) wide x 2.60 in. (66 mm) deep x 3.35 in. (85 mm) tall

#### Table 5.24: 20 Amp Relay

Catalog No.	Catalog Description	\$ Price
SLC5504TRVF20	4 Channel Relay, 120 V, 20 A with power supply	1320.00
SLC5504TRVF20P	4 Channel Relay, 120 V, 20 A without power supply	1142.00
SLC5504HRVF20	4 Channel Relay, 277 V, 20 A with power supply	1320.00
SLC5504HRVF20P	4 Channel Relay, 277 V, 20 A without power supply	1142.00

#### 8-Channel Low Voltage Relay

The C-Bus 8-Channel Low Voltage Relay is a C-Bus output device that controls up to eight low voltage relay channels. The unit is powered from C-Bus and requires no other power source. The 8-Channel Low Voltage Relay can be used in many low voltage applications including controlling irrigation solenoids and low voltage damper solenoids for HVAC control. The unit can also be used in integrating 3rd party equipment through pulse signal controls.

- 8 channels of 2 A switched loads @ 30 Vac/dc
- 8 channels are all isolated change over relays
- Control of 3rd party products

#### Table 5.25: 8-Channel Low Voltage Relay

Catalog No.	Catalog Description	\$ Price
SLC5108RELVP	8-Channel Low Voltage Relay	298.00

#### **Phase Angle Dimmers**

C-Bus Phase Angle Dimmers are intended for controlling incandescent and compatible low-voltage and florescent lighting. Each of the unit's channels can independently control loads to create dynamic lighting scenes. These dimmer units automatically compensate for voltage and frequency fluctuations and employ advanced phase-control techniques to reduce flicker and increase lamp life.

- Four (4) independent channels supporting up to 4 A continuous load per channel, eight (8) independent channels supporting up to 2 A continuous load per channel
- Units available both with and without a 200 mA power supply on-board.
- 120 Vac
- Dimensions: 8.46 in. (215 mm) wide x 2.60 in. (66 mm) deep x 3.35 in. (85 mm) tall







C-Bus™

Professional Dimmer



4 Channel 0-10 V Dimmer Unit



**DALI Gateway** 



Network Bridge

#### **Professional Dimmer**

C-Bus Professional Dimmers can control incandescent and compatible low-voltage and florescent lighting. These dimmers are ideal for larger heavily loaded circuits. Each channel provides independent dimming and incorporates thermal overload and over-current protection. These dimmer units automatically compensate for voltage and frequency fluctuations and employ advanced phase-control techniques to reduce flicker and increase lamp life.

An optional terminal box is available for conduit connections. Configuration options include network monitoring of the channel load and network voltages, adjustable delays for dimming levels, and master override.

- Specialized dimming modes—soft turn on/off and linear brightness control
- Built-in power supply sources 60 mA to the C-Bus network
- Individual channels can be turned On/Off at the unit or via C-Bus commands
- LEDs indicate the status of the network at the unit and the status of the unit's load and power
- Optional terminal box for connecting conduit
- 120 Vac
- Dimensions: 7.5 in. (190 mm) wide x 3.0 in. (75 mm) deep x 7.7 in. (195 mm) tall

#### Table 5.26: **C-Bus Dimmers**

Catalog No.	Catalog Description	\$ Price
SLC5504TD4A	4 x 4 A dimmer, incan/mag,125 V, 4 A, with power supply	1024.00
SLC5504TD4AP	4 x 4 A dimmer, incan/mag,125 V, 4 A, without power supply	800.00
SLC5508TD2A	8 x 2 A dimmer, incan/mag,125 V, 2 A, with power supply	1024.00
SLC5508TD2AP	8 x 2 A dimmer, incan/mag,125 V, 2 A, without power supply	800.00
SLC5104TD5	4 x 5 A dimmer, incan/mag,125 V, with power supply	1926.00
SLC5102TD10	2 x 10 A dimmer, incan/mag,125 V, with power supply	1926.00
SLC5101TD20	1 x 20 A dimmer, incan/mag,125 V, with power supply	1926.00
SLCU5100TB	Termination box for SLCLU510X Series dimmer units	78.00

#### 0-10 V Dimming Unit

The C-Bus Analog Output Unit provides four channels of analog 0-10 Vdc for controlling electronically dimmable fluorescent lighting ballasts.

- Produces four independently controllable channels of 0-10 Vdc for controlling dimmable flourescent lighting ballasts, or other 0-10 V controllable loads
- Individual channels can be turned ON/OFF at unit, via C-Bus commands, and through a remote override option
- 120 V or 277 Vac models available
- DIN style construction 4M wide: 3.4"(L) x 2.8"(W) x 2.6"(H)

#### Table 5.27:

Catalog No.	Catalog Description	\$ Price
	4 Channel 0–10 V Output, 120 V 4 Channel 0–10 V Output, 277 V	624.00 624.00

#### **DALI Gateway**

The C-Bus Digital Addressable Lighting Interface (DALI) Gateway provides an isolated two-way communications path between a C-Bus network and two DALI networks, making it possible to use C-Bus devices to control DALI ballasts.

- Provides two-way communications between C-Bus and DALI networks, routing selected messages from one to the other
- Unit is transparent and invisible to DALI ballasts
- Receives data and power over the network, so the unit does not require power packs or line-voltage connections
- DIN style construction 4M wide: 3.4"(L) x 2.8"(W) x 2.6"(H)

#### Table 5.28:

Catalog No.	Catalog Description	\$ Price
SLC5502DAL	2 Channel DALI Gateway	1014.00

#### **DMX Gateway**

The C-Bus DMX Gateway is a DIN rail mounted unit that maps C-Bus Group Addresses and levels to a DMX-

The C-Bus DMX Gateway is a one way device. It permits C-Bus input devices such as keypads, DLTs and PIRs to control lighting devices with DMX interface capabilities. These include many manufacturers of LED fixtures and theatrical lighting equipment.

- Includes DMX interface (bootlace connnectors to 5-pin female XLR)
- DMX Master device
- Receives data and power over the C-Bus network, so the unit does not require a line voltage connection
- DIN style construction 4M wide: 3.4" (L) x 2.8" (W) x 2.6" (H)

#### Table 5.29:

Catalog No.	Catalog Description	\$ Price
SLC5500DMX	C-Bus to DMX Gateway	936.00

#### **Network Bridge**

The C-Bus Network Bridge provides a communication channel between C-Bus units on separate networks, expanding the total number of units that can be configured, controlled, and monitored.

- Increases transmission distances by acting as a repeater station for data transmission
- Expands the total number of C-Bus devices that can operate on the system by isolating devices to individual networks
- Indicates each network's status level
- Uses built-in connectors to connect to a C-Bus network
- Compatible with Powerlink G3 3000C controller and all C-Bus components, including keypads, sensors, and dimmers
- DIN style construction 4M wide: 3.4"(L) x 2.8"(W) x 2.6"(H)





Power Supply



PC Interface

#### **Power Supply**

The C-Bus Power Supply is specifically designed to operate with the C-Bus network as a power source for passive C-Bus devices. Up to five power supplies can be connected to a single C-Bus network.

- Available in 120 and 277 Vac models
- Regulating power supply compensates for line voltage and frequency variations, so there is constant output
- Sources up to 350 mA to the C-Bus network
- UL listed to operate in parallel with other Clipsal power supplies, up to five on a single C-Bus network
- Incorporates short circuit and reverse polarity protection
- DIN style construction 4M wide: 3.4"(L) x 2.8"(W) x 2.6"(H)

#### **PC Interface**

The C-Bus PC Interface (PCI) expands options for configuring, controlling, and monitoring C-Bus networks by providing an interface between the network and a personal computer (PC). The C-Bus PCI module easily mounts to a DIN rail and connects to the C-Bus network. Power to the unit is provided through the C-Bus network.

- Unit/Comms LED shows the status of the unit's power and of any data transmissions
- Three RS-232 serial connectors for connecting to a PC or to external devices: (1) 9-pin D-type serial connector (female) and (2) 8-pin RJ-45 connectors
- Two C-Bus network connector ports: RJ-45 sockets
- Data cable for connecting PCI and personal computer, including DB9 connectors

#### **HSR**

- Unit/Comms LED shows the status of the unit's power and of any data transmissions
- Two C-Bus network connector ports: RJ-45 sockets
- USB PC connection
- Data cable for connecting PCI and personal computer

#### **Pascal Automation Controller**

C-Bus Pascal Automation Controller (PAC) provides extended conditional and real-time event programming to C-Bus systems. The PAC supports a full range of programming commands including conditional logic, flow control variables

Systems integrators will appreciate the built-in scheduling tools, scene tools, and wizards for creating basic logic programs. Full programming capabilities can be achieved utilizing the free-form script editor based off the pascal programming language.

- Connects directly to C-Bus network
- Powered from the C-Bus network
- USB port for connection to personal computer
- (2) RS232 ports for third party device control
- Real time, astronomical and C-Bus system clock included with 24 hour internal capacitor backup and external 12 Vdc battery

Programming capabilities including: i.e. Conditional logic (if, then, and, or, not, etc.), Flow Control (for, repeat, while), Variables (integer, real, Boolean, character, string), Control and monitoring of group addresses, Control and monitoring of scenes.



Ethernet Network Interface

#### **Ethernet Network Interface**

The C-Bus Ethernet Network Interface unit is a C-Bus system device designed to provide an isolated communications path between an Ethernet 10Base-T Network and a C-Bus Network. This allows high-speed control and monitoring of a C-Bus installation via the TCP/IP protocols used in computer networks and by the Internet. System integrators and installers will also benefit from having remote access to the system. With the C-Bus Ethernet Network Interface unit, access to a single or multiple networks can be as close as the nearest Ethernet connection.

- Remote access to Clipsal systems
- Bridge multiple C-Bus networks together over LAN or WAN
- Fully supports all Clipsal commands
- Small size, mounts in standard DIN enclosure (4M wide)
- Includes 12 Vdc power supply



Telephone Interface Unit

#### **Telephone Interface Unit**

C-Bus Telephone Interface Unit offers a dial-in and dial-out capability for control of a C-Bus system. Remote location override, monitoring, diagnostics and configuration of a C-Bus system is possible with this unit. The C-Bus Telephone Interface Unit is programmed using a connection to a PC running TICA (Telephone Interface Commissioning Application) configuration software. The interface can also act as a C-Bus PC Interface. The Telephone Interface Unit can be installed in a C-Bus 36 or 60M enclosure or as a wall mountable stand-alone item with connection to C-Bus.

- Remote location override
- Voice prompts and confirmation
- Password protected
- 32 supported devices
- Automatic dial out on present conditions
- Local or remote site access to C-Bus system
- Audio Out





#### Bar Code Reader

C-Bus™

The C-Bus Bar Code Reader allows installers and integrators to quickly scan C-Bus devices with serial numbers and import them into C-Bus Toolkit software. Using a USB connection to a PC, users can easily identify and track C-Bus Unit locations on a floorplan/network.

#### **Network Analyzer**

The C-Bus Analyzer is a C-Bus device designed to help an installer quickly analyze, detect, and troubleshoot potential problems on a C-Bus network. The device analyzes the network parameters and prompts the user for appropriate actions via its front LED (Light Emitting Diode) indicators.

Table 5.30: **System Units** 

Catalog No.	Catalog Description	\$ Price
SLC5500NB	Network bridge	663.00
SLC5500TPS	120 V Power supply, 350 mA	500.00
SLC5500HPS	277 V Power supply, 350 mA	500.00
SLC5500PC	RS-232 PC Interface	488.00
SLC5500PCU	USB PC Interface	488.00
SLC5500PACA	Pascal Automation Controller	586.00
SLC5500CN	Ethernet Network Interface	664.00
SLC5100TUS	Telephone Interface Unit	898.00
ccessories		<u> </u>
SLC5100BCS	Bar Code Reader	604.00
SLC5100NA	C-Bus Network Analyzer	328.00



8M Enclosure

#### **8M Enclosure**

The 8M enclosure is specifically designed for distributed applications. Suitable for surface mounting, the 8M enclosure consists of a box with a cover and a DIN rail for mounting one 8M or two 4M C-Bus units. The enclosure also has provisions for mounting neutral and ground bars.

- Surface-mount NEMA 1 enclosure
- Welded sheet steel with knockouts
- Gray baked enamel, electrodeposited over cleaned, phosphatized steel
- Triple-lead cover screws for fast installation of cover
- DIN rail, suitable for mounting one 8M or two 4M C-Bus DIN modules



12M Enclosure

#### 12M Enclosure

The 12M enclosure is specifically designed for distributed applications that require physical proximity between DIN units and keypads, sensors or controlled loads. Suitable for surface mounting, the 12M enclosure consists of a box with a cover and a DIN rail for mounting three 4M C-Bus units, one 8M unit plus one 4M unit or one 12M unit. The enclosure also has factory mounted neutral and ground bars.

- Surface-mount NEMA 1 enclosure
- Welded sheet steel with knockouts
- Gray baked enamel, electrodeposited over cleaned, phosphatized steel
- Triple-lead cover screws for fast installation of cover
- DIN rail, suitable for mounting one 12M or three 4M C-Bus DIN modules



24M Enclosure

#### 24M Enclosure

The 24M enclosure is specifically designed for distributed applications that require physical proximity between DIN units and keypads, sensors or controlled loads. Suitable for surface mounting, the 24M enclosure consists of a box with a cover and two rows for mounting C-Bus DIN-mounted C-Bus units. Each row can hold one 12M unit, one 8M unit plus one 4M unit, or three 4M units. The enclosure also has provisions for additional neutral and ground bars.

- Surface-mount NEMA 1 enclosure
- Welded sheet steel with knockouts
- Gray baked enamel, electrodeposited over cleaned, phosphatized steel
- Triple-lead cover screws for fast installation of cover
- DIN rail, suitable for mounting Clipsal DIN-mounted C-Bus units. Each row can hold one 12M unit, one 8M unit plus one 4M unit, or three 4M units



36M Enclosure

#### 36M and 36MS Enclosure

The 36M and 36MS enclosures provide a multi-purpose means for housing various C-Bus DIN-mounted devices. Suitable for flush or surface mounting, the enclosure consists of a mounting pan assembly, and a cover assembly. The box is to be ordered separately, allowing for its installation with the rough-in of field wiring. Enclosures feature:

- NEMA 1 enclosure suitable for flush or surface mounting
- Welded sheet steel with knockouts
- Gray baked enamel paint, electrodeposited over cleaned, phosphatized steel
- Triple-lead cover screws for fast installation of cover
- 3 DIN mounting rails, each accommodating up to one 12M unit, one 8M unit with one 4M unit, or three 4M units
- Complete with barriers for separation of Class 2 circuits from line voltage (36M only)
- The 36MS offers a reduced footprint than the 36M

#### 60M Enclosure

The 60M enclosure provides a means for housing DIN style relays and dimmers. Suitable for flush or surface mounting, the enclosure consists of a mounting pan assembly, and a cover assembly. The box is to be ordered separately, allowing for its installation with the rough-in of field wiring. Enclosures feature:

- NEMA 1 enclosure suitable for flush or surface mounting
- Welded sheet steel with knockouts
- Gray baked enamel paint, electrodeposited over cleaned, phosphatized steel
- Triple-lead cover screws for fast installation of cover
- 5 DIN mounting rails, each accommodating up to one 12M unit, one 8M unit with one 4M unit, or three 4M units
- Complete with barriers for separation of Class 2 circuits from line voltage

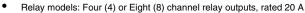
#### Table 5.31: Enclosures and Accessories

Catalog No.	Catalog Description	\$ Price
8M Enclosure		
SLC8M	C-Bus single row enclosure, surface mount	110.00
12M Enclosure		
SLC12MSG	C-Bus single row enclosure, surface mount	120.00
24M Enclosure		
SLC24MSG	C-Bus dual row enclosure, surface mount	240.00
36MS Enclosure		
SLC36SC SLC36MSFG SLC36MSFW SLC36MSSG	C-Bus box for small three row interior C-Bus small three row interior with flush gray cover C-Bus small three row interior with flush white cover C-Bus small three row interior surface mount gray cover	120.00 690.00 690.00 690.00
36M Enclosure		
SLC36C SLC36MFG SLC36MFW SLC36MSG	C-Bus box for three and five row interiors C-Bus three row interior with gray cover, flush mount C-Bus three row interior with white cover, flush mount C-Bus three row interior surface gray	136.00 740.00 740.00 740.00
60M Enclosure		
SLC36C SLC60MFG SLC60MFW SLC60MSG	C-Bus box for three and five row interiors C-Bus five row interior with gray cover, flush mount C-Bus five row interior with white cover, flush mount C-Bus five row interior surface gray	136.00 1233.00 1233.00 1233.00
Accessories		
PK7GTA PKGTAB SLC4CSF8	Ground/Neutral Bar Neutral Insulator Kit Filler Plate, 4M	7.80 29.20 18.00

#### **Area Lighting Panels**

C-Bus Area lighting Panels are ideally suited to meet lighting control energy code requirements in classrooms, offices and other small spaces. Area Lighting Panels are designed to be used with C-Bus input units, including: keypads, sensors (occupancy and light level detection) and touch screens. A simple CAT-5 cable is all that is required for connecting of these devices.

C-Bus Area Lighting Panels provide on/off switching, stepped dimming or continuous dimming. All relays feature rugged 20 A rated contacts for switching electronic ballast loads. Models with continuous dimming capabilities are available with phase angle or 0–10 V control. C-Bus Area Lighting Panels can operate independently or as part of an entire facility wide lighting control system. Enclosures can easily be mounted in electrical closets or in ceiling spaces. They include all necessary connections and are UL<sup>®</sup> Listed. Area Lighting Panels can also be used in conjunction with Powerlink™ panels.



- Phase Angle Dimmer Model: Four (4) channels of 4 A outputs for incandescent lighting loads.
- 0-10 V outputs available for control of compatible 0-10 V dimmable fluorescent ballasts, or LED drivers
- Integral neutral and ground bar terminal strips
- Meets NEC 300.22 requirements to be installed above ceilings and other spaces that handle environmental air
- Bypass mode to facilitate quick start up
- Meets NEC Article 409
- UL Listed 508 A

#### Table 5.32: C-Bus Area Lighting Panels

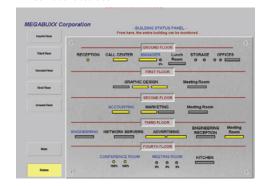
Tubic 0.02.	o buo Area Eighting Funcio	
Catalog No.	Description	\$ Price
4 Channel 20 A Re	lay Models	
SLCZ042000T SLCZ042000H SLCZ042000TP SLCZ042000HP	4 Channel 20 A Relay @ 120 V with power supply▲ 4 Channel 20 A Relay @ 277 V with power supply▲ 4 Channel 20 A Relay @ 120 V without power supply 4 Channel 20 A Relay @ 277 V without power supply	1769.00 1769.00 1675.00 1675.00
8 Channel 20 A Re	lay Models	
SLCZ082000T SLCZ082000H SLCZ082000TP SLCZ082000HP	8 Channel 20 A Relay @ 120 V with power supply▲ 8 Channel 20 A Relay @ 277 V with power supply▲ 8 Channel 20 A Relay @ 120 V without power supply 8 Channel 20 A Relay @ 277 V without power supply	2646.00 2646.00 2462.00 2462.00
4 Channel 20 A Re	lay Models with 0-10 V Output Units	
SLCZ04204AT SLCZ04204AH SLCZ04204ATP SLCZ04204AHP	4 Channel 20 A Relay @ 120 V with power supply and 4 Channel 0–10 V Output Unit▲ 4 Channel 20 A Relay @ 277 V with power supply and 4 Channel 0–10 V Output Unit▲ 4 Channel 20 A Relay @ 120 V without power supply and 4 Channel 0–10 V Output Unit 4 Channel 20 A Relay @ 277 V without power supply and 4 Channel 0–10 V Output Unit	2492.00 2492.00 2308.00 2308.00
4 Channel 20 A Ph	ase Angle Dimmer Models	
SLCZ00004DT SLCZ00004DTP	4 Channel 20 A Phase Angle Dimmer @ 120 V with C-Bus power supply▲ 4 Channel 20 A Phase Angle Dimmer @ 120 V without C-Bus power supply	1144.00 920.00
4 Channel 20 A Re	lay Models with Phase Angle Dimmer Units	
SLCZ04204DT SLCZ04204DTP	4 Channel 20 A Relay @ 120 V with C-Bus power supply and 4 Ch. Phase Angle Dimmer Unit ▲ 4 Channel 20 A Relay @ 120 V without C-Bus power supply and 4 Ch. Phase Angle Dimmer Unit	2630.00 2182.00

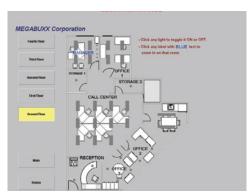
<sup>▲</sup> For stand-alone applications order unit with power supply.



Area Lighting Panel

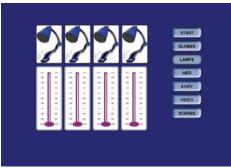






Schedule Plus Software Screen Captures

# SCENES START GLOBES LAMPS RELAYING SCENE MOVIE SCENE 4 KETY VICEO SCENES



HomeGate Software Screen Captures

#### **C-Bus Toolkit Software**

The C-Bus Toolkit Software includes the C-Bus Installation and programming Software, Project Manager, and C-Bus Calculator. The software works under Windows™ 98, ME, 2000 and XP and supports a unique barcode scanning feature. This allows the installer to scan the C-Bus packaging of each new unit to add the unit to the database. The software prints adhesive labels that can be affixed to building plans. These labels include the Unit Address and the physical location that the unit is to be installed. Labels are duplicated so that one label can be affixed to the unit and one to the electrical plan for the installation. The labels have barcodes on them so that units can be easily re-identified if required.

NOTE: C-Bus Toolkit Software is a free download from

http://www.schneider-electric.us/solutions/lighting-and-whole-home-control/

#### Schedule Plus Software V.4

C-Bus Schedule Plus Version 4 includes a number of major features, including enhanced scheduling features, support for monitoring load run times, load power and energy consumed, support for fully customizable multilevel, password protected, access level control, support for sunrise and sunset times, support for daylight saving times, support for 128 bit encrypted secure Internet connectivity allowing control and monitoring via any Web Browser. The software also includes a graphic display as well as a fully featured programmable logic engine. The USB Code Key works under Windows XP Home, XP Professional, Server 2003, Vista Ultimate, Vista Business and Vista Enterprise.

NOTE: An evaluation version of Schedule Plus is available for download by going to http://www.schneider-electric.us/solutions/lighting-and-whole-home-control/ and clicking Software Downloads in the far-left column.

#### HomeGate Software V.4

Residential application PC control of a C-Bus Control System. C-Bus HomeGate Version 4 includes a number of major features, including support for 128 bit encrypted secure Internet connectivity allowing control and monitoring via any Web Browser, irrigation system control feature, enhanced scheduling features, support for sunrise and sunset times, support for daylight saving times. The software also includes a fully featured programmable logic engine. The C-Bus USB Key works under Windows XP Home, XP Professional, Server 2003, Vista Ultimate, Vista Business and Vista Enterprise.

NOTE: An evaluation version of HomeGate is available

for download by going to http://www.schneider-electric.us/solutions/lightingand-whole-home-control/ and clicking Software Downloads in the far-left column.

#### Installer License Key

The C-Bus Software Installer License Key is a valuable tool for installers to create/commission projects using C-Bus Version 4 Schedule Plus & HomeGate software. This code key is time restricted and allows the software to operate in 'normal' mode for anywhere between 48 to 72 hours per use (the software then returns to evaluation/demo mode).

**NOTE:** The installer code key will also be compatible with future software releases.

#### Table 5.33:

Catalog No.	Catalog Description	\$ Price
Schedule PlusV. 4		
SLC5000SDSP24	License Key for 2 Networks	792.00
SLC5000SDSP104	License Key for 10 Networks	1680.00
SLC5000SDSPU4	License Key for Unlimited Networks	2665.00
HomeGate V. 4		
SLC5000SDHG24	License Key for 2 Networks	352.00
SLC5000SDHG104	License Key for 10 Networks	680.00
SLC5000SDSP24	Installer key for Schedule Plus or Homegate (unlimited networks)	389.00

DE-8

**Basic Wall Switch Occupancy Sensors** 

Wall Switch Occupancy Sensors are ideally used in

commercial buildings to save energy that would otherwise

be wasted to light unoccupied rooms or spaces. These Wall Switch Occupancy Sensors employ the latest in

passive infrared (PIR) sensing technology to accurately

sense when a room or space is occupied, then turn lights on. When the room is unoccupied, the sensor turns lights

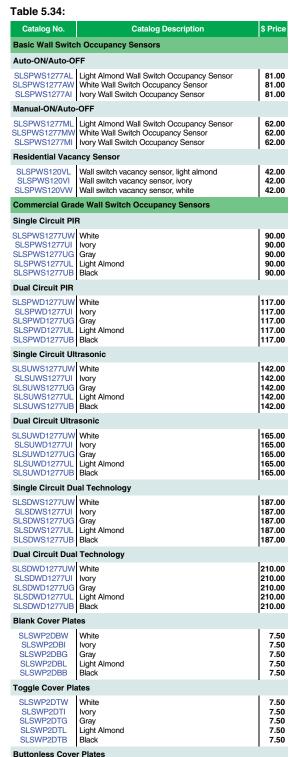
on. When the room is unoccupied, the sensor taris lights off after a time delay of up to 30 minutes as determined by the user. Auto-ON and Manual-ON models available with decorator wall plate in White, Ivory or Light Almond. Simply mount the sensor in place of existing single gang

switch - no neutral connection required. Special multi-

accurately detects major motion in rooms up to 1000 sq. ft.

**Lighting Control** 

- Rated for both 120 V incandescent and fluorescent lighting
- Title 24 2005 Residential Lighting requirements, Sec. 150(k)
- No override on
- Manual-on only (no auto-on mode)
- 30 minute time delay



Buttonless Adjustment Access Covers, White

Buttonless Adjustment Access Covers, Ivory

Buttonless Adjustment Access Covers, Gray

Buttonless Adjustment Access Covers, Black

Buttonless Adjustment Access Covers, Light Almond



- Input: 120/277 Vac 60 Hz
- Output: 1000W Max. Load @ 120 V (1000 VA@120 V 1800 VA@277 V)

segmented lens creates a coverage pattern that

- 1/4 HP Max. Motor Load
- UL and cUL Listed
- For use with electronic and magnetic ballasts
- CEC Title 24 Certified

# **Commercial Grade Wall Switch Occupancy**

Maximum energy savings in a format that will complement any decor. Low profile sensors are available in white, ivory, gray, light almond and black with color-matched segmented lens.

Light Level Sensor Mode: Each sensor includes an adjusatble light level sensor to hold off artificial lighting when adequate natural light is present.

Walk-Through Mode: To maximize energy savings, the sensor detects when areas are briefly occupied as a result of a person walking through and turns off lighting based on a shorter time delay. Walk-Through Mode is available on single and dual circuit units.

Lamp Saver Mode: When the lamp saver feature is enabled, the sensor automatically alternates which load responds to motion. The result is more predictable lamp life and reduced maintenance. (Dual circuit only)

Adaptive Technology: Commercial Grade dual technology and ultrasonic wall switch occupancy sensors feature a patented adaptive technology that significantly reduces the learning period typically associated with adaptive sensors. Adaptive Sensors from Schneider Electric reduce the occurrence of nuisance on and nuisance off while at the same time extending lamp life and reducing maintenance.

- Available in white, ivory, gray, light almond and black with matching cover plate (included)
- Color matching multi-segmented lens
- Audible alert
- Selectable auto-on and manual-on modes
- Red LED motion indicator
- For use with electronic and magnetic ballasts
- 1000 VA@120 V, 1800 VA@277 V
- User adjustable light level, time delay, and sensitivity
- 30 second grace period in the manual-on mode

#### **Residential Wall Switch Vacancy Sensors**

The Residential Vacancy Sensor directly replaces standard light switches in bathrooms, garages, laundry rooms and utility rooms in accordance with Title 24 2005 requirements for residential lighting (Sections 119(d) and 150 (k)) Vacancy Sensors from Schneider Electric operate just like a standard light switch, requiring a button press to turn lights on. Lights may be turned off with a button press or the sensor will turn off lighting automatically when the area is

- No user time delay and sensitivity adjustments necessary
- Available in White, Ivory or Light Almond
- Furnished with cover plate
- Manual On/Manual Off or Automatic Off operation
- No neutral or minimum load required

Commercial Grade

Wall Switch

Blank Cover Plate

with decorator style opening

Toggle Cover Plate

with decorator style opening



SLSBCW

SLSBCI

SLSBCG

SLSBCI

SLSBCB

15.00

15.00

15.00

15.00

15.00

S







**Dual Technology Wall Mount** 



**Dual Technology Ceiling Mount** 



Power Pack

#### **Wall Mount Occupancy Sensors**

Wall Mount Occupancy Sensors from Schneider Electric accurately detect occupancy and automatically switch lighting on and off as needed. These sensors are wall or ceiling mounted for superior motion detection. Sensors employ Passive Infrared (PIR) and Ultrasonic technology. Dual Technology model features combined PIR and Ultrasonic detection for the ultimate performance. The PIR Occupancy Sensor has 3 interchangeable lenses for custom coverage patterns. Wide Angle, Long Range and High Bay. Wall mount sensors also incorporate an integral light level sensor, and features an isolated relay for use with building automation, security and HVAC systems.

- Adjustable Sensitivity
- Adjustable time delay
- UL and cUL Listed
- CEC Title 24 Certified
- FCC Part 15, Class B
- ASHRAE/IES 90.1

#### Table 5.35: **Wall Mount Occupancy Sensors**

Catalog No.	Catalog Description	\$ Price
SLSWPS1500	PIR occupancy sensor	161.00
SLSWUS1500	Ultrasonic occupancy sensor	191.00
SLSWDS1500	Dual Technology occupancy sensor	221.00

#### **Ceiling Mount Occupancy Sensors**

Ceiling Mount Occupancy Sensors are ideal for offices, conference rooms, class rooms and other shared areas to automatically turn lights on and off based on occupancy. Sensors employ Passive Infrared (PIR) and Ultrasonic technology. Dual Technology model features combined PIR and Ultrasonic detection for the ultimate performance. Requires power pack. Set of normally closed and normally opened auxiliary contacts for use with building automation and security systems.

- Input: 24 Vdc
- Output: +24 Vdc
- Adjustable Sensitivity
- Low Profile Housing
- Adjustable Light Level Sensor
- UL and cUL Listed
- CEC Title 24 Certified
- FCC Part 15, Class B
- ASHRAE/IES 90.1

#### Table 5.36: **Ceiling Mount Occupancy Sensors**

Catalog No.	Catalog Description	\$ Price
SLSCPS1000	PIR occupancy sensor	134.00
SLSCUS2000	Ultrasonic occupancy sensor	197.00
SLSCDS2000	Dual Technology occupancy sensor	231.00
SLSCUS800	180 Degree Ultrasonic sensor	129.54
SLSCDS800	180 Degree Dual Technology Sensor (PIR and Ultrasonic Sensors combined)	141.76

#### **Power Pack**

For use with wall and ceiling mount sensors to supply power to sensor and switch the load when the sensor detects occupancy. May supply power to multiple sensors and auxiliary relays up to 100 mA nominal load.

- Input: 120/277 Vac 50/60 Hz
- Output: 24 Vdc/100 mA Nom.
- Relay rating: 20 A Max. Ballast Load at 120 Vac (20 A Max. at 277 V)
- UL cUL Listed

#### In Canada:

- Input: 347 Vac60 Hz
- Output: 24 Vdc/150 mA Nominal
- Relay rating: 15 A Max. Ballast Load at 347 Vac (15 A Max. at 5200 watts)
- UL cUL Listed

#### **Auxiliary Relay**

For use with wall and ceiling mount sensors to turn lights on when an area is occupied or off when it is not. Requires power pack to supply input power to operate relay.

- Input: 24 Vdc/36 mA Nom.
- Relay rating: 20 A Max. Ballast Load at 120 Vac (20 A Max. at 277 V)
- UL cUL Listed

- Input: 24 Vdc/2 mA Nominal
- Relay rating: 15 A Max. Ballast Load at 347 Vac

#### Table 5.37: **Power Pack and Auxiliary Relay**

Catalog No.	Catalog Description	\$ Price
SLSPP1277	120–277 Vac Power Pack	46.50
SLSSP24	120-277 Vac Auxiliary Relay	36.00
SLSPP1347	347 Vac Power Pack	47.50
SLSSP24347	347 Vac Auxiliary Relay	36.00



Indoor Occupancy Sensor

#### Table 5.38: **Table Line Voltage Occupancy Sensors**

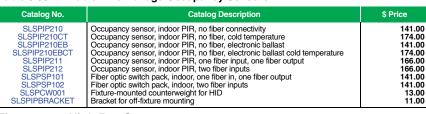
User adjustable sensitivity and delay time settings (0-15 minutes)

**Fixture Mounted Sensors and Controls** 

special tools or installer training.

field

mounting heights up to 45 feet.



Fifteen minute power ON warm-up timer assures rated lamp life even if the fiber network is broken.

Schneider Electric extends its occupancy-sensing capability with a range of line voltage sensors based on passive infrared (PIR) technology. These sensors feature rugged housings that resist moisture and dust typical of manufacturing and shipping dock areas. Sensors incorporate universal power supply, relay and PIR element

Sensors are available either as stand alone sensor-per-fixture devices or equipped with connectors for low-cost

All sensors feature oversized Fresnel lenses and premium, low-noise pyroelectric elements for reliable PIR sensing at

Single-pole/close-on-motion relays sized for switching dry contact, magnetic HID or electronic ballast loads. Mounts directly to reflector with included pinch bracket or to ballast housing with "NPT threaded pipe nipple.

Both area- and aisle-sensing Fresnel lenses ship with each sensor. Color-coded snap-out lenses can be swapped in the

Built-in manual override test switch and diagnostic LED to assist in installation. Diagnostic LED can be seen at distance to

plastic optical fiber cable. Plastic optical fiber connectivity between sensors allows implementation of control zones within aisles and work areas without back-pulling signaling wire in conduit. Each sensor acts as a network repeater, allowing 200 foot spacing between sensors. Plastic fiber can be cut and terminated without

in a single housing ready for direct attachment to popular high-bay and low-bay luminaires.

Switch packs open and close based on fiber optic commands from fiber sensors Universal power supply design adapts to 120-480 Vac, 50/60 Hz without jumpers or taps.

#### Fluorescent High Bay Sensors

The SLSFPS1347 and SLSFPS1480 Occupancy Sensors are Class 1, fixture mounted, 360° high bay occupancy sensors. They are designed to operate directly with T5 and T8 fluorescent fixtures that use single or multiple electronic ballasts. Motion is detected using passive infrared technology (PIR). The operation voltage range for the SLSFPS1347 Sensor is 120–347 V. The SLSFPS1480 Sensor operates at 48∩ V

#### **Features**

- Includes a user-adjustable time dial to set the length of time the luminaires stay on from 15 seconds to 30 minutes.
- Includes a user-adjustable range dial to customize PIR sensitivity.
- Includes a user-adjustable time dial to set the length of time the luminaires stay on from 15 seconds to 30 minutes.
- Includes a user-adjustable range dial to customize PIR sensitivity.
- 90 degree rotating lens for a variety of aisle-way applications.
- High bay area, low bay area, and high bay aisle lenses provided.
- 18 minutes time-out preset for maximum energy to lamp life savings.

#### Table 5.39: Specificiations

Catalog No.	Catalog Description	\$ Price
SLSFPS1347	120–347 Vac High bay Occupancy Sensor	78.00
SLSFPS1480	480 Vac High Bay Occupancy Sensor	89.00

#### **UL 924 Emergency Control Devices**

Schneider Electric UL 924 Emergency Lighting Control Devices provide the ability to use and control standard fixtures for emergency and standard lighting. The use of UL 924 emergency lighting control device, under normal operating power the devices turn on and off emergency lighting along with standard lighting in an area. In the event of normal power loss the UL 924 emergency lighting control devices detect the power loss, and will automatically transfer emergency power to the fixtures. This provides emergency lighting through standard fixtures. Schneider Electric provides a wide selection of UL 924 emergency lighting control devices that work with occupancy and dimming based lighting control.

### **Features**

- Saves energy by controlling Emergency Lighting
- Multiple mounting methods
- Convenient test switch
- Works with occupancy or dimmer controls
- Visible Power LED
- Easy to install

#### Table 5.40: Specificiations

Table 0.40.	Jeoniolations	
Catalog No.	Catalog Description	\$ Price
SLSEDC120	UL 924 Emergency Lighting Dimmer Control 120 Vac	700.00
SLSEDC277	UL 924 Emergency Lighting Dimmer Control 277 Vac	700.00
SLSEPMC120	UL 924 Emergency Lighting Control Relay Panel Mount 120 Vac	300.00
SLSEPMC277	UL 924 Emergency Lighting Control Relay Panel Mount 277 Vac	300.00
SLSERC1277	UL 924 Emergency Lighting Control Relay 120/277 Vac	300.00



Fluorescent High Bay Sensor



5-22



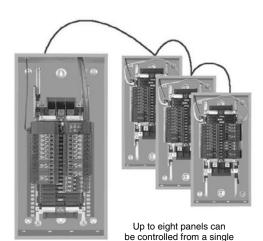
UL 924 Emergency Control Device

Class 1210





Powerlink available in column width design



controller.

Powerlink G3 systems are ideally suited for controlling lighting and other loads in commercial, institutional, and industrial facilities. Such systems are typically used to lower utility cost by switching branch circuits OFF during non-occupied periods when lighting is unnecessary or during peak demand periods when a partial reduction in load can save significant money.

These systems utilize remotely operated circuit breakers to switch branch circuits ON and OFF via a time schedule or by an externally generated signal (typically a low voltage wall switch, photocell, access system, fire alarm or building management system). All Powerlink components mount inside a standard lighting panelboard to provide a compact, space saving installation.

Powerlink G3 systems feature a powerful microprocessor based controller that provides system intelligence for 168 remotely operated branch circuits. Master panelboards contain the control electronics, power supply, and control bus strips for up to 42 branch circuit breakers. Slave panels extend the capability of the system by allowing remotely operated branch circuit breakers to be operated from the master controller via a simple, 4-wire, sub-net connection.

All Powerlink G3 systems have the capability of being networked together and operated from a central workstation or via a remote modem connection. Powerlink software allows users to remotely configure the system, change time schedules, monitor circuit breaker or input status, and override zones and breakers.

#### **BACnet Capability**

The Building Automation and Control network (BACnet) communication protocol is incorporated into the Powerlink™ G3 controller design. The addition of the BACnet protocol allows Powerlink panels to be easily integrated into a Building Automation System (BAS) employing this open communication standard without the need for communication bridges or gateways.

#### **Controller Models**

The following Powerlink G3 controller models support 'native' BACnet communications:

- NF2000G3 Ethernet communications, shared remote inputs, network time synchronization
- NF3000G3 Email upon alarm, onboard web pages for status/control/configuration
- NF3000G3C C-Bus communications (ability to interface with a Clipsal™ lighting control network)

#### **Factory Assembled System**

The following factory engineered pricing procedure may be used to price either 240 V or 480Y/277 V Powerlink G3 systems:

- Select system type and interior size from Table 5.43 on 5-24. All Powerlink G3 panels are furnished with either 1 or 2 control bus strips.
- Select panelboard base price from Table 5.44. All Powerlink G3 panels use NF type panelboard interiors, boxes, and trims and are suitable for either 240 V or 480Y/277 V systems.
- Select branch circuit breaker requirements from Table 5.45. Powerlink G3 panels can accommodate both ECB-G3 remotely operated circuit breakers and EDB, EGB and EJB standard branch circuit breakers
- Refer to panelboard section for additional panelboard accessories.
- For complete price, order by description.
- Apply appropriate discount schedule.

#### 240 V Factory Assembled System Example:

500 level system with 225 A MLO panelboard rated for 208Y/120 V, 3Ø4W, 10kAIR, Type 1, surface mount with ground bar and (12) 20 A 1-pole bolt-on remote operated circuit breakers.

#### Table 5.41:

Item	Page No.	\$ Price
System Type: 500 controller with 12 ckt bus	5-24	5074.00
Panel type: 250 A MLO	5-26	864.00
Branch circuit breakers: (12) 20 A 1-pole	5-26	2628.00
Ground bar	5-26	28.50
Total price		8594.50

#### Table 5.42:

Feature		System Level		
Feature	500	1000	2000	3000
Inputs				•
2 - wire 2 - wire with status feedback 3 - wire	8 8 8	16 8 8	16 8 8	16 8 8
Time Scheduler	<u>'</u>	•		
7 day, each configurable Daily on/off periods Holiday events Automatic daylight savings Sunrise/sunset tracking	_ _ _ _	16 24 32 X X	16 24 32 X X	16 24 32 X X
Networking				
Modbus™ ASCII/RTU Modbus TCP Johnson Controls N2 DMX C-Bus	X	X X▲ X —	X X X	X X — X X■
BACnet MSTP/IP	_	_	X	X

- ▲ Specify N2 suffix
- Specify C suffix

Class 1210





Ampere Rating	One-Pole 27 7 Vac – 14,000 120 Vac – 65,000		Two-Pole 480Y/277 Vac – 14,000 120/240 Vac – 65,000 / 240 Vac – 14,000 AIR Ground	AIR	Three-Pole 480Y/277 Vac – 14,00 240 Vac – 42,000 A	
	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
15 20 30	ECB14015G3 ♦ ECB14020G3 ♦ ECB14030G3	237.00	ECB24015G3 ♦ ECB24020G3 ♦ ECB24030G3	558.00	ECB34015G3 ♦ ECB34020G3 ♦ ECB32030G3★	890.00

Table 5.44: **ECB-G3 Circuit Breakers for Emergency Lighting** (requires 2-pole spaces)

Ampere Rating	One-Pole 480 Y/277 – 14,000 AIR 240 V – 65,000 AIR	
	Catalog No.	\$ Price
20	ECB142020G3EL	558.00

Note: All are listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers. UL listed as HID rated for use with high intensity discharge lighting systems. (1) #12–8 Al or (1) #10–8 Cu. Suitable for use with 75°C conductors.

- UL listed as SWD (switching duty) rated. Rated for 240 Vac only 42,000 AIR

#### Table 5.45: **Control Bus**

\$ Price	Catalog No.	Panel Orientation	Required Interior Size	Max. No. of Control Circuits	
851.00	NF12SBLG3 NF12SBRG3	Left Right	30 30	12 12	•
1065.00	NF18SBLG3 NF18SBRG3	Left Right	42 42	18 18	
1163.00	NF21SBLG3 NF21SBRG3	Left Right	54 54	21 21	

Table 5.46: **Power Supply** 

	Voltage	Primary Source	Catalog No.	\$ Price
	120 V 240 V 277 V	Panel Bus Panel Bus Panel Bus	NF120PSG3 NF240PSG3 NF277PSG3	791.00
•	120 V 240 V 277 V	External External External	NF120PSG3L NF240PSG3L NF277PSG3L	899.00

Table 5.47: Controller

Description	Catalog No.	\$ Price
500	NF500G3	1946.00
1000	NF1000G3	3968.00
1000N2 (N2 protocol)	NF1000G3N2	8288.00
2000	NF2000G3	7107.00
3000	NF3000G3	9741.00
3000C (C-bus	NF3000G3C	9741.00

#### Remote Source Controller (for additional inputs)—

Includes NEMA 1 enclosure, source controller and power supply

Voltage	Catalog No.	\$ Price
120 V	RSC16G3120	3045.00
240 V	RSC16G3240	3045.00
277 V	RSC16G3277	3045.00

#### Cables & Accessories Table 5.49:

Description	Catalog No.	\$ Price
Control bus cables		
Harness standard panel	NF2HG3	89.00
Sub-net accessories & cables		
Slave address selector▼	NFSELG3	173.00
6' sub-net cable	NFSN06	75.00
10' sub-net cable	NFSN10	105.00
25' sub-net cable	NFSN25	234.00
50' sub-net cable	NFSN50	405.00
Serial cables		
Controller front panel cable	NFFPCG3	102.00

One slave address selector required for each slave panel.

#### Table 5.50: Miscellaneous Hardware

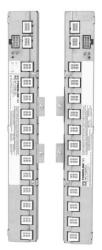
Description	Catalog No.	\$ Price
Circuit Breaker Handle Padlock (Lock On or Off) Fixed Barrier Remote Mounting Adapter	HPAFD △ NFASBKG3 NFADAPTERG3	25.50 177.00 102.00
△ DE2 Discount		

Table 5.51: Software

Table Clott				
Description	Catalog No.	\$ Price		
LCSAdvanced Software	LCSADVANCED	4000.00		
LCSBasic Software	LCSBasic	1500.00		
Powerlink Controller Software□	PCS101	1523.00		



ECB-G3 Circuit Breaker



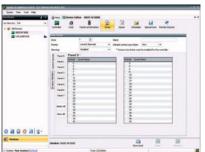
Control Bus



Power Supply



NF3000G3 Controller



Powerlink Software

 $\ensuremath{\mathsf{N2}}$  supported controllers. All other controllers use LCSAdvanced or LCSBasic.





Remote Mount Controller



**Device Power Supply** 



Powerlink Device Router

# Table 5.52: Remote Mount Controller (for externally mounted electronics Includes NEMA 1 enclosure, controller, and power supply

Voltage	Catalog No.	Controller Type	\$ Price
120 V	RMC500G3120	NF500G3	4272.00
240 V	RMC500G3240	NF500G3	4272.00
277 V	RMC500G3277	NF500G3	4272.00
120 V	RMC1000N2G3120	NF1000N2G3	10615.00
240 V	RMC1000N2G3240	NF1000N2G3	10615.00
277 V	RMC1000N2G3277	NF1000N2G3	10615.00
120 V	RMC1000G3120	NF1000G3	6990.00
240 V	RMC1000G3240	NF1000G3	6990.00
277 V	RMC1000G3277	NF1000G3	6990.00
120 V	RMC2000G3120	NF2000G3	9860.00
240 V	RMC2000G3240	NF2000G3	9860.00
277 V	RMC2000G3277	NF2000G3	9860.00
120 V	RMC3000G3120	NF3000G3	12680.00
240 V	RMC3000G3240	NF3000G3	12680.00
277 V	RMC3000G3277	NF3000G3	12680.00
120 V	RMC3000G3C120	NF3000G3C	12680.00
240 V	RMC3000G3C240	NF3000G3C	12680.00
277 V	RMC3000G3C277	NF3000G3C	12680.00

#### **Device Power Supply**

The Powerlink Device Power Supply is used to distribute power on a C-Bus<sup>™</sup> network. Placed at critical points on the network, device power supplies will provide the current necessary for operating a variety of passive C-Bus devices. A Powerlink Device Power Supply consists of an 8M enclosure containing one or two 4M Power Supplies (120 or 277 Vac).

- Surface-mount NEMA 1 enclosure, with cover
- Unit and C-Bus LEDs indicate the status of the line voltage and the network
- Sources up to 700 mA (dual power supplies) to the C-Bus network
- 120 V or 277 Vac models available
- Dimensions: 8.9 in. (226mm) wide x 3.8 in. (97mm) deep x 12.57 (319mm) tall

#### **Device Router**

The Powerlink Device Router allows the exchange of data between a Powerlink NF3000G3C controller and C-Bus devices. This device router receives data from C-Bus input devices such as keypads and touchscreens and sends data to the Powerlink system and isa versa. The device router consists of a C-Bus 8M enclosure containing a C-Bus PC Interface and a C-Bus Power Supply (120 Vac or 277 Vac). Communication between the device router and the NF3000G3C controller is made with the included 50-foot serial cable.

- Surface-mount NEMA 1 enclosure, with cover
- Unit, Unit/Comms, and C-Bus LEDs indicate the status of data transmission and power to the unit and the network
- System network clock for synchronizing communications data
- Network power source, supplying up to 350 mA
- 120 Vac or 277 Vac models available
- Dimensions: 8.9 in. (226mm) wide x 3.8 in. (97mm) deep x 12.57 in. (319mm) tall

#### Table 5.53: Powerlink Device Routers▲

Description	Catalog No.	\$ Price
120 V Device Router	NFDR120G3C■	1632.00
277 V Device Router	NFDR277G3C■	1632.00

- ▲ Required for interface to Clipsal units.
- DE-8 Discount.

Table 5.54: Powerlink Device Power Supplies ♦

Description	Catalog No.	\$ Price
Single Supply 120 V	NFDP1120G3C★	900.00
Dual Supply 120 V	NFDP2120G3C★	1650.00
Single Supply 277 V	NFDP1277G3C★	900.00
Dual Supply 277 V	NFDP2277G3C★	1650.00
Filler Plate	SLC4CSF8	27.00

- ♦ Extends C-Bus power to Clipsal devices.
- ★ DE-8 Discount.

#### **Powerlink Network Accessories**

Table 5.55: Powerlink Network Accessories

Description	Catalog No.	\$ Price
RS232/485 Converter	6382RS485G3KIT	526.50

Table 5.56: Powerlink Remote Modem Support▼

Description	Catalog No.	\$ Price
Modem Kit (for G3 Controllers)	6382G3MODEM	876.00

<sup>▼</sup> Requires 2000 and 3000 controller and either Analog or Ethernet modem connection to each master panel.

G



#### G3 NF Panelboards 240 V and 480 Y/277 V Factory **Assembled Systems**

#### Maximum Voltage 480 Y/277 Vac

Table 5.57: **Powerlink G3 System Price** 

List	30 ckt l	nterior	42 ckt l	nterior	54 ckt Interior		
System Type	12 ckt bus	24 ckt bus	18 ckt bus	36 ckt bus	21 ckt bus	42 ckt bus	
Slave Panel	1650.00	3450.00	2025.00	4200.00	2370.00	4890.00	
NF500G3	6753.00	8553.00	7128.00	9303.00	7473.00	10143.00	
NF1000G3★	10728.00	12528.00	11103.00	13278.00	11448.00	14118.00	
NF2000G3	17298.00	19098.00	17673.00	19848.00	18018.00	20688.00	
NF3000G3	21072.00 22872.0		21447.00	23622.00	21792.00	24462.00	

**NOTE:** Powerlink EM option BCPM list price adder.

Table 5.58: Panelboard Base Price (including solid neutral)

Mains	Marker I			Main Circuit Breaker (Circuit Breaker Interrupting Rating—6-2 through 6-8)▲▼											
Rating	Main I	Lugs		Standard IC			HIC			Extra HIC			I-Limiter™		
	2-pole	3-pole	Circuit Bkr.	2-pole	3-pole	Circuit Bkr.	2-pole	3-pole	Circuit Bkr.	2-pole	3-pole	Circuit Bkr.	2-pole	3-pole	
100 A	_	_	ED■	2454.00	2823.00	EG■	3150.00	3624.00	HJ	4872.00	5397.00	FI	6375.00	7326.00	
125 A	1269.00	1458.00	ED■	5058.00	5643.00	EG■	6486.00	7464.00	_	_	-	_	_		
150 A	_	_	HD	4905.00	5430.00	HG	6072.00	6597.00	HJ	6105.00	6630.00	_	_		
225 A	_	-	JD	6180.00	6570.00	JG	7605.00	8100.00	JJ	9930.00	10995.00	KI	10899.00	12528.00	
250 A	1503.00	1728.00	JD	6750.00	7710.00	JG	8985.00	9270.00	JJ	10785.00	12675.00	KI	13731.00	15783.00	
400 A	1989.00	2286.00	LA	7995.00	9189.00	LH	11568.00	13296.00	LC	12759.00	14664.00	LI	14025.00	16119.00	
600 A♦	3549.00	3933.00	ı	_	_	_	_	_	LC	14331.00	16326.00	LI	20460.00	23517.00	
♦A 008	5325.00	5850.00	_	_	_	_	_	_	_	_	_	_	_		

- HL and JL frame circuit breakers are also available as main circuit breakers Backfed Main Circuit Breaker—54 circuit only.
- Copper Bus Only.
- For N2 protocol, add \$3819.
- Contact your nearest Square D/Schneider Electric sales office for MICROLOGIC™ trip

main circuit breakers

Table 5.59: Branch Circuit Breaker - Price Per Circuit Breaker

Powerlink G3—ECB Bolt-On 65 kA AIR@240 Vac, 14 kA AIR@480 Y/277				Standard Breakers—EDB Bolt-On 18 kA AIR 1-pole, 25 kA AIR 2 & 3-pole @ 240 V, 18 kA AIR@480 Y/277				Standard Breakers HIC—EGB Bolt-On 65 kA AIR@240 Vac, 35 kA AIR@480 Y/277				Standard Breakers Extra HIC—EJB Bolt-On 100 kA AIR@240 Vac, 65 kA AIR@480 Y/277							
Voltage	Ampere Rating	1-pole	2-pole	3-pole	Voltage	Ampere Rating	1-pole	2-pole	3-pole	Voltage	Ampere Rating	1-pole	2-pole	3-pole	Voltage	Ampere Rating	1-pole	2-pole	3-pole
240	15–20	438.	1215.	1929.		15–60	288.	663.	1122.		15–60	486.	1119.	1896.		15–60	777.	1767.	3036.
Vac	30	438.	1215.	1929.	480Y/	70	513.	1308.	1569.	480Y/	70	867.	2211.	2565.	480Y/	70	1386.	3540.	4245.
480Y/277	15–20	438.	1215.	1929.	277	80–100	_	1308.	1569.	277	80-100	_	2211.	2655.	277	80–100	_	3540.	4245.
Vac	30	438.	1215.	-	Vac	110-125	_	3825.	4845.	Vac	110-125	-	6171.	7131.	Vac	110–125	_	7950.	9450.
Space	e Only	63.	126.	189.		Space Only	63.	126.	189.		Space Only	63.	126.	189.		Space Only	63.	126.	189.

Note: All EC, ED, EG and EJ branch circuit breakers are UL Listed as HACR type.

#### **Sub-Feed Circuit Breaker**

- Available on 10 or 30, 125-800 A main lugs or 125-600 A main circuit breaker
- One sub-feed JD, JG, JJ or JL circuit breaker per 250 A panelboard
- LC and JJ may not be combined.

#### Table 5.60: Sub-Feed Circuit Breaker (150-400 A)

No. of Poles	JD	JG	JJ□	JL	LA	LH	LC□	Space
2	2265.00	3165.00	3844.50	4230.00	2985.00	4150.50	6475.50	619.50
3	2527.50	3825.00	4665.00	5296.50	3687.00	4882.50	7617.00	619.50

JJ and LC sub-feed circuit breakers cannot be used together.

#### **Sub-Feed Breaker Cabinet Data** Table 5.61:

	Box Height (20" W x 5.75" D)										
Max. No. of	25	0 A	400 A	LA/LH	600	0 A	800 A				
Branch Spaces (Does not include sub-feed breaker spaces)	Main Lugs	Main Circuit Breaker	Main Lugs	Main Circuit Breaker	Main Lugs⊽	Main Circuit Breaker ☆	Main Lugs <b>≎</b>				
30	56	68	68	80	68	80♦	68				
42	62	74	74	86	74	86◊	74				
54	68	80	80	92	80	92◊	80				

- Dimensions also for 400 A LC/LI main circuit breaker panels
- 600 A main lug panelboards require an 8" deep, 26" wide box. 600 A main lug panelboards require an 8.75" deep box.
- 800 A main lug panelboards require an 8.75" deep, 26" wide box.

To obtain pricing for the following Special Features please refer to the Supplemental Digest.

- PowerLogic<sup>™</sup> metering
- Customer equipment space
- Increased box depth
- Box extensions top, bottom and side
- Drip hoods
- Non-standard paint
- NEMA 1 gasketed
- NEMA 4 Stainless steel enclosure
- NEMA 4X Fiberglass enclosure (NQOD and NF)
- Stainless steel trim front (NQOD, NF and I-LINE)
- Padlockable hasp
- Special locks (Corbin, Yale, Best)
- Equal height boxes
- Common trip to cover two equal height boxes
- Panelboard skirthides conduits feeding a panelboard
- Panelboard wireway for terminating conduit in wireway endwall
- Panelboard interiors and special fronts to fit existing boxes

Class 1210



Powerlink Energy Management (EM) Lighting Control System

#### Powerlink™ Energy Management (EM)

The Powerlink Energy Management (EM) Lighting Control System incorporates the same features found in the The Powerlink Energy Management (EM) Lighting Control System in Composition to state the Powerlink G3 3000 level system, in addition to integral branch circuit accomplished using the Powerl original to accomplished using the Powerl original to accomplished using the Powerl original to accomplished using the Powerl original to accomplished using the Powerl original to accomplished using the Powerl original to the powerl original to the powerl original to the powerl or the powerland to the powerl monitoring and verification of the lighting system. Integral metering is accomplished using the PowerLogic Branch Circuit Power Meter (BCPM), which is a highly accurate, full-featured multi-branch circuit power meter that provides unrivalled low-current monitoring.

The Powerlink G3 system reduces electrical energy consumption associated with lighting and other loads by automatically switching loads off during non-occupied periods. The Powerlink G3 system is often ideal for reducing th epeak demand by switching unnecessary lights off in response to an automated response signal or when high time-of-day energy tariffs occur.

- Integral individual and optional mains metering to provide utmost flexibility in assuring a sustainable metering and
- Monitors current, voltage, energy consumption, demand, and power factor for complete energy profiling
- Accumulated metering information transmitted via Modbus communications interface
- Data updates occurring within seconds to provide timely preventative maintenance information
- Optional EGX web interface for storing and reporting data via standard web browser (suggested for applications without Energy Management System [EMS] software)
- Alarm indication when parameters approach user-configured thresholds
- 16 hard-wired inputs available for connection to devices with physical dry-contacts
- 64 communication inputs available for network connection
- 16 independent time schedules, each can be configured into 24 distinct periods
- 7-day repeating clock with changeable automatic daylight savings time
- Automatic sunrise/sunset tracking with offsets
- 32 special event periods
- 32 remote sources for sharing input status, time schedules, or zone status between controllers
- Full custom logic capabilities, including full Boolean functions and synchronization services
- RS232 and RS485
- Serial communications using Modbus ASCII/RTU, BACnet MS/TP and DMX512 protocols (metering Modbus only)
- Ethernet 10BaseT communications using Modbus TCP and BACnet/IP protocols

#### Table 5.62:

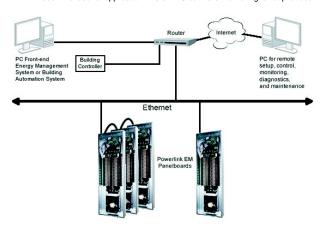
Characteristics	
Operating Temperature	-5° to 40°C (23° to 104°F) (95%RH, non-condensing)
Storage Temperature	-20° to 85°C (-4° to 185°F) (<95%RH, non-condensing)

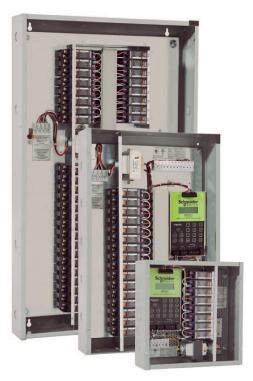
#### Regulatory/Standards Compliance

- UL Listed 916, Energy Management Equip
- FCC Part 15, Class
- NEC Class 1 and Class 2 Control Circuits
- ESD Immunity: IEC 1000, level 4
- RF Susceptibility: IEC 1000, level 3
- Electrical Fast Transient Susceptibility: IEC 1000, level 3
- Electrical Surge Susceptibility: IEC 1000, level 4 (power line)
  Electrical Fast Transient Susceptibility: IEC 1000, level 3 (interconnection lines)

#### BCPM Specifications General Control Power 90-277 Vac Frequency 50/60 Hz Sampling Frequency 2560 Hz Update Rate 1.6 seconds per panelboard Overload Capability 10 kAIC Ribbon Cable Support Up to 20 ft 0° to 60°C (32°C to 122°F) (<95%RH, non-condensing) Operating Temperature Storage Temperature -40° to 70°C (-40° to 158°F) Accurancy **Current Monitoring** 0.25 A to 100A: 3% of reading from 0.25 A to 2 A; 2% of reading from 2 A to 100 A Auxiliary Inputs 2% of reading from 1% to 10% of rated current; 1% of reading from 10% to 100% of rated current (0 to 0.333 Vac) Voltage Input 90-277 Vac; 1% of reading from 90-277 L-N (models BCPMA and BCPMB only) Power 4% of reading from 0.25 A to 2 A; 3% of reading 2 A to 100 A▲ (models BCPMA and BCPM only) Netwo Serial Modbus™ RTU Ethernet TCP/IP

Recommended for application where EMS software monitoring is not provided.





Relay Panels Family

Schneider Electric LPS Lighting Control Relay Panels offer a practical design for meeting energy codes requirements in smaller commercial spaces. Panels are available preassembled with 8, 16, or 32 relays. They consist of relays, time scheduler, panel controller, power supply, and NEMA 1 cabinet and cover.

Schneider Electric LPS Lighting Control Relay Panels offer a practical design for meeting energy codes requirements in smaller commercial spaces. Panels are available preassembled with 8, 16, or 32 relays. They consist of relays, time scheduler, panel controller, power supply, and NEMA 1 cabinet and cover.

#### LPS-Standalone Relay Panel

LPS reduces energy use by automatically shutting off lights in response to a scheduled time event from its built-in time controller or in response to an external control device, such as a keypad switch, occupancy sensor, or photocell. These panels are ideal for use in smaller commercial applications, such as small strip retail and office spaces, where a centralized building management system is not practical.

#### **Features**

- Stand-alone lighting control system meets ASHRAE90.1 and CA Title 24
- Individual heavy duty, mechanically latching, 20A relays
- Built-in time controller supports 8 independent zones
- Time retained during power outages for up to 30 days; nonvolatile program memory
- Two universal switch inputs
- Individual relay overrides can directly control each relay
- Easy to program interface
- 2-wire relay used for monitoring and control
- Manual operation lever with ON/OFF indicator built-in for easy maintenance
- Screw terminals on load and control sides
- UL 916 listed
- Full 365-day, 7-day repeating clock with event priorities
- Multi-group relay assignment
- Inegral power supply (120 / 277 / 347 Vac)
- Standard sizes: (LPS) 8, 16, 32; (LPB/LPL) 8, 16, 32, 48, or 64

#### **LPB Additional Features**

- Application controller with the BACnet protocol
- Heavy duty plug-in relays and electronic cards
- Movable protection plate between high and low voltage sections

#### **LPL Additional Features**

Application controller with the LonWorks protocol

#### Available options include:

Multi-voltage separator (120/277/347 VAC)

# Software provides a graphic interface that is simple and intuitive, providing the following:

• System configuration, programming, and operation: Scheduler and Data logger

#### **LPB-Bacnet Protocol**

The Schneider Electric LPB Lighting Control Relay Panel with Native BACnet Protocol offers cost effective and code compliant lighting control. Panels are pre-packaged for ease of ordering and installation. Standard configurations are available with 8, 16, 32, 48, or 64 relays.

Relays come in a heavy duty, high intensity discharge (HID) version that carries up to 20A full load and are rated for over 120,000 mechanical operations. Heavy duty relays are recommended for high inrush loads or where higher short circuit current ratings are required.

LPBs are designed to operate on a BACnet network where control intelligence is provided through a BACnet building automation system. These panels are ideal for smaller commercial or retail spaces where a low cost way to achieve automatic shut-off is required. These simple to install and commission panels include full feature schedule control. Switch overrides and photocells are easily added for complete control.

#### **LPL-LonWorks Protocol**

The Schneider Electric LPL Lighting Control Relay Panel with LonWorks<sup>®</sup> Protocol offers cost effective and code compliant lighting control. The LPL is pre-packaged for ease of ordering and installation. Standard configurations are available with 8, 16, 32, or 64 relays.

Whether from a stand-alone system, a soft-wired networked panels system, or a fully programmable network system, the LPL offers engineers and facilities managers all the flexibility they need to meet their lighting control requirements. LPL software scheduling and event programming capabilities easily support all common sequences encountered in lighting control.

The LPL was developed using open LonWorks technology from the Echelon® Corporation. By adopting LonTalk® communication protocols and incorporating Neuron® microprocessors, the LPL panel complies with LonMark(tm) Interoperability Guidelines and is ready to interoperate in highly functional, flexible, and open building systems.

The Schneider Electric Lighting Control Relay Switches provide manual ON/OFF operation of lighting in zones. The switches are equipped with a switch based device using reversible polarity pulse technology. The switches are fully compatible with Lighting Control Relay Panels by Schneider Electric.

5

www.schneider-electric.us

#### **Key Switch (SERPKWS)**

- Wall mountable to any standard wall box
- Key operated (ON—turn right; OFF—turn left)
- Operates up to 4 relays per switch
- 6 switches per relay
- 3 Amp, 24 Vdc, Reversible polarity Impulse

#### **Rocker Switch (SERPRWS)**

 Wall mountable to any standard wall box (1-gang requires mounting bracket (SFRPWSMB)

**Relay Panels** 

- LED ON/OFF indication
- Operates up to 8 relays per switch
- 6 LED switches per relay
- Optional filler plate (SERPWSFP)
- 3 Amp, 24 Vdc, Reversible polarity Impulse

#### Push Button Switch (SERPWS) (Individual switch)

- Wall mountable to any standard wall box (1-gang requires mounting bracket SERPWSMB; 3-gang comes ready to mount)
- Switch input from common terminal
- LED ON/OFF indication
- Clear plastic labeling cap
- Operates up to 4 relays per switch
- 6 LED switches per relay
- Optional filler plate (SERPWSFP) may be required
- 1.5 Amp, 24 Vdc, Reversible polarity Impulse

# Push Button Switch (SERPWS) (Assembled switch)

- Factory assembled
- Includes mounting bracket, switch(es), cover plate
- LED ON/OFF indication
- Clear plastic labeling cap
- Operates up to 4 relays per switch
- 6 LED switches per relay

**NOTE:** Refer to 1290HO1101 Relay Switches handout for cover plate dimension



Relay Switches SERPKWS, SERPWS, SERPRWS, SERPWS

#### Table 5.63: Relay Panels, Switches and Plates

Cat. No.	Description	Price
SERP8NHS	SE SERIES RELAY PANEL 8 NON-HID RELAYS	1556.13
SERP16NHS	SE SERIES RELAY PANEL 16 NON-HID RELAYS	3334.58
SERP32NHS	SE SERIES RELAY PANEL 32 NON-HID RELAYS	6545.67
SERP8HS	SE SERIES RELAY PANEL 8 HID RELAYS	2726.58
SERP16HS	SE SERIES RELAY PANEL 16 HID RELAYS	4829.59
SERP32HS	SE SERIES RELAY PANEL 32 HID RELAYS	8385.48
SERPB8HS	SE SERIES BACnet RELAY PANEL 8 HID RELAYS	4559.36
SERPB16HS	SE SERIES BACnet RELAY PANEL 16 HID RELAYS	5322.60
SERPB32HS	SE SERIES BACnet RELAY PANEL 32 HID RELAYS	9521.71
SERPB48HS	SE SERIES BACnet RELAY PANEL 48 HID RELAYS	13078.59
SERPB64HS	SE SERIES BACnet RELAY PANEL 64 HID RELAYS	16684.88
SERPL8HS	SE SERIES LonWorks RELAY PANEL 8 HID RELAYS	3555.23
SERPL16HS	SE SERIES LonWorks RELAY PANEL 16 HID RELAYS	4897.76
SERPL32HS	SE SERIES LonWorks RELAY PANEL 32 HID RELAYS	8785.62
SERPL48HS	SE SERIES LonWorks RELAY PANEL 48 HID RELAYS	11932.49
SERPL64HS	SE SERIES LonWorks RELAY PANEL 64 HID RELAYS	15800.60
SERPFLC16	SE SERIES FLUSH COVER FOR 16 RELAY PANELS	239.00
SERPFLC32	SE SERIES FLUSH COVER FOR 32 RELAY PANELS	325.00
SERPFLC48	SE SERIES FLUSH COVER FOR 48 AND 64 RELAY PANELS	415.00
SERPR1	SE SERIES 1 POLE 20A HID RELAY 120-347 V	255.95
SERPR2	SE SERIES 2 POLE 20A HID RELAY 208-480 V	389.00
SERPTC411	SE SERIES RELAY PANEL TIME CLOCK CONTROLLER MODULE	1037.42
SERPRC401	SE SERIES RELAY PANEL SEQUENCER MODULE	1025.08
SERPBC601	SE SERIES RELAY PANEL BACnet Controller	1051.16
SERPTC811	SE SERIES RELAY PANEL TIME CLOCK CONTROLLER LonWorks MODULE	730.00
SERPLIC	SE SERIES RELAY PANEL INPUT CONTROLLER LonWorks MODULE	645.00
SERPLOC	SE SERIES RELAY PANEL OUTPUT CONTROLLER LonWorks MODULE	957.00
SERPLUSB	SE SERIES FT—10 NETWORK INTERFACE USB	950.00
SERPLS	SE SERIES Lon SOFTWARE	1050.00
SERPPBWS	SE SERIES RELAY PANEL WALL SWITCH WITH BRACKET	85.90
SERPKWS	SE SERIES RELAY PANEL LOW VOLTAGE KEY OPERATED SWITCH	85.57
SERPRWS	SE SERIES RELAY PANEL LOW VOLTAGE ROCKER WALL SWITCH	50.40
SERPWSMB	SE SERIES RELAY PANEL WALL SWITCH MOUNTING BRACKET	9.69
SERPWS1G1B	SE SERIES RELAY PANEL WALL SWITCH 1 GANG 1 BUTTON	95.57
SERPWS1G2B	SE SERIES RELAY PANEL WALL SWITCH 1 GANG 2 BUTTON	149.88
SERPWS1G3B	SE SERIES RELAY PANEL WALL SWITCH 1 GANG 3 BUTTON	194.29
SERPWS2G4B	SE SERIES RELAY PANEL WALL SWITCH 2 GANG 4 BUTTON	259.14
SERPWS2G6B	SE SERIES RELAY PANEL WALL SWITCH 2 GANG 6 BUTTON	367.97
SERPWS3G9B	SE SERIES RELAY PANEL WALL SWITCH 3 GANG 9 BUTTON	531.64
SERPWS3G12B	SE SERIES RELAY PANEL WALL SWITCH 4 GANG 12 BUTTON	695.31
SERPWS5G15B	SE SERIES RELAY PANEL WALL SWITCH 5 GANG 15 BUTTON	859.42
SERPWS6G18B	SE SERIES RELAY PANEL WALL SWITCH 6 GANG 18 BUTTON	1003.53
SERPWSFP	SE SERIES RELAY PANEL WALL SWITCH FILER PLATE	8.07
SERPWP1G1B	SE SERIES RELAY PANEL WALL PLATE 1 GANG 1 BUTTON	30.00
SERPWP1G2B	SE SERIES RELAY PANEL WALL PLATE 1 GANG 2 BUTTON	30.00
SERPWP1G3B	SE SERIES RELAY PANEL WALL PLATE 1 GANG 3 BUTTON	30.00
SERPWP2G4B	SE SERIES RELAY PANEL WALL PLATE 2 GANG 4 BUTTON	45.00
SERPWP2G6B	SE SERIES RELAY PANEL WALL PLATE 2 GANG 6 BUTTON	45.00
SERPWP3G9B	SE SERIES RELAY PANEL WALL PLATE 3 GANG 9 BUTTON	60.00
SERPWP3G12B	SE SERIES RELAY PANEL WALL PLATE 4 GANG 12 BUTTON	70.00
SERPWP5G15B	SE SERIES RELAY PANEL WALL PLATE 5 GANG 15 BUTTON	80.00
SERPWP6G18B	SE SERIES RELAY PANEL WALL GANG 6 GANG 18 BUTTON	90.00
·		



Cassia System Components

The Cassia energy management system (EMS) from Schneider Electric is a revolutionary wireless in-room solution that can have a dramatic impact on all key aspects contributing to your bottom line, from delighting your guests and reducing your carbon footprint, to enjoying a rapid return on investment and helping to maximize energy savings.

#### **Thermostat**

The Cassia thermostat controls heating and cooling equipment in guest rooms. Each thermostat uses two independent Zigbee radios for the local Room Area Network (RAN) within the room and the Hotel Area Network (HAN).

#### **Motion Sensor (PIR)**

The Cassia wireless motion sensor uses a Passive Infrared (PIR) sensor to detect heat patterns in the room. Motion will be signaled to the thermostat if the heat pattern changes.

#### Door Sensor

The Cassia wireless door sensor consists of a base and magnet. It sends a signal to the RAN indicating when the door is opened or closed.

#### **Lighting Control**

The Cassia Lighting Control System, including switches (1000 W), dimmers (800 W), and plug modules (Leading Edge Dimmer and Relay types), uses ZigBee wireless technology that provides dimming and/or on/off functions

Wall switches and dimmers are available in black, white, cream or light almond, with one and three button options.

#### **Plug Modules**

Leading Edge Dimmer and Relay Plug Modules are designed to work as part of a Cassia EMS network installation and can be controlled by other devices on a Cassia EMS network. The modules may be placed into any standard 120 V wall outlet.

Plug modules are available in white.

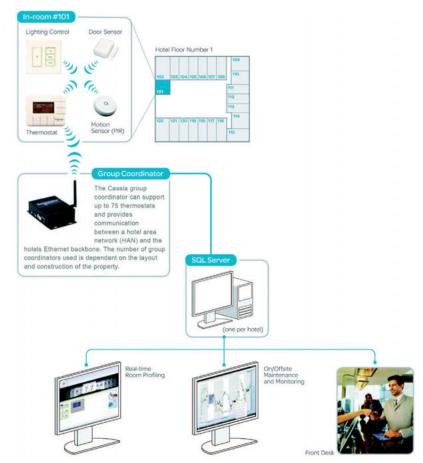
#### **Group Coordinator (GC)**

The Cassia EMS Group Coordinator is a Zigbee<sup>®</sup> wireless gateway that can support up to 75 thermostats and provides communication between a Room Area Network (RAN) Hotel Area Network (HAN) as well as a Property Management System (PMS).

#### Server

The EMS Server receives temperature, door events, motion events, and other data from the rooms. Data flows across the Ethernet network between the Thermostats, Group Coordinators and the EMS server.

Contact your Schneider Electric representative for more information about the Cassia Energy Management System.



6-5



# Section 6

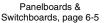
## **Surge Protective Devices**

#### **Commercial Applications**



EMA/EBA SPDs, pages 6-2, 6-3, & 6-4







Retrofit. page 6-5

#### **Residential & Light Commercial Applications**



Nipple Mounted SPDs, pages 6-6, 6-7, and 6-8



Whole House SPDs, page 6-8



QO/HOM SPDs, page 6-8



#### **Externally Mounted Surge Protective Devices**

External Modular SPDs—EMA SPDs	6-2
External Modular L-L Enhanced SPDs	6-3
External Brick Assembly SPDs—EBA SPDs	6-3
Replacement Modules	6-4

#### Internally Mounted Surge Protective Devices—New Construction

Panelboards—Refer to 9-1 Switchboards and Switchgear—Refer to 11-1 Model 6 Motor Control Centers—Refer to 17-1 IPaCS—Refer to 10-1 Busway **12-1** 

### Internally Mounted Surge Protective Devices—Retrofit Internally Mounted SPD-Retrofit

OEM/Assembler Kits	6-6
Nipple-Mounted Surge Protective Devices	
Newl SDSA3650 SPDs	6-6

New!)	SDSA3650 SPDs	6-6
	HWA SPDs	6-7
New!	SDSA1175 SPDs	6-7
	Mounting Brackets and Flush Mount Kits	6-7
New!	XR SPDs	6-8

#### **Residential Surge Protective Devices**

New!	Whole House SPDs	6-8
	Whole House Accessories	6-8
	QO™, NQ, and Homeline™ Loadcenter SPDs	6-8

#### **Externally Mounted Surge Protective Devices**

Surgelogic<sup>TM</sup> offers a full range of externally mounted SPDs. These units are designed to provide surge suppression from service entrance panels to point-of-use equipment.

US and Canadian UL® Listed to UL 1449 3rd Edition and UL 1283 5th Edition. Complies with requirements of NEC® Article 285 and CSA 22.2 No. 8-M1986 as appropriate. Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

- 10 year product warranty
- 10 modes of protection
- 200 kA SCCR

**o** 

SURGE PROTECTIVE DEVICES

- EMI/RFI filtering
- Audible alarm with enable/disable switch, dry contacts, and surge counter standard
- Indicator LEDs; normal (green) and fault condition (red) for each phase
- UL 1449 Type 2 (or Type 1 with optional suffix in catalog number)

#### **External SPD Options:**

- Sine Wave Tracking Module. Sine Wave Tracking (SWT) circuitry provides enhanced EMI/RFI filtering of -54 dB at 100 kHz and establishes the power surge clamping window relative to the sine wave voltage to increase performance at distribution and branch panel applications.
- Type 1. UL 1449 Type 1 SPDs can be located at any point in the electrical system, on the line or load side of the equipment overcurrent device.
- Integral Switch. The integral switch provides a mechanical means to electrically isolate the entire surge suppressor before opening the enclosure door to facilitate servicing of the unit's components.
- Remote Monitor. This option displays the alarm status of the surge protective device up to 1000 feet from the unit.
- Flush Mount Kits. Flush mounting kits can be used on 120-240 kA EMA and EBA series devices. Devices with integral switch require a 20 inch flush mounting collar.

#### External Modular Assembly (EMA) SPDs

EMA SPD products feature a design based on individual phase modules for a flexible, cost effective way to achieve superior surge suppression at every level of the electrical distribution system. Modularity results in lower life cycle costs and fast, easy service or replacement.



External Modular SPD with Integral Switch



External Modular SPD with Sine Wave Tracking Module



External Modular High-Resistance Ground SPD

#### **Table 6.1: EMA SPDs**

	Service Voltage	Peak Surge Current Rating per Phase (kA)	NEMA 3R Cat. No.	\$ Price	NEMA 4X Stainless Steel Cat. No.	\$ Price
•	120/240 V, 1-phase, 3-wire + ground	120 160 240 320 480	TVS1EMA12A() TVS1EMA16A() TVS1EMA24A() TVS1EMA32A() TVS1EMA48A()	4547.00 4997.00 7421.00 9962.00 14798.00	TVS1EMA12S() TVS1EMA16S() TVS1EMA24S() TVS1EMA32S() TVS1EMA48S()	5964.00 6414.00 8838.00 11379.00 16215.00
•	208Y/120 V, 3-phase, 4-wire + ground ▲■ Wye	120 160 240 320 480	TVS2EMA12A() TVS2EMA16A() TVS2EMA24A() TVS2EMA32A() TVS2EMA48A()	4760.00 5231.00 7782.00 10431.00 15522.00	TVS2EMA12S() TVS2EMA16S() TVS2EMA24S() TVS2EMA32S() TVS2EMA48S()	6177.00 6648.00 9200.00 11849.00 16940.00
•	240/120 V, 3-phase, 4-wire + ground High-leg Delta	120 160 240 320 480	TVS3EMA12A() TVS3EMA16A() TVS3EMA24A() TVS3EMA32A() TVS3EMA48A()	4760.00 5231.00 7782.00 10431.00 15522.00	TVS3EMA12S() TVS3EMA16S() TVS3EMA24S()	6177.00 6648.00 9200.00
New!)	240 V, 3-phase, 3-wire + ground Delta	120 160 240 320 480	TVS6EMA12A() TVS6EMA16A() TVS6EMA24A() TVS6EMA32A() TVS6EMA48A()	4760.00 5231.00 7782.00 10431.00 15522.00	TVS6EMA12S() TVS6EMA16S() TVS6EMA24S() TVS6EMA32S() TVS6EMA48S()	6177.00 6648.00 9200.00 11849.00 16940.00
•	480Y/277 V, 3-phase, 4-wire + ground ■ ♦ Wye	120 160 240 320 480	TVS4EMA12A() TVS4EMA16A() TVS4EMA24A() TVS4EMA32A() TVS4EMA48A()	4973.00 5468.00 8147.00 10904.00 16250.00	TVS4EMA12S() TVS4EMA16S() TVS4EMA24S() TVS4EMA32S() TVS4EMA48S()	6390.00 6885.00 9564.00 12321.00 17667.00
New!)	480Y/277 V, 3-phase, 3-wire + ground High-Resistance Ground	120 160 240 320 480	TVS4HEMA12A() TVS4HEMA16A() TVS4HEMA24A() TVS4HEMA32A() TVS4HEMA48A()	4973.00 5468.00 8147.00 10904.00 16250.00	TVS4HEMA12S() TVS4HEMA16S() TVS4HEMA24S() TVS4HEMA32S() TVS4HEMA48S()	6390.00 6885.00 9564.00 12321.00 17667.00
New!)	480 V, 3-phase, 3-wire + ground, Delta	120 160 240 320 480	TVS5EMA12A() TVS5EMA16A() TVS5EMA24A() TVS5EMA32A() TVS5EMA48A()	4973.00 5468.00 8147.00 10904.00 16250.00	TVS5EMA12S() TVS5EMA16S() TVS5EMA24S() TVS5EMA32S() TVS5EMA48S()	6390.00 6885.00 9564.00 12321.00 17667.00
-	600Y/347 V, 3-phase, 4-wire + ground ■ Wye	120 160 240 320 480	TVS8EMA12A() TVS8EMA16A() TVS8EMA24A() TVS8EMA32A() TVS8EMA48A()	5220.00 5714.00 8528.00 11399.00 17012.00	TVS8EMA12S() TVS8EMA16S() TVS8EMA24S() TVS8EMA32S() TVS8EMA48S()	6638.00 7131.00 9945.00 12816.00 18429.00
New!)	600Y/347 V, 3-phase, 3-wire + ground High-Resistance Ground	120 160 180 240 320	TVS8HEMA12A() TVS8HEMA16A() TVS8HEMA18A() TVS8HEMA24A() TVS8HEMA32A()	5220.00 5714.00 8528.00 11399.00 17012.00	TVS8HEMA12S() TVS8HEMA16S() TVS8HEMA18S() TVS8HEMA24S() TVS8HEMA32S()	6638.00 7131.00 9945.00 12816.00 18429.00
New!)	600 V, 3-phase, 3-wire + ground, Delta	120 160 180 240 320	TVS9EMA12A() TVS9EMA16A() TVS9EMA18A() TVS9EMA24A() TVS9EMA32A()	5220.00 5714.00 8528.00 11399.00 17012.00	TVS9EMA12S() TVS9EMA16S() TVS9EMA18S() TVS9EMA24S() TVS9EMA32S()	6638.00 7131.00 9945.00 12816.00 18429.00

- 208Y/120 series also applies to the following voltage 220Y/127.
- Can be used on 4-wire or 3-wire grounded neutral system. 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

New!	External M	odular Options ( )		\$ Price	
	(1)	UL 1449 Type 1		0.00	
	(l) ★	Integral Switch		738.00	
	(SWT)	Sine Wave Tracking Module (not applicable for Delta or HRG)		750.00	
	(I1) ★	UL 1449 Type 1 and Integral Switch		738.00	
	(SWT1) UL 1449 Type 1 and Sine Wave Tracking Module (not applicable for Delta or HRG)				
	(ISWT) ★ Integral Switch and Sine Wave Tracking Module (not applicable for Delta or HRG)				
	(ISWT1) ★	UL 1449 Type 1, Integral Switch and Sine Wave Tracking Module (not applicable for	or Delta or HRG)	1488.00	
	Accessory	Description	Cat. No.	\$ Price	
	Remote Mo	nitor	TVS12RMU	788.00	
	12-inch Flus	sh Mount Kit	TVS12FMK	945.00	
	20-inch Flus	sh Mount Kit	TVS20FMK	1103.00	

Not available in stainless steel for 320 and 480 kA



#### **Surge Protective Devices**



External Modular L-L Enhanced SPD with Sine Wave Tracking Module



External Brick Assembly SPD with Integral Switch

#### **External Modular L-L Enhanced SPDs**

External modular Line-to-Line (L-L) Enhanced SPDs are parallel systems that provide 10 modes of protection and enhanced, discrete L-L suppression paths.

**Table 6.2:** L-L Enhanced SPDs

Service Voltage	Peak Surge Current Rating per Phase (kA)	NEMA 3R Cat. No.	\$ Price	NEMA 4X Stainless Steel Cat. No.	\$ Price
208Y/120 V, 3-phase, 4-wire + ground ▼ Wye	120 180 270 360	TVS2MEMA12A() TVS2MEMA18A() TVS2MEMA27A() TVS2MEMA36A()	8810.00 10790.00 13760.00 16730.00	TVS2MEMA18S() TVS2MEMA27S()	10010.00 12657.00 15627.00 18597.00
480Y/277 V, 3-phase, 4-wire + ground △ Wye	120 180 270 360	TVS4MEMA12A() TVS4MEMA18A() TVS4MEMA27A() TVS4MEMA36A()	9023.00 11003.00 13973.000 16943.00	TVS4MEMA12S() TVS4MEMA18S() TVS4MEMA27S() TVS4MEMA36S()	10890.00 12870.00 15840.00 18810.00

208Y/120 series also applies to the following voltage 220Y/127.
480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

New!) External Modular L-L Enhanced Options ( )	\$ Price
(1) UL 1449 Type 1	0.00
(SWT) Sine Wave Tracking Module	750.00
(SWT1) UL 1449 Type 1 and Sine Wave Tracking Module	750.00
Accessory Description Cat. No.	\$ Price
Remote Monitor TVS12RMU	788.00
20-inch Flush Mount Kit TVS20FMK	1103.00

#### **External Brick Assembly SPDs**

External Brick Assembly (EBA) SPD products consist of a consolidation of phase modules into one solid brick casting and offered at a competitive price for those who want superior surge suppression on a limited budget.

**Table 6.3: EBA SPDs** 

Service Voltage	Peak Surge Current Rating per Phase (kA)	NEMA 3R Cat. No.	\$ Price	NEMA 4X Stainless Steel Cat. No.	\$ Price
120/240 V,1-phase,	120	TVS1EBA12A()	3467.00	TVS1EBA12S()	4884.00
3-wire + ground	160	TVS1EBA16A()	4208.00	TVS1EBA16S()	5625.00
Wye	240	TVS1EBA24A()	6290.00	TVS1EBA24S()	7707.00
208Y/120 V, 3-phase,	120	TVS2EBA12A()	3588.00	TVS2EBA12S()	5006.00
4-wire + ground ▲ ■	160	TVS2EBA16A()	4388.00	TVS2EBA16S()	5805.00
Wye	240	TVS2EBA24A()	6525.00	TVS2EBA24S()	7943.00
240/120 V, 3-phase,	120	TVS3EBA12A()	3588.00	TVS3EBA12S()	5006.00
4-wire + ground	160	TVS3EBA16A()	4388.00	TVS3EBA16S()	5805.00
High-leg Delta	240	TVS3EBA24A()	6525.00	TVS3EBA24S()	7943.00
480Y/277 V, 3-phase,	120	TVS4EBA12A()	3743.00	TVS4EBA12S()	5160.00
4-wire + ground ■ ♦	160	TVS4EBA16A()	4581.00	TVS4EBA16S()	5999.00
Wye	240	TVS4EBA24A()	6827.00	TVS4EBA24S()	8244.00
600Y/347 V, 3-phase,	120	TVS8EBA12A()	3905.00	TVS8EBA12S()	5322.00
4-wire + ground ■	160	TVS8EBA16A()	4787.00	TVS8EBA16S()	6204.00
Wye	240	TVS8EBA24A()	7143.00	TVS8EBA24S()	8561.00

- 208Y/120 series also applies to the following voltage 220Y/127.
- Can be used on 4-wire or 3-wire grounded neutral system. 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

External	Brick Assembly Options ( )		\$ Price		
(1)	UL 1449 Type 1		0.00		
(I)	Integral Switch		738.00		
(SWT)	Sine Wave Tracking Module (not applicable for Delta)		750.00		
(11)	UL 1449 Type 1 and Integral Switch		738.00		
(SWT1) UL 1449 Type 1 and Sine Wave Tracking Module (not applicable for Delta)			750.00		
(ISWT)	Integral Switch and Sine Wave Tracking Module (not applicable for Delta)		1,488.00		
(ISWT1)	UL 1449 Type 1, Integral Switch and Sine Wave Tracking Module (not applicable	e for Delta)	1,488.00		
Accesso	ry Description	Cat. No.	\$ Price		
Remote N	Remote Monitor TVS12RMU				
12-inch F	ush Mount Kit	TVS12FMK	945.00		
20-inch F	ush Mount Kit	TVS20FMK	1103.00		

Refer to Catalog 6671CT9701



#### Replacement Modules \*

All modules and brick assemblies are US and Canadian UL® Recognized to UL 1449 3rd Edition and UL 1283 5th Edition.

Complies with requirements of NEC  $^{\! \otimes}$  Article 285 and CSA C22.2 No. 8-M1986 as appropriate.

For UL 1449 Type 1 Modules, add suffix (1). Example: MA1IMA121







**HRG Replacement** Module



Delta Replacement Module



**EBA Replacement Module** 



MA Replacement Module



L-L Enhanced Replacement Module

#### **EMA Replacement Modules Table 6.4:**

System	Peak Surge		Catalog Numbers				
Voltage	Current Rating (kA)	Phase A	\$ Price	Phase B	\$ Price	Phase C	\$ Price
400/040 \ / 4 =	120	MA1IMA12	906.00	_	_	MA1IMA12	906.0
	160	MA1IMA16	1064.00	_	_	MA1IMA16	1064.0
5-Wile + ground	240	MA1IMA24	1229.00	_	_	MA1IMA24	1229.0
208Y/120 V. 3-phase.	120	MA1IMA12	906.00	MA1IMA12	906.00	MA1IMA12	906.0
4-wire + ground ▲	160	MA1IMA16	1064.00	MA1IMA16	1064.00	MA1IMA16	1064.0
Wye	240	MA1IMA24	1229.00	MA1IMA24	1229.00	MA1IMA24	1229.0
120/240 V. 3-phase.	120	MA1IMA12	906.00	MA3IMA12	906.00	MA1IMA12	906.0
4-wire + ground ■	160	MA1IMA16	1064.00	MA3IMA16	1064.00	MA1IMA16	1064.0
High-Leg Delta	240	MA1IMA24	1229.00	MA3IMA24	1229.00	MA1IMA24	1229.0
240 V. 3-phase.	120	MA6IMA12	906.00	MA6IMA12	906.00	MA6IMA12	906.0
3-wire + ground	160	MA6IMA16	1064.00	MA6IMA16	1064.00	MA6IMA16	1064.0
Delta	240	MA6IMA24	1229.00	MA6IMA24	1229.00	MA6IMA24	1229.0
480Y/277 V. 3-phase.	120	MA4IMA12	906.00	MA4IMA12	906.00	MA4IMA12	906.0
4-wire + ground ♦	160	MA4IMA16	1064.00	MA4IMA16	1064.00	MA4IMA16	1064.0
Wye	240	MA4IMA24	1229.00	MA4IMA24	1229.00	MA4IMA24	1229.0
480Y/277 V 3-phase	120	MA4IMA12H	906.00	MA4IMA12H	906.00	MA4IMA12H	906.0
3-wire + ground ♦	160	MA4IMA16H	1064.00	MA4IMA16H	1064.00	MA4IMA16H	1064.0
High-Resistance Ground	240	MA4IMA24H	1229.00	MA4IMA24H	1229.00	MA4IMA24H	1229.0
480 V 3-phase	120	MA5IMA12	906.00	MA5IMA12	906.00	MA5IMA12	906.0
	160	MA5IMA16	1064.00	MA5IMA16	1064.00	MA5IMA16	1064.0
Delta	240	MA5IMA24	1229.00	MA5IMA24	1229.00	MA5IMA24	1229.0
600Y/347 V 3-phase	120	MA8IMA12	906.00	MA8IMA12	906.00	MA8IMA12	906.0
	160	MA8IMA16	1064.00	MA8IMA16	1064.00	MA8IMA16	1064.0
Wye	240	MA8IMA24	1229.00	MA8IMA24	1229.00	MA8IMA24	1229.0
600V/3/17 V 3-phase	120	MA8IMA12H	906.00	MA8IMA12H	906.00	MA8IMA12H	906.0
							1064.0
High-Resistance Ground	180	MA8IMA18H	1229.00	MA8IMA18H	1229.00	MA8IMA18H	1229.0
600 V 3-nhase	120	MA9IMA12	906.00	MA9IMA12	906.00	MA9IMA12	906.0
	-	MA9IMA16	1064.00	MA9IMA16	1064.00	MA9IMA16	1064.0
Delta	180	MA9IMA18	1229.00	MA9IMA18	1229.00	MA9IMA18	1229.0
	120/240 V, 1-phase, 3-wire + ground  208Y/120 V, 3-phase, 4-wire + ground ▲ Wye  120/240 V, 3-phase, 4-wire + ground ■ High-Leg Delta  240 V, 3-phase, 3-wire + ground ● High-Leg Delta  480Y/277 V, 3-phase, 4-wire + ground ◆ Wye  480Y/277 V, 3-phase, 3-wire + ground ◆ High-Resistance Ground  480 V, 3-phase, 3-wire + ground  600Y/347 V, 3-phase, 4-wire + ground High-Resistance Ground High-Resistance Ground  600 V, 3-phase, 3-wire + ground High-Resistance Ground	120/240 V, 1-phase, 3-wire + ground	120/240 V, 1-phase, 3-wire + ground 160 MA1IMA12  208Y/120 V, 3-phase, 120 MA1IMA12  4-wire + ground 160 MA1IMA12  120/240 V, 3-phase, 160 MA1IMA12  120/240 V, 3-phase, 120 MA1IMA12  120/240 V, 3-phase, 120 MA1IMA12  4-wire + ground 160 MA1IMA12  240 V, 3-phase, 120 MA6IMA12  3-wire + ground 160 MA6IMA12  480Y/277 V, 3-phase, 120 MA6IMA12  480Y/277 V, 3-phase, 120 MA6IMA12  480Y/277 V, 3-phase, 120 MA4IMA12  480 V, 3-phase, 120 MA4IMA12  480 V, 3-phase, 120 MA4IMA16  160 MA4IMA16  160 MA4IMA16  160 MA5IMA16  160 MA5IMA16  160 MA8IMA16  160 MA8IMA18  160 MA8IMA18  170 MA8IMA18  180 MA8IMA18	120/240 V, 1-phase, 3-wire + ground 4 160 MA1IMA12 906.00 MA1IMA12 1229.00 MA1IMA12 4229.00 MA1IMA12 1229.00 MA1IMA12 906.00 MA1IMA14 1229.00 MA1IMA15 1064.00 MA1IMA16 1064.00 MYve 240 MA1IMA12 1229.00 MA1IMA12 MA1IMA16 1064.00 MA1IMA12 MA1IMA16 1064.00 MA1IMA12 MA1IMA14 M	120/240 V, 1-phase, 3-wire + ground 240 MA1IMA12 906.00 — 208Y/120 V, 3-phase, 120 MA1IMA12 906.00 MA1IMA16 1064.00 MA1IMA16 1229.00 MA1IMA16 1229.00 MA1IMA16 1229.00 MA1IMA16 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA12 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA24 1229.00 MA1IMA12 MA1IMA12 MA1IMA24 1229.00 MA1IMA12	120/240 V, 1-phase, 3-wire + ground	120/240 V, 1-phase, 3-wire + ground

- 208Y/120 series also applies to the following voltage 220Y/127.
- High-leg delta (Phase B modules are different than Phase A and Phase C modules). 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

#### **Table 6.5: EBA Replacement Modules**

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers	\$ Price
400/040 \ / 4	120	MA1IBA12	2717.00
120/240 V, 1-phase, 3-wire + ground	160	MA1IBA16	3189.00
3-wile + ground	240	MA1IBA24	3686.00
000)//400 ) / 0	120	MA2IBA12	2717.00
208Y/120 V, 3-phase, 4-wire + ground ▲	160	MA2IBA16	3189.00
4-wire + ground =	240	MA2IBA24	3686.00
240/120 V, 3-phase,	120	MA3IBA12	2717.00
4-wire + ground ■	160	MA3IBA16	3189.00
High-leg Delta	240	MA3IBA24	3686.00
480Y/277 V, 3-phase,	120	MA4IBA12	2717.00
4-wire + ground ♦	160	MA4IBA16	3189.00
Wye	240	MA4IBA24	3686.00
600Y/347 V, 3-phase,	120	MA8IBA12	2717.00
4-wire + ground	160	MA8IBA16	3189.00
Wye	240	MA8IBA24	3686.00

- 208Y/120 series also applies to the following voltage 220Y/127.
- High-leg delta (Phase B modules are different than Phase A and Phase C modules). 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

#### **Table 6.6:** L-L Enhanced MA (L-N, L-G) Replacement Modules

System	Peak Surge	Catalog Numbers						
Voltage	Current Rating (kA)	Phase A	\$ Price	Phase B	\$ Price	Phase C	\$ Price	
	120	MA1IMA12	906.00	MA1IMA12	906.00	MA1IMA12	906.00	
208Y/120 V, 3-phase, 4-wire + ground ▲	180	MA1IMA16	1064.00	MA1IMA16	1064.00	MA1IMA16	1064.00	
4-wire + ground ▲ Wve	270	MA1IMA16	1064.00	MA1IMA16	1064.00	MA1IMA16	1064.00	
,5	360	MA1IMA24	1229.00	MA1IMA24	1229.00	MA1IMA24	1229.00	
	120	MA4IMA12	906.00	MA4IMA12	906.00	MA4IMA12	906.00	
480Y/277 V, 3-phase, 4-wire + ground ■ Wye	180	MA4IMA16	1064.00	MA4IMA16	1064.00	MA4IMA16	1064.00	
	270	MA4IMA16	1064.00	MA4IMA16	1064.00	MA4IMA16	1064.00	
. ryc	360	MA4IMA24	1229.00	MA4IMA24	1229.00	MA4IMA24	1229.00	

- 208Y/120 series also applies to the following voltage 220Y/127. 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

#### **Table 6.7:** L-L Enhanced (L-L) Replacement Modules

System	Peak Surge	Catalog Numbers					
Voltage	Current Rating (kA)	Phase A	\$ Price	Phase B	\$ Price	Phase C	\$ Price
0001//1001/101	120	MA2IMA40LL	604.00	MA2IMA40LL	604.00	MA2IMA40LL	604.00
208Y/120 V, 3-phase, 4-wire + ground ▲	180	MA2IMA60LL	709.00	MA2IMA60LL	709.00	MA2IMA60LL	709.00
Wve	270	MA2IMA90LL	819.00	MA2IMA90LL	819.00	MA2IMA90LL	819.00
,5	360	MA2IMA12LL	946.00	MA2IMA12LL	946.00	MA2IMA12LL	946.00
	120	MA4IMA40LL	604.00	MA4IMA40LL	604.00	MA4IMA40LL	604.00
480Y/277 V, 3-phase, 4-wire + ground ■ Wve	180	MA4IMA60LL	709.00	MA4IMA60LL	709.00	MA4IMA60LL	709.00
	270	MA4IMA90LL	819.00	MA4IMA90LL	819.00	MA4IMA90LL	819.00
	360	MA4IMA12LL	946.00	MA4IMA12LL	946.00	MA4IMA12LL	946.00

- 208Y/120 series also applies to the following voltage 220Y/127. 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.



#### **Surge Protective Devices**

#### Internally Mounted Surge Protective Devices

Internally mounted surge protective devices are installed integrally to systems for service entrance and branch panel surge suppression. Internally mounted SPDs installed next to supply busses provide maximum performance inside Square D<sup>TM</sup> systems. Built-in performance is the best way to ensure cost effective power quality (especially important for critical power facilities).

US and Canadian UL® Recognized as a Type 2 (or 1 with optional suffix in catalog number) SPD Component Assembly to UL 1449 3rd Edition and UL 1283 5th Edition. Complies with requirements of NEC® Article 285 and CSA C22.2 No. 8-M1986 as appropriate. Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

#### Internally Mounted—New Construction

Factory installed integral/internal Surgelogic™ SPD products make adding surge suppression to new construction projects easy. Refer to the sections listed below to identify the correct product for your application or contact Surgelogic™ TAG at 1-800-577-7353 for assistance.

Panelboards Refer to Section 9



Switchboards and Switchgear Refer to Section 11



Motor Control Centers Refer to Section 17

MCC

Integrated Power and Control Centers Refer to Section 10



IPAC2

Busway-Refer to Section 12

#### Internally Mounted—Retrofit

To ensure high-performance surge suppression at critical power locations, a variety of Surgelogic<sup>™</sup> products have been designed specifically for retrofitting into commonly used Square D<sup>™</sup> systems. The QMB fusible switch, 6 in. MCC bucket, I-Line and Busway plug-on units come with the SPD factory-installed. Retrofitting SPD units into I-Line, QMB, MCC, and Busway applications is simple.

- Audible alarm with enable/disable switch, dry contacts, and surge counter standard.
- 200 kA SCCR
- Indicator LEDs
- EMI/RFI filtering

**Table 6.8:** Internally Mounted—Retrofit

PZ4

	Voltage	Surge		-Line Bran	ch Units ▲		QMB Branci	n Units 🗖	Busway	Units	Model 6 MCC	Units ◆
	voitage	Current Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price▼	Cat. No.	\$ Price★
		120 kA	HL1IMA12C()	9518.00	FI1IMA12C()	10185.00	QMB1IMA12	6663.00	_	_	_	_
	120/240 V, 1-phase, 3-wire + ground	160 kA	HL1IMA16C()	10455.00	FI1IMA16C()	11199.00	QMB1IMA16	7340.00	_	_	_	_
	3-wile + glouliu	240 kA	HL1IMA24C()	14100.00	FI1IMA24C()	15525.00	QMB1IMA24	10055.00	_	_	_	_
	208Y/120 V, 3-phase,	120 kA	HL2IMA12C()	9893.00	FI2IMA12C()	10562.00	QMB2IMA12	6899.00	_	_	MCC2IMA12	6700.00
	4-wire + ground △□	160 kA	HL2IMA16C()	10872.00	FI2IMA16C()	11616.00	QMB2IMA16	7602.00	PIU2IMA16	4472.00	MCC2IMA16	8700.00
	Wye	240 kA	HL2IMA24C()	15423.00	FI2IMA24C()	16170.00	QMB2IMA24	10460.00	PIU2IMA24	6407.00	MCC2IMA24	12200.00
	240/120 V, 3-phase,	120 kA	HL3IMA12C()	9893.00	FI3IMA12C()	10562.00	QMB3IMA12	6899.00	_	_	MCC3IMA12	6700.00
	4-wire + ground	160 kA	HL3IMA16C()	10872.00	FI3IMA16C()	11616.00	QMB3IMA16	7602.00	PIU3IMA16	4472.00	MCC3IMA16	8700.00
_	High-leg Delta	240 kA	HL3IMA24C()	15423.00	FI3IMA24C()	16170.00	QMB3IMA24	10460.00	PIU3IMA24	6407.00	MCC3IMA24	12200.00
	240 V, 3-phase,	120 kA	HL6IMA12C()	9893.00	FI6IMA12C()	10562.00	_	-	_	_		_
New!)	3-wire + ground,	160 kA	HL6IMA16C()	10872.00	FI6IMA16C()	11616.00	_	_	_	_	_	_
	Delta	240 kA	HL6IMA24C()	15423.00	FI6IMA24C()	16170.00	_	_	1	_		_
	480Y/277 V, 3-phase,	120 kA	HL4IMA12C()	10271.00	FI4IMA12C()	10944.00	QMB4IMA12	7137.00			MCC4IMA12	7200.00
	4-wire + ground △♦	160 kA	HL4IMA16C()	11292.00	FI4IMA16C()	12039.00	QMB4IMA16	7868.00	PIU4IMA16	4740.00	MCC4IMA16	9200.00
	Wye	240 kA		16070.00	FI4IMA24C()		QMB4IMA24	10868.00	PIU4IMA24	6792.00	MCC4IMA24	13200.00
	480Y/277 V, 3-phase,				FI4HIMA12C()	10944.00	_	_	_	_	_	_
New!)	3-wire + ground ◊		HL4HIMA16C()			12039.00	_	_	_	_	_	_
<u> </u>	High-Resistance Ground	240 kA	HL4HIMA24C()		- ( )	16818.00	_	_	_		_	
	480 V, 3-phase,	120 kA		10271.00	FI5IMA12C()	10944.00	_	_	_	_	_	_
New!)	3-wire + ground,	160 kA	( )	11292.00	FI5IMA16C()	12039.00	_	_	_	_	_	_
	Delta	240 kA	HL5IMA24C()	16070.00	FI5IMA24C()	16818.00	_	_	_	_	_	
	600Y/347 V, 3-phase,	120 kA	_	_	FI8IMA12C()	11342.00	QMB8IMA12	7388.00	_	_	MCC8IMA12	7700.00
	4-wire + ground △	160 kA	_	_	FI8IMA16C()				PIU8IMA16	4919.00	MCC8IMA16	9700.00
	Wye	240 kA	_		FI8IMA24C()		QMB8IMA24	11295.00	PIU8IMA24	7048.00	MCC8IMA24	14200.00
	600Y/347 V, 3-phase,	120 kA	_	_	FI8HIMA12C()	11342.00	_	_	_	_	_	_
New!)	3-wire + ground,	160 kA	_	_	FI8HIMA16C()	12482.00	_	_	_	_	_	_
	High-Resistance Ground	180 kA	_	_	FI8HIMA18C()	16692.00	_	_	_	_	_	
	600V, 3-phase,	120 kA	_	_	FI9IMA12C()	11342.00	_	_	_	_	_	_
New!	3-wire + ground, Delta	160 kA	_	_	FI9IMA16C()	12482.00	_	_	_	_	_	_
	Delta	180 kA			FI9IMA18C()	16692.00		_			—	<u> </u>



QMB Surgelogic™ SPD Unit

I-Line™ Surgelogic™ SPD Unit

Busway Surgelogic™ SPD Unit



MCC Surgelogic™ SPD Unit

- Requires 13.5-inch mounting height
- Requires 9-inch mounting height.
  - Requires 6-inch mounting height
- PE4 Discount Schedule.
- PE7 Discount Schedule Δ
  - Can be used on 4-wire or 3-wire grounded
- 208Y/120 series also applies to the following voltage 220Y/127.
- 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

() For a Type 1 SPD, add a "1" suffix to the catalog number. New!)

**o**n



OEM Kit

#### **OEM/Assembler Kits**

Surgelogic™ OEM/assembler kits allow manufacturers to add industry-leading surge surgelogic: OEM/assembler kits allow manufacturers to add industry-leading surge suppression directly to customized equipment. Manufacturers benefit from shorter wire lengths that optimize the clamping voltage of the SPD. Products come with a backplane-mounted SPD, mounting hardware and diagnostic display with 36-inch cables. Audible alarm, silence switch, remote monitoring contacts, and surge counter are standard. Available as UL 1449 Type 2 (or 1 with optional suffix in catalog number).

US and Canadian UL® Recognized to UL 1449 3rd Edition and UL 1283 5th Edition. Complies with requirements of NEC® Article 285 and CSA 22.2 No. 8-M1986 as appropriate. Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

**Table 6.9: OEM/Assembler Kits** 

Ν

Ν

Ν

Ν

Ν

	Service Voltage	Peak Surge Current Rating per Phase (kA)	Cat. No. ▲	\$ Price
	100/040 \ / 4	120	TVS1IMA12O()	4137.00
	120/240 V, 1-phase, 3-wire + ground	160	TVS1IMA16O()	4547.00
	o who i ground	240	TVS1IMA24O()	6753.00
	208Y/120 V, 3-phase,	120	TVS2IMA12O()	4331.00
	4-wire + ground ■ ♦	160	TVS2IMA16O()	4760.00
	Wye	240	TVS2IMA24O()	7082.00
	240/120 V, 3-phase,	120	TVS3IMA12O()	4331.00
	4-wire + ground	160	TVS3IMA16O()	4760.00
	High-leg Delta	240	TVS3IMA24O()	7082.00
_	240 V, 3-phase,	120	TVS6IMA12O()	4331.00
vew!)	3-wire + ground ■★	160	TVS6IMA16O()	4760.00
	Delta	240	TVS6IMA24O()	7082.00
	480Y/277 V, 3-phase,	120	TVS4IMA12O()	4526.00
	4-wire + ground ■★	160	TVS4IMA16O()	4976.00
	Wye	240	TVS4IMA24O()	7413.00
_	480Y/277 V, 3-phase,	120	TVS4HIMA12O()	4526.00
vew!)	3-wire + ground ■★	160	TVS4HIMA16O()	4976.00
	High-Resistance Ground	240	TVS4HIMA24O()	7413.00
_	480 V, 3-phase,	120	TVS5IMA12O()	4526.00
vew!)	3-wire + ground	160	TVS5IMA16O()	4976.00
	Delta	240	TVS5IMA24O()	7413.00
	600Y/347 V, 3-phase,	120	TVS8IMA12O()	4751.00
	4-wire + ground ■	160	TVS8IMA16O()	5199.00
	Wye	240	TVS8IMA24O()	7760.00
_	600Y/347 V, 3-phase,	120	TVS8HIMA12O()	4751.00
vew!)	3-wire + ground ■	160	TVS8HIMA16O()	5199.00
<u> </u>	High Resistance Ground	180	TVS8HIMA18O()	7760.00
_	600 V, 3-phase,	120	TVS9IMA12O()	4751.00
vew!)	3-wire + ground	160	TVS9IMA16O()	5199.00
	Delta	180	TVS9IMA18O()	7760.00

- For a Type 1 SPD, add a "1" suffix to the catalog number. Note the last character of the catalog number is the letter "O", not a zero.

- Can be used on 4-wire or 3-wire grounded neutral system.
  208Y/120 series also applies to the following voltage 220Y/127.
  480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

#### **Nipple-Mounted Surge Protective Devices**



SDSA3650



SDSA3650D

#### SDSA3650 Surge Protective Devices

SDSA3650 SPDs are designed and listed for indoor or outdoor installation and surge suppression for three-phase grounded electrical services up to 600 Vac, including delta services (SDSA3650D). The SDSA3650 series is used extensively in service entrance panels to provide an efficient and economical means of surge suppression.

US and Canadian UL $^{\circledR}$  Listed as a Type 1 SPD to UL 1449 3rd Edition. Complies with requirements of NEC $^{\circledR}$  Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as appropriate.

- LEDs indicate operational status
- Short circuit current rating 200 kA
- Suitable for indoor and outdoor applications (NEMA Type 4X rated)
- Convenient back-nipple mounting

Table 6.10: SDSA3650 Surge Protective Devices

	Description	Peak Surge Current Rating per Phase (kA)	Cat. No.	\$ Price
	600 Vac Maximum, 3-phase, 4-wire▼	40	SDSA3650 △	248.00
New!	600 Vac Maximum, 3-phase, 3-wire Delta	40	SDSA3650D △	248.00

- Do not use on ungrounded systems. Systems must be solidly grounded. See Table 6.13 for QOSAMK mounting kit for installation in QO™ load centers.







**Surge Protective** 

**Devices** 

**HWA Series** 

#### **HWA Surge Protective Devices**

Surgelogic™ HWA surge protective devices are compact, nipple-mounted parallel-connected surge suppressors that come in a variety of voltage configurations, including Delta. A surge suppression path is provided for each mode, and the product is rated NEMA Type 4X. Internal diagnostics continuously monitor the device status.

US and Canadian UL<sup>®</sup> Listed as a Type 2 SPD to UL 1449 3rd Edition and UL 1283 5th Edition. Complies with requirements of NEC<sup>®</sup> Article 285 and CSA C22.2 No. 8-M1986 as appropriate. Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

- LEDs indicate operational status
- Short circuit current rating 200 kA
- Suitable for indoor and outdoor applications (NEMA Type 4X rated)
- Convenient side-nipple mounting
- Compact design provides easy mounting inside or outside the equipment cabinets
- -54 dB EMI/RFI filtering
- Sine wave tracking
- Audible alarm indicates loss of suppression (does not contain alarm enable/disable switch)
- Optional flush-mount kit TVSHWAFMK

#### Table 6.11: **HWA Surge Protective Devices**

	Service Voltage	Peak Surge Current Rating per Phase (kA)	NEMA 4X Cat. No.	\$ Price
_		50	TVS1HWA50X	2385.00
	120/240 V, 1-phase, 3-wire + ground	80	TVS1HWA80X	2660.00
	5-wife + ground	100	TVS1HWA10X	3401.00
	0001//4001/404	50	TVS2HWA50X	2544.00
	208Y/120 V, 3-phase, 4-wire + ground ▲■	80	TVS2HWA80X	2810.00
		100	TVS2HWA10X	3611.00
	240/120 V, 3-phase,	50	TVS3HWA50X	2544.00
	4-wire + ground	80	TVS3HWA80X	2810.00
	High-leg Delta	100	TVS3HWA10X	3611.00
_	240 V, 3-phase, 3-wire + ground Delta	50	TVS6HWA50X	2583.00
New!)		80	TVS6HWA80X	2924.00
		100	TVS6HWA10X	3606.00
		50	TVS4HWA50X	2640.00
	480Y/277 V, 3-phase, 4-wire + ground ▲ ♦	80	TVS4HWA80X	2907.00
	+-wife + ground = +	100	TVS4HWA10X	3853.00
_	480 V. 3-phase.	50	TVS5HWA50X	3052.00
New!)	3-wire + ground	80	TVS5HWA80X	3393.00
	Delta	100	TVS5HWA10X	4075.00
		50	TVS8HWA50X	2915.00
	600Y/347 V, 3-phase, 4-wire + ground	80	TVS8HWA80X	3171.00
	4-wile + glodila	100	TVS8HWA10X	3853.00
	600 V, 3-phase,	50	TVS9HWA50X	3052.00
New!)	3-wire + ground	80	TVS9HWA80X	3393.00
_	Delta	100	TVS9HWA10X	4075.00

- Can be used on 4-wire or 3-wire grounded neutral system
- 208Y/120 series also applies to the following voltage 220Y/127.
- 480Y/277 series applies to the following voltages 380Y/220, 400Y/230, and 415Y/240.

#### **SDSA1175 Surge Protective Devices**

SDSA1175 SPDs are designed and listed for indoor or outdoor installation and surge suppression for single-phase three-wire 120/240 Vac or two-wire 120 Vac 60 Hz electrical services. This product is ideal for panel builders as well as manufacturers and integrators of instrumentation cabinets for industrial, commercial, and residential applications for singlephase power systems. Two SDSA1175 surge protection devices can be installed to provide suppression for 208Y/120 Vac three-phase four-wire services.

US and Canadian UL® Listed as Type 1 SPD to UL 1449 3rd Edition. Complies with requirements of NEC® Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as appropriate.

- LED indicates operational status
- Short circuit current rating 25 kA
- Suitable for indoor and outdoor applications (NEMA Type 4X rated)
- Convenient back-nipple mounting

#### **SDSA1175 Surge Protective Devices** Table 6.12:

	System Voltage	Peak Surge Current Rating per Phase (kA)	Cat. No.	\$ Price
	120/240 V, 1-phase, 3-wire	36	SDSA1175 ▲	92.00
New!	120 V, 1-phase, 2-wire	36	SDSA1175T ▲	92.00

See Table 6.13 for QOSAMK mounting kit for installation in QO™ load centers.

#### **Mounting Brackets and Flush Mount Kits**

The nipple products shown in this catalog provide a convenient means of incorporating surge suppression within a new or existing cabinet. The mounting bracket and flush-mount kits are designed for easy mounting of nipple products.

**Mounting Bracket for Enclosures** Table 6.13:

	Description	Cat. No.	\$ Price
	Mounting bracket for QO™ and Homeline™ load centers and other enclosures	QOSAMK	11.40
	Flush-mount kit for XR SPDs	TVSXRFMK	58.00
New!	Flush-mount kif for HWA SPDs	TVSHWAFMK	180.00





**QOSAMK** 



# **XR Surge Protective Devices**

The XR SPD provides high-quality surge suppression in a compact and versatile package. This product is ideal for panel builders as well as manufacturers and integrators of instrumentation cabinets for industrial, commercial, and residential applications for singlephase power systems.

US and Canadian UL® Listed as Type 1 SPD to UL 1449 3rd Edition. Complies with requirements of NEC® Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as

- LEDs indicate operational status
- Short circuit current rating 25 kA
- Convenient side nipple mounting
- Suitable for indoor and outdoor applications (NEMA Type 4X rated)
- Optional flush mount kit TVSXRFMK

#### Table 6.14: **XR Nipple-Mounted Surge Protective Devices**

New!	System Voltage	Peak Surge Current Rating per Phase (kA)	Cat. No.	\$ Price
	120/240 V, 1-phase,	50	TVS120XR50S	315.00
	3-wire + ground	80	TVS120XR80S	515.00

#### **Residential Surge Protective Devices**

XR Series





**o**n

SURGE PROTECTIVE DEVICES



HEPD80







HOM2175SB QO2175SB

#### Whole House Surge Protective Devices

Whole House devices are designed to deliver surge suppression that addresses the entire home. AC modules are connected to the circuit breaker load center and provide suppression for all equipment connected to the power system. Whole House systems incorporate AC modules as well as modules for other metallic lines coming into the home including telephone/DSL and coaxial video/data.

US and Canadian UL® Listed as Type 2 SPD to UL 1449 3rd Edition. Complies with requirements of NEC® Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as appropriate. Telephone and coaxial video modules US and Canadian UL® Recognized to UL 497A 4th Edition and UL 497B 4th Edition.

- 120/240 Vac, 80 kA/phase AC surge suppression
- LED status indicators for AC surge suppression
- Telephone surge suppression module supports four lines with tool-less Insulation Displacement Connectors (IDC)
- Coaxial surge suppression module supports one line of video/data

#### Table 6.15: Whole House Surge Protective Devices

lew!)	Description	Included Modules	Cat. No.	\$ Price
	Whole House NEMA 1 Basic	AC	SDSB1175CB	439.00
	Whole House NEMA 1	AC, Telephone, Coax (1)	SDSB1175C	630.00
	Whole House NEMA 3R Basic	AC	SDSB1175RB	546.00
	Whole House NEMA 3R	AC, Telephone, Coax (1)	SDSB1175R	737.00
	Home Electronics Protective Device	AC	HEPD80	185.00

#### **Whole House Accessories**

Add additional surge suppression or replace existing modules in Whole House products.

Coaxial and telephone modules: US and Canadian UL® Recognized to UL 497A 4th Edition and UL 497B 4th Edition.

**AC Module:** US and Canadian UL $^{\odot}$  Listed as Type 1 SPD to UL 1449 3rd Edition. Complies with requirements of NEC $^{\odot}$  Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as appropriate.

Table 6.16: **Accessories** 

_			
lew!	Description	Cat. No.	\$ Price
	4-Line telephone surge suppressor with tool-less IDC terminations	SDSA4P	101.00
	Coaxial video surge suppressor	SDSA2V	90.00
	Whole House AC Module (HEPD80) replacement kit	HEPD80RK	204.00

#### QO™, NQ, and Homeline™ Load Center Surge Protective Devices

Square D™ load center surge protective devices are easy to install plug-in units that install as quickly as a standard circuit breaker. The surge suppressors use two pole spaces in a QO™ or Homeline™ load center, or NQ panelboard.

US and Canadian UL $^{\odot}$  Listed as Type 2 SPD to UL 1449 3rd Edition. Complies with requirements of NEC $^{\odot}$  Article 285, CSA 233.1-87, and CSA C22.2 No. 8-M1986 as appropriate.

- QO2175SB for QO™ load centers, combination devices, and NQ panelboards
- HOM2175SB for Homeline™ load centers and combination devices
- Plug-on design requires two pole spaces

© 2012 Schneider Electric

All Rights Reserved

- LED indicates operational status
- 22.5 kA per phase

#### Table 6.17: QO™, NQ, and Homeline™ Panelboard Surge Arresters

Description	Cat. No.	\$ Price
QO™ Surgebreaker for QO and NQ	QO2175SB	159.00
Homeline™ Surgebreaker	HOM2175SB	159.00

7-2

7-50

7-51

7-54

7-56

7-59



# y Goodien Ele





H-Frame

J-Frame



L-Frame



M-Frame



P-Frame



R-Frame

	QO™ and QOU Miniature Circuit Breakers	7-10
	QO™ Miniature Circuit Breakers	7-10
	QO™ Circuit Breaker Accessories	7-12
	QO™ and Multi 9™ Mounting Bases	7-13
	QOU Miniature Circuit Breakers and QYU Supplementary Protectors	7-14
	QOU Accessories	7-15
	Multi 9™ Miniature Circuit Breakers	7-16
	PowerPact™ Molded Case Circuit Breakers	7-21
	PowerPact Family	7-21
ew!)	H- and J-Frame Circuit Breakers	7-22
	Q-Frame Circuit Breakers	7-24
ew!)	L-Frame Circuit Breakers	7-25
	M-Frame Circuit Breakers	7-26
	P-Frame Circuit Breakers	7-27
	R-Frame Circuit Breakers	7-28
	Motor Circuit Protectors	7-29
ew!)	PowerPact™ H- and J-Frame Electronic Motor Circuit Protectors	7-29
	H-Frame and J-Frame MCP Selector	7-30
ew!)	Motor Circuit Protectors and Motor Protector Circuit Breakers	7-31
	H-, J-, and LA-Frame MCP Selection	7-32
	Motor Protection Selection Tables	7-33
	Automatic Switches	7-34
	500 Vdc Circuit Breakers	7-35
	Mission Critical Circuit Breakers	7-37
	PowerPact™ Circuit Breaker Accessories	7-39
	Micrologic™ Electronic Trip Units	7-46

Masterpact™ Universal Power Circuit Breakers

**Ground-Fault Protection** 

**Circuit Breaker Enclosures** 

**Dimensions and Shipping Weights** 

New! Photovoltaic Circuit Breakers and Switches

**Miniature and Molded Case Circuit Breakers** 

**Selection Information** 





Pages 7-10, 7-11

				ном	Circui	it Brea	akers	5												C	МТОЙ	Circuit I	Breakers									
										5 Ril 21 D													- 304 E.S.									
<u> </u>	Plug-on	HOM HO			HOM- DF	HOM GFI	1- HC	OM- PD	НОМТ		QO		QO-H	C	O-V	Ή			QH		QOT	QO- CAFI	QO- VHCAFI	QO- DF	QOVH- DF	QO-GF		iFI QO- VHGF		QO-EP		)
Circuit Breaker Type	Bolt-on				_	_  _ -				QOB			QOB- H		-[-[-		QOB-VH		Qł	QHB		QOB- CAFI	QOB- VHCAFI	QOB- DF	QOB- VHDF	Q	DB-G	· E I	QOB- VHGFI	QC	B-EP	D
.,,,,	Unit Mount						1				_		_									_	_	_	_		<u> </u>		_	_	_	_
Number of Po		1	2	1	1	1 2	2 1	2	1	1	2	3	2	1	2	3	1	2, 3 ▲	1,2	3	1	1	1	1	1	1	2	3	1	1	2	3
						++	+	H			_						H		1									-			-+	
Current Range	e	15–50	15–200♦	15–20	15–20	15-20		15–50	15-50	10–70	10–200♦	10–100	15–100	15–70	15–125	15–100	15–70	15–150	15–30	15–30	15–30	15–20	15–20	15–20	15–20	15–30	15–60	15–50	15-30	15–30	15–60	15–50
Interrupting R	atings																															
	120 Vac	10	10	10	10	10 1	0 10	10	10	10	10	10	10	22		22	22	22	65	65	10	10	22	10	22	10	10	-	22	10	10	=
UL/CSA	120/240 Vac	10	10	_	l	<u> </u>	0 —	10	10	10	10	10	10	22	22	22	22	22	65	65	10		_	_		l	10	-	_	_	10	_
Rating	208Y/120	_	_	_	_				_	_	_	_	_	—	_	_	_	_	_	—	_	_	_	_	_	_	—	10	_	_	_	
(kA) (50/60 Hz)	240 Vac ★	_	_		_		╘		_	_	_	10	10	_	_	22		22▼	<u> </u>	65	_		_		_	_		-		_	_	10
,	277 Vac	_	_		_		上					_	=	_	_	_		_	_	_	_		_					_		_	_	_
	480Y/277 Vac 48 Vdc		_		=	=	╄	H			_ 5 △	_ 5 ∆	_	_	-	_	H	_	1		_		_	Η=		_	=	_		_	_	=
	60 Vdc				=						5 4		=	Ε				_	E	$\equiv$	_	_	_	Η=		=		=			=	_
DC Ratings	65 Vdc				=				_		$\equiv$		=					_			_		_	H		$\equiv$					=	=
2011411190	125 Vdc				_	tt	+		_	_			_	_				_			_	_	_	_	_	_		_	_		_	_
	250 Vdc	_	_	_	_	<b>T-</b>  -	= -		_	_	_	_	_	_	_	_		_	<u> </u>	_	_	_	_	_	_	_	_	_	_	_	_	_
IEC 60947-2	IEC	_	_	_	_		==		_	_	_	_	_	_	_	_		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
(50/60 Hz)□	(lcu)	_		_	_		- -	-	_	<u> </u>	_	_	_	_	<u> </u>	<u> </u>	-	_	<u> </u> —	_	_		_		_	_		-	_		-	_
Special Rating	js –																															
ccc		_	_	_	_		#			_	_	_	_	_	_	_	-	_	_		_		_	_	_	_		_		_	-	_
Fed. Specs W-C-375B/GEN	I	Х	Х	Х	Х	XX	( X	Х	Х	Х	_	_	_	Х	_	_	—	_	Х	_	Х	Х	_	Х	Х	Х	_		_	Х	_	
Other Standard			HACR ♦ NOM HACR ♦							HACR☆ NOM HACR ⊀						R☆	r  - -			_	HACR ☆	_	HACR ☆	R HACR ∧		NOM		_	NOM			
Accessories a	ınd Modificati	ons																														
Shunt Trip ▽		Ŀ		_			Ŀ		_	Х	Х	Χ	Χ	Х	Х	Х	Х	Χ÷	Х	Χ	Χ	_	_	_		L		_	_		-	Ξ
Undervoltage Ti				_					_	_			_	_	_	_	-	=	<u> </u>			_	_	_	_	_		_	_			
Auxiliary Switches ▽				_	_	上上	- -	닏	_	Х	Х	Х	Х	Х	Х	Х	Х	X°	Х	Х	Х	_	X	_	_	Х		Х	X	Х	Х	Х
Alarm Switch ▽		_			_	##	ᆂ	븨		Х	Х	Х	Х	Χ	Х	Х	Х	Χ°	Х	Х	Χ		Х		_	Х	Х	Х	Х	Χ	Χ	Χ
Handle Operators Handle Padlock		$\vdash$			_	H	丰	티		ᆮ		_	_	ᆮ		$\vdash$	듸	_	上		_	_	_	_		$\vdash$	니	_		$\vdash$	_	_
Attachment		Х	Х	Х	Х				X *	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Trip System Type																																
Thermal-magnetic		Χ	Χ	Χ	Х	XX	( X	Х	Χ	Х	Χ	Х	Х	Х	Χ	Х	Х	Χ	Χ	Χ	Χ	Х	Х	Х	Х	Х	Χ	Χ	Х	Х	Х	Χ
Molded Case Switch		_		_	l —	1-1-	- -		_	Х	Х	Х	_	_		<u> </u>			1-		_	l –	l – _	L —_	l —_	_		-	_		-1	_
Dimensions (1	IP Unit Mount	(1)																														
Dimensions	Height	3.13 (79)												3.5	(89)	•						4.75	(121)	4.75 (121)	4.75 (121)			4	4.12 (10	03)		
(1P Unit Mount) in. (mm)	Width	1.00 (25)																			0.7	'5 (19) <b>▲</b>		_ ( /	/							—
111. (111111)	Depth															2.9	2 (74) 🔺															

- Pages Page 1-13 See page 7-54 for dimensions for: QOB2150VH, QOB3110VH, QOB3125VH and QOB3150VH.
  - HOMT tandem is 30 A maximum. HOMT quad tandem has 20 A maximum on outside poles, and 50 A maximum on the inside poles. AFI, EPD and GFI products are rated 60 Hz only. See the Supplemental Digest Page 3-22 for 3Ø corner grounded systems.
- 22 kA @ 240 Vac for 3P only.

  1P and 2P, 10–70 A and 3P 10–60 A only.

  See the Supplemental Digest Section 10 for circuit breakers with IEC ratings.
- HACR on HOM 1P 15–50 A and 2P 15–100 A HACR on QO, QOB 1P 10–70 A, 2P 15–100 A, 3P 10–100 A; QOB-VH 1P 15–70 A, 2P 15–125 A, 3P 15–100 A
- Factory-installed option only
- Factory-installed accessories are not available on QOB-VH 2P150 A and 3P 110–150 A Handle padlock attachment available for HOMT quad tandem only. 2P 150–200 A requires 4P width.

by Schneider Electric

**Selection Information** 

Class 500, 600

www.schneide	r-electric.us																				
			Q Circuit	OU Breake	rs	QOM1 and Circuit I	QOM2 Main Breakers			Multi Su	9™ Cir opleme	cuit Brentary P	eakers a rotecto	and rs			ED	B Circu	it Break	ers	
			3						7	The state of the s				1	- Janes - Jane			1			
	Plug-on		_		_	_	_					_				-	_	-	_	-	
Circuit Breaker	Bolt-on		_		_	QOM1-VH	QOM2-VH		_			_				El	DB	E	ЗB	E	JB
Туре	Unit Mount		QOU		QYU▲	_	_		UL 489 C60			UL1077 C60■		C60	H-DC	-	_	-	_	-	
Number of Po	oles	1	2	3	1	2	2	1	2	3	1	2	3,4	1	2	1	2, 3	1	2, 3	1	2, 3
Current Rang	ge	10–100	10–125	10-100	10-30	50–125	100–225	0.5–35	0.5–35	0.5–35	0.5–63	1–63	1–63	0.5-40	0.5-40	15–70	15–125	15–70	15–125	15–70	15–125
Interrupting I	Ratings									,	,										
	120 Vac	10	10	10		22	22	10	_	_	10	10	10	_	_	25	25	65	65	100	100
UL/CSA Rating	120/240 Vac	10	10	10	_	22	22	5	10	10	10	10	10	_	_	18	25	35	65	65	100
(kA RMS)	240 Vac ♦ 277 Vac	=	_	10	5	_	_	5	10	10	10 5	10 5	10 5			18 18	25 18	35 35	65 35	65 65	100 65
(50/60 Hz)	480Y/277 Vac			=	<u> </u>			10	10	10	_	5	5	<del></del>		10 —	18	- 33	35	- 03	65
	48 Vdc	5★	5★	5★	_	_	_		_	_	10	10	_	5	5	_	_	_	_	_	
	60 Vdc	5▼	5▼	5▼	_	_	_	10	10	_	_	_	_	5	5		_	_	_		
DC Ratings	65 Vdc	_	_	_		_	_	_	_	_	10	10	_	5	5	_	_	_	_	_	
	125 Vdc		_		_		_	_	10		_	10	_	5	5	_	_	_	_		
	250 Vdc 500 Vdc	_	_	_	_		_		_			=	_	5	5 5€		_	_		=	
IEC 60947-2	240 Vac					_		20	20	20	10	10	10	20	10	20					
(50/60 Hz) Icu	415 Vac	_	_	_	_	_	_	_	10	10	_	5	5	_	_	10	_	_	_	_	_
Special Ratin	ngs														ı						
CCC		Х*	X*	X*	I —	_	_	_	-	l —	l —	l —	I —	I –	I —	I —	I —	I –	-	_	_
Fed. Specs W-C-375B/GE	:NI	Х	Х	Х	Х	Х	Х	Х	Х	Х	_	_	_	_	_	Х	Х	Х	Х	Х	Х
Other Standar			HACR 4	2	_	_	_		_	_		_	_	_	_			HA	CR		
	and Modificat									I.	I.				l				-		
Shunt Trip		Χ¢	Χ¢	Χ¢	X◊	_	X ◊	Х	Х	Х	Х	Х	Х	Х	Х	Х◊	Х◊	Х◊	Х◊	Х◊	X ◊
Undervoltage		-	_		_	_	_	Χ	Χ	Χ	Χ	Χ	Χ	Х	Х	_	_	_	_		
Auxiliary Switch	hes	Χ¢	Χ¢	Χ¢	X◊	_	_	Х	Х	Х	Х	Х	Х	X	Х	Χ¢	Χ¢	Χ¢	Χ¢	Χ¢	X♦
Alarm Switch Handle Operat	tore	X◊	X◊	X◊	X◊		_	X	X	X	X	X	X	X	X	X◊	X◊	Χ¢	Χ¢	X◊	X >
Handle Operat																					
Attachment		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Trip System	••																				
Thermal-magn		Х	X	X	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Molded Case S	Switch (1P Unit Moun	+)	Х	Х																	_
	Height	·, I	4.05	(103)		5 09 (129)+	5.60 (142)☆	Λ	21 (107	) \( \tau \)		3.19 (81	)	3 10	(81)			5.66	(144)		
Dimensions (1P Unit Mount				5 (19)			5.00 (142)☆ 5.07 (129)☆		0.71 (18			0.71 (18			1.42 (36)				(25)		
in. (mm)	Depth		2.92	2 (74)		3.47 (88)☆	` '		2.76 (70	)		2.76 (70	))	2.56	(65)			4.05	<u> </u>		
Pages	2.1			s 7-14			es 1-2			P	ages 7-	16 throu	gh 7-19		-			Page	9-17		
Note: All circu	uit hraakare on	thic che	art ara l	II Liete	on and C	SA Cartifiad	unlace othan	vica not	ho:												

2.92 (74) Pages 7-14 Pages Pages 7-14 Pages 1-2

Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

- •
- All circuit breakers on this chart are UL Listed and USA Certified unless otherwise noted.

  QYU is a UL 1077 supplementary protector.

  C60 are recognized components per UL 1077.

  For information regarding 3Ø corner grounded systems see the Supplemental Digest. Page 3-22
  1P and 2P, 10–70 A and 3P 10–60 A only.

  QUI is UL Listed for 60 Vdc per pole 80–100 A, 1P; 80–125 A, 2P; and 70–100 A, 3P.

  HACR on QOU 1P and 3P 15–100 A, 2P 15–125 A;

  UL 489A for DC Telecom applications (1-pole only).

  Factory-installed option only

  QOM1 and QOM2 dimensions are for 2-pole unit.

  480 V C60 height is 5.56 in. (141 mm).

- 480 V C60 height is 5.56 in. (141 mm). 2 poles must be wired in series for 500 Vdc. 15–70 A 1P and 2P, 15–60 A 3P







Circuit Breaker T	Гуре	HD	HG	HJ	HL	HR	JD	JG	JJ	JL	JR		
Number of Poles	3	2, 3	2, 3	2, 3▲	2, 3▲	3	2, 3▲	2, 3▲	2, 3▲	2, 3▲	3		
Current Range		15–150 A	15–150 A	15–150 A	15–150 A	15–150 A	70–250 A■	70–250 A■	70–250 A■	70–250 A■	70–250 A■		
Interrupting Rati	ngs												
	240 Vac	25	65	100	125	200	25	65	100	125	200		
UL/CSA/NOM	480Y/277 Vac	18	35	65	100	200	18	35	65	100	200		
Rating (kA RMS)	480 Vac	18	35	65	100	200	18	35	65	100	200		
(50/60 Hz)	600Y/347 Vac	14	18	25	50	100	14	18	25	50	100		
	600 Vac	14	18	25	50	100	14	18	25	50	100		
DC Ratings	250 Vdc◆	20	20	20	20		20	20	20	20			
	500 Vdc◆		_	_	_	_	_	20	_	_			
IEC Rating (kA RMS)	240 Vac	25/25	65/65	100/100	125/125	125/125	25/25	65/65	100/100	125/125	125/125		
lcu/lcs★	415 Vac	18/18	35/35	65/65	100/100	100/100	18/18	35/35	65/65	100/100	100/100		
IEC 50/60 Hz													
<b>Special Ratings</b>													
CCC		X	X	X	X	X	X	X	X	X	Х		
Fed. Specs W-	-C-375B/GEN	X	X	X	X	X	Х	X	Х	Х	Х		
HACR (2P, 3P)	)	Х	X	X	X	X	X	X	X	X	Х		
Connections/Ter	minations												
Unit Mount		X	X	X	X	X	Х	X	Х	X	Х		
I-Line™		X	X	X	X	X	X	X	X	X	Х		
Rear Connecti	on	X▼	X▼	X	X	X	X	X	X	X	Х		
Drawout		X▼	X▼	X	X	X	X	X	X	X	X		
Optional Lugs		X▼	X▼	X	X	X	X	X	X	X	Х		
Accessories and	I Modifications												
Shunt Trip		X	X	X	X	X	Х	X	Х	X	Х		
Undervoltage 7	Trip	X	X	X	X	X	X	X	X	X	X		
Auxiliary Switch	hes	X	X	X	X	X	X	X	X	X	Х		
Alarm Switch		X	X	X	X	X	Х	X	X	X	Х		
Motor Operato	r	X▼	X▼	X	X	X	X	X	X	X	X		
Handle Operat	ors	X▼	X▼	X	X	X	X	X	X	X	Х		
Mechanical Int	erlocks (3P)	X	X	X	X	X	Х	X	X	X	Х		
Handle Padloc	k Attachment	X▼	X▼	X	X	X	X	X	X	X	X		
Cylinder Lock (	(3P)		_	_	_	1	_	1	_	_	_		
Optional GF P	rotection		_	_	_	_	_	_	_	_	_		
<b>Trip System Typ</b>	е												
Thermal-magn	etic	X	X	X	X	_	X	X	X	X	Х		
Instantaneous	only (MCP)		_	XΔ	XΔ	XΔ	_	XΔ	XΔ	X	Х		
Molded Case S	Switch (Automatic)	X	X	X	X	X	X	X	X	X	X		
Electronic		XΔ	XΔ	XΔ	XΔ	XΔ	XΔ	XΔ	XΔ	XΔ	XΔ		
<b>Enclosures (Pag</b>	es 7-56-7-58)												
General Purpo	se (NEMA 1)	X	X	X	X		X	X	X	_			
Raintight (NEM	//A 3R)	X	X	X	X	_	Х	X	Х	_	_		
Dust-tight (NEI	Dust-tight (NEMA 12)		X	X	X		Х	X	Х	_	_		
Watertight (NE	Watertight (NEMA 4, 4X, 5)		X	X	X	1	X	X	X	_	_		
Explosion Prod	of (NEMA 7, 9)	_						_					
Dimensions	Height			6.4 (163)					7.5 (191)				
(3P Unit Mount)	(3P Unit Mount) Width		4.1 (104)					4.1 (104)					
in. (mm) Depth		3.4 (86)					3.4 (86)						
Pages (Unit Mount)/(I-Line)		Pages 7-22, 7-23, 7-29, 7-34/9-25					Pages 7-22, 7-23, 7-29, 7-34, 7-35/9-25						
Note: All circuit b	reakers on this cha	rt are UL Listed	and CSA Certi	fied unless othe	rwise noted.		rages 1-22, 1-23, 1-24, 1-33/3-23						

- All circuit breakers on this chart are U2P in a 3P module. 70–250 A with electronic trip system
- Not available with electronic trip units
  Dual UL and IEC ratings and CE markings on circuit breakers. For additional IEC ratings, see the Supplemental Digest. Section 10
  Not available in HD and HG 2P rating (2P module).
- 3P only.

by Schneider Electric www.schneider-electric.us **Selection Information** Class 500, 600, 800

www.schneider-ele	ctric.us								_	
			PowerPact 2	50 A Q-Frame			Powe	erPact 600 A L-F	rame	
			Ed. Fin	5			Newl)			
Circuit Breaker T	уре	QB	QD	QG	QJ	LD	LG	LJ	LL	LR
Number of Poles	-	2, 3	2, 3	2, 3	2, 3	3, 4	3, 4	3, 4	3, 4	3, 4
Current Range		70–250■	70–250■	70–250■	70–250■	70–600	70–600	70–600	70–600	70–600
Interrupting Ratir	ngs									
	240 Vac	10	25	65	100	25	65	100	125	200
UL/CSA/NOM	480Y/277 Vac	_	_	1	_	18	35	65	100	200
Rating (kA RMS)	480 Vac	_	_	_	_	18	35	65	100	200
(50/60 Hz)	600Y/347 Vac	_	_	_	_	14	18	25	50	100
	600 Vac	_	_	_	_	14	18	25	50	100
DC Ratings	250 Vdc☆	_	_	_	_	_	_	_	_	
	500 Vdc◆☆	_	_		_				_	
IEC Rating (kA RMS)	240 Vac	10/5	10/5	10/5	10/5	25/25	65/65	100/100	125/125	125/125
lcu/lcs★	415 Vac	10/5	10/5	10/5	10/5	18/18	35/35	65/65	100/100	100/100
IEC 50/60 Hz										
Special Ratings		1	ı		Ī		1	1		
CCC		_	_	_	_	Х	Х	Х	Х	X
Fed. Specs W-	C-3/5B/GEN	X	X	X	Х		_			
HACR (2P, 3P)		Х	Х	Х	_	Х	Х	Х	Х	Х
Connections/Terr	minations	l v	l v	v		V	. v	I v	l v	
Unit Mount		X	X	X	X	X	X	X	X	X
I-Line™		Х	Х	Х	Х	X	X	X	X	X
Rear Connection  Drawout	ON .		_		_	X	X	X	X	X
Optional Lugs		_	_	_	_	X	X	X	X	X
Accessories and	Modifications			_	_	^	_ ^		_ ^	^
Shunt Trip	Modifications	1	l		Ì	Х	Х	Х	Х	X
Undervoltage T	rin	<u> </u>	_		<u> </u>	X	X	X	X	X
Auxiliary Switch						X	X	X	X	X
Alarm Switch	163					X	X	X	X	X
Motor Operator		_			_	X	X	X	X	X
Handle Operato			_		_	X	X	X	X	X
Mechanical Inte		Х	Х	Х	Х	X	X	X	X	X
Handle Padlock	. ,	Х	х	Х	Х	Х	Х	Х	Х	х
Cylinder Lock (		_	_	_	_	_	_	_	_	_
Optional GF Pr		_	_	_	_	Х	Х	Х	Х	Х
Trip System Type			·						·	
Thermal-magne		Х	Х	Х	Х	l –	_	-	_	_
Instantaneous-	only (MCP)	_	_	_	_	Х	Х	Х	Х	Х
Molded Case S	Switch (Automatic)	Х	_	_	_	_	Х	_	Х	Х
Electronic		_	_	_	_	Х	Х	Х	Х	Х
Enclosures (Page	es 7-56-7-58)	•								
General Purpos	General Purpose (NEMA 1)		Х	Х	Х	] –	-	-	_	-
Raintight (NEM	A 3R)	Х	Х	Х	Х	_	_	_	_	
Dust-tight (NEN	ИА 12)	_	_	_	=	_	_	_	_	
Watertight (NEI	MA 4, 4X, 5)	_	_	_	_	_	_	_	_	_
Explosion Proo	f (NEMA 7, 9)		_	_	_	_	_	_	_	
Dimensions	Height		6.47	(164)				13.38 (340)		
(3P Unit Mount)	Width		4.5 (	114)				5.51 (140)		
in. (mm)	Depth			(100)				4.33 (110)		
Pages (Unit N	flount)/(I-Line)		Pages 7	-24/9-24	<u> </u>		-	Pages 7-25/7-33	3	

Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

- 2P in a 3P module
- Line Q-frame circuit breakers are available 70–225 A only. 250 A Q-frame unit-mount circuit breakers are limited to Cu conductors only. Ungrounded UPS systems only. See page 7-35. Special DC J-Frame only. Dual UL and IEC ratings and CE markings on circuit breakers. For additional IEC ratings, see the Supplemental Digest, Section 10. Requires factory-installed "C" shunt trip and 3P module. Factory-installed option only.

- 3P only.
- 70–250 A with electronic trip system Not available with electronic trip units

		PowerPact 80	00 A M-Frame		PowerPact 12	00 A P-Frame			PowerPact 30	00 A R-Frame	
						MICES				1 2 3	
Circuit Breaker T	Гуре	MG	MJ	PG	PJ	PK	PL	RG	RJ	RK	RL
Number of Poles	3	2, 3	2, 3	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4
Current Range		300–800	300–800	100-1200	100-1200	100-1200	100-1200	240-3000	240-3000	240-3000	240-3000
Interrupting Rati	ngs			-							
	240 Vac	65	100	65	100	65	125	65	100	65	125
UL/CSA/NOM	480Y/277 Vac	35	65	35	65	50	100	35	65	65	100
Rating (kA RMS)	480 Vac	35	65	35	65	50	100	35	65	65	100
(50/60 Hz)	600Y/347 Vac	18	25	18	25	50	25	18	25	65	50
	600 Vac	18	25	18	25	50	25	18	25	65	50
DC Ratings	250 Vdc	_	_	_	_	_	_	_	_	_	
	500 Vdc▲	_	_	_	_	_	_	_	_	_	
IEC (kA RMS)	240 Vac	50/25	65/35	50/25	65/35	50/25	125/65	50/25	65/35	85/65	125/65
`lcu/lcs■´	415 Vac	35/20	50/25	35/20	50/25	50/25	85/45	35/20	50/25	70/55	85/45
IEC 50/60 Hz											
Special Ratings											
CCC		X	X	X	Х	X	Х	X	Х	Х	Х
Fed. Specs W-		X	X	X	X	X	Х	Х	Х	Х	Х
HACR (2P, 3P)		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Connections/Ter	minations	.,		l v			l v			l v	
Unit Mount		X	X	X	X	X	X	X	X	X	X
I-Line™		Х	Х	Х	Х	Х	Х	X▼	X▼	X▼	X▼
Rear Connection	on	_	_						=	_	
Drawout		X	X	X <b>★</b> X	X*	X <b>★</b>	X★	X			X
Optional Lugs	I Mandifications	^	^	^	Х	^	Х	^	^	Х	^
Accessories and	Modifications	v	v		v	V	V	V	V	l v	
Shunt Trip	Tulus .	X	X	X	X	X	X	X	X	X	X
Undervoltage 7	•	X	X	X	X	X	X	X	X	X	X
Auxiliary Switch  Alarm Switch	nes	X	X	X	X	X	X	X	X	X	X
Motor Operator	r			^ X★	X*	X*	× ×		_	_	^
Handle Operati				X <b>★</b>	X <b>★</b>	X*	X*		_		
Mechanical Inte				X	X	X	X				
Handle Padloc	, ,	Х	Х	X	X	X	X	Х	Х	Х	Х
Cylinder Lock (				_							
Optional GF Pr		_	_	Х	X	Х	Х	Х	Х	Х	Х
Trip System Typ										1	
Thermal-magn		_	_	_	_	_	_	_	_	_	_
Instantaneous-		_	_	_	Х	Х	_	_	_	_	_
	Switch (Automatic)	_	_	Х	Х	Х	Х	Х	Х	Х	Х
Electronic	. ,	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
	Enclosures (Pages 7-56-7-58)									1	1
	General Purpose (NEMA 1)		Х	Х	Х	Х	х	_	_	_	
	Raintight (NEMA 3R) X X			Х	Х	Х	Х	_	_	_	_
Dust-tight (NEN		Х	Х	Х	Х	Х	Х	_	_	_	_
Watertight (NE		Х	Х	_	_	_	_	_	_	_	_
	Explosion Proof (NEMA 7, 9)		_	l _	_	_	_	_	_	_	_
	Height-in. (mm)		(325)		16.20	(413)	1		15 (	381)	L
Dimensions (3P Unit Mount)	Width—in. (mm)	8.30							16.50	-	
(Or Orne Mourit)	Depth—in. (mm)	8.10		8.30 (210) 8.10 (205)			14.40 (366)				
Pages (Unit N	Nount)/(I-Line)	Page 7-			Page 7-27, 7-	31, 7-34/9-29			Page 7-28	7-34/9-30	
Note: All circuit h			0040								

Pages (Unit Mount)/(I-Line) Page 7-26/9-28 Pag
Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

- Ungrounded UPS systems only. See page 7-35.

  Dual UL and IEC ratings and CE markings on circuit breakers. For additional IEC ratings, see the Supplemental Digest, Section 10.

  Requires breaker with WB suffix 65/50 kA lcu/lcs for 450–600 A ratings.

  1000 A and 1200 A only..

# **Selection Information**



											1 - OSE .!!			
Circuit Breaker 1	Гуре	NT-N	3,4 3,4 3 3				NW-N	NW-H	NW-L	NW-LF ▲	NW-H	NW-L	NW-H	NW-L
Number of Poles	;	3,4	3, 4	3	3	3	3, 4	3, 4	3	3	3,4	3	3, 4	3
Current Range		100-1200	100-1200	100-1200	100-1200	100-1200	100-2000	100-2000	100-2000	100-2000	640-3000	640-3000	1200-6000	1200-6000
Interrupting Rati	ngs	•	<u>l</u>		<u>l</u>	<u>l</u>			<u>l</u>		<u>l</u>	<u>l</u>	<u>l</u>	<u>l</u>
	240 Vac	50	65	100	200	200	65	100	200	200	100	200	100	200
UL/CSA/NOM	480Y/277 Vac	50	50	65	100	100	65	100	150	150	100	150	100	150
Rating (kA RMS)	480 Vac	50	50	65	100	100	65	100	150	150	100	150	100	150
(50/60 Hz)	600Y/347 Vac	35	50	_	_	_	50	85	100	100	85	100	85	100
	600 Vac	35	50	_	_	_	50	85	100	100	85	100	85	100
	250 Vdc	_	_	_	_	_	_	_	_	_	_	_	_	_
DC Ratings	500 Vdc	_	_	_	_	_	_	_	_	_	_	_	_	_
IEC■	240 Vac	_	_	_	_	_	_	_	_	_	_	_	_	_
(kA RMS) Icu/lcs	415 Vac	_	_	_	_	_	_	_	_	_	_	_	_	_
Special Ratings					l.				l.			l.		
CCC		_	_	_	_	_	_	_	_	_	_	_	_	_
Fed. Specs W-	C-375B/GEN	_	_	_	_	_	_	_	_	_	_	_	_	_
HACR (2P, 3P)		_	_	_	_	_	_	_	_	_	_	_	_	_
Connections/Ter	minations	•												
Unit Mount		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
I-Line™		_	_	_	_	_	_	_	_	_	_	_	_	_
Rear Connecti	on	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Drawout		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Optional Lugs		_				_	_	_	_	_	_	_	_	_
Accessories and	Modifications		<u>.                                    </u>	<u>.</u>	<u>l</u>	<u>.                                    </u>	<u> </u>		<u>l</u>		<u>.                                    </u>	<u>l</u>	<u>.                                    </u>	<u>.                                    </u>
Shunt Trip		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Undervoltage 7	[rip	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Auxiliary Switc	hes	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Alarm Switch		Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Motor Operato	r	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Handle Operat	ors	_	_	_	_	_	_	_	_	_	_	_	_	_
Mechanical Int	erlocks	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Padlock Attach	ment	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Cylinder Lock		_	_	_	_	_	_	_	_	_	_	_	_	_
Optional GF Pi	rotection	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Trip System Typ	е	•	•	•		•	•				•		•	•
Thermal-magn	etic	_	_	_	_	_	_	_	_	_	_	_	_	_
Instantaneous-	only (MCP)	_	_	_	_	_	_		_		_	_	_	_
Molded Case S	Switch (Automatic)	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Electronic				Х	Х	Х	Х	Х	Х	Х	Х	Х		
Enclosures		•							<b>'</b>			<b>'</b>		
General Purpo	se (NEMA 1)	(1)				_	_	_	_	_	_	_	_	_
Raintight (NEM	1A 3R)					_	_	_	_	_	_	_	_	_
Dust-tight (NEI	MA 12)					_	_	_	_	_	_	_	_	_
Watertight (NE	ortight (NEMA 4, 4X, 5) — — — — — —				_	_	_	_	_	_	_	_	_	
Explosion Prod	Explosion Proof (NEMA 7, 9) — — — — —							_						
Height 12 67 (322)			17.28 (439) 17.28 (439) 17.28 (				(439)							
(3P Unit Mount) Width 11.25 (286)			17.74 (450) 17.74 (450)				30.94	(786)						
in. (mm) Depth 13.00 (331)			18.38 (467) 18.38 (467) 18.38 (467)				(467)							
Pa	ages Page 7-50 and Catalog 0613CT0001				Page 7-50 and Catalog 0613CT0001				T0001					
Note: All circuit b		and and III I is	Page 7-50 and Catalog 0613CT0001											

Pages Page 7-50 and Catalog 0613CT0001

Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

- Tested to show arc flash hazard risk category as reference by NFPA70E. See Catalog 0613CT0001 for additional ratings and other information.

Circuit Breaker Type									, ,	www.schneider-electr
Number of Poles					100 A Frame				100 A F	-Frame
Number of Poles										a a
Terror   T	Circuit Breaker 1	Гуре	FA (240 V)	F	-A	FH	FH■	FH	FI	FY
	Number of Poles	3	1, 2, 3	1	2, 3	1	1	2, 3	2, 3	1
Authority   Auth	Current Range		15–100	15–100	15–100	15–30	35–100	15–100	20–100	15–30
ULCSANOMN   4807/3272 Not	Interrupting Rati	ngs								
Garding   Gard		240 Vac	10⊖	25⊖	25	65	25	65	200	14
G00/VEV   G00/VEV Voc	UL/CSA/NOM	480Y/277 Vac	_	18	18	65	25	25	200	14
G00/VEV   G00/VEV Voc	Rating	480 Vac	_	_	18	_	_	25	200	_
DC Plainings   250 Viole ★   5	(50/60 Hz)	600Y/347 Vac	_	_	14	_	_	18	100	_
DO Ratings   S00 Volc x +		600 Vac	_	_	14	_	_	18	100	_
SOUNDA #   SOUNDA #	DC 2 ::	250 Vdc*	5♦	10♦	10	10♦	10♦	50	_	_
(A.P.MS)   (A.P.MS)	DC Ratings	500 Vdc▲*	-	_	_	_	_	20	_	_
(A-PMS)	IEC Rating	240 Vac	_	18/9	_	18/9	_	_	_	_
	(kA RMS) Icu/lcs★	415 Vac	10/2.5	10/2.5	10/2.5	10/2.5	10/2.5	10/2.5	6/1.5	_
Special Ratings		I.	For addit	ional IEC ratings	s, see the Supple	mental Digest, S	Section 10.	l .	For additional IEC ratir	ngs, see the
COC	Special Ratings									
MACR (2P.3P)         X         —         X         — </td <td></td> <td></td> <td><u> </u></td> <td>_</td> <td><u> </u></td> <td><u> </u></td> <td><u> </u></td> <td>_</td> <td>_  </td> <td>_</td>			<u> </u>	_	<u> </u>	<u> </u>	<u> </u>	_	_	_
MACR (2P.3P)         X         —         X         — </td <td>Fed. Specs W-</td> <td>-C-375B/GEN</td> <td>X</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td>Х</td> <td></td>	Fed. Specs W-	-C-375B/GEN	X	Х	Х	Х	Х	Х	Х	
Connections/Terminations         Unit Mount         X	HACR (2P, 3P)	)	X	_	Х	_	_	_	_	
Unit Mount	, , , ,									
Filine			Х	х	×	×	х	х	х	_
Rear Connection										Х
Optional Lugs         X	Rear Connecti	on						_		
Optional Lugs         X	Drawout		_	_	_	_	_	_	_	_
Shurt Trip   X△▼	-		Х	Х	Х	Х	Х	Х	Х	_
Shunt Trip         X Δ ▼         —         X Δ         —         X Δ         —         X Δ         —         X Δ         —         A Δ         —         A Δ         X Δ         Φ         —         X Δ         —         X Δ		I Modifications		Į.	l .	l .	J.			
Undervoltage Trip         XΔ▼         —         XΔ         —         XΔ         —         XΔ         —         AΔ         —         —         XΔ         —         —         XΔ         —         —         XΔ         —         —         XΔ         —         —         —         XΔ         — <td< td=""><td></td><td></td><td>X△▼</td><td>_</td><td>XΔ</td><td>I —</td><td>I –</td><td>XΔ</td><td>XΔ</td><td>_</td></td<>			X△▼	_	XΔ	I —	I –	XΔ	XΔ	_
Auxiliary Switches		Trip		_	XΔ	_	_			_
Alarm Switch				_		_	_			_
Motor Operator				ΧΔ	XΔ	XΔ	XΔ	XΔ	XΔ	_
Handle Operators	-	r	_	_	Х	_	_	Х	Х	_
Mechanical Interlocks (3P)         —         —         X         —			Х	_		Х	Х		1	_
Handle Padlock Attachment				_					_	_
Cylinder Lock (3P△)         —         —         X         —         X	Handle Padloc	k Attachment	X	Х	Х	Х	Х	Х	Х	Х
Trip System Type           Thermal-magnetic         X <td>Cylinder Lock</td> <td>(3P△)</td> <td>=</td> <td>_</td> <td>Х</td> <td>_</td> <td>_</td> <td>Х</td> <td>_</td> <td>_</td>	Cylinder Lock	(3P△)	=	_	Х	_	_	Х	_	_
Trip System Type           Thermal-magnetic         X <td></td> <td>,</td> <td>_</td> <td>_</td> <td></td> <td>_</td> <td>_</td> <td></td> <td>Х</td> <td></td>		,	_	_		_	_		Х	
Instantaneous-only (MCP)					l	l	l			
Instantaneous-only (MCP)	Thermal-magn	etic	Х	х	x	x	х	Х	х	Х
Molded Case Switch (Automatic)         — <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>										
Electronic			_	_		_	_		_	_
Comparison   Com		,	_	_	_	_	_		_	
General Purpose (NEMA 1)         X <td></td> <td>es 7-56-7-58)</td> <td></td> <td></td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td></td> <td></td>		es 7-56-7-58)			1	1	1			
Raintight (NEMA 3R)         X	, ,		Х	Х	Х	Х	Х	Х	х	
Dust-tight (NEMA 12)         X										
Watertight (NEMA 4, 4X, 5)         X </td <td></td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		,								
Explosion Proof (NEMA 7, 9)         X<										
Dimensions (3P Unit Mount)         Height         6 (152)         6 (152)         8 (203)           Unit Mount) in (mm)         Width         4.5 (114)         4.5 (114)         4.5 (114)										
Dimensions		· · · · · ·		-	1		1	1		
in (mm)	Dimensions (3P Unit Mount)								, ,	
	in. (mm)	Depth	4.13 (105)			4.13 (105)				•

Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

Ungrounded UPS systems only. See page 7-35.

65 kA @120 Vac

Supplemental Digest Section 3, Pages 9-23

- 1Ø 125 Vdc rating only.

Pages (Unit Mount)/(I-Line)

- Dual UL and IEC ratings and CE markings on circuit breakers. For additional IEC ratings, see the Supplemental Digest. Section 10
  Not available on 1P FA (240 V).

- Factory-installed option only.
  Requires factory-installed "G" Shunt trip and 3P module.
  Not available in HD and HG 2P rating (2P module).
- 2P in a 3P module.
- $\nabla$

Supplemental Digest Section 3/Page 9-24

- 3P only.

  1P FA is 120 Vac.

  Not available with electronic trip units

Supplemental Digest Section 3/Pages 9-24

		250 A K-Frame		400 A L-Frame		600 A L	-Frame	
		250 A ROTTaille		400 A Litranie		000 A L	æ¹æ	
		The state of the s						
Circuit Breaker Typ	ре	KI	Q4	LA	LH	LI	LXI	
Number of Poles	-	2, 3	2, 3	2, 3	2, 3	2, 3	3	
Current Range		110–250	250-400	125-400	125-400	300-600	100-600	
Interrupting Rating	js .							
	240 Vac	200	25	42	65	200	200	
UL/CSA/NOM	480Y/277 Vac	200	_	30	35	200	200	
Rating (kA RMS)	480 Vac	200	_	30	35	200	200	
(50/60 Hz)	600Y/347 Vac	100	_	22	25	100	100	
	600 Vac	100	_	22	25	100	100	
	250 Vdc	_	_ 10 50		50	_	_	
DC Ratings	500 Vdc▲	_			_	_		
IEC 60947-2	240 Vac	_		_	_	_		
(kA RMS) lcu/lcs■	415 Vac	130/65	_	20/5	20/5	_	_	
IEC 50/60 Hz		<u> </u>	For addition	nal IEC ratings, see the Si	upplemental Digest Sectio	n 10.		
Special Ratings				<u> </u>	, , , , , , , , , , , , , , , , , , ,			
CCC		_	_	_	_	l – I	_	
Fed. Specs W-C-	-375B/GEN	Х	Х	Х	Х	Х		
HACR (2P, 3P)		_		X	X	_		
Connections/Term	inations					<u>l</u>		
Unit Mount		Х	X	Х	Х	х	Х	
I-Line™		X	X	X	X	X	X	
Rear Connection	1		X	X	_			
Drawout	•	_			X	_		
Optional Lugs		Х	X	Х	Х	Х		
Accessories and M	Modifications				Α	, <u>, , , , , , , , , , , , , , , , , , </u>		
Shunt Trip	iodifications	X♦	X	Х	Х	Х		
Undervoltage Tri	n	X•	X	X	X	X	Х	
Auxiliary Switche		X <b>+</b>	X	X	X	X	X	
Alarm Switch		X <b>+</b>	X	X	X	X	X	
Motor Operator		X	X	X	X	_		
Handle Operator	re	_	X	X	X	_		
Mechanical Inter			^	^ X <b>★</b>	X*	_		
Handle Padlock	. ,	X	X	X	X	X	X	
Cylinder Lock (3F		_	X	X	X	_		
Optional GF Prot					_	_	X <b>*</b>	
Trip System Type	lection	^**	_	_	_	ļ	X.*	
Thermal-magnet	ic	Х	X	Х	х	х		
Instantaneous-or		^		X	X	_		
Molded Case Sw	* `	<del>-</del>		†	X			
	vitori (Automatic)	_	<u> </u>	<u> </u>	X —	_	X	
Electronic	7 56 7 50\		<del>_</del>	_			Χ	
Enclosures (Pages			V	V	V	l		
General Purpose	, ,	_ _	X	X	X	_		
Raintight (NEMA		X	X	X	X	_		
Dust-tight (NEMA	,	X	X	X	X	Х	Х	
Watertight (NEM		Х	X	Х	X —	_	_	
Explosion Proof		-			_			
Dimensions	Height	8 (203)		11 (279)		11.86 (301)		
(3P Unit Mount) in. (mm)	Width	4.5 (114)		6 (152) 5.84 (148)		7.5 (190)		
\	Depth	4.75 (121)		6.74 (171)				
Pages (Unit N	Pages (Unit Mount)/(I-Line) Supplemental Digest Section 3 / Pages 9-27 Supplemental Digest Section 3 / Pages 9-27				Pages 9-27	Supplemental Digest Section 3 / Pages 9-27		
	Unit Mount)/(I-Line) Supplemental Digest Section 3 / Pages 9-27 Pages 9-26 Supplemental Digest Section 3 / Pages 9-27 It breakers on this chart are LIL Listed and CSA Cortified unless atherwise pated.					Supplemental Digest Section 37 Fages 9-27		

Note: All circuit breakers on this chart are UL Listed and CSA Certified unless otherwise noted.

- Ungrounded UPS systems only. See page 7-35.

  Dual UL and IEC ratings and CE markings on circuit breakers. For additional IEC ratings, see the Supplemental Digest, Section 10.

  Factory-installed option only.

  Requires circuit breaker with WB suffix.

  Requires factory-installed "G" Shunt trip. Available only for 3P.

  65/50 kA Icu/lcs for 450 A–600 A ratings

# **Circuit Breakers**

Class 730, 731, 733 / Refer to Catalog 0730CT9801

QO™ miniature circuit breakers are plug-on products for use in QO load centers, NQOD panelboards, NQOD OEM interiors or Speed-D™ switchboard distribution panels. Bolt-on QOB circuit breakers are for use in NQOD panelboards or interiors. ▲
The QO exclusive Qwik-Open™ mechanism, with a trip reaction within 1/60th of a second, is standard on all 1P 15 A and 20 A QO circuit breakers.



QO 1P 1 Space Required



QOT 1P Tandem 1 Space Required

125 A

150 A

175 A

200 A

20 A

25 A

QH120▼

QH125<sup>★</sup>



QQ 2P 2 Spaces Required



QO2200 2P 200 4 Spaces Requir



QO<sub>3P</sub> 3 Spaces Require

l: Plug-	∙On Circι	uit Breakers						Table 7.2:	
1P—120/2	240 Vac								
Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Ampere Rating	
								10–30 A	
QO110	29.10	QO210	67.00	_	_	QO310	248.00	35–60 A	
QO115*▼	29.10	QO215*	67.00	Q0215H	200.00	QO315*	248.00	35–50 A	i
QO120 <sup>★</sup> ▼	29.10	QO220*	67.00	QO220H	200.00	QO320 <sup>★</sup>	248.00	70–110 A	
QO125*	29.10	QO225*	67.00	Q0225H	200.00	QO325 <sup>★</sup>	248.00	60-100 A	
QO130*	29.10	QO230*	67.00	QO230H	200.00	QO330 <sup>★</sup>	248.00		
QO135*	29.10	QO235*	67.00	_	_	QO335*	248.00	Table 7.3:	
QO140*	29.10	QO240 <sup>★</sup>	67.00	QO240H	200.00	QO340*	248.00	Circuit Breaker	
QO145*	29.10	QO245*	67.00	_	_	QO345*	248.00	Type	
QO150*	29.10	QO250 <sup>★</sup>	67.00	QO250H	200.00	QO350 <sup>★</sup>	248.00	00	
QO160*	29.10	QO260*	67.00	QO260H	200.00	QO360*	248.00		
QO170*	67.00	QO270*	134.00	QO270H	224.00	QO370 <sup>★</sup>	315.00		
_	_	QO280*	189.00	QO280H	315.00	QO380*	366.00		
_	_	QO290*	189.00	QO290H	315.00	QO390*	366.00	00	
_	_			QO2100H	315.00	QO3100*	366.00	QO 2P	
_	_	QO2110*	428.00	_	-	_	-		
	Q0110 Q0115*V Q0120*V Q0125* Q0135* Q0140* Q0145* Q0145* Q0160*	TP—120/240 Vac  Cat. No. \$ Price  Q0110	1P—120/240 Vac         2P—120/24 Common           Cat. No.         \$ Price         Cat. No.           Q0110         29.10         Q0210           Q0115*▼         29.10         Q0215*           Q0120*▼         29.10         Q0225*           Q0135*         29.10         Q0225*           Q0135*         29.10         Q0230*           Q0140*         29.10         Q0240*           Q0145*         29.10         Q0240*           Q0150*         29.10         Q0250*           Q0160*         29.10         Q0260*           Q0170*         67.00         Q0270*           Q0280*         Q0280*	1P—120/240 Vac   2P—120/240 Vac   Common Trip	1P—120/240 Vac	1P—120/240 Vac   2P—120/240 Vac   Common Trip   Cat. No.   \$ Price   1P—120/240 Vac   2P—120/240 Vac   2P—240 Vac	1P—120/240 Vac   2P—120/240 Vac   2P—240 Vac	1P—120/240 Vac   2P—120/240 Vac   Common Trip   2P—240 Vac   Common Trip   Cat. No.   S Price   Cat. No.   Cat	

428.00

491.00

491.00

491.00

Molded Case	e Switch 60 A m	ax240 Vac	_	_	QO200	70.00	QO300	248.00
Molded Case	Switch 100 A m	nax240 Vac	_	_	QO2000*	200.00	QO3000*	366.00
22 k AIR*								
15 A	QO115VH▼	63.00	QO215VH <sup>D</sup>	146.00	_	_	QO315VH <sup>D</sup>	371.00
20 A	QO120VH▼	63.00	QO220VH <sup>D</sup>	146.00	_	_	QO320VH <sup>D</sup>	371.00
25 A	QO125VH	73.00	QO225VH <sup>D</sup>	146.00	_	_	QO325VH <sup>D</sup>	371.00
30 A	QO130VH	73.00	QO230VH□	146.00	_	_	QO330VH <sup>D</sup>	371.00
40 A	QO140VH	73.00	QO240VH <sup>□</sup>	146.00	_	_	QO340VH <sup>D</sup>	371.00
50 A	QO150VH	73.00	QO250VH <sup>D</sup>	146.00	_	_	QO350VH <sup>D</sup>	371.00
60 A	QO160VH	73.00	QO260VH <sup>□</sup>	146.00	_	_	QO360VH <sup>□</sup>	371.00
70 A	QO170VH	112.00	QO270VH <sup>□</sup>	224.00	_	_	QO370VH <sup>D</sup>	477.00
80 A	_	_	QO280VH <sup>□</sup>	315.00	_	_	QO380VH <sup>D</sup>	530.00
90 A	_	_	QO290VH <sup>D</sup>	315.00	_	_	QO390VH <sup>D</sup>	530.00
100 A	_	_	QO2100VH <sup>□</sup> ◊	315.00	_	_	QO3100VH <sup>-</sup>	530.00
110 A	_	_	QO2110VH <sup>□</sup> ◊	1034.00	_	-	_	l —
125 A	_	_	QO2125VH <sup>□</sup> ◊	1034.00	_	_	_	l —
150 A	_	_	QO2150VH△□e	1061.00	_	_	_	l —

QO2125\*

QO2150<sup>\*</sup>△ •

QO2175<sup>★</sup>△♀

QO2200\*∆⊖

	150 A	_	_	QO2150VH△=€	1061.00	_	_	_	_
la constant	175 A	_		QO2175VH△□€		_	_	_	_
) A	200 A	_	_	QO2200VH△□	1061.00	_	_	_	_
ired	42 k AIR*								
	40 A	_	_	QOH240*	317.00	_	_	_	_
	45 A	_	_	QOH245 <sup>★</sup>	317.00	_	_	_	_
	50 A	_	_	QOH250 <sup>★</sup>	317.00	_	_	_	_
-	60 A	_	_	QOH260*	317.00	_	_	_	_
	70 A	_	_	QOH270	528.00	_	_	_	_
	80 A	_	_	QOH280	651.00	_	_	_	_
	90 A	_	_	QOH290	651.00	_	_	_	_
	100 A	_	_	QOH2100	651.00	_	_	_	_
	110 A	_	_	QOH2110*	1389.00	_	_	_	_
	125 A	_	_	QOH2125	1389.00	_	_	_	_
	65 k AIR <sup>★</sup>								
red	15 A	QH115▼	117.00	QH215	293.00	_	_	QH315*	507.00

30	QH130	117.00	QH230	293.00	_	_	QH330	50
<b>A</b> :	See Digest Section	n 1 for load ce	nters, and Section	n 9 for pa	inelboards	and inte	eriors.	
			table for use with h 75°C conductor		75°C cond	uctors. 3	85-125 A circ	uit

QH220

QH225<sup>★</sup>

UL Listed 5 k AIR on corner grounded Delta systems.

117.00

117.00

UL Listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.

293.00

293.00

- UL Listed as SWD (switching duty) rated. Suitable for switching 120 Vac fluorescent lighting loads. Δ Requires four spaces (1 AWG-300 kcmil Al/Cu.) Suitable for switching 120 Vac fluorescent lighting
- UL Listed for use ahead of QO, QO-GFI, QO-EPD, QO-AFI, QOT,QOCAFI, and QO-PL 10 k AIR circuit breakers to permit their application at 22 kA fault level.

  100 A maximum branch mounted opposite.
- Order only. Contact your local Field Office.
- Includes two circuit breakers (one QO2030 and one QO3020) and handle tie QOTHT.
- Not suitable for use in 3Ø panels. Use only in 1Ø panel rated 150 A or greater.

Interrupting Ratings . . . . . Page 7-2 ..... Page 7-12 Accessories . . . DimensionsPage 7-54

#### **QO-QOB Ring Terminal** (20% \$ Price Adder)-Factory Installed Only

		i actory i	nstanca Omy
е	Ampere Rating	Poles	Suffix
	10–30 A	1, 2, 3	5237
)	35-60 A	1,2	5238
)	35–50 A	3	3230
)	70–110 A	2	5273
)	60-100 A	3	3273

Wire Sizes■

Circuit Breaker Ampere Wire Size Type Rating (AWG/kcm	
10–30 A 14–8 Al/C	u
QO 1P 10–30 A (2) 14–10 (	Cu
35–70 A 8–2 Al/Cu	J
10–30 A 14–8 Al/C	u
10–30 A (2) 14–10 (	Cu
QO 2P 35–70 A 8–2 Al/Cu	J.
80–125 A 4–2/0 AI/C	u
150–200 A 4–300 Al/C	Cu
10–30 A 14–8 Al/Cu, (2) 1	4-10 Cu
QO 3P 35–70 A 8–2 Al/Cu	ı
80–125 A 4–2/0 AI/C	u
QOB-VH 110–150 A 4–300 Al/0	Cu
QOT 15–20 A 12–8 AI 14–8	3 Cu
QO-AFI, QO-GFI 15-30 A 12-8 AI 14-8	3 Cu
& QO-EPD 40, 50, 60 A 12–4 Al 14–6	3 Cu
QO-PL 10–60 A 12–2 Al 14–2	2 Cu

#### **QOT Tandem Circuit Table 7.4: Breakers**

Ampere Rating■	Cat. No.*	\$ Price
1P-120/240 Va	c	
15 A & 15 A	QOT1515	58.00
15 A & 20 A	QOT1520	58.00
20 A & 20 A	QOT2020	58.00
2D_120/240 Va		•

Order two QOT1515 or QOT2020 circuit breakers and handle tie QOTHT for common switching of center two poles.

#### **Table 7.5: Replacement Tandem Circuit Breakers**

For Use in Old Style Non-Class CTL QO Load Centers—10 k AIR

QO 2000 OUTROID TO 117 111 1					
Ampere Rating■	Cat. No.*	\$ Price			
1P—12	0/240 Vac—1 S	pace Required			
15 &A 15 A	QO1515	73.00			
15 A & 20 A	QO1520	73.00			
20 A & 20 A	QO2020	73.00			
20 A & 30 A	QO2030	73.00			
30 A & 20 A	QO3020	73.00			
Two 1P Individua	l Trip—120/240	Vac—2 Spaces Required			
15 A & 15 A		1515 or QO2020 circuit			
15 A & 20 A		I handle tie QOTHT for hing of center two poles.			
20 A & 20 A	_	_			
20 A & 30 A	QO20303020∇	134.00			
30 A & 20 A	_				
• •					

#### **QOT Tandem**

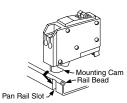
507.00

507.00

507.00

QH320

QH325\*



Circuit limiting QOT tandem circuit breakers have a mounting cam as shown. Installation into a QO load center can only be made in those positions having a mounting pan rail slot. Meets Paragraph 408.15 of the NEC®. UL Listed as Class CTI as Class CTL





# QO-PCAFI

# QO-GFI QO-GFI



3F QO-GFI







QO 1P With Shunt Trip



QO-K Key Operated

# QO™ and QOU Miniature **Circuit Breakers**

#### **QO™** Arc-Fault Circuit Breaker New!) (Pigtail and Plug-On Neutral)

QO arc-fault circuit breakers provide protection for Series and Parallel Type Arcing as required by the NEC and local code adoption, and comply with UL1699.

**Table 7.6:** QO Arc Fault Circuit Breakers

		1P 120 \	Vac	1P 120 Vac		
Circuit Breaker	Ampere	10 k A	IR	22 k AIR		
Туре	Rating	1 Space Re	quired	1 Space Required		
		Cat. No.	\$ Price	Cat. No.	\$ Price	
Combination	15 A	QO115CAFI	282.00	QO115VHCAFI	534.00	
Arc-fault Interrupter (Pigtail Neutral)	20 A	QO120CAFI	282.00	QO120VHCAFI	534.00	
Plug-On Neutral	15 A	QO115PCAFI		QO115VHPCAFI		
Arc-fault Interrupter	20 A	QO120PCAFI	282.00	QO120VHPCAFI	534.00	

NOTE: QO Dual Function (Combination Arc Fault and Ground Fault

Circuit Interrupter) breakers are on page 7-63.

#### QO-GFI

Qwik-Gard™ circuit breakers provide overload and short circuit protection, combined with Class A ground fault protection. Class A denotes a ground fault circuit interrupter that will trip when a fault current to ground is 6 mA or more, for people protection. Do not connect to more than 250 feet of load conductor for the total one-way run to prevent nuisance tripping.

Table 7.7: **QO-GFI Circuit Breakers** 

<b>(A)</b>			Qwik-Ga With Ground		cuit Breakers Circuit Interr			
Rating ♦ (	1P 120 Vac				2P Commor 120/240 V		3P Common Trip 208Y/120 Vac	
Rat	10 k Al	R	22 k AIR		10 k Alf	₹	10 k Al	R
Ampere			1 Space Req	Space Required		quired	3 Spaces Required	
Am	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15	QO115GFI	233.	QO115VHGFI	482.	QO215GFI	413.	QO315GFI	791.
20	QO120GFI	233.	QO120VHGFI	482.	QO220GFI	413.	QO320GFI	791.
25	QO125GFI	233.	QO125VHGFI	482.	QO225GFI	413.	_	_
30	QO130GFI	233.	QO130VHGFI	482.	QO230GFI	413.	QO330GFI	791.
40	_	_	_	_	QO240GFI	413.	QO340GFI	791.
50	_	_	_	l —	QO250GFI	413.	QO350GFI	791.
60	_	_	_	_	QO260GFI★	413.	_	_

# QO-EPD/EPE

QO-EPD/EPE circuit breakers provide overload and short circuit protection combined with Class B ground fault protection. They are designed to provide ground fault protection of equipment at a 30 milliampere level (EPD) or 100 milliamp level (EPE). They are not designed to protect people from electrical shock.

**Table 7.8: QO-EPD Circuit Breakers** 

€	1P 120 Va									
Rating	10 k All	R	10 k AIR	ì		10 k	AIR			
_	1 Spac Require		2 Spaces Rec	Spaces Required		Required 3 Space		paces	aces Required	
Ampere	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price		
15	QO115EPD	410.	QO215EPD	660.	QO315EPD▼	1077.	QO315EPE▼	1077.		
20	QO120EPD	410.	QO220EPD	660.	QO320EPD▼	1077.	QO320EPE▼	1077.		
25	QO125EPD	410.	QO225EPD	660.	_	_	_	l —		
30	QO130EPD	410.	QO230EPD	660.	QO330EPD▼	1077.	QO330EPE▼	1077.		
40	_	l —	QO240EPD	660.	QO340EPD▼	1077.	QO340EPE▼	1077.		
50	_	_	QO250EPD	660.	QO350EPD▼	1077.	QO350EPE▼	1077.		
60	_	_	QO260EPD★	660.	_	_	_	_		

# QO-SWN

Switch Neutral Common Trip 2008 NEC™ 514.11

**Table 7.9: QO-SWN Circuit Breakers** 

	2 Wire 120	Vac	3 Wire 120/240 Vac 10 k AIR 3 Spaces Required		
Ampere	10 k All	R			
Rating <b>♦</b>	2 Spaces Re	quired			
	Cat. No. \$ Pric		Cat. No.	\$ Price	
10 A	QO210SWN	95.00	_	_	
15 A	QO215SWN	95.00	QO315SWN	143.00	
20 A	QO220SWN	95.00	QO320SWN	143.00	
25 A	QO225SWN	95.00	_	_	
30 A	QO230SWN	95.00	QO330SWN	143.00	
40 A	QO240SWN	95.00	QO340SWN	143.00	
50 A	QO250SWN	95.00	QO350SWN	143.00	

HID circuit breakers are for use on circuits feeding fluorescent and high intensity discharge (HID) lighting systems such as mercury vapor, metal halide, or high pressure sodium. These circuit breakers are physically interchangeable with QO circuit breakers.

Table 7.10: **QO-HID Circuit Breakers** 

	1P 120/24	0 Vac	2P Common Trip 120/240 Vac		3P Common Trip 240 Vac	
Ampere	10 k A	IR	10 k A	IR .	10 k A	JR
Rating • 1 Space Requ		quired	2 Spaces R	equired	3 Spaces Required	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15 A	QO115HID	38.10	QO215HID	87.00	QO315HID	300.00
20 A	QO120HID <sup>■</sup>	38.10	QO220HID	87.00	QO320HID	300.00
25 A	QO125HID	38.10	QO225HID	87.00	QO325HID	300.00
30 A	QO130HID	38.10	QO230HID	87.00	QO330HID	300.00
40 A	QO140HID	38.10	QO240HID	87.00	_	_
50 A	QO150HID	38.10	QO250HID	87.00	_	_

#### QO-K

Key operated QO circuit breakers are available in singlepole construction and can be mounted in any single-pole space which will accept a standard QO. These circuit breakers can be turned ON or OFF or to RESET with a special key (catalog number QOK10) included with the circuit breaker. These circuit breakers are UL Listed and available as shown in the table.

Table 7.11: **QO-K Circuit Breakers** 

120 Vac—10 k AIR (1 Space Required)					
Ampere Rating ♦	Cat. No.	\$ Price			
10 A	QO110K	164.00			
15 A	QO115K	164.00			
20 A	QO120K	164.00			
30 A	QO130K	164.00			

#### QO-HM

High magnetic trip circuit breakers are recommended for applications where high initial inrush may occur and for individual dimmer applications.

Table 7.12: **QO-HM Circuit Breakers** 

Annual Dation A	1P	
Ampere Rating ♦	Cat. No	\$ Price
120 Vac-10 k AIR		
15 A	QO115HM▲	30.60
20 A	QO120HM▲	30.60

# Non-automatic (Standard) Miniature Switches

Miniature non-automatic switches have the same physical packaging as miniature circuit breakers, but open only when the handle is switched to the OFF position.

Non-automatic switches provide no overcurrent protection or short circuit protection. They must not be used on systems that have an available fault current greater than the values listed in the table

Non-automatic switches are UL Listed per UL 1087 and are CSA certified.

Table 7.13: **QO Non-Automatic Miniature Switches,** 240 Vac 10 kA

Ampere	2F	,	3P		
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	
60 A	QO200	70.00	QO300	248.00	
100 A	QO2000	200.00	QO3000	366.00	

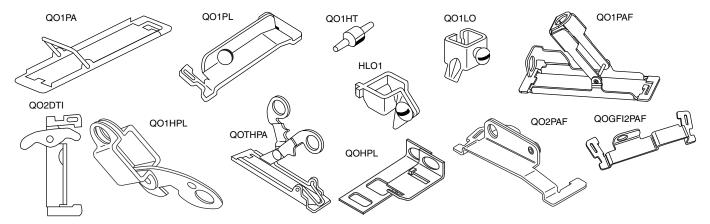
- UL Listed as HACR type for use with air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.
- UL Listed as SWD (switching duty) rated. Suitable for switching 120 Vac fluorescent lighting loads.
- 10–30 A circuit breakers are suitable for use with 60° C or 75° C conductors. 35–60 A circuit breakers are suitable for use with 75° C conductors.
- Suitable only for feeding 240 Vac and 208 Vac two-wire loads. Does not contain load neutral connection. See note in Instruction Bulletin when using in an enclosure with a QO403 or QON prefix.
- Interrupting Ratings.....

by Schneider Electric www.schneider-electric.us

## Table 7.14: Accessories for Use with QO™ and QOB Miniature Circuit Breakers

Handle Attachments	Description	Cat. No.	\$ Price	Schedule
	Converts any two adjacent 120/240 Vac 1P QO circuit breakers to independent trip 2P	QO1HT	3.80	DE2E
Handle Tie:	Converts any two adjacent 120/240 Vac 1P side-by-side QOT circuit breakers to independent trip 2P	QOTHT	3.80	DE2E
	Handle tie and lock-off for three 1P QO, QOB circuit breakers	QO3HT	13.40	DE2E
Handle Clamp:	Clamp for holding QO 1P handle in ON or OFF position	QO1LO	3.80	DE2E
Tiandie Ciamp.	Clamp for holding QO or Q1 1P, 2P or 3P circuit breaker handles in ON or OFF position	HLO1	9.90	DE2E
	For padlocking 1P QO circuit breaker in ON or OFF position			
	Loose attachment	QOHPL	9.50	DE2E
	Fixed attachment	QO1PA	10.70	DE2E
Handle Padlock Attachment: for	For padlocking 1P side-by-side QOT circuit breaker in ON or OFF position	QOTHPA	11.10	DE2E
Padlocking in ON or OFF position	For padlocking 2P and 3P QO-GFI, QO-EPD, and QO-EPE in either ON or OFF position, fixed attachment.	GFI2PA	9.20	DE2A
	For 2P and 3P QO and Q1 standard circuit breakers which require padlocking in either ON or OFF position.			
	Loose attachment	QO1HPL	10.70	DE2E
	Fixed attachment	QO1PL	10.70	DE2E
	For padlocking 1P QO circuit breaker in OFF position only, fixed attachment.	QO1PAF	43.50	DE2E
	For padlocking 2P and 3P QO circuit breakers in OFF position only, fixed attachment.	QO2PAF	25.80	DE2E
Handle Padlock Attachment: for Padlocking in OFF position	For padlocking 1P QO-GFI, QO-AFI, QO-CAFI, QO-PCAFI, and QO-EPD circuit breakers in OFF position only, fixed attachment.	QOGFI1PAF	51.00	DE2E
	For padlocking 2P and 3P QO-GFI, QO-EPD, and QO-EPE circuit breakers in OFF position only, fixed attachment.	QOGFI2PAF	38.40	DE2E
Ring Terminal	Ring terminals are available as a factory-installed option.	See Page 7-10	+20% Price Adder	DE2A
Sub-Feed Lugs	60 A 2P plug-on – 2 spaces required (6–2 Al/Cu)	QO60SL	47.10	DE2A
	125 A 2P plug-on – 2 spaces required (12–2/0 Al/Cu)	QO2125SL	137.00	DE2A
	225 A 2P plug-on – 4 spaces required (4–300 Al/Cu)	QO2225SL▲	308.00	DE2A
	125 A 3P plug-on – 3 spaces required (12–2/0 Al/Cu)	Q03125SL	137.00	DE3
Mechanical Interlock Attachment	For interlocking the handles of two 2P or one 2P and one 1P QO and Q1 circuit breakers mounted side-by- side so that only one circuit breaker can be ON at a time (Not QOU)	QO2DTI	24.90	DE2E
With Retaining Kit:	QC2DTI mechanical interlock attachment with retaining kits for securing two adjacent back-fed circuit breakers in dual power supply applications. Can be used with (2) 2Ps or (1) 2P and (1) 1P QO circuit breakers in QO816	QO2DTIM	63.00	DE2E

<sup>▲</sup> Not suitable for use in 3Ø panels. Use only in 1Ø panel rated 150 A or greater.



#### Factory-Installed Accessories for Use with QO and QOB Miniature Circuit Breakers

Factory-installed electrical accessories take up an additional pole space on QO<sup>TM</sup>, QO-GFI, QO-EPD, QO-SWN and QOU circuit breakers. All AC electrical accessories shown below are rated for 50/60 Hz. Accessories are not available for QOB-VH (2P 150 A and 3P 110–150 A) circuit breakers or QO, QOU molded case switches. QO circuit breakers will accept only one accessory per circuit breaker. Undervoltage trip is not available on miniature circuit breakers. Factory-installed accessories are not available for QO-AFI, QO-CAFI or OQ-PCAFI Arc Fault Circuit Breakers or on QO2150, QO2175, or QO2200 circuit breakers.

Table 7.15: Factory-Installed Accessories

Accessory	Description	Rate Volta		Coil Burden	Cat. No. Suffix	\$ Price Adder	Accessory	Description	Contact Comb.	Max. Voltage		Cat. No. Suffix	\$ Price Adder
	Trips the circuit breaker from a remote location by means of a trip coil energized from a separate circuit. A 120 Vac shunt trip will operate at 55% or more of rated voltage. All other shunt trips will operate at 75% or more of rated voltage.	AC/DC	12 24	60 VA 168 VA	-1042	189.00		Monitors circuit breaker contact status and provides a remote signal indicating the circuit breaker contacts are OPEN or					
Chunt Trin		AC	120 208	72 VA 228 VA	-1021	189.00	Auxiliary Switches	CLOSED.  Application	1A 1B	AC 120 AC 120	5 A 5 A	-1200 -1201	132.00 132.00
			240	288 VA				Auxiliary switch terminals accept     (2) 14–12 AWG Cu leads.					
	Application     For use with momentary or maintained push button.     Not available on QO-GFI, QO-EPD, QO-AFI, QO-CAFI, QO-PCAFI.     Shunt trip terminals accept (2) 14–12 AWG Cu.						Alarm Switches	Used with control circuits and is actuated only when the circuit breaker has tripped. Standard construction includes a normally-open contact.  Application  Alarm switch terminals accept (2) 14–12 AWG Cu leads.	1A	AC 120	5 A	-2100	132.00







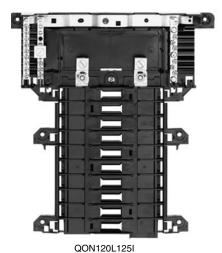


Table 7.16: **QO OEM Mounting Bases—UL Recognized Components** 

Valtage Cycless	Main Lug	1P	Max. No.	Mounting Ba	ases	Main Wire Size
Voltage System	Rating	Spaces	1P	Cat. No.	\$ Price	AWG/kcmil
QO Plug-On Mounting Bases-	For unit mo	unting QO,	QO-GFI, QC	-AFI and QO-EPD ci	rcuit breakers	s
	70 A	2	2	QON2L70	27.30	14-4 Cu, 12-3 Al
	125 A	4	4	SK9948BW	75.00	12–1/0 Cu/Al
	125 A	4	4	SK9842	78.00	12-1/0 Cu/Al
1Ø2W 240 Vac Max. 10 k AIC	125 A	6	6	SK9795	84.00	12–1/0 Cu/Al
(Without Neutral Assembly)	125 A	6	6	SK9801	108.00	12–1/0 Cu/Al
	150 A	6	6	SK9796BW	131.00	8–3/0 Cu/Al
	150 A	8	8	SK9797	140.00	8–3/0 Cu/Al
	40 A	2	2	QON2L40	35.00	14–6 Cu, 12–6 Al
	70 A	2	4	QON24L70	50.00	14–4 Cu, 12–3 Al
	100 A	6	12	QON612L100	70.00	8–1/0 Cu/Al
	100 A	8	16	QON816L100	92.00	8–1/0 Cu/Al
		12	12		113.00	
	100 A	12		QON12L100		12–2/0 Cu/Al
	100 A		12	QON12L100SF■	161.00	6–2/0 Cu/Al
	125 A	12	12	QON112L125I	120.00	4–2/0 Cu/Al
	125 A	12	24	QON11224L125I	168.00	4–2/0 Cu/Al
	125 A	16	16	QON116L125I	131.00	4–2/0 Cu/Al
1001101011 11 101 110	125 A	16	24	QON11624L125I	191.00	4–2/0 Cu/Al
1Ø3W 240 Vac Max. 10 k AIC	125 A	20	20	QON120L125I	225.00	4–2/0 Cu/Al
	125 A	24	24	QON124L125I	263.00	6–2/0 Cu/Al
	125 A	32	32	QON132L125I	360.00	4–2/0 Cu/Al
	125 A	20	24	QON12024L125I	263.00	4–2/0 Cu/Al
	150 A	24	24	QON124L150I	263.00	4–250 Cu/Al
	200 A	12	12	QON124L200I	339.00	4–250 Cu/Al
	200 A	12	12	QON12L200FTL◆	500.00	4-250 Cu/Al
	200 A	24	24	QON124L200I	339.00	4–250 Cu/Al
	200 A	24	24	QON124L200DL★	500.00	(2) 4-300 Cu/Al
	200 A	30	30	QON130L200I	417.00	4-250 Cu/Al
	225 A	42	42	QON142L225I	599.00	4-300 Cu/Al
	125 A	12	12	QON312L125	251.00	4-2/0 Cu/Al
	125 A	20	20	QON320L125	380.00	4-2/0 Cu/Al
000000000000000000000000000000000000000	125 A	24	24	QON324L125	395.00	4-2/0 Cu/Al
3Ø3W 240 Vac Max. 10 k AIC (Without Neutral Assy.)	200 A	18	18	QON318L200	327.00	4-300 Cu/Al
(Williout Neutral Assy.)	200 A	24	24	QON324L200	402.00	4-300 Cu/Al
	200 A	30	30	QON330L200	477.00	4-300 Cu/Al
	225 A	42	42	QON342L225	674.00	4-300 Cu/Al
	60 A	3	3	QON403L60N	49.80	12-6 Cu/Al
	125 A	12	12	QON312L125I	281.00	4-2/0 Cu/Al
	125 A	20	20	QON320L125I ▲	441.00	4-2/0 Cu/Al
3Ø4W 240 Vac Max.	125 A	24	24	QON324L125I	461.00	4-2/0 Cu/Al
10 k AIC	200 A	18	18	QON318L200I	426.00	4–300 Cu/Al
	200 A	24	24	QON324L200I	468.00	4–300 Cu/Al
	200 A	30	30	QON330L200I ▲	528.00	4–300 Cu/Al
	225 A	42	42	QON342L225I	716.00	4–300 Cu/Al
QO Plug-On Mounting Bases—I						
	70 A	1	1	QOMB1	29.60	14-4 Cu 12-2 Al
1Ø2W 240 Vac Max. 10 k AIC	70 A	2	2	QOMB2	59.00	14–4 Cu 12–2 Al
(Without Neutral Assembly)	70 A	3	3	QOMB3	87.00	14-4 Cu 12-2 Al
QOB Bolt-On Mounting Bases-	For unit mo	unting QOB,	QOB-GFI, C	OB-EPD circuit brea	kers	
3Ø3W 240 Vac Max.10 k AIC	1	1		Ì	1	40.40.71
(Without Neutral Assembly)	100 A	3	3	QON3B	56.00	12-1 Cu/Al

- Also IEC rated and CE marked for IEC 60439-1. Use only Square D brand Type QOXC, QOXD, QOHX and QOE circuit breakers for 415Y/240 Vac max. systems.

  Device comes with factory-installed sub-feed lugs.
- Device comes with factory-installed feed-thru lugs.
- Device comes with factory-installed dual-line lugs.

#### Table 7.17: **Solid Neutral Assemblies**

	Number of Branch	Cat. No.	\$ Price	Main Neutral Lug Wire Size	Branch Neutral Terminal Wire Size		
Rating	Neutral Terminals	Cat. No.	\$ FIICE	Cu/Al	Cu	Al	
125 A 125 A 200 A 200 A 225 A	12 20 12 30 42	SN12125 SN20 SN12200 SN30 SN42	36.30 39.50 40.70 54.00 63.00	4–2/0 AWG 4 AWG–300 kcmil	14–4 AWG 14–4 AWG 14–4 AWG 14–4 AWG 14–4 AWG	12–4 AWG 12–4 AWG 12–4 AWG 12–4 AWG 12–4 AWG	

## Multi-9 Mounting Bases for UL489 C60, 240 Vac max.



**US Mounting Base** for UL489 C60 (3 conductor shown)

Description	Poles	Amperes	Ler	igth	Cat. No.▼	\$ Price
Description	Foles	Amperes	in.	mm	Cat. No. ₹	\$ FIICE
	12		10.4	264	US11220018	330.00
One-conductor	24		14.4	366	US12420018	476.00
Mounting Base	36	200 A	19	483	US13620018	632.00
Wounting Dasc	48		23	584	US14820018	810.00
	60		27.5	699	US16020018	972.00
	12	150 A	10.4	264	US21215018	429.00
Two-conductor	24		14.4	366	US22420018	645.00
Mounting Base	36	200 A	19	483	US23620018	887.00
Wounting Dasc	48	200 A	23	584	US24820018	1140.00
	60		27.5	699	US26020018	1359.00
	12	100 A	10.4	264	US31210018	467.00
Three-conductor	24		14.4	366	US32420018	701.00
Mounting Base	36	200 A	19	483	US33620018	960.00
Wounting Dasc	48	200 A	23	584	US34820018	1245.00
	60		27.5	699	US36020018	1547.00

Table 7.19: Accessories for US Mounting Base for UL489 C60

Description	Cat. No.▼	\$ Price
Main lug kit for US mounting bases, 1 lug per kit, for 6 AWG to 300 kcmil cable	USMBLK	24.00
Terminal cover for US mounting base; provides IP20 ingress protection per IEC 60529; suitable for jumper bars or cable	USMBTC	49.50

DE2 Discount Schedule



Low Ampere QOU

#### **Low Ampere QOU Miniature Circuit Breakers**

QOU unit mount miniature circuit breakers (cable-in/cable-out) are ideal for OEM applications. They have the Square D™ circuit breaker's unique Visi-Trip™ feature and can be DIN rail-mounted or surface- or flush-mounted using mounting feet.

#### General Specifications Common to All Low Ampere QOU Circuit Breakers

- For convenient flush mount, surface mount or DIN mount (symmetrical rail 35 x 7.5 DIN/EN 50 022)
- Single handle with internal common trip
- Terminal lug wire size (1) 14-2 AWG Cu or Al
- Reversible line and load lugs
- Field-installable quick connectors

- UL Listed 48 Vdc (5 k AIR)
- UL Listed as HACR Type: 10-70 A
- High magnetic trip circuit breakers (QOU-HM) are recommended for applications where high initial inrush may occur and for individual dimmer applications.
- For DIN mounting rails, see IEC Starters and Relays, Section 18.

#### Table 7.20: **QOU Low Ampere Miniature Circuit Breakers**

Ampere	1P 120/240	0 Vac	2P 120/24	0 Vac	2P 240	Vac	3P 240	Vac
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.▲	\$ Price	Cat. No.	\$ Price
10 k AIR								
10 A	QOU110		QOU210		_		QOU310	
15 A	QOU115		QOU215		QOU215H		QOU315	
20 A	QOU120		QOU220		QOU220H	168.00	QOU320	
25 A	QOU125		QOU225		QOU225H		QOU325	
30 A	QOU130	40.20	QOU230	87.00	QOU230H		QOU330	285.00
35 A	QOU135	40.20	QOU235	87.00	_	_	QOU335	205.00
40 A	QOU140		QOU240		_	_	QOU340	
45 A	QOU145		QOU245		_	_	QOU345	
50 A	QOU150		QOU250		_	_	QOU350	
60 A	QOU160		QOU260		_	_	QOU360	
70 A	QOU170	78.00	QOU270	171.00	_	_	QOU370	363.00
22 k AIR								
15 A	QOU115VH		QOU215VH		_	_	QOU315VH	
20 A	QOU120VH		QOU220VH		_	_	QOU320VH	426.00
25 A	QOU125VH		QOU225VH		_	_	QOU325VH	426.00
30 A	QOU130VH		QOU230VH		_	_	QOU330VH	
35 A	QOU135VH	101.00	QOU235VH	189.00	_	_	_	_
40 A	QOU140VH		QOU240VH		_	_	_	_
45 A	QOU145VH		QOU245VH		_	_	_	_
50 A	QOU150VH		QOU250VH		_	_	_	_
60 A	QOU160VH		QOU260VH		_	_	_	_

QOU-H interrupting rating is 10 kA at 240 Vac.

#### Table 7.21: QOU-HM Miniature Circuit Breakers (10 k AIR)

Ampere	1P 120/240 \	/ac	2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
15 A	QOU115HM	40.20	_	_	_	_	_	_
20 A	QOU120HM	40.20	_	_	_	_	_	_

#### Table 7.22: QYU UL1077 Recognized Supplementary Protectors (5 k AIR)

Ampere	1P 277 \	/ac	2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
10 A	QYU110		_	_	_	_	_	_
15 A	QYU115		_	_	_	_	_	_
20 A	QYU120	122.00	_	_	_	_	_	_
25 A	QYU125		_	_	_	_	_	_
30 A	QYU130		_	_	_	_	1	_

#### **High Ampere QOU Circuit Breakers**

#### General Specifications Common to All High Ampere QOU Circuit Breakers

- Flush mount, surface mount, and DIN rail mount.
- Internal common trip.
- Non-reversible line and load lugs.
- Terminal lug wire size (1) 12-2/0 AWG Cu or Al.
- UL Listed 60 Vdc per pole (5 k AIR). (Note: except switches)
- UL Listed as HACR type, 80-125 A.
- Non-automatic switches have the same physical packaging as miniature circuit breakers, but provide no overcurrent or short circuit protection. They are UL Listed per UL1087 and are CSA certified.

#### Table 7.23: QOU High Ampere Miniature Circuit Breakers (10 k AIR)

Ampere	1P 120/240 Vac		2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
80 A	QOU180		QOU280		_	_	QOU380	
90 A	QOU190	176.00	QOU290	246.00	_	_	QOU390	416.00
100 A	QOU1100		QOU2100		_	_	QOU3100	
125 A	_	_	QQU2125	452.00	_	_	_	_

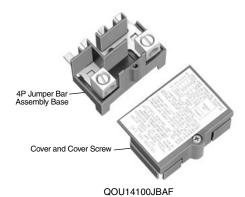
#### Table 7.24: **QOU Non-Automatic Switches**

Ampere	1P 120 Vac	1P 120 Vac \$ Price		\$ Price	2P 240 Vac	\$ Price	3P 240 Vac	\$ Price	
Rating	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	3 FIICE	
60 A	_	<u> </u>	_	_	QOU200	87.00	QOU300	285.00	
100 A	_	_	_	_	QOU2000	246.00	QOU3000	416.00	
125 A	_	_		_	QOU20001	452.00	QOU30001	716.00	

. Page 7-3 

High Ampere QOU

# QO™ and QOU Miniature **Circuit Breakers**



QOURT Field-installable Ring Tongue Terminal Connector Crimp connectors are not included with Square D brand connectors QOUEC Fieldinstallable Quick Connector

2P DIN Mounted QOU Circuit Breakers





Accessories for QOU Low Ampere Circuit Breakers (Except as Noted) Table 7.25:

Description	Order Qty.	Cat. No.	Unit \$ Price
Factory-installed ring tongue terminal, 10-32 screw, for 1P, 2P, 3P QOU, 10-60 A	_	Suffix -5283	Add 20% to price
Hex drive 5/32 in. wire binding screw for QOU	_	Suffix -5280	Add 20% to price
For padlocking 1P low ampere QOU circuit breaker in OFF or ON position	_	QOU1PA	10.10
For padlocking 2P and 3P low ampere QOU circuit breaker in OFF or ON position	_	QOU1PL	10.10
For padlocking 1P low ampere QOU circuit breaker in OFF position only	_	QOU1PAFLA◆	43.50
For padlocking 2P and 3P low ampere QOU circuit breaker in OFF position only	_	QOU2PAFLA◆	25.80
For padlocking 2P and 3P high ampere QOU circuit breaker in OFF position only	_	Suffix -7100	Add 20% to price
Handle lock-out, ON or OFF position	_	HLO1 ♦	9.90
4P 100 A Jumper bar assy. w/front wiring with base, cover and screw	1	QOU14100JBAF	73.00
4P 100 A Jumper bar assy. w/right side wiring with base, cover and screw	1	QOU14100JBAR	73.00
4P 100 A Jumper bar assy. w/left side wiring with base, cover and screw	1	QOU14100JBAL	73.00
1Ø, 4P, 100 A Jumper bar base with front wiring	40	QOU14100BAFB	53.00
1Ø, 4P, 100 A Jumper bar base with left side wiring	40	QOU14100BALB	53.00
1Ø, 4P, 100 A Jumper bar base with right side wiring	40	QOUI4100BARB	53.00
4P Jumper bar cover	40	QOU14100CAB	13.20
Mounting screw for jumper bar cover	40	QOU1CMSB	0.35
6P 150 A Jumper bar assy. w/front wiring with base, cover and screw	1	QOU16150JBAF	99.00
1Ø, 6P, 150 A Jumper bar base with front wiring	40	QOU16150BAFB	69.00
1Ø, 6P, 150 A Jumper bar base with left side wiring	40	QOU16150BALB	69.00
1Ø, 6P, 150 A Jumper bar base with right side wiring	40	QOUIG150BARB	69.00
6P jumper bar cover	40	QOU16150CAB	17.10
Vertical rainproof cover 2P and 3P QO, QOU, FA and KA	10	BCV▲◆ BCVB▲◆	30.80 30.80
Horizontal rainproof cover 2P QO, QOU, and 3P Q2, EH	1 10	BCH▲◆ BCHB▲◆	30.80 30.80
1P Fingersafe™ cover for high ampere QOU circuit breaker	1 40	QOUHFSC1 QOUHFSC1B	2.60 2.10
1P Fingersafe cover for low ampere QOU circuit breaker	1 40	QOULFSC1 QOULFSC1B	2.60 2.10
Cover plate for one 2P QOU circuit breaker	1 40	QOUCP2 QOUCP2B	8.30 6.60
Cover plate for one 3P QOU circuit breaker	1 40	QOUCP3 QOUCP3B	15.80 12.80
Cover plate for two 2P QOU circuit breakers	1 40	QOUCP4 QOUCP4B	9.90 7.90
Cover plate for three 2P QOU circuit breakers	1 40	QOUCP6 QOUCP6B	15.60 12.20
Field-installable ring tongue terminal adaptor	1 80	QOURT QOURTB	5.70 4.40
Quick connector end connection wiring	1 40	QOUEC QOUECB	5.70 4.40
Quick connector forward or reverse wiring	1 40	QOUFR QOUFRB	5.70 4.40
1P QOU mounting foot	1 80	QOUMF1▲ QOUMF1B▲	0.71 0.54
2P QOU mounting foot	1 40	QOUMF2▲ QOUMF2B▲	1.40 1.10
3P QOU mounting foot	1 24	QOUMF3▲ QOUMF3B▲	2.30 1.70
Tapped mounting foot for QOU, 1P and 2P 10–70 A, 3P 10–60 A			
Packaged with circuit breaker		Suffix -3100	Add 20% to price
Individually packaged	1	QOUMFS1	2.40
Bulk packed	80	QOUMFS1B	2.30
Mechanical interlock attachment: Used to interlock two circuit breakers mounted side-by-side so that only one circuit breaker can be ON at a time. A 1P or 2P circuit breaker can be mounted on the left and interlocked with a 2P or 3P circuit breaker on the right.	1	QOU2DTILA ■	24.90

- For use on low and high ampere QOU. 10–70 A 1P and 2P, 10–60 A 3P.

DE2E Discount Schedule

## For QOUQ Low Ampere Circuit Breakers with Four-Point Quick-Connect **Terminals**

QOUQ low ampere circuit breakers with four-point quick-connect terminals are provided with permanent factory-installed terminals which are affixed to the Load or OFF end of the circuit breaker. This special terminal will accommodate up to four 1/4-inch insulated female quick connect wire terminations. Total ampacity of these connections must not exceed the rating of the circuit breaker.

**QOUQ Four-Point Quick-Connect Terminals** Table 7.26:

	Poles	Order Qty.	Cat. No.	Unit \$ Price Adder
	1	1	0. 00	8.90
Four-Point Quick-Connect Terminals	2	1	Change QOU to QOUQ	17.70
	3	1	uoou	26.40

Class 860 / Refer to Catalog 0860CT0201

#### by Schneider Electric www.schneider-electric.us



2P C60

## Multi 9 C60 UL 489 Listed 240 V Miniature **Circuit Breakers**

- UL 489 Listed and CSA 22.2 No. 5.1 for branch circuit protection
- Eliminates concerns and uncertainty of using a UL 1077 device where a UL 489 device is required
- Replaces fuses in low-ampere range; 17 ratings up to 35 A

Trip Curve	Use	Magnetic Release
С	For typical loads	7-10 x ampere rating (7-14 for DC)
D	For high inrush	10-14 x ampere rating

10 k AIR (1P @ 120 Vac; 2P and 3P @ 240 Vac)

- 60 Vdc for 1P and 125 Vdc for 2P (on C-curve circuit breakers only, see table below)
- Increased installation flexibility with standard box lugs or optional ring terminals
- Allows easy front-mounting and rear wiring when using ring terminals
- A wide range of electrical and mechanical accessories
- Suitable for reverse feeding
- Positive indication of contact disconnect

#### **Table 7.27:** UL 489 Circuit Breakers (120/240 V)

able 7.27:	UL 48	9 Circui	. Бгеаке	15 (120/2	40 V)							
		C Curve—7–10 Times Ampere Rating (7–14 DC)						D Curve—10–14 Times Ampere Rating				
Rating (A)	1₽▲		2P■		3P		1P		2P		3P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Pri
ox Lug/Box	Lug											
0.5	60100	125.00	60134	269.00	_	_	60117	125.00	60151	269.00	_	_
1	60101	125.00	60135	269.00	60168	387.00	60118	125.00	60152	269.00	60184	387
1.5	60102	125.00	60136	269.00	60169	387.00	60119	125.00	60153	269.00	60185	387
2	60103	125.00	60137	269.00	60170	387.00	60120	125.00	60154	269.00	60186	387
3	60104	125.00	60138	269.00	60171	387.00	60121	125.00	60155	269.00	60187	387
4	60105	125.00	60139	269.00	60172	387.00	60122	125.00	60156	269.00	60188	387
5	60106	125.00	60140	269.00	60173	387.00	60123	125.00	60157	269.00	60189	387
6	60107	114.00	60141	246.00	60174	356.00	60124	114.00	60158	246.00	60190	356
7	60108	114.00	60142	246.00	60175	356.00	60125	114.00	60159	246.00	60191	356
8	60109	114.00	60143	246.00	60176	356.00	60126	114.00	60160	246.00	60192	356
10	60110	114.00	60144	246.00	60177	356.00	60127	114.00	60161	246.00	60193	356
13	60111	114.00	60145	246.00	60178	356.00	60128	114.00	60162	246.00	60194	356
15	60112	114.00	60146	246.00	60179	356.00	60129	114.00	60163	246.00	60195	356
20	60113	114.00	60147	246.00	60180	356.00	60130	114.00	60164	246.00	60196	356
25	60114	114.00	60148	246.00	60181	356.00	60131	114.00	60165	246.00	60197	356
30	60115	120.00	60149	257.00	60182	372.00	60132	120.00	60166	257.00	60198	372
35	60116	120.00	60150	257.00	60183	372.00	60133	120.00	60167	257.00	60199	372
ng Tongue/I	Ring Tongu	e				•						
0.5	60200	131.00	60234	282.00	_	_	60217	131.00	60251	282.00	_	_
1	60201	131.00	60235	282.00	60268	410.00	60218	131.00	60252	282.00	60284	410
1.5	60202	131.00	60236	282.00	60269	410.00	60219	131.00	60253	282.00	60285	410
2	60203	131.00	60237	282.00	60270	410.00	60220	131.00	60254	282.00	60286	410
3	60204	131.00	60238	282.00	60271	410.00	60221	131.00	60255	282.00	60287	410
4	60205	131.00	60239	282.00	60272	410.00	60222	131.00	60256	282.00	60288	410
5	60206	131.00	60240	282.00	60273	410.00	60223	131.00	60257	282.00	60289	410
6	60207	122.00	60241	261.00	60274	378.00	60224	122.00	60258	261.00	60290	378
7	60208	122.00	60242	261.00	60275	378.00	60225	122.00	60259	261.00	60291	378
8	60209	122.00	60243	261.00	60276	378.00	60226	122.00	60260	261.00	60292	378
10	60210	122.00	60244	261.00	60277	378.00	60227	122.00	60261	261.00	60293	378
13	60211	122.00	60245	261.00	60278	378.00	60228	122.00	60262	261.00	60294	378
15	60212	122.00	60246	261.00	60279	378.00	60229	122.00	60263	261.00	60295	378
20	60213	122.00	60247	261.00	60280	378.00	60230	122.00	60264	261.00	60296	378
25	60214	122.00	60248	261.00	60281	378.00	60231	122.00	60265	261.00	60297	378



60215

30

35

nterrupting ratings
Accessories
Dimensions Page 7-54
Mounting Bases Page 7-13
DIN Mounting Rail Section 18

126.00

126.00

60249

60250

273.00

273.00

60282

60283

395.00

395.00

60232

60233

126.00

126.00

60266

60267

273.00

273.00

60298

60299

395.00

395.00



3P C60



Box Lug C60



Ring Tongue C60



Box/Ring C60





1P UL489 C60



2P UL489 C60



3P UL489 C60

#### Multi 9 C60 UL 489 Listed 480V Miniature Circuit Breakers

- UL 489 Listed, CSA C22.2 No. 5.1; Also IEC 60947-2; CE marked
- 480Y/277 Vac @ 10 kA (2P and 3P), 277 Vac @ 10 kA (1P)
- 0.5 A through 20 A

**Breakers** 

• 1P, 2P, 3P, 18 mm wide per pole

Multi 9™ Miniature Circuit

Trip Curve	Use	Magnetic Release
С	For typical loads	7-10 x ampere rating (7-14 for DC)
D	For high inrush	10-14 x ampere rating

- UL 486B Listed single-barrel lug: (2) 18–10 AWG (1-25 mm²) cables, Cu only
- Optional ring tongue terminals
- A wide range of electrical and mechanical accessories
- Suitable for reverse feeding
- Trip-free mechanism
- Positive indication of contact disconnect

### Table 7.28: UL 489 Circuit Breakers (480Y/277 Vac)

	C Curve—7–10 Times Ampere Rating (7–14 DC)					D Curve—10–14 Times Ampere Rating						
Rating (A)	1P		2P		3P		1P	1P			3P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
Single-I	Barrel Wire Lu	g		·		·		· · · ·				
0.5	MGN61300	168.00	_	-	_	-	MGN61333	168.00	_	-	_	T -
1	MGN61301	168.00	MGN61312	357.00	MGN61323	519.00	MGN61334	168.00	MGN61345	357.00	MGN61356	519.00
2	MGN61302	168.00	MGN61313	357.00	MGN61324	519.00	MGN61335	168.00	MGN61346	357.00	MGN61357	519.00
3	MGN61303	168.00	MGN61314	357.00	MGN61325	519.00	MGN61336	168.00	MGN61347	357.00	MGN61358	519.00
4	MGN61304	168.00	MGN61315	357.00	MGN61326	519.00	MGN61337	168.00	MGN61348	357.00	MGN61359	519.00
5	MGN61305	168.00	MGN61316	357.00	MGN61327	519.00	MGN61338	168.00	MGN61349	357.00	MGN61360	519.00
6	MGN61306	168.00	MGN61317	357.00	MGN61328	519.00	MGN61339	168.00	MGN61350	357.00	MGN61361	519.00
8	MGN61307	168.00	MGN61318	357.00	MGN61329	519.00	MGN61340	168.00	MGN61351	357.00	MGN61362	519.00
10	MGN61308	168.00	MGN61319	357.00	MGN61330	519.00	MGN61341	168.00	MGN61352	357.00	MGN61363	519.00
15	MGN61309	168.00	MGN61320	357.00	MGN61331	519.00	MGN61342	168.00	MGN61353	357.00	MGN61364	519.00
20	MGN61310	168.00	MGN61321	357.00	MGN61332	519.00	MGN61343	168.00	MGN61354	357.00	MGN61365	519.00
Ring To	ngue Termina	ıl										
0.5	MGN61366	168.00	_	-	_	-	MGN61399	168.00	_	-	_	T —
1	MGN61367	168.00	MGN61378	357.00	MGN61389	519.00	MGN61400	168.00	MGN61411	357.00	MGN61422	519.00
2	MGN61368	168.00	MGN61379	357.00	MGN61390	519.00	MGN61401	168.00	MGN61412	357.00	MGN61423	519.00
3	MGN61369	168.00	MGN61380	357.00	MGN61391	519.00	MGN61402	168.00	MGN61413	357.00	MGN61424	519.00
4	MGN61370	168.00	MGN61381	357.00	MGN61392	519.00	MGN61403	168.00	MGN61414	357.00	MGN61425	519.00
5	MGN61371	168.00	MGN61382	357.00	MGN61393	519.00	MGN61404	168.00	MGN61415	357.00	MGN61426	519.00
6	MGN61372	168.00	MGN61383	357.00	MGN61394	519.00	MGN61405	168.00	MGN61416	357.00	MGN61427	519.00
8	MGN61373	168.00	MGN61384	357.00	MGN61395	519.00	MGN61406	168.00	MGN61417	357.00	MGN61428	519.00
10	MGN61374	168.00	MGN61385	357.00	MGN61396	519.00	MGN61407	168.00	MGN61418	357.00	MGN61429	519.00
15	MGN61375	168.00	MGN61386	357.00	MGN61397	519.00	MGN61408	168.00	MGN61419	357.00	MGN61430	519.00
20	MGN61376	168.00	MGN61387	357.00	MGN61398	519.00	MGN61409	168.00	MGN61420	357.00	MGN61431	519.00

# Multi 9 C60 UL 489A Listed Miniature Circuit Breakers for DC Telecommunication Applications

A limited range of C60 products are UL Listed as UL 489A circuit breakers for protection of DC telecommunications circuits.

Table 7.29: UL 489A Circuit Breakers for DC Telecommunications Applications (1P, 2 Modules, C curve)

Rating (A)	Cat. No.	\$ Price	Rating (A)	Cat. No.	\$ Price
0.5	60406	120.00	10	60414	101.00
1	60407	101.00	13	60415	101.00
2	60408	101.00	15	60416	101.00
3	60409	101.00	20	60417	101.00
4	60410	101.00	30	60418	101.00
5	60411	101.00	40	60419	111.00
6	60412	101.00	50	60420	117.00
8	60413	101.00	60	60421	123.00

Interrupting Rating	Page 7-3
Accessories	age 7-20
Dimensions	Page 7-5/

www.schneider-electric.us

1P C60H-DC

2P C60H-DC

#### Multi 9 C60H-DC UL 1077 Recognized Supplementary Protectors (250 and 500 Vdc)

The C60H-DC supplementary protectors are used in direct current circuits (industrial control and automation, transport, renewable energy, etc.). They provide overcurrent protection within appliances or electrical equipment.

- Range from 0.5-40 A
- 5 k AIR at 250 Vdc (1-pole) and 5 k AIR at 500 Vdc (2-pole, wired in series)
- Trip-free mechanism
- Positive indication of contact disconnect
- C-Curve: 7 to14 times ampere rating
- UL 1077, IEC 60947-2, EN 60947-2, GB 14048.2, CCC and CE mark

#### Multi 9 C60H-DC UL 1077 Recognized Supplementary Protectors

	1-Pole 24–250 V		2-Pole 24–500 Vd	lc
Current (A)▲	Cat. No.	\$ Price	Cat. No.	\$ Price
0.5	MGN61500	182.00	MGN61520	392.00
1	MGN61501	182.00	MGN61521	392.00
2	MGN61502	182.00	MGN61522	392.00
3	MGN61503	182.00	MGN61523	392.00
4	MGN61504	182.00	MGN61524	392.00
5	MGN61505	182.00	MGN61525	392.00
6	MGN61506	182.00	MGN61526	392.00
10	MGN61508	182.00	MGN61528	392.00
13	MGN61509	182.00	MGN61529	392.00
15	MGN61510	182.00	MGN61530	392.00
16	MGN61511	182.00	MGN61531	392.00
20	MGN61512	182.00	MGN61532	392.00
25	MGN61513	182.00	MGN61533	392.00
30	MGN61514	182.00	MGN61534	392.00
32	MGN61515	182.00	MGN61535	392.00
40	MGN61517	200.00	MGN61537	412.00

At 25°C/77°F, for other temperatures see temperature derating table in Multi 9 Catalog 0860CT0201R1/08

# Multi 9 UL1053 Listed GFP Ground Fault Protectors

- Provides ground fault protection for electrical circuits.
- Available in 2P (2-wire) and 4P (3- or 4-wire) versions
- Provides no thermal or magnetic protection. The circuit must be protected by an upstream device.
- Contains Si Technology to increase immunity to noise and to minimize the potential for nuisance tripping in noisy electrical
- Tripped condition due to a ground fault is displayed on the front face by a red mechanical indicator.

Discount

DIN rail mounting for easy installation.

Multi 9 UL 1053 Listed GFP Ground Fault Protectors Table 7.31:



Interrupting Ratings	Page 7-3
Accessories	Page 7-20
Dimensions	Page 7-54





4P GFP (3- or 4-wire)

7-18





1P UL 1077 C60



2P UL 1077 C60



3P UL 1077 C60



4P UL 1077 C60

# Multi 9<sup>™</sup> Miniature Circuit Breakers

Intended for use within equipment where branch circuit protection is already provided or not needed

- Range from 0.5 to 63 A
- 10 k AIR @ 120/240 Vac; 5 k AIR at 480Y/277; 10 k AIR @ 60 Vdc (1P) and 125 Vdc (2P)
- Suitable for reverse feeding
- DIN mounting for easy installation
- Suitable for reverse feeding

## Table 7.32: UL 1077 Supplementary Protectors

# **UL 1077 C60 Supplementary Protectors**

Class 860 / Refer to Catalog 0860CT0201

- A wide range of electrical and mechanical accessories
- Trip-free mechanism
- Positive indication of contact disconnect

Trip Curve	Use	Magnetic Release
В	For sensitive equipment	3.2-4.8 x ampere rating
С	For typical loads	7-10 x ampere rating (7-14 for DC)
D	For high inrush	10-14 x ampere rating

1 MC24110 101.00 MC24125 218.00 MC24140 315.00 MC24155 416.00 11.5 MC37428 101.00 MC37432 218.00 MC24142 315.00 MC24156 416.00 12.5 MC37428 101.00 MC37428 218.00 MC24142 315.00 MC24156 416.00 13.6 MC34141 101.00 MC34129 218.00 MC24142 315.00 MC24156 416.00 15.6 MC37441 101.00 MC34129 218.00 MC24142 315.00 MC24156 416.00 15.6 MC37441 101.00 MC34129 218.00 MC24142 315.00 MC24156 416.00 16. MC24114 101.00 MC24129 218.00 MC24142 315.00 MC24156 416.00 17. MC34141 101.00 MC24129 218.00 MC24142 315.00 MC24156 416.00 17. MC34141 101.00 MC24129 218.00 MC24142 315.00 MC24156 416.00 18. MC24151 101.00 MC24129 218.00 MC24142 315.00 MC24156 416.00 19. MC24151 101.00 MC24129 218.00 MC24143 315.00 MC24161 416.00 19. MC24151 101.00 MC24129 218.00 MC24147 315.00 MC24161 416.00 19. MC24151 101.00 MC24129 218.00 MC24147 315.00 MC24161 416.00 19. MC24151 101.00 MC24129 218.00 MC24143 315.00 MC24161 416.00 19. MC24151 101.00 MC24129 218.00 MC24143 315.00 MC24161 416.00 20. MC24151 101.00 MC24123 218.00 MC24143 315.00 MC24161 416.00 20. MC24151 101.00 MC24123 218.00 MC24143 315.00 MC24163 416.00 20. MC24151 101.00 MC24123 218.00 MC24143 315.00 MC24163 416.00 20. MC24151 101.00 MC24152 218.00 MC24143 315.00 MC24164 416.00 20. MC24152 111.00 MC24152 218.00 MC24163 315.00 MC24164 416.00 20. MC24152 111.00 MC24152 218.00 MC24163 315.00 MC24164 416.00 20. MC24152 111.00 MC24154 218.00 MC24163 315.00 MC24164 416.00 20. MC24152 111.00 MC24154 218.00 MC24164 315.00 MC24164 416.00 20. MC24152 111.00 MC24154 218.00 MC24164 315.00 MC24164 416.00 20. MC24152 111.00 MC24154 218.00 MC24164 315.00 MC24164 416.00 20. MC24152 111.00 MC24154 218.00 MC24164 315.00 MC24164 416.00 20. MC24154 218.00 MC24164 315.00 MC24164 315.00 MC24164 416.00 20. MC24154 218.00 MC24164 315.00 MC24164 315.00 MC24164 416.00 20. MC24154 218.00 MC24164 218.00 MC24164 315.00 MC24164 416.00 20. MC24154 218.00 MC24164 218.00 MC24164 315.00 MC24164 416.00 20. MC24154 218.00 MC24164 218.00 MC24164 315.00 MC24164 416.00 20. MC24164 210.00 MC24164 218.00 MC24164 315.00 MC24164 41	B Curve—Magnetic	Setting Betweer	n 3.2 and 4.8 Tir	nes Ampere Rati	ng				
1.5. MG17493 101.00 MG17493 218.00 MG24141 315.00 MG24155 416.00 3 MG24112 101.00 MG24125 218.00 MG24141 315.00 MG24155 416.00 MG24141 101.00 MG24125 218.00 MG24143 315.00 MG24155 416.00 MG24143 315.00 MG24155 416.00 MG24143 315.00 MG24145 416.00 MG24144 101.00 MG24129 218.00 MG24144 315.00 MG24159 416.00 MG24145 315.00 MG24159 315.00 MG24145 315.00						MG24140	315.00	MG24155	416.00
2 MG24111 101.00 MG24127 218.00 MG24142 315.00 MG24159 416.00 4 MG24113 101.00 MG24128 218.00 MG24143 315.00 MG24159 416.00 5 MG31401 101.00 MG34128 218.00 MG24143 315.00 MG24159 416.00 7 MG31403 101.00 MG31439 218.00 MG24144 315.00 MG24159 7 MG31405 101.00 MG31439 218.00 MG24144 315.00 MG24160 416.00 10 MG24110 101.00 MG34131 218.00 MG24143 315.00 MG24160 416.00 110 MG24111 101.00 MG24131 218.00 MG24143 315.00 MG24161 416.00 113 MG24117 101.00 MG24132 218.00 MG24147 315.00 MG24161 416.00 113 MG24117 101.00 MG24132 218.00 MG24147 315.00 MG24161 416.00 113 MG24117 101.00 MG24132 218.00 MG24149 315.00 MG24161 416.00 110 MG24141 101.00 MG24131 218.00 MG24149 315.00 MG24161 416.00 110 MG24141 101.00 MG24131 218.00 MG24149 315.00 MG24161 416.00 120 MG24110 101.00 MG34135 218.00 MG24149 315.00 MG24161 416.00 120 MG24110 101.00 MG31435 218.00 MG24149 315.00 MG24161 416.00 120 MG24110 101.00 MG31435 218.00 MG24149 315.00 MG24161 416.00 120 MG24110 101.00 MG34135 218.00 MG24163 315.00 MG24161 416.00 120 MG24121 101.00 MG34135 218.00 MG24163 315.00 MG24169 416.00 120 MG34121 101.00 MG34135 218.00 MG24163 315.00 MG24169 416.00 120 MG34121 101.00 MG34135 218.00 MG24163 315.00 MG24169 416.00 120 MG34121 101.00 MG34135 220.00 MG24163 315.00 MG24169 416.00 120 MG34121 210.00 MG24134 220.00 MG24163 315.00 MG24169 416.00 120 MG34121 210.00 MG24143 220.00 MG24143 315.00 MG24169 416.00 120 MG34121 210.00 MG24143 220.00 MG24143 315.00 MG24169 416.00 120 MG34242 218.00 MG2443 315.00 MG24469 315.00 MG24469 416.00 120 MG34243 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24442 218.00 MG24469 315.00 MG24469 416.00 120 MG24434 101.00 MG24454 218.00 MG24469 315.00 MG24469 416.00 120 MG24454 101.0						_	_	_	_
3 MG24112 101.00 MG24127 218.00 MG24143 315.00 MG24159 416.00 5 MG37494 101.00 MG37428 218.00 MG24143 315.00 MG24159 416.00 5 MG37414 101.00 MG37428 218.00 MG24143 315.00 MG24159 416.00 6 MG24115 101.00 MG24129 218.00 MG24144 315.00 MG24169 416.00 6 MG24115 101.00 MG24129 218.00 MG24145 315.00 MG24161 416.00 10 MG24115 101.00 MG24129 218.00 MG24146 315.00 MG24161 416.00 113 MG24117 101.00 MG24132 218.00 MG24146 315.00 MG24161 416.00 115 MG34116 101.00 MG24132 218.00 MG24146 315.00 MG24161 416.00 116 MG24118 101.00 MG24132 218.00 MG24145 315.00 MG24161 416.00 116 MG24118 101.00 MG24133 218.00 MG24145 315.00 MG24161 416.00 116 MG24118 101.00 MG24137 218.00 MG24145 315.00 MG24161 416.00 117 MG24118 101.00 MG24139 218.00 MG24145 315.00 MG24165 416.00 118 MG24118 101.00 MG24139 218.00 MG24145 315.00 MG24165 416.00 118 MG24141 101.00 MG24136 218.00 MG24145 315.00 MG24165 416.00 118 MG24141 101.00 MG47437 218.00 MG24145 315.00 MG24165 416.00 118 MG2413 101.00 MG47437 218.00 MG24145 315.00 MG24165 416.00 118 MG24145 101.00 MG7437 218.00 MG24145 315.00 MG24165 416.00 118 MG24123 117.00 MG24138 218.00 MG24145 315.00 MG24166 416.00 118 MG24123 117.00 MG24138 218.00 MG24145 315.00 MG24166 416.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24166 416.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24166 416.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24166 416.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24167 420.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24167 420.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24167 420.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24167 420.00 118 MG24123 117.00 MG24137 218.00 MG24145 315.00 MG24147 416.00 118 MG2413 101.00 MG24144 218.00 MG24145 315.00 MG24147 416.00 118 MG24143 101.00 MG24144 218.00 MG24145 315.00 MG24147 416.00 118 MG24143 101.00 MG24144 218.00 MG24145 315.00 MG24147 416.00 118 MG24143 101.00 MG24144 218.00 MG24145 315.00 MG24146 416.00 118 MG24143 101.00 MG24144 218.00 MG24145 315.00 MG24146 416.00 118 MG24143									
4 MG24113 101.00 MG24129 218.00 MG24144 315.00 MG24159 416.00 6 MG24114 101.00 MG24129 218.00 MG24144 315.00 MG24159 416.00 7 MG24114 101.00 MG24129 218.00 MG24145 315.00 MG24159 416.00 10 MG24117 101.00 MG24131 218.00 MG24145 315.00 MG24161 416.00 113 MG24117 101.00 MG24131 218.00 MG24146 315.00 MG24161 416.00 115 MG24118 101.00 MG24139 218.00 MG24147 315.00 MG24161 416.00 116 MG24118 101.00 MG24139 218.00 MG24147 315.00 MG24161 416.00 116 MG24118 101.00 MG24139 218.00 MG24148 315.00 MG24161 416.00 20 MG24119 101.00 MG24139 218.00 MG24149 315.00 MG24161 416.00 20 MG24119 101.00 MG24139 218.00 MG24149 315.00 MG24161 416.00 20 MG24119 101.00 MG24139 218.00 MG24149 315.00 MG24161 416.00 20 MG24121 101.00 MG24139 218.00 MG24149 315.00 MG24169 416.00 21 MG24121 101.00 MG24139 218.00 MG24149 315.00 MG24169 416.00 22 MG24121 101.00 MG24139 218.00 MG24149 315.00 MG24169 416.00 23 MG24121 101.00 MG24139 218.00 MG24151 315.00 MG24169 416.00 25 MG24121 101.00 MG24139 218.00 MG24151 315.00 MG24169 416.00 26 MG24121 101.00 MG24139 218.00 MG24151 315.00 MG24169 416.00 27 MG24121 101.00 MG24139 218.00 MG24151 315.00 MG24169 416.00 28 MG24121 101.00 MG24139 250.00 MG24151 315.00 MG24169 406.00 29 MG24121 101.00 MG24139 250.00 MG24151 315.00 MG24169 406.00 20 MG24121 101.00 MG24139 250.00 MG24150 305.00 MG24167 400.00 20 MG24124 121.00 MG24139 250.00 MG24150 305.00 MG24167 400.00 21 MG24124 121.00 MG24139 250.00 MG24150 305.00 MG24169 406.00 21 MG24124 121.00 MG24139 250.00 MG24150 315.00 MG24169 406.00 21 MG24131 101.00 MG24134 218.00 MG24459 315.00 MG24469 416.00 21 MG24439 101.00 MG24434 218.00 MG24439 315.00 MG24469 416.00 21 MG24439 101.00 MG24434 218.00 MG24449 315.00 MG24469 416.00 21 MG24439 101.00 MG24445 218.00 MG24449 315.00 MG24469 416.00 21 MG24439 101.00 MG24445 218.00 MG24449 315.00 MG24469 416.00 21 MG24439 101.00 MG24445 218.00 MG24459 315.00 MG24469 416.00 21 MG24439 101.00 MG24445 218.00 MG24459 315.00 MG24469 416.00 21 MG24439 101.00 MG24459 218.00 MG24459 315.00 MG24469 416.00 21 MG24439 101.00 MG24459 218									
5 MG17494 101.00 MG24129 218.00 MG24141 315.00 MG24169 416.00 7 MG17405 101.00 MG24129 218.00 MG24146 315.00 MG24169 416.00 11.00 MG24139 218.00 MG24146 315.00 MG24169 416.00 11.00 MG24139 218.00 MG24147 315.00 MG24162 416.00 MG24131 315.00 MG24162 416.00 MG24131 315.00 MG24162 416.00 MG24164 315.00 MG24162 416.00 MG24164 315.00 MG241									
6 MG24114 101.00 MG24129 218.00 MG24145 315.00 MG24159 416.00 7 MG17435 101.00 MG24139 218.00 MG24145 315.00 MG24151 101.00 MG24139 218.00 MG24146 315.00 MG24151 110.00 MG24151 101.00 MG24151 315.00 MG24151 110.00 MG24151 110.00 MG24151 315.00 MG24151 110.00 MG24151 110.00 MG24151 315.00 MG24151 110.00 MG24151 110.00 MG24152 218.00 MG24148 315.00 MG24151 110.00 MG24152 218.00 MG24148 315.00 MG24151 110.00 MG24152 218.00 MG24151 315.00 MG24151 110.00 MG24152 218.00 MG24150 315.00 MG24154 416.00 30 MG24151 315.00						_	_		_
8 MG24116 101.00 MG24119 101.00 MG24130 218.00 MG24146 315.00 MG24160 116.00 113.00 MG24117 101.00 MG24132 218.00 MG24147 315.00 MG24162 416.00 115.00 MG24181 101.00 MG24132 218.00 MG24147 315.00 MG24162 416.00 116.00 MG24181 101.00 MG24133 218.00 MG24148 315.00 MG24168 416.00 116.00 MG24181 101.00 MG24133 218.00 MG24148 315.00 MG24188 416.00 116.00 MG24181 101.00 MG24183 218.00 MG24148 315.00 MG24188 416.00 116.00 MG24181 101.00 MG24183 218.00 MG24183 315.00 MG24186 416.00 116.00 MG24181 101.00 MG24183 218.00 MG24181 315.00 MG24186 416.00 116.00 MG24181 101.00 MG24183 315.00 MG24181 101.00 MG24183 218.00 MG24181 315.00 MG24184 116.00 116.00 MG24181 101.00 MG24183 315.00 MG24183 315.00 MG24184 116.00 116.00 MG24184 116.00 116.00 MG24184 116.00 MG						MG24144	315.00	MG24159	416.00
10		MG17405	101.00	MG17435	218.00	_	_	_	_
13 M624177 101.00 M624182 218.00 M624477 315.00 M624162 416.00 15 M634186 101.00 M6374383 218.00 M634188 315.00 M624183 416.00 20 M624119 101.00 M624133 218.00 M624183 315.00 M624184 416.00 28 M624121 010.00 M624135 218.00 M624185 315.00 M624184 416.00 29 M624121 101.00 M624138 218.00 M624185 315.00 M624186 416.00 39 M624121 101.00 M624138 218.00 M624183 315.00 M624186 416.00 30 M624122 1111.00 M624138 218.00 M624183 315.00 M624186 416.00 50 M624122 1111.00 M624138 240.00 M624183 315.00 M624186 418.00 00 M624122 1111.00 M624138 240.00 M624183 335.00 M624184 380.00 00 M637499 123.00 M624138 240.00 M624183 335.00 M624184 380.00 00 M637499 123.00 M624138 240.00 M624183 335.00 M624184 380.00 00 M637499 123.00 M624138 240.00 M624183 335.00 M624184 380.00 00 M637499 123.00 M624138 240.00 M624185 335.00 M624184 380.00 00 M63749 123.00 M624438 225.00 M624185 335.00 M624189 480.00 00 M637491 123.00 M624428 225.00 M624489 315.00 M624487 418.00 12 M624124 101.00 M624442 218.00 M624469 315.00 M624478 416.00 12 M624425 101.00 M624442 218.00 M624469 315.00 M624478 416.00 13 M624425 101.00 M624444 218.00 M624469 315.00 M624478 416.00 14 M624426 101.00 M624444 218.00 M624469 315.00 M624478 416.00 15 M617414 101.00 M624444 218.00 M624469 315.00 M624478 416.00 16 M624428 101.00 M624444 218.00 M624469 315.00 M624479 416.00 16 M624428 101.00 M624444 218.00 M624468 315.00 M624479 416.00 16 M624428 101.00 M624444 218.00 M624468 315.00 M624479 416.00 16 M624428 101.00 M624444 218.00 M624468 315.00 M624479 416.00 16 M624428 101.00 M624444 218.00 M624468 315.00 M624479 416.00 16 M624428 101.00 M624444 218.00 M624468 315.00 M624489 416.00 16 M624438 101.00 M624448 218.00 M624468 315.00 M624489 416.00 16 M624438 101.00 M624449 218.00 M624468 315.00 M624489 416.00 17 M624452 101.00 M624469 218.00 M624468 315.00 M624489 416.00 18 M624458 101.00 M624469 218.00 M624468 315.00 M624489 416.00 19 M624458 101.00 M624469 218.00 M624468 315.00 M624489 416.00 10 M624459 101.00 M624469 218.00 M624469 315.00 M624469 315.00 M624469 315.00 M624469 315.									
15 MG17406 101.00 MG24138 218.00 MG37461 315.00 MG24163 416.00 20 MG241418 101.00 MG24143 218.00 MG24148 315.00 MG24163 416.00 25 MG24120 101.00 MG24134 218.00 MG24148 315.00 MG24165 416.00 30 MG37407 101.00 MG24137 218.00 MG24162 315.00 MG24165 416.00 30 MG37407 101.00 MG24137 218.00 MG24162 315.00 MG24166 416.00 315.00 MG24161 315.00 MG24166 416.00 30 MG24161 315.00 MG24461 315.00 MG24461 315.00 MG24461 315.00 MG24477 416.00 315.00 MG24461 315.00 MG24477 416.00 315.00 MG24461 315.00 MG24477 416.00 315.00 MG24461 315.00 MG24477 416.00 315.00 MG24461 315.00 MG24461 315.00 MG24477 315.00 MG24461 315.									
16 M624118 101.00 M624133 218.00 M624146 315.00 M624161 416.00   25 M624119 101.00 M624135 218.00 M624149 315.00 M624161 416.00   30 M637407 101.00 M624135 218.00 M624160 315.00 M624161 416.00   31 M624121 101.00 M624138 218.00 M624161 315.00 M624166 416.00   32 M624121 101.00 M624318 218.00 M624161 315.00 M624166 416.00   33 M624122 111.00 M624317 228.00 M624161 315.00 M624166 416.00   34 M624122 111.00 M624317 228.00 M624162 328.00 M624161 315.00 M624166 416.00   36 M624122 111.00 M624317 228.00 M624162 328.00 M624161   36 M624124 128.00 M624139 228.00 M624164 335.00 M624166 48.00   36 M624124 128.00 M624139 228.00 M624164 335.00 M624166   37 M624124 128.00 M624429 228.00 M624154 353.00 M624169   38 M624124 128.00 M624429 228.00 M624154 353.00 M624169   35 M624124 128.00 M624428 218.00								MG24162	416.00
20 M624119 101.00 M624134 218.00 M624169 315.00 M624165 416.00 30 M617407 101.00 M624137 218.00 M617462 315.00 M624166 416.00 30 M617407 101.00 M624137 218.00 M617462 315.00 M624166 416.00 30 M617408 101.00 M624138 218.00 M624163 315.00 M624166 416.00 35 M617408 101.00 M624138 218.00 M624163 315.00 M624167 420.00 50 M624122 111.00 M624138 228.00 M624163 338.00 M624168 488.00 60 M627424 123.00 M624438 248.00 M624153 388.00 M624168 488.00 60 M627424 123.00 M627438 252.00 M624153 388.00 M624168 488.00 60 M627424 123.00 M627438 252.00 M624154 383.00 M624168 488.00 60 M627424 123.00 M627438 252.00 M624154 383.00 M624168 488.00 60 M627424 123.00 M627438 252.00 M624154 383.00 M624168 488.00 60 M627424 123.00 M627424 218.00 M627424 123.00 M627424 123.00 M627424 123.00 M627424 123.00 M627424 123.00 M627424 123.00 M627425 123.00 M627425 123.00 M627425 123.00 M627425 123.00 M627425 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627426 123.00 M627427 416.00 60 M627427 123.00 M627428 123.								MC04169	416.00
25									
30 MG17407 101.00 MG17437 218.00 MG274182 315.00 — — — — — — — — — — — — — — — — — —									
32 MG24121 101.00 MG24138 218.00 MG24151 315.00 MG24166 416.00  40 MG24122 1117.00 MG24138 224.00 MG24152 324.00 MG24165 438.00  50 MG24123 117.00 MG24138 224.00 MG24152 338.00 MG24168 438.00  60 MG17409 123.00 MG37439 282.00 MG24163 338.00 MC24168 438.00  63 MG24124 123.00 MG24139 282.00 MG24163 338.00 MC24169 450.00  63 MG24124 123.00 MG24139 282.00 MG24163 353.00 MC24169 450.00  C Curve-Magnetic Setting Between 7 and 10 Times Ampere Rating  1 MG24421 101.00 MG34442 218.00 MG24499 315.00 MG24467 416.00  1.2 MG37412 101.00 MG37443 218.00 — — — — — — — — — — — — — — — — — —								_	_
35								MG24166	416.00
50 MG24128 117.00 MG24138 220.00 MG24153 338.00 MG24168 438.00 MG24169 123.00 MG24139 252.00 MG24154 353.00 MG24169 450.00 MG24169 353.00 MG24169 450.00 MG24169 353.00 MG24169 450.00 MG24169 353.00 MG24169 450.00 MG24169 353.00 MG24169 450.00 MG24469 101.00 MG24462 101.00 MG24462 218.00 MG24469 315.00 MG24476 416.00 MG24461 101.00 MG24478 218.00 MG24460 315.00 MG24476 416.00 MG24461 101.00 MG24464 218.00 MG24460 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG24478 416.00 MG24461 315.00 MG2								_	_
60 M617409 123.00 M617439 252.00 M617464 353.00 — — — — — — — — — — — — — — — — — —	40	MG24122	111.00	MG24137	224.00	MG24152	324.00	MG24167	420.00
63 Mg241g4 123.00 Mg241g3 252.00 Mg241f5 353.00 Mg241g9 450.00 CCurve_Mgnetic Setting Between 7 and 10 Times Ampere Bating		MG24123	117.00	MG24138		MG24153		MG24168	438.00
Course—Magnetic Setting Between 7 and 10 Times Ampere Rating								_	_
0.5 MG17411 120.00 MG24442 218.00 MG2449 315.00 MG24476 416.00 1.2 MG17412 1010.00 MG17442 218.00 — — — — — — — — — — — — — — — — — —						MG24154	353.00	MG24169	450.00
1 MG24425 101.00 MG24442 218.00 MG24459 315.00 MG24477 416.00 1.5 MG17412 101.00 MG17442 218.00 MG24451 315.00 MG24477 416.00 1.5 MG24428 101.00 MG24443 218.00 MG24460 315.00 MG24477 416.00 1.5 MG24428 101.00 MG244445 218.00 MG24461 315.00 MG24479 416.00 1.5 MG24428 101.00 MG24445 218.00 MG24461 315.00 MG24479 416.00 1.5 MG24420 101.00 MG24445 218.00 MG24462 315.00 MG24479 416.00 1.5 MG24420 101.00 MG244447 218.00 MG24464 315.00 MG24479 416.00 1.5 MG24420 101.00 MG24447 218.00 MG24464 315.00 MG24479 416.00 1.5 MG24420 101.00 MG24447 218.00 MG24464 315.00 MG24497 116.00 1.5 MG24427 218.00 MG24464 315.00 MG24428 116.00 MG24431 101.00 MG24448 218.00 MG24464 315.00 MG24482 416.00 1.3 MG24433 101.00 MG24448 218.00 MG24466 315.00 MG24482 416.00 1.3 MG24433 101.00 MG244450 218.00 MG24466 315.00 MG24489 416.00 1.5 MG24433 101.00 MG244450 218.00 MG24468 315.00 MG24489 416.00 1.5 MG24434 101.00 MG24445 218.00 MG24468 315.00 MG24489 416.00 1.5 MG24434 101.00 MG24452 218.00 MG24468 315.00 MG24489 416.00 1.5 MG24434 101.00 MG24452 218.00 MG24468 315.00 MG24488 416.00 1.5 MG24434 101.00 MG24452 218.00 MG24468 315.00 MG24468 416.00 1.5 MG24434 101.00 MG24452 218.00 MG24468 315.00 MG24467 416.00 1.5 MG24454 101.00 MG24452 218.00 MG24468 315.00 MG24467 416.00 1.5 MG24454 101.00 MG24452 218.00 MG24478 315.00 MG24468 116.00 1.5 MG24458 110.00 MG24454 218.00 MG24473 315.00 MG24468 116.00 1.5 MG24458 110.00 MG24454 218.00 MG24472 315.00 MG24488 116.00 1.5 MG24458 110.00 MG24454 218.00 MG24472 315.00 MG24489 420.00 MG24449 110.00 MG24458 218.00 MG24472 315.00 MG24488 416.00 1.5 MG24459 110.00 MG24458 218.00 MG24472 315.00 MG24489 420.00 MG24489 110.00 MG24458 218.00 MG24472 315.00 MG24489 420.00 MG24459 110.00 MG24459 128.00 MG24459 315.00 MG24459 416.00 MG24559 110.00 MG24559 218.00 MG24553 315.00 MG24559 416.00 1.5 MG24590 110.00 MG24559 218.00 MG24553 315.00 MG24559 416.00 1.5 MG24590 110.00 MG24559 218.00 MG24553 315.00 MG24559 416.00 1.5 MG24590 110.00 MG24559 218.00 MG24551 315.00 MG24559 416.00 1.5 MG24559 110.00 MG24559 218.				s Ampere Rating					
1.2   MG17412   101.00   MG17442   218.00   —   —   —   —   —   —   —   —   —				_	_	_	_	_	_
1.5   MG17413   101.00   MG24443   218.00   MG24460   315.00   MG2447   416.00   MG24428   101.00   MG244445   218.00   MG24461   315.00   MG24479   416.00   MG24428   101.00   MG244445   218.00   MG24462   315.00   MG24479   416.00   MG24430   101.00   MG24447   218.00   MG24464   315.00   MG24479   416.00   MG24430   101.00   MG24447   218.00   MG24464   315.00   MG24479   416.00   MG24430   101.00   MG24447   218.00   MG24464   315.00   MG24431   416.00   MG24431   101.00   MG24448   218.00   MG24466   315.00   MG24432   416.00   MG24433   101.00   MG24449   218.00   MG24466   315.00   MG24433   416.00   MG24430   218.00   MG24466   315.00   MG24434   416.00   MG24433   101.00   MG244490   218.00   MG24466   315.00   MG24434   416.00   MG24434   101.00   MG24445   218.00   MG24468   315.00   MG24434   416.00   MG24434   101.00   MG24451   218.00   MG24468   315.00   MG24435   416.00   MG24438   315.00   MG24435   416.00   MG24439   416.00   MG24439   416.00   MG24439   416.00   MG24439   416.00   MG24431   416.00   MG24438   416.00   MG24439   MG24439   MG24439   MG24439   4						MG24459	315.00	MG24476	416.00
2 MG24427 101.00 MG24443 116.00 MG24446 315.00 MG24478 416.00 3 MG24427 101.00 MG24444 218.00 MG24466 315.00 MG24479 416.00 4 MG24428 101.00 MG24445 218.00 MG24466 315.00 MG24479 416.00 5 MG17414 101.00 MG17444 218.00 MG24464 315.00 MG24479 416.00 6 MG24430 101.00 MG24447 218.00 MG24468 315.00 MG24481 416.00 7 MG17415 101.00 MG27445 218.00 MG24468 315.00 MG24481 416.00 10 MG24432 101.00 MG24448 218.00 MG24468 315.00 MG24483 416.00 113 MG24433 101.00 MG24449 218.00 MG24466 315.00 MG24483 416.00 113 MG24433 101.00 MG244461 218.00 MG17466 315.00 MG24484 416.00 116 MG24434 101.00 MG24451 218.00 MG17466 315.00 MG24485 416.00 20 MG24435 101.00 MG24452 218.00 MG17466 315.00 MG24485 416.00 25 MG24436 101.00 MG24452 218.00 MG24469 315.00 MG24486 416.00 30 MG17417 101.00 MG24452 218.00 MG24469 315.00 MG24486 416.00 30 MG17417 101.00 MG24454 218.00 MG17467 315.00 MG24486 416.00 30 MG17417 101.00 MG24454 218.00 MG17467 315.00 MG24486 416.00 30 MG17417 101.00 MG24454 218.00 MG17467 315.00 MG24489 416.00 30 MG17417 101.00 MG24454 218.00 MG17467 315.00 MG24489 416.00 30 MG17418 101.00 MG24454 218.00 MG17468 315.00 MG24489 420.00 35 MG24439 117.00 MG24456 228.00 MG17469 335.00 MG24490 438.00 60 MG17419 123.00 MG17449 252.00 MG17469 335.00 MG24490 438.00 60 MG17419 123.00 MG17449 252.00 MG24477 333.00 MG24490 438.00 61 MG24480 110.00 MG24457 252.00 MG24477 353.00 MG24491 450.00 62 MG24490 101.00 MG24518 218.00 MG24533 315.00 MG24490 438.00 63 MG24400 123.00 MG17452 218.00 MG24533 315.00 MG2458 416.00 63 MG24400 101.00 MG24518 218.00 MG24533 315.00 MG2455 416.00 64 MG24502 101.00 MG24519 218.00 MG24533 315.00 MG2455 416.00 65 MG24501 101.00 MG24551 218.00 MG24533 315.00 MG24559 416.00 66 MG24501 101.00 MG24551 218.00 MG24534 315.00 MG24555 416.00 7 MG17422 101.00 MG17454 218.00 MG24553 315.00 MG24555 416.00 67 MG24501 101.00 MG24560 218.00 MG24543 315.00 MG24555 416.00 68 MG24501 101.00 MG24562 218.00 MG24543 315.00 MG24555 416.00 69 MG24501 101.00 MG24562 218.00 MG24543 315.00 MG24555 416.00 60 MG17428 101.00 MG24562 218.00 MG2						_	_	_	_
3 M/G24427 101.00 M/G24444 218.00 M/G24462 315.00 M/G24478 416.00 4 M/G24428 101.00 M/G244444 218.00 M/G24462 5 M/G17414 101.00 M/G17444 218.00 M/G24464 315.00 M/G24479 416.00 7 M/G17415 101.00 M/G17445 218.00 M/G24465 315.00 M/G24481 416.00 7 M/G17415 101.00 M/G24448 218.00 M/G24465 315.00 M/G24482 416.00 10 M/G24432 101.00 M/G244489 218.00 M/G24465 315.00 M/G24483 416.00 113 M/G24433 101.00 M/G24449 218.00 M/G24466 315.00 M/G24484 416.00 115 M/G17416 101.00 M/G17446 218.00 M/G24466 315.00 M/G24484 416.00 120 M/G24435 101.00 M/G24452 218.00 M/G24468 315.00 M/G24486 416.00 20 M/G24435 101.00 M/G24452 218.00 M/G24468 315.00 M/G24486 416.00 25 M/G24435 101.00 M/G24452 218.00 M/G24468 315.00 M/G24486 416.00 25 M/G24435 101.00 M/G24452 218.00 M/G24468 315.00 M/G24486 416.00 25 M/G24435 101.00 M/G24452 218.00 M/G24469 315.00 M/G24487 416.00 25 M/G24435 101.00 M/G24452 218.00 M/G24469 315.00 M/G24487 416.00 26 M/G24435 101.00 M/G24452 218.00 M/G24470 315.00 M/G24487 416.00 27 M/G24438 101.00 M/G24454 218.00 M/G24471 315.00 M/G24488 416.00 28 M/G24437 101.00 M/G24454 218.00 M/G24471 315.00 M/G24488 416.00 30 M/G17418 101.00 M/G24455 228.00 M/G24471 315.00 M/G24488 416.00 31 M/G17418 101.00 M/G24455 228.00 M/G24471 315.00 M/G24489 438.00 30 M/G17419 123.00 M/G24457 250.00 M/G24473 335.00 M/G24489 438.00 30 M/G17419 123.00 M/G24457 250.00 M/G24473 335.00 M/G24489 438.00 31 M/G17419 123.00 M/G24457 250.00 M/G24453 315.00 M/G24489 438.00 31 M/G17419 123.00 M/G24457 250.00 M/G24453 315.00 M/G24459 438.00 31 M/G17412 100.00 M/G17452 218.00 M/G17488 353.00 M/G24490 438.00 31 M/G17412 100.00 M/G24516 218.00 M/G2453 315.00 M/G2456 416.00 31 M/G24501 101.00 M/G24516 218.00 M/G2453 315.00 M/G2455 416.00 31 M/G24501 101.00 M/G24518 218.00 M/G2453 315.00 M/G2455 416.00 31 M/G24501 101.00 M/G24518 218.00 M/G2453 315.00 M/G2455 416.00 31 M/G24500 101.00 M/G24520 218.00 M/G2453 315.00 M/G2455 416.00 31 M/G24501 101.00 M/G24520 218.00 M/G2453 315.00 M/G2455 416.00 31 M/G24501 101.00 M/G24525 218.00 M/G2453 315.00 M/G2455 416.00 31 M/									
4 MG24428 101.00 MG24445 218.00 MG24465 315.00 MG24479 416.00 − − − − − − − − − − − − − − − − − −									
5         MG17414         101.00         MG24447         218.00         MG24481         315.00         MG24481         416.00           7         MG17415         101.00         MG17445         218.00         MG24468         315.00         MG24482         416.00           8         MG24431         101.00         MG24448         218.00         MG24466         315.00         MG24483         416.00           10         MG24432         101.00         MG24449         218.00         MG24467         315.00         MG24488         416.00           15         MG17416         101.00         MG24451         218.00         MG24468         315.00         MG24485         416.00           20         MG24435         101.00         MG24452         218.00         MG24468         315.00         MG24486         416.00           25         MG24435         101.00         MG24452         218.00         MG24470         315.00         MG24486         416.00           30         MG17417         101.00         MG24452         218.00         MG24471         315.00         MG24488         416.00           32         MG24437         101.00         MG17448         218.00         MG24471         315									
6 MG244430 101.00 MG24447 218.00 MG24464 315.00 MG24481 416.00 10 MG24431 101.00 MG24448 218.00 MG24466 315.00 MG24482 416.00 10 MG244432 101.00 MG24449 218.00 MG24466 315.00 MG24483 416.00 13 MG244433 101.00 MG24449 218.00 MG24466 315.00 MG24488 416.00 15 MG17416 101.00 MG17446 218.00 MG17466 315.00 — — — — — — — — — — — — — — — — — —							_		_
7 MG17415 101.00 MG24448 218.00 MG24466 315.00 MG24483 416.00 10 MG24432 101.00 MG24449 218.00 MG24466 315.00 MG24483 416.00 113 MG24432 101.00 MG24450 218.00 MG24467 315.00 MG24488 416.00 115 MG17416 101.00 MG7446 218.00 MG24467 315.00 MG24488 416.00 120 MG24435 101.00 MG24451 218.00 MG24468 315.00 MG24488 416.00 220 MG24435 101.00 MG24451 218.00 MG24468 315.00 MG24486 416.00 25 MG24436 101.00 MG24452 218.00 MG24469 315.00 MG24486 416.00 25 MG24436 101.00 MG24452 218.00 MG24467 315.00 MG24486 416.00 26 MG24437 101.00 MG24452 218.00 MG24470 315.00 MG24486 416.00 30 MG17417 101.00 MG17447 218.00 MG17467 315.00 MG24488 416.00 31 MG17418 101.00 MG24452 218.00 MG24471 315.00 MG24488 416.00 35 MG24438 111.00 MG24452 218.00 MG24471 315.00 MG24488 416.00 50 MG24438 111.00 MG24455 224.00 MG24471 315.00 MG24489 420.00 50 MG24438 111.00 MG24455 224.00 MG24473 338.00 MG24490 438.00 60 MG17419 123.00 MG17447 252.00 MG17469 353.00 MG24499 438.00 63 MG24440 123.00 MG24456 224.00 MG24473 338.00 MG24490 438.00 63 MG24440 123.00 MG17449 252.00 MG17469 353.00 MG24491 450.00  1 MG24450 101.00 MG244516 218.00 MG2453 315.00 MG24454 416.00 1.2 MG17422 101.00 MG17452 218.00 MG24533 315.00 MG24584 416.00 1.2 MG17422 101.00 MG17452 218.00 MG24534 315.00 MG2459 416.00 1.2 MG24501 101.00 MG24516 218.00 MG24534 315.00 MG2459 416.00 1.2 MG24501 101.00 MG24516 218.00 MG24534 315.00 MG24550 416.00 1.3 MG24501 101.00 MG24517 218.00 MG24534 315.00 MG24551 416.00 1.4 MG24501 101.00 MG17452 218.00 MG24534 315.00 MG24551 416.00 1.5 MG17424 101.00 MG17452 218.00 MG24539 315.00 MG24551 416.00 1.6 MG24501 101.00 MG24517 218.00 MG24539 315.00 MG24551 416.00 1.6 MG24501 101.00 MG24525 218.00 MG24534 315.00 MG24555 416.00 1.5 MG17425 101.00 MG24525 218.00 MG24534 315.00 MG24555 416.00 1.5 MG17425 101.00 MG24525 218.00 MG24539 315.00 MG24555 416.00 1.0 MG24509 101.00 MG24525 218.00 MG24534 315.00 MG24555 416.00 1.0 MG24509 101.00 MG24525 218.00 MG24534 315.00 MG24555 416.00 1.0 MG24509 101.00 MG24525 218.00 MG24544 335.00 MG24555 416.00 1.0 MG24501 101.						MG24464	315.00	MG24481	416.00
10				MG17445		_	_	_	_
13	8	MG24431	101.00	MG24448	218.00	MG24465	315.00	MG24482	416.00
15									
16								MG24484	416.00
20								<del>-</del>	
25									
30									
32   MG24437   101.00   MG24454   218.00   MG24471   315.00   MG24488   416.00								NG24487	416.00
35								MG24488	416.00
40         MG24438         111.00         MG24456         224.00         MG24472         324.00         MG24489         420.00           50         MG24439         117.00         MG24456         240.00         MG24473         338.00         MG24490         438.00           60         MG17419         123.00         MG17449         252.00         MG24474         353.00         MG24491         450.00           D Curve—Magnetic Setting Between 10 and 14 Times Ampere Rating           0.5         MG17421         120.00         —         <									_
50         MG24439         117.00         MG24456         240.00         MG24473         338.00         MG24490         438.00           63         MG24440         123.00         MG17449         252.00         MG17469         353.00         —         —           0.5         MG24474         353.00         MG24491         450.00         —								MG24489	420.00
D Curve	50								
D Curve	60	MG17419	123.00	MG17449	252.00	MG17469	353.00	_	_
0.5         MG17421         120.00         —	63	MG24440	123.00	MG24457	252.00	MG24474	353.00	MG24491	450.00
1         MG24500         101.00         MG24516         218.00         MG24532         315.00         MG24548         416.00           1.2         MG177423         101.00         MG17452         218.00         —         <	D Curve—Magnetic	Setting Betwee	n 10 and 14 Tim	es Ampere Ratin	ıg				
1.2       MG17422       101.00       MG17452       218.00       —<	0.5	MG17421	120.00	_	_	_	_	_	_
1.5         MG17423         101.00         MG17453         218.00         —         —         —         —           2         MG24501         101.00         MG24517         218.00         MG24533         315.00         MG24549         416.00           3         MG24502         101.00         MG24518         218.00         MG24534         315.00         MG24550         416.00           4         MG24503         101.00         MG24519         218.00         MG24535         315.00         MG24551         416.00           5         MG17424         101.00         MG17454         218.00         —<	1	MG24500	101.00	MG24516	218.00	MG24532	315.00	MG24548	416.00
2         MG24501         101.00         MG24517         218.00         MG24533         315.00         MG24549         416.00           3         MG24503         101.00         MG24518         218.00         MG24534         315.00         MG24550         416.00           4         MG24503         101.00         MG24519         218.00         MG24535         315.00         MG24551         416.00           5         MG17424         101.00         MG17454         218.00         —         —         —         —         —           6         MG24504         101.00         MG24520         218.00         MG24536         315.00         MG24552         416.00           7         MG17425         101.00         MG24521         218.00         MG24536         315.00         MG24552         416.00           10         MG24505         101.00         MG24522         218.00         MG24537         315.00         MG24553         416.00           13         MG24506         101.00         MG24522         218.00         MG24538         315.00         MG24555         416.00           15         MG17426         101.00         MG17456         218.00         MG17471         315.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td>  -</td> <td>_  </td> <td>_</td> <td>_</td>						-	_	_	_
3         MG24502         101.00         MG24518         218.00         MG24534         315.00         MG24550         416.00           4         MG24503         101.00         MG24519         218.00         MG24535         315.00         MG24551         416.00           5         MG17424         101.00         MG17454         218.00         —								_	
4         MG24503         101.00         MG24519         218.00         MG24535         315.00         MG24551         416.00           5         MG177424         101.00         MG24520         218.00         —         —         —         —           6         MG24504         101.00         MG24520         218.00         MG24536         315.00         MG24522         416.00           7         MG177425         101.00         MG24525         218.00         —         —         —         —           8         MG24505         101.00         MG24521         218.00         MG24538         315.00         MG24553         416.00           10         MG24506         101.00         MG24522         218.00         MG24538         315.00         MG24554         416.00           13         MG24507         101.00         MG24523         218.00         MG24539         315.00         MG24555         416.00           15         MG17426         101.00         MG17456         218.00         MG17471         315.00         —         —           16         MG24508         101.00         MG24524         218.00         MG24541         315.00         MG24556         416.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
5         MG17424         101.00         MG17454         218.00         —									
6 MG24504 101.00 MG24520 218.00 MG24536 315.00 MG24552 416.00 7 MG17425 101.00 MG17455 218.00 — — — — — — — — — — — — — — — — — —						IVIG24535	315.00	IVIG2455 I	410.00
7         MG17425         101.00         MG17455         218.00         —         —         —         —           8         MG24505         101.00         MG24521         218.00         MG24537         315.00         MG24553         416.00           10         MG24506         101.00         MG24522         218.00         MG24538         315.00         MG24554         416.00           13         MG24507         101.00         MG24523         218.00         MG24539         315.00         MG24555         416.00           15         MG17426         101.00         MG17456         218.00         MG17471         315.00         —         —           16         MG24508         101.00         MG24524         218.00         MG24540         315.00         MG24556         416.00           20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG24527         218.00         MG17472         315.00         —	•					MG24536	315.00	MG24552	416.00
8         MG24505         101.00         MG24521         218.00         MG24537         315.00         MG24553         416.00           10         MG24506         101.00         MG24522         218.00         MG24538         315.00         MG24554         416.00           13         MG24507         101.00         MG24523         218.00         MG24539         315.00         MG24555         416.00           15         MG17426         101.00         MG17456         218.00         MG17471         315.00         —         —           16         MG24508         101.00         MG24524         218.00         MG24540         315.00         MG24556         416.00           20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG17472         315.00 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td>_</td></td<>							_		_
13         MG24507         101.00         MG24523         218.00         MG24539         315.00         MG24555         416.00           15         MG17426         101.00         MG17456         218.00         MG17471         315.00         —         —           16         MG24508         101.00         MG24524         218.00         MG24540         315.00         MG24556         416.00           20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG24543         315.00         MG24558         416.00           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG24528         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>MG24537</td><td>315.00</td><td>MG24553</td><td>416.00</td></t<>						MG24537	315.00	MG24553	416.00
15         MG17426         101.00         MG17456         218.00         MG17471         315.00         —         —           16         MG24508         101.00         MG24524         218.00         MG24540         315.00         MG24556         416.00           20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG24544         324.00         MG24561 </td <td>10</td> <td>MG24506</td> <td>101.00</td> <td>MG24522</td> <td>218.00</td> <td>MG24538</td> <td>315.00</td> <td>MG24554</td> <td>416.00</td>	10	MG24506	101.00	MG24522	218.00	MG24538	315.00	MG24554	416.00
16         MG24508         101.00         MG24524         218.00         MG24540         315.00         MG24556         416.00           20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG245444         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG24544         324.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         <	13	MG24507		MG24523	218.00	MG24539		MG24555	416.00
20         MG24509         101.00         MG24525         218.00         MG24541         315.00         MG24557         416.00           25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG24544         324.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><del></del></td> <td>_</td>								<del></del>	_
25         MG24510         101.00         MG24526         218.00         MG24542         315.00         MG24558         416.00           30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG24545         338.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00									
30         MG17427         101.00         MG17457         218.00         MG17472         315.00         —         —           32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24528         224.00         MG24545         338.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00									
32         MG24511         101.00         MG24527         218.00         MG24543         315.00         MG24559         416.00           35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG245454         338.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00								IVIG24558	416.00
35         MG17428         101.00         MG17458         218.00         MG17473         315.00         —           40         MG24512         111.00         MG24528         224.00         MG24544         324.00         MG24560         420.00           50         MG24513         117.00         MG24529         240.00         MG24545         338.00         MG24561         438.00           60         MG177429         123.00         MG17459         252.00         MG177474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00								MG24550	416.00
40       MG24512       111.00       MG24528       224.00       MG24544       324.00       MG24560       420.00         50       MG24513       117.00       MG24529       240.00       MG24545       338.00       MG24561       438.00         60       MG17429       123.00       MG17459       252.00       MG17474       353.00       —       —         63       MG24514       123.00       MG24530       252.00       MG24546       353.00       MG24562       450.00								IVIG24559 —	410.00
50         MG24513         117.00         MG24529         240.00         MG24545         338.00         MG24561         438.00           60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00								MG24560	420.00
60         MG17429         123.00         MG17459         252.00         MG17474         353.00         —         —           63         MG24514         123.00         MG24530         252.00         MG24546         353.00         MG24562         450.00									
63 MG24514 <b>123.00</b> MG24530 <b>252.00</b> MG24546 <b>353.00</b> MG24562 <b>450.00</b>								_	_
Interrupting Ratings								MG24562	450.00
	Interrupting Ratings								

 Interrupting Hatings.
 Page 7-3

 Accessories.
 Page 7-20

 Dimensions.
 Page 7-54



MN

Undervoltage Release

C60

SD Alarm Switch

Max. 54 mm

OF Auxiliary Switch

MX

Shunt trip + Aux Switch

Ring Tongue



Terminal



Screw Shield



C60 Padlock Attachment



Heavy-duty Padlock Attachment



Rotary Handle



Label Holders for 2, 3 or 4P C60



Front Mounting Kit for C60 1P, 2P, 3P, 4P (1 per circuit breaker)



MGN26380 Locking Device Left Side Mount



MGN26381 Locking Dev Right Side Mount



Multi-pole Front Mounting Kit





	Teri
	Cor
vice	Too
	Rot
	One

Comb Bus Bar

Table 7.33: Multi 9 C60 Electrical Accessories												
Descriptions	Control \	/oltage	Width in 9 mm	C60 UL/IEC								
	Vac Vdc		modules	Cat. No.	\$ Price							
OF Auxiliary Switch (1a1b)	12–277	12-125	1	MG26925	60.00							
SD Alarm Switch (1a1b)	12–277	12-125	1	MG26928	60.00							
MAY Observed Trians OF Assertions	24	24	2	27118								
MX Shunt Trip + OF Auxiliary Switch (1a1b)	48	48	2	27110	140.00							
CWIGH (1415)	110-240-277	125	2	27109								
	24	24	2	27108								
MN Undervoltage Release	48	48	2	27106	201.00							
WIN Officervoltage helease	120	_	2	27107	201.00							
	240	_	2	27105								
Multi-9 GFP UL 1053 Listed Ground Fault Protectors			c; 30, 100, and 300 mA; t, <b>0860HO0602</b> or Catal									

Table 7.34: Multi 9 C60 Mechanical Accessories

Descriptions		C60		
Descriptions		Cat. No.	\$ Price	
Ring tongue terminal kit for UL1077 C60	For one pole	17400	15.80	
Spacer for DIN rail, Not UL Recognized	9 mm wide	MG27062	9.30	
Padlock Attachment (1 per for 1P, 2P, 3P or 4P)	2 per pack	MG26970	33.20	
Heavy-duty Padlock Attachment for C60, Locks OFF only	2 per pack	M9PAF	60.00	
Padlocking Device Left Side Mount, Locks OFF only▲	4	MGN26380	37.50	
Padlocking Device Right Side Mount, Locks OFF only■	1 per pack	MGN26381	37.50	
•	1P	MG26983	16.80	
Front Mounting 1/2	2P	MG26984	16.80	
Front Mounting Kit	3P	MG26985	16.80	
	4P	MG26989	16.80	
Label holders for 2, 3 or 4P C60 (Not UL Recognized)	Bag of 10	MG27150	51.00	
Terminal Screw Shield (Not UL Recognized)	Bag of two 4P shields	MG26981	51.00	
	1P	MG26975	26.10	
Townsian Lawrence (Nach III. Dannessian all)	2P	MG26976	51.00	
Terminal cover (Not UL Recognized)	3P	MG26975+M	MG26976	
	4P	MG26978	102.00	
	1Ø	MG10285	63.00	
Comb Bus Bar Kit for UL1077 C60, 12 poles, Fixed Length	2Ø	MG10286	69.00	
	3 Ø	MG10287	80.00	
Tooth Caps for UL Comb Bus Bar, Bag of 20		60488	37.80	
Rotary Handle for C60 (Non UL Recognized)		•	•	
Operating Subassembly		MG27046	129.00	
Door Interlock Handle	2P/3P/4P	MG27047	107.00	
Fixed Handle (Front or Lateral)		MG27048	117.00	
Multi-pole Front Mounting Kit	•			
Rail Support (20 of 9 mm modules)		14211	54.00	

- Left-side mounted padlocking device cannot be used in conjunction with accessories SD, OF, MX or MN. Use right-side mounted padlocking device when accessories are required.
- Right-side mounted padlocking device cannot be used in conjunction with VIGI module. Use left-side mounted padlocking device when VIGI Module is required..



# PowerPact™ Molded **Case Circuit Breakers**

## The PowerPact Advantage

- Proven Performance: Industry-leading circuit breaker innovation and protection for heavy-duty commercial and industrial
- Smart: Integrated metering options provide a cost-effective solution to reduce energy consumption, optimize energy costs, and improve energy availablility for your facilities.
- Flexible: Full range of thermal-magnetic and electronic trip molded case circuit breakers from 15 A to 3000 A, delivering the ratings, configurations, and operators for your unique applications.
- Simple: Common catalog numbers, standardized ratings, and a full range of field-installable accessories make product selection, installation and maintenance easier than ever.
- Common Design Features: Mounting holes, door trim, and handle accessories

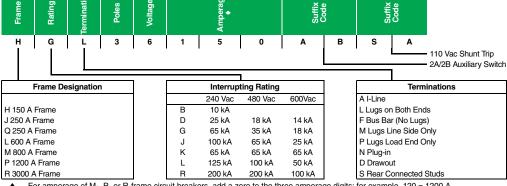
H-Frame 150 A	J-Frame 250 A	Q-Frame 250 A	L-Frame 600 A	M-Frame 800 A	P-Frame 1200 A	R-Frame 3000 A
Newl Electronic Trip Version	Electronic Trip Version		New!		- 1-1-1	) ) ) ) ) 3 3

Table 7.35: **PowerPact Interrupting Ratings** 

Voltage		Interrupting Rating												
	В	D	G	J	K	L	R							
240 Vac	10 kA	25 kA	65 kA	100 kA	65 kA	125 kA	200 kA							
480 Vac		18 kA	35 kA	65 kA	65 kA ▲	100 kA	200 kA							
600 Vac		14 kA	18 kA	25 kA	65 kA ▲	50 kA■	100 kA							

- P-frame K interrupting is 50 kA at 480 and 600 Vac.
- P-frame L interrupting is 25 kA at 600 Vac.

**Table 7.36: Common Catalog Numbering System** 



For amperage of M-, P- or R-frame circuit breakers, add a zero to the three amperage digits; for example, 120 = 1200 A.

DescriptionPage
H- and J-Frame Circuit Breakers
H- and J-Frame Circuit Breakers
Q-Frame Circuit Breakers
L-Frame Circuit Breakers
P-Frame Circuit Breakers
R-Frame Circuit Breakers
PowerPact™ H- and J-Frame Electronic Motor Circuit Protectors 7-29
Motor Circuit Protectors and Motor Protector Circuit Breakers 7-31
Automatic Switches
500 Vdc Circuit Breakers
Mission Critical Circuit Breakers
PowerPact™ Circuit Breaker Accessories
Motor Operators and Rotary Handles
Locks, Installation Accessories, and Rear Connections
Mechanical Lugs
Compression Lugs and Power Distribution Connectors (PDC)7-43
Terminal Nuts, Terminal Pads, Terminal Shields and Accessories 7-44
Plug-In and Drawout Mountings
Micrologic™ Electronic Trip Units
Micrologic™ Trip Unit Accessories

HD and HG 2P Thermal-Magnetic Trip Unit (2P HJ, HL in 3P module)



Table 7.37: H-Frame 150 A Thermal-Magnetic UL Current-Limiting★ Circuit Breakers(600 Vac, 250 Vdc) With Factory Sealed Trip Unit Suitable for Reverse Connection▲

		Fixe	4 40		Interrupting Rating (2nd Letter of Catalog Number)									
	Current	Mag	netic	0 . N	[	)	(	à	J	<b>*</b>	L	*		
	Rating @ 40° C	Ťr	ip	Cat. No.■◆			,	\$ P	rice				Terminal Wire Range	
		Hold	Trip		80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	Wife Hange	
	H-Frame	, 150A 2	P, 600 \	/ac 50/60 Hz, 2	250 Vdc									
	15 A	350 A	750 A	H()L26015(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
	20 A	350 A	750 A	H()L26020(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
	25 A	350 A	750 A	H()L26025(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
	30 A	350 A	750 A	H()L26030(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
	35 A	400 A	850 A	H()L26035(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
it	40 A	400 A	850 A	H()L26040(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
ı	45 A	400 A	850 A	H()L26045(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00		
	50 A	400 A	850 A	H()L26050(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00	AL150HD 14-3/0 AWG	
	60 A	800 A	1450 A	H()L26060(C)	870.00	1044.00	1269.00	1523.00	1559.00	1871.00	2364.00	2837.00	Al or Cu	
	70 A	800 A	1450 A	H()L26070(C)	1062.00	1274.00	1497.00	1797.00	1721.00	2066.00	2613.00	3137.00	7.1.01.00	
	80 A	800 A	1450 A	H()L26080(C)	1062.00	1274.00	1497.00	1797.00	1721.00	2066.00	2613.00	3137.00		
	90 A	800 A	1450 A	H()L26090(C)	1062.00	1274.00	1497.00	1797.00	1721.00	2066.00	2613.00	3137.00		
	100 A	800 A	1700 A	H()L26100(C)	1062.00	1274.00	1497.00	1797.00	1721.00	2066.00	2613.00	3137.00		
	110 A	900 A	1700 A	H()L26110(C)	2072.00	2486.00	3059.00	3671.00	4449.00	5339.00	5534.00	6641.00		
	125 A	900 A	1700 A	H()L26125(C)	2072.00	2486.00	3059.00	3671.00	4449.00	5339.00	5534.00	6641.00		
	150 A	900 A	1700 A	H()L26150(C)	2072.00	2486.00	3059.00	3671.00	4449.00	5339.00	5534.00	6641.00		
	H-Frame	150A 3	P, 600 V	ac 50/60 Hz, 2	50 Vdc						•			
	15 A	350 A	750 A	H()L36015(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	20 A	350 A	750 A	H()L36020(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	25 A	350 A	750 A	H()L36025(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	30 A	350 A	750 A	H()L36030(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	35 A	400 A	850 A	H()L36035(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	40 A	400 A	850 A	H()L36040(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	45 A	400 A	850 A	H()L36045(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00		
	50 A	400 A	850 A	H()L36050(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00	AL150HD 14-3/0 AWG	
	60 A	800 A	1450 A	H()L36060(C)	1088.00	1305.00	1493.00	1791.00	1949.00	2339.00	2849.00	3419.00	Al or Cu	
	70 A	800 A	1450 A	H()L36070(C)	1328.00	1592.00	1701.00	2042.00	2099.00	2519.00	3149.00	3779.00	7.1.01.00	
	80 A	800 A	1450 A	H()L36080(C)	1328.00	1592.00	1701.00	2042.00	2099.00	2519.00	3149.00	3779.00		
ι	90 A	800 A	1450 A	H()L36090(C)	1328.00	1592.00	1701.00	2042.00	2099.00	2519.00	3149.00	3779.00		
	100 A	800 A	1700 A	H()L36100(C)	1328.00	1592.00	1701.00	2042.00	2099.00	2519.00	3149.00	3779.00		
	110 A	900 A	1700 A	H()L36110(C)	2600.00	3120.00	3599.00	4319.00	5174.00	6209.00	6749.00	8099.00		
	125 A	900 A	1700 A	H()L36125(C)	2600.00	3120.00	3599.00	4319.00	5174.00	6209.00	6749.00	8099.00		
	150 A	900 A	1700 A	H()L36150(C)	2600.00	3120.00	3599.00	4319.00	5174.00	6209.00	6749.00	8099.00		

New!

H-Frame Thermal-Magnetic Trip Unit

Table 7.38: J-Frame 250 A Thermal-Magnetic UL Current-Limiting★ Circuit Breakers (600 Vac, 250 Vdc) With Factory Sealed Trip Unit Suitable for Reverse Connection▲

	Adjust	able AC					Interrupting I	Rating (2nd	Letter of Cata	log Number	)			
Current	Magnetic		0-4 No - 4	D			G	J★		L★		F	l <b>★</b>	Terminal
Rating @ 40°C			Cat. No.■ ♦		\$ Price									Wire Range
	Low	High		80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	
J-Frame	250A 2P	, 600 Vac	50/60 Hz, 250 V	Vdc										
150 A	750 A	1500 A	J()L26150(C)	2175.00	2610.00	3212.00	3854.00	4671.00	5606.00	5811.00	6972.00	_	_	AL175JD
175 A	875 A	1750 A	J()L26175(C)	2175.00	2610.00	3212.00	3854.00	4671.00	5606.00	5811.00	6972.00	_	_	4-4/0 AWG Al or Cu
200 A	1000 A	2000 A	J()L26200(C)	2175.00	2610.00	3212.00	3854.00	4671.00	5606.00	5811.00	6972.00	_	_	AL250JD
225 A	1125 A	2250 A	J()L26225(C)	2175.00	2610.00	3212.00	3854.00	4671.00	5606.00	5811.00	6972.00	_	_	3/0 AWG-350 kcmil
250 A	1250 A	2500 A	J()L26250(C)	2988.00	3585.00	4251.00	5102.00	6225.00	7469.00	7194.00	8633.00	_	_	Al or Cu
J-Frame	250A 3P	, 600 Vac	50/60 Hz, 250 V	Vdc										
150 A	750 A	1500 A	J()L36150(C)	2730.00	3276.00	3779.00	4535.00	5432.00	6519.00	7086.00	8504.00	9212.00	11055.00	AL175JD
175 A	875 A	1750 A	J()L36175(C)	2730.00	3276.00	3779.00	4535.00	5432.00	6519.00	7086.00	8504.00	9212.00	11055.00	4-4/0 AWG Al or Cu
200 A	1000 A	2000 A	J()L36200(C)	2730.00	3276.00	3779.00	4535.00	5432.00	6519.00	7086.00	8504.00	9212.00	11055.00	AL250JD
225 A		2250 A	J()L36225(C)	2730.00	3276.00	3779.00	4535.00	5432.00	6519.00	7086.00	8504.00	9212.00	11055.00	3/0 AWG-350 kcmil
250 A		2500 A	J()L36250(C)	3749.00	4499.00	5001.00	6002.00	7238.00	8685.00	8993.00	10791.00	11169.00	13402.00	Al or Cu

- See Supplemental Digest pages 3-2 and 3-3 for circuit breakers with field interchangeable trip units.
- To complete catalog number, replace the blank with the appropriate rating (D, G, J, L).
   For 100% rated circuit breakers add a "C" in the 9th character place (for example, HDL26015C or JDL26150C).
   100% rated H- and J-frame circuit breakers have copper lugs and can only be used with copper wire.
- ★ Circuit breakers with J, L, and R interrupting ratings are UL certified as current limiting..

S = Rear Connected ▼

Table 7.39: H- and J-Frame Termination Options

Termination Let	tter	
A = I-Line (See Section 9) F = No Lugs (includes terminal nut kit on both ends) L = Lugs both ends M = Lugs ON end Terminal Nut Kit OFF end P = Lugs OFF end Terminal Nut Kit ON end	For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.	
N = Plug-in ▼ D = Drawout ▼	<sub>ı</sub> H <sub>ı</sub> G <sub>ı</sub> L <sub>ı</sub> 3 <sub>ı</sub> 6 <sub>ı</sub> 1 <sub>ı</sub> 0 <sub>ı</sub> 0	1

▼ For N and D pricing, add termination pricing on page 7-45 to price. For S pricing, add termination pricing on page 7-41 to price.

LTermination Letter

# Table 7.40: H- and J-Frame Interrupting Ratings

Voltage	Interrupting Rating									
voitage	D	G	J	L	R					
240 Vac	25 kA	65 kA	100 kA	125 kA	200 kA					
480 Vac	18 kA	35 kA	65 kA	100 kA	200 kA					
600 Vac	14 kA	18 kA	25 kA	50 kA	100 kA					

Accessories	
Optional Lugs Dimensions	
Enclosures	Page 7-56

Drawout

Plug-in

Rear Connected



Electronic Trip Version

Table 7.41: H-Frame 150 A and J-Frame 250 A Electronic Trip UL Current-Limiting▲ Circuit Breakers (600 Vac) With Factory Sealed Trip Unit ■ Suitable for Reverse Connection □

Electro	onic Trip U	Init					In	terrupting R	ating (2nd L	etter of Cata	alog Numbe	r)			
			0		D	)	G		J.	<b>\</b>	L	<u> </u>	R	<u> </u>	
Type	Function	Trip	Sensor Rating						\$ Pr	ice					Terminal
.,,,,,							80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated
600 Vac, 5	500 Vac, 50/60 Hz, 3P														
Micrologic Standard	LI	3.2△	60 A 100 A 150 A	H( )L36060(C)U31X H( )L36100(C)U31X H( )L36150(C)U31X	1247.00 1487.00 2759.00	1455.00 1735.00 3220.00	1652.00 1860.00 3758.00	1928.00 2171.00 4386.00	2108.00 2258.00 5333.00	2460.00 2635.00 6224.00	3008.00 3308.00 6908.00	3510.00 3860.00 8062.00	3971.00 4367.00 9119.00	4633.00 5095.00 10642.00	AL150HD★
			250 A	J()L36250(C)U31X	2957.00	3451.00	4006.00	4675.00	5659.00	6604.00	7313.00	8534.00	9653.00	11265.00	AL250JD▼
Micrologic Standard	LSI	3.2S△	60 A 100 A 150 A	H( )L36060(C)U33X H( )L36100(C)U33X H( )L36150(C)U33X	1433.00 1673.00 2945.00	1641.00 1921.00 3405.00	1838.00 2046.00 3944.00	2113.00 2356.00 4571.00	2294.00 2444.00 5519.00	2646.00 2821.00 6409.00	3194.00 3494.00 7094.00	3696.00 4046.00 8247.00	4216.00 4612.00 9364.00	4879.00 5341.00 10886.00	AL150HD★
			250 A	J()L36250(C)U33X	3221.00	3715.00	4270.00	4939.00	5923.00	6868.00	7577.00	8798.00	10002.00	11613.00	AL250JD▼
Micrologic Ammeter	LSI	5.2A	60 A 100 A 150 A	H( )L36060(C)U43X H( )L36100(C)U43X H( )L36150(C)U43X	2031.00 2271.00 3543.00	2240.00 2520.00 4004.00	2436.00 2644.00 4542.00	2712.00 2955.00 5170.00	2892.00 3042.00 6117.00	3244.00 3419.00 7008.00	3792.00 4092.00 7692.00	4295.00 4645.00 8846.00	5005.00 5401.00 10153.00	5669.00 6131.00 11677.00	AL150HD★
			250 A	J()L36250(C)U43X	4075.00	4569.00	5124.00	5793.00	6777.00	7722.00	8431.00	9653.00	11129.00	12742.00	AL250JD▼
Micrologic Energy	LSI	5.2E	60 A 100 A 150 A	H( )L36060(C)U53X H( )L36100(C)U53X H( )L36150(C)U53X	2391.00 2631.00 3903.00	2599.00 2879.00 4363.00	2796.00 3004.00 4902.00	3072.00 3314.00 5529.00	3252.00 3402.00 6477.00	3604.00 3779.00 7367.00	4152.00 4452.00 8052.00	4654.00 5004.00 9205.00	5481.00 5877.00 10629.00	6143.00 6605.00 12151.00	AL150HD★
			250 A	J()L36250(C)U53X	4588.00	5082.00	5637.00	6306.00	7290.00	8235.00	8944.00	10165.00	11806.00	13418.00	AL250JD▼
Micrologic Ammeter	LSIG	6.2A	60 A 100 A 150 A	H( )L36060(C)U44X H( )L36100(C)U44X H( )L36150(C)U44X	2751.00 2991.00 4263.00	2960.00 3240.00 4724.00	3156.00 3364.00 5262.00	3432.00 3675.00 5890.00	3612.00 3762.00 6837.00	3964.00 4139.00 7728.00	4512.00 4812.00 8412.00	5015.00 5365.00 9566.00	5956.00 6352.00 11104.00	6620.00 7082.00 12627.00	AL150HD★
			250 A	J()L36250(C)U44X	5100.00	5594.00	6149.00	6818.00	7802.00	8747.00	9456.00	10678.00	12482.00	14095.00	AL250JD▼
Micrologic Energy	LSIG	6.2E	60 A 100 A 150 A	H( )L36060(C)U54X H( )L36100(C)U54X H( )L36150(C)U54X	3111.00 3351.00 4623.00	3319.00 3599.00 5083.00	3516.00 3724.00 5622.00	3792.00 4034.00 6249.00	3972.00 4122.00 7197.00	4324.00 4499.00 8087.00	4872.00 5172.00 8772.00	5374.00 5724.00 9925.00	6431.00 6827.00 11579.00	7094.00 7556.00 13101.00	AL150HD★
	ouit brooks		250 A	J( )L36250(C)U54X	5613.00	6107.00	6662.00	7331.00	8315.00	9260.00	9969.00	11190.00	13159.00	14771.00	AL250JD▼

Circuit breakers with J, L, and R interrupting ratings are UL certified as current limiting.

Table 7.43:

- See Supplemental Digest page 3-2 for circuit breakers with field-interchangeable trip units
- For 100% rated circuit breakers, add a "C" in the 9th character place (for example, HGL36150CU31X, JGL36250CU43X) 100% rated H- and J-frame circuit breakers have copper lugs and can only be used with copper wire.
- AL150HD wire range is 14-3/0 AWG Al or Cu.
- AL250JD wire range is 3/0 AWG-350 kcmil Al or Cu. For smaller wire range (4-4/0 AWG Al or Cu), replace the lug's wire binding screws with the larger binding screws provided.
- 3P circuit breakers with this trip unit can be used for 2P applications.
- For applications requiring communications see page 7-49.

#### H- and J-Frame Termination Options Table 7.42: **Termination Letter**



H-Frame Micrologic™ Trip Unit

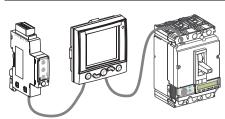
A - I-Line (See Section 9) For factory-installed F = No Lugs (includes terminal nut kit on both ends) termination, place termination L = Lugs both ends letter in the third block of the M = Lugs ON end Terminal Nut Kit OFF end circuit breaker catalog number. P = Lugs OFF end Terminal Nut Kit ON end N = Plug-in ◊  $_{1}H_{1}D_{1}L_{1}3_{1}6_{1}0_{1}1_{1}5_{1}T_{1}$ 

 $\mathsf{D} = \mathsf{Drawout} \ \Diamond$ Letter S = Rear Connected ◊ For N and D pricing, add termination pricing on page 7-45 to price. For S pricing, add termination pricing on page 7-41 to price.

H- and J-Frame Interrupting Ratings

J-Frame Micrologic™ Trip Unit

					•						
Voltage	Interrupting Rating										
voltage	D	G	J	L	R						
240 Vac	25 KA	65 kA	100 kA	125 kA	200 kA						
480 Vac	18 kA	35 kA	65 kA	100 kA	200 kA						
600 Vac	1/ k/	18 ៤∆	25 kA	50 kA	100 kA						



H-Frame Circuit Breaker with Optional FDM and IFM Modules

AccessoriesPa	ge 7-39
Optional LugsPa	ge 7-42
Dimensions	ge 7-55
Enclosures	go 7-56

Class 0734 / Refer to Catalogs: 0734CT0201

QBL 2P 70-250 A



QBL 3P 70-250 A

#### **Table 7.44:** PowerPact Q-Frame ▲ 250 A Thermal-Magnetic Circuit Breaker (240 Vac)

	Fixe	d AC	Interrupting Rating								
Ampere Rating	ng magnetie mp		В		D		G		J		Terminal Wire Range
	Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	9-
2P, 240 Vac											
70 A	1000 A	1800 A	QBL22070	474.00	QDL22070	1143.00	QGL22070	1521.00	QJL22070	1890.00	
80 A	1000 A	1800 A	QBL22080	474.00	QDL22080	1143.00	QGL22080	1521.00	QJL22080	1890.00	
90 A	1000 A	1800 A	QBL22090	474.00	QDL22090	1143.00	QGL22090	1521.00	QJL22090	1890.00	
100 A	1200 A	2400 A	QBL22100	474.00	QDL22100	1143.00	QGL22100	1521.00	QJL22100	1890.00	
110 A	1200 A	2400 A	QBL22110	474.00	QDL22110	1143.00	QGL22110	1521.00	QJL22110	1890.00	
125 A	1200 A	2400 A	QBL22125	474.00	QDL22125	1143.00	QGL22125	1521.00	QJL22125	1890.00	#4 AWG - 300 kcmil Al/Cu
150 A	1200 A	2400 A	QBL22150	474.00	QDL22150	1143.00	QGL22150	1521.00	QJL22150	1890.00	74/04
175 A	1200 A	2400 A	QBL22175	474.00	QDL22175	1143.00	QGL22175	1521.00	QJL22175	1890.00	
200 A	1200 A	2400 A	QBL22200	474.00	QDL22200	1143.00	QGL22200	1521.00	QJL22200	1890.00	
225 A	1200 A	2400 A	QBL22225	474.00	QDL22225	1143.00	QGL22225	1521.00	QJL22225	1890.00	
250 A■	1200 A	2400 A	QBL22250	693.00	QDL22250	1544.00	QGL22250	1970.00	QJL22250	2348.00	
3P, 240 Vac											
70 A	1000 A	1800 A	QBL32070	1248.00	QDL32070	1784.00	QGL32070	2442.00	QJL32070	2796.00	
80 A	1000 A	1800 A	QBL32080	1248.00	QDL32080	1784.00	QGL32080	2442.00	QJL32080	2796.00	
90 A	1000 A	1800 A	QBL32090	1248.00	QDL32090	1784.00	QGL32090	2442.00	QJL32090	2796.00	
100 A	1200 A	2400 A	QBL32100	1248.00	QDL32100	1784.00	QGL32100	2442.00	QJL32100	2796.00	
110 A	1200 A	2400 A	QBL32110	1248.00	QDL32110	1784.00	QGL32110	2442.00	QJL32110	2796.00	
125 A	1200 A	2400 A	QBL32125	1248.00	QDL32125	1784.00	QGL32125	2442.00	QJL32125	2796.00	#4 AWG - 300 kcmil Al/Cu
150 A	1200 A	2400 A	QBL32150	1248.00	QDL32150	1784.00	QGL32150	2442.00	QJL32150	2796.00	Ai/Cu
175 A	1200 A	2400 A	QBL32175	1248.00	QDL32175	1784.00	QGL32175	2442.00	QJL32175	2796.00	
200 A	1200 A	2400 A	QBL32200	1248.00	QDL32200	1784.00	QGL32200	2442.00	QJL32200	2796.00	
225 A	1200 A	2400 A	QBL32225	1248.00	QDL32225	1784.00	QGL32225	2442.00	QJL32225	2796.00	
250 A■	1200 A	2400 A	QBL32250	1812.00	QDL32250	2442.00	QGL32250	3150.00	QJL32250	3465.00	

- Replacement lugs and electrical accessories are not available for PowerPact Q-frame circuit breakers. 250 A requires the use of copper cables only.

#### Table 7.45: **Q-Frame Termination Options** Termination Letter

E = Bolt-on I-Line (See Section 9)

F = No lugs

L = Lugs both ends

M = Lugs ON end, studs on OFF end

P = Lugs OFF end, studs on ON end

For factory-installed termination, place termination letter in the third block of the circuit breaker

catalog number. Q<sub>1</sub>G<sub>1</sub>L<sub>1</sub>3<sub>1</sub>2<sub>1</sub>2<sub>1</sub>0<sub>1</sub>0<sub>1</sub>

Discount Schedule

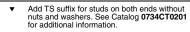
LTermination Letter

Table 7.46: **Q-Frame Interrupting Ratings** 

Voltage	Interrupting Rating							
Voltage	В	D	G	J				
240 Vac♦	10 kA	25 kA	65 kA	100 kA★				

- Q-frame circuit breakers are 240 Vac only.
- 3P QJ circuit breakers are rated at 208Y/120 Vac only.

DimensionsPage 7-55 EnclosuresPage 7-56



# PowerPact™ Circuit **Breakers**

New!)

Table 7.47: L-Frame 600 A Circuit Breakers with Lugs and Factory-Sealed Electronic Trip Units Suitable for Reverse Connection△\*

Electronic Trip Unit		The state					In	terrupting R	ating (2nd L	etter of Cat	alog Numbe	er)			
					)	C	ì	J	<b>♦</b>	L	<b>♦</b>	R	<b>♦</b>		
			Sensor Rating	Cat. No.□					\$ P	rice					Terminal
Туре	Function	Trip Unit			80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	
600 Vac, 5	60/60 Hz, 3	P													
Minunlania			250 A	L( )L36250(C)U31X	4827.00	5648.00	5081.00	5945.00	8478.00	9919.00	9918.00	11604.00	11406.00	13345.00	AL400L61K3▽
Micrologic Standard	LI	3.3☆	400 A 600 A	L( )L36400(C)U31X L( )L36600U31X	4827.00 7109.00	5648.00 —	5081.00 7484.00	5945.00 —	8478.00 10541.00	9919.00	9918.00 11837.00	11604.00 —	11406.00 13613.00	13345.00	AL600LS52K3
Micrologic			250 A	L( )L36250(C)U33X	5391.00	6211.00	5674.00	6538.00	9071.00	10513.00	10511.00	12198.00	12088.00	14028.00	AL400L61K3▽
Standard	LSI	3.3S☆	400 A 600 A	L( )L36400(C)U33X L( )L36600U33X	5391.00 7673.00	6211.00	5674.00 8077.00	6538.00	9071.00 11134.00	10513.00	10511.00 12430.00	12198.00	12088.00 14295.00	14028.00	AL600LS52K3
Micrologic Ammeter	LSI	5.3A	400 A 600 A	L( )L36400(C)U43X L( )L36600U43X	6253.00 8535.00	7073.00 —	6582.00 8984.00	7445.00 —	9979.00 12041.00	11420.00 —	11419.00 13337.00	13105.00	13132.00 15338.00	15071.00 —	
Micrologic Energy	LSI	5.3E	400 A 600 A	L( )L36400(C)U53X L( )L36600U53X	7200.00 9483.00	8021.00	7579.00 9982.00	8443.00	10976.00 13039.00	12418.00	12416.00 14335.00	14103.00	14278.00 16485.00	16218.00 —	AL600LS52K3
Micrologic Ammeter	LSIG	6.3A	400 A 600 A	L( )L36400(C)U44X L( )L36600U44X	8149.00 10431.00	8969.00	8578.00 10980.00	9441.00	11975.00 14037.00	13416.00	13415.00 15333.00	15101.00	15427.00 17633.00	17366.00	ALOUULOSZKO
Micrologic Energy	LSIG	6.3E	400 A 600 A	L( )L36400(C)U54X L( )L36600U54X	9097.00 11379.00	9917.00	9575.00 11978.00	10439.00	12972.00 15035.00	14414.00	14412.00 16331.00	16099.00	16574.00 18781.00	18514.00 —	
600 Vac, 5	60/60 Hz, 4	P													
Micrologic			250 A	L( )L46250(C)U31X	5327.00	6233.00	5581.00	6530.00	8978.00	10501.00	10418.00	12189.00	11981.00	14017.00	AL400L61K4▽
Standard	LI	3.3	400 A 600 A	L( )L46400(C)U31X L( )L46600U31X	6227.00 8509.00	6233.00	6481.00 8884.00	7583.00 —	9878.00 11941.00	11557.00	11318.00 13237.00	13242.00	13016.00 15223.00	15228.00 —	AL600LS52K4
Micrologic			250 A	L( )L46250(C)U33X	5891.00	6796.00	6174.00	7123.00	9571.00	11098.00	11011.00	12783.00	12663.00	14700.00	AL400L61K4∇
Standard	LSI	3.3S	400 A 600 A	L( )L46400(C)U33X L( )L46600U33X	6791.00 9073.00	7849.00 —	7074.00 9477.00	8176.00 —	10471.00 12534.00	12151.00	11911.00 13830.00	13836.00	13698.00 15905.00	15911.00 —	AL600LS52K4
Micrologic Ammeter	LSI	5.3A	400 A 600 A	L( )L46400(C)U43X L( )L46600U43X	7653.00 9935.00	8711.00 —	7982.00 10384.00	9083.00	11379.00 13441.00	13058.00	12819.00 14737.00	14743.00 —	14742.00 16948.00	16954.00 —	
Micrologic Energy	gic ly LSI 5.3E	5.3E	400 A 600 A	L( )L46400(C)U53X L( )L46600U53X	8600.00 10883.00	9659.00 —	8979.00 11382.00	10081.00	12376.00 14439.00	14056.00	13816.00 15735.00	15741.00 —	15888.00 18095.00	18102.00	AL COOL SECULA
Micrologic Ammeter	LSIG	6.3A	400 A 600 A	L( )L46400(C)U44X L( )L46600U44X	9549.00 11831.00	10607.00	9978.00 12380.00	11079.00	13375.00 15437.00	15054.00	14815.00 16733.00	16739.00 —	17037.00 19243.00	19250.00	AL600LS52K4
Micrologic Energy	LSIG	6.3E	400 A 600 A	L( )L46400(C)U54X L( )L46600U54X	10497.00 12779.00	11555.00	10975.00 13378.00	12077.00	14372.00 16435.00	16052.00	15812.00 17731.00	17791.00	18184.00 20391.00	20460.00	

- See Supplemental Digest page 3-4 for circuit breakers with field-interchangeable trip units
  For 100% rated circuit breakers (250 A and 400 A only), add a "C" in the 9th character place (for example, LGL36400CU31X)
  Circuit breakers with J, L, and R interrupting ratings are UL certified as current limiting.

  3P circuit breakers with this trip unit can be used for 2P applications.

- AL400L61K3 terminal wire ranges are (1) 2 AWG–600 kcmil Cu or 1) 2 AWG–500 kcmil Al. AL600LS52K3 terminal wire range is (2) 2/0 AWG–500 kcmil Al/Cu. For applications requiring communicatins see page 7-49.



L-Frame Circuit Breaker

**Termination Options** Table 7.48:

Termination Letter	Termination Option
Α	I-Line (See Section 9)
F	No lugs
L	Lugs both ends
M	Lugs ON end, terminal nut kit OFF end
Р	Lugs OFF end, terminal nut kit ON end
N≎	Plug In
D∳	Drawout
S∳	Rear Connected

For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.

### LGL36600U444X

LTermination Letter

For N and D pricing, add termination pricing on page 7-45 to price. For S pricing, add termination pricing on page 7-41 to price.

Table 7.49:	Interrupting	Ratings
1 able 1.45.	IIILEITUPIIIIQ	nauiiyə

Voltovo	Interrupting Rating								
Voltage	D	G	J	L	R				
240 Vac	25 kA	65 kA	100 kA	125 kA	200 kA				
480 Vac	18 kA	35 kA	65 kA	100 kA	200 kA				
600 Vac	14 kA	18 kA	25 kA	50 kA	100 kA				

Ac	essories
Op	onal Lugs page 7-42
Di	ensions
En	osurespage 7-56

by Schneider Electric
www.schneider-electric.us



M-Frame Circuit Breaker

## Table 7.50: M-Frame 800 A, Basic Electronic Trip System Type ET 1.0 Factory-Sealed Trip Unit

Electroni	io Trip Unit	Sensor		Interrupting			
Electroni	Electronic Trip Unit  Type Function		G		J		Terminal Wire Range (AWG/kcmil)
Туре			Cat. No.	\$ Price	Cat. No.	\$ Price	
2P, 600 Vac 50	/60 Hz						
		300 A	MGL26300	5960.00	MJL26300	7829.00	
		350 A	MGL26350	5960.00	MJL26350	7829.00	
	Fixed	400 A	MGL26400	5960.00	MJL26400	7829.00	
Basic	Long-time,	450 A	MGL26450	5960.00	MJL26450	7829.00	AL800M23K
basic	Adjustable Instantaneous	500 A	MGL26500	5960.00	MJL26500	7829.00	(3) 3/0-500 Al/Cu
	Trip	600 A	MGL26600	5960.00	MJL26600	7829.00	
		700 A	MGL26700	7719.00	MJL26700	9657.00	
		800 A	MGL26800	7719.00	MJL26800	9657.00	
3P, 600 Vac 50	/60 Hz						
		300 A	MGL36300	7560.00	MJL36300	9456.00	
		350 A	MGL36350	7560.00	MJL36350	9456.00	
	Fixed	400 A	MGL36400	7560.00	MJL36400	9456.00	
Di-	Long-time,	450 A	MGL36450	7560.00	MJL36450	9456.00	AL800M23K
Basic	Adjustable Instantaneous	500 A	MGL36500	7560.00	MJL36500	9456.00	(3) 3/0-500 Al/Cu
	Trip	600 A	MGL36600	7560.00	MJL36600	9456.00	
		700 A	MGL36700	9927.00	MJL36700	11882.00	
		800 A	MGL36800	9927.00	MJL36800	11882.00	

The ET 1.0 trip unit cannot be field replaced or have the long-time trip point setting adjusted. It is considered an electronic equivalent of a thermal-magnetic circuit breaker.

Table 7.51: Termination Options

Termination Letter	Termination Option
Α	I-Line (See Section 9)
F	No lugs
L	Lugs both ends
M	Lugs ON end, terminal nut kit OFF end
Р	Lugs OFF end, terminal nut kit ON end

For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.

 $_{1}M_{1}G_{1}L_{1}3_{1}6_{1}4_{1}0_{1}0_{1}$ 

LTermination Letter

## Table 7.52: Frame Interrupting Ratings

Voltage	Interrupting Rating								
voitage	D	G	J	L					
240 Vac	25 kA	65 kA	100 kA	125 kA					
480 Vac	18 kA	35 kA	65 kA	100 kA					
600 Vac	14 kA	18 kA	25 kA	50 kA					

 Accessories
 page 7-39

 Optional Lugs
 page 7-42

 Dimensions
 page 7-55

 Enclosures
 page 7-56

PowerPact™ Circuit **Breakers** 

P-Frame 1200 A (600 Vac, 50/60 Hz) 3P▲ Circuit Breaker with Electronic Trip Unit Table 7.53:

Floring	arta Mata Harte							\$ P	rice				
Electro	nic Trip Unit		Sensor	Cat. No.■♦	G	_	J	•	K	[=	Li	<b>■</b> ★	Terminal
Туре	Function	Trip Unit	Rating		80% Rated	100% Rated ♦	80% Rated	100% Rated ♦	80% Rated	100% Rated ◆	80% Rated	100% Rated ♦	Wire Range
Basic Electronic Trip Unit	Fixed long- time,		600 A 800 A	P( )L36060 P( )L36080	13905.00	_	14783.00	_	14783.00	_	15660.00	_	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
(Not Interchangeable)	Adjustable	ET1.0I	1000 A 1200 A	P()L36100 P()L36120	19049.00	_	20250.00	_	20250.00	_	21452.00	_	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
			250 A 400 A	P()L36025(C)U31A P()L36040(C)U31A									AL DOOM ADDIV
	LI	3.0	600 A 800 A	P()L36060(C)U31A P()L36080(C)U31A P()L36080(C)U31A	14693.00	21510.00	15570.00	22868.00	15570.00	22868.00	16448.00	24224.00	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
Micrologic Interchangeable			1000 A 1200 A	P()L36100(C)U31A P()L36120(C)U31A	19836.00	30239.00	21038.00	32147.00	21038.00	32147.00	22239.00	34052.00	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
Standard Trip Unit			250 A 400 A	P()L36025(C)U33A P()L36040(C)U33A									AL800M23K
	LSI	5.0	600 A 800 A	P()L36060(C)U33A P()L36080(C)U33A	15032.00	21812.00	15909.00	23187.00	15909.00	23187.00	16787.00	24564.00	(3) 3/0 AWG-500 kcmil Al or Cu
			1000 A 1200 A	P()L36100(C)U33A P()L36120(C)U33A	20177.00	30540.00	21378.00	32466.00	21378.00	32466.00	22580.00	34392.00	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
			250 A 400 A	P()L36025(C)U41A P()L36040(C)U41A	15543.00	22266.00	16421.00	23670.00	16421.00	22670.00	17298.00	25076.00	AL800M23K
	LI	3.0A	600 A 800 A	P()L36060(C)U41A P()L36080(C)U41A	15543.00	22200.00	16421.00	23670.00	16421.00	23670.00	17296.00	25076.00	(3) 3/0 AWG-500 kcmil Al or Cu
			1000 A 1200 A	P()L36100(C)U41A P()L36120(C)U41A	20688.00	30995.00	21890.00	32949.00	21890.00	32949.00	23091.00	34904.00	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
Micrologic			250 A 400 A	P()L36025(C)U43A P()L36040(C)U43A	17043.00	23597.00	17921.00	25085.00	17921.00	25085.00	18798.00	26574.00	AL800M23K
Interchangeable Ammeter Trip Unit	LSI	5.0A	600 A 800 A	P( )L36060(C)U43A P( )L36080(C)U43A		20007100					10700.00		(3) 3/0 AWG-500 kcmil Al or Cu
IIIP OIIII			1000 A 1200 A	P()L36100(C)U43A P()L36120(C)U43A	22185.00	32324.00	23387.00	34364.00	23387.00	34364.00	24590.00	36402.00	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
			250 A 400 A	P()L36025(C)U44A P()L36040(C)U44A	18909.00	25256.00	19787.00	26849.00	19787.00	26849.00	20664.00	28442.00	AL800M23K
	LSIG	6.0A	600 A 800 A	P()L36060(C)U44A P()L36080(C)U44A									(3) 3/0 AWG–500 kcmil Al or Cu
			1000 A 1200 A	P()L36100(C)U44A P()L36120(C)U44A	24054.00	33983.00	25256.00	36128.00	25256.00	36128.00	26457.00	38270.00	AL1200P25K (4) 3/0 AWG-500 kcmil Al or Cu
			250 A 400 A 600 A	P()L36025(C)U63AE1 P()L36040(C)U63AE1 P()L36060(C)U63AE1	21455.00	27516.00	22332.00	29252.00	22332.00	29252.00	23210.00	30986.00	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
	LSI	5.0P	800 A 800 A	P()L36080(C)U63AE1									
Micrologic Interchangeable Power			1200 A 1200 A 250 A	P()L36100(C)U63AE1 P()L36120(C)U63AE1 P()L36025(C)U64AE1	26597.00	36243.00	27800.00	38529.00	27800.00	38529.00	29001.00	40814.00	AL1200P25K (4) 3/0 AWG–500 kcmil Al or Cu
Trip Unit			400 A 600 A	P()L36040(C)U64AE1 P()L36060(C)U64AE1	22536.00	28476.00	23414.00	30272.00	23414.00	30272.00	24291.00	32067.00	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
	LSIG	6.0P	800 A 1000 A	P( )L36080(C)U64AE1 P( )L36100(C)U64AE1									AL1200P25K
			1200 A 250 A	P( )L36120(C)U64AE1 P( )L36025(C)U73AE1	27680.00	37203.00	28881.00	39551.00	28881.00	39551.00	30083.00	41895.00	(4) 3/0 AWG–500 kcmil Al or Cu
			400 A 600 A	P( )L36040(C)U73AE1 P( )L36060(C)U73AE1	25538.00	31140.00	26415.00	33104.00	26415.00	33104.00	27291.00	35067.00	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
Miorologia	LSI	5.0H	800 A 1000 A	P()L36080(C)U73AE1 P()L36100(C)U73AE1		20057.00	04004.00	40004.00	04004.00	40004.00	20000 00	44005.00	AL1200P25K
Micrologic Interchangeable Harmonic			1200 A 250 A	P()L36120(C)U73AE1 P()L36025(C)U74AE1	30680.00	39867.00	31881.00	42381.00	31881.00	42381.00	33083.00	44895.00	(4) 3/0 AWG-500 kcmil Al or Cu
Trip Unit	LSIG	6.0H	400 A 600 A	P( )L36040(C)U74AE1 P( )L36060(C)U74AE1	26619.00	32100.00	27497.00	34125.00	27497.00	34125.00	28374.00	36150.00	AL800M23K (3) 3/0 AWG–500 kcmil Al or Cu
	LSIG	0.UH	800 A 1000 A	P( )L36080(C)U74AE1 P( )L36100(C)U74AE1	31761.00	40829.00	32963.00	43404.00	32963.00	43404.00	34166.00	45978.00	AL1200P25K
▲ For 2P ar	nd 4P information	on see (		P()L36120(C)U74AE1 612CT0101.	31701.00	-5025.00	52300.00	-10-10-1.00	02300.00	70707.00	54100.00	4557 0.00	(4) 3/0 AWG–500 kcmil Al or Cu

- For 2P and 4P information see Catalog 0612CT0101.

  To complete the catalog number, replace the () with the appropriate interrupting rating (G, J, K or L).

  For 100% rated circuit breakers add a "C" in the 9<sup>th</sup> character place. For example, the catalog number for a 100% trip unit with LI trip functions at 250A would be PGL36025**C**U31A. For all L interrupting rating, change the 5<sup>th</sup> character (voltage rating) from a 6 (600V) to a 4 (480V); for example, PLL34025U31A. The 480V AIR is standard 100 kA.

#### Table 7.54: **P-Frame Termination Options**

Termination	Letter
F = No Lugs (Includes terminal nut kit on both ends)	For factory-installed termination, place
L = Lugs both ends	termination letter in the third block of
M = Lugs ON end, terminal nut kit OFF end	the circuit breaker catalog number.
P - Luas OFF and terminal nut kit ON and	

 $D = Drawout \blacktriangle$ 

F

A = I-Line (See Section 9)

# <sub>1</sub>P<sub>1</sub>G<sub>1</sub>L<sub>1</sub>3<sub>1</sub>6<sub>1</sub>0<sub>1</sub>4<sub>1</sub>0<sub>1</sub>U<sub>1</sub>4<sub>1</sub>1<sub>1</sub>A<sub>1</sub> LTermination Letter

▲ For D pricing add termination pricing on page 7-45.

#### P-Frame and R-Frame Interrupting Ratings Table 7.55:

Voltage	P-Fr	ame Inter	rupting R	ating	R-Frame Interrupting Rating				
voitage	G	J	K	L	G	J	K	L	
240 Vac	65 kA	100 kA	65 kA	125 kA	65 kA	100 kA	65 kA	125 kA	
480 Vac	35 kA	65 kA	50 kA	100 kA	35 kA	65 kA	65 kA	100 kA	
600 Vac	18 kA	25 kA	50 kA	25 kA	18 kA	25 kA	65 kA	50 kA	

R-frame catalog numbers and pricing	.Page 7-28
Dimensions	.Page 7-55
Trip Unit Options	.Page 7-47
Optional Lugs	.Page 7-42
Alternate Rating Plugs	.Page 7-48
Enclosure	.Page 7-56
Accessories	.Page 7-39

www.schneider-electric.us

Table 7.56: R-Frame 3000 A (600 Vac, 50/60 Hz) 3P▲ Circuit Breaker with Electronic Trip Unit

								\$ P	rice			
Elect	tronic Trip Unit		Sensor	Cat. No. ■ ♦	G	<u> </u> ★		<u> </u>		<u> </u>	l l	<u>.</u>
Туре	Function	Trip Unit	Rating		80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated
		mp om	1200 A	R( )F36120	0070 Hateu	- Too /o Hateu	00 /6 Hateu	-	0078 Hateu	- Too /o Hateu	00 /6 Hateu	-
Basic Electronic Trip Unit	Fixed long-time,	ET4 01	1600 A	R( )F36160	22373.00	_	23549.00	_	23549.00	_	24723.00	_
(Not	Adjustable	ET1.0I	2000 A	R( )F36200		_		_		_		_
Interchangeable)	Instantaneous		2500 A	R( )F36250	35639.00		37512.00	_	37512.00	_	39383.00	_
			600 A	R( )F36060(C)U31A								
			800 A	R( )F36080(C)U31A		27759.00		29301.00		29301.00		30843.00
			1000 A 1200 A	R( )F36100(C)U31A R( )F36120(C)U31A	23160.00		24336.00		24336.00		25511.00	
	LI	3.0	1600 A	R( )F36160(C)U31A		29775.00		31430.00		31430.00	1	33083.00
			2000 A	R( )F36200(C)U31A		35042.00		36989.00		36989.00	1	38936.00
			2500 A	R( )F36250(C)U31A	36426.00	57075.00	38300.00	60248.00	38300.00	60248.00	40170.00	63417.00
Micrologic Interchangeable			3000 A	R( )F36300(C)U31A	54027.00	62451.00	57236.00	65738.00	57236.00	65738.00	60246.00	69024.00
Standard Trip Unit			600 A	R( )F36060(C)U33A								
			800 A	R( )F36080(C)U33A		28065.00		29624.00		29624.00		31184.00
			1000 A 1200 A	R( )F36100(C)U33A R( )F36120(C)U33A	23501.00		24675.00		24675.00		25851.00	
	LSI	5.0	1600 A	R( )F36160(C)U33A		30081.00		31752.00	1	31752.00	1	33423.00
			2000 A	R( )F36200(C)U33A		35348.00		37313.00		37313.00	1	39276.00
			2500 A	R( )F36250(C)U33A	36767.00	57383.00	38640.00	60570.00	38640.00	60570.00	40511.00	63758.00
			3000 A	R( )F36300(C)U33A	54513.00	62757.00	57542.00	66060.00	57542.00	66060.00	60570.00	69363.00
			600 A	R( )F36060(C)U41A								
			800 A	R( )F36080(C)U41A		28493.00		30075.00		30075.00		31658.00
			1000 A 1200 A	R( )F36100(C)U41A R( )F36120(C)U41A	24012.00		25188.00		25188.00		26363.00	
	LI	3.0A	1600 A	R( )F36160(C)U41A		30509.00		32202.00		32202.00		33897.00
			2000 A	R( )F36200(C)U41A		35775.00		37763.00		37763.00	1	39750.00
			2500 A	R( )F36250(C)U41A	37278.00	57809.00	39152.00	61020.00	39152.00	61020.00	41022.00	64232.00
			3000 A	R( )F36300(C)U41A	54918.00	63185.00	57969.00	66510.00	57969.00	66510.00	61020.00	69836.00
			600 A	R( )F36060(C)U43A								
			800 A	R( )F36080(C)U43A		29874.00		31533.00		31533.00		33194.00
Micrologic			1000 A 1200 A	R( )F36100(C)U43A	25511.00		26685.00		26685.00		27860.00	
Interchangeable Ammeter	LSI	5.0A	1200 A 1600 A	R( )F36120(C)U43A R( )F36160(C)U43A		31889.00		33662.00	-	33662.00	1	35433.00
Trip Unit			2000 A	R( )F36200(C)U43A		37158.00		39221.00		39221.00	1	41286.00
			2500 A	R( )F36250(C)U43A	38777.00	59190.00	40649.00	62478.00	40649.00	62478.00	42521.00	65768.00
			3000 A	R( )F36300(C)U43A	56231.00	64569.00	59354.00	67968.00	59354.00	67968.00	62480.00	71367.00
			600 A	R( )F36060(C)U44A								
			800 A	R( )F36080(C)U44A		31556.00		33308.00		33308.00		35061.00
			1000 A	R( )F36100(C)U44A	27378.00		28553.00		28553.00		29729.00	
	LSIG	6.0A	1200 A	R( )F36120(C)U44A		33570.00		35436.00		35436.00		37301.00
			1600 A 2000 A	R( )F36160(C)U44A R( )F36200(C)U44A		38838.00		40995.00		40995.00	1	43154.00
			2500 A	R( )F36250(C)U44A	40644.00	60870.00	43368.00	64253.00	43368.00	64253.00	44388.00	67635.00
			3000 A	R( )F36300(C)U44A	57827.00	66255.00	60965.00	69743.00	60965.00	69743.00	64254.00	73230.00
			600 A	R( )F36060(C)U63AE1								
			800 A	R( )F36080(C)U63AE1		33845.00		35724.00		35724.00		37605.00
			1000 A	R( )F36100(C)U63AE1	29922.00		31097.00		31097.00		32273.00	
	LSI	5.0P	1200 A	R( )F36120(C)U63AE1				07050 00		07050 00		00045.00
			1600 A 2000 A	R( )F36160(C)U63AE1 R( )F36200(C)U63AE1		35859.00 41129.00		37853.00 43413.00	+	37853.00 43413.00	1	39845.00 45698.00
			2500 A	R( )F36250(C)U63AE1	43188.00	63161.00	45062.00	66671.00	45062.00	66671.00	46932.00	70179.00
Micrologic			3000 A	R( )F36300(C)U63AE1	60003.00		63338.00	72161.00	63338.00	72161.00	66671.00	75858.00
Interchangeable Power Trip Unit			600 A	R( )F36060(C)U64AE1								
. 3.10p Offit			800 A	R( )F36080(C)U64AE1		34818.00		36753.00		36753.00		38687.00
			1000 A	R( )F36100(C)U64AE1	31004.00		32180.00	30733.00	32180.00	30733.00	33354.00	30007.00
	LSIG	6.0P	1200 A	R( )F36120(C)U64AE1					-			40000 00
			1600 A 2000 A	R( )F36160(C)U64AE1 R( )F36200(C)U64AE1		36834.00 42102.00		38880.00 44441.00		38880.00 44441.00	-	40926.00 46779.00
			2500 A	R( )F36250(C)U64AE1	44270.00	64136.00	46143.00	67698.00	46143.00	67698.00	48014.00	71261.00
			3000 A	R( )F36300(C)U64AE1	60929.00		64313.00	73188.00	64313.00	73188.00	67698.00	76848.00
			600 A	R( )F36060(C)U73AE1								
			800 A	R( )F36080(C)U73AE1		37518.00		39603.00		39603.00		41687.00
			1000 A	R( )F36100(C)U73AE1	34005.00		35180.00	J9003.00	35180.00	J9003.00	36354.00	71007.00
	LSI	5.0H	1200 A	R( )F36120(C)U73AE1	5.000.00		33.00.00	44	35.00.00	44	1 33331.30	405
			1600 A	R( )F36160(C)U73AE1		39534.00		41730.00		41730.00	4	43928.00
			2000 A 2500 A	R( )F36200(C)U73AE1 R( )F36250(C)U73AE1	47271.00	44801.00 66836.00	49143.00	47291.00 70548.00	49143.00	47291.00 70548.00	51015.00	49779.00 74262.00
Micrologic Interchangeable			3000 A	R( )F36250(C)U73AE1	63494.00		67020.00	76038.00	67020.00	76038.00	70550.00	74262.00
Harmonic Trip			600 A	R( )F36060(C)U74AE1	00454.00	12230.00	01020.00	, 5030.00	0,020.00	, 5030.00	, 0000.00	7 304 1.00
Unit			800 A	R( )F36080(C)U74AE1		20402.00		40004.00		40004.00		40770.00
			1000 A	R( )F36100(C)U74AE1	35087.00	38493.00	36261.00	40631.00	36261.00	40631.00	37436.00	42770.00
	LSIG	6.0H	1200 A	R( )F36120(C)U74AE1	35067.00		30201.00		30201.00			
	2510	0.011	1600 A	R( )F36160(C)U74AE1		40509.00		42758.00		42758.00		45009.00
			2000 A	R( )F36200(C)U74AE1	40050.00	45776.00	E0005 00	48320.00	E0005 00	48320.00		50862.00
			2500 A	R( )F36250(C)U74AE1	48353.00	67809.00	50225.00	71576.00	50225.00	71576.00	52097.00	75344.00
	l		3000 A	R( )F36300(C)U74AE1	64419.00	73212.00	67997.00	77066.00	67997.00	77066.00	71577.00	80919.00

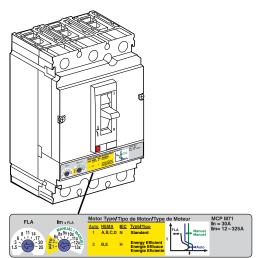
3000 A R ()F36300(C)U74AE1 64419.00 73212.00 67997.00 77066.00 67997.00 77066.00 71577.00 80919.00 R-frame circuit breakers can be bus- or cable-connected. For cable connections, optional terminal pad kit RLTB or equivalent bus structure is required. Each RLTB kit contains terminal pads for one end of the circuit breaker only and has provisions for mounting a maximum of 8 lugs per phase (9 lugs for 3000 A). RLTB kits are included with 2500 A 100% rated circuit breakers. The RL3TB kits are included with the 3000 A, 80% and 100% rated circuit breakers. For other circuit breakers, order terminal pad kit (RLTB) and optional lugs separately. See pages 7-42-7-44.

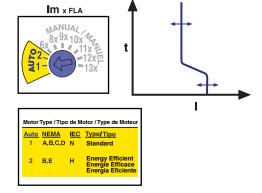
See page 7-27 for interrupting ratings table.

For 2P and 4P information see Catalog **0612CT0101**.

To complete the catalog number, replace the blank () with the appropriate interrupting rating (G, J, K or L). Listed catalog numbers are for 80% rated circuit breakers. For 100% rated circuit breakers add a "C" in the 9<sup>th</sup> character place. For example, the catalog number for a 100% standard trip unit with LI trip functions at 2500A would be RGF36250CU31A.







PowerPact H- and J-frame electronic Motor Circuit Protectors (MCP) are magnetic-only instantaneous-trip circuit breakers. They are designed to offer short circuit protection and are National Electrical Code (NEC) compliant when installed as part of a combination controller having motor overload protection. MCP circuit breakers accept the same accessories and terminals as the equivalent thermal-magnetic circuit breakers.

Determine the hp rating from the nameplate of the motor. Select a MCP with an ampere rating recommended for the hp and voltage involved. When using the automatic settings the MCP microprocessor automatically adjusts the trip settings for both current and time to align with the start-up characteristic for the motor type, whether it is a standard or energy-efficient motor. This includes a dampening means to accommodate a transient motor inrush current without nuisance tripping of the circuit breaker.

Table 7.57: H- and J-Frame Electronic Motor Circuit Protectors (MCP)

						Interrupt	ing Rating	
Frame	Sensor Rating	Full Load Amperes Range	Adjustable Instantaneous Trip Range	Suffix	J (See SCCR Tabl	e Below)	L (See SCCR Tabl	e Below)
		3-			Cat. No.	\$ Price	Cat. No.	\$ Price
	30 A	1.5–25 A	9–325 A	M71	HJL36030M71	1089.00	HLL36030M71	1223.00
H-Frame	50 A	14–42 A	84-546 A	M72	HJL36050M72	1385.00	HLL36050M72	1553.00
п-гіапіе	100 A	30–80 A	180-1040 A	M73	HJL36100M73	1646.00	HLL36100M73	1827.00
	150 A	58-130 A	348-1690 A	M74	HJL36150M74	2069.00	HLL36150M74	2306.00
J-Frame	250 A	114-217 A	684-2500 A	M75	JJL36250M75	2393.00	JLL36250M75	2673.00

Table 7.58: Maximum Rating or Setting of Motor Protective Devices▲

	Suna of Mateu	Percentage of Full-load Current			
	ype of Motor	Setting	Not to Exceed■		
A, B, C, D	Standard	800%	1300%		
B, E	Energy Efficient	1100%	1700%		

- Based on 2005 NEC Table 430.52.
- See NEC Exception No. 1 to Table 430.52. The NEC 1300% maximum setting may be inadequate for instantaneous trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from "start" to "run," constant hp multi-speed motors, and motors labeled "high efficiency."

Table 7.59: MCP Selection by HP Ratings ♦ of Induction-type Squirrel-Cage and Wound-rotor Motors★

	3Ø 60 Hz \	Voltages▼		Full-Load Amperes	Suffix
200 Vac	230 Vac	460 Vac	575 Vac	ruii-Load Amperes	Sullix
.5–5	.5–7.5	.75–15	1–20	1.5–25	M71
5–10	5–15	10–30	15–40	14–42	M72
10–25	15–30	25–60	30–75	30–80	M73
20–40	25–50	50-100	60–125	58–130	M74
40–60	50–75	100–150	125–200	114–217	M75

- Based on 2005 NEC Table 430.250.
- Per NEC 430.3, part-winding motors should select two circuit breakers, each at not more than one-half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per NEC 430.103.
- ▼ Listed voltages are rated motor voltages. Corresponding system voltages are 200 Vac, 220–240 Vac, 440–480 Vac and 550–600 Vac. Select wire and circuit breakers based on horsepower rather than nameplate full-load current per NEC 430.6 (A) for general motor applications.

# Short Circuit Current Rating (SCCR)

Tested to meet NEC and UL508A requirements for short circuit current ratings as part of an approved combination controller.

Table 7.60: Short Circuit Current Ratings (SCCR)

			Interrupt	ing Rating		
Contactor/Starter		J			L	
	200-240 Vac	480 Vac	600 Vac	200-240 Vac	480 Vac	600 Vac
sys D-line and F-line	100 kA	65 kA	25 kA	125 kA	100 kA	50 kA
NEMA Type S	100 kA	65 kA	25 kA	125 kA	100 kA	50 kA
	Contactor/Starter  sys D-line and F-line  NEMA Type S	200–240 Vac sys D-line and F-line 100 kA	200–240 Vac         480 Vac           sys D-line and F-line         100 kA         65 kA	Contactor/Starter	Contactor/Starter J J 200–240 Vac 480 Vac 600 Vac 200–240 Vac sys D-line and F-line 100 kA 65 kA 25 kA 125 kA	Contactor/Starter         J         L           200-240 Vac         480 Vac         600 Vac         200-240 Vac         480 Vac           sys D-line and F-line         100 kA         65 kA         25 kA         125 kA         100 kA

See www.us.schneider-electric.us for specific ratings and combination ID numbers.

Accessories	
Optional Lugs	
Dimensions	Page 7-55
Enclosures	Page 7-56

To select combination starters and motor controllers using MCP's meeting NEC Article 430, refer to pages 16-34—16-36.

	H
	Ė
	-
	ľ
	_
	7
-	М
ีก	
RC	
	Œ
-	E
G	H
	п
_	
Ξ	Е
	2
_	
10	П
	4
77	_
111	3
- 22	e
ㅈ	П
-	г
100	Е
77	ш
-	П
Ŋ	C
	7
	g
	н

lorsepower Rat Starter Size	ing of Induction-ty 200 Vac	ype Squirrel-cage	and Wound-rotor 480 Vac	Motors 3Ø 60 Hz 575 Vac	NEC Full Load Amperes	PowerPact I J-Frame Ele	I-Frame and ctronic MCP
0.20				1/2	0.9 A		
			1/2		1.1 A	1	
				3/4	1.3 A	PowerPact h J-Frame Ele  HJL36030M71 and HLL36030M71 1/2–10 hp  HJL36100M73 and HLL36100M73 15–50 hp	
			3/4	1	1.7 A		
			1		2.1 A		
		1/2			2.2 A		
				1-1/2	2.4 A	1	
	1/2				2.5 A	1	
				2	2.7 A	1	
			1-1/2		3 A	1	
00		3/4			3.2 A	1	
			2		3.4 A	1	
	3/4	İ		i	3.7 A	1	
				3	3.9 A		
		1		Ĭ	4.2 A		
	1				4.8 A	HJL36030M71	
			3		4.8 A	and HLL36030M71	
		1-1/2	J		6 A		
		1 1/2		5	6.1 A	1/2-10 hp	
		2			6.8 A		
	1-1/2	_			6.9 A	and HLL36030M71  1/2–10 hp  HJL36100M73 and HLL36100M73  15–50 hp  JJL36250M75 and JLL36250M75	
	1-1/2	<b>ļ</b>	5	1	7.6 A		
	2		3		7.8 A		
0	2			7-1/2	9 A		
O		3		7-1/2	9.6 A		
	3	3	7-1/2	10	11 A		
	3	ļ	10	10	14 A		
		-	10	ļ	15.2 A		
		5		45			
4	-			15	17 A		
1	5		45		17.5 A		
		7.46	15		21 A		
	7.4/0	7-1/2		20	22 A		HJL36050M7
	7-1/2	ļ			25.3 A		and
		40	20	25	27 A	HJL36030M71 and HLL36030M71 1/2–10 hp  HJL36100M73 and HLL36100M73 15–50 hp  JJL36250M75 and JLL36250M75	HLL36050M7
2		10			28 A		10–25 hp
				30	32 A		
	10	ļ			32.2 A	HJL36030M71 and HLL36030M71 1/2–10 hp  HJL36100M73 and HLL36100M73 15–50 hp  JJL36250M75 and JLL36250M75	
			25	J	34 A		
			30		40 A		
				40	41 A		
		15			42 A	HJL36100M73	
	15				48.3 A	and	
3			40	50	52 A	HLL36100M73	
•		20			54 A	15–50 hp	
	20			60	62 A	10 001.p	
			50		65 A		
		25			68 A		
			60	75	77 A		
	25	[			78.2 A	]	
		30			80 A		HJL36150M7
	30				92 A		and HLL36150M7
4			75		96 A		
•				100	99 A		30–100 hp
		40			104 A		
	40	[		ĺ	120 A		
		Ī	100		124 A	]	
				125	125 A	HJL36030M71 and HLL36030M71 1/2–10 hp  HJL36100M73 and HLL36100M73 15–50 hp  JJL36250M75 and JLL36250M75	
		50			130 A	.LII 36250M75	
				150	144 A	and	
	50				150 A	JLL36250M75	
5		60			154 A	50_150 bp	
			125		156 A	30-130 rip	
	60				177.1 A	1	
			150		180 A	1	
		75		200	192 A	1	
	75				221 A		•
			000	I		i	
			200		240 A		

Shaded area is not covered by J-frame electronic motor circuit protector.





Motor Circuit Protector



Motor Protector Circuit Breaker

#### **Motor Circuit Protectors**

Mag-Gard™ Motor Circuit Protectors (MCP) are instantaneous-trip magnetic-only circuit breakers. They have a single adjustment which simultaneously sets the magnetic trip level of each individual pole. Mag-Gard™ circuit breakers comply with NEC requirements for providing motor circuit protection when installed as part of a UL Listed combination controller having motor overload protection. Interrupting ratings are established for these UL Recognized Components only when they are used in combination with motor starters with properly sized overload relays and contactors.

All Mag-Gard circuit breakers will accept the same lugs and accessories as equivalent circuit breakers. Mag-Gard circuit breakers are available with I-Line construction. ★ High-interruption (H) construction Mag-Gard circuit breakers (LHL) are also available.

Table 7.62: Magnetic Only 3 Pole, 600 Vac, 50/60 Hz☆—Three Device Solutions□

Ampere Ra	iting	Trip Unit	Adjustable∆ Trip Range (A)	24 Vdc Multiplier	Cat. No.	\$ Price
LAL	400		500–1000 A 750–1600 A 1000–2000 A 1125–2250 A 1250–2500 A 1500–3000 A 1750–3500 A 2000–4000 A	High = 1.2 Low = 1.4	LAL3640022M LAL3640028M LAL3640030M LAL3640031M LAL3640032M LAL3640033M LAL3640035M LAL3640036M	4619.00 4619.00 4619.00 4619.00 4619.00 4619.00 4619.00

For PowerPact L- and P-Frames, an instantaneous-only version of the electronic trip circuit breaker is also available for motor circuit protection. These MCPs comply with NEC® requirements for providing short-circuit protection when installed as part of a Listed combination controller having motor overload protection.

Table 7.63: Magnetic Only 3 Pole, 600 Vac, 50/60 Hz☆—Three Device Solutions□

		Trip					Interrupti	ng Rating			
Sensor Ra	Sensor Rating		Adjustable△ Trip Range (A)	G		J		L		R	
				Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
PowerPact	400	1.3 M	500-1200%	LGL36400M37X	4619.00	LJL36400M37X	4727.00	LLL36400M37X	5007.00	LRL36400M37X	5307.00
L-Frame <b>☆</b>	600	1.3 1	500-1200%	LGL36600M37X	6790.00	LJL36600M37X	6949.00	LLL36600M37X	7360.00	LRL36600M37X	7802.00
	600		1200-10000 A	_	_	PJL36060M68	7560.00	PLL34060M68	8006.00	_	_
PowerPact	800		1200-10000 A	_	_	PJL36080M68	9927.00	PLL34080M68	10514.00	_	_
PJL, PLL☆	1000		1500-10000 A	_	_	PJL36100M69	12705.00	PLL34100M69	13455.00	_	_
	1200		1800-10000 A	_	_	PJL36120M70	16517.00	PLL34120M70	17492.00	_	_

- $\Delta$   $\;\;$  UL magnetic trip tolerances are -20%/+30% from the nominal values shown.
- □ Three-device solutions are the traditional solutionss: motor circuit protector plus motor starter plus overload relay.
- $\diamond$  250 Vdc ratings are available. No UL component recognition
- ★ These electronic magnetic only motor circuit protectors are available with I-Line constructions. Consult the factory.

#### **Motor Protector Circuit Breakers**



Motor protection circuit breakers provide built-in thermal and magnetic protection. They are used in two-device motor feeder solutions to provide protection against short-circuits, overloads, and phase unbalance.

Table 7.64: H-Frame (150 A), J-Frame (250 A) and L-Frame (600 A) Electronic Motor Protector Circuit Breakers (UL Ratings)—
Two Device Solutions 

✓

Electronic				Full Load		Interrupting Rating										
Trip Unit	Frame	Sensor Rating	Trip Unit	Amperes Range	Isd (x FLA)	G		J		L		R				
Туре				(FLA)		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price			
		30		14–25	5-13 x FLA	HGL36030M38X	1608.00	HJL36030M38X	1658.00	HLL36030M38X	1812.00	HRL36030M38X	1993.00			
		50		14-42	5-13 x FLA	HGL36050M38X	1938.00	HJL36050M38X	1998.00	HLL36050M38X	2191.00	HRL36050M38X	2410.00			
	H-Frame	100	2.2 M	2.2 M	2.2 M	2.2 M	30–80	5-13 x FLA	HGL36100M38X	2229.00	HJL36100M38X	2298.00	HLL36100M38X	2506.00	HRL36100M38X	2757.00
Standard€		150		58-130	5-13 x FLA	HGL36150M38X	2701.00	HJL36150M38X	2785.00	HLL36150M38X	3057.00	HRL36150M38X	3363.00			
	J-Frame	250		114–217	5-13 x FLA	JGL36250M38X	3105.00	JJL36250M38X	3201.00	JLL36250M38X	3523.00	JRL36250M38X	3875.00			
L-Frame	I Frame	400	2.3 M	190–348	5-13 x FLA	LGL36400M38X	6041.00	LJL36400M38X	6160.00	LLL36400M38X	6468.00	LRL36400M38X	7115.00			
		Frame 600		312–520	5-13 x FLA	LGL36600M38X	8429.00	LJL36600M38X	8604.00	LLL36600M38X	9156.00	LRL36600M38X	10072.00			

<sup>7</sup> Two-device solutions (these electronic motor protector circuit breakers include short circuit and overload protection) —1 electronic motor circuit protector with a Micrologic 2.2 M plus

To select combination starters and motor controllers using MCP's meeting NEC Article 430, refer to pages 16-34—16-36.

<sup>—1</sup> contactor

The standard trip unit offers Class 5, 10 and 20 and phase unbalance or phase loss protection.

www.schneider-electric.us



Adjustable instantaneous-trip circuit breakers are intended for use in combination with motor starters with overload relays for the protection of motor circuits from short circuits. Other specific applications include rectifiers and resistance welders. These circuit breakers contain a magnetic trip element in each pole with the trip point adjustable from the front. Interrupting ratings are determined by testing the instantaneous-trip circuit breakers in combination with a contactor and overload relay.

Select instantaneous-trip circuit breakers as follows:

This selection table is suitable for motors, other than NEMA Design E, with locked-rotor indicating code letters per NEC® Table 430.7 (b) as follows:

Table 7.65: **Locked-Rotor Indicating Codes** 

Horsepower	Motor Code letter
1/2 or less	A-L
3/4 to 1-1/2	A-K
2 to 3	A-J
5 to 25	A-H
30 to 125	A-G
150 or more	A-F

- For other motors order a special thermal-magnetic circuit breaker with magnetic trip settings for the specific motorspecify motor horsepower, voltage, frequency, full-load current and code letter or locked rotor current
- 2. Determine motor hp rating from the motor nameplate.
- 3. Refer to the tables and select an instantaneous-trip circuit breaker with an ampere rating recommended for the hp and voltage involved.
- Select an adjustable trip setting of at least 800%, not to exceed 1300%, of the motor full-load amperes (FLA) for other than Design E motors. For Design E motors, select an adjustable trip setting of at least 1100% not to exceed 1700% of FLA.
- The NEC 1300% maximum setting may be inadequate for instantaneous-trip circuit breakers to withstand current surges typical of the magnetization current of autotransformer type reduced voltage starters, or open transition wye-delta starters during transfer from "start" to "run," constant hp multi-speed motors, and motors labeled "high efficiency." Select thermalmagnetic circuit breakers from page 7-33 for those applications.
- Part-winding motors, per NEC 430.3, should have two circuit breakers selected from the above at not more than one half the allowable trip setting for the horsepower rating. The two circuit breakers should operate simultaneously as a disconnecting means per NEC 430.103.
- Based on NEC 430.52 and NEC Table 430.150. See page 7-31 for available Adjustable Instantaneous-Trip Circuit Breakers.

Table 7.66: PowerPact H-Frame and L-Frame Motor **Protector Circuit Breaker** 

	Protector Circuit Breaker												
s	ings of I quirrel- ound Ro	Cage ai	nd	Full Load	PowerPact Family Motor Protector Circuit Breaker	Magnetic Trip Settings ♦							
200	230	460	575	Amperes▲	Cat. No.■	MIN	MAX						
Vac	Vac	Vac	Vac			IVIIIN	WAX						
		10		14	H()L36030M38X								
	5			152	H()L36030M38X								
			15	17	H()L36030M38X								
5				17.5	H()L36030M38X								
		15		21	H()L36030M38X								
	7-1/2		20	22	H()L36030M38X								
7-1/2				25.3	H()L36030M38X								
		20	25	27	H()L36050M38X								
	10			28	H()L36050M38X								
			30	32	H()L36050M38X								
10				32.2	H()L36050M38X								
		25		34	H()L36050M38X								
		30		40	H()L36050M38X								
			40	41	H()L36050M38X								
	15			42	H()L36050M38X								
15				48.3	H()L36100M38X								
		40	50	52	H()L36100M38X								
	20			54	H()L36100M38X								
20			60	62	H()L36100M38X	500%	1300%						
		50		65	H()L36100M38X								
75				221	L()L36400M38X								
		200		240	L()L36400M38X								
			250	242	L()L36400M38X								
	100			248	L()L36400M38X								
100				285	L()L36400M38X								
			300	289	L()L36400M38X								
		250		302	L()L36400M38X								
	125			312	L()L36400M38X								
			350	336	L()L36400M38X								
125				359	L()L36600M38X								
	150			360	L()L36600M38X								
		300		361	L()L36600M38X								
			400	382	L()L36600M38X								
150		350		414	L()L36600M38X								
			500	472	L()L36600M38X								
		400		477	L()L36600M38X								
	200			480	L()L36600M38X								

Table 7.67: LAL Adjustable Instantaneous-Trip **Circuit Breakers for Single Motor** Circuit Protection

' s	ings of l quirrel- ound Ro 3Ø	Cage ar	nd 🦊	Full Load Amperes▲	Mag-Gard Circuit Breaker Cat. No.	Magnetic Trip Settings ◆		
200 Vac	230 Vac	460 575 Vac Vac				MIN	MAX	
75				221	LAL3640033M	700%	1400%	
		200		240	LAL3640035M	700%	1500%	
			250	242	LAL3640035M	700%	1400%	
	100			248	LAL3640035M	700%	1400%	
100				285	LAL3640036M	700%	1400%	
			300	289	LAL3640036M	700%	1400%	
		250		302	LAL3640036M	700%	1300%	
	125		312	LAL3640036M	600%	1300%		

- Motor full-load currents are taken from NEC Table 430.150. Select wire and circuit breakers on basis of horsepower rather than nameplate full-load current per NEC 430.6 (A) for general motor applications. Do not use these values to select overload relay thermal units. See Digest pages 14-129–14-152 for selection of thermal units when actual full load current is not known. The voltages listed are rated motor voltages. Corresponding nominal system voltages are 200–208, 220–240, 440–480 and 550–600 V.
- To complete catalog number, replace the blank with the appropriate rating (G, J, or L). M38X is for standard trip units. For advanced trip units (FO display, metering and communication, replace with M58X). Only MIN and MAX settings are shown, intermediate settings are
- available on all circuit breakers.
- See NEC 430.52(A) for circuit breaker settings above 800%
- If due to motor starting characteristics, trip settings at the 1300% maximum permitted level are needed, the next size Mag-Gard circuit breaker should be chosen.

by Schneider Electric www.schneider-electric.us



- ▲ 8 XHHW requires 3/4 in. conduit for 3W.
- ■200 V motors are commonly used on 208 V services.
- ♦ Ordinary service for normal starting duty only, acceleration time
- starting duty only, acceleration time of 10 sec. or less.

  \*Heavy service is jogging or plugging duty or cycling load with over 25 starts per hour or over 5 starts per minute. Energy efficient motors are polyphase motors defined in NEMA Standard MG1 and exhibit high starting current.
- starting current.

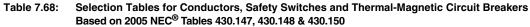
  \*NEC 430.22 for Single Motor,

  \*Smaller conductors may be
  permitted for light duty-cycle service
  per 430.22 (B) Exception No. 1. DC
  motors operating from rectified 10
  power supply will require larger
  conductors per 430.22 (A) Exception
  No. 1. For motor-generator arc
  welders, see 630.11.

  \*Motor full lead currents that 200 be.
- AMotor full load currents thru 200 hp are taken from NEC Tables 430.147, 148 and 150. Above 200 hp from UL 148 and 150. Above 200 hp from UI 98. Select wire size, circuit breakers, or fuses on basis of hp rather than nameplate full load current per NEC 430.6. Do not use these values to select overload relay thermal units. See Digest pages 16-129—16-152 for selection of thermal units when actual full load current is not known. Voltages listed are rated motor voltages. Corresponding nominal system voltages are 110—120 V, 200–208 V, 220–240 V, 440–480 V and 550–600 V.
- □Switch size only is shown in table Selected fuses should not exceed Selected fuses should not exceed maximum percent of full-load current as given in NEC Table 430.52. Above 50 hp dc switches are not hp rated by UL as Motor Circuit Switches, but as General Use Switches only and are not necessarily capable of interrupting the max. operating overload current of a motor. See NEC 100 for definition of General Use Switch. When protecting a 3Ø, Design E energy efficient motor, the switch is required by NEC 430.109 to have a hp rating of not less than 1.4 times that of a motor rated 3–100 hp, or not less than 1.3 times that of a motor rated over 100 hp. Switches shown in this table do not necessarily comply with that requirement. ♦ Thermal-magnetic circuit breaker necessarily capable of interrupting
- or Thermal-magnetic circuit breaker ampere ratings recommended are approximate for average conditions, based on trip characteristics of Square D circuit breakers and NEC Table 430.52. Under some Table 430.52. Under some conditions, the next size larger switch or circuit breaker rating may be necessary to accommodate the motor starting current and is permitted by NEC 430.52(C)(1) Exception 2. High starting currents are anticipated with Design E and other energy efficient motors. For explanation of Code letter markings, see NEC 430.7(B). For Busway Plugin units, see page 9-7. ★Thermal-magnetic breaker ampere ratings recommended are
- ratings recommended are approximate for average conditions approximate for average conditions and based on trip characteristics of Square D circuit breakers and NEC Tables 430.7(B) and 430.52.

  ▼Type LC, LI, LX, LXI, and LE circuit breakers are NOT recommended tested as a pinet metal breaker.
- for use on single motor branch

Contact your local Field Office for circuit breaker selection on constant horsepower multi-speed motors.



	Horsepower Ratings Squirrel-Cage and Wound-							10.010	- 1001	147, 430.1	Amp	perage of Therr		QMB	Mir	nimum Size	metallic
	Roto	el-Cage r Motor que Ch	s with I	Norm.		1Ø		Averag	e Direct Motors	Full		♦ Inverse Tim Breaker lotor Code		and Heavy Duty	Installe	uit 75° C, C ed Sized for	125% FLA▼
1	Opera	ting at	usual S 60 Hz	peeds	1	IO Hz a	С	Opera	ting at Speed	Load Amperage△	Lett	er B to E	For Motor Code	Duty Switch with	AWG		uit 3 W
ı	200 Vac∎	230 Vac	460 Vac	575 Vac	115 Vac	200 Vac∎	230 Vac	120 Vdc	240 Vdc		Ordinary Service ♦	HeavyService and Energy Efficient★	Letter F to V☆	Time Delay Fuses□	kcmil	THHN THWN XHHW	THW
			_		1/3		3/4			6.9 A 7.2 A		15 A					
	2		5			3/4		3.4		7.6 A 7.8 A 7.9 A			20 A				
r				7.4/0			1		2	8.0 A 8.5 A	15 A	00.4					
d				7-1/2		1		1		9.0 A 9.2 A 9.5 A		20 A	OF A				
е		3			1/2		1.1/0			9.6 A 9.8 A			25 A		14	1/2 in.	N/A
g	3		7-1/2	10		1-1/2	1-1/2			10.0 A 11.0 A 11.5 A	20 A		30 A	30 A			
							2	1-1/2	3	12.0 A 12.2 A 13.2 A		25 A					
,			10		3/4	2		1-1/2		13.8 A 14.0 A	25 A		35 A				
		5		15	1		3	2		15.2 A 16.0 A 17.0 A	30 A	35 A	40 A				
;	5			15		3	3	2		17.5 A 19.6 A	35 A	40 A	45 A 50 A		12	1/2 in.	N/A
n		7-1/2	15		1-1/2				5	20.0 A 21.0 A 22.0 A	40 A	45 A	60 A				
)		7-1/2			2			3		24.0 A 25.0 A	45 A	50 A	00 A		10	1/2 in.	N/A
7, L S.	7-1/2	10	20	25		5				25.3 A 27.0 A 28.0 A	50 A	60 A	70 A				
)		10		30		3			7-1/2	29.0 A 32.0 A	60 A		80 A				
)	10		25		3				10	32.2 A 34.0 A 38.0 A	00 /	70 A	90 A	60 A	8	1/2 in.▲	N/A
3							7-1/2	5	10	40.0 A 41.0 A	80 A	80 A 90 A	100 A 110 A				
	15	15				71/2				42.0 A 46.0 A 48.3 A		3071	125 A		6	3/4 in.	1 in.
_	.0		40	50			10			50.0 A 52.0 A	00.4	110 A	12071				
nt		20			5				15	54.0 A 55.0 A 56.0 A	90 A		150 A				
)				00		10		7-1/2		57.5 A 58.0 A		125 A			4	1 in.	1 in.
	20		50	60						62.0 A 62.1 A 65.0 A	100 A		175 A	100 A			
t		25						10	20	68.0 A 72.0 A 76.0 A	110 A 125 A	150 A					
	25		60	75				10		77.0 A 78.2 A	110 A	175 A	200 A		3	1 in.	1-1/4 in.
	30	30			7-1/2				25	80.0 A 89.0 A 92.0 A	125 A		225 A		2	1 in.	1-1/4 in.
ot n			75	100						96.0 A 99.0 A		200 A	250 A		1	1-1/4 in.	1-1/2 in.
′		40			10				30	100.0 A 104.0 A 106.0 A	150 A	225 A	300 A				
	40		100						00	120.0 A 124.0 A	175 A	250 A	00071	200 A	1/0	1-1/4 in.	1-1/2 in.
		50		125					40	125.0 A 130.0 A 140.0 A	200 A	250 A	350 A		2/0	1-1/2 in.	1-1/2 in.
h	50			150						144.0 A 150.0 A		300 A	400.4		3/0	1-1/2 in.	2 in.
		60	125						50	154.0 A 156.0 A 173.0 A	225 A	350 A	400 A		0,0	,	
	60	7.	150	000						177.0 A 180.0 A	250 A	400 A	500 A		4/0	2 in.	2 in.
s, g-	75	75	200	200						192.0 A 221.0 A 240.0 A	300 A	450 A	600 A		250 300	2 in. 2 in.	2 in. 2-1/2 in.
)	400	100		250						242.0 A 248.0 A	350 A	500 A	700 A	400 A	350	2-1/2 in.	2-1/2 in.
i	100		250	300						285.0 A 289.0 A 302.0 A	400 A	600 A	800 A		500	3 in.	3 in.
:	105	125		350						312.0 A 336.0 A	450 A 500 A	700 A	900 A			(2) 2-1/2 in.	
it	125	150	300	L						359.0 A 360.0 A 361.0 A	600 A	800 A	1000 A		(2) 4/0	(2) 2 in.	(2) 2 in.
	150		350	400	E00					382.0 A 414.0 A		900 A		600 A	(2)300	(2) 2 in.	(2) 2-1/2 in.
			200	400	500					472.0 A 477.0 A 480.0 A	800 A	1000 A	1200 A		(2) 350	(2) 2-1/2 in.	(2) 2-1/2 in.
	200	050	500							552.0 A 590.0 A	900 A	1200 A	1600 A	_	(3) 300	(3) 2 in.	(3) 2-1/2 in.
		250	l				1	L	ı	602.0 A	ı			l	l	I.	L

# Class 600 / Refer to Catalog 0612CT0101

SQUARE D by Schneider Electric

www.schneider-electric.us



J-Frame Switch

New

L-Frame Switch

Automatic molded case switches open instantaneously at a factory preset magnetic trip point, calibrated to protect only the molded case switch itself, when it is subjected to high fault currents. The trip point is nonadjustable and provides no overload or low level fault protection.

Molded case switches open when the handle is switched to the OFF position or in response to an auxiliary tripping device such as a shunt trip.

All molded case switches will accept the same lugs and accessories as equivalent thermal-magnetic circuit breakers, with the exception of Q-frame switches which do not have electrical accessories available.

Automatic molded case switches are UL Listed per UL 489 and are CSA Certified.

#### Table 7.69: H-Frame, J-Frame, and L-Frame PowerPact™ Automatic Molded Case Switches, 600 Vac

Circuit Breaker	Polos	Ampere	G Wi	thstand		L Withstand			R \	Withstand		Terminal	Wire Range	
Breaker	Foles	Rating	Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Terrinia	wire natige	
		150 A	HGL26000S15▲	1349.00	2250A	HLL26000S15	1590.00	2250 A	_	_	_	AL150HD	14 AWG-3/0 AWG Al/Cu	
$\odot$	2	175 A	JGL26000S17	1827.00	3125 A	JLL26000S17	1980.00	3125 A	_	_	-	AL175JD	4-4/0 AWG Al/Cu	
<i>w!)</i> H-Frame		250 A	JGL26000S25	1827.00	3125 A	JLL26000S25	1980.00	3125 A	_	_	1	AL250JD	3/0 AWG-350 kcmil Al/Cu	
J-Frame		150 A	HGL36000S15	1799.00	2250 A	HLL36000S15	1988.00	2250 A	_	_	_	AL150HD	14 AWG-3/0 AWG Al/Cu	
	3	175 A	JGL36000S17	2286.00	3125 A	JLL36000S17	2475.00	3125 A	JRL36000S17	2673.00	3125 A	AL175JD	4-4/0 AWG Al/Cu	
		250 A	JGL36000S25	2286.00	3125 A	JLL36000S25	2475.00	3125 A	JRL36000S25	2673.00	3125 A	AL250JD	3/0 AWG-350 kcmil Al/Cu	
	3	400 A	LGL36000S40X	4572.00	4800 A	LLL36000S40X	4972.00	4800 A	LRL36000S40X	5370.00	4800 A	AL150HD	AL600LS52K3	
I Emmo	3	600 A	LGL36000S60X	5065.00	6600A	LLL36000S60X	5465.00	6600 A	LRL36000S60X	5902.00	6600 A	AL250JD	(2) 2/0 AWG-500 kcmil Al/Cu	
L-Frame	4	400 A	LGL46000S40X	5972.00	4800 A	LLL46000S40X	6372.00	4800 A	LRL46000S40X	6882.00	4800 A	AL150HD	AL600LS52K4	
	4	600 A	LGL46000S60X	6465.00	6600A	LLL46000S60X	6865.00	6600 A	LRL46000S60X	7414.00	6600 A	AL250JD	(2) 2/0 AWG-500 kcmil Al/Cu	

True 2P device. Others are a 2P in a 3P module.

#### Q-Frame (240 Vac) PowerPact™ Automatic Molded Case Switches Table 7.70:

Circuit Breaker	Poles	Ampere Rating	J	Withstand		Wire Range
Бгеакег			Cat. No.	\$ Price	Trip Point	
Q-Frame■	2	225 A	QBL22000S22◆	440.00	4500 A	4 AWG-300 kcmil
Q-Flame	3 2		QBL32000S22◆	1193.00 4500 A		4 AVVG-300 KCIIII

- Withstand rating of 10 kA at 240 Vac
- DE2A discount schedule

Table 7.71: P-Frame and R-Frame PowerPact™ Automatic Molded Case Switches ▼, 600 Vac

Eramo	Frame Poles Amper		J Withstand			K Withstand			L Withstand			Terminal	Wire Range
Traille	roles	Rating	Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Terminal	Wife halige
		600 A	PJL26000S60	5340.00	10 kA	PKL26000S60	5340.00	24 kA	PLL24000S60★	5715.00	10 kA	AL800M23K	(3) 3/0 AWG-500 kcmil
	2	800 A	PJL26000S80	5991.00	10 kA	PKL26000S80	5991.00	24 kA	PLL24000S80★	6414.00	10 kA	ALOUDIVIZOR	Al or Cu
		1000 A	PJL26000S10	7469.00	10 kA	PKL26000S10	7469.00	24 kA	PLL24000S10★	7995.00	10 kA	AL1200P25K	(4) 3/0 AWG-500 kcmil
Р		1200 A	PJL26000S12	11744.00	10 kA	PKL26000S12	11744.00	24 kA	PLL24000S12★	10887.00	10 kA	ALT200F23K	Al or Cu
'		600 A	PJL36000S60	6584.00	10 kA	PKL36000S60	6584.00	24 kA	PLL34000S60★	6974.00	10 kA	AL800M23K	(3) 3/0 AWG-500 kcmil
	3	800 A	PJL36000S80	7236.00	10 kA	PKL36000S80	7236.00	24 kA	PLL34000S80★	7667.00	10 kA	ALOUDIVIZOR	Al or Cu
	0	1000 A	PJL36000S10	9287.00	10 kA	PKL36000S10	9287.00	24 kA	PLL34000S10★	9837.00	10 kA	AL1200P25K	(4) 3/0 AWG-500 kcmil
		1200 A	PJL36000S12	11867.00	10 kA	PKL36000S12	11867.00		PLL34000S12★	12570.00	10 kA	ALIZOOI ZOIX	Al or Cu
		1200 A	_	_	_	RKF26000S12	12213.00	_	RLF26000S12	12855.00	48 kA		
	2	1600 A	_	_	_	RKF26000S16	14685.00	57 kA	RLF26000S16	14825.00	48 kA		
	_	2000 A	_	_	_	RKF26000S20	15687.00	57 kA	RLF26000S20	15837.00	48 kA		rcuit breakers can be
		2500 A	_	_	_	RKF26000S25	24948.00	57 kA	RLF26000S25	25185.00	48 kA		ed or cable-connected.
R		1200 A	_	_	_	RKF36000S12	13602.00	-	RLF36000S12	14318.00	48 kA		nnections, RLTB kit or is structure is required.
		1600 A	_	_	_	RKF36000S16	15911.00	57 kA	RLF36000S16	16062.00	48 kA	Kit is included	d with 3000 A switches.
	3	2000 A	_	_	_	RKF36000S20	19374.00	57 kA	RLF36000S20	19559.00	48 kA	For all oth	ers, see page 7-44.
		2500 A	_	_	_	RKF36000S25	30836.00	57 kA	RLF36000S25	31130.00	48 kA		
		3000 A	_	_	-	RKF36000S30	41104.00	57 kA	RLF36000S30	41496.00	48 kA		

- P-frame L-interrupting is available in 480 Vac only.
- UL magnetic trip tolerances are -20% / +30% from the nominal values shown.

Table 7.72: H-, J-, L- P-, and R-Frame Withstand Ratings△

Voltage	Withstand										
voitage	G	J	K	L	R						
240 Vac	65 kA	100 kA	65 kA	125 kA	200 kA						
480 Vac	35 kA	65 kA	50 kA□	100 kA	200 kA						
600 Vac	18 kA	25 kA	50 kA□	50 kA	100 kA						

- Δ The withstand rating is the fault current at rated voltage that the molded case switch will withstand without damage when protected by a circuit breaker with an equal continuous current rating.

  R-frame withstand is 65 kA.

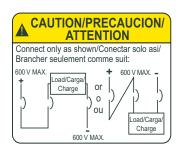
Accessories . . . . . . Page 7-39 and Supplemental Digest Pages 3-24-3-31 Optional Lugs . . . . . Page 7-42 and Supplemental Digest Pages 3-29-3-30 



#### CAUTION/PRECAUCION/ ATTENTION Connect only as shown/Conectar solo asi/ Francher seulement comme suit: 300 V 300 V MAX. 600 V or 0 οu Load/Carga Load/Carga Charge Charge

Source = 600 Vdc max. (floating) 500 Vdc max. (loaded)

DC Circuit Breaker Label



Source = 600 Vdc max. (floating) 500 Vdc max. (loaded)

MHL-DCH Breaker Only

The UL Listed thermal-magnetic molded case circuit breakers shown below are specifically designed for use on ungrounded dc systems having a maximum short-circuit voltage of 500 Vdc or a maximum floating (unloaded) voltage of 600 Vdc. The circuit breakers are suitable for use only with UPS (uninterruptable power supplies) and ungrounded systems.

This two-level voltage rating allows these circuit breakers to be applied to battery sources having a short-circuit availability of 20,000 amperes for LH, and MH circuit breakers and 25,000 amperes for PAF circuit breakers at 500 Vdc.

LH and MH circuit breakers are provided with an adjustable magnetic trip that is readily accessible by means of a single adjustment on the face of the circuit breaker. PAF circuit breakers have a fixed magnetic trip range.

These circuit breakers are UL Listed for the interrupting ratings shown only if applied with three poles connected in series (series connection is external to circuit breaker). See diagram below.

**NOTE:** Due to external series connection, I-Line™ circuit breakers are not available for this application.

**DC Molded Case Circuit Breakers Table 7.73:** 

Ampere Rating	Circuit Breaker Cat. No.	Adjustable Magn DC Am	etic Trip Range— peres▲	Interrupting Rating @ 500 Vdc	\$ Price	
	Cat. No.	Low	High	@ 500 vac		
100 A	JGL37100D81	400	600		3779.00	
125 A	JGL37125D81	400	600	20 k AIR	3779.00	
150 A	JGL37150D81	400	600	20 K AIH	3779.00	
175 A	JGL37175D81	400	600		3779.00	
200 A	JGL37200D82	500	850		3779.00	
225 A	JGL37225D82	500	850	20 k AIR	3779.00	
250 A	JGL37250D82	500	850		5001.00	
250 A	LHL3625025DC	625	1250		7598.00	
300 A	LHL3630026DC	750	1500	20 k AIR	7598.00	
350 A	LHL3635029DC	875	1750	20 K AIN	7598.00	
400 A	LHL3640030DC	1000	2000		7598.00	
450 A	MHL3645031DC	1125	2250		9456.00	
500 A	MHL3650032DC	1250	2500		9456.00	
600 A	MHL3660033DC	1500	3000		9456.00	
700 A	MHL3670035DC	1750	3500	20 k AIR	11882.00	
800 A	MHL3680036DC	2000	4000		11882.00	
900 A	MHL3690039DC	2500	5000		14078.00	
1000 A	MHL36100040DC	2500	5000		14078.00	
1200 A	MHL36120040DC■	2500	5000	25 k AIR	16758.00	
450 A	MHL3645031DCH	1125	2250		12506.00	
500 A	MHL3650032DCH	1250	2500		12506.00	
600 A	MHL3660033DCH	1500	3000		12506.00	
700 A	MHL3670035DCH	1750	3500	50 k AIR	14932.00	
800 A	MHL3680036DCH	2000	4000		14932.00	
900 A	MHL3690039DCH	2500	5000		17128.00	
1000 A	MHL36100040DCH	2500	5000		17128.00	
1200 A	MHL36120040DCH■	2500	5000	50 k AIR	19808.00	

- Magnetic trip tolerances are -20%/+30% from the nominal values shown.
- Suitable for use only in a ventilated enclosure. Minimum enclosure dimensions are 38" h x 20" w x 7" d with a minimum of 300 square inches of ventilation near the top and bottom of the enclosure.

Ampere Rating	Circuit Breaker Cat. No.		: Trip Range—DC peres▲	Interrupting Rating @ 500 Vdc	\$ Price	
	Cat. No.	Hold	Trip	@ 500 Vac		
1200 A	PAF361200DC	1200	1620		24726.00	
1600 A	PAF361600DC	1600	2160	25 k AIR	24726.00	
2000 A	PAF362000DC	2000	2700		24726.00	
2500 A	PCF362500DC	2500	3375	25 k AIR	39365.00	

Accessories......Page 7-39 and Supplemental Digest Pages 3-24-3-31 Optional Lugs . . . . . Page 7-42 and Supplemental Digest Page 3-29 Dimensions . . . . . . . . . Page 7-55 and Supplemental Digest Page 3-33 



Masterpact NW DC Circuit Breaker

Table 7.74: **Masterpact NW DC Circuit Breakers** 

Ampere Rating	Circuit Breaker	Interrupting Rating 500 Vdc	\$ Price Fixed Circuit Breaker		\$ Price Drawout	Circuit Breaker	\$ Price Cradle	
Ampère naung	Cat. No.	(max 600 Vdc unloaded)	Version C	Version C1	Version C	Version C1	Version C	Version C1
800 A	NW08NDC	35 kA	42214.00	42746.00	39824.00	40888.00	11778.00	12842.00
1200 A	NW12NDC	35 kA	42214.00	42746.00	39824.00	40888.00	11778.00	12842.00
1600 A	NW16NDC	35 kA	42214.00	42746.00	39824.00	40888.00	11778.00	12842.00
2000A	NW20NDC	35 kA	42214.00	42746.00	39824.00	40888.00	11778.00	12842.00
2500 A	NW25NDC	35 kA	56158.00	56690.00	56662.00	57726.00	11778.00	12842.00
3000 A	NW30NDC	35 kA	70100.00	70632.00	73500.00	74564.00	11778.00	12842.00
4000 A	NW40NDC	35 kA	84044.00	84576.00	90338.00	90142.00	11778.00	12842.00
800 A	NW08HDC	85 kA	46858.00	47448.00	44205.00	45386.00	11778.00	12842.00
1200 A	NW12HDC	85 kA	46858.00	47448.00	44205.00	45386.00	11778.00	12842.00
1600 A	NW16HDC	85 kA	46858.00	47448.00	44205.00	45386.00	11778.00	12842.00
2000A	NW20HDC	85 kA	46858.00	47448.00	44205.00	45386.00	11778.00	12842.00
2500 A	NW25HDC	85 kA	62335.00	62926.00	64076.00	64076.00	11778.00	12842.00
3000 A	NW30HDC	85 kA	77811.00	78402.00	81585.00	82766.00	11778.00	12842.00
4000 A	NW40HDC	85 kA	93289.00	93879.00	100275.00	100058.00	11778.00	12842.00

QO 100 A 2P

PowerPact D-Frame Mission Critical Circuit Breaker

208 Y/120 V 3 Phase Pane

# Mission Critical Circuit Breakers

Designed for selectively coordinated systems, mission critical circuit breakers maximize continuity of the electrical service by allowing the branch circuit breaker to clear the fault.

Mission critical circuit breakers are engineered with technology that optimizes current, time and energy selectivity so the fault is cleared by the circuit breaker immediately upstream of the occurrence. This technology (see figure below) allows the remaining areas of the electrical system to continue operation without disruption. In addition to unique design attributes, Square D mission critical circuit breakers have also undergone rigorous testing procedures to certify the coordination with downstream circuit breakers—combining innovative engineering with validated test results.

Apply Square D mission critical circuit breakers in emergency power distribution systems, data centers, hospitals or anywhere continuity of service is desired.

The PowerPact<sup>TM</sup> J- and L-Frame Mission Critical circuit breakers deliver high levels of selective coordination in a flexible design that can be easily configured for a variety of applications. Tested to be selectively coordinated with the  $QO^{TM}$  family of miniature circuit breakers and the ED, EG, and EJ circuit breakers, this solution provides peace of mind when power availability is critical.

An electronic trip unit provides adjustable long-time settings in four sensor sizes, allowing coverage from 70 A through 600 A on a 120–240, 208Y/120, 240, 480Y/277, and 480 V systems.

Table 7.75: PowerPact J- and L-Frame Mission Critical Circuit Breakers

Load

Ratings	Available Configurations					
UL 489 Listed CSA Certified Voltage: 480 V	I-Line mounting Main circuit breaker in NQ and NF panelboards Unit mount for OEM users Plug-in base for OEM users Drawout base ofr OEM users					

Table 7.76: J-Frame 250 A Electronic Trip Mission Critical Circuit Breakers (480/277 Vac) with Factory Sealed Trip Units Suitable for Reverse Connection▲

Electronic Trip Trip Trip II		Trip Unit	Continuous	D Interrupting		G Interrupting		J Interrupting		L Interrupting		Terminal
Unit Type	Function	mp om	Current	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Terriniai
Standard	LI	3.2 W	250	JDL34250WU31X	3489.	JGL34250WU31X	4727.	JJL34250WU31X	6678.	JLL34250WU31X	8629.	AL250JD■
Standard	LSI	3.2S-W	250	JDL34250WU33X	3801.	JGL34250WU33X	5039.	JJL34250WU33X	6989.	JLL34250WU33X	8941.	AL250JD■
High Perf. Ammerter	LSI	5.2A-W	250	JDL34250WU43X	4809.	JGL34250WU43X	6046.	JJL34250WU43X	7997.	JLL34250WU43X	9949.	AL250JD■
High Perf. Energy	LSI	5.2E-W	250	JDL34250WU53X	5414.	JGL34250WU53X	6652.	JJL34250WU53X	8602.	JLL34250WU53X	10554.	AL250JD■
High Perf. Ammerter	LSIG	6.2A-W	250	JDL34250WU44X	6018.	JGL34250WU44X	7256.	JJL34250WU44X	9206.	JLL34250WU44X	11158.	AL250JD■
High Perf. Energy	LSIG	6.2E-W	250	JDL34250WU54X	6623.	JGL34250WU54X	7861.	JJL34250WU54X	9812.	JLL34250WU54X	11763.	AL250JD■

- ▲ Standard rated (80%). Not available in 100% rated.
- AL250JD terminal wire range is (1) 3/0 AWG–350 kcmil Al or Cu.

Table 7.77: L-Frame 600 A Electronic Trip Mission Critical Circuit Breakers (480/277 Vac) with Factory Sealed Trip Units Suitable for Reverse Connection▲

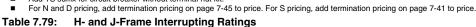
Electronic Trip	Trip	Trip Unit	Continuous	D Interrupti	ng	G Interrupting	ng	J Interruptii	ng	L Interruptii	ng	Terminal
Unit Type	Function	IIIp Ullit	Current	Cat. No.	\$ Price	Terminai						
480/277 Vac, 50/60 H	z, 3P											
			250	LDL34250WU31X	5696.	LGL34250WU31X	5996.	LJL34250WU31X	10004.	LLL34250WU31X	11703.	AL400L61K3■
Standard	LI	3.3 W	400 600	LDL34400WU31X LDL34600WU31X	5696. 8389.	LGL34400WU31X LGL34600WU31X	5996. 8831.	LJL34400WU31X LJL34600WU31X	10004. 12438.	LLL34400WU31X LLL34300WU31X	11703. 13968.	AL600LS52K3◆
			250	LDL34250WU33X	6361.	LGL34250WU33X	6695.	LJL34250WU33X	10704.	LLL34250WU33X	12403.	AL400L61K3■
Standard	LSI	3.3S-W	400 600	LDL34400WU33X LDL34600WU33X	6361. 9054.	LGL34400WU33X LGL34600WU33X	6695. 9531.	LJL34400WU33X LJL34600WU33X	10704. 13138.	LLL34400WU33X LLL34300WU33X	12403. 14667.	AL600LS52K3◆
High Perf. Ammeter	LSI	5.3A-W	400 600	LDL34400WU43X LDL34600WU43X	7379. 10071.	LGL34400WU43X LGL34600WU43X	7767. 10601.	LJL34400WU43X LJL34600WU43X	11775. 14208.	LLL34400WU43X LLL34300WU43X	13474. 15738.	AL600LS52K3◆
High Perf. Energy	LSI	5.3E-W	400 600	LDL34400WU53X LDL34600WU53X	8496. 11190.	LGL34400WU53X LGL34600WU53X	8943. 11779.	LJL34400WU53X LJL34600WU53X	12952. 15386.	LLL34400WU53X LLL34300WU53X	14651. 16915.	AL600LS52K3◆
High Perf. Ammeter	LSIG	6.3A-W	400 600	LDL34400WU44X LDL34600WU44X	9616. 12309.	LGL34400WU44X LGL34600WU44X	10122. 12956.	LJL34400WU44X LJL34600WU44X	14131. 16844.	LLL34400WU44X LLL34300WU44X	15830. 18093.	AL600LS52K3◆
High Perf. Energy	LSIG	6.3E-W	400 600	LDL34400WU54X LDL34600WU54X	10734. 13427.	LGL34400WU54X LGL34600WU54X	11299. 14134.	LJL34400WU54X LJL34600WU54X	15307. 17741.	LLL34400WU54X LLL34300WU54X	17006. 19271.	AL600LS52K3◆
480/277 Vac, 50/60 H	z, 4P											
	1		250	LDL44250WU31X	6196.	LGL44250WU31X	6496.	LJL44250WU31X	10504.	LLL44250WU31X	12203.	AL400L61K4■
Standard	LI	3.3 W	400 600	LDL44400WU31X LDL44600WU31X	7096. 9789.	LGL44400WU31X LGL44600WU31X	7396. 10231.	LJL44400WU31X LJL44600WU31X	11404. 13838.	LLL44400WU31X LLL44300WU31X	13103. 15368.	AL600LS52K4◆
			250	LDL44250WU33X	6861.	LGL44250WU33X	7195.	LJL44250WU33X	11204.	LLL44250WU33X	12903.	AL400L61K4■
Standard	LSI	3.3S-W	400 600	LDL44400WU33X LDL44600WU33X	7761. 10454.	LGL44400WU33X LGL44600WU33X	8095. 10931.	LJL44400WU33X LJL44600WU33X	12104. 14538.	LLL44400WU33X LLL44300WU33X	13803. 16067.	AL600LS52K4◆
High Perf. Ammeter	LSI	5.3A-W	400 600	LDL44400WU43X LDL44600WU43X	8779. 11471.	LGL44400WU43X LGL44600WU43X	9167. 12001.	LJL44400WU43X LJL44600WU43X	13175. 15608.	LLL44400WU43X LLL44300WU43X	14874. 17138.	AL600LS52K4◆
High Perf. Energy	LSI	5.3E-W	400 600	LDL44400WU53X LDL44600WU53X	9896. 12590.	LGL44400WU53X LGL44600WU53X	10343. 13179.	LJL44400WU53X LJL44600WU53X	14352. 16786.	LLL44400WU53X LLL44300WU53X	16051. 18315.	AL600LS52K4◆
High Perf. Ammeter	LSIG	6.3A-W	400 600	LDL44400WU44X LDL44600WU44X	11016. 13709.	LGL44400WU44X LGL44600WU44X	11522. 14356.	LJL44400WU44X LJL44600WU44X	15531. 18244.	LLL44400WU44X LLL44300WU44X	17230. 19493.	AL600LS52K4◆
High Perf. Energy	LSIG	6.3E-W	400 600	LDL44400WU54X LDL44600WU54X	12134. 14827.	LGL44400WU54X LGL44600WU54X	12699. 15534.	LJL44400WU54X LJL44600WU54X	16707. 19141.	LLL44400WU54X LLL44300WU54X	18406. 20671.	AL600LS52K4◆

- Standard rated (80%). Not available in 100% rated.
- AL400L61K3 terminal wire ranges are (1) #2 AWG-500 kcmil Al or (1) #2 AWG-600 kcmil Cu.
- ♦ AL600LS52K3 terminal wire ranges are (2) 2/0 AWG-500 kcmil Al or Cu.

# Table 7.78: J-Frame Termination Options

Termination Lett		
A = I-Line (See Section 9) F = No Lugs (includes terminal nut kit on both ends).▲ L = Lugs both ends M = Lugs ON end Terminal Nut Kit OFF end P = Lugs OFF end Terminal Nut Kit ON end N = Plug-in ■ D = Drawout ■	For factory-installed termination, place termination letter in the third block of the circuit breaker catalog number.    H_G_L_3_6_1_0_0   —Termination Letter	

Add TS suffix for circuit breaker without terminal nut kit.



Voltage	Interrupting Rating							
	D	G	J	L				
240 Vac	25 kA	65 kA	100 kA	125 kA				
480 Vac	18 kA	35 kA	65 kA	100 kA				

Accessories	Page 7-39
Optional Lugs	
Dimensions	Page 7-55
Enclosures	Page 7-56

Rear Connected

Plug-in



#### **LA Mission Critical Circuit Breakers**

The LA High Magnetic Withstand MC Circuit Breakers are designed to trip at a higher magnetic trip level (18–20 times handle rating) than typical molded case circuit breakers (MCCBs) (which trip at 5–10 times the handle rating).

The high magnetic withstand value of these LA circuit breakers allow the downstream branch circuit breaker to clear

Table 7.80: L-Frame—400 A, Thermal-Magnetic, High Magnetic Withstand Circuit Breakers For Mission **Critical Loads** 

Ampere	Ampere AC Magnetic Level Factory Set		Standard Interrupting		High Interru	pting	Terminal		
naurig	Hold	Trip	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	Wire Range	
LA/LH MC C	ircuit Breaker,	3P, 480 Vac	•						
200 A	3400 A	4000 A	LAL34200MC	4962.00	LHL34200MC	7941.00			
225 A	3825 A	4500 A	LAL34225MC	4962.00	LHL34225MC	7941.00	AL250LAMC	(1) 250–350 kcmil Al (1) 3/0 AWG–350 kcmil Cu	
250 A	4250 A	5000 A	LAL34250MC	5355.00	LHL34250MC	8336.00		(1) 6/67/11/4 666 (61/11) 64	
400 A	6000 A	7200 A	LAL34400MC	6615.00	LHL34400MC	9596.00	AL400LA	(1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al	

#### **Table 7.81:** L-Frame Interrupting Table

	LAL	LHL
240 Vac	42 kA	65 kA
480 Vac	30 kA	35 kA

## PowerPact™ Circuit Breakers with Micrologic™ Electronic Trip Units

The advantages of being able to adjust the trip curve of a circuit breaker equipped with an electronic trip system are obvious. There are other advantages, such as being able to adjust or turn off the instantaneous trip function on some circuit beakers and models of trip units.

Accessories	Supplemental Digest Pages 3-29-3-3	30
Compression	and PDC Lugs Supplemental Digest Page 3-3	30
Dimensions.		<b>j</b> 4
Frales: was	Dog 7 5	

www.schneider-electric.us

Electrical Accessories New! Table 7.82:

**PowerPact™ Circuit** 

**Breaker Accessories** 

						H-, J-	-, and L-F	rame		M-, P-, and R-Frame			
						H- and J-F	Frame	L-Fra	me				
Accessory	Descrip	otion	Rated Voltage		Factory- Installed Cat. Suffix	Field- Installable Cat. No.	\$ Price	Field- Installable Cat. No.	\$ Price	Factory Installed Cat. Suffix	Field- Installable Cat. No.	\$ Price	
			1 auxiliary switch (	OF) 1a1b	AA	S29450	297.00	S29450	297.00	AA	S29450	297.00	
			2 auxiliary switch (		AB	2x S29450	594.00		594.00	AB	2x S29450	594.00	
			3 auxiliary switch (		AC	_	_	3x S29450	891.00	AC	3x S29450	891.0	
			Alarm Switch (SD)	1a1b	BC	S29450	297.00	S29450	297.00	BC	S29450	297.0	
uxiliary and larm Switches		Standard	Overcurrent trip sw	vitch (SDE) 1a1b	BD	_	338.00	S29450	297.00	BD	S29450	297.0	
DF, SD, SDE)		Min Load =	Consisting of:	OF Switch	_	S29450	297.00	_	_	_	_	_	
2., 02, 022,	Provides circuit	10mA with	ŭ	SDE Adapter	_	S29451	40.00	_	_	_	_		
	breaker	24V	Alarm switch and (	Overcurrent trip switch			635.00	2x S29450	594.00	BE	2x S29450	594.0	
FQ.	contact status.		Consisting of:	OF Switch SDE Adapter	_	2x S29450	594.00	_		_	_	_	
	Note: The		Auxilian/ Cwitch/Al	arm Switch/Adapter	_	S29451	40.00	_	_	_	_	_	
	location of the		(OF/SD/SDE) Kit	arm Switch/Adapter	_	_	_	_	_	_	S33801 ◆	297.0	
	accessory in the circuit breaker		One auxiliary switch	ch (OF) 1a1b	AE	S29452	372.00	S29452	372.00	AE	S29452	372.0	
11			Two auxiliary switch	hes (OF) 2a2b	AF	2x S29452	744.00	2x S29452	744.00	AF	2x S29452	744.0	
10	determines its function.		3 auxiliary switche	s (OF) 3a3b	AG	_	_	3x S29452	1116.00	AG	3x S29452	1116.0	
H-, J-, L-, M-, P,	tunction.	Low Level	Alarm Switch (SD) 1a1b		BH	S29452	372.00	S29452	372.00	BH	S29452	372.0	
and R-Frame		Min Load =	Overcurrent trip sw	. ,	BJ	_	413.00	S29452	372.00	BJ <b>▼</b>	S29452	372.0	
		1mA with	Consisting of:	OF Switch	_	S29452	372.00	_	_	_	_	_	
		24V		SDE Adapter	_	S29451	40.00			_			
			Alarm switch and (	Overcurrent trip switch			785.00		744.00	BK▼	2x S29452	744.0	
			Consisting of:	OF Switch	_	2x S29452 S29451	744.00 40.00	_	_	_	_	_	
				SDE Adapter★ 24	SK	S29451 S29384	40.00	S29384	_	SK	S33659		
hunt Trip (MX)				48	SL	S29385		S29385		SL	S33660		
				110–130	SA	S29386		S29386		SA	S33661		
			AC	220–240	_	329300	717.00	329300	717.00	SC	S33662	755.0	
P. P. Car			AO	208–277	SD	S29387	717.00	S29387	717.00	SD	S33663	7 33.0	
Canada Ca	Trips the circuit	breaker from		380–480	SH	S29388		S29388		SH	S33664		
	a remote location	on by means		525–600	SJ	S29389		S29389		_	_		
	of a trip coil ene separate supply			12	SN	S29382		S29382		SN	S33658		
	circuit.	y voltage		24	SO	S29390	717.00	S29390		SK	S33659		
				30	SU	S29391		S29391		SK	S33659		
			DC	48	SP	S29392		S29392	2 717.00 SL 3 SL SA	SL	S33660	755.0	
H-, J-, and L-Frame				60	SV	S29383		S29383		SL	S33660		
21140				125	SR	S29393		S29393			S33661	ĺ	
				250	SS	S29394		S29394		SC	S33662		
				24	UK	S29404		S29404		UK	S33668		
Indervoltage Trip (MN)				48	UL	S29405		S29405		UL	S33669		
				110–130	UA	S29406		S29406		UA	S33670		
	Instantaneously circuit breaker v		AC	220–240			717.00		717.00	UC	S33671	755.0	
9 9	under-voltage ti			208–277	UD	S29407		S29407		_	<u></u>		
SIB. TO	voltage drops to	a value		380–480	UH	S29408		S29408		UH	S33673		
10 man - 1	between 35% a rated voltage. C			525–600 12	UJ	S29409 S29402	1	S29409 S29402				1	
	allowed when the	he supply		24	UO	S29402 S29410		S29402 S29410		UK	S33668		
W. W.	voltage of the u			30	UU	S29410 S29411		S29410 S29411		UK	S33668		
	trip reaches 85° voltage.	∕o Ui ialeu	DC	48	UP	S29411	717.00	S29411	717.00	UL	S33669	755.0	
H-, J-, and				60	UV	S29403		S29403		UL	S33669		
L-Frame				125	UR	S29413		S29413		UA	S33670		
				250	US	S29414		S29414		UC	S33671		
	Undervoltage tr	rip with		48	_	S33680		S33680		_	S33680▲■		
Time Delay Unit	externally mour	nted		100-130	_	S33681	1140.00	S33681	1140.00		S33681▲■		
A CONTRACTOR OF THE PARTY OF TH	adjustable time UVR of 0.5, 0.9	ueiay uriil ior ), 1.5, 3.0	AC/DC	220–250	_	S33682		S33682		_	S33682▲■	1140.0	
****** m	seconds before breaker trips	circuit		380-480	_			_		_	S33683▲■		
EN A	bicanci liips			48	_	S29426	930.00	S29426	930.00		_		
ex ac 0.	Undervoltage tr	rip with	_	100–130	_	_	_	_	_	_	\$33684▲■		
	externally mounted non- adjustable time delay unit of 0.25 sec before circuit	of AC/DC											
	adjustable time	delay unit of	AC/DC	200–250	_	_	_	_	_	_	\$33685▲■	930.0	

- Field-installable kit includes time delay module only. Order undervoltage trip separately. Discount schedule DE2F.
  P-frame drawout circuit breaker only.
  SDE Adapter used for H- and J-frame only.
  Not available on electrically operated P-frame.

EMENE
Sec. Sec.
题
Motor Operator

				Factory			FieldIns	tallable Kit		
	Description	Rated Voltage		Installed	H-Frai	me▲	J-Fra	me	L-Frame 600 A	
				Cat. No. Suffix	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
			48-60	ML	S29440		S31548		S432639	
			110-130	MA	S29433	1 [	S31540	1	S432640	New!
Jan Sallan	Standard motor for electrically- operated circuit breakers★	AC	208–277 220–240	MD	S29434	1161.00	S31541	3123.00	S432641	3395.00
The same of the sa			380-415	MF	_	1 [	_		S432642	
THE REAL PROPERTY.			440-480	MH	S29435	1 [	S31542		S432647	
-			24-30	MO	S29436		S31543		S432643	3545.00
		DC	48–60	MV	S29437	<b>─</b> 1161 00 <b>──</b>	S31544	2102.00	S432644	
		DC	110-130	MR	S29438		S31545	3123.00	S432645	
- <u> </u>			250	MS	S29439	1 [	S31546		S432646	
Motor Operator	Communicating motor for electrically- operated circuit breakers▼	AC	220–240	NC	S429441	1509.00	S431549	4060.00	S432652	4414.00
		Mount	ing hardware	_	_	_	_	_	S32649	59.00
	Locking device	R	onis lock	_	S41940	146.00	S41940	146.00	S41940	146.00
		Pro	ofalux lock	_	S42888	146.00	S42888	146.00	S42888	146.00
			g hardware plus onis lock	_	S429449	155.00	S429449	155.00	_	
	Operations counter			_	_	_	_	_	S32648	225.00
	Adapter for I-Line circuit breaker			_	S37420	119.00	S37420	119.00	_	_

Table 7.84: Spring-Charging Motors for Electrically-Operated P-Frame Circuit Breakers

	to a culmation	Do	ted Veltere	Factory Insta	lled	P-Frame (For Field-replaceme	ent Only)	Replacement Coils		
	escription	Ha	ted Voltage	Cat. No. Suffix	\$ Price	Spring Charging Motor Cat. No.	\$ Price +	Opening/Closing Coil Cat. No.	\$ Price	
			48	ML		S47391		S33660		
		AC	100-130	MA	5090.00	S47395	3580.00	S33661	755.00	
	Standard motor for electrically-	AC	220-240	220–240 MC	5090.00	S47396	3560.00	S33662	755.00	
	operated circuit breakers. Factory-installed includes		380-415	MF		S47398		S33664		
motor and opening/closing coils.		24-30	MO		S47390		S33659			
	DC	48–60	MV	5090.00 \$47391	3580.00	S33660	755.00			
		DC	110-130	MR	5090.00 S4	S47392	3560.00	S33661	755.00	
			200-250	MS		S47393		S33662		
ant by			48	NL	S47391		S33034			
		AC	100-130	NA	E000.00	S47395	0500.00	S33035		
	Communicating motor mechanism for electrically	AC	220-240	NC	5090.00	S47396	3580.00	S33036	755.00	
Spring-charging	operated circuit breakers.		380-415	NF		S47398		S33038		
Motor Factory-installed includes motor and opening/closing coils.		24-30	NO		S47390		S33033			
		DC	48–60	NV	F000 00	S47391	2500.00	S33034	755.00	
	and opening/closing coils.	DC	110-130	NR	5090.00	S47392	3580.00	S33035	755.00	
			200-250	NS		S47393		S33036		

Table 7.85: **Rotary Operated Handles** 

			H-	and J-Frame▲			L-Frame		P-Frame	
	Device	Description	Factory Installed Cat. No. Suffix		\$ Price	Factory Installed Cat. No. Suffix	Field Installable Cat. No.	\$ Price	Factory Installed Cat. No. Suffix	\$ Price
	Standard black handle	Handle only	RD10	S29337	225.00	RD10	S32597	366.00	RD10	539.00
	Ohamaland blank bandla will	Two early-break and two early make switches	_	1	1	_	_	-	RD16	822.00
	Standard black handle with	One early-break switch	RD12	S29337 + S29345	345.00	RD12	S32597 + S32605	486.00	_	
Direct		Two early-make switches	RD13	S29337 + S29346	404.00	RD13	S32597 + S29346	545.00	_	_
Mounted	Handle only	RD20	S29339	234.00	RD20	S32599	407.00	_	_	
	Red handle on yellow bezel	One early-break switch	RD22	S29339 + S29345	354.00	RD22	S32599 + S32605	527.00	_	_
		Two early-make switches	RD23	S29339 + S29346	413.00	RD23	S32599 + S29346	586.00	_	_
MCC conversion accessory			_	S429341	102.00	_	S32606	102.00	_	_
CNOMO conversion accessory		_	_	_	_	S32602	102.00	_	_	
	Standard black handle	Handle only	RE10	S29338	383.00	RE10	S32598	557.00	RE10	971.00
Door Mounted	Standard black handle with:	Two early-break and two early make switches	_	1	_	_	_	-	RE16	1268.00
Mounted	with.	Two early make switches	RE13	S29338 + S29346	503.00	RE13	S32598 + S29346	736.00	_	_
	Red handle on yellow bezel	Handle only	RE20	S29340	399.00	RE20	S32600	597.00	_	_
Rotary Handl	e Replacement Kit		_	_	_	_	_	_	S33875	795.00
Telescoping			RT10	S29343	492.00	RT10	S32603	617.00	_	_
	Key lock adapter		_	S429344	58.00	_	S32604	58.00	_	
		Ronis 1351.500	_	S41940	146.00	_	S41940	146.00	_	_
	Koy looko	Profalux KS5 B24 D4Z	_	S42888	146.00	_	S42888	146.00	_	_
	Ney locks	2 Ronis keylocks with 1 key	_	S41950	185.00	_	S41950	185.00	_	_
		2 Profalux keylocks with 1 key	_	S42878	185.00	_	S42878	185.00	_	_
	Indication Auxilians Switch	One early-break switch	_	S29445	120.00	_	S32605	120.00	_	
	Two early-make switches	_	S29346	179.00	_	S29346	179.00	_	_	





- Not available in H-frame 2P modules.
- CP1 discount schedule.
- DE2F discount schedule.
- DEZ\* discount schedule.

  Factory and field-installed standard motor operators for H- and J-frame circuit breakers require the SDE switch and SDE adapter (both included).

  Factory and field-installed standard motor operators for L-frame circuit breakers require the SDE switch (included).
- Installation requires BSCM with NSX Cord. SeeTable 7.118, page 7-49 for ordering information.

handle

New!

#### PowerPact™ Circuit **Breaker Accessories**

Table 7.86: Locks. Interlocking New!)

Table 7.00	. Locks, interiock	ing —													
			Н- а	ind J-Fram	ne	Q-Fr	ame	L-Fra	ame	M-	and P-Frai	ne		R-Frame	
Device	Description		Factory Installed Cat. No. Suffix	Field- Installed Cat. No.	\$ Price	Field- Installed Cat. No.	\$ Price	Field- Installed Cat. No.	\$ Price	Factory Installed Cat. No. Suffix	Field- Installed Cat. No.	\$ Price	Factory Installed Cat. No. Suffix	Field- Installed Cat. No.	\$ Price
	Removable (lock OFF only)		_	S29370	50.00			S29370	50.00	_	S44936	50.00	_	S33996	50.00
Handle Padlocking	Fixed (lock OFF or ON)		YP	S29371	77.00	QBPA	77.00	S32631	122.00	YP	S32631	122.00	YP	S32631	122.00
Padiocking Device	Fixed (lock OFF only)▲		YQ	S37422	122.00	QBPAF	77.00	NJPAF	122.00	YQ	MPRPAF	122.00	YQ	MPRPAF	122.00
201.00	Fixed (lock OFF only)-2P		YQ	H2PHLA	122.00	_	_	_	_	_	_	_	_	_	_
Interlocking	Mechanical for circuit breake handles▲	ers with rotary	_	S29369	494.00	_	_	S32621	494.00	_	S33890	1220.00	_	_	_
(Not UL listed) M	Mechanical for circuit breakers with toggles▲		_	S29354	494.00	QBMIK	90.00	S32614	494.00	_	_	_	_	_	_
	Provision only, vertical mount, 1 or 2 locks	Kirk	_	_	_	_	_	_	_	JA	_	323.00		_	
	Provisions only, vertical mounting one key interlock including padlock provision, open position only.	Kirk	_	_	_	_	_			JE■★		445.00	JE★	_	445.00
(()	Provision only, horizontal	Kirk	_	_	_	_	_	_	_	JK	_	323.00	JK	_	323.00
	mount 1 lock, M- and P-frame	Ronis	_	_	_	_	_	_	_	JB♦	_	323.00	JB	_	323.00
	1 or 2 locks, R-frame	Profalux	_	_	_	_	_	_	_	JD♦	_	323.00	JD	_	323.00
	Provision and 1 lock, vertical mount	Kirk	_	_	_	_	_	_	_	JG	_	1796.00	_	_	_
Key Locking	B 141 1	Kirk	_	_	_	_	_	_	_	JL	_	1796.00	JL	_	1796.00
	Provision and 1 lock, horizontal mount	Ronis	_	_	_	_	_	_	_	JC♦	_	2285.00	JC	_	2285.00
	Honzontai mount	Profalux	_	_	_	_	_	_	_	JF♦	_	2285.00	JF	_	2285.00
	Provision and 2 locks keyed alike	Kirk	_	_	_	_	_	_	_	JN	_	2285.00	JN	_	2285.00
	Provision and 2 locks keyed differently	Kirk	=	_	_	_	_	=	_	JP	_	3269.00	JP	_	3269.00

- Not available in M frame or HD and HG 2P modules.
- Not available on M-frame
- Not available for M, P or P frame drawout. Only available on P frame electronic.
- Not available on I-Line.

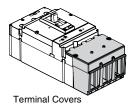






Handle Rubber Boot

Door Escutcheon





Rear Connection





Removable Padlock Attachment

Fixed Padlock Attachment

New!

Installation Accessories fo H-, J-, and L-Frame Circuit Breakers

	H- and J-	-Frame	L-Fra	me
Description	Field- Installed Cat. No.	\$ Price	Field- Installed Cat. No.	\$ Price
Front Panel Escutcheon for Toggle Breakers	S29315	48.00	32556	55.00
Front Panel Escutcheon for Rotary Handle, Motor Operator, or extended escutcheon	S29317	63.00	S32558	74.00
Phase Barriers (set of 6)	S29329	53.00	32570	72.00
Handle Rubber Boot▼	S29319	135.00	S32560	171.00
Sealing Accessories (for front cover screws)	S29375	42.00	S29375	42.00
DIN rail mounting kit (requires 15 mm depth on a 35 mm DIN rail)▼	S29305	188.00	_	_
DIN rail adapter	_	_	_	_
Handle Extensions (set of 5)	S29313	140.00	S432553	165.00
Met available in HD and HC 2B medules	320010	140.0	,,,,	0102000

Not available in HD and HG 2P modules.

#### Installation Accessories for M-, P-, and R-Frame Circuit Breakers

ı	Description	Frame	Field- Installed Cat. No.	\$ Price
	Accessory Cover	M-, P-Frame	S33718△	176.00
Door Escutcheon	Accessory Cover	R-Frame	S33929	176.00
Door Esculcrieori	Toggle Handle	M-, P-Frame	S33717	47.00
	Drawout	P-Frame	S33857△	308.00
	Short lug cover 3P		S33932	165.00
Terminal Covers	Short lug cover 4P	P-Frame	S33933	216.00
Terminal Covers	Long lug cover 3P	P-Frame	S33934	216.00
	Long lug cover 4P		S33935	281.00
Replacement Handle	Standard	R-Frame	S33997	111.00
	Standard Short	M-, P-Frame	S46998	44.00
	Long	M-, P-Frame	S46996	44.00

DE2F discount schedule.

#### Table 7.89: **Rear Connections**

			H-F	rame		J-Frame				L-Frame			
Device	Description	Poles	Factory- Installed Termination No.	Field- Installable Cat. No.	\$ Price	Poles	Factory- Installed Termination No.	Field- Installed Cat. No.	\$ Price	Poles	Factory- Installed Termination No.	Field-Installed Cat. No.	\$ Price
Mixed Rear		2	S	_	_	2	S		_	3	S	S32477	1059.00
Connection Kit□		3	S	S37432	381.00	3	S	S37437	381.00	4	S	S32478	1344.00
	Short rear connections (set of 2)	2 or 3	_	2x S37433\$	84.00	2 or 3	_	2x S37438♦	84.00	2	_	2x S432475◊	219.00
Consisting of:	Long rear connections (set of 2)	2013	_	S37434	105.00	2013	_	S37439★	105.00	3	_	2x S432476\$	261.00
	Short terminal cover (3P)	3	_	S37436	119.00	3	_	S37440	119.00	3	_	2x S32562♦	149.00
	Short terminal cover (4P)	4	_	_	_	_	_	_	_	4	_	2x S32563♦	161.00

- Kit contains 4 short rear connections, 2 long rear connections (4 long rear connections for 4P), hardware, and 2 terminal covers...
- Price shown is for quantity one.
- For use with 3P circuit breakers only.



J-Frame Lug

L-Frame Lugs

M- and P-Frame Lugs (800 A and below)

New!



Per Kit P	
	Per Kit
3	75.00
3 1	113.00
3 1	113.00
3 1	156.00
3 3	314.00
2	53.00
2	53.00
	3 3 3 3 2

See page 7-44 for terminal nuts/bus bar connections.

#### Table 7.91: Mechanical Lug Kits for L-Frame Circuit Breakers

		Circuit Bre	aker Application		Number of Wires		Qty	\$ Price
Description	Ampere Rating	Poles	Unit Mount	I-Line	Per Lug and Wire Range	Kit Cat. No.	Per Kit	Per Kit
	250	3	Х	Х	(1) 2 AWG-500 kcmil Al	AL400L61K3	3	143.00
		4	Х	_	(1) 2 AWG-600 kcmil Cu	AL400L61K4	4	176.00
Al Lugs for Use with Al or Cu Wire	400/600	3	Х	_	(0) 0/0 1110 5001 1111 0	AL600LS52K3	3	341.00
of Cu Wife		4	Х	_	(2) 2/0 AWG-500 kcmil Al or Cu	AL600LS52K4	4	449.00
	400/600	3	Х	Х	(2) 3/0 AWG-500 kcmil Al or Cu	AL600LF52K3	3	831.00
	250/400	3	Х	X	(4) 0 AMO 000 lessell Occ	CU400L61K3	3	755.00
		4	Х	_	(1) 2 AWG-600 kcmil Cu	CU400L61K4	4	983.00
Cu Lugs for Use with Cu Wire Only	400/600	3	Х		(O) 0/0 ANNO 500 barrell Ove	CU600LS52K3	3	1832.00
cu Wire Only		4	Х	_	(2) 2/0 AWG-500 kcmil Cu	CU600LS52K4	4	2385.00
	400/600	3	X	X	(2) 3/0 AWG-500 kcmil Cu	CU600LF52K3	3	2395.00

#### Table 7.92: Mechanical Lug Kits for M-Frame, P-Frame and R-Frame Circuit Breakers▼

Doggrintion		Circuit Br	eaker Application		Missa may Lare		Luma	\$ Price					
Description	Standard	Rating	Optional	Ampere Rating	Wires per Lug and Wire Range	Cat. No.	Lugs Per Kit	Per Kit					
		800 A		800 A	(3) 3/0 AWG-500 kcmil	AL800M23K	3	284.00					
		000 A	_	000 A	(3) 3/0 AVVG-300 KCITIII	AL800M23K4	4	378.00					
		1200 A	PG, PJ, PL, MG, MJ	800 A	(4) 3/0 AWG-500 kcmil	AL1200P24K■	1	155.00					
	M-, P-Frame	_	PG, PJ, PL, MG, MJ	800 A	(2) 3/0 AWG-600 kcmil	AL800P6K■	3	416.00					
			ra, ra, re, ivia, ivia	000 A	(2) 3/0 AVVG-000 KCITIII	AL800P6K4■	4	554.00					
		DO DI DI MO		900 A	(2) 3/0 AWG-750 kcmil	AL800P7K■	3	464.00					
A11		_	PG, PJ, PL, MG, MJ	800 A (2) 3/0 AWG-750 KCHIII 750 kcmil: compact AL only		AL800P7K4■	4	602.00					
Al Lugs for AL or Cu Wire							1200 A	PG ,PJ, PL	800 A	(4) 3/0 AWG-500 kcmil	AL1200P25K◆	3	378.00
	P-Frame	1200 A	FG ,F3, FL	000 A	(4) 3/0 AVVG-300 KCITIII	AL1200P25K4◆	4	504.00					
	r-riaille		PG. PJ.P L	800-1200 A	(3) 350-600 kcmil	AL1200P6KU◆	3	786.00					
			FG, FJ,F L	600-1200 A	(5) 330-000 KCITIII	AL1200P6KU4◆	4	1038.00					
	PG,PJ,PL		PG, PJ, PL	1200 A	(3) 3/0 AWG-750 kcmil	AL1200P7KU ♦	3	1233.00					
	FG,FJ,FL	_	— FG, PJ, PL 12007		750 kcmil: compact AL only	AL1200P7KU4◆	4	1635.00					
	R-Frame	1200 A	I-Line	_	(4) 3/0 AWG-600 kcmil	AL1200R53K	1	215.00					
	n-i iailie	2500 A	Unit Mount	_	(1) 3/0 AWG-750 kcmil	AL2500RK★	2	132.00					
		_	PJ	100-150 A	(1) 1-1/0 AWG	CU250P1K△	3	990.00					
	M P-Frame	800 A	MG, MJ, PG, PJ, PL		(3) 3/0 AWG-500 kcmil	CU800M23K	3	1647.00					
01	ivi-, r-riairie	600 A	IVIG, IVIJ, FG, FJ, FL	_	(3) 3/0 AVVG-500 KCITIII	CU800M23K4	4	2190.00					
Cu Lugs for Cu Wire Only□		1200 A	MG, MJ, PG, PJ, PL	800-1200 A	(4) 3/0 AWG-500 kcmil	CU1200P24K■	1	569.00					
ioi ou trile offiya	P-Frame	1200 A	PG. PJ. PL	900 1200 A	(4) 3/0 AMC 500 komil	CU1200P25K◆	3	4886.00					
	r-riame	1200 A	FG, PJ, PL	800–1200 A (4) 3/0 AWG-500 kcmil		CU1200P25K4	4	6503.00					
	R-Frame	1200 A	I-Line	_	(4) 3/0 AWG-500 kcmil	CU1200R53K	1	548.00					

- Does not fit onto ON end of unit-mount P-frame circuit breakers.
- For unit-mount circuit breaker only.

  All unit-mount R-frame circuit breakers require terminal pads for mounting lugs of any type. See page 7-44.

  For lug with a tapped hole for control wire, add a "T" before the "K" in the catalog number (for example, AL800P6TK).
- This lug can only be used on low amp PJ frame breakers where the Instantaneous setting must not be turned OFF. The cables must be laced with rope per lug instructions.

  Not available with tapped hole for control wire.

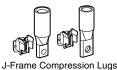
920.00



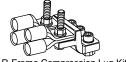
#### PowerPact™ Circuit **Breaker Accessories**

#### Table 7.93: Compression Lug Kits for PowerPact™ Circuit Breakers





Description	Circuit Breaker Type	Ampere Rating	System Range	Mounting Type	Dimension A (in)	Max. Lugs per Terminal	Cat. No.	Qty. Per Kit	\$ Price Per Kit
Compression L	ug Kits for H-Fra	ame and J-	Frame Circuit Breakers						
	I I from a	60 A	6-2 AWG Al or Cu		1.2	1	YA060HD	3	194.00
Aluminum	H-frame	150 A	1/0-4/0 AWG AI or Cu		2.5	1	YA150HD	3	294.00
Compression Lug Kits	J-frame	150 A	1-3/0 AWG Al or Cu		1.2	1	YA150JD	3	237.00
209 1 110	J-Irame	250 A	3/0-350 kcmil Al or Cu	Unit/I-line ♦	2.5	1	YA250J35	3	305.00
	H-frame	60 A	6-1/0 AWG Cu	OHIDI-IIIIe ▼	1.2	194.00			
Copper Compression	n-iiaiiie	150 A	4-2/0 AWG Cu		1.2	1	CYA150HD	3	194.00
Lug Kits	J-frame	150 A	6-1/0 AWG Cu		0.7	1	CYA150JD	3	194.00
	J-IIailie	250 A	2/0–300 kcmil Cu		1.1	1	CYA250J3	3	194.00
Compression L	ug Kits for L-Fra	me Circuit	Breakers						_
		250 A	4-300 kcmil Al/Cu		1.2	1	YA400L31K3	3	294.00
		400 A	4-300 kcmil Al/Cu		2.5	2	YA600L32K3	6	540.00
		250 A	2/0-500 kcmil Al/Cu			1	YA400L51K3	3	361.00
		600 A	2/0-500 kcmil Al/Cu			2	YA600L52K3	6	718.00
Aluminum Compression	L-frame	400 A	500-750 kcmil Al 500 kcmil Cu	Unit/I-line◆		1	YA400L71K3	3	425.00
Lug Kits	L-Irame	250 A	4-300 kcmil Al/Cu	Onivi-line ♥		1	YA400L31K4	4	383.00
209 1110		400 A	4-300 kcmil Al/Cu			2	YA600L32K4	8	709.00
		250 A	2/0-500 kcmil Al/Cu			1	YA400L51K4	4	474.00
		600 A	2/0-500 kcmil Al/Cu		1.2	2	YA600L52K4	8	950.00
		400 A	500-750 kcmil Al 500 kcmil Cu		2.5	1	YA400L71K4	4	560.00
		250 A	2/0-300 kcmil Cu		1.2	1	CYA400L31K3	3	461.00
		400 A	2/0-300 kcmil Cu		2.5	2	CYA600L32K3	6	873.00
		250 A	250-500 kcmil Cu	Unit/I-line◆		1	CYA400L51K3	3	384.00
Copper	ion L-frame	600 A	250-500 kcmil Cu			2	CYA600L52K3	6	764.00
Compression Lug Kits		250 A	2/0-300 kcmil Cu	Unit/I-line ◆		1	CYA400L31K4	4	606.00
Lugitio		400 A	2/0-300 kcmil Cu			2	CYA600L32K4	8	1147.00
		250 A	250-500 kcmil Cu			1	CYA400L51K4	4	505.00
		600 A	250-500 kcmil Cu			2	CYA600L52K4	8	1011.00
Compression L	ug Kits for M-Fr	ame, P-Fra	me, and R-Frame Circuit	t Breakers					
		250 A	2/0-300 kcmil		3.7	2	YA250P3	1	663.00
		300 A	4/0-500 kcmil		3.9	2	YA300P5	1	519.00
		400 A	2/0-300 kcmil		4.3	2	YA400P3	2	542.00
	M-, P-frame	400 A	500-750 kcmil	Unit/I-line◆	3.7	2	YA400P7	1	747.00
		600 A	4/0-500 kcmil		3.9	2	YA600P5	2	788.00
Aluminum <sub>.</sub>		800 A	500-750 kcmil		4.3	2	YA800P7	2	845.00
Compression Lug Kits		1200 A	2/0-300 kcmil		3.8	4	YA1200R3	4	663.00
Lug Itilo		1200 A	4/0-500 kcmil	I-line◆	4.0	4	YA1200R5	4	707.00
	D frame t	1200 A	500-750 kcmil		4.4	4	YA1200R7	4	888.00
	R-frame▲	2000 A	2/0-300 kcmil		<b>A</b>	8	YA2000R3	2	317.00
		2000 A	4/0-500 kcmil	Unit♦	<b>A</b>	8	YA2000R5	2	291.00
		2500 A	500-750 kcmil		<b>A</b>	8■	YA2500R7	2	350.00
		400 A	4/0-500 kcmil		3.3	2	CYA400P5	1	651.00
Copper	M-, P-frame	600 A	4/0-500 kcmil	Unit♦	3.3	2	CYA600P5	2	753.00
Compression		800 A	500-750 kcmil		3.6	2	CYA800P7	2	554.00
Lug Kits	P. framo	1200 A	4/0-500 kcmil	LLino▲	3.5	4	CYA1200R5	4	987.00



P-Frame Compression Lug Ki

R-Frame Compression Lug Kit

- 4/0-500 kcmil 1200 A 500-750 kcmil All unit-mount R-frame circuit breakers require terminal pads for mounting lugs of any type. See page 7-44
- 9 lugs for 3000 A circuit breakers

R-frame

Not for use on I-Line™ circuit breakers unless wire bending space is adequate.

#### Power Distribution Connectors for H-Frame, J-Frame and L-Frame Circuit Breakers

Use with Circuit Breaker Type	Circuit Breaker Ampere Rating	Wires Per Terminal & Wire Range	Dimension A (in.)	Cat. No.	Qty. Per Kit	\$ Price Per Kit
HD, HG, HJ, HL★	15–150	(6) 14–6 AWG Cu	1.0	PDC6HD6	3	443.00
nD, nd, nJ, nL★	15-150	(3) 14–2 AWG Cu	1.2	PDC3HD2	3	434.00
JD. JG. JJ. JL★	150-250	(6) 14–4 AWG Cu	1.0	PDC6JD4	3	305.00
JD, JG, JJ, JL*	150-250	(2) 14-1 AWG and (1) 3-2/0 AWG Cu	1.5	PDC3JD20	3	594.00
LD. LG. LJ. LL	150-600	(3) 14-1 AWG and (2) 3-2/0 AWG	1.28△	PDC5DG20L3	3	387.00
LD, LG, LD, LL	150-600	(12) 14–4 AWG	1.31△	PDC12DG4L3	3	387.00

I-I ine ♦

3.8

# PDC12P4

PDC3HD2

0 PDC6HD6

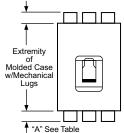


PDC3JD20

PDC6JD4

0

Crimp lug or PDC connectors extension past end or circuit



breaker "A" See Table

Not for use with I-Line™ circuit breakers.

• For Cu wire only.

Kit includes long terminal shield and cover, which adds 1.65 inches to standard lug with short terminal shield.

Discount Schedule

#### Table 7.95: Power Distribution Connectors for M-Frame and P-Frame Circuit Breakers▼

(Wires Per Terminal) Wire Range Ampere Rating Cat. No. Qty Per Kit Per Kit (6) 12-2/0 AWG Cu PDC6P20 573.00 3 250-1200 A (6) 12-2/0 AWG Cu PDC6P204 756.00 PDC12P4 3 866.00 250-1200 A (12) 10-4 AWG Cu PDC12P44 929.00

Use for multiple load connections on one circuit breaker in place of standard distribution block to save space and time.

• Use on load end of circuit breaker only.

• Use in UL508 Industrial Control applications only.

• Use in UL1995/CSA C22.2 No. 236 heating and cooling equipment.

OFF end only when OFF end is the load end.

www.schneider-electric.us

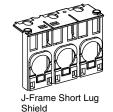


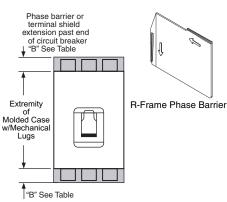






Shield





**Table 7.96:** Terminal Nuts for Bus Bar Connection of H-Frame and J-Frame Circuit

Description	Frame	Тар	Cat. No.	Qty Per Kit	\$ Price Per Kit
H-Frame Terminal Nut Insert–English	HD/HG/HJ/HL	1/4-20	S37425	2	53.00
H-Frame Terminal Nut Insert-English	HD/HG/HJ/HL	1/4-20	S37444	3	75.00
H-Frame Terminal Nut Insert-Metric	HD/HG/HJ/HL	M6	S37426	2	53.00
J-Frame Terminal Nut Insert–English	JD/JG/JJ/JL	1/4-20	S37427	2	75.00
J-Frame Terminal Nut Insert-English	JD/JG/JJ/JL	1/4-20	S37445	3	113.00
J-Frame Terminal Nut Insert-Metric	JD/JG/JJ/JL	M8	S37428	2	75.00
Control Wire Terminal for H-Frame Terminal Nut	HD/HG/HJ/HL		S37429	2	53.00
Control Wire Terminal for J-Frame Terminal Nut	JD/JG/JJ/JL		S37430	2	53.00

Bus Bar Connections Hardware for L-Frame, M-Frame and P-Frame Table 7.97: **Circuit Breakers** 

|--|

Frame	Description	Term. No.	Poles	Cat. No.	\$ Price
L-Frame	Set of 4 terminal screws and washers for one side	F	4	S36967	31.00
M- and P-Frame	Bus Connector Kit for one pole, one end		1	S33928	28.00

#### **Terminal Pad Kits for R-Frame Circuit Breakers**

	Terminal Pad Kit	Field-Installable Kits				
R-Frame Circuit Breaker	Usage	Lugs per	3P Kit (One	End Only)	4P Kit (One End Only)	
	Usage	Phase	Cat. No.	\$ Price.	Cat. No.	\$ Price
3000 A, 100% Rated	Required for cable or bus	9	RL3TB	1440.00	RL3TB4	2016.00
3000 A, Standard (80% Rated)	Required for cable or bus					
2500 A, 100% Rated	Required for cable or bus					
2500 A, Standard (80% Rated)	Required for cable, optional for bus	8	RLTB	914.00	RLTB4	1280.00
All Other R-Frame Circuit Breakers	Required for cable, optional for bus					

For cable connection to RLTB, use AL2500RK lug. See page 7-43.

**Table 7.99: Terminal Shields and Phase Barriers** 

	Used With		Descrip	Description			Dimension B (in.)	Cat. No.	Qty Per Kit	\$ Price
			Frame		Max	. Wire Size				
	H- and J-Frame	Short Lug	H-Frame 6	60 A		3 AWG	0.50	S37446	1	149.00
	Mechanical Lugs	Shield▲	H-Frame 1	50 A	3	3/0 AWG	0.50	S37447	1	149.00
			J-Fram	е	3	50 kcmil	0.24	S37448	1	149.00
			С	ompati	ble with:					
🔿			PDC Compression Lugs							
New!)	H- and J-Frame Power Distribution Connectors and Compression Lugs		PDC	Alumi	num Copper					
		ors and H-Frame Long	PDC6HD6	YA06	OHD	CYA060HD	2.24	S37449	1	209.00
			PDC3HD2	YA15	OHD	CYA150HD	2.24	337449	'	209.00
		J-Frame Long Lug	PDC6JD4	YA15	0JD	CYA150JD	1.68	S37450	1	209.00
		Shield	PDC3JD2			CYA250J3	1.00	337430	'	209.00
	M-, P-Frame		Dhasa Da					S33646	47.00	
	R-Frame		Phase Barriers					S33998	3	47.00

- J-frame terminal shield is not compatible with the YA250J35 compression terminal.

Table 7.100: Miscellaneous H-, J-, and L-Frame Circuit Breaker Accessories

Accessory	Description	Field-Installed Cat. No,	\$ Price
	Bag of screws for accessory cover, L-frame	S432552	63.00
Spare Parts	1 spare toggle extension, L-frame	32595	342.00
	Set of 10 identification labels	LV429226	82.00

DE5A Discount Schedule





H-Frame and J-Frame Plug-in Mounting



H-Frame and J-Frame **Drawout Mounting** 



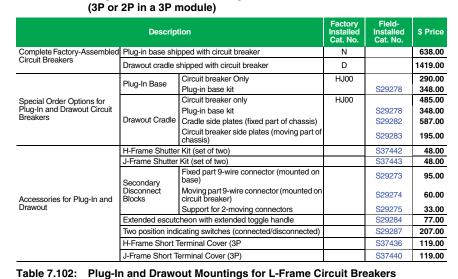


Table 7.101: Plug-In and Drawout Mountings for H- and J-Frame Circuit Breakers

Description			F	Plug-in Mountin	g	Drawout Mounting			
		Poles	Factory Installed Cat. No.	Field- Installed Cat. No.	\$ Price	Factory Installed Cat. No.	Field- Installed Cat. No.	\$ Price	
Kit (stationary and moving parts)		3	N		1542.00	D		2466.00	
		4	N		2082.00	D		3281.00	
	Plug-in base	3		S32514	1065.00		S32514	1065.00	
Stationary Part		4		S32515	1439.00		S32515	1439.00	
	Fixed part of chassis						S32532	693.00	
	Circuit breaker only		HJ00		710.00	HJ00		710.00	
Moving Part	Moving part of chassis						S32533	231.00	
	Short terminal covers	3		2x S32562	149.00		2x S32562	149.00	
	Short terminal covers	4		2x S32563	161.00		2x S32563	161.00	

Price shown is for quantity of 1.

#### Table 7.103: Plug-In and Drawout Accessories for L-Frame Circuit Breakers

	Description		Field- Installed Cat. No.	\$ Price
	Fixed Part	9-wire connector	S29273	95.00
Secondary Disconnecting Blocks	Moving Part	9-wire connector	S32523	60.00
Secondary Disconnecting Blocks	Moving Fait	Support for 3 moving connectors	S32525	43.00
	Fixed + Moving	S29272	480.00	
Shutters	Two shutters for plug-	in base	32521	81.00
	Extended escutcheon	S32534	104.00	
Chassis Accessories	Locking device (key lock is not included)		S29286	164.00
	Two position indicating	29287	207.00	

#### Table 7.104: Termination Options

	•
Termination Letter	For factory-installed termination, place
N = Plug-in	termination letter in the third block of the
D = Drawout	circuit breaker catalog number.

#### LGL36400U31X

#### **Drawout Cradle and Accessories for P-Frame Circuit Breakers**

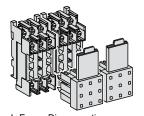
	Description	Cat. No.	\$ Price
Drawout Cradle		Product Selector	6400.00
Cradle	Front Connected Flat (FCF)	SFCF12■◆	716.00
Connectors	Rear Connected T Horizontal/Vertical (RCTH/RCTV)	SRCTV12■◆	408.00
	Modbus™ cradle communication module	S33852	2237.00
	Safety shutters		342.00
	Secondary disconnects terminal shield	S33763◆	220.00
	Cradle position switch 1a/1b Form C— Connected/test/disconnected	S33170◆	148.00
	Low level cradle position switch 1a/1b Form C—Connected/test/disconnected	S33171♦	216.00
	Cell keying kit	S33767◆	97.00
- "	Disconnected position key locking—provision for Kirk or Federal Pioneer Lock	S33772◆	908.00
Cradle Accessories	Door interlock kit	S33786◆	330.00
Accessories	Racking interior kit	S33788◆	358.00
	Door escutcheon (for replacement only, included with circuit breaker)	S33857◆	308.00
	Transparent cover	S33859◆	1290.00
	Push-in terminal kit (3 wires)	S33098◆	120.00
	Push-in terminal kit (6 wires)	S33099◆	240.00
	Finger cluster	S33166◆	164.00
	Cluster grease (12 oz. tube)	S48899◆	132.00

Needs 2 kits per cradle

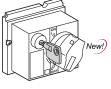


L-Frame Plug-In Mounting

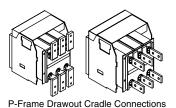




L-Frame Disconnecting **Blocks** 



L-Frame Locking Device



Discount Schedule DE2F

#### Class 611 / Refer to Catalog 0611CT1001



New!

#### PowerPact™ H-, J-, and L-Frame Micrologic™ Trip Units







Micrologic Ammeter and Energy Trip Unit

PowerPact™ H-, J-, and L-frame molded case circuit breakers may be specified with any of the following Micrologic Electronic Trip Units.

#### Micrologic Standard 3.2/3.3 Trip Units

- True RMS sensing
- LI, LSI trip configurations
- Field-interchangeable trip units
- LED long-time pickup and trip indication
- Test kits available
- Thermal imaging

#### Micrologic Ammeter 5.2A/5.3A/6.2A/6.3A Trip Units

Includes all features listed for Micrologic standard trip unit, as well as:

- Advanced user interface
- Neutral protection
- Incremental fine tuning of settings
- Up to 12 alarms
- Digital ammeter-phase and neutral (4-pole only)
- Phase loading bar graph
- Maintenance indicators including contact wear, number of operations, operating hours, and load profiles
- Cause of trip information for troubleshooting assistance
- LCD Display
- Zone-selective interlocking (ZSI) (short-time & ground-fault)
- Optional Modbus™ communications—PowerLogic™ compatible

#### Micrologic Energy 5.2E/5.3E/6.2E/6.3E Trip Units

Includes all features listed for Micrologic ammeter trip unit, as well as:

- Ground-fault trip with programmable ground fault alarm (available on 6.2E/6.3E only)
- Power and energy measurement
- Power quality measurements
- Current demand and power demand measurements

#### Table 7.106: Micrologic Trip Units☆ for PowerPact H-, J-, and L-Frame Circuit breakers

x- Standard Feature o - Available Option

Features	Sta	ndard	Amn	neter	Energy		
reatures	3.2/3/3	3.25/3.35	5.2A/5.3A	6.2A/6.3A	5.2E/5.3E	6.2E/6.3E	
LI	х						
LSI★		Х	Х		Х		
LSIG / Ground-Fault Trip▼				Х		Х	
Ground-Fault Alarm/Trip▼				Х		Х	
Current Setting Directly in Amperes	х	Х	Х	Х	Х	Х	
True RMS Sensing	х	Х	Х	Х	Х	Х	
UL Listed	Х	Х	Х	Х	Х	х	
Thermal Imaging	х	Х	Х	Х	Х	Х	
LED for Long-time Pickup	х	Х	Х	Х	Х	Х	
LED for Trip Indication	х	Х	Х	Х	Х	Х	
LED for Green "Ready"	Х	Х	Х	Х	Х	х	
Up to 12 Alarms Used Together			Х	Х	Х	Х	
Digital Ammeter			Х	Х	Х	Х	
Zone-selective Interlocking△			Х	Х	Х	Х	
Communications	0	0	0	0	0	0	
LCD Display			Х	Х	Х	Х	
Front Display Module FDM121			0	0	0	0	
Advanced User Interface			Х	Х	Х	Х	
Neutral Protection▼			Х	Х	Х	Х	
Contact Wear Indication□			Х	Х	Х	х	
Incremental Fine Tuning of Settings			Х	Х	Х	Х	
Load Profile□,◊			Х	Х	Х	х	
Power Measurement					Х	х	
Power Quality Measurements					Х	х	

- The LSI with 3.2S/3.3S trip units have fixed short time and long time delays.
- Requires neutral current transformer on the three-phase four-wire loads ZSI for H/J frames in only IN. for L-frame ZSI is In and OUT.

- Indication available using the communication system only.
  % of hours in 4 current ranges: 0–49%, 50–79%, 80–89%, and >90% In.
  DC not available with electronic trip units.

#### Table 7.107: Micrologic Trip Unit Settings for H- and J-Frame

Model	Trip Function	Trip Unit	Ampere Setting
			15-20-25-30-35-40-45-50-60
	ы	3.2	35-40-45-50-60-70-80-90-100
	-		50-60-70-80-90-100-110-125-150
Standard			70-80-100-125-150-175-200-225-250
Otaridard			15-20-25-30-35-40-45-50-60
	LSI	3.28	35-40-45-50-60-70-80-90-100
	LOI	3.23	50-60-70-80-90-100-110-125-150
			70-80-100-125-150-175-200-225-250
			15–60
	LSI	5.2A	35–100
	Loi		50–150
Ammeter			70–250
Ammeter	LSIG	6.2A	15–60
			35–100
	Loid	O.L.	50–150
			70–250
			15–60
	LSI	5.2E	35–100
	Loi	3.2L	50–150
Energy			70–250
Lifelgy			15–60
	LSIG	6.2E	35–100
	Loid	0.ZE	50–150
			70–250

#### Table 7.108: Micrologic Trip Unit Settings for L-Frame

Model	Trip Function	Trip Unit	Ampere Setting
			70-80-100-125-150-175-200-225-250
	LI	3.3	125-150-175-200-225-250-300-350-400
Standard			200-225-250-300-350-400-450-500-600
Stariuaru			70-80-100-125-150-175-200-225-250
	LSI	3.3S	125-150-175-200-225-250-300-350-400
			200-225-250-300-350-400-450-500-600
	LSI 5.	5.3A	125–400
Ammeter	LSI	3.3A	200–600
Ammeter	LSIG	6.3A	125–400
	Loid	0.5A	200–600
	LSI	5.3E	125–400
Energy	LOI	J.JL	200–600
Lifeigy	LSIG	SIG 6.3E	125–400
	LSIG	U.JL	200–600

#### PowerPact P- and R-Frame Micrologic Trip Units



PowerPact™ P- and R-frame molded case circuit breakers may be specified with any of the following Micrologic Electronic Trip Units.

#### Micrologic (Standard) 3.0 and 5.0 Trip Units

- True RMS sensing
- LI, LSI trip configurations
- Field-interchangeable long-time rating plugs
- LED long-time pickup indication
- Test kits available
- Thermal imaging

#### Micrologic (Ammeter) 3.0A, 5.0A and 6.0A Trip Units

Includes all features listed for Micrologic standard trip unit, as well as:

- LSIG trip configurations
- Digital ammeter—phase and neutral (4-pole only)
- Phase loading bar graph
- LED trip indication
- Zone-selective interlocking (ZSI) (short-time & ground-fault)
- Optional Modbus<sup>™</sup> communications—PowerLogic<sup>™</sup> compatible

#### Micrologic (Power) 5.0P and 6.0P Trip Units

Power measurement and advanced protection features includes all features listed for Micrologic ammeter trip unit, as well as:

- LSI trip configuration with programmable ground fault alarm
- LSIG (Ground-fault trip) with programmable ground fault alarm
- Incremental "fine tuning" of L, S, I, and G pickup and delay settings
- LCD dot matrix display and LED trip indication
- Advanced user interface
- Advanced protection IDMTL—selectable long-time delay bands
- Neutral protection
- Power measurement
- Contact wear indication
- Modbus communications—PowerLogic compatible
- Local and remote settings

#### Micrologic (Harmonic) 5.0H and 6.0H Trip Units

Power quality measurement and advanced protection features. Includes all features listed for the Micrologic power trip unit, as well as:

- Enhanced power measurements functions
- Power quality measurements

# Adjustable Rating Plugs for PowerPact™ P-Frame and R-Frame and Masterpact™ NT and NW Circuit Breakers—Selection

To provide maximum design flexibility, system protection, and field upgradeability, each Micrologic™ trip unit is equipped with an interchangeable long-time rating plug. Each trip unit requires an adjustable rating plug to determine the long-time pickup range of the circuit breaker. These plugs are factory installed on new trip units, or can be ordered separately for field-installable upgrades.

Adjustable rating plugs are offered in eight different ranges of long-time pickup adjustments. The following chart show the ranges of adjustments. Each adjustment times the sensor rating (Ir X In) of the circuit breaker sets the long-time pickup value of the circuit breaker.

#### Table 7.109: Long-time Pickup Settings

Rating Plug		Long-time Pickup Settings           .40         .45         .50         .60         .63         .70         .80         .90         1.0           .40         .44         .50         .56         .63         .75         .88         .95         1.0           .42         .50         .53         .58         .67         .75         .83         .95         1.0           .40         .48         .64         .70         .80         .90         .93         .95         1.0           .60         .70         .75         .80         .85         .90         .93         .95         1.0								
Α	.40	.45	.50	.60	.63	.70	.80	.90	1.0	
В	.40	.44	.50	.56	.63	.75	.88	.95	1.0	
С	.42	.50	.53	.58	.67	.75	.83	.95	1.0	
D	.40	.48	.64	.70	.80	.90	.93	.95	1.0	
Е	.60	.70	.75	.80	.85	.90	.93	.95	1.0	
F	.84	.86	.88	.90	.92	.94	.96	.98	1.0	
G	.66	.68	.70	.72	.74	.76	.78	.80	.82	
Н	.48	.50	.52	.54	.56	.58	.60	.62	.64	

Table 7.110: Micrologic Trip Units

x- Standard Feature o - Available Option

E turn	Stan	dard	A	mmet	er	Power		Harmonic	
Features	3.0	5.0	3.0A	5.0A	6.0A	5.0P	6.0P	5.0H	6.0H
LI	х		х						
LSI (Instantaneous can be turned off)		Х		Х	Х	Х	Х	Х	Х
LSIG / Ground-Fault Trip▲					Х		Х		Х
Ground-Fault Alarm (No Trip) ▲■						Х		Х	
Ground-Fault Alarm and Trip ▲							Х		Х
Adjustable Rating Plugs	Х	Х	Х	Х	Х	Х	Х	Х	Х
True RMS Sensing	Х	Х	Х	Х	Х	Х	Х	Х	Х
UL Listed	Х	Х	Х	Х	Х	Х	Х	Х	Х
Thermal Imaging	Х	Х	Х	Х	Х	Х	Х	Х	Х
Phase Loading Bar Graph			Х	Х	Х	Х	Х	Х	Х
LED for Long-time Pickup	Х	Х	Х	Х	Х	Х	Х	Х	Х
LED for Trip Indication			Х	Х	Х	Х	Х	Х	Х
Digital Ammeter			Х	Х	Х	Х	Х	Х	Х
Zone-selective Interlocking			Х	Х	Х	Х	Х	Х	Х
Communications			0	0	0	Х	Х	Х	Х
LCD Dot Matrix Display						Х	Х	Х	Х
Advanced User Interface						Х	Х	Х	Х
Protective Relay Functions						Х	Х	Х	Х
Neutral Protection						Х	Х	Х	Х
Contact Wear Indication						Х	Х	Х	Х
Incremental Fine Tuning of Settings						Х	Х	Х	Х
Selectable Long-time Delay Bands						Х	Х	Х	Х
Power Measurement						Х	Х	Х	Х
Power Quality Measurements								Х	Х
Waveform Capture								Х	Х

- Requires neutral current transformer in 3Ø4W systems.
- Requires M2C or M6C Programmable Contact Module.

#### Table 7.111: Micrologic Trip Unit and Options

Model	Protection	Additional Features	Field-Installable Cat. No. ♦	Kit \$ Price / Circuit Breaker \$ Price Adder
2.0 (IEC only)	LSO		S132R	2920.00
3.0 (UL/ANSI only)	LI	None	S131A	2920.00
5.0	LSI		S133A	4176.00
2.0A (IEC only)	LSO		S142R★	4554.00
3.0A (UL/ANSI only)	LI	Ammeter	S141A★	4554.00
5.0A	LSI	Ammeter	S143A★	5812.00
6.0A	LSIG		S144A★	7418.00
5.0P	LSI	Metering, Adv. Protection	S163A★▼	8720.00
6.0P	LSIG	ivietering, Adv. Protection	S164A★▼	10324.00
5.0H	LSI	Metering, Adv. Protection	S173A★▼	14770.00
6.0H	LSIG	& Harmonic Analysis	S174A★▼	16374.00

- ↑ The standard rating plug supplied with a trip unit will be the "A" rating plug. To specify an alternative adjustable rating plug, please add the letter designation to the end of the catalog number. Please refer to page 7-48 for a complete listing of adjustable settings available with each plug. (Example: S143B would specify a "B" rating plug instead of the standard "A" plug.) Use suffix "N" if no rating plug is required, deduct \$200.00 from the complete trip unit kit price.
- When replacing a standard trip unit with Type A (Ammeter), P (Power metering) or H (Harmonic analysis) trip unit, order the 12-pin connector kit S33101 for the Masterpact NW and NT and the PowerPact P-frame drawout circuit breakers or kit S33100 for PowerPact P-frame and R-frame unit-mount and I-Line circuit breakers. See page 7-48.
- ▼ Requires Circuit Breaker Communications Module.
- Δ The LSI with 3.2S/3.3S trip units have fixed short time and long time delays.
- □ Requires neutral current transformer on the three-phase four-wire loads

  ♦ ZSI for H/J frames in only IN. for L-frame ZSI is In and OUT.
- ♦ ZSI for H/J frames in only IN. for L-frame ZSI is In and OU

   indication available using the communication system only.
- % of hours in 4 current ranges: 0-49%, 50-79%, 80-89%, and >90% In.

#### Table 7.112: Special Options

•	•		
Description	Factory-Installed Suffix	Field-Installable Cat. No.	\$ Price
Ship circuit breaker in closed position	YK	N/A	N/C
CT Characterization (Calibrated trip system)	Q	N/A	3308.00

# **Trip Unit**

Full Function Test Kit

Sensor Plug

Trip Unit Seal

Class 612, 612/ Refer to Catalog 0611CT1001, 0612CT0101

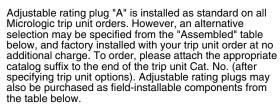


Table 7.113: Rating Plugs

Rating	Factory-	Installed	Field-Instal				
Plug▲	Cat. Suffix	\$ Price Adder	Cat. No.■	\$ Price			
Α	A (standard)	N/C	S48818	200.00			
В	В	N/C	S48819	200.00			
С	С	N/C	S48820	200.00			
D	D	N/C	S48836	200.00			
Е	E	N/C	S48837	200.00			
F	F	N/C	S48838	200.00			
G	G	N/C	S48839	200.00			
Н	Н	N/C	S48840	200.00			

- Long-time pickup amperes (Ir) = Sensor Rating (In) X Setting of rating plug. "Fine adjustment tuning" is included on Micrologic Power and Harmonic trip units, allowing for incremental settings of 1 A between the plug setting and 40 X Sensor Rating.
- DE2F Discount Schedule

Table 7.114: Neutral Current Transformers

Cat. No.	Sensor	\$ Price
S429521	60-100	588.00
S430562	S430563 250	588.00
S430563	250	588.00
S432575	400-600	647.00
\$33575♦,★	250	1914.00
S33576♦,★	400-1600	1914.00
S48916♦,★	250	2014.00
S34036♦,★	400-1600	2014.00
S48896♦,★	2000	2044.00
S48182♦,★	3000	2208.00
NCTWIRING	All	204.00
	S429521 S430562 S430563 S432575 S33575 ◆,★ S33576 ◆,★ S48916 ◆,★ S44896 ◆,★ S48896 ◆,★ S48182 ◆,★	S429521     60-100       S430562     150       S430563     250       S432575     400-600       S33576♠,★     250       S34916♠,★     250       S34036♠,★     400-1600       S48916♠,★     250       S4898♠,★     3000

- DE2F Discount Schedule
- Includes NCTWIRING kit.

Table 7.115: Trip Unit Accessories

Device	Frame	Cat. No.♦	\$ Price
Pocket Tester		S434206	1000.00
UTA Tester		STRV00910	16365.00
Spare UTA Tester		STRV00911	6000.00
BLuetooth/Modbus for UTA Tester	H/J/L	SVW3A8114	2800.00
Spare Power Supply for UTA Tester 110–120 Vac		TRV00915	771.00
Micrologic Cord for UTA Tester		TRV00917	1210.00
Micrologic 5/6 Cover, Transparent	H/J	S429478	19.00
Micrologic 2/3 Cover, Transparent	П/Ј	S429481	41.00
Micrologic 5/6 Cover, Transparent	L	S432459	36.00
Micrologic 2/3 Cover, Transparent	_	S432461	156.00
LCD Display for Micrologic 5	H/J/L	S429483	575.00
LCD Display for Micrologic 6	∏/J/L	S429484	575.00
Hand-held Test Kit		S33594	5386.00
Primary Injection Test Adaptor		S33937	252.00
Full-function Adapter Kit		S48981	19699.00
Full-function Test Kit	P/R	S33595	33792.00
Seven-pin Test Cable (for connection between test kit and trip unit)▼		S48907	1488.00
Two-pin Test Cable (for connection between test kit and trip unit)△		S48908	784.00
230 Vac Filtered Power Cord□		S48856	166.00
120 Vac Filtered Power Cord□	P/R	S48855	61.00
Trip Unit Battery for Trip Indicator Lights		S33593	438.00
Power supply with:			
24–30 Vdc input		685823	
48/60 Vdc input		685824	
125 Vdc input	H/J/L/P/R	685825	1130.00
110-130 Vac input		685826	1130.00
200-240 Vac input		685827	
380-415 Vac input		685829	
Micrologic A Trip Unit Cover, clear		S33592	16.00
Micrologic P/H Trip Unit Cover, opaque gray	P/R	S47067	16.00
Trip Unit Seal (6 pieces) for compliance with NEC 240.6(c)	H/J/L/P/R	MICROTUSEAL	60.00
12-pin Trip Unit Connector for NT/NW Masterpact Circuit Breakers		S33101	228.00
12-pin Trip Unit Connector for P- and R-Frame Circuit Breakers	P/R	S33100 <b>☆</b>	255.00
Battery Back-up (12 Hours)		685831	3570.00
▼ Llead for testing Micrologic trip	units Inclu	ded in the price o	f the Hand-

- Used for testing Micrologic trip units. Included in the price of the Handheld/Full-function Test Kits. Kit for replacement only.

  Used for testing STR trip units. Included in the price of the Handheld/Full-function Test Kits. Kit for replacement only.
- Included in the price of the Full-function Test Kit. Kit for replacement
- DE2F Discount Schedule.
- DE2 Discount Schedule.

Table 7.116: Sensor Plugs for P- and R-Frame Circuit Breakers ♥ ♦

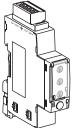
Circuit Breaker	Sensor Plug Range	Sensor Plug Catalog No.			Circuit	Breaker Fr	ames Acce	pting Sens	or Plug			\$ Price €
P-Frame Ci	rcuit Breaker		250 A	400 A	600 A	630 A*	800 A	1000 A	1200 A	1250 A*	1600 A	
	250 A	S47052	Х									1040.00
	400 A	S47053		Х	Х		Х					1040.00
UL	600 A	S48823			Х		Х	Х	Х			1040.00
UL	800 A	S33092					Х	Х	Х			1040.00
	1000 A	S33093						Х	Х			1040.00
	1200 A	S48824							Х			1040.00
	630 A	S33091				Χ	Χ	Χ		Χ	Х	1040.00
	800 A	S33092					Х	Х		Х	Х	1040.00
IEC	1000 A	S33093						Х		Х	Х	1040.00
	1250 A	S33094								Х	Х	1040.00
	1600 A	S33095									Х	1040.00
R-Frame C	ircuit Breaker		600 A	800 A	1000 A	1200 A	1600 A	2000 A	2500 A	3000 A	3200 A	
	600 A	S48823	Х	Х								1040.00
	800 A	S33092		Х	Х	Χ	Χ					1040.00
	1000 A	S33093			Х	Χ	Χ	Χ				1040.00
	1200 A	S48824				Χ	Χ	Χ	Χ			1040.00
UL	1600 A	S33095					Х	Х	Х	Х		1040.00
	2000 A	S33982						Χ	Χ	Χ		1040.00
	2500 A	S33983							Χ	Χ		1040.00
	3000 A	S48825								Χ		1040.00
	1600 A	S33095					Х	Х	Х	Х	Х	1040.00
IEC	2000 A	S33982						Х	Х	Х	Х	1040.00
IEC	2500 A	S33983							Х	Х	Х	1040.00
	3200 A	S33984									Х	1040.00

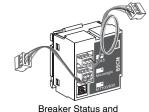
- For use only with circuit breakers with date codes later than 07011.
- DE2F Discount Schedule.
- IEC Only.
- See rating plug for long-time pickup range on page 7-47.

#### Table 7.117: Trip Unit Field-Installable Accessories for P- and R-Frame Circuit Breakers

	Factory-	Installed	Field-Installable Kit Cat. No.							
Description	Cat. No.	\$ Price			P-Frame			R-Fı	rame	\$ Price
	Suffix		Unit Mount	I-Line	Motor Operated	Drawout	With Rotary Handle	Unit Mount	S64205 S64273	
Circuit Breaker Communication Module (BCM) (Modbus)	E1	1778.00	S64205	S64205	S64207	S64206	S64205	S64205	S64205	2805.00
Two Programmable Contacts Module (M2C)	V	1248.00	S64273	S64273	S64273	S64273	S64273	S64273	S64273	1248.00
Six Programmable Contacts Module (M6C)	W	1599.00	S64204	S64204	S64204	S64202	S64204	S64201	S64201	1665.00
External Voltage Sensing (EVS)	YV	290.00	S64203	S64203	S64210	S64209	S64210	S64208	S64208	330.00







Modbus Interface Module (IFM)



Front Display Module (FDM)



Control Module (BSCM)

NSX Cord for **Modbus Communications** 



SDTAM Module (Remote indication relay for motor applications)



ZSI Interface Module (Connects PowerPact H/J/L circuit breakers to PowerPact P/R and Masterpact NT/NW circuit breakers)

#### Table 7.118: Trip Unit Field-Installable Accessories for H-, J-, and L-Frame Circuit Breakers▼

Description		Factory-	Installed	Field-Installable	Kit Cat. No.
Description		Cat. No. Suffix	\$ Price Adder	Cat. No.	\$ Price
External Accessories					
Modbus Interface Module IFM▲		_	_	STRV00210	1000.00
Stacking Connections for IFM (10)		_	_	TRV00217	946.00
Front Display Module FDM121▲		_	_	STRV00121	1500.00
FDM Mounting Accessory (Dia. 22 mm)		_	_	TRV00128	26.00
Isolated Modbus Repeater Module	_	_	STRV00211	1508.00	
ZSI Interface Module	_	_	S434212	975.00	
Internal Accessories					
NSX Cord ■	L = 1.3 m	EA	576.00	S434201	480.00
(for Modbus Communication)	L = 3 m	EB	600.00	S434202	500.00
BSCM (Breaker Status and Control	L = 1.3 m	EG△	1776.00	S434201BS	1480.00
Module) with NSX Cord■	L = 3 m	EH△	1800.00	S434202BS	1500.00
Replacement BSCM	8	_	_	S434205	1000.00
NSX Cord for V > 480 Vac■	L = 1.3 m	ED	2880.00	S434204	2400.00
NSX Cord for V > 480 Vac■	L = 3 m	EE	3000.00	S434303	2500.00
DOOM with NOV Count for V 400 Vo - =	L = 1.3 m	EK△	4080.00	S434204BS	3400.00
BSCM with NSX Cord for V > 480 Vac■	L = 3 m	EL△	4200.00	S434303BS	3500.00
24 Vdc Terminal Block	EN	480.00	S434210	400.00	
SDTAM 24/415 Vac/dc Module ♦	V	1114.00	S429424	928.00	
SDX Module 24/415 Vac/dc★	V	1820.00	S429532	1517.00	

- Require NSX Cord
- Installation requires IFM (STRV00210) for Modbus communication and/or FDM (STRV00121) for external display Remote indication relay for motor applications
- Remote indication relay
- For proper selection, see catalog 0611CT1001.
- If using with motor operator requires communicating motor operator (suffix NC).

Table 7.119: Wire Harness□ and ULP Cords for H-, J-, and L-Frame Circuit Breakers

Description		Factory	-Installed	Field-Installable	Kit Cat. No.
Description		Cat. No. Suffix	\$ Price Adder ◊	Cat. No.	\$ Price
ZSI Wire Harness, H/J Frame		YH3	237.00	S434300	197.00
ZSI Wire Harness, L-Frame		YH3	237.00	S434301	197.00
ENCT Wire Harness		YH2	237.00	S434302	197.00
OF Wire Harness		YH1	237.00	S434500	197.00
SD/SDE Wire Harness		YH1	237.00	S434501	197.00
SDx/SDTAM Wire Harness		YH1	237.00	S434502	197.00
MN Wire Harness	YH1	237.00	S434503	197.00	
MX Wire Harness	YH1	237.00	S434504	197.00	
24 Vdc Terminal Block Wire Harness☆	YH1	237.00	S434505	197.00	
Motor Operator Wire Harness		YH1	237.00	S434506	197.00
Communicating Motor Operator Wire H	arness	YH1	237.00	S434507	197.00
NSX Wire Harness☆		YH1	237.00	S434508	197.00
ENCT and ZSI Wire Harness		YH4	237.00	_	_
10 RJ45 Connectors female/female		_	_	TRV00870	195.00
10 ULP Line Terminations		_	_	TRV00880	130.00
10 RJ45/RJ45 Male Cords	L = 0.3  m	_	_	TRV00803	200.00
10 hJ45/hJ45 Wale Colus	L = 0.6 m	_	_	TRV00806	320.00
	L = 1 m	_	_	TRV00810	195.00
5 RJ45/RJ45 Male Cords	L = 2 m	_	_	TRV00820	300.00
	L = 3m	_	_	TRV00830	500.00
1 RJ45/RJ45 Male Cord	1 RJ45/RJ45 Male Cord L = 5 m		_	TRV00850	155.00

Wire harness is required for I-Line applications, optional for unit-mount applications YH1 = all installed accessories but ZSI and ENCT YH2 = ENCT and all installed accessories YH3 = ZSI and all installed accessories

YH4 = ZSI, ENCT and all installed accessories

Price adder is for each accessory ordered.

I-Line wire harness is included for communication network accessories. Optional wire harness for unit mount requires YH1 suffix.





Masterpact NW

The Masterpact universal power circuit breaker offers a family of circuit protection products meeting the most common world standards, ANSI, UL and IEC. The basic design platform for each is common. The final result is UL, ANSI and IEC circuit breakers with the same basic external dimensions, features and accessories.

#### **Full-Featured Performance**

- Complete product offering up to 200 k AIR without fuses
- Circuit breakers tested to show arc flash hazard risk category as referenced by NFPA70E
- 800 A to 6000 A frames, fixed and draw-out
- Rated for AC voltage systems through 600 V (635 V ANSI)
- Short-time withstand ratings up to 100 kA
- Cradle position indicator: connected, test and disconnected
- Simple, visual contact wear indicators
- Full complement of field-installable accessories common to all standards
- Four interchangeable Micrologic trip units to choose from
- Available PowerLogic<sup>™</sup> based power metering and monitoring capabilities
- Available protective relay functions as defined by ANSI C37.2 and C37.90

The following charts show the Masterpact NW and NT ratings for ANSI and UL 489. See Pricing Guide 0613PL0001 and Catalog 0613CT0001.

#### Table 7.120: Masterpact NW Circuit Breaker Ratings

Standard							1A	NSI C	37 (	Certifi	ed/UI	L 1066	List	ted									UL	. 489 L	isted		
Frame Rating				800	-160	0 A				2000	Α		3	3200/4000 A△ 4000/5000 A			800/1200/1600/2000 A 2500/3000 A 4000/5000/6000 A				00/6000 A						
Interrupting Code		N1	H1	H2	НЗ	L10	L1F0	H1	H2	НЗ	L10	L1F0	H1	H2	Н3	L10	H2	НЗ	L10	N	Н	Lo	LFO	Н	Lo	Н	Lo
	240 Vac	42	65	85	100	200	200	65	85	100	200	200	65	85	100	200	85	100	200	65	100	200	200	100	200	100	200
Interrupting Current (kA RMS) 50/60 Hz	480 Vac	42	65	85	100	200	200	65	85	100	200	200	65	85	100	200	85	100	200	65	100	150	150	100	150	100	150
(IOA 1 IIVIO) 30/00 1 IZ	600 Vac	42	65	85	85	130	130	65	85	85	130	130	65	85	85	130	85	85	130	50	85	100	100	85	100	85	100
Short-time Withstand Current (kA RMS)		42	65	85	85	30	22	65	85	85	30	22	65	85	85	100	85	85	100	42▲	65▲	30▲■	22	65	65	85	100
Built-in Instantaneous Override (kA RMS ±10%)		٠	٠	*	85	35♦	24	_	_	85	35	24	_	_	85	117	_	_	117	40	40	35▲■	24	65	65	75	75
Close and latch rating (kA RMS)		42	65	40	40	25	22	65	40	40	25	22	65	40	40	40	85	75	40	40	40	25★	22	40	40	40	40
Tested to show the arc flash haza category as referenced by NFPA		_	_	_	_	_	Yes	_	_	_	_	Yes	_	_	_	_	_	_	_	_	_	_	Yes	_	_	_	_
Breaking time								•	•	- 2	25–30	ms w	ith no	o inte	ention	al dela	ay (9 i	ms for	L1, L	1F, L a	and LF	-)					
Closing time																70 m	ıs										
Sensor Rating 100–250 A 400–800 A 800–1600 A 1000–2000 A			1	1600	-3200	А		00–40 00–50			400- 600- 800-	-250 A -800 A ·1200 A ·1600 A -2000 A			2500 A 3000 A	2500-	4000 A 5000 A 6000 A										
Endurance Rating (C/O Cycles)	Mechanical			1	2,500	)				10,0	00			10,0	00	5k		5,000	)		12,	500▼		10,	000	5,0	000
With No Maintenance	Electrical				2800					1,00	00			1,00	00	1k		1,000	)		28	800▼		1,0	000	1,0	000

- 24 kA RMS for 800 A circuit breaker frame with 100 A or 250 A sensor.
- 65 kA RMS for 2000 A.
- None except 24 kA RMS for 800 A circuit breaker frame with 100 A or 250 A sensor.
- 40 kA RMS for 2000 A.
- The endurance rating for 2000 A, N/H/L/LF is 10,000 for mechanical and 1000 for electrical.
- 4000 A standard width circuit breaker is not available in L1 interrupting rating code or drawout construction (fixed mounting only).

#### Table 7.121: Masterpact NT Circuit Breaker Ratings

	ANSI C37 Certified/UL 1066 Listed							UL 489	Listed						
	800 A			800 A					1200 A				1600	) <b>A</b> ♦	
	N1	N	Н	L1	L	LF☆	N	Н	L1	L	LF☆	N	Н	L1	L
240 Vac	42	50	65	100	200	200	50	65	100	200	200	50	65	100	200
480 Vac	42	50	50	65	100	100	50	50	65	100	100	50	50	65	100
600 Vac		35	50	_	1	_	35	50	_	_	_	35	50	N/A	N/A
MS)	42	35	35	10	10	10	35	35	10	10	10	35	35	10	10
RMS ±10%)		40	40	10	10	10	40	40	10	10	10	40	40	10	10
	40	25	25	10	10	10	25	25	10	10	10	25	25	10	10
risk E	_	_	_	_	_	Yes	_	_	_	_	Yes	_	_	_	_
	25-30 ms with no intentional delay				25	–30 ms	with no i	ntention	al delay	(9 ms fo	r L and L	.F)			
						< 50 m	S								
Concer Dating			1	00–250	A			60	00–1200	Α			900 1	600 A	
Sensor Rating			4	008-00	Α				_				600-i	600 A	
Endurance Rating (C/O Cycles) Mechanical With No Maintenance Flectrical				12,500			12,500					12,500			
Electrical	2800			2800					2800			2800			
	480 Vac 600 Vac MS) RMS ±10%) risk	800 A   N1   240 Vac   42   480 Vac   42   42   600 Vac   —   MS)   42   RMS ± 10%   —   40   risk   =   25–30 ms with no intentional delay   100–250 A   400–800 A   Mechanical   12,500	N1	800 A   N1	RMS + 10%   RMS + 100   RMS	N1	800 A         800 A           N1         N         H         L1         L         LF★           240 Vac         42         50         65         100         200         200           480 Vac         42         50         50         65         100         100         100           600 Vac         —         35         50         —         —         —         —           MS)         42         35         35         10         10         10         10           RMS ±10%)         —         40         40         10         10         10         10           risk         —         —         —         —         —         Yes           25–30 ms with no intentional delay         25–30 ms         < 50 m	800 A         800 A           N1         N         H         L1         L         LF★         N           240 Vac         42         50         65         100         200         200         50           480 Vac         42         50         50         65         100         100         50           600 Vac         —         35         50         —         —         35         35         10         10         10         35           RMS)         42         35         35         10         10         10         35           RMS±10%)         —         40         40         10         10         10         40           40         40         10         10         10         40         40         10         10         10         25           risk         —         —         —         —         —         Yes         —           25–30 ms with no intentional delay         25–30 ms with no intentional delay         25–30 ms with no intentional delay         <50 ms	N1	N1	N1	N1	N1	N1	N1

Fixed-mounted only.

Drawout mounted only



Table 7.122: Masterpact NW/NT Circuit Breaker Remote Racking

Description	Cat. No.	\$ Price
Masterpact NW/NT Remote Racking Devices   ✓	NWNTMPRRT	32000.00
Masterpact NW Remote Racking Device   ✓	NWMPRRT	21500.00
Masterpact NT Remote Rackign Device ∇	NTMPRRT	21500.00
Mounting Bracket Kit for NW Remote Racking (contains 10 mounting brackets)   ■	S47100	215.00
Mounting Bracket Kit for NT Remove Racking (contains 10 mounting brackets)   ■	S47104	215.00
Control Unit for NW Remote Racking	S47101	3650.00
30 ft Control Cable for NW Remote Racking	S47102	620.00
Drive Shaft for NW Remote Racking	S47103	290.00
Drive Shaft for NT Remote Racking	S47105	290.00

Unit comes with 10 mounting brackets included.

For replacement only

Class 931, 940, 960







T3B Toroid Sensor



GT912 Rectangular Sensor

#### GC-200 Ground-Fault Relay System

The GC-200 Ground-fault relay system protects a grounded distribution system from low-level arcing ground faults. The system includes the GC-200 relay, a sensor (current transformer), and optional GC DSP display and is used with a bolted pressure switch or circuit breaker to open a circuit upon detection of a ground fault. (Replaces GC-100 relay.)

#### **GC-200 Relay Features**

- Five models with sensitivities suitable for main, feeder, or branch circuits
- Ten adjustable pickup settings for each model
- Small, non-metallic enclosure mounts on DIN rail
- 10 A and 5 A output contacts for trip and alarm
- Zone-selective interlocking (ZSI) to optimize coordinated systems
- I<sup>2</sup>t inverse time characteristics

#### **GC2DSP Display (Optional)**

- Real-time display of ground-fault values
- Also recalls ground-fault at last trip or at maximum since reset
- · Allows remote testing or resetting of the relay
- LCD back-lit display
- Surface mounts over panel meter cutout
- Fine adjust pickup settings (D and E versions only)

#### Sensors

- Zero sequence sensing current transformers for all phases and neutral
- Several sizes of toroids and rectangular CTs
- Many are split-core or open frame for ease of installation

#### Table 7.123: Ground-Fault Relay

Cat. No.	Description	Specifications	\$ Price
GC200C		3.0 A-30.0 A	2960.00
GC200D	Ground-fault relay	30.0 A-300 A	2960.00
GC200E		120 A-1200 A	2960.00
GC2DSP	Display module		948.00
VW3A1104R10		1 m	35.00
VW3A1104R30	Diaminus abla =	3 m	35.00
VW3A1104R50	Display cable ■	5m	35.00
VW3A1104R100		10 m	45.00
GC2ADAPTER	Adapter plate	To replace GSDSP with GC2DSP	59.00

- One GC12 twelve foot cable is included with GCDSP display modules.
- Discount schedule CP4C

#### Table 7.124: GC-200 Relay Settings

Cat. No.	Adjustable Pickup Settings (in Amperes)										
GC200C	3	3 6 9 12 15 18 21 24 27 30									
GC200D	30	90	90	120	150	180	210	240	270	300	
GC200E	120	240	360	480	600	720	840	960	1080	1200	

#### Table 7.125: GC-200 Sensors

Relay Cat.	Sensor	<b>T</b>	СТ	Window Di	mensions	A Dules
No.	Cat. No.	Туре	Ratio	in	mm	\$ Price
	T2A	Toroid		1.875 dia.	48 dia.	704.00
	T3A	Toroid		2.75 dia.	70 dia.	774.00
	T6A	Toroid		5.75 dia.	146 dia.	774.00
GC200C	T6AS	Toroid, split-core	1000:1	5.75 dia.	146 dia.	1326.00
GC200D	T9A	Toroid	1000:1	8.75 dia.	222 dia.	1106.0
	R713A			7.5 x 13.5	191 x 343	3063.00
	R417A	Rectangular		4.25 x 17.625	108 x 448	3650.00
	R826A			8 x 26.5	203 x 674	4446.00
	All "A" type sensor	rs above, plus:		-		
	RZ511		1000:1	4.5. x 11	114 x 280	1914.00
	RZ521	Rectangular, Open Frame	1000:1	4.5 x 21	114 x 534	2255.00
	RZ531	Rectangular, Open Frame	1000:1	4.5 x 31	114 x 788	2706.00
	RZ535		1000:1	4.5 x 35	114 x 890	2834.00
	RZ1011		1000:1	10.5 x 11	267 x 280	2450.00
	RZ1021	Rectangular, Open Frame	1000:1	10.5 x 21	267 x 514	3075.00
	RZ1031		1000:1	10.5 x 31	114 x 788	4233.00
GC200E	GT912		600:1	5.5 x 8.5	140 x 216	1769.00
	GT918	Rectangular, Open Frame	600:1	5.5 x 14.5	140 x 368	2058.00
	GT930		600:1	5.5 x 26.5	140 x 673	2766.00
	GT1218		600:1	8.5 x 14.5	216 x 368	2645.00
	GT1224	Rectangular, Open Frame	600:1	8.5 x 20.5	216 x 521	2901.00
	GT1230		600:1	8.5 x 26.5	292 x 673	3246.00
	GT1327	Destancy les Ones France	600:1	9.5 x 24	241 x 610	2844.00
	GT1330	Rectangular, Open Frame	600:1	9.5 x 27	241 x 686	3219.00
	GT1530	Rectangular, Open Frame	600:1	11.5 x 26.5	292 x 673	3726.00

RH99M





PA50



#### Vigirex™ Ground-Fault Relay System

The Vigirex ground-fault relays, with associated sensors (current transformers), measure the residual current in an electrical installation to detect levels which may be damaging. When used for protection, they cause an associated circuit breaker or switch to interrupt the supply of power to the protected system. They may also be used for monitoring only, with output to an alarm. The product line includes fixed sensitivities from 30 mA to 1 A and adjustable sensitivities up to 30 A.

The Vigirex relays may be easily mounted on DIN rail or may be panel mounted in a meter cutout. Sensors for conductors range from a little more than an inch diameter toroids, to large rectangular sensors measuring 6 x 18 inches. The compact size of the relay and its sensor make it ideal for protection of OEM equipment as well as branch circuits.

Table 7.126: Vigirex Ground-Fault Relays (UL 1053 Listed)

Model	Delay	Reset	Control Voltage	Sensitivity	Cat. No.	\$ Price
DIN Rail	Mounted					
			12-24 Vac/12-48 Vdc	30 mA 100 mA 300 mA 500 mA 1 A	56300 56302 56305 56306 56307	1988.00
RH10M	Instantaneous	Manual	110–130 Vac	30 mA 100 mA 300 mA 500 mA 1 A	56320 56322 56325 56326 56327	1988.00
			220-240 Vac	30 mA 100 mA 300 mA 500 mA 1 A	56330 56332 56335 56336 56337	1988.00
RH21M	Instantaneous or 60 msec (2 settings)	Manual	12–24 Vac/12–48 Vdc 110–130 Vac 220–240 Vac	30 mA▲ or 300 mA (2 settings)	56360 56362 56363	2363.00
RH99M	Adjustable (9 settings):	Manual	12-24 Vac/12-48 Vdc 110-130 Vac 220-240 Vac	Adjustable, (9 settings):	56370TD 56372TD 56373TD	2700.00
111 199IVI	RH99M 0, 0.06, 0.15, 0.23, 0.31, 0.5, 0.8, 1.0, 4.5 sec	Automatic	12–24 Vac/12–48 Vdc 110–130 Vac 220–240 Vac	0.03 <b>A</b> , 0.1, 0.3, 0.5, 1, 3, 5, 10, 30 A	56390TD 56392TD 56393TD	2700.00
Panel Mo	unted					
			12-24 Vac/12-48 Vdc	30 mA 100 mA 300 mA 500 mA 1 Amp	56400 56402 56405 56406 56407	2063.00
RH10P	Instantaneous	Manual	110–130 Vac	30 mA 100 mA 300 mA 500 mA 1 Amp	56420 56422 56425 56426 56427	2063.00
			220–240 Vac	30 mA 100 mA 300 mA 500 mA 1 A	56430 56432 56435 56436 56437	2063.00
RH21P	Instantaneous or 60 msec (2 settings)	Manual	12–24 Vac/12–48 Vdc 110–130 Vac 220–240 Vac	30 mA▲ or 300 mA (2 settings)	56460 56462 56463	2438.00
	Adjustable (9 settings):	Manual	12–24 Vac/12–48 Vdc 110–130 Vac 220–240 Vac	Adjustable (9 settings):	56470TD 56472TD 56473TD	2813.00
RH99P	0, 0.06, 0.15, 0.23, 0.31, 0.5,	Automatic	12-24 Vac/12-48 Vdc	0.03 , 0.1, 0.3, 0.5, 1,	56490TD	
	0.23, 0.31, 0.5, 0.8, 1.0, 4.5 sec		110–130 Vac 220–240 Vac	3, 5, 10, 30 A	56492TD 56493TD	
			220-240 VaC		015640C	

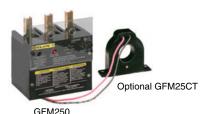
<sup>30</sup> mA is instantaneous only, except for RH99M and RH99P models. Their suffix TD indicates time delay at 30 mA. For models with no time delay (IEC compliant) consult catalog 0972CT0401.

Table 7.127: Sensors for Vigirex Ground-Fault Relays

Sensors	Туре	Maximum	Inside Dia	ameter	Cat. No.	\$ Price
36115015	Туре	Current◆	in.	mm	Cat. No.	\$ FIICE
Closed Toroids, Type A	TA30	65 A	1.18	30	50437	375.00
	PA50	85 A	1.97	50	50438	488.00
	IA80	160 A	3.15	80	50439	615.00
	MA120	250 A	4.72	120	50440	833.00
	SA200	400 A	7.87	200	50441	1253.00
	GA300	630 A	11.81	300	50442	2295.00
Vigirex Sensor Iron Rings (Optional)	TA30 PA50 IA80 MA120	65 A 85 A 160 A 250 A	0.79 1.58 2.76 4.33	20 40 70 110	56055 56056 56057 56058	56.00 59.00 62.00 83.00
Split toroids, Type OA	POA■	85 A	1.81	46	50485	1718.00
	GOA■	250 A	4.33	110	50486	3015.00
Rectangular Sensors	280 x 115	1600 A	11.02 x 4.53	280 x 115	56053	5333.00
	470 x 160	3200 A	18.50 x 6.30	470 x 160	56054	7088.00

- POA and GOA are not UL recognized
- Use as a guideline for sizing wire through sensor.

#### **Ground-Fault Protection Equipment**



# Micrologic™ Add-on Ground-Fault Module (GFM)

The Micrologic Ground-Fault Module (GFM) is a UL Listed/CSA Certified circuit breaker accessory which protects equipment from damage caused by ground faults. It is an add-on module which, when connected to a PowerPact H- or J-frame thermal-magnetic circuit breaker only, provides ground-fault sensing and ground-fault relay functions.

#### HD/JD ground-fault modules feature:

- Adjustable ground-fault pickup levels
- Adjustable ground-fault time delays
- Integral ground fault push-to-test feature
- Ground-fault indicator (mechanical for local, contacts for remote)
- All GFMs are supplied for I-Line™ mounting as standard, easily convertible to unit mount by removing the I-Line bracket
- Fault-powered (through the sensing current transformer) for electronics, shunt trip, and integral test feature. Meets NEC 230.95(C)
- A 12 Vdc shunt trip module (Catalog No. S29382) is required in the circuit breaker. This may be field installed or factory installed when the circuit breaker is ordered with an -SN suffix.
- UL 1053 Ground-fault Sensing and Relaying Equipment

#### The GFM system requires the following:

- H-frame (15-150 A) or J-frame (150-250 A) molded case circuit breaker
- Shunt trip is required for the function of the GFM (may be factory-installed or field-installed)
- Bus bar connection (terminal nut inserts) for OFF end of circuit breaker
- Optional neutral current transformer, catalog number GFM25CT (must be ordered for 4-wire applications)

NOTE: Ground-fault modules cannot be used for alarming only.

#### Table 7.128: Module/Enclosure Selection Chart▲

Companion Circuit Breaker Prefix	Cat. No.■	I-Line Switchboard	Ground-fault Pickup Adjustment Range	GFM \$ Price
HD, HG, HJ, HL	GFM150HD	LA	20-100 A	4250.00
JD, JG, JJ, JL	GFM250JD	LA	40–200 A	4250.00
Accessories				
H & J	GFM25CT	Optional Neutral Current Tra	375.00	

- At 250 A, the GFM250JD can be used with 80% rated circuit breakers only.
- See Supplemental Digest page 3-37 for additional GFMs.

#### Earth Leakage Module (ELM) for PowerPact H- and J-Frame MCCBs

The Earth Leakage Module (ELM) is an add-on module which, when connected to a PowerPact H- or J-frame MCCB, provides low-level ground-fault sensing and ground-fault relay functions

Because these ELMs are highly sensitive (30 mA to 3 A), they provide much greater protection than GFMs (20 Amps to 200 Amps sensitivity). The ELMs provide greater protection of control circuits and other sensitive equipment. The associated circuit breaker must have a 48 Vdc shunt trip, which may be field-installed (kit S29392) or factory-installed (suffix -SP) in the H- or J-Frame circuit breaker.

#### Add-on Earth Leakage Module (ELM) Features:

- Adjustable ground-fault pickup levels as low as 30 mA
- Adjustable ground-fault time delays from instantaneous to 500 msec (Time delay can be applied to the 30 mA setting)
- Integral ground fault push-to-test feature
- Ground-fault indicator (LED for local status; contacts for remote indication)
- All ELMs are supplied for I-Line™ mounting and are easily convertible to unit-mount by removing the
- Three poles; 240 to 600 Vac maximum: 3-wire applications only (no neutral)
- Line-power obtained through internal bus to provide power for electronics, shunt trip, and integral test feature.
- A shunt trip is required in the circuit breaker; it may be field-installed or factory-installed in the PowerPact H and J circuit breakers.
- UL 1053 Ground-fault Sensing and Relaying Equipment

#### Table 7.129: ELM Selection Chart ◆

Companion Circu	Companion Circuit Breaker★		Pick-Up Adjustment	Catalan Number	Ĉ Drian
Prefix	Size	Required I-Line Switchboard	Range	Catalog Number	\$ Price
HD, HG, HJ, HL	15-150 A	LA	30 mA-3 A	ELM150HD	4500.00
JD, JG, JJ, JL	150-250 A	LA	30 mA-3 A	ELM250JD	4650.00

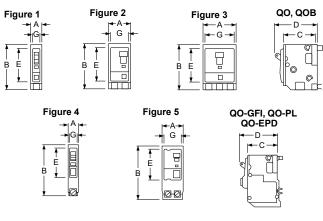
- At 250 A, the ELM250JD can be used with 80% rated circuit breakers only.
- For Factory Installation of ELM Module: For termination designation (3rd letter of catalog number) use ONLY "M". Add factory installed 48 Vdc shunt trip (suffix SP) to breaker plus suffix VL or VM. SP \$717. adder.
  Use VL for H frame \$4736. adder.
  Use VM for J frame \$4886. adder.
  Plus the List Price of the H or J breaker.

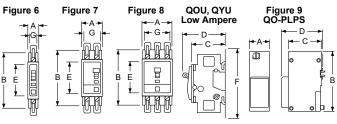
I-Line™ J-Frame with ELM installed

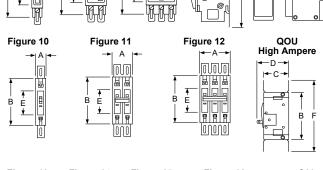
#### **Miniature and Molded Case Circuit Breakers**

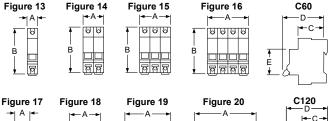


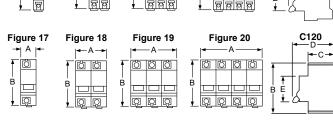
by Schneider Electric www.schneider-electric.us











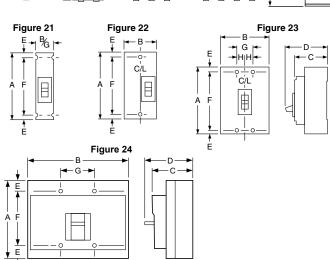


Table 7.130: QO™, QOU, Multi 9™ Circuit Breakers

Circuit Breaker	Poles	Fig.			Dimen	sions—	Inches		
Cat. No. Prefix	Poles	No.	Α	В	С	D	Е	F	G
	1	1	0.75	3.00▲	2.31	2.91	2.25	_	0.59
QO, QOB	2	2	1.50	3.00▲	2.31	2.91	2.25	_	1.34
	3	3	2.25	3.00▲	2.31	2.91	2.25	_	2.09
QOB-VH 150 A	2	2	3.0	5.72	2.53	4.90	3.78	_	2.85
QOB-VH 110-150 A	3	3	4.50	5.72	2.53	4.90	3.78	_	4.35
QO-PL	1	4	0.75	4.12■	2.31	2.91	2.25	_	0.59
QO-GFI	2	5	1.50	4.12■	2.31	2.91	2.25	_	1.34
QO-EPD	3	5	2.25	4.12■	2.31	2.91	2.25	_	2.09
QOU	1	6	0.75	4.05♦	2.38	2.98	2.25	5.00★	0.62
QYU	2	7	1.50	4.05♦	2.38	2.98	2.25	5.00★	1.37
Low Ampere	3	8	2.25	4.05★	2.38	2.98	2.25	5.00△	2.12
0011	1	10	0.75	4.45	2.37	2.96	2.25	6.78	_
QOU High Ampere	2	11	1.50	4.45	2.37	2.96	2.25	6.78	_
. iig.i./ iii.po.o	3	12	2.25	4.45	2.37	2.96	2.25	6.78	
	1	13	0.71	3.19	1.73	2.76	1.77	_	_
Multi 9™ C60	2	14	1.42	3.19	1.73	2.76	1.77	_	_
Mulii 9 Coo	3	15	2.13	3.19	1.73	2.76	1.77	_	_
	4	16	2.84	3.19	1.73	2.76	1.77	_	_
QO-PLPS Power Supply	2	9	1.45	4.35	2.42	3.11	_	_	_
A 05 70 A is 0.10 is	. 00 10	0 4 00	I 70	100 10	D ava 0	ΓO :			

- 35-70 A is 3.12 in; 80-100 A 2P and 70-100 A 3P are 3.50 in.
- QO-PL is 4.55 in. 80–100 A 1P and 80–125 A 2P are 4.45 in
- 80-100 A 1P and 80-125 A 2P are 6.78 in.
- 70-100 A 4.45 in.
- 70-100 A is 6.78 in. Δ

Table 7.131: QB, QD, QG, QJ, Q4, FA, FI, KI, LA, LI, LX, LXI Circuit **Breakers** 

Circuit Breaker	Poles	Fig.								
Cat. No. Prefix	Foles	No.	Α	В	С	D	Е	F	G	Н
QB, QD,	2	22	6.47	3.00	3.02	3.93		4.25	_	
QG, QJ	3	23	6.47	4.50	3.02	3.93		4.25	1.50	0.75
	1	21	6.00	1.50	3.16	4.13	0.44	5.13	1.50	_
FAL, FHL	2	22	6.00	3.00	3.16	4.13	0.44	5.13	_	_
	3	23	6.00	4.50	3.16	4.13	0.44	5.13	1.50	0.75
FIL, KIL	2 & 3	23	8.00	4.50	3.66	4.75	0.44	7.13	1.50	0.75
Q4L, LAL, LHL	2 & 3	23	11.00	6.00	4.06	5.84	0.88	9.25	2.00	1.00
LIL, LXIL	2 & 3	24	11.86	7.50	5.48	6.74	0.55	10.75	2.50	

Dimensions E are 1.59 in at ON end and 0.63 in at OFF end.

#### Table 7.132: Shipping Weights ◊

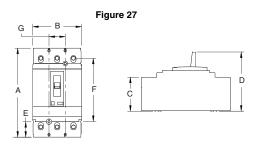
Frame Size	Approx. Shipping Weight (Lbs.)	Frame Size	Approx. Shipping Weight (Lbs.)
FAL, FHL 1P	2	KIL	9
FAL, FHL 2P	3	LAL, LHL	15
FAL, FHL 3P	5	LIL LXIL	25
FIL	8	Q4L	15
QB, QD, QG, QJ	4		

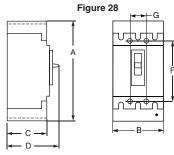
All weights are for 3P circuit breakers unless otherwise noted.

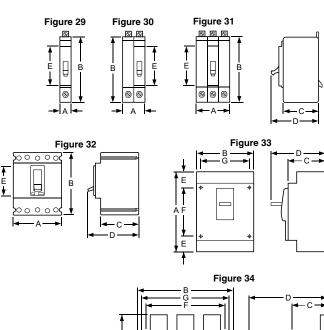
#### SQUARE D by Schneider Electric www.schneider-electric.us

## **Dimensions and Shipping Weights**

Figure 25 Figure 26 - G <del>-</del> B → 0 0 0 0 0 0 Ħ D Ė ®, Ø,







#### **Molded Case Circuit Breakers**

Table 7.133: HD, HG, HJ, HL, HR, JD, JG, JJ, JL, JR, LG, LJ, LL, and LR Circuit Breakers

Circuit Breaker		Ele Ne	Dimensions — Inches							
Cat. No. Prefix	Poles	Fig. No.	A	В	С	D	E	F	G	
HD, HG, HJ,	2▲	25	6.40	2.74	2.87	4.36	0.74	4.92	_	
HL, HR	3	26	6.40	4.12	2.87	4.36	0.74	4.92	1.38	
JD, JG, JJ, JL, JR	3	27	7.52	4.12	2.87	5.00	1.30	4.92	1.38	
LG, LJ, LL, LR	3	28	13.38	5.51	3.75	6.61	2.22	7.87	1.77	

Only HD and HG are in 2P module, HJ, HL and HR 2P are in 3P module.

Table 7.134: ED, EG, and EJ Circuit Breakers

Circuit Breaker	No. of	Elec No.	Dimensions — Inches						
Cat. No. Prefix	Poles	Fig. No.	Α	В	С	D	E		
ED, EG, EJ	1	29	0.98	5.66	3.09	4.05	3.32		
ED, EG, EJ	2	30	1.96	5.66	3.09	4.05	3.32		
ED, EG, EJ	3	31	2.94	5.66	3.09	4.05	3.32		
GJ	3	32	3.54	4.72	2.76	3.94	2.20		

Table 7.135: MG, MJ, PG, PJ, PL, RG, RJ and RL Circuit Breakers

	Circuit Breaker	No. of	Fig.	Dimensions — Inches							
	Cat. No. Prefix	Poles	No.	Α	В	С	D	E	F	G	
Ī	MG, MJ (800 A and below)	2, 3	33	12.86	8.27	5.77	8.05	2.49	7.87	7.83	
	PG, PJ, PK, PL (1000–1200 A)	2, 3	33	16.16	8.27	5.77	8.05	4.19	7.87	7.83	
_	RG, RJ, RL	2, 3	34	16.24	16.54	6.63	14.49	8.73	14.25	15.35	

Table 7.136: Shipping Weights▲

Frame Size	Approx. Shipping Weight (Lbs.)	Frame Size	Approx. Shipping Weight (Lbs.)
HD, HG, HJ, HL 2P	4	JD, JG, JJ, JL, JR	5
HD, HG, HJ, HL, HR 3P	5	LD, LG, LJ, LL, LR	14
ED, EG, EJ 1P	2	MG, MJ	29
ED, EG, EJ 2P	3	PG, PJ, PK, PL	32
ED, EG, EJ 3P	4	RG, RJ, RK, RL (Without RLTB)	52

All weights are for 3P circuit breakers unless otherwise noted.

回

**FA100S** 

FA100RB

FA100DS

www.schneider-electric.us



Circuit breaker enclosures are UL Listed, CSA Certified and are suitable for use as service equipment except as footnoted. The short circuit rating of an enclosed circuit breaker is equal to the rating of the circuit breaker installed, except as footnoted.

- Circuit breakers are ordered and shipped separately for field installation.
- For enclosure accessories and dimensions refer to page 7-58.
- See Supplemental Digest page 3-35 for NEMA 7 and 9 enclosures for FAL circuit breakers.

#### Table 7.137: Circuit Breaker Enclosures



- Enclosures with NRB or RB suffix have provisions for 3/4 in. through 2-1/2 in. bolt-on hubs in top endwall. Enclosures with R suffix have blank endwalls and require field cut opening. For details and hub catalog numbers see page 3-9. ▲
- Accepts standard rated 80% breakers. Not rated at 100%.

  Maximum short circuit rating is 25 kAIR at 600 Vac, 65 kAIR at 480 Vac, 125 kAIR at 240 Vac.
- Earth Leakage Module and Ground Fault Module are not compatible with these enclosures.
- Δ Maximum short circuit rating is 25 kAIR, 240 Vac. Order service ground kit PKOGTA2 if required.
- Maximum short circuit rating is 18 kAIR, 480 Vac and 240 Vac.
- **☆** ▽
- Copper wire only.

  When using a CT in the M800S and R enclosure the unit will no longer accommodate a 200% neutral solution.
- CE certified per IEC60439-1, IP20D, PE type TN-C or TN-S
- Accepts MGL or MJL standard rated (80%) breakers. Accepts PGL, PJL or PLL circuit breakers rated 80% (1200 A maximum) or 100% rated breakers, (800A maximum).
- ٥ CE certified per IEC60439-1, IP24D, PE type TN-C or TN-S
- Suitable for rainproof NEMA 3R application by removing drain screw from bottom endwall. CE certified per IEC60439-1, IP56, PE type TN-C or TN-S
- LEL 100% rated circuit breaker except for 600 A sensor.
- Short circuit rating is 100 k AIR at 480 Vac maximum.
- NEMA 7—Indoor Hazardous Locations—Division 1 and 2, Class I, Groups C and D; Class II, Groups E, F, and G; Class III.
- 80% rated circuit breakers only; SCCR 65 kA @ 240 Vac, 25 kA @ 480 Vac, 18 kA @ 600 Vac
- Not UL Listed due to wire bending space.

  NEMA 9—Indoor Hazardous Locations—Division 1 and 2, Class II, Groups E, F, and G; Class III.
- Has a tapped 2-1/2 in. conduit opening on top and bottom end wall
- Short circuit current rating is 30 k AIR at 480 Vac.

#### 316 Grade Stainless Steel Circuit Breaker Enclosures—NEMA 3, 3R, 4X, 5 and 12

Type 316 stainless steel circuit breaker enclosures offer superior corrosion resistance to a wider range of chemicals than Type 304 stainless steel enclosures. Type 316 better resists chloride and is often used in marine, waste treatment and transportation applications. Use watertight hubs from Section 3 page 10 of Digest 176. For other accessories reference Table 7.142 and Table 7.143. For dimensional information, reference Table 7.144.

Table 7.138: 316 Grade Stainless Steel Circuit Breaker Enclosures

Circuit Bre	NEMA 3, 3R, 4X, 5 an	d 12			
Cat. No. PrefixSuffix	Ampere Rating	Poles	Enclosure Cat. No.	\$ Price	
HDL, HGL, HJL, HLL	15–150 A	2, 3	J250SS	4698.00	
JDL, JGL, JJL, JLL	150-250 A	2, 3	323033		
MGL, MJL, PGL, PJL	300-800 A	2, 3	M800SS	13972.00	
PKL, PLL	300-800 A	2, 3	10160033	13972.00	

Table 7.139: DC Circuit Breaker Enclosures for MA and MH DC-Rated Circuit Breakers

	Circuit Breakery	NEMA 1 Surface End	closurex	
Cat. No. PrefixSuffix	Ampere Rating	Poles	Enclosure Cat. No.	\$ Price
MAL, MHL	125-1000 A	2, 3	MA1200S	1355.00

- UL Listed Only
- Use 500 Vdc or 250 Vdc rated circuit breakers only





#### **Circuit Breaker Enclosures**

Class 610

**Enclosures for Walking Beam Manually Operated Mechanical Interlock** Table 7.140: Circuit Breakers (UL Listed)

Circuit Breaker			NEMA 1 Surfac	e■	NEMA 3R ■ ♦		
	Cat. No. PrefixSuffix	Ampere Rating	Poles	Enclosure Cat. No.	\$ Price	Enclosure Cat. No.	\$ Price
	FALWB, FHLWB	15-250 A	2, 3	KA250SWB	1040.00	KA250RWB	1827.00

- Catalog number in table is enclosure only. For complete installation, the following must be ordered separately: WB Circuit Breakers (qty. 2, Supplemental Digest page 3-27), Walking Beam Assembly (Supplemental Digest page 3-27), Mounting Pan (Supplemental Digest) page 3-27, Neutral (page 7-56) and Service Ground Kit (page 7-58).
- Enclosure has blank top endwall
- For applications above 200 A requiring a neutral, use copper wire only.

#### **Enclosed Motor-Operated Molded Case Circuit Breakers**

For information on Enclosed Motor-Operated Molded Case Circuit Breakers see the Supplemental Digest page 3-35.

#### **Enclosed Molded Case Switches**

For ordering information on molded case switches see page 7-34. For ordering information on enclosed molded case switches, see Supplemental Digest 175 Section 3-36.

#### **Enclosed Walking Beam Mechanical Interlock**

NOTE: Contact local Field Office for catalog number prior to quoting or placing an order.

Industrial molded case circuit breakers with walking beam mechanical interlocks are available in NEMA 1 and 3R construction as completely enclosed device. Walking beam mechanical interlock is available manually operated or electrically operated using (2) 120 Vac motor operators. Not UL Listed.

Enclosed walking beam mechanically interlocked circuit breaker.

- Specify circuit breaker catalog numbers
- Specify manually or electrically operated (electrically operated factory installed only)
- Specify enclosure type (NEMA 1 or 3R)
- Specify if neutrals are required. (Same price)

Table 7.141: Enclosed Walking Beam Mechanical Interlock

Circuit Breaker	\$ Price▲					
Cat. No. Prefix (Standard Thermal-	Manually	Operated	Electrically Operated			
` Magnetic Only)	NEMA 1	NEMA 3R	NEMA 1	NEMA 3R		
FAL—240 V 100 A FAL—480 V 100 A FAL—600 V 100 A	_ _ _	_ _ _	5783.00 6311.00 6879.00	3675.00 6896.00 7446.00		
FHL-600 V 100 A	_	_	8691.00	9407.00		

- Price includes (2) walking beam 3P circuit breakers, walking beam operator and mounting pan, (2) neutrals (if specified), and (2) motor operators (if specified) factory assembled in specified enclosure.

  Not available factory assembled. Refer to page 7-56 for merchandise enclosure.

NOTE: Contact local Field Office for catalog number prior to quoting or placing an order.

BQUARE D

	8
	_
	_
	~
	_
	-
	в
^	-
$\overline{\Omega}$	-
_	
CIRC!	
~	
ถ	E.
Ľ	ш
c	
-	_
_	в
-1	
	2
	_
w	◛
四刀	
	Ь.
ш	-
_	_
כו	ч
EAK	Е.
	-
ш	$\sim$
EAKERS	E
ñ	_
un	ч
9,	
	S
	ч
	GAS
	(n
	~
	ш

Circuit Breaker			Neutral Asse	Terminal Lug Data—Total Available				
Cat. No. Prefix	Ampere	NEMA 1 & 3R		NEMA 4, 4X, 5, 12 & 12K		NEMA 7 & 9		(Line plus Load)
Cat. No. Prefix	Rating	Cat. No.	\$ Price	Cat. No.	Price	Cat. No.	\$ Price	AWG/kemil
FAL, FHL, FCL	100	SN100FA	72.00	SN100FA	72.00	_	_	(4) 14–1/0 Cu or (4) 12–1/0 Al
FAL, FHL, FIL	100	_	_	_	_	100SNA	150.00	FA060X/Y—(1) 14– 6 Cu, plus (1) 14–4 Cu FA100X/Y—(1) 14– 3 Cu, plus (1) 14–4 Cu
HDL,HGL,HJL,HLL	15-100	SN100FA	72.00	SN100FA	72.00	_	_	(4) 14-1/0 Cu or (4) 12-1/0 Al
HDL,HGL,HJL,HLL	125-150	SN400LA	251.00	SN400LA	251.00	225SNA	198.00	(2) 1-600 or (4) 1-250 Al/Cu, plus (2) 4-300 Al/Cu
JDL,JGL,JJL,JLL	150-250	SN400LA	251.00	SN400LA	251.00	_	_	(2) 1-600 or (4) 1-250 Al/Cu, plus (2) 4-300 Al/Cu
FALWB, FHLWB	200	Requires (2) SN20A plus (1) SN20NI link	(2) @\$200.00 ea plus (1) @\$27.60 ea	_	_	_	_	(4) 6-250 Al/Cu, plus (2) 14-1/0 Al/Cu
LCL, LIL, LXL, LXIL	400	_	_	SN400LA	251.00	_	_	(2) 1-600 or (4) 1-250 Al/Cu, plus (2) 4-300 Al/Cu
LCL, LIL, LXL ■, LXIL ■	400	_	_	SNC400LX◆	1152.00	_	_	(2) 2-600 Cu, plus (2) 6-250 Cu
LCL, LXL LIL, LXIL, LEL	600	_	_	SNC800LX◆	1506.00	_	_	(4) 2-600 Cu, plus (1) 2-4/0 Cu
LCL, LXL■, LIL, LXIL■, LEL■	1000★	AL800SN	365.00	_	_	_	_	(6) 3/0-500 Al/Cu, plus (2) 6-250 Al/Cu
	1000★	_	_	SN1000MA	365.00	_	_	(6) 3/0-500 Al/Cu, plus (1) 1-4/0 Al/Cu
MGL, MJL▼	300-800 A	AL800SN	365.00	AL800SN	365.00	_	_	(6) 3/0-500 Al/Cu, plus (2) 6-250 Al/Cu
PGL, PJL, PKL, PLL△	250-1200 A	SN1200	1034.00	SN1200	1034.00	_	_	(8) 3/0-500 Al/Cu, plus (2) 350 4-300 Al/Cu

- For applications above 200 A requiring a neutral, use copper wire only.

  When using LXL, LEL or LXIL circuit breaker with integral ground fault protection on a 3Ø4W system, neutral assembly SN1000MA or SNC800LX must be used for neutral CT. Order neutral CT separately.
- All Cu neutral assembly.
- For NEMA 1 and 3R 200% neutral applications order Jumper kit SN800SNI and 2 of kit SN1200. (No 200% neutral is available for NEMA 4X or 12 devices.)

  For applications with integral ground fault protection order Neutral Mounting Kit S33576MK and Neutral CT S33576 (400–1200 A only).

# NEMA Type 1 Q2, FA, J, SWB LA, MG, PG WB enclosure uses 2 circuit breakers

Table 7.143: Service Ground Kits

Circuit Breaker Cat. No. Prefix		Number of		Wire Range	\$ Price		
Cilcuit Bleaker Cat. No. Fleiix	Cat. No.	Terminals	Per Terminal	AWG/kcmil	Field-Installable	Factory-Installed	
QBL, QDL, QGL, QJL FAL, FHL, FCL, FIL, FALWB, FHLWB KCL, KIL, LAL, LHL, Q4L	PKOGTA20	2	1	10–2/0 Cu or 6–2/0 Al	56.00	191.00	
HDL,HGL,HJL,HLL,JDL,JGL,JJL,JLL	PKOGTJ250	2	1	6-300 Al/Cu	75.00	195.00	
LCL, LEL, LIL, LXL, LXIL MGL, MJL PGL, PJL, PKL, PLL	PKOGTA4	4	1	6–250 Al or Cu	213.00	263.00	

Quantity (2) required if ground wires are run in parallel.

NEMA Type 3R Q2, FA, LA, MG, J, PG, RWB (uses side hinge cover)

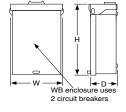
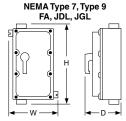


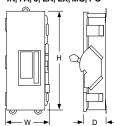
Table 7.144: Dimensions

			Approxi	mate Dii	mension		
Cat. No.	Series	H	1	V	V		)
	Series	in.	mm	in.	mm	in.	mm
FA100A, AWK	E2	19.50	495	9.13	232	4.88	124
FA100DS	E2	19.50	495	9.13	232	4.88	124
FA100F	E2	19.50	495	9.88	251	4.13	105
FA100RB	E2	18.00	457	8.88	226	4.88	124
FA100S	E2	18.13	461	8.63	219	4.13	105
IK250AWK	E2	42.25	1073	13.88	353	7.50	191
IK250DS	E2	42.25	1073	13.88	353	7.50	191
HD100S	A1	17.00	431.8	7.90	200.7	4.75	120.7
J250F	A01	32.40	823	15.40	391	6.00	152
J250S	A01	31.36	797	14.36	365	6.00	152
J250R	A01	31.05	789	14.47	368	6.28	160
J250DS	A01	32.26	819	9.72	247	7.94	202
J250SS	A01	32.26	819	9.72	247	7.94	202
J250AWK	A01	32.26	819	9.72	247	7.94	202
JD250S	A1	26.40	670.6	8.90	226.1	5.50	139.7
J225X	A1	22.70	577	10.93	278	7.70	196
J225Y	A1	22.70	577	10.93	278	7.70	196
KA250SWB	E2	20.00	508	19.00	483	5.63	143
KA250RWB	E2	20.25	514	19.00	483	7.12	181

			Approx	imate Di	nension		
Cat. No.	Series	н		1	V	D	
	Series	in.	mm	in.	mm	in.	mm
LA400AWK	E2	42.25	1073	13.75	349	7.25	184
LA400DS	E2	42.25	1073	13.75	349	7.25	184
LA400F	E2	45.63	1159	16.50	419	6.50	165
LA400R	E2	44.00	1118	15.38	391	7.88	200
LA400S	E2	44.50	1130	15.38	391	6.50	165
LA400LS	A1	27.40	696.0	15.40	391.2	6.625	168.3
M800S	A1	40-3/8	1025.52	21	533.4	9-3/4	247.65
M800R	A1	40-3/8	1025.52	21	533.4	9-3/4	247.65
M800DS	A1	40-7/8	1036.96	20-3/4	527.05	9-1/2	241.3
M800SS	A1	40-7/8	1036.96	20-3/4	527.05	9-1/2	241.3
M800AWK	A1	40-7/8	1036.96	20-3/4	527.05	9-1/2	241.3
P1200S	A1	52-1/8	1323.98	21	533.4	9-3/4	247.65
P1200R	A1	52-1/8	1323.98	21	533.4	9-3/4	247.65
P1200AWK	A1	53	1346.20	20-3/4	527.05	9-1/2	241.3
Q22200NRB	E3	23.38	594	7.63	194	4.75	121
Q22200NS	E3	23.13	588	7.63	194	4.25	108
Q23225NF	E3	26.25	667	9.88	251	4.75	121
Q23225NRB	E3	26.25	667	9.88	251	5.50	140
Q23225NS	E3	26.25	667	9.88	251	4.75	121



#### NEMA Type 4, 4X, 5, 12, 12K IK, FA, J, LA, LX, MG, PG



See Supplemental Digest 3-37 and 3-38 for:

- Special paint
- Stainlee steel fronts
- Pilot lights, push buttons
- Lock-on SPL0
- Key interlock systems
- Legend plates



# Photovoltaic Circuit Breakers and Switches

#### 600 Vdc and 1000 Vdc PV Circuit Breakers and Switches

Class 611 / Refer to Catalog 0611CT1302

The UL listed thermal-magnetic molded case circuit breakers and switches shown below are specifically designed for use in PV applications, rated at 50°C, offering grounded or ungrounded configurations.

The products are fully tested and calibrated under the PV UL489B standard.

The products come ready to install, including specially designed serial connectors for optimal thermal response, and adapted terminal covers for optimal isolation. Circuit Breakers come 100% rated for ease of use and selection.

These two new frames are fully compatible with the current line of PowerPact accessories, from aux contacts and shunt trips to motor operators and rotary handles.

Table 7.145: PV Molded Case Circuit Breakers

Ampere Rating		600 Vdc	(3 poles)		1000 Vdc (4 poles)			
	Ungrou	ınded	Grounded		Ungrounded		Grounded	
riumg	Part Number	\$ Price	Part Number	\$ Price	Part Number	\$ Price	Part Number	\$ Price
50 60 70 80 100	TGL36050L TGL36060L TGL36070L TGL36080L TGL36100L	911.00 911.00 1013.00 1013.00 1125.00	TGL36050K TGL36060K TGL36070K TGL36080K TGL36100K	984.00 984.00 1094.00 1094.00 1215.00	TBL41050L TBL41060L TBL41070L TBL41080L TBL41100L	1212.00 1212.00 1212.00 1212.00 1347.00	TBL41050K TBL41060K TBL41070K TBL41080K TBL41100K	1309.00 1309.00 1309.00 1309.00 1455.00
125 150 175 200	TGL36125L TGL36150L TGL36175L TGL36200L	1250.00 1250.00 1438.00 1438.00	TGL36125K TGL36150K TGL36175K TGL36200K	1350.00 1350.00 1553.00 1553.00	TBL41125L TBL41150L TBL41175L TBL41200L	1496.00 1496.00 1721.00 1721.00	TBL41125K TBL41150K TBL41175K TBL41200K	1616.00 1616.00 1859.00 1859.00
225 250 300 350 400 450 500	UGL36225L UGL36250L UGL36300L UGL36350L UGL36450L UGL36450L N/A	1703.00 1892.00 2270.00 2270.00 2306.00 2536.00	UGL36225K UGL36250K UGL36300K UGL36350K UGL36450K UGL36450K UGL36500G	1839.00 2043.00 2451.00 2451.00 2490.00 2739.00 2739.00	UCL41225L UCL41250L UCL41300L UCL41350L UCL41400L UCL41450L UCL41500J	2044.00 2271.00 2611.00 2611.00 2765.00 3041.00 3041.00	UCL41225K UCL41250K UCL41300K UCL41350K UCL41400K UCL41450K UCL41500G	2207.00 2453.00 2820.00 2820.00 2986.00 3284.00

▲ 500 A 80% rated.

Table 7.146: PV Circuit Breaker Max. Interrupting Ratings

Frame	600 Vdc	1000 Vdc
T-Frame	10 kA	3 kA
U-Frame	10 kA	5 kA

Table 7.147: Circuit Breaker Numbering

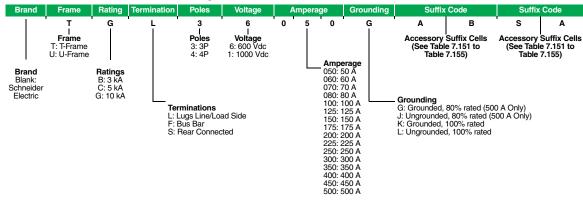


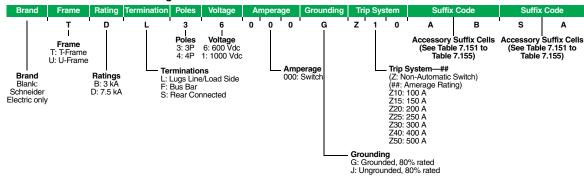
Table 7.148: PV Molded Case Non-Automatic Switches

		600 Vdc (3 poles)				1000 Vdc (4 poles)				
Ampere Rating	Ungrounded		Grounded		Ungrounded		Grounded			
· · · · · · · · · · · · · · · · · · ·	Part Number	\$ Price	Part Number	\$ Price	Part Number	\$ Price	Part Number	\$ Price		
100 150 200	TBL36000JZ10 TBL36000JZ15 TBL36000JZ20	872.00 960.00 1104.00	TBL36000GZ15	934.00 1028.00 1182.00	TBL41000JZ15	1048.00 1156.00 1332.00	TBL41000GZ15	1122.00 1237.00 1426.00		
250 300 400 500	UDL36000JZ25 UDL36000JZ30 UDL36000JZ40 UDL36000JZ50	1676.00 1876.00	UDL36000GZ25 UDL36000GZ30 UDL36000GZ40 UDL36000GZ50	1557.00 1794.00 2007.00 2569.00	UDL41000JZ30 UDL41000JZ40	2012.00 2254.00	UDL41000GZ25 UDL41000GZ30 UDL41000GZ40 UDL41000GZ50	1870.00 2153.00 2412.00 2901.00		

Table 7.149: PV Switches Withstand Ratings

Frame	600/1000 Vdc
T-Frame	3 kA
U-Frame	7.5 kA

#### Table 7.150: Switch Numbering



#### **Factory Installed Accessories**

Class 611 / Refer to Catalog 0611CT1302



Table 7.151: Auxiliary Switches

Contacts	Factory-Installed Suffix	Field-Installable Kit No.	Kit Qty.	\$ Price
1A/1B Standard	AA	S29450	1	297.00
2A/2B Standard	AB	S29450	2	594.00
3A/3B Standard▲	AC	S29450	3	891.00
1A/1B Low-Level (Gold)	AE	S29452	1	372.00
2A/2B Low-Level (Gold)	AF	S29452	2	744.00
3A/3B Low-Level (Gold)▲	AG	S29452	3	1116.00

U-Frame only

Table 7.152: Alarm/Overcurrent Trip Switches

	THOSE THAINS TO CONTONE THE CHING			
Suffix	Switch	Kit No.	Kit Qty.	\$ Price
Powe	rPact T-Frame			
ВС	Alarm Switch	S29450	1	297.00
BH	Alarm Switch, Low-Level	S29452	1	372.00
BD	Overcurrent Trip Switch, Standard	S29450	1	338.00
БО	SDE Actuator	S29451	1	336.00
BJ	Overcurrent Trip Switch, Low-Level	S29452	1	413.00
БJ	SDE Actuator	S29451	1	413.00
BE	Alarm Switch and Overcurrent Trip Switch, Standard	S29450	2	635.00
DE	SDE Actuators	S29451	2	035.00
BK	Alarm Switch and Overcurrent Trip Switch, Low-Level	S29452	2	785.00
DK	SDE Actuators	S29451	2	765.00
Powe	rPact U-Frame			
ВС	Alarm Switch	S29450	1	297.00
ВН	Alarm Switch, Low-Level	S29452	1	372.00
BD	Overcurrent Trip Switch, Standard	S29450	1	297.00
BJ	Overcurrent Trip Switch, Low-Level	S29452	1	372.00
BE	Alarm Switch and Overcurrent Trip Switch, Standard	S29450	2	594.00
BK	Alarm Switch and Overcurrent Trip Switch, Low-Level	S29452	2	744.00

Table 7.153: Shunt Trips

	Shunt Trip (MX)						
Voltage	Factory-Installed Suffix	Field-Installable Kit No.	\$ Price				
120 Vac	SA	S29386	717.00				
24 Vdc	SO	S29390	717.00				
48 Vdc	SP	S29392	717.00				
125 Vdc	SR	S29393	717.00				

Table 7.154: Rotary Operated Handles

			Factory	T-Frar	ne	U-Frame	
D	evice	Description	Installed Suffix	Field Installable Kit No.	\$ Price	Field Installable Kit No.	\$ Price
Direct Mounted	Standard Handle Black	Handle Only	RD10	S29337	255.00	S32597	366.00
Door Mounted	Standard Black Handle	Handle Only	RE10	S29338	383.00	S32598	557.00

Table 7.155: Locks

		T-Fram		ne	U-Fran	ne
Device	Description	Factory Installed Suffix	Field Installable Kit No.	\$ Price	Field Installable Kit No.	\$ Price
Handle Padlocking Device	Handle Padlock, ON or OFF	ΥP	S29371	77.00	S32631	122.00

NOTE: For a complete list of Field installable accessories and details, including also motor operator (electrical only) and locks, refer to accessories information for the PowerPact, J-Frame (compatible with T-Frame) and L-Frame (Compatible with U-Frame). Or consult Photovoltaic offer catalog 0611CT1302.

#### Table 7.156: PV Unit Mount Terminal Covers

Choose termination "L" for having the termination kit factory installed with the breaker (Lugs, Term Covers, Serial Connectors)

Ф	Description▲			Config	uratio	n	Field	
Frame			Ungrounded		Grounded		Installable Catalog	\$ Price
			Тор	Bottom	Тор	Bottom	No.	
	Long Terminal Cover (3P)	3	Х				S35175	145.00
В	Long Terminal Cover (3P/1SC)	3		Х	Х	Х	S35176	145.00
T-Frame	Long Terminal Cover (4P)	4		Х			S35177	162.00
芷	Long Terminal Cover (4P/2SC)	4	Х		Х		S35178	162.00
	Long Terminal Cover (4P/1SC)	4				Х	S35179	162.00
	Long Terminal Cover (3P)	3	Х				S32593	185.00
ne	Extended Term Cover (3P/1SC)	3		Х	Х	Х	S38291	205.00
J-Frame	Long Terminal Cover (4P)	4		Х			S32594	198.00
∃	Extended Term Cover (4P/2SC)	4	Х		Х		S38293	215.00
	Extended Term Cover (4P/1SC)	4				Х	S38294	215.00

P: Poles, SC: Serial connector.

Table 7.157: PV Rear Connection Terminal Covers and Connectors Choose termination "S" for having the termination kit included with the breaker (Rear Connectors, Term Covers, Serial Connectors)

١,	D			Config	uratio	n	Field	
	Description ◆	Poles	Ung	rounded	Gro	ounded	Installable Catalog	\$ Price
ľ		-	Тор	Bottom	Тор	Bottom	No.	
	Short Terminal Cover (3P)	3	Х				S29515	121.00
	Long Terminal Cover (3P/1SC)	3		Χ	Χ	Х	S35169	145.00
9	Short Terminal Cover (4P)	4		Χ			S29516	141.00
T.Frame	Long Terminal Cover (4P/1SC)	4				Х	S35170	162.00
Ë	Long Terminal Cover (4P/2SC)	4	Χ		Χ		S35178	162.00
	Short Rear Connector (set of 2)▲	3, 4		Χ		Χ	S29235	162.00
	Long Rear Connector (set of 2)▲	3, 4		Χ			S29236	206.00
	Short Terminal Cover (3P)	3	Χ				S32562	149.00
	Extended Terminal Cover (3P/1SC)	З		Χ	Х	Х	S35171	205.00
9	Short Terminal Cover (4P)	4		Х			S32563	161.00
L-Framo	Extended Term Cover (4P/1SC)	4				Х	S35172	215.00
Ξ	Extended Term Cover (4P/2SC)	4	Х		Х		S38293	215.00
	Short Rear Connector (set of 2)▲■	3, 4		Χ		Х	S432475	219.00
	Long Rear Connector (set of 2)▲■	3, 4		Χ			S432476	261.00
	·							

The ungrounded configurations (3P or 4P) need 2 short and 2 long rear connectors. The grounded configurations only use 2 short rear connectors.

#### Table 7.158: PV T-Frame Bus Bar and Rear Connections Hardware

Choose termination "F" for having the termination kit included with the breaker (Terminal Nuts, Term Covers, Serial Connectors)

Description	Cat. No.	\$ Price	
T-Frame Term Nut Insert-Metric/M8 (12)	S30554	150.00	

#### Table 7.159: PV U-Frame Bus Bar and Rear Connections Hardware

Choose termination "F" for having the termination kit included with the breaker (Screws and Washers, Term Covers, Serial Connectors)

Description	Cat. No.	\$ Price
Set of 4 M10 x 25 terminal screws and washers for one side	S36967	31.00

Table 7.160: Mechancal Lug Kits for T- and U-Frame Circuit **Breakers and Switches** 

a)		Conductor		onductor			Qty.	
Frame	Description	Туре	No. Per Lug	Size	Current	Cat. No.	Per Kit	\$ Price
	Lug(2) T-Frame,	Al	1	#12–#4 AWG (4–25 mm <sup>2</sup> )	50–60 A	S35167	2	86.00
Ф	12-4 AWG, Al/Cu	Cu	1	#14-#4 AWG (2.5-25 mm <sup>2</sup> )	50-60 A	333107	2	86.00
T-Frame	Lugs(2) T-Frame, 4–4/0 AWG, Al/Cu	Al/Cu	1	#4-#4/0 AWG (25-95 mm <sup>2</sup> )	70–150 A	S29255	2	86.00
F	Lug(2) T-Frame, 250–350 kcmil.	Al	1	#250–350 AWG (120–185 mm <sup>2</sup> )	175–200 A	S35168	2	86.00
	Al/Cu	Cu	1	#2/0-350 AWG (70-185 mm <sup>2</sup> )	173-200 A	333100	۷	00.00
J-Frame	Lug(2) U-Frame, 2/0 AWG-500 kcmil.	Al	2	2/0 AWG-500 kcmil (70-240 mm <sup>2</sup> )	225–500 A	S35180	2	225.00
U-Fr	Al/Cu	Cu	2	2/0 AWG-500 kcmil (70-240 mm <sup>2</sup> )		333180	2	223.00

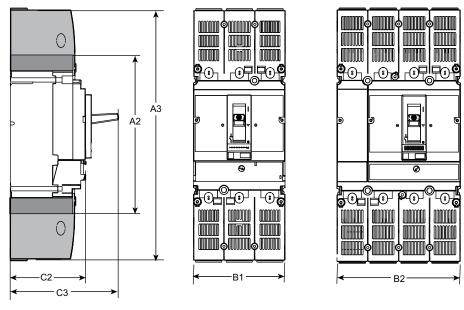
NOTE: For availability dates of field installable accessories in Tables 7.156. 7.157, 7.158 and 7.160 contact Schneider Electric.

Parts only, no hardware is included. See Table 7.159 U-Frame, below. P: Poles, SC: Serial connector.

# Photovoltaic Circuit Breakers and Switches

Table 7.161: PV T-Frame Circuit Breaker and Switches Dimensions

	A2	A3	B1	B2	C2	C3
in	7.40	11.42	4.13	5.51	3.39	4.96
mm	188	290	105	140	86	126



A2: Short A3: Long

Table 7.162: Terminal Cover Configuration According to Wiring Configuration

Wiring Configuration	Connect	tion Type	Terminal Cover Configuration			
wiring Conniguration	Unit Mount/Bus	Rear Connected	Тор	Bottom		
3P Ungrounded	Х		Long	Long		
or originariaea		X	Short	Long		
3P Grounded	X	X	Long	Long		
4P Ungrounded	X		Long	Long		
4F Origiourided		X	Long	Short		
4P Grounded	Х	X	Long	Long		

Table 7.163: Approximate Weights

T-Frames	Product Weight (lbs)	Shipping Weights (lbs)
3P Ungrounded	5	8
3P Grounded	5.5	8.5
4P Ungrounded	6.3	9.3
4P Grounded	6.7	9.7

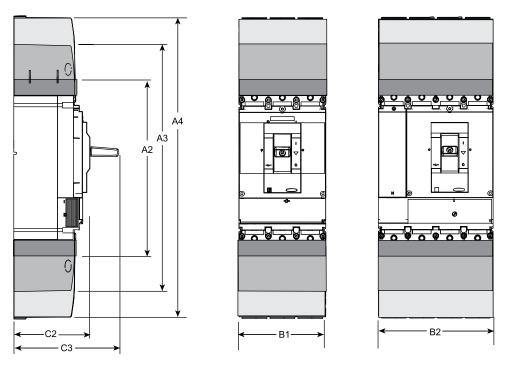
# **U-Frame Dimensions and Shipping Weights**

Class 611 / Refer to Catalog 0611CT1302



Table 7.164: PV U-Frame Circuit Breaker and Switches Dimensions

	A2	А3	A4	B1	B2	C2	C3
in	11.2	15.7	19.1	5.5	7.2	4.3	6.6
mm	285	400	484	140	183	110	168



A2: Short A3: Long A4: Extended

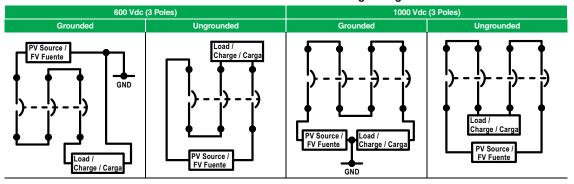
Table 7.165: Terminal Cover Configuration According to Wiring Configuration

Wiring Configuration	Connect	tion Type	Terminal Cove	r Configuration	
Wiring Conniguration	Unit Mount/Bus	Rear Connected	Тор	Bottom	
3P Ungrounded	Х		Long		
or Origiounided		X	Short	Extended	
3P Grounded	Х	X			
4P Ungrounded	X		Extended	Long	
4F Origiourided		X	Exterided	Short	
4P Grounded	Χ	X		Extended	

Table 7.166: Approximate Weights

U-Frames	Product Weight (lbs)	Shipping Weights (lbs)
3P Ungrounded	15	19.5
3P Grounded	17	21.5
4P Ungrounded	21	25.5
4P Grounded	23	27.5

Table 7.167: PV T- and U-Frame Circuit Breakers and Switches Wiring Configurations





# 1P 1P QO-PDF QO-PDF

#### QO™ and QOU Miniature Circuit Breakers

New! QO™ Dual Function Circuit Breaker

QO Combination Arc Fault and Ground Fault Circuit Interrupters (Dual Function) provide overload and short circuit protection, plus arc fault and ground fault protection in a single device in accordance with the NEC, UL1699 and UL943.

#### **QO™ Miniature Circuit Breakers**

Class 685, 690, 730, 912, 950 / Refer to Catalog 0730CT9801

#### Table 7.168: QO Dual Function Circuit Breakers

		1P 120 \	Vac	1P 120 Vac		
Circuit Breaker	Ampere	10 k A	IR	22 k AIR		
Туре	Rating	1 Space Re	quired	1 Space Required		
		Cat. No.	\$ Price	Cat. No.	\$ Price	
Combination Arc-fault and Ground Fault Circuit	15 A	QO115DF	326.00	QO115VHDF	578.00	
Interrupter with Pigtail Neutral	20 A	QO120DF	326.00	QO120VHDF	578.00	
Plug-On Neutral Combination Arc-fault and Ground	15 A	QO115PDF	326.00	QO115VHPDF	578.00	
Fault Circuit Interrupter	20 A	QO120PDF	326.00	QO120VHPDF	578.00	



by Schneider Electric
www.schneider-electric.us

# **Section 8**

# **Operating Mechanisms and Disconnect Switches**

## **Operating Mechanisms and Disconnect Switches**

Selection Guide	8

#### **UL508 Motor Disconnect Switches**

Mini-Vario and Vario™ Assembled and Enclosed Switches	8-3
Mini-Vario and Vario Switches	8-4
Mini-Vario and Vario Accessories	8-6
MD Motor Disconnect Switches	8-7

#### **UL98 IEC Style Disconnect Switches**

LK4 Nonfusible and GS2 Fusible Disconnect Switches	8-8
Accessories, LK4 Nonfusible and GS2 Fusible	8-10
Dimensions, LK4 Nonfusible and GS2 Fusible	8-11

#### Flange-Mounted and Cable-Operated Disconnect Switches

Disconnect Switches	8-15
Accessories, Disconnect Switches	8-16
Dimensions, Disconnect Switches	8-17

#### **Operating Mechanisms for Circuit Breakers**

Door Mounted	8-19
Flexible Cable Mechanisms	8-21
Dimensions, Flange Mounted and Variable Depth	8-23

#### **Operating Mechanisms, Accessories**

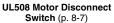
Disconnect Switches and Circuit Breakers 8-24

#### **Door Closing Mechanisms**

Introduction	8-2:
Types M5, M6, M1, and M8	8-20
Single and Multi-Door Enclosures	8-27
Types M5, M6, M1, and M8	8-28







**UL98 Fusible Switch** (p. 8-9)





**UL98 Style Flange Handle** Disconnect Switch (p. 8-15)

9421 Type L Circuit Breaker Mechanism (p. 8-19)



9422 Type R Circuit Breaker Mechanism (p. 8-23)



















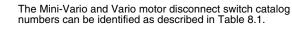




Class	Vario	LK4	GS2	9422	9421	9422	9423
Туре	Manual motor control switches	Nonfusible IEC style disconnect switches	Fusible IEC style disconnect switches	NEMA style fused or nonfusible disconnect switches	Circuit breaker operating mechanisms	Circuit breaker operating mechanisms	Door closing mechanisms
UL Rating	UL508	UL98	UL98	UL98	_	_	_
Handle Type	Rotary	Rotary	Rotary	Flange Adjustable rod or cable mechanism	Rotary	Flange Adjustable rod or cable mechanism	Rotary, works in conjunction with 9422 handle mechanisms
Mounting	Door or panel	_	Flange with cable mechanism panel	Panel or bracket mount	Panel	Panel	_
Load Voltage (maximum)	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	_
Current Ratings	10–115	30–1200	30–800	30–400	Circuit breaker frame sizes 100–1200	Circuit breaker frame sizes 100–1200	_
Horsepower Ratings (maximum)	2–60	7.5–500	7.5–500	7.5–350	_	_	_
Enclosure Type	Metallic: NEMA Type 1, 12, 4, 4X Plastic: IP55, NEMA Type 4X	Handle ratings: NEMA Type 1, 3R, 4, 4X, 12	Handle ratings: NEMA Type 1, 3R, 4, 4X, 12	Handle ratings: NEMA Type 1, 3R, 4, 4X, 12	Handle ratings: NEMA Type 1, 3R, 4, 4X, 12	Handle ratings: NEMA Type 1, 3R, 4, 4X, 12	Handle ratings: NEMA Type 4 and 12 sheet steel or stainless
Accessories	Power poles and auxiliary contacts	Auxiliary contacts and power lugs	Auxiliary contacts and power lugs	Auxiliary contacts	Auxiliary contacts	Auxiliary contacts	Right or left-hand operation
Approvals	UL File E164864 NLRV CSA File LR 81630 Class 3211 05	UL File E191098 WP2X / WP2X7 CSA 703149 Class 4652 04	UL File E191098 WP2X / WP2X7 CSA 703149 Class 4652 04	UL File E52639 WHTY2 CSA LR44199 Class 4652-04	UL File E62922 DIHS2 CSA LR44199 Class 3211 07	UL File E62922 DIHS2 CSA LR44199 Class 3211 07	_
Page	8-3	8-8	8-9	8-15	8-19	8-21	8-25

N12

GE





VCFN12GE



VN12



VN12/KCC1YZ



VBDN12



VCDN12

#### **Table 8.1: Identification System**

odel (V-Vari	o, K-Operator)		
perator Type	e/ Accessory Designation		
CD	Single hole Red & Yellow	BD	Single hole Black and Gray
CF	Four hole Red & Yellow	BF	Four hole Black and Gray
CCD	Single hole Red & Yellow w/extension shaft	VE	Switch with Red handle installed on unit (one padlock only)
CCF	Four hole Red & Yellow w/ extension shaft	VD	Switch with Black handle installed on unit (no padlock provision)
Blank	No operator or accessory	Z	Accessory, power pole, neutral or ground
vitch Type▲			
Blank		1	Vario 20/32 A
N12	Mini-Vario 10/12 A	2	Vario 25/40 A
N20	Mini-Vario 16/20 A	3	Vario 45/63 A
02	Vario 10/12 A	4	Vario 63/80 A
01	Vario 16/20 A	5	Vario 100/125 A
0	Vario 20/25 A	6	Vario 115/175 A
closure Typ	pe (if applicable)		
Blank	No Enclosure	G30, A30	D, W30 Type 1/12/4/4X Metallic (Class 9421)
GE	Mini-Vario IP55 Non-Metallic	GU	Vario IP55 Non-Metallic

Switches/contacts are dual rated (UL/IEC).

#### Mini-Vario

**Table 8.2:** Assembled Switches—Degree of Protection IP65, Type 1 and 12

Ratir	ng (A)	Complete	Switches for Do	oor Mounting (3-Padlo	ck)	Complete Switches for Rear Mounting, Includes Extension Shaft (3-Padlock)		
		Red/Yellow (Single Hole)		Black/Gray (Single Hole)		Red/Yellow (Single Hole)		
UL	IEC	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	
10	12	VCDN12	90.00	VBDN12	90.00	VCCDN12	134.00	
16	20	VCDN20	135.00	VBDN20	135.00	135.00 VCCDN20		

**Table 8.3: Enclosed Switches** 

Complete Switches Mounted in	IP55 Non-Metallic Enclosure				
Red/Yellow Mounted In Sealable Enclosure, Non-UL Listed, Non-NEMA Rated					
Catalog Number	\$ Price				
VCFN12GE	179.00				
VCFN20GE	189.00				

**Table 8.4: Component Parts** 

	Catalog Number	Description	\$ Price
Ī	VN12▲	10/12 A switch only	52.00
	VN20▲	16/20 A switch only	63.00
	VZN12▲	Add on power pole for 10/12 A switch	26.00
	VZN20▲	Add on power pole for 16/20 A switch	31.50
	VZN11	Neutral Pole with early make, late break for VN12 or VN20 switch	29.30
_	VZN14	Grounding module for VN12 or VN20	29.30
	VZN05	N.O. late make auxiliary contact■	27.00
	VZN06	N.C. early break auxiliary contact■	27.00
_	VZN26	Single-pole shroud for auxiliary contacts	5.90
_	VZN08	Three-pole shroud for VN12 or VN20	7.70
	A Curitoh	acciontacto are dual rated (LIL/IEC)	

Switches/contacts are dual rated (UL/IEC).
Auxiliary contacts are dual rated (UL/IEC 10/12 A).

#### **Table 8.5: Operators and Accessories**

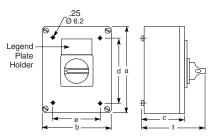
Catalog Number	Description	\$ Price
KCC1YZ	45 x 45 mm Red & Yellow operator	39.20
KCD1PZ	60 x 60 mm Red & Yellow operator	39.20
KAD1PZ	60 x 60 mm Black & Gray operator	39.20
VZN17	300-340 mm shaft extension	22.50
VZN30	400-430 mm shaft extension	27.00
KZ32	Door interlocking plate for 45 or 60 mm operator	20.30
KZ83	Door mounting plate for 45 or 60 mm operator	20.30









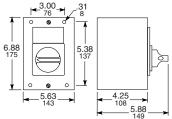


Non-Metallic Enclosure

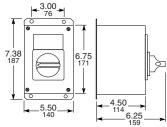


Metallic Enclosure

#### Metallic Enclosed Switch Dimensions



Class 9421 NEMA Type 1 V1G30, V2G30



Class 9421 NEMA Type 4, 4X, 12 V1W30, V2W30, V1A30, V2A30

#### Vario

Table 8.6: NEMA Type 1 and 12 Assembled Switches for Door Mounting

Pati	ing (A)	Complete Switches (Switch and Handle) for Door Mounting (3-padlock)									
nau	Rating (A) Red/Yellow (Four Hole)		our Hole)	Black/Gray (F	Black/Gray (Four Hole)		Red/Yellow (Single Hole)		Black/Gray (Single Hole)		
UL	IEC	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price		
10 16 20 20 25	12 20 25 32 40	VCF02 VCF01 VCF0 VCF1 VCF2	125.00 147.00 174.00 185.00 237.00	VBF01 VBF0	125.00 147.00 174.00 185.00 237.00	VCD01 VCD0 VCD1	134.00 161.00 206.00 219.00 252.00	VBD01 VBD0	134.00 161.00 206.00 219.00 252.00		
45 63 100 115	63 80 125 175	VCF3 VCF4 VCF5 VCF6	282.00 329.00 401.00 612.00	VBF4	282.00 329.00 401.00 612.00	_		_ _ _			

Table 8.7: NEMA Type 1 and 12 Assembled Switches for Rear Mounting

Ratir	ng (A)			s for Rear Moun haft (3-Padlock)		Switches with Handles Installed on Unit, DIN Rail Mount Only				
		Red/Yellow (Fe	Red/Yellow (Four Hole)		Red/Yellow (Single Hole)		-Padlock)	Black/Gray (No	Black/Gray (No-Padlock)	
UL	IEC	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	
10 16 20 20 25	12 20 25 32 40	VCCF02 VCCF01 VCCF0 VCCF1 VCCF2	162.00 185.00 197.00 206.00 252.00	VCCD01 VCCD0 VCCD1	162.00 185.00 197.00 206.00 252.00	VVE0 VVE1 VVE2	149.00 156.00 180.00	VVD0 VVD1 VVD2	149.00 156.00 180.00	
45 63 100 115	63 80 125 175	VCCF3 VCCF4 VCCF5 VCCF6	320.00 356.00 464.00 606.00	_		VVE3 VVE4	212.00 300.00 —	VVD3 VVD4 —	212.00 300.00 —	

▲ Complete switch includes handle operator, shaft, door interlock plate, and line terminal shroud.

#### **Non-Metallic Enclosed Switches**

The Vario Motor Disconnect Switch is also offered as an enclosed switch. The 3-pole version makes the Vario switch ideal for manual motor control applications. They are compact, easy to wire and connect, and come undrilled to allow aable cable entry positions.

NOTE: VCGUN enclosures are UL approved.

Table 8.8: Non-Metallic Enclosed Switch▲■

Ampere Size	IP55-PVC 3-Pole, NEMA Type 1 & 12					
ÚL/IEC	Catalog No.	\$ Price				
20/32 25/40 45/63 63/80 100/125 115/175	VC1GUN VC2GUN VC3GUN VC4GUN VC5GUN VC5GUN	239.00 287.00 345.00 381.00 548.00 845.00				

- Assembled, includes switches mounted in enclosure with handle.
- Refer to Table 8.11 and Table 8.12 for horsepower ratings.

Table 8.9: Dimensions

Туре	No. of Poles	а	b	С	d	е	f	
VC1GUN	3	6.5 (164)	4.8 (121)	3.4 (87)	5.6 (141)	3.9 (98)	5.2 (132)	
VC2GUN	3	0.5 (104)	4.0 (121)	3.4 (67)	5.0 (141)	3.9 (90)	3.2 (132)	
VC3GUN	3	7.6 (193)	6.5 (164)	3.4 (87)	6.7 (170)	5.6 (141)	5.2 (132)	
VC4GUN		7.6 (193)	6.5 (164)	3.4 (67)	6.7 (170)			
VC5GUN	3	11.5 (291)	9.5 (241)	5.0 (128)	10.6 (269)	8.6 (219)	7.5 (191)	
VC6GUN		11.5 (291)	9.5 (241)	5.0 (126)	10.0 (209)			

The V1 and V2 come in metallic enclosures (NEMA Type 1, 4, 4X, and 12). The NEMA Type 1 comes with conduit knockouts top and bottom. To factory install a VZ7 auxiliary contact in these metallic enclosures, add Form X11 to the end of the catalog number (for example, 9421V1G30X11). To factory install a VZ20 auxiliary contact in these enclosures, add Form X20 to the end of the catalog number (for example, 9421V1W30X20). Price adder: \$42.00

Table 8.10: Metallic Enclosed Switches ▲ ■

Ratir	ıg (A)	Horse	power Ratings		Horsepower Ratings NEMA Type 1		NEMA Type 12		NEMA Type 4/4X■	
UL	IEC	240 V	480 V	600 V	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
20	32	5	10	10	9421V1G30	333.00	9421V1A30	548.00	9421V1W30	783.00
25	40	5	10	15	9421V2G30	381.00	9421V2A30	594.00	9421V2W30	831.00

- Assembled, includes switches mounted in enclosure with handle
- For indoor use only. The NEMA Type 4/4X enclosure is made of #304 stainless steel with 3/4 in. T&B stainless steel hubs on the top and bottom.

Table 8.11: Vario Manual Motor Control Switches, IEC

Rating (A)		kW R	ating		3-Pole Switch Body		
IEČ` ´	230 V	240 V	400 V	415 V	500 V	690 V	
12	3	3	4	4	5.5	7.5	
20	4	4	5.5	5.5	7.5	11	
25	5.5	5.5	7.5	7.5	11	15	
32	5.5	5.5	11	11	11	15	
40	7.5	7.5	15	15	18.5	15	
63	15	15	22	22	30	22	
80	18.5	18.5	30	30	37	30	
125	22	22	37	37	45	37	
175	30	30	45	45	55	45	

 $\infty$ 



#### **UL508 Motor Disconnect Switches**

## **Vario Manual Motor Control Switches**

Vario switches meet UL508 requirements as open manual motor controllers. They are also marked "Suitable as Motor Disconnect" allowing installation on the load side of the motor branch circuit short-circuit and ground-fault protection. If motor branch circuit short-circuit and ground-fault protection is needed, use a GS1 or 9422 fusible switch or circuit breaker meeting NEC 430.52 requirements.



Manual Motor Control Switch

**Vario Manual Motor Control Switches** Table 8.12:

Rating (A)	Hors	sepower Ra	ating	Shaft Size	3-Pole Switch Body
UL	240 V	480 V	600 V	mm	Туре
10	2	5	5	6	V02
16	3	7.5	7.5	6	V01
20	5	10	10	6	V0
20	5	10	10	6	V1
25	5	10	15	6	V2
45	10	20	30	8	V3
63	15	30	40	8	V4
100	25	50	50	8	V5
115	30	50	60	8	V6

Table 8.13: Switch Body▲

Ratir	ng (A)	Shaft Size	3-Pole Sw	itch Body
UL	IEC	mm	Туре	\$ Price
10	12	6	V02	62.00
16	20	6	V01	74.00
20	25	6	V0	84.00
20	32	6	V1	95.00
25	40	6	V2	143.00
45	63	8	V3	179.00
63	80	8	V4	215.00
100	125	8	V5	287.00
115	175	8	V6	428.00

Refer to Table 8.10 and Table 8.12 for horsepower ratings.

Table 8.14: NEMA Type 1 and 12 Handle Operators: V02-V2 (6 mm Shaft), V3-V6 (8 mm Shaft) ▲

KAF3PZ

Operator Type		Red/Yellow Single Hole 45 x 45 mm		Red/Yellow Four Hole 45 x 45 mm		Black/Gray Single Hole 45 x 45 mm		Black/Gray Fo 45 x 45 n	
Switches	No. of Padlocks	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
V02-V2	0	KCC1LZ	39.20	KCE1LZ	39.20	KAC1BZ	39.20	KAE1BZ	39.20
V02-V2	1	KCC1YZ	39.20	KCE1YZ	39.20	_	_	_	_
Opera	rator Type Red/Yellow Single Hole 60 x 60 mm			Red/Yellow Four Hole 60 x 60 mm		Black/Gray Single Hole 60 x 60 mm		Black/Gray Four Hole 60 x 60 mm	
V02-V2	0	KDD1PZ	39.20	KDF1PZ	39.20	KBD1PZ	39.20	KBF1PZ	39.20
V3-V4	0	_	_	KDF2PZ	39.20	_	_	KBF2PZ	39.20
V02-V2	3	KCD1PZ	39.20	KCF1PZ	39.20	KAD1PZ	39.20	KAF1PZ	39.20
V3-V4	3	_	_	KCF2PZ	39.20	_	_	KAF2PZ	39.20
Opera	ator Type	Red/Yellow Fo 90 x 90 n		Black/Gray Fo 90 x 90 n					
V5_V6	Λ	KDE3P7	107.00	KBE3P7	107.00				

V5-V6 KCF3PZ 107.00 107.00 When using these handles for replacements on the non-metallic enclosed switches, the handle shaft that comes with the enclosure must be reused. See Section 17 of the Supplemental Digest.



Single-Hole Operator

Four-Hole Operator (All except KDF3PZ and KBF3PZ)

**Low Profile Handle Operators**▲ Table 8.15:

Oper	ator Type	Red/Yellow Single Hole 60 x 60 mm		Red/Yellow Four Hole 60 x 60 mm		Black/Gray Single Hole 60 x 60		Black/Gray Fo 60 x 60 m	
Switches	No. of Padlocks	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
V02-V2	3	KCD1YZ	39.20	KCF1YZ	39.20	KADIXZ	39.20	KAF1XZ	39.20
V3-V4	3	_	_	KCF2YZ	39.20	_	_	KAF2XZ	39.20
Oper	ator Type		Red/Yellow Four Hole 90 x 90 mm Black/Gray Four Hole 90 x 90 mm						
V5-V6	3	KCG2YZ	72.00	KAG2XZ	72.00				

When using these handles for replacements on the non-metallic enclosed switches, the handle shaft that comes with the enclosure must be reused. See Section 17 of the Supplemental Digest.

Table 8.16: **Gasket Kits** 

Catalog No.	Description	\$ Price Each
KZ65	45 x 45 mm gasket for V02-V2 for 4-hole type handles (order in quantities of 5)—IP65	5.90
KZ66	60 x 60 mm gasket for V02-V2 for 4-hole type handles (order in quantities of 5)	12.00
KZ62	60 x 60 mm gasket for V3-V4 for 4-hole type handles (order in quantities of 5)	12.00
KZ67	90 x 90 mm gasket for V5-V6 for 4-hole type handles (order in quantities of 5)—IP65	15.60



Four-Hole Operator KDF3PZ and KBF3PZ

Low-Profile Handle KCD1YZ



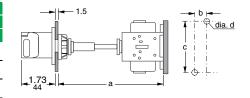
Four-Hole 60 x 60 Single-Hole Mounting Dimensions **Mounting Dimensio** 

Four-Hole 90 x 90 Mounting Dimensions

The door interlock plate included with VCC Kits has the same drilling as the handle operators.

#### Table 8.17: Rear/Panel Mounting Switch Body Dimensions

			Dimensions								
		Shaft Extension	í	a	b		(	;	d		
			in.	mm	in.	mm	in.	mm	in.	mm	
	V02 to V2	VZ17 VZ30	5.5–13.0 5.5–16.9	140–330 140–430	0.60	15	2.4	60	0.17	4.2	
	V3 to V4	VZ18 VZ31	5.5–12.6 5.5–16.5	140–320 140–420	0.79	20	2.4	60	0.20	5.2	
	V5 to V6	VZ18 VZ31	6.5–13.8 6.5–17.7	165–350 165–450	1.20	30	3.9	100	0.28	7.0	



www.schneider-electric.us





Door Interlock Plate KZ32

Shaft Extension Kit



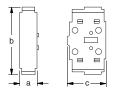
Add-On Contact Modules



Terminal Shroud for Main Switch VZ8



Terminal Shroud for Auxiliary Contact VZ29



Main Pole Module

#### Table 8.18: **Door Mounting Switch Body Dimensions**

<del>)</del>		Dimensions								
	Switch Type	a			b		c			
-		in.	mm	in.	mm	in.	mm	Approx. lbs.		
	V02 to V2▲	2.83	72	2.17	55	2.91	74	0.44		
	V02 to V2	2.36	60	2.17	55	2.91	74	0.44		
	V3 to V4	2.56	65	2.36	60	3.27	83	1.10		
	V5 to V6	3.54	90	3.54	90	4.92	125	2.00		

▲ Dimensions for single-hole mounting.

#### Table 8.19: **Shaft Extension and Door Interlock**

Switch Type	Maximum Panel Depth		Shaft Extension \$ Pri		Door Interlock	\$ Price	Door Mounting	\$ Price
	in.	mm	Kit		Plate		Plate	
V02 to V2	13.0	330	VZ17	28.70	KZ32	20.30	KZ83	20.30
V3, V4	12.6	320	VZ18	35.60	KZ74	39.20	KZ81	39.20
V5, V6	13.8	351	VZ18	35.60	KZ74	39.20	KZ81	39.20
V02 to V2	16.9	429	VZ30	35.60	KZ32	20.30	KZ83	20.30
V3, V4	16.5	419	VZ31	42.80	KZ74	39.20	KZ81	39.20
V5, V6	17.7	450	VZ31	42.80	KZ74	39.20	KZ81	39.20

Table 8.20: **Accessories** 

Switch Type	Line Side Terminal Shroud For Main Switch	\$ Price	Terminal Shroud for Add-on Power Pole	\$ Price	Terminal Shroud for Auxiliary Contact	\$ Price
V02 to V2	VZ8	8.40	VZ26	5.90	VZ29	5.90
V3, V4	VZ9	8.40	VZ27	5.90	VZ29	5.90
V5, V6	VZ10	12.00	VZ28	9.50	VZ29	5.90

#### Table 8.21: **Add-On Contact Modules**

	Main Pole	Main	Ampere		Auxiliary	Contacts	
Switch Type	Module	Pole	Rating UL/IEC	\$ Price	1 N.O. & 1 N.C. ▲	2 N.O.	\$ Price
V02	VZ02	VZ02	10/12	31.50		ĺ	ĺ
V01	VZ01	VZ01	16/20	32.90			
V0	VZ0	VZ0	20/25	34.20	-1		
V1	VZ1	VZ1	20/32	35.60			
V2	VZ2	VZ2	25/40	55.00	VZ7■	VZ20■	42.80
V3	VZ3	VZ3	45/63	66.00			
V4	VZ4	VZ4	63/80	82.00	0 - -		
V5	_	_	_	_			
V6	_	_	_	_			

- Early Break, Late Make.
- Auxiliary contacts are rated UL/IEC 10/12 A.

#### Table 8.22: **Add-On Contact Modules**

Switch	Neutral Modules Early Make/Late Break		Grounding Module		Auxiliary Contacts				
Туре	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	Description	\$ Price		
V02-V2	VZ11	42.80	VZ14	42.80	VZ7	1 Late Make N.O. & 1 Early Break N.C.	42.80		
V3-V4	VZ12	54.00	VZ15	54.00	VZ20	2 N.O. Contacts	42.80		
V5-V6	VZ13	70.00	VZ16	70.00	_	_	_		

#### Table 8.23: **Labeling Accessories**

Nameplate	Holder with Nam	eplate	Nameplate Holder Only		Na		
Size	Catalog No.	\$ Price	Catalog No.	\$ Price	Use With	Catalog No.	\$ Price
45 x 45 mm	KZ13	4.80	KZ14	4.40	KZ14	KZ76	3.50
60 x 60 mm	KZ15	4.80	KZ16	4.40	KZ16	KZ77	3.50
90 x 90 mm	KZ103	7.80	KZ101	6.80	KZ1010	KZ100	3.50

Table 8.24: **Shrouds** 

Curitals Tuna	3-Pole S	Shroud	Single-Pole Shroud					
Switch Type	Catalog No.	\$ Price	For Add-On Power Pole	Catalog No.	\$ Price			
V02-V2	VZ8	8.40	VZ02-VZ2, VZ11 & VZ14	VZ26	5.90			
V3-V4	VZ9	8.40	VZ23, VZ4, VZ12 & VZ15	VZ27	6.90			
V5-V6	VZ10	12.00	VZ13 & VZ16	VZ28	9.50			
_	_	_	For 2-Pole Aux. Contact	VZ29	5.90			

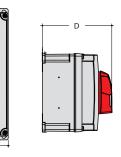
Table 8.25: **Main Pole Module Dimensions** 

Switch Type	a		b		С		Weight Approx. lbs.
	in.	mm	in.	mm	in.	mm	
V02 to VZ2	0.63	16	2.9	74	1.38	35	0.10
VZ3 to VZ4	0.79	20	3.3	83	1.80	46	0.22





**Switches** 



MD Motor Disconnect Switches



The MD motor disconnect switch is listed UL508 Suitable for Motor Control (UL File E164864) and conforms to IEC standard 60947-3. It is in a compact NEMA Type 4X enclosure suitable for use in NEMA Type 1, 3, 3R, 4, 4X, and 12 applications. The MD's key benefits are an extremely small footprint, a more economically efficient NEMA Type 4X solution and a handle interlock preventing cover removal when the switch is in the ON position.

MD Motor Disconnect Switch—Non-Metallic NEMA Type 1, 3, 3R, 4, 4X, Table 8.26: and 12 Enclosure ▲ ■ ♦

		Maximu	m Horsepower						
Amperes	Cat. No.	Three Phase Vac			\$ Price	Height (in.)	Width (in.)	Depth (in.)	
		220-240	440–480	600			()	()	
30	MD3304X	7.5	20	25	121.00	6.38	3.9	4.37	
60	MD3604X	20	40	40	161.00	8.27	4.94	4.37	

- See Table 8.20 for accessories.
- Complies with OSHA lockout/tagout requirements—accepts up to three 8 mm padlocks.
- Suitable for NEMA Type 1, 3R, 4, 4X, and 12 enclosure applications.

Table 8.27: **MD Motor Disconnect Accessories** 

Cat. No.	Description	\$ Price
MDSAN20	2 N.O. auxiliary contact module	57.00
MDSAN11	1 N.O. and 1 N.C. auxiliary contact module	27.00
MDS30P	30 A add on power pole	35.00

8-7

#### Example of the parts to order to build a complete GS or LK switch:



600 A, LK4SU3N



Shaft

Shaft 320 mm, GS2AE6



**Handle Assembly** 

Black Handle, GS2AH150



Lugs if needed

Lugs Kit, GS1AW503

Short Circuit Current Rating

#### Example:

Table 8.28:

LK4SU3N (600 A nonfusible switch, use 15x12 shaft) + GS2AE6 (320 mm Type S shaft) + GS2AH150 (black, lockable)

#### To add auxiliary contacts:

For front-mounted contacts order LK4AD30N (front-mounted auxiliary contact holder) + GS2AM110.



30-100 A Compact



100-400 A



GS2AH130

Pole	Rating	Catalog Number	\$ Price	М	aximum Hors	sep
	(A) <sup>-</sup>		*****	240 V	480 V	

LK Nonfusible IEC Style Disconnect Switches

Pole	Haung	Catalog Number	\$ Price				-3	600	vac	Shart
	(A)	Ŭ		240 V	480 V	600 V	250 Vdc	Fuse	SCCR kA	Sty;e
3	30	LK4DU3CN	218.00	10	20	30	_	J	100	AL
3	60	LK4GU3CN	263.00	20	40	50	_	J	100	AL
3	100	LK4JU3CN	458.00	20	50	50	N/A	J	100	AL
3	100	LK4JU3N	458.00	30	75	100	15	J	200	В
3	200	LK4MU3N	1010.00	75	150	200	15	J	200	В
3	400	LK4QU3N	1910.00	125	250	350	50	J	200	В
3	600	LK4SU3N	2873.00	200	400	350	50	J	200	D
3	800	LK4TU3N	4301.00	200	500	500	_	L	100	D
3	1000	LK4UU3N	5372.00	200	500	500	_	L	100	D
3	1200	LK4WU3N	6450.00	200	500	500	_	L	100	D

Table 8.29: Handles and Shafts for LK Switches

Rating	Handle				Shaft: 12.6/320 in./mm		Shaft: 15.7/400 in./mm		Shaft Guide▲		Shaft Style
(A)	Catalog No.	Туре	Color	\$ Price	Catalog No.	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Style
30-100	LK4AH110CN■	1, 3R, 12	Black	62.00	LK4AE12CN 18.60			_	LK4AEAH12CN		AL
30-100	LK4AH120CN■	1, 3R, 12	Red/Yellow	62.00						15.50	
30-100	LK4AH410CN■	4, 4X	Black	70.00	LN4AE IZON	16.60	_		LN4ALAITIZON	15.50	AL
30-100	LK4AH420CN■	4, 4X	Red/Yellow	70.00							
100-400	GS2AH130	1, 3R, 12	Black	70.00							
100-400	GS2AH140	1, 3R, 12	Red/Yellow	70.00	GS2AE2	20.30	GS2AE21	25.00	_	_	В
100-400	GS2AH430	4, 4X	Black	78.00	GOZALZ	20.30					
100-400	GS2AH440	4, 4X	Red/Yellow	78.00							
600	GS2AH150	4, 4X	Black	263.00							
600	GS2AH160	4, 4X	Red/Yellow	263.00	GS2AE6 32.60	GS2AE61	40.40	_		D	
800-1200	GS2AH170	4, 4X	Black	296.00		GOZAEDI	40.40		_		
800-1200	GS2AH180	4, 4X	Red/Yellow	296.00							

\$ Price

14.70

27.50

14.70

14.70

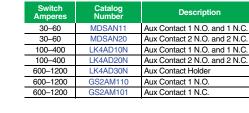
14.70

14.70

14.70

- Optional on shafts for LK4DU3CN, LK4GU3CN and LK4JU3CN.
- For use on switches ending with CN only.

Table 8.30: **Auxiliary Contacts for LK Switches** 



**Terminal Shrouds for LK Switches** 

Switch Amperes	Catalog Number	Description	\$ Price
30–60	LK4AP3CN	Shroud Top and Bottom, 3-Pole	79.00
100-200	LK4AP33TN	Shroud Top LK4, 3-Pole, 100/200 A	101.00
100–200	LK4AP33BN	Shroud Bottom LK4, 3-Pole, 100/200 A	101.00
400	LK4AP53TN	Shroud Top LK4, 3-Pole, 400 A	140.00
400	LK4AP53BN	Shroud Bottom LK4, 3-Pole, 400 A	140.00
600▲	LK4AP63N	Shroud Bottom LK4, 3-Pole, 600 A	280.00
800–1200▲	LK4AP83N	Shroud Bottom LK4, 3-Pole, 800–1200 A	280.00

<sup>600-1200</sup> A standard with top shroud.



GS2AH150



GS2AH170

#### **UL98 IEC Style Disconnect Switches**

**GS Fusible IEC Style Disconnect Switches** New!) Table 8.32:



GS2GU3N

Pole Rating	Rating	Catalog Number			\$ Price	ı	Maximum Hore	sepower Ratin	Short Circuit (	Shaft Style
	(A)			240 V	480 V	600 V	250 Vdc	Fuse	SCCR kA	
3	30	GS1DDU3	237.00	7.5	15	20	5	CC	100	AG
3	30	GS1DU3	260.00	7.5	15	20	5	J	100	AG
3	30	GS2EEU3	237.00	7.5	15	20	5	CC	100	В
3	30	GS2EU3N	260.00	7.5	15	20	5	J	100	В
3	60	GS2GU3N	336.00	15	30	50	10	J	100	В
3	100	GS2JU3N	536.00	30	60	75	20	J	200	В
3	200	GS2MU3N	1181.00	60	125	150	40	J	200	В
3	400	GS2QU3N	2252.00	125	250	350	50	J	200	В
3	600	GS2SU3	3378.00	200	500	500	_	J	200	С
3	800	GS2TU3	5061.00	200	500	500	_	J	200	С



GS2AH130 100-400 A Optional 30-60 A

Table 8.33: Handles and Shafts for GS Switches▲

Rating		Handl	le	Shaft: 12.6 in. (320 mm)		Shaft: 15.7 in. (400 mm)		Shaft Guide		Shaft Style	
(A)	Catalog No.	Туре	Color	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Style
30–60	GS2AH110	1, 3R, 12	Black	62.00	GS2AE8 <b>18.60</b>		GS2AE81		LKN4AEAH12C		AG
30–60	GS2AH120	1, 3R, 12	Red/Yellow	62.00				22.30		15.50	
30-60	GS2AH410	4, 4X	Black	70.00	GSZAEO	10.00	GOZALOT	22.30	LKN4ALAITIZO	13.50	Ad
30–60	GS2AH420	4, 4X	Red/Yellow	70.00							
30-400	GS2AH130	1, 3R, 12	Black	70.00			GS2AE21	25.00	_		В
30-400	GS2AH140	1, 3R, 12	Red/Yellow	70.00	GS2AE2	20.30					
30-400	GS2AH430	4, 4X	Black	78.00	GOZAEZ	20.30	GOZAEZI	25.00		_	
30-400	GS2AH440	4, 4X	Red/Yellow	78.00							
600-800	GS2AH150	4, 4X	Black	263.00	GS2AE5	20.00	GS2AE51	40.40	_		С
600-800	GS2AH160	4, 4X	Red/Yellow	263.00	GOZAES	32.60	GOZAEST	40.40		_	

GS2AH100TO200-GS1 to GS2 Handle Adapter if using GS1 holes.

NOTE: Hole adapter kit for GS1 to GS2 Handles: GS2AH100TO200 \$17.43.

Table 8.34: Auxiliary Contacts for GS Switches▲

Switch Amperes	Catalog Number	Description	\$ Price
30-800	GS1AM110	Aux Contact 1 N.O.	14.70
30–800	GS1AM101	Aux Contact 1 N.C.	14.70
30	GS1AD10	Aux Contact Holder	46.70

GS1DU3 and GS1DDU3 switches allow up to 4 auxiliary contacts without adding contact holder GS1AD10. For more than 4 contacts, GS1AD10 is required.

Table 8.35: **Shorting Links** 

For use on	Shorting Links per Kit	Catalog No.	\$ Price
GS2, 60 A	3	GS1AU203	29.60
GS2, 100 A	3	GS1AU303	41.90
GS2, 200 A	3	GS1AU403	62.10
GS2, 400 A	3	GS1AU503	93.00
GS2, 600-800 A	3	GS1AU803	156.00

Table 8.36: Terminal Shrouds for GS Switches, Line or Load▲

Switch Amperes	Catalog Number	Description	\$ Price
30-100	_	Standard on product	_
200	GS2AP43	GS2, 3-Pole, 200 A	101.00
400	GS2AP53	GS2, 3-Pole, 400 A	101.00
600-800	GS2AP73	GS2, 3-Pole, 600-800 A	140.00

Order one terminal shroud per side. For example, order one terminal shroud for either the line side or load side; order two terminal shrouds for both the line side and load side



**Auxiliary Contacts** GS1AD10 + GS2AM110



Flange Handle Cable Operator Kit



Shorting Links

#### Table 8.37: Flange Handle Cable Operator Kits for GS2 Switches▲

Catalog Number	Description	\$ Price
GS2AH36F	Flange Handle and 36 in. Cable Operator Kit	417.00
GS2AH60F	Flange Handle and 60 in. Cable Operator Kit	432.00
GS2AH120F	Flange Handle and 120 in. Cable Operator Kit	476.00

Compatible with 30 through 200 Amp switches (Not GS100430, GS1063).

8-9

#### **Accessories**





Terminal Lugs

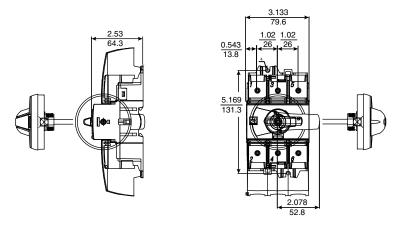
For Use On	Rating	No. of Wires per Lug	No. of Lugs per Terminal	Lug Size (AWG)	Wire Type	Lugs per Kit	Lug Kit Catalog Number
LK4DU3CN	30	1	1	#12-2/0	Cu	_	Standard
LK4GU3CN	60	1	1	#12-2/0	Cu	_	Standard
LK4JU3N	100	1	1	6-300 kcmil	Cu/Al	6	GS1AW403
LK4MU3N	200	1	1	6-300 kcmil	Cu/Al	6	GS1AW403
		2	1	350 MCM-6	Cu/Al	6	GS1AW603
LK4QU3N	400	1	1	600 MCM-4	Cu/Al	6	GS1AW606
		2	'	250 MCM-1/0	Cu/Ai	ь	GSTAVV606
LK4SU3N	600	2	1	2 x 2-600 kcmil	Cu/Al	6	GS1AW503
LK4TU3N	800	2	2	2 x 2-600 kcmil	Cu/Al	12	GS1AW903
LK4UU3N	1000	2	2	2 x 2-600 kcmil	Cu/Al	12	GS1AW903
LK4WU3N	1200	2	2	2 x 2-600 kcmil	Cu/Al	12	GS1AW903
GS1DDU3	30	1	1	#14-#10	Cu	_	Standard
GS1DU3	30	1	1	#14-#10	Cu	_	Standard
GS2EEU3	30	1	1	#14#10	Cu	_	Standard
GS2EU3N	30	1	1	#14-#6	Cu	_	Standard
GS2GU3N	60	1	1	#10-#6	Cu	_	Standard
GS2JU3N	100	1	1	#12-#1	Cu	_	Standard
GS2MU3N	200	1	1	6-300 kcmil	Cu/Al	6	GS1AW403
		2	1	350 MCM-6	Cu/Al	6	GS1AW603
GS2QU3N	400	1	4	600 MCM-4	C/AI		CC1 AVAICOC
		2	1	250 MCM1/0	Cu/Al	6	GS1AW606
GS2SU3	600	2	1	2 x 2-600 kcmil	Cu/Al	6	GS1AW503
GS2TU3	800	2	1	2 x 2-600 kcmil	Cu/Al	6	GS1AW503

Table 8.39: Power Distribution Lugs GS1 or GS2 Only

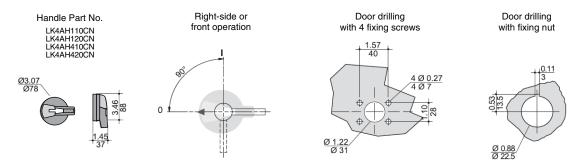
For Use On	Rating	No. of Wires per Lug	Lug Size (AWG)	Wire Type	Lugs per Kit	Lug Kit Catalog Number
GS1JU3	100	6	#14-#6	Cu	3	GS1AW306▲
GS2MU3N GS2QU3N	200 400	12	#14-#4	Cu	3	GS1AW406
GS2MU3N GS2QU3N	200 400	6	#12-2/0	Cu	3	GS1AW506

<sup>▲</sup> Cannot be used on GS2JU3N.

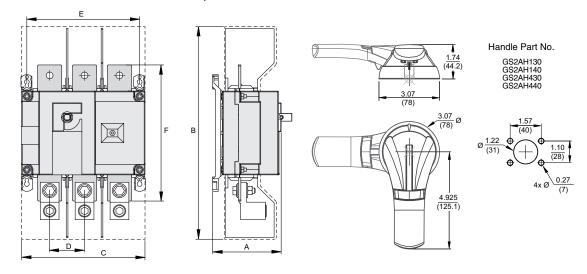
## LK4DU3CN and LK4GU3CN, 30-100 A Compact Nonfusible Disconnect Switches



### Handle for 30-100 A Compact Nonfusible Disconnect Switches



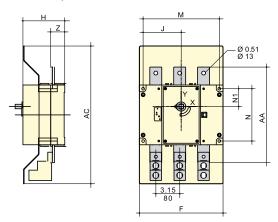
### LK4JU3N / LK4MU3N / LK4QU3N, 100-400 A Nonfusible Disconnect Switches—Dimensions



Rating (A)	Dimensions = in. (mm)								
nating (A)	A	В	С	D	E	F			
100-200	3.72 (94.6)	10.1 (256)	7.09 (1.80)	1.97 (50)	6.3 (160)	6.3 (160)			
400	4.92 (128)	16 (406)	9.05 (230)	2.56 (65)	8.26 (210)	10.2 (260)			

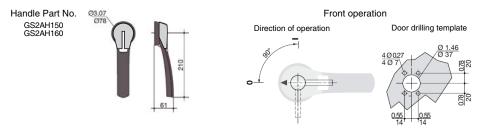
8-11

### LK4SU3N, 600 A Nonfusible Disconnect Switches—Dimensions

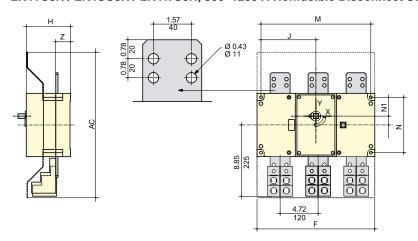


Rating (A)				Din	nensions = in. (r	nm)			
nating (A)	AC	F	н	J	M	N	N1	AA	Z
600	18.12 (460)	11 (280)	5.5 (140)	5.0 (127.5)	10.03 (255)	6.88 (175)	2.34 (59.5)	12.6 (320)	1.85 (47)

### Handle for 600 A and 800 A Fusible Disconnect Switches

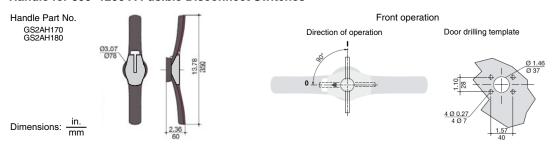


### LK4TU3N / LK4UU3N / LK4WU3N, 800-1200 A Nonfusible Disconnect Switches—Dimensions



Poting (A)				Dimension	s = in. (mm)			
Rating (A)	AC	F	H	J	M	N	N1	Z
800-1200	18.12 (460)	14.64 (372)	5.5 (140)	6.83 (173.5)	13.66 (347)	6.88 (175)	2.34 (59.5)	1.85 (47)

### Handle for 800-1200 A Fusible Disconnect Switches



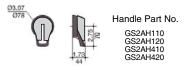
8-12

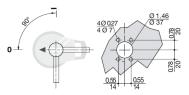
 $\infty$ 

### **UL98 IEC Style Disconnect Switches**

Refer to Catalog 9421CT0301

### Handle for 30 A and 60 A Fusible **Disconnect Switches**

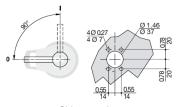




Front operation

Direction of operation

Door drilling template



Side operation

Direction of operation

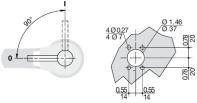
Door drilling template

### Handle for 100 A, 200 A, and 400 A **Fusible Disconnect Switches**



operation

template

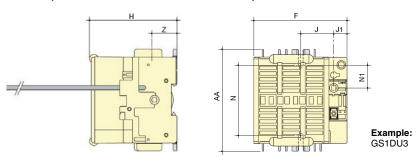


Side operation

Direction of operation

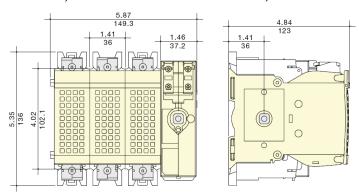
Door drilling template

### GS1DDU3, 30 A Fusible Disconnect Switches, Class CC Fuses and GS1DU3, 30 A Fusible Disconnect Switches, Class J Fuses—Dimensions

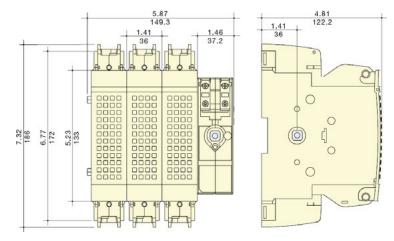


Poting (A)	Dimensions = in. (mm)									
Rating (A)	F	Н	J	J1	N	N1	AA	Z		
30 / CC	3.78 (96)	3.28 (83.5)	1.47 (37.5)	0.59 (15)	3.13 (79.5)	1 (25.5)	4.56 (116)	1.12 (28.5)		
30 / J	4.13 (105)	3.89 (99)	1.47 (37.5)	0.59 (15)	3.13 (79.5)	1 (25.5)	4.56 (116)	1.12 (28.5)		

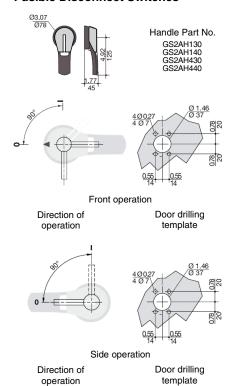
### GS2GU3N, 60 A Fusible Disconnect Switches, Class J Fuses



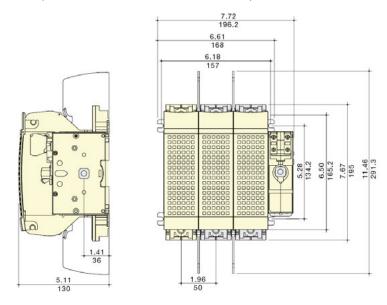
### GS2JU3N, 100 A Fusible Disconnect Switches, Class J Fuses



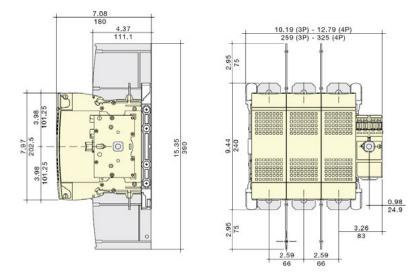
### Handle for 100 A, 200 A, and 400 A Fusible Disconnect Switches



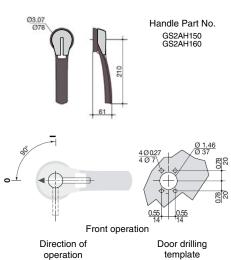
### GS2MU3N, 200 A Fusible Disconnect Switches, Class J Fuses



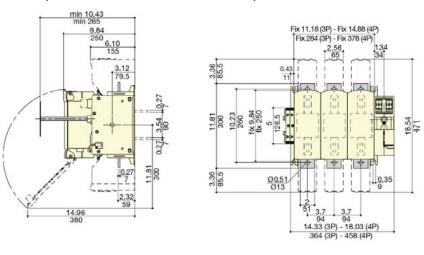
## GS2QU3N, 400 A Fusible Disconnect Switches, Class J Fuses



# Handle for 600 A and 800 A Fusible Disconnect Switches



# GS2SU3, 600 A Fusible Disconnect Switches, Class J Fuses GS2TU3, 800 A Fusible Disconnect Switches, Class J Fuses



Dimensions: -



Class 9422 / Refer to Catalog 9420CT9701

 $\infty$ 

### Flange Mounted and **Cable Operated**

The 9422 disconnect switches are the ideal selections for the PV string combiner box's internal disconnect switch and control

panel applications. These switches are designed for variable depth, flange mounting, traditional side mounting and bracket mounting applications providing complete flexibility in the PV string combiner box designs. The switches are compatible with 9422A handle operators and 9423 door mechanisms and are UL98 recognized (E52369 Vol. 1, Sec. 18) and CSA certified. See pages 8-16, 8-17, and 8-18 for dimensional information.

Table 8.40: 9422 Disconnect Switches, Flange Mounted and Variable Depth

		Maximum Horsepower Ratings			js			p Rating peres)	Switch and		Switch for Use With Cable Operators ONLY—		Switch and Operating Mechanism and Handle Mechanism—Overpacked ◊					
Disconnect Switch Size	Variable Depth MinMax. (in.)	AC Systems Volts (Motor Volts)				dc	Fuse Type	Non-interchangeable Type For Class H, J, K or R Fuses		Does Not	Mechanism Only— Does Not Include Handle Mechanism		— nclude anism or erator☆	Includes Type A1 Handle Mechanism		Includes <sup>*</sup> Handle Me		
	()	208 (200)	240 (230)	480 (460)	600 (575)	250	600		250 V	600 V	Cat. No.◆	\$ Price	Cat. No.◆	\$ Price	Cat. No.◆	\$ Price	Cat. No.◆	\$ Price
								None	_	_	TCN30	329.00	TCN30C	315.00	ATCN301	471.00	ATCN302	585.00
30 A	6.625-18	7.5	7.5	15	20	5	15	H, J,	30	_	TCF30	372.00	TCF30C	359.00	ATCF301	513.00	ATCF302	629.00
								K, R	60	30	TCF33	399.00	TCF33C	386.00		543.00	ATCF332	660.00
								None	_	_	TDN60	386.00	TDN60C	372.00		527.00	ATDN602	642.00
60 A	6.625–18	_	15	30	50	10	30	H, J,	60	30	TDF60	458.00	TDF60C	444.00	ATDF601	599.00	ATDF602	714.00
								K, R	_	60	TDF63	485.00	TDF63C	471.00		629.00	ATDF632	741.00
100 A	6.625-18	25	30	60	75	20	50	None	_	_	TEN10	570.00	TEN10C	557.00		714.00	ATEN102	827.00
	0.025-10	20	50	00	75	20	50	H, J, K, R	100	100	TEF10	783.00	TEF10C	770.00	ATEF101	926.00	ATEF102	1040.00
								None	_	_	TF1	1247.00	_	_	ATF11	1389.00	ATF21	1503.00
200 A	9.12–19.25▲	40	60	125	150	40	50	H, J,	200	200	TF2	1389.00	_	_	ATF12	1530.00	ATF22	1646.00
								K, R	_	400	TF3★	2052.00	_	_	ATF13★	2195.00	ATF23★	2307.00
400 A Fixed Depth■	11.38 (A5 or A6 Handle)	75	125	250	350	50	50	None	_	_	TG1△□	2672.00	_	_	For ha	undlo solocti	on soo Tablo	9.42
400 A Variable Depth■	15.87–19 (A7 or A8 Handle)▼							H, J, K, R	400	400	TG2△□	3027.00	_	_		For handle selection, se		

- 9422 R2 will extend maximum mounting depth 7 inches, see page 8-17 for information.
- Switches are fixed-depth or adjustable depending on handle selection
- For ordering use the suffix 9422, e.g., order TCN30 using catalog number 9422TCN30.
- Accommodates Class J fuses only.
- Variable in increments of 0.63 inches

- Commercially available enclosures may not accept 9422TG1 and 2 operating mechanisms. Contact enclosure manufacturer for availability of enclosures for use with these switches.
- Right hand flange mounting only and requires a special enclosure.
- Variable depth only no cable operator
- See Table 8.46 for ordering information for the cable operator.



9422 TCN30



**Bracket Mounted** Disconnect Switch



Type A1

The 9422 Bracket Mount Disconnect Switch is designed for combiner boxes and control panel applications. The Bracket Mount Disconnect Switch is shipped with the switch and external handle assembled to a bracket, ready for quick installation. A protective trim plate is provided to prevent any mounting screws from being accessible from the front. The trim plate also provides an attractive installation feature. The switches are fully compatible with the 9423 closing mechanisms.

9422 Bracket Mounted Disconnect Switches

		Maxim	ıum Horsep	ower Ratin	g			Fuse Clip Rati		Switch and Operating	
Disconnect Switch Size	AC S	Systems Vo	lts (Motor V	olts)	Vdc		Fuse Type	Non-Interchar For Class H, J,		Mechanism Only — Does Not Include Handle Mechanism	
	208 (200)	240 (230)	480 (460)	600 (575)	250	600		250 V	600 V	Catalog No.■	\$ Price
							None	_	_	BTCN30	471.00
30 A	7.5	7.5	15	20	5	15	H, J, K, R	30	_	BTCF30	543.00
30 A	7.5	7.5	15	20	5	15	п, л, к, п	60	30	BTCF33	543.00
							J▲	60	30	BTCF32	543.00
							None	_	_	BTDN60	527.00
60 A	15	15	30	50	10	30	H, J, K, R	60	30	BTDF60	585.00
00 A	13	13	30	30	10	30	11, 0, 10, 11	_	60	BTDF63	629.00
							J▲	_	60	BTDF62	629.00
							None	_	_	BTEN10	714.00
100 A	25	30	60	75	20	50	H, J, K, R	100	100	BTEF10	926.00
							J▲	100	100	BTEF11	926.00
							None	_	_	TFB1	1488.00
200 A	40	60	125	150	40	50	H, J, K, R	200	200	TFB2	1610.00
							J▲	_	400	TFB3	2264.00

- For ordering use the suffix 9422, e.g., order BTCN30 using catalog number 9422BTCN30.

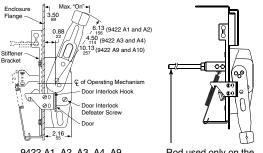
### **Handle Information**

### 9422 Disconnect Switch and Circuit Breaker Handle Mechanisms

The Handle Mechanism kit contains all parts needed to mount the handle to the flange of the enclosure. Two flange mounting methods are offered. For right or left hand flange mounting use Types A1-A4 and Types A9-A10 kits. For right-hand mounting only, use Type A5-A8 handles. The type AP1 and AP2 handles are used exclusively on the PowerPact™ M and P operating mechanisms, 9422 RM1 and 9422 CMP. The dimensions are identical to 9422 A1.

Handle		1, 3, 3R, 4, 12	NEMA Type 4, 4X Stainless			
Depth (in.)		osures	Steel Enclosures			
Deptii (iii.)	Cat. No.♦	\$ Price	Cat. No.♦	\$ Price		
4▲	A3	143.00	A4	257.00		
6▲	A1	143.00	A2	257.00		
6▲★	AP1	188.00	AP2	338.00		
10■	A9	158.00	A10	270.00		
12▼△	A7	300.00	A8	372.00		

- Use with 30-200 A 9422 switches and all circuit breaker mechanisms. Use with Type D2 remote or dual adapter kit listed on page 8-24
- For ordering use the suffix 9422, e.g., order A2 using catalog number 9422A2.
- Use only with 9422 RM1, 9422 CMP and PowerPact M and F operating mechanisms.
- Use only with 400 A 9422TG1 and 9422TG2 disconnect switch.
- Adjustable depth. Δ



9422 A1, A2, A3, A4, A9, and A10 Handles

Rod used only on the variable-depth mechanism.

### Flange Mounted and **Cable Operated**

#### **Accessories**

#### Class R Fuse Kits

When installed, this kit rejects all fuses except Class R. The kits are available for field installation. With rejection kit and Class R fuses installed, the switch is UL component recognized for use on systems with fault current up to 200,000 RMS symmetrical amperes.

Table 8.43: Class R Fuse Kits

Disconnect	Switch	Fuse Cl	ip Rating	Class R Kit		
Switch Type	Туре	250 V▲	600 V	Cat No.	\$ Price	
30 A	TCF30	30	_	RFK03▲	24.50	
30 A	TCF33	60	30	RFK06▲	25.50	
60 A	TDF60	60	30	RFK06▲	25.50	
60 A	TDF63	_	60	RFK06H▲	25.50	
100 A	TEF10	100	100	RFK10▲	47.70	
200 A	TF2	200	200	9999SR4	47.60	
200 A	TF3	200	200	9999SR4	47.60	
400 A	TG2	400	400	9999SR5	104.00	

Use Discount Schedule DE1 for price, not CP1.

Table 8.44: **Electrical Interlocks** 

Disconnect	Curitate Time	Electrical Ir	nterlocks
Switch Size	Switch Type	Cat No.♦	\$ Price
	TCF, TCN, TDF, TDN,	TC10▲	120.00
30 A 60 A	TEF, TEN	TC20■	239.00
100 A	BTCF, BTCN, BTDF, BTDN, BTEF, BTEN	TC11▲	120.00
	BIGI, BIGN, BIDI, BIDN, BILI, BILN	TC21■	239.00
200 A	TF, ATF	R8▲	83.00
200 A	TF, ATF	R9■	243.00
400 A	TG	R35▲	275.00
400 A	TG	R36■	521.00

- 1 N.C. or N.O. Contact depending on wiring. 2 N.C. or N.O. or 1 N.O. or 1 N.C. Contact depending on wiring.
- For ordering use the suffix 9999, e.g., order TC10 using catalog number 9999TC10.



### **Internal Barrier Kits**

Provides an additional barrier that helps prevent accidental contact with live parts. Field-installed transparent barriers do not restrict visual inspection of the switch. Barriers provide IEC529 IP2X "finger safe" protection when door of enclosed disconnect switch is open. A convenient door allows use of test probes without accessing fuses and replacement of fuses without removing barrier. Barrier must be used with the skirt kit to enclose a panel mounted 9422 disconnect.

Table 8.45: **Internal Barrier Kits** 

Disconnect	Barı	rier	Skirt		
Switch Size	Cat. No.	\$ Price ▲	Cat No.	\$ Price ▲	
30 A	SS06	165.00	SS0306SK	225.00	
60 A	SS06	165.00	SS0306SK	225.00	
100 A	SS10	195.00	SS10SK	255.00	

Use Discount Schedule DE1 for price, not CP1

#### **Cable Operators for 9422 Disconnect Switches** Table 8.46:

Switch Type	Ca	ble Mechanism	Cable Mechanisms with A1 Handle for NEMA Type 1, 3, 3R, 4, and 12 Enclosures			
Switch Type	Cable Length (inches)	Cat. No.	\$ Price	Cat. No.	\$ Price	
TCN30C, TCF30C,	36	9422CFT30	273.00	9422CFT31	417.00	
TCF33C, TDN60C,	48	9422CFT40	291.00	_		
TDF60C, TDF63C,	60	9422CFT50	291.00	9422CFT51	432.00	
TEN10C, TEF10C	120	9422CFT10	333.00	9422CFT11	476.00	

Purchase handle mechanism separately (9422A1, A2, A3, or A4).

### **Accessories, Disconnect Switches**

Class 9422 / Refer to Catalog 9420CT9701



Table 8.47: Class 9422 Replacement/Refrofit Fuse Clip Kits

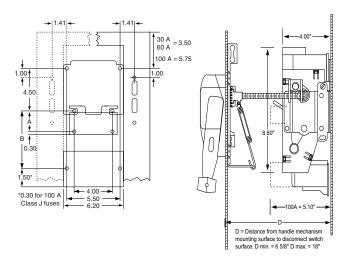
Disconnect Switch Size	Switch Type	Fuse Type		ip Rating peres)	Line and Load (includes lo and fuse	oad base
3126			250 V	600 V	Туре	\$ Price
	TCF30		30	_	TC30	42.80
30 A	TCN30 TCF33	H, K, J, R	60	30	TC33	71.00
60 A	TDN60	H, K, J, R	60	30	TC33	71.00
- 00 A	IDINOU	11, 13, 0, 11	_	60	TD63	99.00

Table 8.48: **Lug Data** 

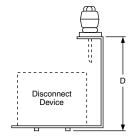
Disconnect	Wire Size	(Min-Max)	Lug Kits	Copper	Lug Kits Al		
Switch Size	Cu	Al	Cat No.	\$ Price	Cat No.	\$ Price	
30-60 A	#14-#2	#10-#2	CL0306F	69.00	AL0306F	36.90	
100 A	#10-#0	#6-#0	CL10F	159.00	AL10F	77.00	
200 A	#6-600 kcmil	#6-#600 kcmil	_	_	_	_	
400 A	#4-500 kcmil	_	_	_	_	_	

Table 8.49: Dimensions 30 A, 60 A, and 100 A Class 9422 **Disconnect Switches** 

Switch Type	Maximum Voltage	Fuse Type	Dimension A	Dimension B
	30 A, 250 V	H, K, R	1.625	
	30 A, 600 V	H, K, R	4.25	
30 A	30 A, 600 V	J	1.625	
60 A	60 A, 250 V	H, K, R	2.25	_
	60 A, 600 V	H, K, R	4.75	
	60 A, 600 V	J	1.625	
	100 A, 250 V	H, K, R		3.25
100 A	100 A, 600 V	H, K, R	_	5.25
	100 A, 600 V	J		3.25

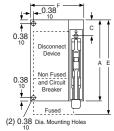


#### **Dimensions** Table 8.50:



Type	Α	С	D	Min. Enclosure Depth ▲	Fusible Device	F
Туре	in. (mm)	in. (mm)	in. (mm)	in. (mm)	E in. (mm)	in. (mm)
BTCN, BTDN, BTEN	_	_	6.56 (167)	8.00 (203)	_	_
BTCF, BTDF, BTEF	9.50 (241)	1.88 (48)	8.56 (217)	10.00 (254)	11.88 (302)	6.38 (162)
TFB1	11.50 (292)	3.88 (99)	9.50 (241)	12.00 (305)	_	13.19 (335)
TFB2, TFB3	20.00 (508)	3.00 (99)	9.50 (241)	12.00 (303)	20.00 ■ (508)	13.19 (333)

- The minimum enclosure depth is greater than Dimension D since additional space is needed when mounting
- Fuses and fuse base assembly do not extend beyond bracket. Back panel support is recommended for Types TFB1, 2, & 3. Other devices may also require support if the flange is not sufficiently rigid.



(For back panel support if necessary.)

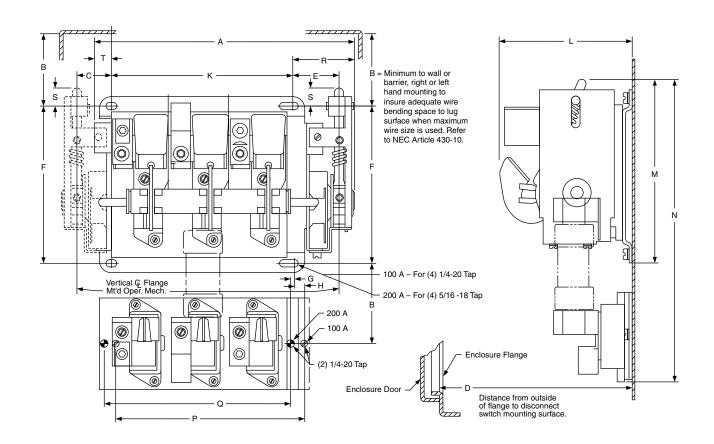
Flange Mounted and Cable Operated

### **Dimensions**

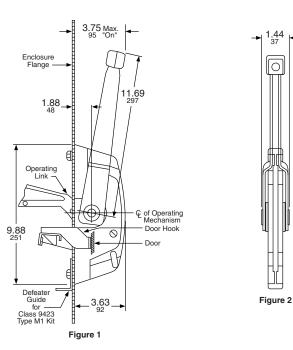
Table 8.51: Dimensions (in. / mm) for 200 A Type TF Disconnect Switches

Tuno		Switch Size	Α	В	_	D▲	_	e e			н ј		J K	J		М	N		0	R	s	_
Туре	(A)	Fuse Clips	A	•	·	MinMax.	-		G	ч		Γ.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		IN	F	u	, n	3			
TF1	200	None	<b>13.33</b> 339	<b>9.38</b> 238	<b>1.64</b> 42	<b>9.12–19.25</b> 232 489	<b>2.33</b> 59	<b>8.00</b> 203	_	_	_	<b>9.44</b> 240	<b>6.50</b> 165	<b>9.53</b> 242	_	_	_	<b>3.14</b> 80	<b>1.03</b> 26	<b>0.75</b> 19		
TF2	200	Class J 200 A 600 V	<b>13.33</b> 339	<b>9.38</b> 238	<b>1.64</b> 42	<b>9.12–19.25</b> 232 489	<b>2.33</b> 59	<b>8.00</b> 203	<b>0.09</b> 3		<b>2.77</b> 70	<b>9.44</b> 240	<b>6.50</b> 165	_	<b>14.11</b> 358	1	<b>9.63</b> 245	<b>3.14</b> 80	<b>1.03</b> 26	<b>0.75</b> 19		
TF2	200	Class H, K, R 200 A 250 V	<b>13.33</b> 339	<b>9.38</b> 238	<b>1.64</b> 42	<b>9.12–19.25</b> 232 489	<b>2.33</b> 59	<b>8.00</b> 203	<b>0.09</b> 3	1	<b>4.14</b> 105	<b>9.44</b> 240	<b>6.50</b> 165	-	<b>15.48</b> 393	1	<b>9.63</b> 245	<b>3.14</b> 80	<b>1.03</b> 26	<b>0.75</b> 19		
TF2	200	Class H, K, R 200 A 600 V	<b>13.33</b> 339	<b>9.38</b> 238	<b>1.64</b> 42	<b>9.12–19.25</b> 232 489	<b>2.33</b> 59	<b>8.00</b> 203	<b>0.09</b> 3	-	<b>6.64</b> 169	<b>9.44</b> 240	<b>6.50</b> 165	_	<b>17.98</b> 457	-	<b>9.63</b> 245	<b>3.14</b> 80	<b>1.03</b> 26	<b>0.75</b> 19		
TF3	200	Class J 400 A 600 V	<b>13.33</b> 339	<b>9.38</b> 238	<b>1.64</b> 42	<b>9.12–19.25</b> 232 489	<b>2.33</b> 59	<b>8.00</b> 203	<b>0.09</b> 3		<b>2.77</b> 70	<b>9.44</b> 240	<b>6.50</b> 165	<b>9.53</b> 242	<b>18.53</b> 471	1	<b>9.63</b> 245	<b>3.14</b> 80	<b>1.03</b> 26	<b>0.75</b> 19		

<sup>▲</sup> The dimensions shown may be extended 7 in. by using 9422R2 (two required per switch).



#### Table 8.52: Handle Mechanism—Type A7 and A8



NOTE: Commercially available enclosures may not accept type TG operating mechanisms. Contact the enclosure manufacturer for availability of enclosures for use with these switches.

			_	
Switch Type	В	X		1
TG1, 2	<b>11.28</b> 286	<b>16.06</b> 408		B 13.00 11.50 330
barı wire surf size	nd X = Minimurier to ensure a bending space accementation of the control of the c	adequate ce to lug ximum wire		4.78 0.75 121 0.38 0.38 0.00 4.25 108

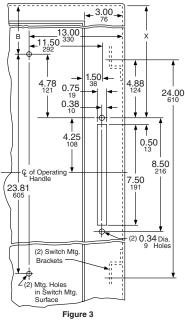
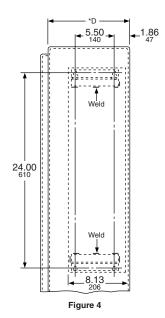


Table 8.53: Nonfusible and Fusible Switches



Dimension D = Distance from disconnect switch mounting			ange	to
For Type TG1 or TG2 with:				
Type A7 or A8 adjustable depth handle mechanism	D=	1 <b>5.87</b> 403	to	<b>19</b> 483
In ste	eps of	<b>0.63</b> 16		

Note: Copper lugs are standard on all Type TG disconnect switches.

\* D = Mounting depth measured from the switch mounting surface to the surface of flange.

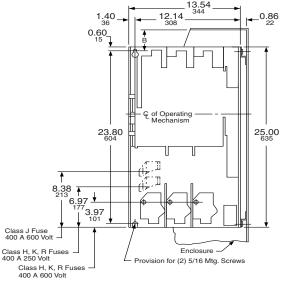


Figure 5

Dim. = 
$$\frac{\text{in.}}{\text{mm}}$$

### **Operating Mechanisms** for Circuit Breakers

## Type L Circuit Breaker Mechanisms

Type L door-mounted, variable depth operating mechanisms feature heavy duty, all metal construction with trip indication. All mechanisms can be padlocked in the "OFF" position when the enclosure door is open. Further, the handle assemblies can be locked "OFF" with up to three padlocks, which also locks the enclosure when the door is closed. (The 3" handle accepts one padlock.) Complete kits are rated for NEMA Type 1, 3R, and 12 enclosures. They include a handle assembly, operating mechanism, and shaft assembly.



9421 Type L Circuit Breaker Mechanism

Table 8.54: **Complete Kits** 

Complete Does Not Include C	ircuit Bre	aker			les: lechanism in. Handle			les: echanism n. Handle		s: hanism andle		
Use Wi	th		:	Standard S	Shaft Kit		Long Sh	aft Kit	L	ong Shaf	aft Kit	
Circuit Breaker or Interrupter Type	No. of Poles	Frame Size (A)	Туре	\$ Price	Mounting Depth ▲ Min. – Max.	Туре	\$ Price	Mounting Depth ▲ Min. – Max.	Туре	\$ Price	Mounting Depth ▲ Min. – Max.	
NSF, PowerPact™ H and J	2–3	250	LJ1	171.00	5-1/2-10-3/4	LJ4	189.00	5-1/2-21-3/8	LJ3	230.00	5-1/2-21-3/8	
PowerPact D and L	2–3	600	LD1	242.00	7-1/4-12-1/16	LD4	255.00	7-1/4-22-5/8			ecommended	
PowerPact M and P◆	3	1200	LW1■	242.00	9.00-12.50	LW4■	255.00	9.00-23.50	for use with	these circ	uit breakers.	

- Mounting depth measured in inches from circuit breaker mounting surface (control panel) to outside of enclosure door.
- Type LW1 and LW4 include an 8 in. handle (9421LHP8) rather than a 6 in. handle. These circuit breaker operating mechanisms must use the 9421LHP\*\* or LCP\*\* handles only.

#### Table 8.55: **Component Parts**

Use With		3 in. Handle Assemblies Type 1, 3R, 12 Standard Handle Assemblies Type 1, 3R, 12		Operating Mechanism Includes Lockout		Standard Shaft (Support Bracket Not Required)			Long Shaft (Support Bracket Included)					
Circuit Breaker or Interrupter Type	No. of Poles	Frame Size (A)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Mounting Depth ▲ Min. – Max.	Туре	\$ Price	Mounting Depth ▲ Min. – Max.	Туре	\$ Price
NSF, PowerPact H & J	2–3	250	LH3▼	90.00	LH6▼	50.00	LJ7	105.00	5-1/2-10-1/4	LS8	21.50	5-1/2-21-3/8	LS13	35.60
PowerPact D & L	2–3	600	*	_	LH6▼	50.00	LD7	170.00	7-1/4-12-1/16	LS8	21.50	7-1/4-22-5/8	LS13	35.60
PowerPact M & P◆	3	1200	*	_	LHP8▼	50.00			7-3/16-11-5/8			7-3/16-22-1/4	LS10	35.60

- Mounting depth measured in inches from circuit breaker mounting surface (control panel) to outside of enclosure door. Type LW1 and LW4 include an 8 in. handle (9421LHP8) rather than a 6 in. handle.
- These circuit breaker operating mechanisms must use the 9421LHP\*\* or LCP\*\* handles only.
- 3 in. handles are not recommended for use with these circuit breakers.
- For a red handle and yellow bezel, add suffix RY to catalog number, e.g., 9421LH6RY.

#### Table 8.56: **NEMA Type 4 and 4X Handle Assemblies**

Use V	Use With				Standard Handle Assemblies				Special 3 in. Version			
Circuit Breaker or Interrupter Type	No. of Poles	Frame Size	NEMA Type 1, 3R, 4, 12 (Painted)		4, 4	/pe 1, 3R, X, 12 e Plated)	4,	ype 1, 3R, 12 nted)	NEMA Type 1, 3R, 4, 4X, 12 (Chrome Plated)			
	Foles	(A)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price		
NSF, PowerPact H and J	2–3	250	LH46	90.00	LC46	149.00	LH43	165.00	LC43	233.00		
PowerPact D and L	2–3	600	LH46	90.00	LC46	149.00	3 in. handles are not recommended for use with the circuit breakers.					
PowerPact M and P	3	1200	LHP48	90.00	LCP48	149.00						
							•					



3 in. Handle Assembly

New!)

Standard Handle Assembly

#### **Table 8.57:** Auxiliary and Alarm Switches for PowerPact™ Circuit Breakers ▲

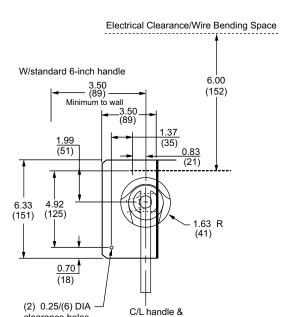
Description	H- and J-Frame	\$ Price	D- and L-Frame	\$ Price	D- and L-Frame	\$ Price
1 Auxiliary Switch 1a 1b	S29450	297.00	S29450	297.00	S29450	297.00
2 Auxiliary Switch 2a 2b	2 x S29450	594.00	2 x S29450	594.00	2 x S29450	594.00
3 Auxiliary Switch 3a 3b	_	1	3 x S29450	891.00	3 x S29450	891.00

Discount Schedule: DF2

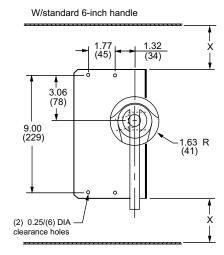
NOTE: The location of the accessory in the circuit breaker determines its function.

www.schneider-electric.us

Panel Drilling for PowerPact<sup>™</sup> H and J Circuit Breaker Operating Mechanisms: 9421LJ1, 9421LJ4, and 9421LJ7



Panel Drilling for PowerPact D and L Circuit Breaker Operating Mechanisms: 9421LD1, 9421LD4, and 9421LD7



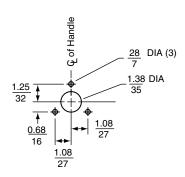
X: Minimum to wall or barrier to insure adequate wire bending space to lug surface when the maximum wire size is used. Refer to NEC 430-10.

Dimensions:  $\frac{\text{in.}}{\text{mm}}$ 

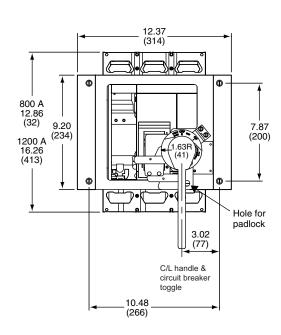
Panel Drilling for PowerPact M and P Circuit Breaker Operating Mechanisms: 9421LW1, 9421LW4, and 9421LW7

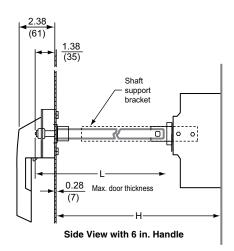
circuit breaker toggle

clearance holes



**Door Drilling Dimensions** 





**Shaft Cutting Dimensions** Table 8.58:

Class	Туре	Shaft Length	H = Stand	dard Shaft	H = Long Shaft		
Ciass	Турс	Formula	Min.	Max.	Min.	Max.	
9421	LJ1, LJ4, LJ7	$L = H - \frac{3.00}{76}$	5.5 138	10.75 273	5.5 138	21.63 543	
9421	LD1, LD4, LD7	L = H - 4.25 108	7.25 184	12.06 306	7.25 184	22.63 575	
9421	LW1, LW4, LW7	L = H - 4.89 124	7.19 183	11.63 295	7.19 183	22.25 565	

 $\infty$ 





9422CSJ30

NOTE: Refer to NEC Article 430-10 for minimum dimension X from circuit breaker top mounting hole to wall or barrier to ensure adequate wire bending space.

NOTE: Bend radius in cable must never be less than 6 inches. Electrical clearances must be maintained between cable and live electrical parts.

### 9422CSF 3-Pole

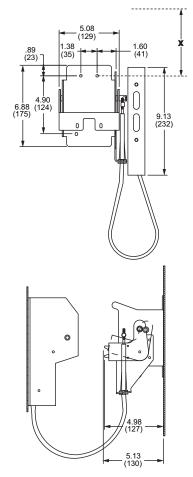
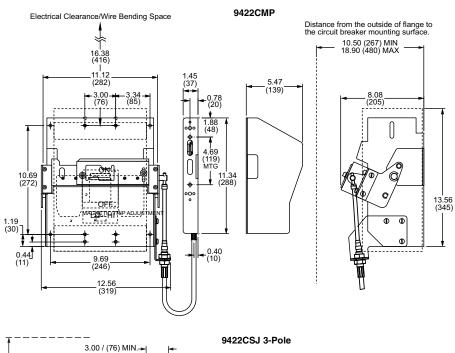


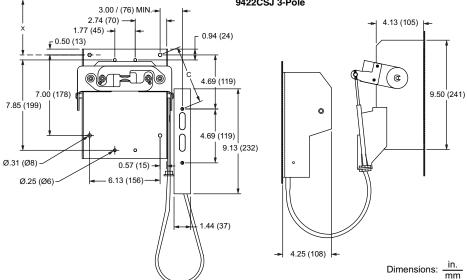
Table 8.59: Flexible Cable Mechanisms for Use with Schneider Electric<sup>™</sup> (formerly Merlin Gerin<sup>™</sup>) Circuit Breakers and PowerPact<sup>™</sup> 3-Pole Circuit Breakers

For use with Class 9422 A handle operators especially designed for tall, deep enclosures where placement flexibility is required.

Circuit Breaker	No. of	Frame Size		Cable Mechanism	
Туре	Poles	A	Length	Туре	\$ Price
			36 in.	CSF30	288.00
MG-NSF	0.0	050	60 in.	CSF50	305.00
PowerPact H- and J-Frame	2 - 3	250	84 in.	CSF70	323.00
Tr dild o Franc			120 in.	CSF10	347.00
			36 in.	CSF304	297.00
MG-NSF	4	250	60 in.	CSF504	314.00
			120 in.	CSF104	356.00
			36 in.	CSJ30	486.00
MG-NSJ PowerPact D and L	3	600	60 in.	CSJ50	504.00
PowerPact D and L			120 in.	CSJ10	548.00
			36 in.	CSJ304	500.00
MG-NSJ PowerPact D and L	4	600	60 in.	CSJ504	516.00
PowerPact D and L			120 in.	CSJ104	558.00
			48 in.	CMP40	759.00
PowerPact	3	1200	50 in.	CMP50	785.00
I- and P-Frame▲			120 in.	CMP10	857.00

▲ Must use 9422AP1 or 9422AP2 Handle with this operating mechanism.





## Dual Cable Operating Mechanisms for Square D<sup>™</sup> Circuit Breakers

Dual Cable Operating Mechanisms are designed for use with Square D brand PowerPact  $^{\text{TM}}$  D, H, J, and L circuit breakers through 600 A frame sizes. The cable mechanisms allow for a single handle operator, Class 9422Ax, to operate both circuit breakers. The cable mechanism is designed especially for tall, deep enclosures where placement flexibility is required. There are numerous cable arrangements to choose from to accommodate many applications.

Class 9422 / Refer to Catalog 9420CT9701

### **Features**

- Separate cables for each circuit breaker
- Rugged metal flange handle operator
- Maximized flexibility of circuit breaker placement for existing and new applications
- Control panel can be fed from two separate supply voltages (if required)
- Dual mechanism allows both separate supply voltages to be controlled by a single handle to improve security features

**Dual Cable Operating Mechanisms Selection** 

Circuit Breaker Type	Cable Length in. / mm (quantity)	Catalog Number	Frame Size (max.)	\$ Price
	120 in. / 3048 mm (2)	9422CSFD1		693.00
	36 in. / 914 mm (1) 60 in. / 1524 mm (1)	9422CSFD35		648.00
	60 in. / 1524 mm (1-CSF 3 pole) 60 in. / 1524 mm (1-CSF 4 pole)	9422CSFD345		672.00
PowerPact H & J MG NSF	36 in. / 914 mm (1) 120 in. / 3048 mm (1)	9422CSFD31	250 A	680.00
	36 in. / 914 mm (2)	9422CSFD33		640.00
	60 in. / 1524 mm (1) 120 in. / 3048 mm (1)	9422CSFD51		687.00
	60 in. / 1524 mm (2)	9422CSFD55		656.00
	60 in. / 1524 mm (2-CSJ)	9422CSJD50▲		1008.00
	120 in. / 3048 mm (2-CSJ)	9422CSJD10▲	600 A	1096.00
PowerPact D & L MG NSJ	60 in. / 1524 mm and 120 in. / 3048 mm (2-CSJ)	9422CSJD51▲	000 A	1052.00
	120 in. / 3048 mm (1-CSF) and 120 in. / 3048 mm (1-CSJ)	9422CSFJD10	250 A	894.00
	60 in. / 1524 mm (1-CSF) 60 in. / 1524 mm (1-CSJ)	9422CSFJD50	and 600 A	809.00

Must use the 9422AP1 or 9422AP2 operating handle with this operating mechanism.

### **Handle Mechanisms**

These handle mechanism kits are used with the circuit breaker variable depth and cable operating mechanisms. The kits contain all parts necessary for mounting the handle to the flange of the enclosure. Types A1/AP1 to A4 are suitable for right or left-hand flange mounting.

#### **Handle Mechanisms** Table 8.61:

Type of Handle	NEMA Type Enclosure	Туре	\$ Price
6 in.	1, 3, 3R, 4 (sheet steel), 12	A1	143.00
o Iri.	4, 4X (stainless)▲	A2	257.00
6 in.■	1, 3, 3R, 4 (sheet steel), 12	AP1	188.00
6 111.■	4, 4X (stainless)▲	AP2	338.00
4 in.	1, 3, 3R, 4 (sheet steel), 12	A3	143.00
4 111.	4, 4X (stainless)▲	A4	257.00
A   A	a ana aithean ataird ann atail an a clearann an latail a	t	

All external metal parts are either stainless steel or a chrome-plated non-ferrous die casting. Must be used with 9422 RM1, 9422CMP, and 9422CSJD (dual cable mechanism) only.

NOTE: See page 8-14 for dimensional information.

### Flange-Mounted, Variable-Depth Operating Mechanisms

Designed for installation in custom built control enclosures where main or branch circuit protective devices are required. All circuit breaker operating mechanisms are suitable for either right- or left-hand flange mounting, convertible on the job. Selection of a 9422Ax handle is required to complete the operating mechanism.

Variable-Depth Operating Mechanisms for Use with Schneider Electric™ (formerly Merlin Gerin™) Circuit Breakers

Use with				Operating I	Mechanism
Circuit Breaker Frame Size	No. of Poles	Frame Size	Variable Depth Mtg. Range MinMax.		hanism Only— clude Handle anism
	A A		(Inches)▲	Туре	\$ Price
Schneider Electric (formerly Merlin Gerin) Circuit Breakers and PowerPact™ Frame 3-Pole Circuit Breakers					
MG-NSF PowerPact H- and J-Frame	2–3	250	5.88-17.75	RQ1	185.00
MG-NSJ PowerPact D and L	3	600	9.00-17.75	RS1	383.00
PowerPact M- and P-Frame■	3	1200	10.50-18.38	RM1	513.00

- Class 9422 Type R2 will extend mounting depth 7 inches—not recommended for use with the 9422RM1 operating mechanism (see page 8-15)
- These circuit breaker operating mechanisms must use the 9422APx handles.

#### Table 8.63: Electrical Interlocks—Class 9999

Description	Class	Type	\$ Price
Single Pole, Double Throw Double Pole, Double Throw	9999 9999	R26 R27	131.00 243.00



9422CSFD33



Handle Mechanisms



9422 Type R Circuit Breaker Mechanism

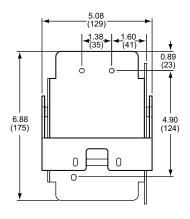
8-22

Class 9422 / Refer to Catalog 9420CT9701

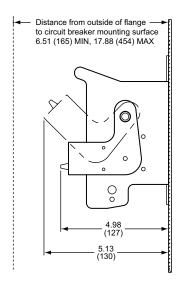
by Schneider Electric

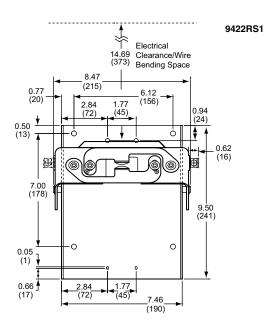
Minimum to wall or barrier to insure adequate wire bending space to lug surface when the maximum wire size is used with standard lugs. Refer to NEC 430-10.

Dimensions:  $\frac{\text{in.}}{\text{mm}}$ 

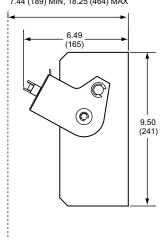


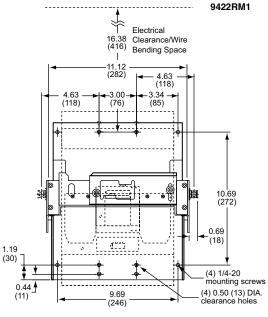
### 9422RQ1





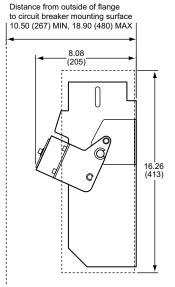
Distance from outside of flange to circuit breaker mounting surface 7.44 (189) MIN, 18.25 (464) MAX





Discount Schedule

CP1

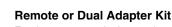


 $\infty$ 

Switch

or

Breaker



For the remote or dual operation of 30, 60, 100, and 200 A disconnect switches.

Remote Operation—permits mounting the Class 9422 Type A9 or A10 handle mechanism at a lower level than the disconnect device it controls. This arrangement is often required where the disconnect device is mounted too high for personnel to easily reach a conventional operator.

Dual Operation—permits controlling two disconnect devices, one in line with and one remote from a single Class 9422 Type A9 or A10 handle mechanism.

NOTE: A Class 9422 Type A9 or A10 handle (page 8-15) and the preferred mounting method must be used.

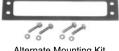


Disconnect Device		Mounting pth	Type	\$ Price
	Min.	Max.	"	
Disconnect Switch				
30 A Type TCF/TCN	10.63	19.50		
60 A Type TDF/TDN	10.63	19.50	D2	251.00
100 A Type TEF/TEN	12.13	20.25	D2	231.00
200 A Type TF	13.13	20.81		



included in kit)

Other Accessories Table 8.65:









Auxiliary Lock Plate

Accessory	Description	Class	Type	\$ Price
Alternate Mounting Kit	Permits mounting Class 9422 Type A1 or A2 handle mechanisms in enclosures with flange thickness of 16 gauge to 0.5 in.	9422	AM2	14.30
Channel/Flange Support Kit	Auxiliary kit recommended for use with 30 and 60 A disconnect switches and PowerPact™, NSF, and NSJ circuit breaker mechanisms when these devices are to be mounted on the center channel of a multi-door enclosure or when extra rigidity for the flange is required. Supplied as standard with 100 and 200 A disconnect switches.	9422	C1	42.80
Auxiliary Lock Plate	Auxiliary kit recommended for use with the Class 9422 Type A-1 flange handle to facilitate padlocking the handle in the "OFF" position. Primarily used when the handle is mounted on the center channel of a multi-door enclosure. Also in any case where the enclosure doors interfere with the normal padlock slot in the flange handle. Meets both the Automotive and NFPA 79 specifications.	9422	L1	36.00
	Copper Lugs only—Specify Form Y157	_	_	No Charge
Special Lugs for	Tin Plated Aluminum Lugs for 400 A Type TG Switch—Specify Form Y1572 (000–750 kcmil Cu/Al wire)	_	_	No Charge
Disconnect Switches	Anderson Type VCEL Compression Lugs—Specify Form Y1574 <b>Exceptions:</b> None of the 30 A or 60 A disconnect switches are available with compression lugs.	_	_	No Charge
	Standard operating rod for use with Class 9422 variable depth mechanisms. Included as standard in each kit.	9422	R1	28.70
Operating Rods	Extra long operating rod for use with Class 9422 variable depth mechanisms. Can be used as a substitute for the standard rod included in each kit to increase the maximum mounting depth 7 in. (Two are required for Types ARR, RR, ART, RT, ATE, TE, ATF, TF).	9422	R2	50.00







9422 TCN30

### **Door Closing Mechanisms**

Class 9423 door closing mechanisms cover a range of enclosures with door openings up to a maximum of 91 in. high. The door closing mechanisms are designed to be used on control enclosures and interlocked with a Class 9422 disconnect device, although they all can be used independently. Three different systems are available, and their use is as recommended below. A complete system is available for interlocking all the doors of a multi-door enclosure with the master door when using the 6 in. or 8 in. vault handle mechanism.

Note that the "Master Door" is defined to be the door of a single or multi-door enclosure which is interlocked directly with the disconnect device. The master door can be hinged on either the right or left hand side. It can be located in any position on a multi-door enclosure. An "Auxiliary Door" is defined to be any remaining doors of a multi-door enclosure which are interlocked with the master door by means of the overhead interlocking system as illustrated on pages 8-26 and 8-27.

### **Selection Procedure**

### Step 1.

Determine enclosure construction (number of doors, door height, hinge location, etc.).

Determine Class 9422 disconnect device to be used—either a disconnect switch or a circuit breaker mechanism.

Determine the location of the disconnect device and handle mechanism (right- or left-hand flange or center channel).

### Step 4.

Select the door closing mechanism required.

### Step 5.

Select the auxiliary door closing mechanisms and multi-door interlocking hardware, if required. (A complete system for interlocking all auxiliary doors of a multi-door enclosure with center channel is available for the medium and large enclosures.)

#### Table 8.66: **Door Closing Mechanism**





Type M4 Latch bar not included, but most prepunched enclosures that accept Square D operating mechanisms supply a predrilled

The door closing mechanisms listed below are for use on small to medium size single door control enclosures. They are designed to be used in conjunction with Class 9422 flange-mounted disconnect switches and circuit breaker operating mechanisms; however, they can be used independently as well. When used on properly designed and gasketed NEMA Type 12 enclosures, they meet NFPA 79 standards.

Table 8.67: Single Door Enclosures—NEMA Type 4 or 12 with 60 in. High Maximum Opening

Description	For Use On (Enclosure Type)	Use In Conjunction With	Door Latch Handle Length	Suggested Maximum Door Opening	Door Depth	Туре	\$ Price
	NEMA Torondoroda	01 0400	4 in.	Less than 39 in.	3/4	M4	228.00
Two point, roller latch, door	NEMA Type 4 and 12 Sheet Steel	Class 9422 Types A1, A3, A9	4 in.	Less than 39 in.	<b>A</b>	M10	314.00
closing mechanism for use on enclosures with doors	Officer Oteer	19000 A1, A0, A0	6 in.	60 in.	3/4	M9	243.00
hinged on the <b>left</b> hand side.	NEMA Type 4 and 12 Stainless Steel	Class 9422 Types A2, A4, A10	4 in.	Less than 39 in.	3/4	M24	300.00
			4 in.	Less than 39 in.	3/4	M4L	228.00
Two point, roller latch, door closing mechanism for use		Class 9422 Types A1, A3, A9	4 in.	Less than 39 in.	<b>A</b>	M10L	314.00
on enclosures with doors	Officer officer	19000711,710,710	6 in.	60 in.	3/4	M9L	243.00
hinged on the <b>right</b> hand side.	NEMA Type 4 and 12 Stainless Steel	Class 9422 Types A2, A4, A10	4 in.	Less than 39 in.	3/4	M24L	300.00
Third roller latch kit for 3 point locking; for use where 3 point locking is desired or where the door opening is 39 in. or more.	NEMA Type 4 and 12 Sheet Steel	Class 9423 Types M4, M9, M4L, M9L	_	_	3/4	M3	50.00
	NEMA Type 4 and 12 Stainless Steel	Class 9423 Types M24, M24L	_	_	3/4	M23	57.00

Suitable for door depths of 1-1/8 in., 1-1/4 in., 1-3/8 in. and 1-1/2 in.



Circuit Breaker Operating Mechanism

8-25

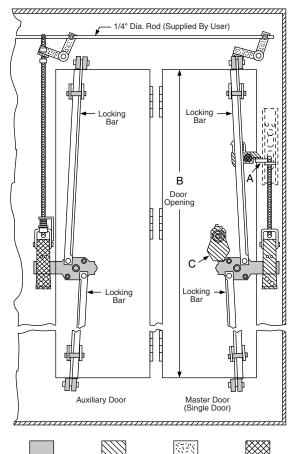
## Vault Type for Single and Multi-Door Enclosures

Table 8.68 shows the requirements for the door closing mechanism, the locking bar kit, and the mechanical interlock kit, if used.

Table 8.68: Single or Multi-Door Enclosures—NEMA Type 12 with 40 in. to 60 in. Door Opening

Single-Door Enclosure		Multi-Door Enclosure			
Without Interlocking	With Interlocking	Without Interlocking With Interlocking			
1—M6 door closing mechanism 1—Type M660 locking bar kit		For each door: 1—M6 door closing mechanism 1—Type M660 locking bar kit	For Master door: 1—M6 door closing mechanism 1—Type M660 locking bar kit 1—Type M5 (for use with 9422A handles)	For each Auxiliary door: 1—M6 door closing mechanism 1—Type M660 locking bar kit Necessary quantities of Types M2 and M7 for each door (see below)	

### View from Inside the Enclosure



Note: A - Interlocking lever extension of the flange-mounted handle

Type M7

Type M2

mechanism.

Type M6

Note: B - Actual enclosure opening—not door height.

Type M5

Note: C - Screwdriver interlock assembly can be ordered separately.

Class 9423 Type CEQ2493. \$45.00

**NOTE:** All mechanisms listed on this page are suitable for either left or right hand mounting.

### Table 8.69: Door Interlocks

Type M6 Door Closing Mechanism	\$ Price
The Class 9423 Type M6 door closing mechanism is designed to close and seal 0.75 in. deep doors of single or multi-door NEMA Type 12 enclosures. The Type M6 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 40–60 in. Vault type handle length is 6 in.	257.00
Type M660 Locking Bar Kits	
The lock bar kit for the Type M6 door closing mechanism contains two lock bars and is available from stock. The bars can be cut to fit door openings through 60 in. One lock bar kit is required for each Type M6 ordered.	86.00
Type M5	
The Class 9423 Type M5 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism with the Type M6 door closing mechanism. This kit prevents the opening of the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screwdriver to gain entry to the enclosure at any time, regardless of the disconnect handle position.	215.00

Table 8.70: Required Accessories for Auxiliary Doors

Type M2	\$ Price
One Type M2 kit is required for each auxiliary door. This kit is required to interlock any auxiliary door(s) with the master door.	257.00
Type M7	
The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The 0.25 in. diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36 in., an additional Type M7 kit should be installed to prevent the rod from buckling.	71.00



# **Door Closing Mechanisms**

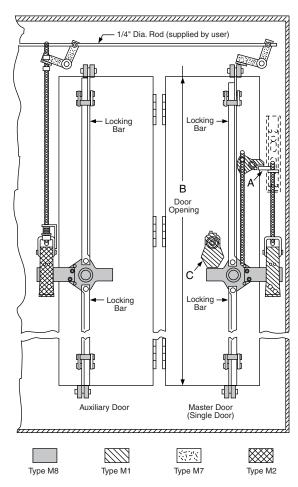
### **Vault Type for Single and Multi-Door Enclosures**

Table 8.71 shows the requirements for the door closing mechanism, the locking bar kit, and the mechanical interlock kit, if used.

Table 8.71: Single Or Multi-Door Enclosures—NEMA Type 12 with 61 in. to 91 in. Door Openings

Single-Door Enclosure		Multi-Door Enclosure			
Without Interlocking	With Interlocking	Without Interlocking With Interlocking			
1—M8 door closing mechanism 1—Type M891 locking bar kit	1—M8 door closing mechanism 1—Type M891 locking bar kit 1—Type M1 (for use with 9422A handles)	For <i>each</i> door: 1—M8 door closing mechanism	For Master door: 1—M8 door closing mechanism 1—Type M891 locking bar kit 1—Type M1 (for use with 9422A handles)	For each Auxiliary door: 1—MB door closing mechanism 1—Type M891 locking bar kit Necessary quantities of Types M2 and M7 for each door (see below)	

### View from Inside the Enclosure



Note: A - Interlocking lever extension of the flange-mounted handle mechanism

Note: B - Actual enclosure opening—not door height.

te: C - Screwdriver interlock assembly can be ordered separately. Class 9423 Type CEQ2493. **\$45.00** 

**NOTE:** All mechanisms listed on this page are suitable for either left or right hand mounting.

Table 8.72:	Door Interlocks
I UDIC O.7 E.	Door miteriooks

Type M8 Door Closing Mechanism	\$ Price
The Class 9423 Type M8 door closing mechanism is designed to close and seal 1.125 in. deep doors of single or multi-door NEMA Type 12 enclosures. The Type M8 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 61–91 in. Vault type handle length is 8 in.	500.00
Type M891 Locking Bar Kits	
The lock bar kit for the Type M8 door closing mechanism contains two lock bars and is available from stock. The bars can be cut to fit door openings through 91 in One lock bar kit is required for each Type M8 ordered.	86.00
Type M1	
The Class 9423 Type M1 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism with the Type M8 door closing mechanism. This kit prevents the opening of the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screwdriver to gain entry to the enclosure at any time, regardless of the disconnect handle position.	428.00

Table 8.73: Required Accessories for Auxiliary Doors

,	
Type M2	\$ Price
One Type M2 kit is required for each auxiliary door. This kit is required to interlock any auxiliary door(s) with the master door.	257.00
Type M7	
The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The 0.25 in. diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36 in., an additional Type M7 kit should be installed to prevent the rod from buckling.	71.00

8-27

Reference

0.25

0.33 Dia.

0.69

0.88 Dia.

Enclosure Door Enclosure

Door Opening Recommended 40 Inches Minimum 60 Inches Maximum

1.63

0.2

www.schneider-electric.us

### **Enclosure Construction and General Location Information** For Types M5 and M6

Drilling and location information below is complete for a single door enclosure with door hinged on left side, incorporating a Type M6, M5, and Class 9422 handle mechanism. Transpose all horizontal dimensions for doors hinged on right side.

#### Dimension A

Note: Single door enclosures: A minimum = 1 in.

Multi-Door enclosures without overhead interlocking system: A minimum = 1 in.

Note: Multi-Door enclosures with overhead interlocking system: A minimum = 41/2 in.

Overhead interlocking system consists of the required number of Class 9423 Type M2 and M7 kits for interlocking the auxiliary doors with the master door. See page 8-26.

#### Table 8.74: **Dimension B (Minimums)**

Disconnect Device	If A = 1 Minimum B =	If A = 4½ Minimum B =	С
60 A Disconnect Switch	3-/16	2-1/2	3-3/16
100 A Disconnect Switch	5-1/4	2-1/2	3-3/16
200 A Disconnect Switch	11-5/8	8-1/8	3-3/16
400 A Disconnect Switch	15-1/16	11-9/16	6-3/4
FAL, FHL, Circuit Breaker	4-27/32	2-1/2	3-3/16
KAL, KHL Circuit Breaker	11-5/32	7-21/32	3-3/16
ILL Circuit Breaker	17-31/32	14-15/32	3-3/16
MAL, MHL, MEL, MXL Circuit Breaker	18-5/8	15-1/8	3-3/16
	Device  60 A Disconnect Switch  100 A Disconnect Switch  200 A Disconnect Switch  400 A Disconnect Switch  FAL, FHL, Circuit Breaker  KAL, KHL Circuit Breaker  ILL Circuit Breaker  MAL, MHL, MEL, MXL	Device         Minimum B =           60 A Disconnect Switch         3-/16           100 A Disconnect Switch         5-1/4           200 A Disconnect Switch         11-5/8           400 A Disconnect Switch         15-1/16           FAL, FHL, Circuit Breaker         4-27/32           KAL, KHL Circuit Breaker         11-5/32           ILL Circuit Breaker         17-31/32           MAL, MHL, MEL, MXL         19-5/8	Device         Minimum B =         Minimum B =           60 A Disconnect Switch         3-/16         2-1/2           100 A Disconnect Switch         5-1/4         2-1/2           200 A Disconnect Switch         11-5/8         8-1/8           400 A Disconnect Switch         15-1/16         11-9/16           FAL, FHL, Circuit Breaker         4-27/32         2-1/2           KAL, KHL Circuit Breaker         11-5/32         7-21/32           ILL Circuit Breaker         17-31/32         14-15/32           MAL, MHL, MEL, MXL         18-5/9         15-1/9

# 0.50 Enclosure Door Enclosure Door Opening Recommended 61 Inches Minimum 91 Inches Maximum 17.69 Minimum 33.69 Minimum 0.33 Dia. 0.69 2.25 1.00 0.2 Dia. –/ 5 (2 Holes)

17.69 Minimum

33.69 Minimum 856

## **Enclosure Construction and General Location Information** For Types M1 and M8

Drilling and location information below is complete for a single door enclosure with the door hinged on the left side, incorporating a Type M8, M1, and Class 9422 handle mechanism. Transpose all horizontal dimensions for doors hinged on the right side.

### Dimension A

Note: Single door enclosures: A minimum = 11/2 in.

Note: Multi-Door enclosures without overhead interlocking system: A minimum =  $1\frac{1}{2}$  in.

Multi-Door enclosures with overhead interlocking system: A minimum = 41/2 in.

Overhead interlocking system consists of the required number of Class 9423 Type M2 and M7 kits for interlocking the auxiliary doors with the master door. See page 8-26.

#### Table 8.75: **Dimension B (Minimums)**

Туре	Disconnect Device	If A = 1½ Minimum B =	If A = 4½ Minimum B =	С
TCF, TCN, TDF, TDN, TD	60 A Disconnect Switch	2-15/16	2-1/2	3-3/16
TE, TEF, TEN	100 A Disconnect Switch	4-3/4	2-1/2	3-3/16
TF	200 A Disconnect Switch	11-1/8	8-1/8	3-3/16
TG	400 A Disconnect Switch	14-9/16	11-9/16	5-7/8
RN1	FAL, FHL Circuit Breaker	4-11/32	2-1/2	3-3/16
RP1	KAL, KHL Circuit Breaker	10-21/32	7-21/32	3-3/16
RR2	ILL Circuit Breaker	17-15/32	14-15/32	3-3/16
RT1	MAL, MHL, MEL, MXL Circuit Breaker	18-1/8	15-1/8	3-3/16

တ



# Section 9

## **Panelboards**



NQ Panelboards Page 9-5



NF Panelboards Page 9-13



I-Line Panelboards Page 9-20



QMB Panelboards Page 9-35

## Series Rated / Fully Rated Tables

NQ	9-2, 9-42
NF	9-3
I-Line™	9-3

## **Lighting and Appliance Panelboards**

NQ/NF	Pricing Procedure	9-5
NQ	Merchandised Main Lug Panelboards	9-6
	Merchandised Main Circuit Breaker Panelboards	9-7
New!	Merchandised 14-inch-wide Panelboards	9-8
	Merchandised Accessories	9-9
	QOB Branch Circuit Breakers	9-10
	Factory Assembled Panelboards and Circuit Breakers	9-11
	Factory Assembled Common Features	9-12
NF	Merchandised Main Lugs Panelboards	9-13
	Merchandised Main Circuit Breaker Panelboards	9-13
	Merchandised Main Lug and Main Circuit Breaker Panelboards with	9-13
	Merchandised Accessories	9-14
	EDB, EGB, EJB Branch Circuit Breakers	9-15
	Factory Assembled Panelboards	9-16
	Factory Assembled Common Features	9-17
NQ/NF	Merchandised Single Row (Column Width) Panelboards	9-18
Column Width	Factory Assembled Single Row (Column Width) Panelboards	9-19

## Power Distribution Panelboards—Circuit Breaker Type

I-Line/QMB	Pricing Procedure	9-20
I-Line	Merchandised Panelboards (HCN, HCM, HCP-SU)	9-21
	Merchandised Panelboards (HCP, HCR-U)	9-22
	Merchandised Accessories	9-23
	Circuit Breakers	9-24
	F-frame Circuit Breakers	9-24
	Q-frame Circuit Breakers	9-25
	H-frame and J-frame Circuit Breakers	9-26
	K-frame Circuit Breakers	9-27
	L-frame Circuit Breakers	9-28
	M-frame Circuit Breakers	9-29
	P-frame and R-frame Circuit Breakers	9-30
	Factory Assembled Pricing	9-31
	Factory Assembled Branch Circuit Breakers	9-32
	Factory Assembled Common Features	9-34

## Power Distribution Panelboards—Fusible Type

QMB Replacement Switches	9-3
Factory Assembled Pricing	9-30
Factory Assembled SPD Units	9-3

### **Panelboard Special Features**

Factory Assembled Modifications	9-38
Terminal Data	9-39



BGUARE D by Schneider Electric www.schneider-electric.us

Class 1640

This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the same enclosure or a remote main located in a separate enclosure.

Table 9.1: NQ Series Connected Circuit Breaker Ratings (RMS Symmetrical)

Maximum System Voltage AC ▲■	Circuit	ort Integral or Remote uit Main Circuit Breakers	Square D <sup>™</sup> Brand Branch Circuit Breaker Catalog Designation and Allowable Ampere Ranges ◆★▼△			
		and Remote Main Fuses	Туре	1 Pole	2 Pole	3 Pole

NOTE: Table 9.1 NQ Series Connected Circuit Breaker Ratings table has moved to page 9-42 and page 9-43.



**Series Ratings** 

Class 2110 / Refer to Catalog 2110CT9701

by Schneider Electric www.schneider-electric.us

This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the same enclosure or a remote main located in a separate enclosure.

NF Series Connected Circuit Breaker Ratings (RMS Symmetrical)

Maximum System Voltage, AC ▲	Circuit Current Rating	Remote Main Fuses	Square D™ Brand Branch Circuit Breaker Catalog Designation and Allowable Ampere Ranges
	65,000	EG, FH, FG, KH, LH, MH, MX, HG, JG, DG LG EG	EDB ECB-G3
120 120/240 240	100,000	EJ, FC, FJ, KC, LC, HJ, JJ DJ, LJ EJ, FC, KC, HJ, JJ	EDB, EDB-EPD, EGB EDB, EGB ECB-G3
240	125,000	HL, JL	EDB, EDB-EPD, EGB, ECB-G3
	200,000	FI, KI, LI, LXI, HR, JR, LR FI, KI, HR, JR Class J or T (600 V) 200 A Max Fuses	EDB, EDB-EPD, EGB, EJB ECB-G3 ECB-G3
	35,000	EG, FG, KH, LH, HG, JG, DG, LG EG, HG, JG	EDB, EDB-EPD ECB-G3
	65,000	EJ, FC, FJ, KC, LC, LX, HJ, JJ, DJ EJ, FC, KC, HJ, JJ	EDB, EDB-EPD, EGB ECB-G3
277		LJ	EDB, EDB-EPD, EGB, EGB-EPD
480Y/277		LL	EDB-EPD, EGB-EPD
4001/277	100,000	HL, JL DL, LL 400 A Max Fuses	EDB, EDB-EPD, EGB, EJB EDB, EGB, EJB EDB, EDB-EPD, EGB, EJB
	200,000		EDB, EDB-EPD, EGB, EJB ECB-G3
	18.000	200 A Max Fuses HG, JG, MG,	EDB, EDB-EPD, EGB, EJB, ECB-G3 EDB
	10,000	LG	EDB (15-110 A)
		EJ, FI, KH, KI, LC, LE, LX, LI, LXI, HJ, JJ	EDB, EGB
	25,000	LJ	EDB (15–110 A), EGB (15–110 A)
		LH	(15–70 A) EDB, EGB
600Y/347	35,000	LC, LE, LX	EDB, EGB, EJB
		HL, JL,	EDB, EGB, EJB
	50,000	Ш	EDB (15–110 A), EGB (15–110 A),EJB (15–110 A)
	65,000	FI, KI, HR, JR LI, LXI, LR	EDB, EGB, EJB EJB
	200,000	Class J or T (600 V) 200 A Max Fuses	EDB, EGB, EJB

I-Line Series Connected Circuit Breaker Ratings (RMS Symmetrical) Table 9.3:

Max. Short			Square D™ Brand Branch Circuit Breakers		
Maximum System Voltage AC ▲	Circuit Current Rating (RMS Symm.)	Integral or Remote 2- or 3-pole Main Circuit Breaker	Designation	Poles	
	42k	MG	FY		
	65k	QG, LH	FA, FD■		
120	100k	FJ■, QJ QJ, LC LJ	FD■ FA FH	1	
	200k	LR	FH, FY		
208Y/120	100k	QJ QJ, PH, PJ, RJ	FA, FD■ QD, QG	2, 3	
	35k	MG	FA	1	
	42k	KA LA, MA	FD■ HD, JD, QD	1, 2, 3 2, 3	
	50k	MG MG	FA FA (25 A Max.)	1	
		HG, JG JG QG LH, MH, PA, PG, RG FG . FH, MH, MX, PJ	FA, HD JD, QD FA, FD■, QD HD, JD, QD FD, ■	2, 3	
		65k	FC, KC, KH, LC, LH LH LH MG LG	FD■, FG■ FA LA HD, JD, KA HD, JD, KA, LA, LD, MA	2, 3
	85k	DG RL	FH, HD, JD, KA, LA, MA FH, KH		
240	OOK	FC, KC, LC, LX	FD■, FG■, FJ	1	
2.0	100k	PH. PJ. RJ	QD. QG	2, 3	
		QJ	FD■	2	
		FJ■ FC, KC LC, LX KC, LC, LX KC, LC LC	FD■ FA, FH, FD■, FG■, FJ■ FH, FD■, FG■, FJ■ KA KH LA, LH, MG	2, 3	
		LC	FA FILLID HG	1, 2, 3	
		LC, LX, MJ, PJ, RJ LC, LX, MJ, PJ, RJ MJ DJ RL HJ, JJ HJ, JJ	FA, FH, HD, HG JD, JG HD, HG, JD, JG LA, LH FH, HD, HG, JD, JG, KA, LA, LD, LG, MA, MG FH, HD, HG, JD, JG, KA, LA, MA, MG RG HD, HG, HJ, FA, H	2, 3	
240	125k	JL PC, PH, PL, RL PC, PL, RL FI, KI, LI, LXI KI, LI, LXI	JD, JG, JJ HD, HG, JD, JG HH, JJ HD, HG, HJ JD. JG. JJ	2, 3	

Table 9.3: I-Line Series Connected Circuit Breaker Ratings (RMS Symmetrical) (continued)

March   Courted   Courte		Max. Short		Square D™ Brand Branch Circuit Brea	kers		
## PA PH, PC, PDB, PGB, FJB PH, PL, PL, PDB, PGB, FJB PH, PL, PL, PDB, PGB, PJB PH, PL, PDB, PGB, PJB PH, PL, PDB, PGB, PJB PH, PL, PDB, PGB, PJB PH, PL, PDB, PGB, PJB PH, PL, PDB, PGB, PJB PH, PJB, PJB, PJB, PJB, PJB, PJB, PJB, PJB	Maximum System Voltage AC ▲	Rating (RMS	Integral or Remote 2- or 3-pole Main Circuit Breaker	Designation	Poles		
240 200k					1		
Right   Line	0.40	0001	LI, LXI	FH, FD■, FG■, FJ■			
18k	240	200k			2, 3		
18k LD FY FY			LÍ	KC			
277  277  278  278  277  278  278  278			LD	FY			
277  277  278  278  278  278  278  278		25k					
FO   FO   FO   FO   FO   FO   FO   FO		35k	DG	FH, FY			
CL, LX (400 A Max)   F, ED				FĎ■			
Column			FC, KC				
DJ		65k	LC, LX (600 A Max.)	FY, FD■, FG■			
100k	277		DĴ	FH, FY	1		
100K							
## PA, FJ#, FY FA, FJ#, FY FA, FJ#, FY FA, FJ#, FY FH, FY FB, FG#, FJ#, FY FH, FY FB, FG#, FJ#, FY FH, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FG#, FJ#, FY FB, FJ#, FY FB, FJ#, FJ#, FY FB, FJ#, FJ#, FJ#, FJ#, FJ#, FJ#, FJ#, FJ#		100k	LL	FH, FJ■			
200k				FA, FJ■, FY			
Li, LXI (600 A Max.)   FY, FD®, FG®, FJ®   FA		200k	JR	FA, FJ■, FY			
100k			LI, LXI (600 A Max.)	FY, FD■, FG■, FJ■			
P.C., P.Y., P.J.   FT		22k			<u> </u>		
Sok			KH, LA, MA, MX, PA,	FH			
MG		30k	LA, MA, PA, PC, PX				
## HP, JD HG, JG HG, JG LH, MG, PG, RG LG, RG LH, MG, PG, RG LH, MJ FH, HD, JD, KA, LA, LD, MA FH, HD, JD, KA, LA, LD, MA FH, HD, JD, KA, LA, MA FH, HD, JD, KA, LA, MA FH, HD, JD, KA, LA, LD, MA FH, HD, JD, KA, LA, MA FH, HD, HG, JD, JG HD, HG, JD, JG HD, HG, JD, JG HD, HG, JD, JG HD, HG, JD, JG HD, HG, HD, HG, JD, JG, JA, LA, LD, LG, MA FH, HD, HG, JD, JG, JJ, KA, LA, LD, LG, MA FH, HD, HG, HD, JD, JG, JJ, KA, LA, LD, LG, MA FH, HD, HG, HD, JD, JG, JJ, KA, LA, LD, LG, MA FH, HD, HG, HD, JD, JG, JJ, KA, LA, LD, LG, MA FH, HD, HG, HJ, JD, JG, JJ, KA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HD, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HD, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HD, HG, HJ, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HL, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HL, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HL, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HL, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, HL, JD, JG, JJ, LA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, JD, LG, LJ, MA FH, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, HL, HL FA, HD, HG, HJ, HL FA, HD, HG, HJ, HL FA, HD, HG, HJ, HL FA, HD, HG, HJ							
35k			MH, MX, PA	HD, JD			
### 100k  ### 10		35k	JG	JD			
DG		OOK		HD, JD FH. HD. JD. KA. LA. LD. MA			
480 65k			DG	FH, HD, JD, KA, LA, MA			
480  65k  F.C. KC H.J. JJ L.C., LI, LX, LXI LC, LX LC, LX LJ DJ FH, HD, HG, JD, JG FH KA FH, HD, HG, JD, JG, KA, LA, MA FH, HD, HG, JD, JG, KA, LA, MA FH, HD, HG, JD, JG, KA, LA, MA FH, HD, HG, JD, JG, KA, LA, MA FH, HD, HG, JD, JG, KA, LA, MA FH, HD, HG, HJ, JD, JG, JJ, KA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, JD, JG, JJ, KA, LA, LD, LG, LJ, MA FH, HD, HG, HJ, JD, JG, JJ, KA, LA, LD, LG, LJ, MA LI PC, PH, PL, RL RL FH, HD, HG, HJ, HL, JD, JG, JJ, JL PC, PH, PL, RL RR FH, HD, HG, HJ, HL, JD, JG, JJ, JL DJG, JJ, KA RA  200k RI FH, KI FA, FH, FC, HD, HG, HJ FA, HD, HG, HJ, HL DJ, JJ, LA, LH LXI FC, KA, KC, LA, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL, LA, LH KA, HJ, HL, JJ, JL, LA, LH KA, HJ, HL, JJ, JL, LA, LH FD  SSK FG, KC FD, FG, FD FG, FG, FJ FG, FJ FA, HD JG JB RG HD, JD, LD HG, JG JB AG RG HD, JD, LG HJ, JJ FA, HD, HG, HJ, HD, HG, HJ FA, HD, HG, HJ, HD, HG, HJ FA, HD, HG, HJ, HL JJ, JJ FA, HD, HG, HJ, HL JJ, JJ FA, HD, HG, HJ, HL JJ, JJ FA, HD, HG, HJ, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, JD, JG, JJ, LA FA, HD, HG, HJ, HD, JD, JG, JJ, LA FA, HD, HG, HJ, HD, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, JD, JG, JJ, LA FA, HD, HG, HJ, HL, LB FA, HD, HG, HJ, HL, HD, HD, HD, HD, HD, HD, HD, HD, HD, HD		42k					
480 65k		50k					
480			HJ, JJ	FA, FH, HD, HG			
KC, LC, LX				051	LC, LI, LX, LXI	JD, JG HD, HG, JD, JG	
LC, LX LJ FH, HD, HG, JD, JG, KA, LA, LD, LG, MA FH, HD, HG, JD, JG, KA, LA, MA    HL, JL JR   JR   LJ, LXI (600 A Max.)   FA, FH, FHD, HG, HJ   JB, JG, JJ, KA, LA, LD, LG, LG, LJ, MA   LL, LXI (600 A Max.)   FA, FH, FHD, HG, HJ   PC, PH, PL, RL RL   PC, PH, PL, RL RR   FH, HD, HG, HJ, JD, JG, JJ, KA, LA, MA   HJ, JJ   RA, FH, C, HD, HG, HJ   RB, HR   HR   HR   HB, HG, HJ, HL, JD, JG, JJ, JL   LR   FH, HD, HG, HJ, HL, JD, JG, JJ, JL   LR   FH, HJ, HL, JJ, JL, LA, LH   KA, HJ, HL, JJ, JL   LA, LH   KA, HJ, HL, JJ, JL   LA, LH   KA, HJ, HL, JD, JG, LD, LG, LJ, MA   HJ, JJ   LJ, LXI (600 A Max.)   FD = FG = FJ = FG = FJ = FA, HD   LB, LJ	480	65k	LC, LX (400 Å Max.)				
DJ			LC, LX	LA			
100k				FH, HD, HG, JD, JG, KA, LA, MA	2, 3		
100k							
100k			JR	FA			
DL DL, MA PC, PH, PL, RL RG FI, KI FR, FH, FC, HD, HG, HJ, HJ JR JR JR HD, HG, HJ, HL, DJ, JG, JJ, KA LI LR FA, FH, FC, HD, HG, HJ JR JR HD, HG, HJ, HL, JJ, JL LR FC, KA, KC, LA, HJ, HL, JJ, JL LR FH, HJ, HL, JJ, JL LA, LH KA, HJ, HL, JJ, JL LXI  480Y/277 65k FG, KC LC, LX (600 A Max.) FD, FG, FG, FG, FD, FG,		100k		FH, HD, HG, HJ, JD, JG, JJ, KA, LA, LD, LG,			
PC, PH, PL, RL RG FI, KI FR, FH, FC, HD, HG, HJ HR FA, HD, HG, HJ, HL JD, JG, JJ, KA LI LR FF, KA, KC, LA, HJ, HL, JJ, JL LXI FH, HJ, HL, JJ, JL, LA, LH KA, HJ, HL, JJ, JL  25k FH, KA FC, KA, KC, LA, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FF, HJ, HL FD  35k FG, KA, KC, LA, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FH, HJ, HL, JJ, JL FF, FG FD FG FG FG FG FG FG FG FG FG FG FG FG FG							
## FI, KI			PC, PH, PL, RL	HJ, JJ			
Description			FI, KI	FA, FH, FC, HD, HG, HJ			
200k			JR	HD. HG. HJ. HL. JD. JG. JJ. JL			
LH		200k	KI LI	JD, JG, JJ, KA FC. KA. KC. LA. HJ. HL. JJ. JL			
25k			LR I XI	FH, HJ, HL, JJ, JL, LA, LH KA HJ HJ JJ JJ			
480Y/277  65k  FJ			FH, KA	FD■			
480Y/277 65k		35k					
200k	480Y/277	65k	FC, KC	FD■, FG■			
600    HG, JG		300k	FI, KI				
600    18k		200K			<u> </u>		
600   MG, PG, RG		101	JG	JD ID ID			
600   HJ, JJ		IOK	MG, PG, RG	HD, JD			
600 25k							
600 PJ, RJ MG  35k LC FH, HD, HG, HJ, JD, JG, JJ, LA  HL, JL FA, HD, HG, HJ  50k LL HD, HG, HJ, JD, JG, JJ, LD, LG, LJ, MA  PK HJ, JJ, MJ  FI, KI HD, HG, HJ, HL, HD, HG, HJ, HL  100k JR FA, HD, HG, HJ, HL, JD, JG, JJ, JL  KI, LI LA  600Y/347 18k MG FA (25 A max.)  50k FJ, KI FA, HD, HG, HJ, HL, JD, JG, JJ, JL  600Y/347 25k MJ FA (30 A max.)  A Short circuit tests are conducted at 100–105% of the maximum rated voltage of the		25k	JJ	JD			
HL, JL		OFI.	PJ, RJ	MG			
100k	600	35K	HL, JL	FA. HD. HG. HJ	2, 3		
PK HJ, JJ, MJ FI, KI HD, HG, HJ HR FA, HD, HG, HJ, HL 100k KI KI, KI, LI LI 600Y/347 18k MG FA (25 A max.) 50k HL, JL FA (30 A max.) Short circuit tests are conducted at 100–105% of the maximum rated voltage of the		50k	JL	JD, JG, JJ			
HR FA, HD, HG, HJ, HL JR JR FA, HD, HG, HJ, HL KI JR, JD, JG, JJ, JL JD, JG, JJ KI, LI LI LA 600Y/347 25k MJ FA (25 A max.) 50k HL, JL  Short circuit tests are conducted at 100–105% of the maximum rated voltage of the			PK	HJ, JJ, MJ			
100k			HR	FA, HD, HG, HJ, HL			
RI, LI		100k	JR KI	FA, HD, HG, HJ, HL, JD, JG, JJ, JL JD, JG. JJ			
600Y/347			KI, LI	FH .			
Short circuit tests are conducted at 100–105% of the maximum rated voltage of the	600\//04=	18k	MG	FA (25 A max.)			
	ουυ Y/347				<u></u>		
				00-105% of the maximum rated voltage of t	he		

configurations.

Snort crult tests are conducted at 100–105% of the maximum rated voltage of the panelboard.
 Obsolete. Contact your local Schneider Electric representative or distributor for the replacement circuit breaker.
 NOTE: LD, LG, LH, and LL breakers are only available in 3 pole

**Table 9.4:** Fuse/I-Line Circuit Breaker Series Connected Ratings



Maximum System	Max. Short Circuit	Remote I	Main Fuse	Square D™ Brand Branch Circuit Breakers
Voltage AC	Current Rating (RMS Symm.)	Maximum Amperage	Fuse Class	Designation ▲
		1200 A	L, T (300 V)	QD, QG
120/240 1Ø 208Y/120	100,000	800 A	T (600 V)	QD, QG
2001/120		600 A	J, RK5	QD, QG
		1200 A	L, T (300 V)	QD
240	65,000	800 A	T (600 V)	QD
		600 A	J, RK5	QD
		1200 A	L, T (300 V)	QD, QG (2-pole)
		800 A	T (600 V)	QD, QG (2-pole)
			J, RK5	QD, QG (2-pole)
		202 4	L, T (600 V)	FA, FH, KA, KH, KC, LA, LH, MA, MH, MX, PG
		600 A	RK5	FH, KA, KH, LA, LH, MA, MH, MX, PG, HD, HG, HJ, HL, JD, JG, JJ, JL
			J	HD, HG, HJ, HL, JD, JG, JJ, JL
240	100,000		T (600 V)	FH, KA, KH, LA, LH, MA, MH, MX, PG
	,	800 A	T (300 V)	PG
			L	FH,KA,KH,LA,LH,MA,MH,MX,PG
			L	FH, KH, LA, LH, MA, MH, MX, PG
		1200 A	T (600 V)	HD, HG, HJ, HL, JD, JG, JJ, JL
		1600/2000 A	L (888 1)	KH, MA, MH, MX, PG
	ŀ	4000 A	ī	HD, HG, HJ, HL, JD, JG, JJ, JL
		400071	. =	FA( 3-pole only), FH, FC, KA, KH, KC, LA, LH, LC,
		600 A	J, T (600 V)	MA, MH, MX, NA, NC, NX, PG, PJ, PL  FH, FC, HD, HG, HJ, HL, JD, JG, JJ, JL KH, KC, LA, LH, LC,
		600 A	RK5	MA, MH, MX, NC, NX, PG, PJ, PL
			J	HD, HG, HJ, HL, JD, JG, JJ, JL
240	200.000		T (600 V)	FH, FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
240	200,000	800 A	T (300 V)	PG, PJ, PL
			L	FH,FC, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
		1200 A	L	FC, KH, KC, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			T (600 V)	HD, HG, HJ, HL, JD, JG, JJ, JL
		1600/2000 A	L	NA, NC, NX, PJ, PL
		4000 A	L	HD, HG, HJ, HL, JD, JG, JJ, JL
		400 A	J, T (600 V)	HD, HG, HJ, HL, JD, JG, JJ, JL
			J, RK5	HJ, HL, JJ, JL
		600 A	J, T (600 V)	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
			RK5	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
480	100.000	800 A	L, T (600 V)	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
	·	1200 A	L	FC, KH, KC, LA, LH, LC, MA, MH, MX, NA, PG, PJ
			T (600 V)	HJ, HL, JJ, JL
		1600 A	L	KC, LC, MA, MH, MX, NA, PG, PJ
		2000 A	L	KC, LC, MH,MG, MJ, MX, NA, PG, PJ
		4000 A	L	HJ, HL, JJ, JL
		200 A	RK5	HJ, HL
		400 A	J	FA, FH, FC, HJ, HL, JJ, JL, KA, KH, KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
			T(600V)	FA, FH, FC, HJ, HL, JJ, JL, KA, KH, KC, LA, LH, MA, MH, MX, NA, NC, NX
			J	FC, KA, KH, KC, LA, LH, LC, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL
480	200.000	600 A	T (600V)	KA, KH, KC, LA, LH, MA, MH, MX, NA, NC, NX
400	200,000		RK5	KC, LA, LH, LC, MA, MH, MX, MG, MJ, NC, NX, PG, PJ,
			T (300 V)	PG, PJ, PL
		800 A	T (600 V)	KA, KH, KC, LA, LH, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL
			L	KC, LA, LH, LC, MA, MH, MX, NA, NC, NX, PG, PJ, PL
		1200 A 1600/2000 A	L	KC, LC, MA, MH, MX, MG, MJ, NA, NC, NX, PG, PJ, PL NA, NC, NX
-		30 A	CC	HG, JG ( molded case switches )
		200 A	.1	HD, HG, HJ, HL, JD, JG, JJ, JL
600	100.000	400 A	J, T (600 V)	HJ, HG, HJ, JL, JJ, JL
500	100,000	600 A	3, 1 (600 V)	MG, MJ
		1200 A	L	MG, MJ
-		600 A	J	MG, MJ
600	200,000	800 A	T (600 V)	MG, MJ
	l l	000 A	1 (000 V)	IVIG, IVIG

Series rating valid for 2-pole or 3-pole circuit breakers.

### Note:

- The fuse used in this UL test is an envelope (umbrella) fuse. This fuse is designed as a "worst case" fuse. Thus, no matter what manufacturer's fuse is used, the Square  $\mathsf{D}^{\scriptscriptstyle\mathsf{TM}}$  brand circuit breaker is protected.
- The line side fused switch may be in a separate enclosure or in the same enclosure as the loadside circuit breaker. A line side fused switch may be a submain, integral main, or remote main. A load side circuit breaker may be a branch, submain, or an integral main used on the load side of a remote main. This series combination short circuit current rating shall not exceed that of the line side fused switch. The charts apply to Square D™ brand load side circuit breakers only. However, the line side fuse ratings are independent of the fuse manufacturer. Not applicable to Corner Grounded Systems.
- Limiters used in Square D™ brand DSL and DSL II fused power circuit breakers are not class L fuses and do not have series ratings.



### **NQ** and NF Merchandised Pricing Procedure

- List circuit breakers required, either plug-on or bolt-on. See the appropriate Digest pages for catalog numbers.
- 2. Determine equivalent number of pole spaces required.
- Select proper main lug interior (from page 9-6) or main lug interior and main circuit breaker adapter kit (from page 9-7) based on equivalent number of poles and ampere rating. Interiors include solid neutral and are field convertible to top-feed.
- 4. Select enclosure from appropriate page.
  - Type 1—Select box and front catalog number corresponding to interior catalog number.
  - Type 3R, 5, 12—Select enclosure. Interior trim kit for Type 3R, 5, 12 is included with the enclosure.
- For complete price, add the component prices. Include panelboard accessories.
- 6. Apply appropriate discount schedule.

### **NQ and NF Factory Assembled Pricing Procedure**

- Select Base Price for main lugs or main circuit breaker from the Base Price Table. Include equipment ground bar when required.
- List Branch Circuit Breakers (either plug-on or bolt-on) and determine total spaces required. Select price from the Branch Circuit Breakers Table. Include space-only charge for future requirements.
- If total spaces required exceeds the maximum listed, price as two or more panelboards and add price for sub-feed or feed-through lugs so installer can cable between sections.
- Add price for special features from appropriate page. Contact your local Schneider Electric representative or distributor for additional special features.
- 5. For complete price, add all prices. Order by description.

**NOTE:** Additional special price adders can be found in the Supplemental and Obsolescence Digest, Section 4.

Apply appropriate discount schedule.

### **NQ Merchandised Pricing Example**

Table 9.5: 208Y/120 Vac, 3Ø4W, 10 kA SCCR, 225 A, MLO, Type-1, surface-mount, bolt-on, branch circuit breakers, main sub-feed lugs

Branches	Page No.	Catalog Number	Spaces	\$ Price
(20) 20/1	9-10	(20) QOB120	20	795.
two 40/2	9-10	two QOB240	4	177.
two 30/3	9-10	two QOB330	6	585.
			Total 30	
			•	
225 A MLO Interior	9-6	NQ430L2	-	1215.
Box	9-6	MH32	_	113.
Cover	9-6	NC32S	_	527.
Sub-feed Lugs	9-6	NQSFL2	_	203.
			Total Price	3615.

### **NQ Factory Assembled Pricing Example**

Table 9.7: 208Y/120 Vac, 3Ø4W, 10 kA SCCR, 225 A, MLO, Type-1, surface-mount, bolt-on, branch circuit breakers, main sub-feed lugs

Item	Page No.	\$ Price
225 A MLO Base Price	9-11	928.
(20) 20/1 Bolt-on	9-11	1360.
two 40/2 Bolt-on	9-11	268.
two 30/3 Bolt-on	9-11	704.
Sub-feed Lugs	9-12	128.
	Total Price	3388.

### **NF Merchandised Pricing Example**

Table 9.6: 480Y/277 Vac, 3Ø4W, 25 kA SCCR, fully rated, copper bus, 100 A, main circuit breaker, Type 1, flush-mount, bolt-on, branch circuit breakers

Branches	Page No.	Catalog No.	Spaces	\$ Price
(13) 20/1	9-15	EGB14020	13	3315.
one 40/2	9-15	EGB24040	2	776.
one 50/3	9-15	EGB34050	3	1131.
			Total 18	
Main circuit breaker adapter kit (less circuit breaker)	9-13	N150MH	-	780.
Main circuit breaker	7-28	HGL36100	-	1701.
125 A MLO Cu Bus Int.	9-13	NF418L1C	-	1838.
Box	9-13	MH38	-	113.
Cover	9-13	NC38F	_	549.
			Total Price	10203.

### **NF Factory Assembled Pricing Example**

Table 9.8: 480Y/277 Vac, 3Ø4W, 25 kA SCCR, fully rated, copper bus, 250 A, main circuit breaker, Type 1, flush-mount, bolt-on, branch circuit breakers

Item	Page No.	\$ Price
250 A Main Circuit Breaker Base Price	9-16	6180.
Copper bus adder	9-17	458.
(13) 20/1	9-16	4212.
one 40/2	9-16	746.
one 50/3	9-16	1264.
	Total Price	12860.

9-5

#### Table 9.9: Main Lug Interiors—Accepts plug-on and bolt-on circuit breakers

		Total Pric	e Interior	Interior Only				Type 1 Encl	osure			Type 3R, 5,	12 Enclos	ure △
Pole Spaces	Mains Rating	Front and	Enclosure	(Order Branch Circ Breakers Separate	ely)	Box 20 in. W x 5.75	in. D ■	Mono-Flat™ F	Front •	Hinged Fr	ont	Enclosu 20 in. W x 6.	re 5 in. D	Height
		Type 1	Type 3R, 5,12	Catalog No. ▲	\$Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	(ln.)
20-inch-w	ride Cabir	net □—Sing	jle Phase 3-	-Wire										
10		1395.	2977.	NQ18L1	785.	MH26		NCCC ()	497.	NC0C()UD	620.	MH26WP	2192.	26
18	100	1474.	3056.	NQ18L1C	864.	IVIT/20	113.	NC26 ()	497.	NC26()HR	620.	IVIH26VVP	2192.	20
30	100	1585.	3149.	NQ30L1	945.	MH32	113.	NC32 ( )	527.	NC32()HR	657.	MH32WP	2204.	32
		1675.	3239.	NQ30L1C	1035.	IVII IOZ		14002 ( )	327.	14002( )1111	037.	WII IOZWI	2204.	52
30		1744.	3308.	NQ30L2	1104.	MH32		NC32 ()	527.	NC32()HR	657.	MH32WP	2204.	32
		1819.	3383.	NQ30L2C	1179.			()		(/			-	
42		2002.	3556.	NQ42L2	1340.	MH38		NC38 ()	549.	NC38()HR	687.	MH38WP	2216.	38
	225	2080.	3634.	NQ42L2C	1418.		113.							
72★		3073.	4900.	NQ72L2	2297.	MH44		NC44 ()	663.	NC44()HR	830.	MH44WP	2603.	44
	_	3206. 3521	5033. 5288.	NQ72L2C NQ84L2	2430. 2679.		_							
84★		3677.	5444.	NQ84L2C	2835.	MH50		NC50 ()	729.	NC50()HR	912.	MH50WP	2609.	50
		2462.	4229.	NQ30L4	1620.									
30		2579.	4346.	NQ30L4C	1737.									
	400	2620.	4387.	NQ42L4	1778.	MH50	113.	NC50V ()	729.	NC50V()HR	912.	MH50WP	2609.	50
42		2738.	4505.	NQ42L4C	1896.		113.							
84★	_	4853.	6534.	NQ84L4C	3792.	MH68		NC68V ( )	948.	NC68V()HR	1185.	MH68WP	2742.	68
30		2705.	4548.	NQ30L6C	1863.			``						
42	600	2861.	4704.	NQ42L6C	2019.	MH50	113.	NC50V ()	729.	NC50V()HR	912.	MH62WP▼	2685.	50/62
84★	=	5099.	6873.	NQ84L6C	4038.	MH68	_	NC68V ()	948.	NC68V()HR	1185.	MH80WP▼	2835.	68/80
20-inch-w	ride Cabir	net 🗆 —Thr	ee Phase 4-	-Wire			,							
		1486.	3068.	NQ418L1	876.		l		l					
18		1561.	3143.	NQ418L1C	951.	MH26		NC26 ()	497.	NC26()HR	620.	MH26WP	2192.	26
	100	1752.	3316.	NQ430L1	1112.		113.							
30		1831.	3395.	NQ430L1C	1191.	MH32		NC32 ()	527.	NC32()HR	657.	MH32WP	2204.	32
		1855.	3419.	NQ430L2	1215.	MUOO		NCCC ()	507	NC00/ VID	657	MUOOMB	2004	20
30	•	1932.	3496.	NQ430L2C	1292.	MH32		NC32 ()	527.	NC32()HR	657.	MH32WP	2204.	32
40		2138.	3692.	NQ442L2	1476.									
42	•	2213.	3767.	NQ442L2C	1551.									
54	005			110112220	1331.	MH30		NC39 ( )	540	NC38( )HD	697	MH36/MD	2216	20
54		2559.	4113.	NQ454L2	1898.	MH38	113	NC38 ()	549.	NC38( )HR	687.	MH38WP	2216.	38
	225	2559. 2655.				MH38	113.	NC38 ( )	549.	NC38( )HR	687.	MH38WP	2216.	38
72★	225	2655. 3307.	4113. 4209. 5134.	NQ454L2 NQ454L2C NQ472L2	1898. 1994. 2531.		113.	,,,	549. 663.		687. 830.		2216. 2603.	38
72★	225	2655. 3307. 3436.	4113. 4209. 5134. 5263.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C	1898. 1994. 2531. 2660.	MH38 MH44	113.	NC38 ()		NC38( )HR NC44( )HR		MH38WP		
72 <b>★</b> 84 <b>★</b>		2655. 3307. 3436. 3794.	4113. 4209. 5134. 5263. 5561.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2	1898. 1994. 2531. 2660. 2952.		113.	,,,						
		2655. 3307. 3436. 3794. 3944.	4113. 4209. 5134. 5263. 5561. 5711.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2	1898. 1994. 2531. 2660. 2952. 3102.	MH44	113.	NC44 ( )	663.	NC44( )HR	830.	MH44WP	2603.	44
	225	2655. 3307. 3436. 3794. 3944. 2704.	4113. 4209. 5134. 5263. 5561. 5711.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ484L2C	1898. 1994. 2531. 2660. 2952. 3102. 1862.	MH44	113.	NC44 ( )	663.	NC44( )HR	830.	MH44WP	2603.	44
84★	225	2655. 3307. 3436. 3794. 3944. 2704.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ480L4 NQ430L4	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980.	MH44	113.	NC44 ( )	663.	NC44( )HR	830.	MH44WP	2603.	44
84★		2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ430L4 NQ430L4C NQ442L4	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012.	MH44 MH50		NC44 ()	663. 729.	NC44( )HR NC50( )HR	830. 912.	MH44WP MH50WP	2603. 2609.	50
84 <b>★</b> 30	400	2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854. 2975.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589. 4621.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ430L4 NQ430L4C NQ442L4 NQ442L4C	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012. 2133.	MH44 MH50	113.	NC44 ()	663. 729.	NC44( )HR NC50( )HR	830. 912.	MH44WP MH50WP	2603. 2609.	50
84 <b>★</b> 30		2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854. 2975. 4449.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589. 4621. 4742. 6134.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ430L4 NQ430L4C NQ442L4 NQ442L4C NQ472L4	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012. 2133. 3449.	MH44 MH50		NC44 ()	663. 729.	NC44( )HR NC50( )HR	830. 912.	MH44WP MH50WP	2603. 2609.	50
84★ 30 42 72★		2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854. 2975. 4449.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589. 4621. 4742. 6134. 6342.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2 NQ430L4 NQ430L4 NQ430L4C NQ442L4 NQ442L4 NQ472L4 NQ472L4	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012. 2133. 3449.	MH44 MH50 MH50 MH62		NC44 () NC50 () NC50V () NC62V ()	663. 729. 729.	NC44()HR NC50()HR NC50V()HR	912. 912.	MH44WP MH50WP MH50WP MH62WP	2603. 2609. 2609.	44 50 50 50
84★ 30 42 72★ 84★		2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854. 2975. 4449. 4657. 5327.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589. 4621. 4742. 6134. 6342. 7008.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2C NQ430L4 NQ430L4C NQ442L4 NQ442L4C NQ472L4 NQ472L4 NQ472L4C NQ484L4C	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012. 2133. 3449. 3657. 4266.	MH44 MH50 MH50 MH62 MH68		NC44 ()  NC50 ()  NC50V ()  NC62V ()  NC68V ()	663. 729. 729. 887.	NC44()HR NC50()HR NC50V()HR NC62V()HR NC68V()HR	830. 912. 912. 1109.	MH44WP MH50WP MH50WP MH62WP MH68WP	2603. 2609. 2609. 2685. 2742.	50 50 62 68
84★ 30 42 72★		2655. 3307. 3436. 3794. 3944. 2704. 2822. 2854. 2975. 4449.	4113. 4209. 5134. 5263. 5561. 5711. 4471. 4589. 4621. 4742. 6134. 6342.	NQ454L2 NQ454L2C NQ472L2 NQ472L2C NQ484L2 NQ484L2 NQ430L4 NQ430L4 NQ430L4C NQ442L4 NQ442L4 NQ472L4 NQ472L4	1898. 1994. 2531. 2660. 2952. 3102. 1862. 1980. 2012. 2133. 3449.	MH44 MH50 MH50 MH62		NC44 () NC50 () NC50V () NC62V ()	663. 729. 729.	NC44()HR NC50()HR NC50V()HR	912. 912.	MH44WP MH50WP MH50WP MH62WP	2603. 2609. 2609.	44 50 50 50

- "C" suffix indicates copper bussing.
  Embossed mounting holes add a 0.25-inch standoff to back of MH box.
  Add "F" for flush mount, "S" for surface mount.
  Use only if the Local Jurisdiction where this panelboard interior is being applied has adopted the 2008 NEC, which allows single panelboard interiors greater than 42 circuits.
  When NEMA 3R, 5, or 12 enclosures are selected, an NQ12RDE kit should also be selected. See Table 9.19.

- Enclosure includes trim kit. For the NQ14-inch-wide panelboard offer, See Digest page 9-8.



### **NQ Merchandised Panelboards**

Table 9.10: Main Circuit Breaker Interiors—Will accept plug-on and bolt-on circuit breakers

			S Price	Interior C	Only	Main Ciro	uit Pro	aker Adapter Kit			Type 1	Enclosure			Type 3R, 5	, 12 Enclo	sure 🔻
Pole Spaces	Mains Rating	Bo	or, Front, ox and ter Kit △	(Order Branch Breakers Sep	h Circuit			aker Adapter Kit t Breaker) △	Box 20 in. W x 5.7	5 in. D ■	Mono-Fla	at™ Front	Hinged	l Front	Enclo 20 in. W x	sure 6.5in. D	Height
		Type 1	Type 3R, 5, 12	Catalog No. ▲	\$ Price	Catalog No.	\$ Price	Circuit Breaker Frame Size □	Catalog No.	\$ Price	Catalog No. ♦	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	(ln.)
20-inch	n-wide (	Cabinet	. ⇔—Singl	e Phase 3-Wire	е												
16€		1395.	2977.	NQ18L1	785.	_	-		MH26	113.	NC26 ()	497.	NC26( )HR	620.	MH26WP	2192.	26
	100 back-	1474.	3056.	NQ18L1C	864.	_	_	Select QOB 2-pole or	IVII 120	113.	14020()	457.	14020()1111	020.	IVII IZOVVI	2192.	20
28€	fed	1585.	3149.	NQ30L1	945.			QOB-VH☆	MH32	113.	NC32 ()	527.	NC32()HR	657.	MH32WP	2204.	32
		1675. 2227.	3239. 3781.	NQ30L1C NQ18L1	1035. 785.		_										
18	100	2306.	3860.	NQ18L1C	864.	NQMB2HJ	780.	HD, HG, HJ, HL*	MH38	113.	NC38 ()	549.	NC38()HR	687.	MH38WP	2216.	38
		2501.	4328.	NQ30L1	945.			100A maximum									
30	100	2591.	4418.	NQ30L1C	1035.	NQMB2HJ	780.		MH44	113.	NC44 ()	663.	NC44()HR	830.	MH44WP	2603.	44
30	225	2660.	4487.	NQ30L2	1104.		780.		MH44	113.	NC44 ( )	663.	NC44()HR	830.	MH44WP	2603.	44
	220	2735.	4562.	NQ30L2C	1179.		700.		10111-1-1	110.	11044 ()	000.	14044()/11/		1011 1-7-7-01	2000.	
42	225	2962.	4729.	NQ42L2	1340.	NQMB2HJ	780.	HD, HG, HJ, HL* or JD, JG, JJ, JL	MH50	113.	NC50()	729.	NC50()HR	912.	MH50WP	2609.	50
		3040. 3976.	4807. 5729.	NQ42L2C NQ72L2	1418. 2297.	NQMB2Q		QB,QD,QG,QJ									
72★	225	4109.	5862.	NQ72L2C	2430.	NQMB2KI	780.		MH56	113.	NC56 ()	786.	NC56()HR	983.	MH56WP	2652.	56
	005	4459.	6144.	NQ84L2	2679.				MUIOO	440	NOSS ()		NOSSANIE	1100	141 1001 A/D		
84★	225	4615.	6300.	NQ84L2C	2835.		780.		MH62	113.	NC62 ()	887.	NC62()HR	1109.	MH62WP	2685.	62
30	400	3400.	5085.	NQ30L4	1620.	NQMB4LA	780.	LA/LH <b></b>	MH62	113.	NC62V ( )	887	NC62V()HR	1109.	MH62WP	2685.	62
	100	3517.	5202.	NQ30L4C	1737.	TTQIVID-TEXT	700.	2, 72,117	WITTOL	110.	110021()	007.	140024()/111	1100.	1011102111	2000.	- OL
42	400	3558.	5243.	NQ42L4	1778.	NQMB4LA	780.	LA/LH <b></b>	MH62	113.	NC62V()	887.	NC62V()HR	1109.	MH62WP	2685.	62
84★	400	3676. 5686.	5361. 7407.	NQ42L4C NQ84L4C	1896. 3792.	NQMB4LA	780.	LA/LH <b></b>	MH80	113.	NC80V ( )	1001.	NC80V()HR	1245.	MH80WP	2835.	80
	l			Phase 4-Wire	l	TTQTVID-1E/T	700.	E VEIIV	IVII IOO	110.	110001()	1001.	110001()/111	1240.	IVII IOOVVI	2000.	00
20		1395.	2977.	NQ418L1	785.	_	_	I	l			l			l	ı	l l
15⊖	100	1474.	3056.	NQ418L1C	864.		_	Select	MH26	113.	NC26 ()	497.	NC26()HR	620.	MH26WP	2192.	26
	back- fed	1585.	3149.	NQ430L1	945.	_	_	QOB 3-pole or QOB-VH▽	141100								
27€		1675.	3239.	NQ430L1C	1035.	_	_	1	MH32	113.	NC32 () <b>527.</b>	NC32()HR	657.	MH32WP	2204.	32	
18		2318.	3872.	NQ418L1	876.				MH38	113.	NC38 ()	549.	NC38()HR	687.	MH38WP	2216.	38
	100	2393.	3947.	NQ418L1C	951.	NQMB2HJ	780.	HD, HG, HJ, HL 100A maximum	1111100			0.0.	. 1000( )				
30		2668.	4495.	NQ430L1	1112.			100A maximum	MH44	113.	NC44 ()	663.	NC44()HR	830.	MH44WP	2603.	44
		2747. 2771.	4574. 4598.	NQ430L1C NQ430L2	1191. 1215.												
30		2848.	4675.	NQ430L2C	1292.		780.		MH44	113.	NC44 ()	663.	NC44()HR	830.	MH44WP	2603.	44
		3098.	4865.	NQ442L2	1476.												
42		3173.	4940.	NQ442L2C	1551.	NQMB2HJ	780.	HD, HG, HJ, HL or	MH50	113.	NC50()	729.	NC50()HR	912.	MH50WP	2609.	50
54	225	3519.	5286.	NQ454L2	1898.	NQMB2Q	700.	JD, JG, JJ, JL	IVII 130	113.	14030 ( )	129.	NOSU( )FIR	912.	IVII ISUVVP	2009.	50
		3615.	5382.	NQ454L2C	1994.	NQMB2KI		QB,QD,QG,QJ									
72★		4210. 4339.	5963. 6092.	NQ472L2 NQ472L2C	2531. 2660.		780.	KI	MH56	113.	NC56 ()	786.	NC56()HR	983.	MH56WP	2652.	56
		4339.	6417.	NQ472L2C NQ484L2	2952.												
84★		4882.	6567.	NQ484L2C	3102.		780.		MH62	113.	NC62 ()	887.	NC62()HR	1109.	MH62WP	2685.	62
		3642.	5327.	NQ430L4	1862.												
30		3760.	5445.	NQ430L4C	1980.	NQMB4LA	780.	LA/LH <b></b>	MH62	112	NC62V()	997	NC62V()HR	1100	MH62WP	2685.	62
42		3792.	5477.	NQ442L4	2012.	TAGINIDALA	700.	L/VLII¥	IVII IOZ	113.	140024 ()	007.	INOUZV()FIN	1109.	IVII IOZVVF	2005.	02
	400	3913.	5598.	NQ442L4C	2133.												
72★		5314.	6986.	NQ472L4	3449.	NQMB4LA	780.	LA/LH <b></b>	MH74	113.	NC74V ()	972.	NC74V()HR	1215.	MH74WP	2757.	74
84★		5522. 6160.	7194. 7881.	NQ472L4C NQ484L4C	3657. 4266	NQMB4LA	780.	LA/LH <b></b>	MH80	112	NC80V ()	1001	NC80V()HR	1245.	MH80WP	2835.	80
04*		0100.	7001.	INQ404L4C	4200.	INQIVID4LA	100.	LAVL⊓▼	IVITIOU	113.	140004 ( )	1001.	INCOUN( )TH	1243.	IVITIOUVVP	2005.	60

- "C" suffix indicates copper bussing.
  Embossed mounting holes add a 0.25 inch standoff to back of MH box.
  Add "F" for flush mount, "S" for surface mount.
- Use only if the Local Jurisdiction where this panelboard interior is being applied has adopted the 2008 NEC, which allows single panelboard interiors greater than 42 circuits.
- Enclosure includes trim kit.
- Select the appropriate main circuit breaker from the tables starting on Digest page 7-22 and add the circuit breaker price to the total price of the panelboard. Circuit breaker interrupt ratings, See the tables starting on Digest page 7-22.
- For the NQ14-inch-wide panelboard offer, See Digest page 9-8.
- QOB2150VH takes four pole spaces; all other QOB two pole circuit breakers take two pole spaces.

  QOB3110VH to QOB3150VH take six pole spaces; all other QOB three pole circuit breakers take three pole spaces.

  Pole spaces shown are available for branch circuits, with spaces deducted for the back fed main breaker.
- For single phase applications, order a 3-pole breaker. Example: HDL36100. For 400A applications, order short handle circuit breaker (LAL36400MB).





14-inch-wide NQ Panelboard Main Lug



Main Breaker Panelboard



Main Lug Panelboard

9-8

### NQ 14-inch-wide—240 Vac, 48 Vdc

14-inch-wide NQ panelboards are now available for those customers whose equipment space is limited. Developed with customer input, Square D™ brand NQ panelboards are built to last, featuring innovations for ease of installation and durability.

### **Features**

- 240 Vac, 48 Vdc maximum
- 225 A maximum main circuit breaker or main lugs
- 60 A maximum branch circuit breakers
- Visi-Trip™ indication on branch circuit breakers
- 10,000-65,000 A Short Circuit Current Rating (SCCR)
- Interiors supplied with tin plated copper bus as standard
- Interiors accept bolt-on and plug-on branch circuit breakers
- Three-phase, four-wire, and single-phase, three-wire interiors available
- Panelboards available with Mono-Flat™ front
- Suitable for use as service entrance equipment
- Branch circuit filler plates provide fast and easy installation
- Both fully and series-rated systems are available

Table 9.11: Main Lug Interiors—Accepts Plug-On and Bolt-On Branch Breakers

		Total S	Price	Interior On Branch Circu				Type 1 E	nclosure		
Max. Number of Breakers	Main Ratings		apter Kit		Seperately)		x 5.75" Db	Mono Fl	at Front	Hinge	d Front
OI DIEARCIS	naungs	Type 1	Type 3R, 5, 12	Cat. No.	\$ Price	Cat. No. \$ Price		Cat. No. ■	\$ Price	Cat. No.	\$ Price
14-inch-wide C	14-inch-wide Cabinet—Single Phase 3-Wire										
18	100 A	1407.	_	NQ18L1C14	951.	NQB532	118.	NQC32	338.	N/A	_
30	100 A	1647.	_	NQ30L1C14	1191.	NQB532	118.	NQC32	338.	N/A	_
30	225 A	1748.		NQ30L2C14	1292.	NQB532	118.	NQC32	338.	N/A	-
42	223 A	2028.	_	NQ42L2C14	1151.	NQB538	118.	NQC38	338.	N/A	_
14-inch-wide C	abinet—T	hree Phase	e 4-Wire								
18	100 A	1407.	_	NQ418L1C14	951.	NQB532	118.	NQC32	338.	N/A	_
30	100 A	1647.	_	NQ430L1C14	1191.	NQB532	118.	NQC32	338.	N/A	_
30	225 A	1748.	_	NQ430L2C14	1292.	NQB532	118.	NQC32	338.	N/A	_
42	223 A	2028.	_	NQ442L2C14	1151.	NQB538	118.	NQC38	338.	N/A	_

Table 9.12: Main Circuit Breaker Interiors—Accepts Plug-On and Bolt-On Branch Breakers

			\$ Price		r Only (Order Main Circuit Breaker Adapter Kit						Type 1 Enclo	osure		
Max. Number of	Box and Breakers Some		Branch Čir Breakers Sep		(Less C			Box 14"W x 5.75" Db		Mono Flat	Front	Hinged	Front	
Breakers	nauriys	Type 1	Type 3R, 5, 12	Cat. No.	\$ Price	Cat. No	Cat. No \$ Price		Cat. No.♦	\$ Price	Cat. No. ■	\$ Price	Cat. No.	\$ Price
14-inch-w	ride Cabi	net—Sin	gle Phas	e 3-Wire										
16 ▲	400	1407.	_	NQ18L1C14	951.	_	_	Select QOB	NQB532	118.	NQC32	338.	N/A	_
28 ▲	100	1647.	_	NQ30L1C14	1191.	_	_	2-pole or QOB-VH	NQB532	118.	NQC32	338.	N/A	_
30		1748.	_	NQ30L2C14	1292.	NOMBOULL	780. H		NQB544	118.	NQC44	338.	N/A	_
42	225	2028.	_	NQ42L2C14	1151.	NQMB2HJ14 or NQMB2Q14	78.	HL, OR JD, JG, JJ, JL, QB, QD, QG, QJ	NQB550	118.	NQC50	359.	N/A	_
14-inch-w	ide Cabi	net—Th	ree Phase	4-Wire										
15 ▲	400	1407.	_	NQ418L1C14	951.	_	_	Select QOB	NQB532	118.	NQC32	338.	N/A	_
27 ▲	100	1647.	_	NQ430L1C14	1191.	_	_	3-pole or QOB-VH	NQB532	118.	NQC32	338.	N/A	_
30		1748.	_	NQ430L2C14	1292.	NOMBOLLIAA	780.	HD, HG, HJ,	NQB544	118.	NQC44	338.	N/A	_
42	225	2028.		NQ442L2C14	1151.	NQMB2HJ14 or NQMB2Q14	78.	HL, OR JD, JG, JJ, JL, QB, QD, QG, QJ	NQB550	118.	NQC50	359.	N/A	_

- Pole spaces shown are available for branch circuits, with spaces deducted for the back-fed main breaker. Add "F" for flush mount, "S" for surface mount.
- All 14" W boxes come with blank endwalls.

Table 9.13: NQ Accessories

Description	Catalog No.	\$ Price	Schedule
Equipment Ground Bars			
Aluminum	PK27GTA	33.80	DE3A
PK23GTA+ #1 to #4/0 Al or Cu lug	PK23GTAL	40.70	DESA
Copper	PK27GTACU	84.00	PE-1A
Ground Bar Insulator Kit	PKGTAB	43.80	DE3A
Filler plate (15 per package)	NQFP15★	68.00	PE1A
Handle Attachments—Branch Circuit Breakers			
Handle lock-off	HLO1	9.90	
Handle tie - (QO and QOB only)	QO1HT	3.80	
Handle padlock attachment—1-pole	QO1PA	10.70	DE2A
2- and 3-pole	QO1PL	10.70	
Handle tie and lock-off for three 1-pole (QO, QOB)	QO3HT	13.40	

Filler Plates are \$3.00 each and must be ordered in packages of 15.



### **NQ** Merchandised **Panelboards**

Class 1640 / Refer to Catalog 1640CT0801

### Table 9.14: NQ Merchandised Neutrals

Mains		200% Neutral Kit	Copper 100% Neutral Kit					
Ampacity	Catalog No.	\$ Price	Box Add	Schedule	Catalog No.	\$ Price	Box Add	Schedule
100	NQNL1	315.	no adder	PE-1A	NQN1CU	192.	no adder	PE-1A
225	NQNL2 or NQNL2ACCY■	426.	no adder	FL-IA	NQN2CU	192.	no addei	FL-IA
400	NQNL4▲	639.	no adder	PE-1A	NQN6CU	585.	no adder	PE-1A
600		Not Available			NQN6CU▲	303.	no adder	I L-IA

- Not to be used with SFL, FTL, or SFB. These combinations are factory assembled only. For 225A panel with SFL, FTL, or SFB, use NQNL2ACCY (enclosure size increases by 6 inches). Otherwise, use NQNL2.

Table 9.15: NQ Merchandised Sub-feed Lugs, Feed-through Lugs and Sub-feed Breakers

	Sub-food L	ıqs (N/A in MC	'B Interiore)	Foods	through Lugs		Sub-feed Circuit Breaker Kits (breaker not incl.)					
Mains Ampacity	Sub-leed Lt	igs (IVA III WC	D Interiors)	r ccu-i	inough Lugs		Single SFB Two SFB					
7 mipuoniy	Catalog No.	\$ Price	Schedule	Catalog No.	\$ Price	Schedule	Catalog No.	\$ Price	Schedule	Catalog No.	\$ Price	Schedule
100 A	NQSFL1	155.	PE-1A	100 A not available;	_	_	_	_	_	_	_	_
225 A	NQSFL2	203.	PE-1A	NQFTL2L♦ NQFTL2H★	476.	PE-1A	NQSFB2Q or NQSFB2HJ	1029.	PE-1A	_	-	_
400 A	NQSFL4	260.	PE-1A	NQFTL4L♦ NQFTL4H★	507.	PE-1A	Use the 2	SFB kit	_	NQSFB4Q or NQSFB4HJ	1290.	PE-1A
600 A		Use FTL						Factory Assembled Only				

Note: See Table 9.16 and Table 9.17 for box selection table.

- The final character L indicates the kit is used for Low circuit count interiors 30 and 42.
- The final character H indicates the kit is used for High circuit count interiors 54, 72, and 84.

Table 9.16: Box Selection Table: Merchandised NQ Main Lug Panelboards with Accessories

Feature	5	Sub-fee	ed Lug	s	Fe	ed-thro	ough Lu	ıgs	Sub-	feed Cir	cuit Bre	akers
Circuits		225 A	400 A	600 A	100 A	225 A	400 A	600 A	100 A	225 A (one)	400 A (two)	600 A (two)
18	MH26	_	_	Use	_	_	_	ъ	_	_	_	ъ
30	MH32	MH38	MH50	Use		MH38	MH50	ry bled	_	MH50	MH74	Σ <mark>β</mark> ς
42		MH44	MH50	Use	Use 225A	MH38	MH56	Facto ssem Only	_	MH56	MH74	or or or or or or or or or or or or or o
72		MH50	MH62	Use	Interior	MH50	MH68	Facto ssserr Only	_	MH62	MH86	Ssse Or
84		MH56	MH68	Use		MH56	MH68	Ä	_	MH68	•	¥

▼ (c) Requires box longer than available box offer.

Table 9.17: Box Selection Table: Merchandised NQ Vertically Mounted Main Breaker Panelboards w/ Accessories

Feature		Feed-throu	ıgh Lugs		Su	b-feed Circ	uit Breaker	'S
Circuits	100 A	225 A	400 A	600 A	100 A	225 A (one)	400 A (two)	600 A (two)
18	_	_	_	D.	_	_	_	D.
30	_	MH50	MH62	Sec >	_	MH62	MH86	Σ-gg _
42	_	IVII ISO	MH68		_	MH68	MH86	g a g
72	_	MH62	MH80	Fact	_	MH74	Δ	Fact
84	_	MH68	MH80	Ϋ́	_	MH80	Δ	۴

(c) Requires box longer than available box offer.

Table 9.18: NQ Optional Lugs

	- I								
Ampacity	AL (	Compression Lug Kit		C	U Mechanical Lug Kit		CU		
Ampacity	Catalog No.	Lug Wire Range	\$ Price	Catalog No.	Lug Wire Range	\$ Price	Catalog No.	Lug Wire Range	\$ Price
100	NQALV1	one #8-1/0 AWG	117.00	NQCUM1	one #6-2/0 AWG	347.00	NQCUV1	one #6-1/0 AWG	345.00
225	NQALV2	one #4–300 kcmil	33.00	NQCUM2	one #6-250 kcmil	347.00	NCQUV2	one 2/0–300 kcmil	417.00
400	NQALV4	two 2/0-500 kcmil	663.00	NQCUM4	one 1/0–750 kcmil two 1/0–350 kcmil	636.00	NQCUV4	one 400-700 kcmil	767.00
600	NQALV6	two 2/0-500 kcmil	1208.00	NQCUM6	one 1/0–750 kcmil two 1/0–350 kcmil	1139.00	NQCUV6	two 250-500 kcmil	1364.00

Table 9.19:	NQ Accessorie	s

	Description	Catalog No.	\$ Price	Schedule				
Sub-feed (Bolt-on)								
2-pole		QOB2125SL	176.00	DEGA				
3-pole		QOB3125SL	176.00	DE2A				
Equipment Ground Bars			<u> </u>					
Aluminum		PK27GTA	33.80					
PK23GTA+ #1 to #4/0 Al or Cu lug		PK23GTAL	40.70	DE3A				
Copper		PK27GTACU	84.00	PE-1A				
Ground Bar Insulator Kit		PKGTAB	43.80	DE3A				
Filler plate (15 per package)		NQFP15□	68.00	PE1A				
Circuit I.D. Number Strips								
1-102 odd/even (left side numbere	ed 1,3,5101)	NQ1020E	7.90					
103-204 odd/even (left side numb		NQ2040E	7.90					
1-102 sequential (left side number		NQ102S	7.90					
103-204 sequential (left side numl		NQ204S	7.90	PE1A				
	6 in. Extension	NQ6RDE	252.00	FEIA				
Rail and Deadfront Extensions	12 in. Extension	NQ12RDE	283.00					
nali aliu Deaulioni Exterisions	18 in. Extension	NQ18RDE	343.00					
	24 in. Extension	NQ24RDE	397.00					
Touch-up paint USAS #49 Gray (A		PK49SP	39.00	DE1				
Handle Attachments—Branch	Circuit Breakers							
Handle lock-off		HLO1	9.90					
Handle tie - (QO and QOB only)		QO1HT	3.80					
Handle padlock attachment—1-po	le	QO1PA	10.70	DE2A				
2- and 3-pole		QO1PL	10.70					
Handle tie and lock-off for three 1-		QO3HT	13.40					
Handle tie for two 10–30 A single p		QOHT2	10.90	DE2				
Handle tie for three 10–30 A single	1 (7	QOHT3	12.80	522				
Handle Padlock Attachment fo	r Padlocking in OFF position							
For padlocking 1P QO circuit breal	ker in OFF position only, fixed attachment	QO1PAF	43.50					
	uit breaker in OFF position only, fixed attachment	QO2PAF	25.80	DE2E				
For padlocking 1P QO-GFI, QO-Al	FI, QO-CAFI, and QO-EPD circuit breakers in OFF position only, fixed attachment	QOGFI1PAF	51.00	DE2E				
For padlocking 2P QO-GFI and Q0	D-EPD circuit breakers in OFF position only, fixed attachment	QOGFI2PAF	38.40					
Neutral or Ground Lugs								
#10 to #2 Al or #14 to #4 Cu		QO70AN	9.90					
#4 to #1/0 Al or Cu		Q1100AN	11.10	DE3A				
#1 to #4/0 Al or Cu		Q1150AN	32.40					
Endwalls for MH Enclosures			•					
Blank (one per package)		8011010501	41.10	DE4A				
With Knockouts (one per package)		8011010401	41.10	PE1A				

<sup>□</sup> Filler Plates are **\$4.50** each and must be ordered in packages of 15.

Table 9.21:	Standard Interru	pting C	OB	10,000 A	NR (	Circuit	Breakers	3
		_		_				

Ampere Rating ▲	One-pole		Two-pole- Common T		Three-p	Three-pole—Common Trip				
Rati	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price		
	Gri—QUB QWII	K-Gar	a Circuit Br		With Ground F	ault C	ircuit Interrup	ter—		
UL C	lass A 4–6 mA P	eople								
	120 Vac—10 k	AIR	120/240 Va 10 k AIR		208Y/120 Va 10 k AIR					
15 A	QOB115GFI	248.	QOB215GFI	444.	QOB315GFI	791.				
20 A	QOB120GFI	248.	QOB220GFI	444.	QOB320GFI	791.				
25 A	QOB125GFI	248.	QOB225GFI	444.		-				
30 A	QOB130GFI	248.		444.	QOB330GFI	791.				
40 A		_	QOB240GFI	444.	QOB340GFI	791.				
50 A 60 A			QOB250GFI QOB260GFI ◆	444.	QOB350GFI	791.				
			QUB260GFI V	444.	_					
JOR.	·VHGFI ★									
	120 Vac-22 k									
	QOB115VHGFI									
	QOB120VHGFI									
	QOB125VHGFI QOB130VHGFI									
				-1						
	EPD—QOB Equ									
	JL Listed 30 mA (	(EPD)	or 100 mA (EF	r⊨) ec	luipment protect	ion.				
	120 Vac—10 k	AIR	120/240 Va 10 k AIR		240		-10 k AIR			
15 A	QOB115EPD	417.	10 k AIR QOB215EPD	671.	QOB315EPD♦	) Vac- 1077.	QOB315EPE♦			
15 A 20 A	QOB115EPD QOB120EPD	417. 417.	10 k AIR QOB215EPD QOB220EPD	671. 671.		) Vac- 1077.				
15 A 20 A 25 A	QOB115EPD QOB120EPD QOB125EPD	417. 417. 417.	10 k AIR QOB215EPD QOB220EPD QOB225EPD	671. 671. 671.	QOB315EPD♦	Vac- 1077. 1077. —	QOB315EPE♦ QOB320EPE	1077.		
15 A 20 A 25 A 30 A	QOB115EPD QOB120EPD	417. 417.	10 k AIR QOB215EPD QOB220EPD QOB225EPD QOB230EPD	671. 671. 671. 671.	QOB315EPD♦ QOB320EPD♦ — QOB330EPD♦	Vac- 1077. 1077. - 1077.	QOB315EPE   QOB320EPE   QOB330EPE	1077. — 1077.		
15 A 20 A 25 A 30 A 40 A 50 A	QOB115EPD QOB120EPD QOB125EPD	417. 417. 417.	10 k AIR QOB215EPD QOB220EPD QOB225EPD QOB230EPD QOB240EPD	671. 671. 671. 671.	QOB315EPD♦	1077. 1077. 1077. — 1077.	QOB315EPE   QOB320EPE   QOB330EPE	1077. — 1077. 1077.		

Rating A			Irip		Common I	rıp ◊	Common	Irip
nating A	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
QOB Bolt-O	n							
	120 Vac—10 48 Vdc—5 I		120/240 Vac— 48 Vdc—5 k		240 Vac 10 k All		240 Vac—10 48 Vdc—5 k	
10 A	QOB110	39.80	QOB210	89.	_	_	QOB310	293.
15 A	QOB115☆▼	39.80	QOB215 ★	89.	QOB215H	240.	QOB315☆	293.
20 A	QOB120 <b>★</b> ▼	39.80	QOB220 ☆	89.	QOB220H	240.	QOB320☆	293.
25 A	QOB125 ☆	39.80	QOB225 ☆	89.	QOB225H	240.	QOB325☆	293.
30 A	QOB130 <b>☆</b>	39.80	QOB230 ☆	89.	QOB230H	240.	QOB330☆	293.
35 A	QOB135 ☆	39.80	QOB235 ☆	89.	_	-	QOB335☆	293.
40 A	QOB140 ☆	39.80	QOB240 ☆	89.	QOB240H	240.	QOB340☆	293.
45 A	QOB145 ☆	39.80	QOB245 ☆	89.	_	_	QOB345☆	293.
50 A	QOB150 <b>☆</b>	39.80	QOB250☆	89.	QOB250H	240.	QOB350☆	293.
60 A	QOB160 <b>☆</b>	39.80	QOB260 ☆	89.	QOB260H	240.	QOB360☆	293.
70 A	QOB170 ☆	78.	QOB270 ☆	168.	QOB270H	308.	QOB370☆▽	369.
80 A	_	_	QOB280 ★▽	240.	QOB280H	366.	QOB380☆▽	419.
90 A	_	_	QOB290 ☆▽	240.	QOB290H	366.	QOB390 ☆▽	419.
100 A	_	_	QOB2100 <b>☆</b> ▽	240.	QOB2100H	366.	QOB3100 ☆ ▽	419.
110 A	_	_	QOB2110 <b>☆</b> ▽	501.	_	_		_
125 A	_	_	QOB2125 ★▽	501.	_	_	_	_
Molded Case 240 Vac	Switch 60 A m	ах—	QOB200	89.	_	_	QOB300	293.
Molded Case 240 Vac	Switch 100 A	max—	QOB2000	234.	_	_	QOB3000	507.

### Table 9.22: High Interrupting QOB and Specialty Circuit Breakers

122.

122.

122.

49.50

49.50

49.50

49.50

49.50

49.50

70 A										QUDUTULI		
50 A	_	I					QOB350EF	°D ♦ 107	77.	QOB350EP	È∳.	1077.
60 A	_	I	QOE	3260	EPD	671.		-	-	_		
QOB-	-VHEPD											
	120 Vac-22 k	AIR										
15 A	QOB115VHEPD	772.										
20 A	QOB120VHEPD	772.										
25 A	QOB125VHEPD	772.										
30 A	QOB130VHEPD	772.										
QOB-	-HM—High mag	netic	trip c	ircui	it bre	akers	;					
15 A	QOB115HM▼	39.80										
20 A	QOB120HM▼	39.00										
QOB-	-K—Key operate	d QO	B cir	cuit	brea	kers 4	Δ					
	120 Vac-10 k	AIR										
10 A	QOB110K	168.										
15 A	QOB115K	168.	,									
20 A	QOB120K	168.	,									
25 A	QOB125K	168.	,									
30 A	QOB130K	168.	,									
(Footi	notes for Tables 9											
•	10–30 A circuit	break	cers a	are su	uitabl	e for ι	use with 60 '	°C or 75	5°C	conductors	. 35	-60 A

	Hating ▲	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
	QOB-VH						
		120 Vac-22 I	k AIR	120/240 Vac —2	2 k AIR	240 Vac-22 k	AIR
	15 A	QOB115VH☆▼	72.	QOB215VH☆	171.	QOB315VH <del>☆</del>	440.
	20 A	QOB120VH☆▼	72.	QOB220VH <b>☆</b>	171.	QOB320VH☆	440.
	25 A	QOB125VH <del>☆</del>	72.	QOB225VH☆	171.	QOB325VH☆	440.
i	30 A	QOB130VH <del>☆</del>	72.	QOB230VH☆	171.	QOB330VH☆	440.
	40 A	QOB140VH	86.	QOB240VH☆	171.	QOB340VH <b>☆</b>	440.
	50 A	QOB150VH	86.	QOB250VH☆	171.	QOB350VH☆	440.
	60 A	QOB160VH	86.	QOB260VH☆	171.	QOB360VH☆	440.
	70 A	QOB170VH	137.	QOB270VH☆	273.	QOB370VH <del>☆</del>	560.
	80 A	_	_	QOB280VH☆	384.	QOB380VH <b>☆</b>	629.
	90 A	_	_	QOB290VH☆	384.	QOB390VH☆	629.
	100 A	_	_	QOB2100VH☆	384.	QOB3100VH☆	629.
	110 A	_	_	QOB2110VH☆	1110.	QOB3110VH <b>●</b>	1809.
	125 A	_	_	QOB2125VH☆	1110.	QOB3125VH ●	1809.
-	150 A	_	_	QOB2150VH	1223.	QOB3150VH €	1809.
	QHB						
		120 Vac-65 I	k AIR	120 Vac/240 Vac-	65 k AIR	240 Vac-65 k	AIR
	15 A	QHB115 <b>☆</b> ▼	122.	QHB215☆	342.	QHB315★	596.

QHB220☆

QHB230<sup>4</sup>

QOB215HID

QOB220HID

OOB230HID

QOB240HID

QOB250HID

-NEC 514 1

120/240 Vac-10 k AIR

342.

342

342.

108

108.

108.

108.

108.

108.

QHB320☆

QHB330☆

QOB315HID

QOB320HID

QOB330HID

240 Vac-10 k AIR

596.

596.

596

327

327.

327.

327.

i oou	ioles ioi	Tables J.L	υ, υ. <u>~</u> ι, αικ	10.22)				
•	10-30	A circuit be	eakers are	suitable for	use with	60 °C or 75	°C conductors	. 35
	circuit	breakers a	re suitable	for use with	75 °C cc	inductors.		

- circuit breakers are suitable for use with 75 °C conductors.

  Do not connect to more than 250 feet of load conductor for the total one-way run to prove the use see tripping.
- Suitable only for feeding 240 Vac and 208 Vac two-wire loads. Does not contain load neutral connection.
- Recommended for applications where high initial inrush may occur and for individual dimmer applications.
- dimmer applications.

  ✓ UL Listed as SWD (switching duty) rated suitable for switching 120 Vac fluorescent lighting leads.
- Available in single pole construction and can be mounted in any single pole space which will accept a standard QOB. These circuit breakers can be turned ON or OFF or RESET with a special key (Catalog No. QOK10) included with the circuit breaker. These circuit breakers are UL Listed and available as shown in the table.
- UL Listed for use on circuit feeding fluorescent and High Intensity Discharge (HID) lighting systems such as mercury vapor, metal halide, or high pressure sodium. These circuit breakers are physically interchangeable with QOB circuit breakers.
- ♦ UL Listed 5,000 AIR on 3Ø corner grounded delta systems.
- UL Listed as HACR type for use with air conditioning, heating, and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.
- □ DC Rating is not available on indicated products.
- QOB2150VH uses 4 pole spaces. QOB3110VH, QOB3125VH, and QOB3150VH each use 6 pole spaces. 40A maximum circuit breaker mounted opposite. Use with 75 °C wire only.
- \* For QO plug-on circuit breaker pricing, see the tables starting on Digest page 1–2.
- See note in Instruction Bulletin when using in an enclosure with a QO403 or QON prefix.

			1-pole—2-Wire 2 Spaces —120 Vac			re 40 Vac
10 A	_	_	QOB210SWN	116.	QOB310SWN	170.
15 A	_	_	QOB215SWN	116.	QOB315SWN	170.
20 A	_	_	QOB220SWN	116.	QOB320SWN	170.
25 A	_	_	QOB225SWN	116.	QOB325SWN	170.
30 A	_	_	QOB230SWN	116.	QOB330SWN	170.
40 A	=	_	QOB240SWN	116.	QOB340SWN	170.
50 A	_	_	QOB250SWN	116.	QOB350SWN	170.

Table 9.23: QO/QOB Circuit Breaker Wire Sizes

Breaker Type Ampere Rating • ΔΙ 10-30 A #14-8 #14-8 QOB 10–30 A two #14-10 1-pole 35-70 A #8-2 #8-2 10-30 A #14-8 #14-8 10-30 A two #14-10 QOB #8-2 35-70 A #8-2 #4-2/0 80-125 A #4-2/0 150–200 A #4-300 kcmil #4-300 kcmil 10-30 A #14-8 #14-8 35–70 A 3-pole 80-125 A #4-2/0 #4-2/0 QOB-VH 110-150 A #4-300 kcmil #4-300 kcmil QOB-GFI and 15-30 A #12-8 #14-8 40, 50, or 60 A #12-4 #14-6

10–30 A circuit breakers are suitable for use with 60 °C or 75 °C conductors. 35–60 A circuit breakers are suitable for use with 75 °C conductors.

Table 9.24: QO™ Arc-Fault Circuit Breakers ≎ 

□

Circuit Breaker Type	Ampere Rating ♦	1P 120 Vac 10 kAIR 1 Space Requ		1P 120 Vac 22 kAIR 1 Space Requ	
		Catalog Number	\$ Price	Catalog Number	\$ Price
Combination	15 A	QOB115CAFI	306.	QOB115VHCAFI	612.
Arc-Fault Interupter	20 A	QOB120CAFI	306.	QOB120VHCAFI	612.

Note: See Digest page 7-12 for accessories.

- UL Listed as HACR type for use with air conditioning, heating, and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.
- QO arc-fault circuit breakers provide branch feeder protection (for example, QO115AFI) or combination protection (for example, QO115CAFI) as required by the NEC and local code adoption, and comply with UL 1699.
- 10–30 A circuit breakers are suitable for use with 60 °C or 75 °C conductors. 35–60 A circuit breakers are suitable for use with 75 °C conductors.

20 A

25 A

30 A

20 A

25 A

30 A

40 A

50 A

QHB120☆ ▼

OHB130☆

QOB115HID▼

QOB120HID ▼

OOB130HID

QOB140HID

QOB150HID

120 Vac-10 k AIR

**PANELBOARDS** 

**ග** 

Table 9.25: Base Price (With Solid Neutral)

	Main I	Lugo		Main Circuit Breaker (Circuit Breaker Interrupt Rating—pages 6-2 through 6-8) ▲										
Mains	IVIAIII	Lugs	Standard IC			HIC			Extra HIC		I-Limiter™			
Rating	\$ Pr	ice	Circuit			Circuit	\$ Pi	rice	Circuit	\$ Pr	ice	Circuit	\$ Pr	ice
	2-pole	3-pole	Breaker	2-pole	3-pole	Breaker	2-pole	3-pole	Breaker	2-pole	3-pole	Breaker	2-pole	3-pole
60 A	_	_	QOB	1192.	1464.	QOB-VH	1258.	1586.	HJ▲	2950.	3300.	FI	4088.	4858.
	720.	832.	QOB	1254.	1562.	QOB-VH	1382.	1712.		2950.	3300.	FI	4088.	4858.
100 A	720.	832.	QOB	1254.	1502.	QUB-VII	1302.	1712.	HJ▲	2950.	3300.	FI	4088.	4858.
	720.	832.	HD	2030.	2380.	HG	2700.	3050.		2950.	3300.	FI	4088.	4858.
150 A♦		_	HD	3180.	3530.	HG	3840.	4190.	HJ▲	4000.	4350.		_	
225 A♦	772.	928.	QB JD QD	2450. 3980. 3084.	2800. 4300. 3434.	QG JG	3740. 4510.	4090. 5100.	Q3 •	3970. 6450.	4320. 7280.	КІ	7436.	8680.
250 A♦		_	JD	4390.	4640.	JG	5040.	6020.	JJ▲	7100.	8020.	KI	8264.	9672.
400 A♦	1422.	1634.	LA	5366.	6106.	LH	7708.	8834.	LJ	10624.	10624.	LR	13552.	13552.
600 A ■ ♦	2082.	2326.	_	_	_	_	_	_	LJ	12930.	12930.	LR	16002.	16002.

Note: Equipment Ground Bar-38.

- QL, HJ, HL, JJ, and JL circuit breakers are also available.
- Copper bus standard
- Prices are for 54-circuit and fewer interiors. See the Product Selector for 72- and 84-circuit interior pricing.

Table 9.26: Branch Circuit Breakers

**NQ Factory Assembled** 

**Panelboards** 

1 able 9.26: E	ranch Cir	cuit breake	15		
		Plug	-On or Bolt	-On	
Circuit Breaker			\$ Price		
Ampere Rating	1-pole 120 Vac	2-pole 120/240 Vac	2-pole 240 Vac	3-pole 240 Vac	3-pole 208Y/120 Vac
Space Only					
All Space Only except below	28.	58.	58.	86.	_
QOB-VH, Space Only (125-150 A)	_	116.	_	174.	_
10,000 AIR-Bra	anch Circui	t Breakers—	QO™, QOB	, QO-H, QC	В-Н
15-60 A	68.	134.	260. ★	352.	_
70 A	100.	208.	296. ★	396.	_
80-100 A	_	262.	380. ★	458.	
110-125 A	_	482.		_	
10,000 AIR-Co	mbination	Arc Fault Circ	cuit Interru	pters—QO	-CAFI,
QOB-CAFI					
15–20 A	470.		_		
10,000 AIR—Qw Provided with a					
15-30 A	272.	488.	_	_	920.
40–50 A	_	488.	_	_	920.
60 A	_	488.	_	_	_
10,000 AIR-Qw					
Provided with a	30 mA set	ting on grour	nd fault sen	sor	
15–30 A	462.	828.	_	1210.	
40–50 A		828.	_	1210.	_
60 A	_	828.		_	
10,000 AIR—Qw					
Provided with a	100 mA se	tting on grou	ind fault se		
15–30 A		_	_	1210.	_
40–50 A	_		_	1210.	
(High Interruption 22,000 AIR Bran			O-VH OOR	-VH	
15–30 A	92.	212.	O-VII, GOD	462.	
35–60 A		212.		462.	
70 A		292.		556.	
80–100 A	_	378.		606.	_
110–125 A	_	1022.	_		_
150 A	_	1140. ▼		1746.▼	
22,000 AIR—Co QOB-VHCAFI	mbination	Arc Fault Circ	cuit Interru	pters—QO	-VHCAFI,
15–20 A	680.	_			_
22,000 AIR-Qw		Class A—QO-	VHGFI, QO	B-VHGFI	
15–30 A	575.	-	_	_	_
42,000 AIR Bran	ch Circuit	Breakers—Q	ОН		
35–60 A	_	368. △			_
70 A		596. △	_		_
80-100 A	_	688. △	_	_	_
110-125 A	_	<b>1402.</b> △	_	_	_
65,000 AIR Bran	ch Circuit	Breakers—Q	H, QHB		
15–30 A	144.	348.	_	596.	_

Note: Shunt Trip, Auxiliary Switch, and Alarm Switch—accessories for circuit breakers-add \$ Price from page 7-12.

- UL Listed for use on 3Ø, grounded BØ systems, (5,000 AIR for this
- DL Listed for use 5...5., application).

  Bolt-on only; 2-pole requires 4 vertical spaces, 3-pole requires 6 vertical
- Plug-on only.

Table 9.27: Specialty Branch Circuit Breakers

•	-						
	Plug-On or Bolt-On						
Circuit Breaker		\$ Pi	rice				
Ampere Rating	1-pole 120 Vac	2-pole 120/240 Vac	2-pole 240 Vac	3-pole 240 Vac			
Specialty Branch Cir	cuit Breakers	(10,000 AIR)					
For High Intensity Di	scharge Ligh	ting—QO-HI	, QOB-HID				
15–30 A	78.	148.	_	376.			
40–50 A	78.	148.	_	_			
Switch Neutral—QO-	SWN, QOB-S	WN					
15–50 A	_	1-pole 2-wire (2 spaces)	_	2-pole 3-wire (3 spaces)			
	_	154.	_	220.			
High Magnetic Trip (I	For application	ons subject to	high initial i	nrush)—			
15–20 A	68.	_		_			

### **Sub-feed Circuit Breakers**

Main lugs or main circuit breaker interior—1Ø or 3Ø.

Maximum 1 circuit breaker per 225 A main lug or 250 A main circuit breaker panelboard, 2 circuit breakers per 400–600 A panelboard.

Table 9.28: Sub-feed Circuit Breaker (110-225 A) (SeeTable 9.29 for correct box size.)

	Ampacity			QG	HD	HG	JD	JG
	110-225 A							
3	110–225 A	1848.	2296.	4608.	2872.	3798.	3370.	5100.
Space	110–225 A	826.	826.	826.	826.	826.	826.	826.

QJ, HJ, HL, JJ, and JL circuit breakers are also available.

Table 9.29: Sub-feed Circuit Breaker Cabinet Data

Max. No. of	Box Height (20 in. W x 5.75 in. D)							
Branch Spaces (Does not include	225 A	250 A	A 400 A 600		0 A			
sub-feed circuit breaker spaces)	Main Lug	Main Circuit Breaker	Main Lug	Main Circuit Breaker	Main Lug	Main Circuit Breaker		
30	50	62	74	86	74			
42	56	68	74	86	80	Not		
54	56	68	80	_	80	available		
72	62	74	86	_	86	with MCB		
84	68	80	_	_	_			

Not Available in Type 3R, 5, 12 if subfeed breaker is over 150 A.

SQUARE D

### Sub-feed Lugs

NOTE: Available on main lug interiors only, 1Ø or 3Ø.

Table 9.30: Sub-feed Wire Range Per Phase

Mains Rating	Incoming	Outgoing	Price per Panel
100	one #6-2/0 Al or Cu	one #6-2/0 Al or Cu	\$128.
225	one 1/0-350 kcmil Al or Cu	one 1/0-350 kcmil Al or Cu	\$128.
400	one 1/0-750 kcmil Cu only	one 1/0-750 kcmil Cu only	\$164.

Table 9.31: Sub-feed Lug Cabinet Data

Max. No. of	Box Height (20 in. W x 5.75 in. D)						
Branch Spaces	100 A	225 A	400 A				
18	MH26	_	_				
30	MH32	MH38	MH50				
42	_	MH44	MH50				
54	_	MH44	MH50				
72	_	MH50	MH62				
84	_	MH56	MH68				

### Feed-through Lugs

Table 9.32: Feed-through Lugs

Mains Rating	Feed-Through Wire Range Per Phase	\$ Price
100 A	one #6-2/0 Al or Cu	344.
225 A	one #6–350 kcmil Al or Cu	344.
400 A	one 1/0-750 kcmil or two 1/0-350 kcmil Al or Cu	826.
600 A	two 1/0-750 kcmil Al or Cu	826.

Table 9.33: Feed-through Lug Cabinet Data

	Box Height (20 in. W x 5.75 in. D)							
Max. No.	225 A	250 A	400	) A	60	0 A		
of Branch Spaces	Main Lugs	Main Circuit Breaker	Main Lugs	Main Circuit Breaker	Main Lugs	Main Circuit Breaker ▲		
30	38	50	50	62	62	68		
42	38	50	56	68	62	80		
72	50	62	68	80	74	_		
84	56	68	68	80	80	_		

▲ 8.75 in. deep box, ship fully assembled only.

Table 9.34: Ground Bars

Ground Bars	\$ Price Adder
Equipment Ground Bar	38.
Copper Ground Bar (add to Equipment Ground Bar price)	52.
Insulated/Isolated Ground Bar (add to Equipment Ground Bar price)	86.

Table 9.35: Name Plates

Name Plates	\$ Price Adder
Standard white face/black letter laminated bakelite, 1 in. x 3.5 in., adhesive backed or screw mountable with screws in a bag assembly (price includes engraving)	78.

Table 9.36: Copper Bus Bars

Copper Bus Bars	\$ Price Adder
100 A, 225 A, 250 A	128.
400 A	388.
600 A	Standard

Table 9.37: Copper Neutrals

Copper Neutrals	\$ Price Adder
100–600 A	132.

Table 9.38: 200% Rated Neutrals

with 250 A	rds with 200% rated neutrals are not available A J- and K-frame main circuit breakers or ghting contactors	Add Per Panel \$ Price
100 A▲	one #6-2/0 kcmil Al or Cu per lug	586.
225 A▲	one #6-350 kcmil Al or Cu per lug	763.
400 A▲	one #1/0-750 kcmil Al or Cu per lug or two 1/0-300 kcmil per lug	950.

Two incoming neutral lugs per panel

Table 9.39: NQ Main Neutral Conductors—Required Size and Quantity

Panelboard Ampacity	Neutral Conductors Required	Actual Lug Wire Range
100/125	(2) 1/0 Cu or Al	(2) #4-300kcmil
225	(2) 4/0 Cu or (2) 300 kcmil Al	(2) #4-300 kcmil
400 A	(4) 3/0 Cu or (4) 250 kcmil Al (2) 600 kcmil Cu (2) 750 kcmil Al	(2) 1/0-300 kcmil or (1) 750 kcmil

Note: Neutral conductors must be of size and quantity per table above.

Table 9.40: Metal Directory Frames

Metal Directory Frame	\$ Price Adder
Replaces standard plastic stick-on directory pouch	140.

Table 9.41: Hinged Door-in-Door Trims

Hinged Door-in-Door Trim	Add Per Panel \$ Price
Hinged Door-in-Door Trim has piano hinge down one side. Inner door has a lock, outer door is retained with screws	646.
Hinged Door-in-Door with Outer Door Lock in place of screws	836.

Table 9.42: Weatherproof or Dusttight Cabinets—Type 3R, 5, 12

Weatherproof or Dusttight Cabinets	\$ Price Adder
<b>Note:</b> 600 A L-Frame main circuit breaker NQ panelboards are not available with a weatherproof enclosure (Use I-Line)	
400 and 600 A NQ panelboards with sub-feed circuit breakers are not available with a weatherproof enclosure (Use I-Line).	1516.
400 A NQ panelboards are available with a subfeed breaker up to 150 A. See Table 9.29 on page 9-11.	

Table 9.43: Optional Factory Assembled Lugs for Main Lug Interiors

Main Lug Interiors:	Price Per Pole Adder			
Main Lug Interiors.	100A	225A	400A	600A
Aluminum Compression Lugs	58.	58.	148.	148.
Copper Mechanical Lugs	70.	108.	148.	168.
Copper Compression Lugs	70.	108.	148.	168.

**Optional Factory Assembled Lugs** for Main Circuit Breaker Interiors

Main Circuit Breaker Interiors:	Price Per Pole Adder			
Walli Circuit Breaker litteriors.	H Frame	J Frame	LA Frame	LC Frame
Aluminum Compression Lugs	58.	98.	148.	148.
Copper Mechanical Lugs	70.	108.	148.	168.
Copper Compression Lugs	70.	108.	148.	168.

Note: Optional lugs are not available for Q frame main or QOB

Table 9.45: Surgelogic™ Hard Bus SPD-Model IMA ■

Surge Current	Voltage		
Rating kA	120/240 V 1Ø3W	208Y/120 V 3Ø4W	240/120 V 3Ø4W High Leg
100	10130.	11970.	11970.
120	10784.	12548.	15654.
160	12172.	13807.	13807.
200	14637.	17992.	17992.
240	17822.	20583.	20583.

SPD units add 18 in. of box height in NQ panelboards

Table 9.46: Surgelogic SPD Options

5 5 .	
Description	\$ Price
Surge Counter	Standard
Dry Contacts	Standard
Remote Monitor	2588.

Note: Additional factory modifications, See Digest page 9-38.

**NF Merchandised Panelboards** 

Table 9.47: NF Main Lug Interiors—Use I-Line™ Panelboards on 480 V 3Ø3W Delta Applications

Max No. of								NEMA 1 E	nclosure			NEMA 3R,	5, 12 Enclo	sure 🛆
Max No. of Single Pole EDB Circuit	Mains Rating	\$ Tota	al Price ▲	Interior O	nly ■	Bo 20 in. W x 5		Mono-Flat <sup>™</sup>	<sup>M</sup> Front ▼	Hinged F	ront	Enclos 20 in. W x 6		Height (In.)
Breakers		NEMA 1	NEMA 3R, 5, 12	Catalog No. ◆	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	rieignt (iii.)
(Single Phas	se 3-Wire:	Factory As	ssembled Only	) Three Phase	4-Wire									
18	125	2056.	3638.	NF418L1	1446.	MH26	113.	NC26( )	497.	NC26()HR	620.	MH26WP	2192.	26
10	123	2448.	4030.	NF418L1C	1838.	MH26	113.	NC26( )	497.	NC26()HR	020.	MH26WP	2192.	20
30	125	2406.	3970.	NF430L1	1766.	MH32	113.	NC32( )	527.	NC32()HR	657.	MH32WP	2204.	32
30	123	2802.	4366.	NF430L1C	2162.	MH32	113.	NC32( )	321.	NC32()HR	057.	MH32WP	2204.	32
30	250	2881.	4435.	NF430L2	2219.	MH38	113.	NC38( )	549.	NC38()HR	687.	MH38WP	2216.	38
	200	3286.	4840.	NF430L2C	2624.	MH38		NC38( )	0.0.	NC38()HR	0011	MH38WP		
42	250	3194.	5021.	NF442L2	2418.	MH44	113.	NC44( )	663.	NC44()HR	830.	MH44WP	2603.	44
		3602.	5429.	NF442L2C	2826.	MH44		NC44( )		NC44()HR		MH44WP		
54	250	4370.	6067.	NF454L2	2616.	MH50	113.	NC50( )	729.	NC50()HR	912.	MH50WP	2609.	56
		4775.	6472.	NF454L2C	3021.	MH50		NC50( )	_	NC50()HR	_	MH50WP		
66□	250	4800. 5442.	6485. 7127.	NF466L2 NF466L2C	3800.	MH62	113.	NC62( ) NC62( )	887.	NC62()HR	887.	MH62WP	2685.	62
		3308.	5075.	NF430L4	4442. 2466.	MH62 MH50		NC50V()		NC62()HR NC50V()HR		MH62WP MH50WP		<u> </u>
30	400	3716.	5483.	NF430L4C	2874.	MH50	113.	NC50V( )	729.	NC50V()HR	912.	MH50WP	2609.	50
-		3572.	5325.	NF442L4	2673.	MH56		NC56V()		NC56V()HR		MH56WP		
42	400	3895.	5648.	NF442L4C	2996.	MH56	113.	NC56V()	786.	NC56V()HR	983.	MH56WP	2652.	56
		5285.	6957.	NF466L4	4200.	MH74		NC74V( )		NC74V()HR		MH74WP		
66□	400	5792.	7464.	NF466L4C	4707.	MH74	113.	NC74V()	972.	NC74V()HR	1215.	MH74WP	2757.	74
045	400	6524.	8261.	NF484L4	5346.	MH86	440	NC86V/	4005	NC86V()HR	4400	MH86WP	2045	00
84□	400	7169.	8906.	NF484L4C	5991.	MH86	113.	NC86V()	1065.	NC86V()HR	1430.	MH86WP	2915.	86
30	600	3838.	_	NF430L6C	2996.	MH50	113.	NC50V()	729.	NC50V()HR	912.	Factor	v	50
42	600	4087.	_	NF442L6C	3188.	MH56	113.	NC56V()	786.	NC56V()HR	983.	Assemb		56
66□	600	6094.	_	NF466L6C	5009.	MH74	113.	NC74V()	972.	NC74V()HR	1215.	Only		74
84□	600	7553.	_	NF484L6C	6375.	MH86	113.	NC86V( )	1065.	NC86V()HR	1430.		_	
	800					<u> </u>	Facto	ory Assembled	Only	·	·		·	

### Table 9.48: NF Main Circuit Breaker Interiors—Use I-Line Panelboards on 480 V 3Ø3W Delta Applications

Table 9.40	). INI	Main Circ	Juit Di Cakei	IIICIIOIS	036 1-1	Line ran	elboarus on 4	100 V 3x	DOW Della A	• •							
Max. No. of				Main Cir	ouit.						NEMA 1 Enc	losure			NEMA 3R, 5, 1	2 Enclos	sure 🛆
One-pole EDB Circuit	Mains Rating	\$ Tota		Breaker Ada		Main Circuit Breaker	Interior Or	Interior Only ■		5in. D ★	Mono-Fla Front		Hinged Front		Enclosu 20 in. W x 6.5		Height
Breakers	J	NEMA 1	NEMA 3R, 5, 12	Kit	\$ Price	Frame	Catalog No. ♦	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	(ln.)
(Single Ph	ase 3-W	ire: Facto	ry Assembled	Only) Three	Phase	4-Wire											
15	125	2056.	3638.	Dools food			NF418L1	1446.	MH26	113.	NC26()	497.	NC26()HR	620.	MH26WP	2192.	26
15	123	2448.	4030.	Back-fed Main		EDB, EGB		1838.	MH26	113.	NC26()	497.	NC26()HR	020.	MH26WP	2192.	20
27	125	2406.	3970.	Breaker♦	_	or EJB	NF430L1	1766.	MH32	113.	NC32()	527.	NC32()HR	657.	MH32WP	2204.	32
	120	2802.	4366.				NF430L1C	2162.	MH32		NC32()	027.	NC32()HR		MH32WP		02
18	125	2888. 3280.	4442. 4834.	N150MH		HD/HG/	NF418L1	1446.	MH38 MH38	113.	NC38() NC38()	549.	NC38()HR NC38()HR	687.	MH38WP MH38WP	2216.	38
-		3322.	5149.	or	780.	HJ/HL	NF418L1C NF430L1	1838. 1766.	MH44		NC44/		NC44()HR		MH44WP	-	<del></del>
30	125	3718.	5545.	N100MFI☆		or FI	NF430L1C	2162.	MH44	113.	NC44()	663.	NC44()HR	830.	MH44WP	2603.	44
		3841.	5608.				NF430L2	2219.	MH50		NC50/		NC50()HR		MH50WP		
30	250	4246.	6013.	İ	780.		NF430L2C	2624.	MH50	113.	NC50()	729.	NC50()HR	912.	MH50WP	2609.	50
42	250	4097.	5850.	NOTONAL	780.	ID/IO/	NF442L2	2418.	MH56	113.	NC56()	786.	NC56()HR	983.	MH56WP	2652.	56
42	230	4505.	6258.	N250MJ or	700.	JD/JG/ JJ/JL	NF442L2C	2826.	MH56	113.	NC56()	700.	NC56()HR	903.	MH56WP	2032.	30
54	250	5278.	6947.	N250MKC☆	780.	or KI	NF454L2	2616.	MH62	113.	NC62()	786.	NC62()HR	983.	MH62WP	2652.	56
	200	5683.	7352.	· · · · · · · · · · · · · · · · · · ·	700.	0	NF454L2C	3021.	MH62		NC62()	700.	NC62()HR	500.	MH62WP	2002.	- 00
66□	250	5665.	7337.	ļ	780.		NF466L2	3800.	MH74	113.	NC74()	972.	NC74()HR	1215.	MH74WP	2757.	74
		6307. 4246.	7979. 5931.				NF466L2C NF430L4	4442. 2466.	MH74 MH62		NC74() NC62V()		NC74()HR NC62V()HR		MH74WP MH62WP	-	
30	400	4654.	6339.	N400M☆	780.		NF430L4C	2874.	MH62	113.	NC62V()	887.	NC62V()HR		MH62WP	2685.	62
		4514.	6195.				NF442L4	2673.	MH68		NC68V()		NC68V()HR		MH68WP		
42	400	4837.	6518.	N400M☆	780.	LA/LH	NF442L4C	2996.	MH68	113.	NC68V()	948.	NC68V()HR		MH68WP	2742.	68
66□	400	6158.	7895.	N400M☆	780.		NF466L4	4200.	MH86	113.	NC86V/\	1065.	NC86V()HR		MH86WP	2915.	86
00 🗆	400	6665.	8402.	1N4UUIVIX	780.		NF466L4C	4707.	MH86	113.	NC86V()	1005.	NC86V()HR	1430.	MH86WP	2915.	00

- Total Price includes: interior, front, main circuit breaker adapter kit, and enclosure. Order branch circuit breakers separately.
- "C" suffix indicates copper bussing.
- Embossed mounting holes add a 0.25-inch standoff to back of MH box. Add "F" for flush mount, "S" for surface mount.
- Enclosure includes trim kit.
- Use only if the Local Jurisdiction where this panelboard interior is being applied has adopted the 2008 NEC, which allows single panelboard interiors greater than 42 circuits. Back-fed EDB 125 A 3 pole main circuit breaker must be ordered separately and field installed. Maximum breaker rating opposite is 20A. Select the appropriate main circuit breaker from pages starting on 7-21 and add the circuit breaker Price to the total Price of the panelboard.

### Table 9.49: NF Merchandised SPD Box Selection Table

· abio o.			u.00u 0		0.000.0.	···											
				Main L	ug Panell	board Box Re	quireme	nts		Main Circuit Breaker Panelboard Box Requirements						ents	
Mains Rating	Max. Breaker Spaces	NEMA 1 Enclosure					NEMA 3R, 5, 12 l	Enclosure			NEMA ·	1 Enclos	ure		NEMA 3R, 5, 12 Enclosure		
		Box	Box \$ Price Front \$ Price Hinged \$ Price				\$ Price	Enclosure	\$ Price	Box	\$ Price	Front	\$ Price	Hinged	\$ Price	Enclosure	\$ Price
250A	42	MH56	MH56 113. NC56( ) 887. NC56( )HR 110				1109.	MH56WP	2685.	MH68	113.	NC68()	972.	NC68()HR	1215.	MH68WP	2742.
400 A	42	MH68	113.	NC68V( )	972.	NC68V()HR	1215.	MH68WP	2757.	MH80 113. NC80( ) 1722.			M/B NC80V( )HR	1430.	MH80WP	2915.	

### Table 9.50: NF Merchandised Neutrals

Mains		2	00% Neutral Kit		Copper 100% Neutral Kit							
Ampacity	Catalog No.	\$ Price	Box Add	Schedule	Catalog No.	\$ Price	Box Add	Schedule				
125	NFNL1	1029.	No Adder	PE-1A	NFN1CU	405.	No Adder	PE-1A				
250	NFNL2	1277.	NO Addel	FL-IA	NFN2CU	403.	NO Addel	FLIA				
400	NFNL4▲	1914.	No Adder	PE-1A	NFN6CU	1148.	No Adder	PE-1A				
600		Fact	ory Assembled Only		NFN6CU▲	1140.	140 Addel	FL-IA				

Not to be used with SFL, FTL, or SFB. These combinations are factory assembled only.

Table 9.51: Modifications (Single- or Three-phase)

Maine	Sub-fee	d Lugs 🔳	•	Feed-through Lugs ■ ◆						
Mains Ampacity	Catalog No.	\$ Price	Schedule	Catalog No.	\$ Price	Schedule				
125	NF125SFL	167.	PE-1A	NF125FTL	336.	PE-1A				
250	NF250SFL	213.	PE-1A	NF250FTL	476.	PE-1A				
400	NF400SFL▼	356.	PE-1A	NF400FTL	507.	PE-1A				
600	Δ		_			_				
800	1		_	1		_				

			t Breaker Ki not Included			
Mains Ampacity	Single Sub- Circuit Brea	feed aker		Twin Sub- Circuit Brea	Schedule	
	Catalog No.	\$ Price	Schedule	Catalog No.	\$ Price	
250	NF250SFBH/NF250SFBJ	1029.	PE-1A	1	_	_
400		1	_	NF600SFBH	1290.	PE1A
400		_	_	NF600SFBJ	1230.	TEIA
600		FACTOR	RY ASSEMB	LED ONLY		
800		FACTOF	RY ASSEMB	LED ONLY		

Note: NF250SFBH and NF600SFBH are for use with HDL, HGL, HJL, and HLL circuit breakers. NF600SFBJ are for use with JDL, JGL, JJL, and JLL circuit breakers.

- Available factory assembled only on non-linear panelboards.
- Select box from the Box Selection Table. Order appropriate circuit breaker.
- Use copper wire only.
- Available factory assembled only.

Table 9.52: Special Features Box Selection Table—Standard Mechanical Lugs Only

	Main Lugs Only												
Feature			Sub-feed Lug:	S			Fe	ed-through Lu	Sub-feed Circuit Breaker				
No. of Circuits	18	30	42	66	84	18	30	42	66	84	30	42	66
Ampacity	Cat. No.	Cat. No.	Cat. No.	Cat No.	Cat No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
100/125	MH26	MH32	_	_	_	MH32	MH38	_	_	_	<u> </u>	_	_
250	_	MH38	MH44	MH62	_	_	MH50	MH56	MH74	_	MH56	MH62	MH80
400	_	MH50	MH56	MH74	MH86	_	MH56	MH62	MH80	MH92	MH68	MH74	_
600 800	_					_					0		

Available factory assembled only.

Table 9.53: Special Features Box Selection Table—Standard Mechanical Lugs Only (continued)

			Vertical Main C	ircuit Breaker ◊			Back-fed Main Circuit Breaker			
Feature		Feed-thro	ough Lugs		Sub-feed C	ircuit Breaker	Feed-through Lugs			
No. of Circuits	18	30	42	66	30	42	18	30		
Ampacity	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.		
100/125	MH44	MH50	_	_	_	_	MH32	MH38		
250	_	MH62	MH68	MH86	MH68	MH74	MH38	MH44		
400♦	_	MH68	MH74	MH80	MH86	_	_			
600			Available factory	assembled only.			_	_		

<sup>400</sup> A dimension for LA/LH main circuit breakers only.

### Table 9.54: Optional Main Lug Kits for Main Lug Panelboards

	•	•	•									
Ampacity		AL Compression Lug	ompression Lug Kit			CU Mechanical Lu	g Kit		CU Compression Lug Kit ☆			
Ampacity	Catalog No.	Lug Wire Range	\$ Price	Schedule	Catalog No.	Lug Wire Range	\$ Price	Schedule	Catalog No.	Lug Wire Range	\$ Price	Schedule
125	NFALV1 ▽	one #4-300 kcmil			NFCUM1	#6-2/0 AWG	347.	PE-1A	NFCUV1 €	one #6-1/0	345.	PE-1A
250	NFALV2	one 250–350 kcmil	333.	FE-IA	NFCUM2	#6-250 kcmil	347.	FE-IA	NFCUV2 €	one 2/0–300 kcmil	417.	FE-IA
400	NFALV4	two 2/0-500 kcmil	1122.	PE-1A	NFCUM4	one 1/0–750 kcmil, two 1/0–350 kcmil		PE-1A	NFCUV4	one 400–750 kcmil	767.	PE-1A
600	NFALV6	two 2/0-500 kcmil	1206.	PE-1A	NFCUM6	two 1/0-750 kcmil		PE-1A	NFCUV6	two 250-500 kcmil	1364.	PE-1A
800		_		Con	tact your local S	chneider Flectric ren	resentative	or distribut	or .			

- Use copper wire only.
  Use of this kit requires an additional 6 in. added to box height.
- Use of this kit to terminate larger than standard wire size requires an additional 6 in. added to box height.

### Table 9.55: NF Accessories

Description	Catalog No.	\$ Price	Schedule
Aluminum Equipment Ground Bar	PK27GTA	33.80	DE-3A
Copper Equipment Ground Bar	PK27GTACU	84.00	PE-1A
Large Aluminum Lug for Equipment Ground Bar	PK23GTAL	40.70	DE-3A
Equipment Ground Bar Insulator Kit	PKGTAB	43.80	DL-3A
Circuit I.D. number strips			
1–102 odd/even (left side numbered 1, 3, 5101)	NF1020E		
103-204 odd/even (left side numbered 103, 105, 107203)	NF204OE	7.90	PE-1A
1–102 sequential (left side numbered 1, 2, 3102)	NF102S	7.30	I L-IA
103-204 sequential (left side numbered 103, 104, 105 204)	NF204S		
Rail and Deadfront Extensions			
6 in. Extension	NF6RDE	252.00	
12 in. Extension	NF12RDE	284.00	PE-1A
18 in. Extension	NF18RDE	344.00	

Oversized Lugs for Neutral or Ground Bar			
#10 to #2 Al or #14 to #4 Cu	QO70AN	9.90	
#4 to #1/0 Al or Cu	Q1100AN	11.10	DE-3A
#1 to #4/0 Al or Cu	Q1150AN	32.40	
Drip Hood for 20 in. wide enclosures	MHT2DH20	315.00	PE-1A

Description

Filler plate (15 per package)

EXB Fixed padlock attachment, Lock ON/OFF

for ED, EG, and EJ Circuit Breakers 1, 2, or 3 poles EXB Fixed padlock attachment, Lock OFF only for ED, EG, and EJ Circuit Breakers 1, 2, or 3 poles \$ Price

113.00\*

26.00

30.00

NFFP15

EDPA

EDPAF

PE-1A

DE-2

DE-2

Filler plates are \$7.50 each and must be ordered in packages of 15.



# www.schneider-electric.us



**Circuit Breakers** 



EDB-EPD 1-pole with Alarm Switch



EDB, EGB, EJB 3-pole 15-125 A



EDB, EGB, EJB 1-pole 15-70 A



EDB, EGB, EJB 2-pole 15-125 A

Ampere		G, EJ 277 Vac)	"D" Interrupting 18 kA @ 480Y/27		"G" Interrupting 35 kA @ 480Y/27		"J" Interrupting 65 kA @ 480Y/27		Terminal
Rating	Hold	Trip	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Wire Range
1-pole, 277	Vac								
15 A	1	1	EDB14015▲ ■	1 1	EGB14015▲■	1	EJB14015▲■	1 1	
20 A			EDB14020▲■		EGB14020▲■		EJB14020▲■	1	AL30FD
25 A	270	875	EDB14025■	150.	EGB14025■	255.	EJB14025■	408.	#14-#6
30 A			EDB14030■		EGB14030 ■	1 1	EJB14030 ■	1	Al or Cu
35 A			EDB14035■		EGB14035■		EJB14035■		
40 A			EDB14040■		EGB14040■	1	EJB14040■	1	
45 A	000	4000	EDB14045■	150.	EGB14045■	225.	EJB14045■	408.	AL100FD
50 A	630	1800	EDB14050■		EGB14050■	1	EJB14050■		#14-2/0
60 A			EDB14060		EGB14060	1 1	EJB14060		Al or Cu
70 A			EDB14070	302.	EGB14070	507.	EJB14070	812.	
2-pole, 480	Y/277 Vac ♦								
15 A	1	ı	EDB24015■		EGB24015■		EJB24015■		
20 A			EDB24020■		EGB24020■	1 1	EJB24020■	4044	AL30FD
25 A	270	875	EDB24025■	536.	EGB24025■	776.	EJB24025■	1241.	#14-#6
30 A			EDB24030■		EGB24030■		EJB24030■	1	Al or Cu
35 A			EDB24035■		EGB24035■		EJB24035■	1	
40 A			EDB24040■		EGB24040■		EJB24040■	1	AL100FD
45 A	630	1800	EDB24045■	536.	EGB24045■	776.	EJB24045■	1241.	#14-2/0
50 A	630	1000	EDB24050 ■		EGB24050■	] [	EJB24050 ■		Al or Cu
60 A			EDB24060		EGB24060		EJB24060		Al Ol Cu
70 A			EDB24070	756.	EGB24070	1280.	EJB24070	2048.	
80 A			EDB24080		EGB24080		EJB24080		
90 A			EDB24090	756.	EGB24090	1280.	EJB24090	2135.	AL100FD
100 A	1000	2300	EDB24100		EGB24100		EJB24100		#14-2/0
110 A			EDB24110	1946.	EGB24110	2586.	EJB24110	3879.	Al or Cu
125 A			EDB24125		EGB24125		EJB24125	55.5.	
3-pole, 480	Y/277 Vac								
15 A			EDB34015■		EGB34015■		EJB34015■		AL30FD
20 A	270	875	EDB34020■	669.	EGB34020■	1131.	EJB34020■	1358.	#14-#6
25 A	270	0/3	EDB34025■	009.	EGB34025■	1131.	EJB34025■	1330.	Al or Cu
30 A			EDB34030■		EGB34030■		EJB34030 ■		711 01 00
35 A			EDB34035■		EGB34035■	1 1	EJB34035 ■		
40 A			EDB34040■		EGB34040■		EJB34040■		AL100FD
45 A	630	1800	EDB34045■	669.	EGB34045■	1131.	EJB34045■	1358.	#14-2/0
50 A			EDB34050■		EGB34050■		EJB34050■	4	Al or Cu
60 A			EDB34060		EGB34060	1000	EJB34060	0500	
70 A			EDB34070	911.	EGB34070	1292.	EJB34070	2562.	
80 A			EDB34080	911.	EGB34080	1292.	EJB34080	2562.	AL100FD
90 A 100 A	1000	2300	EDB34090 EDB34100	911.	EGB34090 EGB34100	1292.	EJB34090 EJB34100	2302.	#14-2/0
110 A	1000	2300	EDB34100 EDB34110		EGB34100 EGB34110		EJB34110		#14-2/0 Al or Cu
125 A	1	1	EDB34110 EDB34125	2421.	EGB34110 EGB34125	3216.	EJB34125	4826.	Al Ol Ou
	inment Prot	l oction Devic	ces), 1-pole, 277 Vac, T	hormal-ma		und-fault n			
	ipineni Prot	ection Devic		nermai-ma		una-iauit pi			
15 A	070	075	EDB14015EPD▲■	4454	EGB14015EPD▲■	1050	EJB14015EPD▲■	1400	"44 "00
20 A	270	875	EDB14020EPD▲■	1151.	EGB14020EPD▲■	1256.	EJB14020EPD▲■	1409.	#14–#6 Cu
30 A			EDB14030EPD■ EDB14040EPD■		EGB14030EPD■		EJB14030EPD■		or #12–#4 Al
40 A 50 A	630	1800	EDB14040EPD■ EDB14050EPD■	1151.	EGB14040EPD■ EGB14050EPD■	1256.	EJB14040EPD■ EJB14050EPD■	1409.	#12-#4 Al
	OR FGR and	F.IB circuit hr	reakers are UL Listed as H	ACR Type F		a CA suffix N		s are fundus i	nroof as standard

- UL Listed as SWD (Switching duty rated).
- UL Listed as HID (High Intensity Discharge rated).
- UL Listed for use on 240 V Corner-grounded Delta Systems (Grounded B Phase). See data bulletin 2700DB0202.

  All EPDs occupy two spaces, with or without Alarm Switch option. For alarm switch, add 158 list Price and the suffix BA.

### Table 9.57: Factory installed Electrical Accessories

Auxiliary Switch (1A/1B)	Alarm Switch (NO)	Coil Burden Max. (VA)	Supply Transformer (VA)		
		288	50		
Monitors circuit breaker contact status and provides	Used with control circuits and is actuated	Shunt Trip—Trips the circuit breake	er from a remote location by means		
a remote signal indicating the circuit breaker	only when the circuit breaker has tripped.	d. of a coil energized from a separate circuit. A 120 V shunt trip will			
contacts are OPEN or CLOSED.		operate at 55% or more of rated vo	oltage.		
Application	Application	Application			
Max Load = 10 A @ 120 Vac 50/60 Hz	Max Load = 7 A @ 120 Vac 50/60 Hz		ined push button. 120 Vac 50/60 Hz		
Terminals for #14 AWG Cu wire	Terminals for #14 AWG Cu wire.	Terminals for #14 AWG Cu wire.			

# Table 9.58: Factory Installed Electrical Accessory Packages for ED, EG, EJ Circuit Breakers Table 9.60: Handle Accessories ED, EG, EJ Circuit Breaker Type No. of Poles

LD, La, Lo oncan breakers	•	
Accessory Package	Suffix	\$ Price
Auxiliary Switch/Alarm Switch Package▼△	AABA	312.
Shunt Trip Package ▼△	SA	755.
Auxiliary Switch/Alarm Switch/Shunt Trip Package▼△	AABASA	1067.
Alarm Switch (N.O.) Package for EPDs only	BA	237.

Accessory package takes an additional pole space. Δ Not available for EPD.

Table 9.59: Terminal Nut Insert Kit

Circuit Breaker Type	Qty. per Kit	Catalog No.	\$ Price						
ED, EG, EJ	3	TIKFD	17.40						

Circuit Breaker Type	No. of Poles	Catalog No.	\$ Price
<b>EXB Fixed Padlock Att</b>			
ED, EG, EJ	1, 2, or 3	EDPA	39.00
<b>EXB Fixed padlock atta</b>	achment, Lock (	OFF only	
ED, EG, EJ	1, 2, or 3	EDPAF	45.00
EXB Removable padlo	ck attachment, l	Lock OFF only	
ED, EG, EJ	1, 2, or 3	HPAFD	25.50
<b>EXB Handle Ties</b>			
ED, EG, EJ	Ties 2 – 1P	ECB2HT	16.80
LD, EG, EJ	Ties 3 – 1P	ECB3HT	17.85

Table 9.61: Interrupt Ratings (kA)

	EDB	EGB	EJB
120 V	25	65	100
240 V	18 (1P), 25	35 (1P), 65	65 (1P), 100
480Y/277 V	18	35	65

Table 9.62: Mechanical Lug Kit Information (Al lugs for use with Al or Cu wire)

	Circuit Break	er Application		Number of Wires Per Lug	Catalog Number	Lugs Per Kit	\$ price Per Kit
Standard	Ampere Rating	Optional	Ampere Rating	and Wire Range	Catalog Number	Per Kit	Per Kit
EDB. EGB. EJB	15–30 A	_	_	one #12—#6 AWG Al or one #14—#6 AWG Cu	AL30FD	3	
LDD, LGD, L0D	35–125 A	EDB, EGB, EJB	15–30 A □	one #12—2/0 AWG AI or one #14—2/0 AWG Cu	AL100FD	3	41.30
_	_	EDB, EGB, EJB	15–125 A	one #14—1/0 AWG Cu	CU100FD	3	

Factory installed only. Use suffix "LH"

Digest page 7-55

### **Factory Assembled Pricing**

■ Use I-Line™ Panelboards on 480 V 3Ø3W Delta applications.

### Table 9.63: Base \$ Price (including solid neutral)

	Main	Luma		Main Circuit Breaker (Circuit Breaker Interrupt Rating—7-2 through 7-8) ▲ ■										
Mains	Main Lugs —		5	Standard IC			HIC		Extra HIC				I-Limiter™	
Rating	2-pole	3-pole	Circuit Breaker	2-pole	3-pole	Circuit Breaker	2-pole	3-pole	Circuit Breaker	2-pole	3-pole	Circuit Breaker	2-pole	3-pole
100 A	_	_	ED♦	1636.	1882.	EG ♦	2100.	2416.	_	_	_	_	_	_
100 A	_	_	_	_	_	_		_	HJ	3248.	3598.	FI	4250.	4884.
125 A	846.	972.	ED♦	3372.	3762.	EG ♦	4324.	4976.	-	_	_	-	_	_
150 A			HD	3270.	3620.	HG	4048.	4398.	IJ	4070.	4420.		_	_
225 A ★	ı	-	JD	4120.	4380.	JG	5070.	5400.	J	6620.	7330.	KI	7266.	8352.
250 A ★	1002	1152.	JD	4500.	5140.	JG	6180.	6180.	3	7190.	8450.	KI	9154.	10522.
400 A ★	1326.	1524.	LA	5330.	6126.	LH	7712.	8864.	LC	8506.	9776.	ı	9350.	10746.
600 A ★▼	2366.	2622.	_	_	ı	-		I	LC	9554.	10884.	l	13640.	15678.
800 A ▼	3550.	3900.	_	_	_	_		_	_	_		_	_	

- HL and JL frame circuit breakers are also available as main circuit breakers.
- Contact your local Schneider Electric representative or distributor for Micrologic™ trip main circuit breaker pricing.
- Back-fed main circuit breaker.
- Prices are for 54-circuit and fewer interiors. See the Product Selector for 66- and 84-circuit interior pricing.
- Copper bus only.

Table 9.64: Branch Circuit Breakers—\$ Price per circuit breaker

Circuit Breaker Ampere Rating			65,0 35,000	ligh Interruptin 000 AIR @ 240 0 AIR @ 480Y/2 G Bolt-on Bran	Vac, 77 Vac	Extra High Interrupting 100,000 AIR @ 240 Vac, 65,000 AIR @ 480Y/277 Vac EJ Bolt-on Branch			
	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price
15–60 A	192.	442.	748.	324.	746.	1264.	518.	1196.	2024.
70 A	342.	872.	1046.	578.	1474.	1710.	924.	2120.	2540.
80–100 A	_	872.	1046.	_	1474.	1710.	_	2120.	2540.
110-125 A	_	2210.	2724.	_	4114.	4754.	_	5300.	6300.
Space Only	42.	84.	126.	42.	84.	126.	42.	84.	126.

Note: All ED, EG, and EJ branch circuit breakers are UL Listed as HACR type.

Table 9.65: EDB-EPD Equipment Protection Device Branch Circuit Breakers △ □

Circuit Breaker Ampere Rating	Standard Interrupting 25,000 AIR @ 240 Vac, 18,000 AIR @ 480Y/277 Vac ED Bolt-on Branch			65,0 35,000	High Interrupting 65,000 AIR @ 240 Vac, 35,000 AIR @ 480Y/277 Vac EG Bolt-on Branch			Extra High Interrupting 100,000 AIR © 240 Vac, 65,000 AIR © 480Y/277 Vac EJ Bolt-on Branch		
	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price	1-pole \$ Price	2-pole \$ Price	3-pole \$ Price	
15-60 A	1472.	-	_	1596.	_	_	1788.	_	_	

- All 1-pole EDB-EPD branches use 2 poles of mounting space.
- For bell alarm in EDB-EPD branch breaker, add 158, to branch breaker price.

### **Sub-feed Circuit Breaker**

Available on 1Ø or 3Ø, 250-800 A main lugs or 250-600 A main circuit breaker interiors

- One sub-feed HD, HG, HJ, or HL or JD, JG, JJ, or JL circuit breaker per 250 A panelboard
- Two sub-feed HD, HG, HJ, or HL or two JD, JG, JJ, or JL circuit breakers per 400 A panelboard (do not mix H and J in a Panel)
- One sub-feed LA, LH, or LC circuit breaker (400 A max.) and one JD, JG, JJ, or JL circuit breaker or two sub-feed JD, JG, JJ, or JL circuit breakers per 600 A or 800 A panelboard (JJ and LC sub-feed circuit breakers cannot be used together).

Table 9.66: Sub-feed Circuit Breaker (150-400 A)

	No. of Poles	HD	HG	JD	JG	LA	LH	LC ◊	Space
_	2	2456.	3500.	3020.	4220.	3980.	5534.	8634.	826.
	3	2872.	3798.	3370.	5100.	4916.	6510.	10156.	826.

JJ and LC sub-feed circuit breakers cannot be used together.

Table 9.67: Sub-feed Circuit Breaker Cabinet Data

Max. No. of Branch Spaces	Box Height (20 in. W x 5.75 in. D)									
(Does not include sub-feed	250 A		400 A LA/LH		60	800 A				
circuit breaker spaces)	Main Lugs	Main Breaker	Main Lugs	Main Breaker	Main Lugs	Main Breaker ☆	Main Lugs ▽			
30	56	68	68	80	74	80€	68			
42	62	74	74	86	80	86€	74			
54	68	80	80	92	86	92€	80			
66	80	N/A								
84		N/A								

- 600 A main circuit breaker panelboards require an 8.75 in. deep, 26 in. wide box. 800 A main lug panelboards require an 8.75 in. deep, 26 in. wide box.
- Dimensions also for 400 A LC/LI main circuit breaker panels.

# NF Factory Assembled Panelboards

Table 9.68: Sub-feed (Double) Lugs (Standard Aluminum Mechanical Lugs)
An additional mains end termination point that can be used to feed out to
another panelboard or device from the incoming service lines.

NOTE: Available on main lug interiors only.

Mains Rating	Sub-feed Wire Range Wire Bending Space per NEC Table 373-6	\$ Price
125 A	two #6–2/0 Al or Cu	128.
250 A	two 1/0-350 kcmil Al or Cu	128.
400 A	two 1/0-600 kcmil Cu	344.
600 A	(4) 4/0–500 kcmil Al or Cu	344.
800 A	(6) 3/0–500 kcmil Al or Cu	522.

### Table 9.69: Sub-feed Lug Cabinet Data (Standard Aluminum Mechanical Lugs)

Max. No. of	Main Lugs Box Height in Inches (20 in. W x 5.75 in. D)						
Branch Spaces	125 A	250 A	400 A	600 A	800 A ▲		
18	26	<u> </u>	_	<u> </u>	_		
30	32	38	50	74	74		
42	_	44	56	80	80		
54	_	50	62	86	86		

▲ 800 A main lug panelboards require an 8.75 in. deep and 26 in. wide box.

### Table 9.70: Feed-through Lugs (Standard Aluminum Mechanical Lugs)

A second set of lugs assembled at the opposite end from the mains of the panelboard. Often used to connect another panelboard or device to the incoming lines. Available on main lugs and main circuit breaker panelboards.

Mains Rating	Feed-through Wire Range Wire Bending Space per NEC Table 373-6	\$ Price
125 A	one #6–2/0 kcmil Al or Cu	344.
250 A	one #6–350 kcmil Al or Cu	344.
400 A	one 1/0–750 kcmil or two 1/0–350 kcmil Al or Cu	826.
600 A	two 1/0-600 kcmil Al or Cu	826.

## Table 9.71: Feed-through Lug Cabinet Data (Standard Aluminum Mechanical Lugs)

s	Box Height in Inches (20 in. W x 5.75 in. D)									
No. of Spaces	125 A	100/125 A		250 A		400 A LA/LH		600 A		800 A
Max. No Branch S	Main Breaker (back-fed only)	Main Lugs		Main Lugs	Main Breaker	Main Lugs	Main Breaker	Main Lugs	Main Breaker	Main Lugs •
18	38	32	44	_	_	_	_	_	_	_
30	44	38	50	50	62	56	68	62	74	56
42	50	-	1	56	68	62	74	68	80	62
54	_	_	_	62	74	68	80	74	86	68

- 600 A main circuit breaker panelboards require an 8.75 in. deep, 26 in. wide box.
- 800 A main lug panelboards require an 8.75 in. deep, 26 in. wide box.

### Table 9.72: Ground Bars

Ground Bars	\$ Price Adder
Equipment Ground Bar	38.
Copper Ground Bar (Add to Equipment Ground Bar Price)	52.
Insulated/Isolated Ground Bar (Add to Equipment Ground Bar Price)	86.

### Table 9.73: Name Plates

Name Plates	\$ Price Adder
Standard white face/black letter laminated bakelite, 1 in. x 3.5 in., adhesive-backed or screw mountable with screws in a bag assembly (Price includes engraving)	78.

### Table 9.74: Copper Bus Bars

Copper Bus Bars	\$ Price Adder
100 A, 250 A	458.
400 A	624.
600 A, 800 A	Standard

### Table 9.75: Copper Neutral

Copper Neutral	\$ Price Adder
100–600 A	132.
800 A	176.

### Table 9.76: 200% Rated Neutrals

Panelboards with 200% rated neutrals are available with sub-feed lugs, feed-through lugs, and main circuit breakers	Add Per Panel \$ Price
250 A	769.
400 A	950.
600 A	1262.
800 A	1894.

### Table 9.77: NF Main Neutral Conductors—Required Size and Quantity

	Panelboard Ampacity	Neutral Conductors Required ◆	Actual Lug Wire Range	
	125	(2) 1/0 Cu or (2) 1/0 Al	(2) #6-2/0	
	250	(2) 4/0 Cu or (2) 300 kcmil Al	(2) #6-350 kcmil	
	400 A	(4) 250 kemil Al or (4) 3/0 Cuor (2) 600 kemil Al	(2) 1/0-300 kcmil or (1) 1/0-750 kcmil	
600		(4) 500 kcmil Al or (4) 350 kcmil Cu	(2) 1/0-750 kcmil	

Note: Neutral conductors must be of size and quantity per table above.

### Table 9.78: Metal Directory Frame

Metal Directory Frame	\$ Price Adder
Not available with LC/LI main circuit breaker (Replaces standard plastic stick-on directory pouch)	140.

#### Table 9.79: Hinged Door-in-Door Trim

Hinged Door-in-Door Trim	Add Per Panel \$ Price
Hinged Door-in-Door Trim has piano hinge down one side. Inner door has a lock, outer door is retained with screws	646.
Hinged Door-in-Door with Outer Door Lock in place of screws	836.

### Table 9.80: Weatherproof or Dusttight Cabinets (Type 3R, 5, 12)

Weatherproof or Dusttight Cabinets —Type 3R, 5, 12	\$ Price Adder
(Not available with panelboards having LC/LE/LI/LX/LXI main circuit breakers)	1516.

### Table 9.81: Optional Factory Assembled Lugs for Main Lug Interiors

Main Lug Interiors		\$ Price Per Pole Adder						
Main Lug interiors	100 A	225 A	400 A	600 A	800 A			
Aluminum Compression Lugs	58.	58.	90.	118.	200.			
Copper Mechanical Lugs	70.	108.	148.	168.	196.			
Copper Compression Lugs	70.	108.	148.	168.	316.			

## Table 9.82: Optional Factory Assembled Lugs for Main Circuit Breaker Interiors

Main Circuit Breaker Interiors	\$ Price Per Pole Adder					
Main Circuit Breaker interiors	H Frame	J Frame	LA Frame	LC Frame		
Aluminum Compression Lugs	59.	98.	128.	262.		
Copper Mechanical Lugs	70.	108.	148.	168.		
Copper Compression Lugs	70.	108.	148.	168.		

### Table 9.83: Surgelogic™ Hard Bus SPD—Model IMA ★

Voltage					
208Y/120 V 3Ø4W	240/120 V 3Ø4W High Leg	480Y/277 V 3Ø4W			
11970.	11970.	12890.			
12548.	15654.	13340.			
13807.	13807.	14623.			
17992.	17992.	20508.			
20583.	20583.	23598.			
	3Ø4W 11970. 12548. 13807. 17992.	208Y/120 V 304W 304W High Leg 11970. 11970. 12548. 15654. 13807. 13807. 17992. 17992.			

★ Panelboard box height with SPD unit—Contact your local Schneider Electric representative or distributor.

### Table 9.84: Surgelogic SPD Options

Surgelogic SPD Options	\$ Price
Surge Counter	Standard
Dry Contacts	Standard
Remote Monitor	2588.

NOTE: For additional factory modifications, See Digest page 9-38.

Class 1640 / Refer to Catalog 1670CT0701, 1640CT0801

## NQ Single-Row (Column-width)—240 Vac Bolt-on (60 A Max. Branch Circuit Breaker)

## **NQ Application Data**

Application: For use on ac only. Meet Federal Specification W-P-115c,

Type 1, Class 1. UL Listed. **Service:** 1Ø3W, 3Ø3W, 3Ø4W, 3 Grd. "B" Ø—240 Vac max.

AIR: See the tables starting on Digest page 7-2. Mains: Type NQ-Bolt-on main lugs: 100 A, 225 A

- Main circuit breaker: 100 A-QOU, 225 A-QB
- See the tables starting on Digest page 7-2 for main circuit breaker interrupt ratings. See catalog for terminal lug data.
- Main circuit breakers with higher interrupt ratings are available as factory assembled panelboards.

Branches: Bolt-on QOB, 60 A maximum. QOB 10-60 A 1-, 2- and 3-pole. See Digest page 9-10 for branch circuit breaker terminal data. QOB-VH and QHB branch circuit breakers are also available as factory assembled.

Cabinet: Front—Screw cover. Box—galvanized steel with removable endwalls. Gutters:

- 100 A-4 in. min. mains end, 3 in. min. opposite mains
- 225 A-10 in. min. mains end, 5 in. min. opposite mains

Table 9.85: NQ Single-Row (Column-width)—240 Vac Bolt-on ▲

Max. Mains (Box			Box and Interior with Solid Neutral (8.625 in. W. x 5 in. D.) (Order branch circuit breakers separately)			Front (Surface Mount)		
Poles			Catalog Number	\$ Price	Box Height (In.)	Catalog Number	\$ Price	
1 Phase	1 Phase 3-Wire Main Lugs Only							
30	225	1669.	NQ830L2C	1298.	45	LX45TS	371.	
Main Cir	cuit Breal	ker—2-pole						
20	100	1818.	NQ820B1C	1452.	40	LX40TS	366.	
3 Phase	4-Wire Ma	ain Lugs O	nly					
30	100	1608.	NQ8430L1C	1242.	40	LX40TS	366.	
42	225	1938.	NQ8442L2C	1458.	58	LX58TS	480.	
Main Cir	Main Circuit Breaker—3-pole							
30	100	2363.	NQ8430B1C	1992.	45	LX45TS	371.	
42	225	4961.	NQ8442B2C	4416.	62	LX62TS	545.	

60 A Maximum Branch-Copper Bus Standard

Table 9.86: Cable Troughs and Pull Boxes

Cable Troughs (L=Length) ■			Pull Boxes with Solid Neutral			
L (ln.)	8.625 in. x 5 in. Catalog Number	\$ Price	S/N Terminals	Catalog Number	\$ Price	
36	MTX836	590.		MPX81542	479.	
48	MTX848	651.	42			
56	MTX856	753.	42		475.	
66	MTX866	753.				

Cable troughs are standard with a trough barrier.

## NF Single-Row (Column-width)—480Y/277 Vac Bolt-on (60 A Max. Branch Circuit Breaker) **NF Application Data**

Application: For use on ac only. Meet Federal Specification W-P-115c, Type Class 1. UL Listed

Service: 480Y/277 Vac, 3Ø4W

AIR: See the tables starting on Digest page 7-2 Mains: Type NF-Bolt-on main lugs: 125 A, 225 A

- Main circuit breaker: 100 A-FA, 100 A-HD, 225 A-JD. See the tables starting on Digest page 7-2 for main circuit breaker interrupt rating. See the catalog section for terminal lug data.
- Main circuit breakers with higher interrupt ratings are available as factory assembled panelboards.

Branches: EDB, EDG, or EDJ, 60 A maximum. See Digest page 9-15 for branch circuit breaker catalog numbers, List Prices and terminal data.

Cabinet: Front—Screw cover. Box—galvanized steel with removable endwalls.

### **Gutters:**

- 100 A-4 in. min. mains end, 3 in. min.opposite mains
- 225 A-10 in. min. mains end, 5 in. min. opposite mains

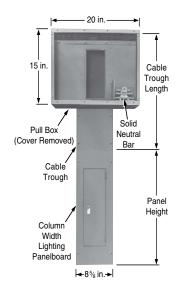
Table 9.87: NF Single-Row (Column-width)—480Y/277 Vac Bolt-on

May No	Max. No. Mains Total \$ Price		Box and Interior with S/N (8.625 in. W. x 5.625 in. D.)			Front (Surface Mount)	
of Poles	Rating	(Box Interior and Front)	Catalog Number	\$ Price	Box Height (In.)	Catalog Number	\$ Price
Main Lu	Main Lugs Only—3 Phase 4-Wire						
30	125	2410.	NF8430L1C	2009.	59	NC59TS	401.
42	225	3281.	NF8442L2C	2759.	71	NC71TS	522.
Main Cir	rcuit Brea	ker—3-pole					
30	100	3767.	NF8430M1C	3246.	65	NC65TS	521.
50	100	3707.	NF8430M1HDC	<b>3240.</b> 03	3	1400510	321.
42	225	6660.	NF8442M2JDC	6042.	85	NC85TS	618.

Table 9.88: Cable Troughs and Pull Boxes

Cable Troughs (L=Length) ◆			Pull Boxes with Solid Neutral			
L (ln.)	8.625 in. x 5.625 in. Catalog Number ★	\$ Price	S/N Terminals	Catalog Number	\$ Price	
36	NTX836	590.		42 MPX81542		
48	NTX848	651.	42		479.	
56	NTX856	753.	42		WIF A01342	475.
66	NTX866	753.				

- Cable troughs are standard with a trough barrier.
- Box width = 8.625 in.; width at front, including flange, is 9.625 in..





## NQ Single Row (Column-Width)—240 Vac Bolt-On Factory Assembled Pricing

Table 9.89: Base Price with Solid Neutral

	\$ Price											
Mains Rating	Main	Lugs	Main Circuit Bre	Main Circuit Breaker (Circuit Breaker Interrupt Rating—see Digest pages 7-2 through 7-5								
	2-Pole	3-Pole	Circuit Breaker	2-Pole	3-Pole	Circuit Breaker	2-Pole	3-Pole				
			QOB	1254.	1562.	_	_	_				
100 A	720.	832.	QB	_	2800.	_	_	_				
			QD	_	3434.	QG	_	4090.				
225 A	772.	912.	QB		2800.		_	_				
LLOA	,,,,	312.	QD	_	3434.	QG	_	4090.				

Copper bus —standard.

Equipment Ground Bar \$ Price adder—\$38.00.

Copper Equipment Ground Bar (Add to Equipment Ground Bar \$ Price) \$ Price adder—\$52.00.

Table 9.90: Branch Circuit Breakers (price per breaker)

Circuit Breaker		\$ Price			
Ampere Rating	1-Pole 120 Vac	2-Pole 120/240 Vac	2-Pole 240 Vac	3-Pole 240 Vac	
Space Only					
All Space Only Except Below	28.	58.	58.	86	
10,000 AIR—Branch Circuit Breakers	—QOB, QOB-H				
15–60 A	68.	134.	260.	352	
10,000 AIR—Qwik-Guard™—Class A	—QOB-GFI				
15–30 A	272.	488.	_	_	
40–60 A	_	488.	_	_	
Specialty Branch Circuit Breakers (1	0,000 AIR)				
For High Intensity Discharge Lightin	g—QO-HID, QOB-HID				
15–30 A	78.	148.	-	37	
40–50 A	78.	148.	_	_	
High Magnetic Trip (For applications	subject to high initial inrus	h)—QO-HM, QOB-HN			
15–20 A	68.	_	_	_	
Provides 30 mA Equipment Protection	n—QO-EPD, QOB-EPD				
15–30 A	462.	828.	_	_	
(High Interrupting Capacity) 22,000 AIR Branch Circuit Breakers–	-QO-VH, QOB-VH				
15–30 A	92.	212.	_	46	
35–60 A	_	212.	_	46	
22,000 AIR—Qwik-Guard—Class A—	QO-VHGFI, QOB-VHGFI				
15–30 A	294.	_	_	_	

## NF Single Row (Column-Width)—480Y/277 Vac 3Ø4W Bolt-on Factory Assembly Pricing

Table 9.91: Base Price with Solid Neutral

	Main	Lugo			Main Circ	uit Breaker (Circuit Breaker Interrupt Rating —see Digest pages 7-3 through 7-4									
Mains	IVIAIII	Lugs	Standard I			HIC				Extra HIC		I-Limiter™			
Rating			Circuit Breaker	\$ Pr	ice	Circuit	\$ P	rice	Circuit	\$ P	rice	Circuit	\$ P	rice	
	2-Pole	3-Pole	Circuit Breaker	2-Pole	3-Pole	Breaker	2-Pole	3-Pole	Breaker	2-Pole	3-Pole	Breaker	2-Pole	3-Pole	
100 A	_		FA	_	2184.	FH	_	3044.	_	_	_	_	_	_	
100 A	_	1074.	HD	_	2842.	HG	_	3792.	HJ	_	4374.	FI	_	7392.	
125 A	_		HD	_	3222.	i i d	_	4172.	110	_	4754.	KI	_	13150.	
150 A	_	1272.	HD	_	3222.	HG	_	4172.	IJ	_	4754.	KI	_	13150.	
225 A	_	1212.	JD	_	4784.	JG	_	5982.	JJ	_	8902.	131	_	10100.	

Copper bus—standard.

Copper Neutral \$ Price adder—\$132.00. Equipment Ground Bar \$ Price adder—\$38.00.

Copper Equipment Ground Bar (Add to Equipment Ground Bar \$ Price) \$ Price adder—\$52.00.

### Table 9.92: Branch Circuit Breakers (price per breaker)

					\$ Price						
Circuit Breaker Ampere Rating		ing 25,000 AIR @ 24 277 Vac ED Bolt-on I		High Interruptin @480Y/	g 65,000 AIR @ 240 ' 277 Vac EG Bolt-on	Vac, 35,000 AIR Branch	Extra High Interrupting 100,000 AIR @ 65,000 AIR @ 480Y/277 Vac EJ Bolt-on Branch				
	1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole		
15–60 A	192.	442.	748.	324.	746.	1264.	518.	1196.	2024.		
Space Only	42.	84.	126.	42.	84.	126.	42.	84.	126.		

### Table 9.93: EDB-EPD Equipment Protection Device Branch Circuit Breakers

					\$ Price				
Circuit Breaker Ampere Rating	Standard Interrupting 25,000 AIR @ 240 Vac, 18,000 AIR @ 480Y/277 Vac ED Bolt-on Branch				g 65,000 AIR @ 240 \ 277 Vac EG Bolt-on		Extra High Interrupting 100,000 AIR @ 65,000 AIR @ 480Y/277 Vac EJ Bolt-on Branch		
	1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole
15-60 A	1472.	_	_	1596.	_	_	1788.	<del>_</del>	_

Class 2110, 4620 / Refer to Catalog 2110CT9701, 4620CT9601

## I-Line Merchandised Pricing Procedure

- Select the appropriate branch circuit breakers and accessories based on the required ampacity and AIR ratings from Digest pages 9-24 through 9-30.
- 2. Determine the total mounting inches required by the branch circuit breakers. Pay close attention to the interior types and any branch mounting restrictions by referring to panel layouts on Digest pages 9-21 and 9-22. For example, larger frame circuit breakers may mount in only one side of the panel due to physical sizes. Therefore, for larger size branches, you may only be able to consider one half of the total mounting inches available.
- 3. Select proper main lug interior or main circuit breaker interior from Digest page 9-21 or 9-22 based on the mains ampacity and branch requirements from step 2.
- 4. Select blanks from the Accessories table on Digest page 9-23 as required to cover unused mounting space.
- 5. Select appropriate box and front from Digest page 9-21 or 9-22 to accommodate panel interior selected in step 3.
- 6. Apply appropriate discount schedule.

### Table 9.94: I-Line Merchandised Pricing Example

600 Vac, 3Ø3W, 400 A, MLO, 14k AIR, Type 1 enclosure, 4 piece surface trim without door.

Description	Catalog No.	Digest Page No.	\$ Price
400 Amp MLO Interior	HCM32734	9-21	2408.
4 Piece Surface Trim Without Door	HCM73TS	9-21	699.
Type 1 Enclosure	HC3273B	9-21	243.
(8) 60/3	FA36060	9-25	7764.
one 100/2	FA26100AC	9-25	947.
one 4.5 in. Blanks	HNM4BL	9-23	126.
one 1.5 in. Blank	HNM1BL	9-23	44.
		Total Price	12231.

## I-Line Factory Assembled Pricing Procedure

- 1. Select price for main lugs or main circuit breaker from Base Price tables on Digest page 9-31. Include solid neutral and ground bar when required.
- 2. List branch circuit breakers and determine total mounting inches required. Include space only charge and mounting inches as required. Price branches from Digest page 9-32.
- If total space required exceeds the maximum listed, price as two or more panels and add price for sub-feed lugs, so installer can cable between sections.
- 4. Add price for special features from Digest page 9-34.
- 5. For complete price, total all prices. Order panel by description.
- 6. Apply appropriate discount schedule.

### Table 9.95: I-Line Factory Assembled Pricing Example

600 Vac, 3Ø3W, 400 A, MLO, 14k AIR, Type 1 enclosure, 4 piece surface trim without door.

Description	Digest Page No.	\$ Price
400 A MLO Base Price	9-31	2799.
(8) 60/3	9-32	12072.
one 100/2	9-32	1446.
(3) 250/3	9-32	17100.
	Total Price	33417.

## **QMB Factory Assembled**

### QMB Panelboards—Method of Pricing

- 1. Make a sketch with main lugs or main switch at the top or bottom.
- 2. List required branch devices (switches and circuit breaker units). Include ampere rating, number of poles, and unit mounting height from the appropriate table on Digest pages 9-35 and 9-36.
- 3. 30-60 twin units are the same price as 600 V 60-60 twin units.
- 4. 30-100 and 60-100 twin units are the same price as 600 V 100-100 twin units.
- 5. List solid neutral from Digest page 9-36 if required. No unit mounting height is required.
- 6. List mains ampere rating, voltage, number of poles, and unit mounting space from the appropriate table on 9-36.
- If total unit mounting height of branch devices exceeds maximum mounting space of the mains, price as two or more panelboards, adding sub-feed lugs or feed-thru lugs from the appropriate table on Digest page 9-36.
- Insert at the right of each item the price from the appropriate table, including any accessories. The sum will be the complete panelboard price including the cabinet.

Discount

9. Specify H, R, or J fuse clips.

## Table 9.96: QMB Factory Assembled Pricing Example

600 Vac, 3Ø3W, 400 A, Fusible 10k AIR, Type 1 Enclosure

Branches	Digest Page No.	\$ Price
400 A MLO Base Price	9-36	2016.
(4) 60/3	9-36	4338.
one 100/3	9-36	3411.
one 30/3	_	_
	Total Price	9765.

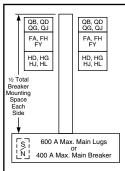
ത



### by Schneider Electric www.schneider-electric.us

### **TYPE HCN**

225 A max. (240 V max.) branci circuit breaker QB, QD, QG, Q 150 A max. branch circuit breaker FA, FH, FY, HD, HG, H, HL \*

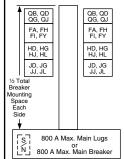


Box Size: 26 in. Wide, 6.5 in. Deep

### TYPE HCM

250 A max. branch circuit

FA, FH, FY, FI, QB, QD, QG, QJ HD, HG, HJ, HL, JD, JG, JJ, JL

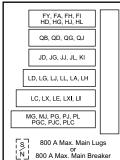


Box Size: 32 in. Wide, 8.25 in. Deep

### TYPE HCP-SU

800 A max. main circuit breake 600 A max. branch circuit

FY, FA, FH, FI, KI, LA, LD, LG, LJ, LL, LH, LC, LX, LI, LXI, LE, MG, MJ, PG, PJ, PL, PGC, PJC, PLC∇, QB, QD, QG, QJ, HD, HG, HJ, HL, JD, JG, JJ, JL



Box Size: 26 in. Wide, 9.5 in. Deep

### Table 9.97: Interiors, Boxes and Fronts

I-Line™ Merchandised

**Panelboards** 

Il others without solid neutral. Order solid neutral from 9-23)

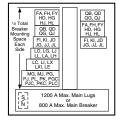
₽ (÷	ng	Com	plete \$ Price				Fro	nt ▲			Во	x <b>+</b>		
Total Circuit Breaker Mounting Space (In.)	Ampere Rating	(4 Piec	e Trim) Branch cuit	Interior Asse (Less Bran Circuit Break	ch Č	4 Piece Tri Without Doo		Trim With Do	oor	Type 1		NEMA 3R/5/12 (Includes F	*	Box Height (In.)
Total Cir Mountin	Mains Ar	Type 1 \$ Price	Type 3R/ 5/12 \$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Box H
	Main Lu		160 26 6	ervice equipmen	t when r	rovided with a r	main cir	rouit breaker 💠						
27	225 A 400 A	2171. 2195.	4004. 4028.	HCN14522N HCN14524	1593. 1617.	HCN52T( )	335.	HCN52T( )D	411.	HC2652B	243.	HC2652WP	2411.	52
45	600 A 225 A 400 A	2392. 2674. 2702.	4225. 4402. 4430.	HCN14526 HCN23652N HCN23654	1814. 1991. 2019.	HCN65T( )	440.	HCN65T( )D	530.	HC2665B	243.	HC2665WP	2411.	65
	600 A 225 A	2960. 3135.	4688. 4709.	HCN23656 HCN32742N	2277. 2298.	TICNOST( )	440.	TICNOST( )D	330.	1102003B	243.	1102003WF	2411.	-
63	400 A 600 A 225 A	3156. 3396. 3548.	4730. 4970. 6233.	HCN32744 HCN32746	2319. 2559. 2552.	HCN74T( )	594.	HCN74T( )D	717.	HC2674B	243.	HC2674WP	2411.	74
81	400 A 600 A	3564. 3824.	6249. 6509.	HCN41832N HCN41834 HCN41836	2568. 2828.	HCN83T( )	753.	HCN83T( )D	890.	HC2683B	243.	HC2683WP	3681.	83
99	225 A 400 A 600 A	4175. 4341. 4434.	6767. 6933.	HCN50922N HCN50924	3086. 3252. 3345.	HCN92T( )	846.	HCN92T( )D	1001.	HC2692B	243.	HC2692WP	3681.	92
	Main Cir	cuit Bre	7026. aker ▼		l	er—Suitable for	. 1169 36	service equipme	l Int					
27	400 A	6649.	8377.	HCN14654M	5966.	ei—Suitable ioi	use as	Service equipme						
36	100 A 225 A	3860. 5303.	5588. 7031.	HCN18651MN HCN18652MN	3177. 4620.	HCN65T( )	440.	HCN65T( )D	530.	HC2665B	243.	HC2665WP	2411.	65
45 54	400 A 100 A 225 A	7287. 4323. 5759.	8861. 5897. 7333.	HCN23744M HCN27741MN HCN27742MN	6450. 3486. 4922.	HCN74T( )	594.	HCN74T( )D	717.	HC2674B	243.	HC2674WP	2411.	74
63	225 A 400 A	6068. 7836.	8753. 10521.	HCN32832MN HCN32834M	5072. 6840.	HCN83T( )	753.	HCN83T( )D	890.	HC2683B	243.	HC2683WP	3681.	83
81 90	400 A 225 A	8154. 6590.	10746. 9182.	HCN41924M HCN45922MN	7065. 5501.	HCN92T()	846.	HCN92T( )D	1001.	HC2692B	243.	HC2692WP	3681.	92
HCM I	Main Lu	gs Only			l								<u>l</u>	
3-pole		ble for ι 2279.	use as s 4566.	ervice equipmen HCM14482N		rovided with a r	main ci	rcuit breaker.☆	1				ı	
27	400 A 600 A	2404. 3175.	4691. 5462.	HCM14484 HCM14486	1644. 1769. 2540.	HCM48T( )	392.	HCM48T( )D	483.	HC3248B	243.	HC3248WP	2922.	48
	800 A 225 A	3709. 2795.	5996. 5717.	HCM14488 HCM23642N	3074. 2036.									-
45	400 A 600 A 800 A	2891. 3530. 4041.	5813. 6452. 6963.	HCM23644 HCM23646 HCM23648	2132. 2771. 3282.	HCM64T( )	516.	HCM64T( )D	633.	HC3264B	243.	HC3264WP	3681.	64
63	225 A 400 A 600 A	3263. 3350. 3921.	6002. 6089. 6660.	HCM32732N HCM32734 HCM32736	2321. 2408. 2979.	HCM73T( )	699.	HCM73T( )D	864.	HC3273B	243.	HC3273WP	3681.	73
	800 A 225 A	4644. 4205.	7383. 7918.	HCM32738 HCM50912N	3702. 2966.									
99	400 A 600 A 800 A	4281. 4586. 5321.	7994. 8299. 9034.	HCM50914 HCM50916 HCM50918	3042. 3347. 4082.	HCM91T()	996.	HCM91T( )D	1217.	HC3291B	243.	HC3291WP	4952.	91
			aker ▼											
27	400 A 225 A		10485. 8504.	HCM14644M HCM18642MN	6804. 4823.	er—Suitable for HCM64T( )	516.	HCM64T( )D	633.	HC3264B	243.	HC3264WP	3681.	64
36	600 A 800 A	11648. 14549.	10706. 13607.	HCM18736MP HCM18738MP	10706. 13607.	HCM73T( )	699.	HCM73T( )D	864.	HC3273DB9�	243.	Use HCP	_	Ŀ
45 54	400 A 225 A	8007. 5969.	10746. 8708.	HCM23734M HCM27732MN	7065. 5027.	HCM73T()	699.	HCM73T( )D	864.	HC3273B	243.	HC3273WP	3681.	73
72	600 A 800 A	12377. 15431.	11138. 14192.	HCM36916MP HCM36918MP	11138. 14192.	HCM91T( )	996.	HCM91T( )D		HC3291DB9♦	243.	Use HCP	_	E
81 HCD 6	400 A		13028.	HCM41914M Row Main Lugs o	8076.	HCM91T( )	996.	HCM91T( )D	1217.	HC3291B	243.	HC3291WP	4952.	91
				tow Main Lugs o ervice equipmen				cuit breaker. 🖈						
54	800	5858.	9466.					HC2686T( )HR△	1658.	HC2686DB	243.	HC2886WP	4952.	86

- Add "F" for flush mount, "S" for surface mount. Add-on door kit available from Peru. Example: For HCM48TS surface trim kit, order HCM48DS door kit.
- For Type 1 applications, order interior, front, and box. For Type 3R/5/12 applications, order interior and box only. The front is included with the box. Remove drain screws for Type 3R rating.
- Bottom feed standard.
- Δ Hinged trim with door.
- For main lugs panel, order sub-feed lug kit and back-feed as main lugs.

  For main circuit breaker panel, order plug-on I-Line type PG, PJ, PL, MG, or MJ circuit breakers from 9-28 through 9-30 and backfeed as the main breaker (order solid neutral from 9-22).
- Suitable for use as service equipment if equipped with an integral main circuit breaker or when not more than six main disconnecting means are provided and the panelboard is not used as a lighting and appliance branch circuit panelboard.
  PG, PJ, PL circuit breakers are available with both thermal-magnetic equivalent and Micrologic trip. The Micrologic circuit breakers are available 80% and 100% rated. "C" suffix denotes a 100% rating.
- $\nabla$ 
  - Circuit breaker interrupt ratings, starting on Digest page 7-2. I-Line Surgelogic SPD not available. DB9 box is 9.5 inches deep.

### **TYPE HCP**

800 A max, branch circuit breaker FA ▲, FH, FI, FY, QB, QD, QG, QJ, HD, HG, HJ, HL, JD, JG, JJ JL, KI, LA, LD, LG, LJ, LL, LH, LC, LI, LX, LXI, LE, MG, MJ, PG, PJ, PL, PGC, PJC, PLC■



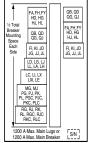
### Box Size:

### 42 in. Wide, 9.5 in. Deep

- FA and JDA circuit breakers with field installable ground fault kits may be mounted in type HCP, HCP-SU, and HCR-U panelboards as shown, and require L-frame mounting space
- PG, PJ, and PL circuit breakers are available with both thermalmagnetic equivalent and Micrologic trip. The Micrologic circuit breakers are available 80% and 100% rated. "C" suffix denotes a 100% rating.

### **TYPE HCR-U Universal** Mains

1200 A max. branch circuit breaker FA ♦, FH, FI, FY, QB, QD, QG,  $\mathsf{QJ}, \mathsf{HD}, \mathsf{HG}, \mathsf{HJ}, \mathsf{HL}, \mathsf{JD}, \mathsf{JG}, \mathsf{JJ},$ JL, KI, LA, LD, LG, LJ, LL, LH, LC, LI, LX, LXI, LE, MG, MJ, PG, PJ, PL, PGC, PJC, PLC, RGC, RJC, RLC★▼



### Box Size: 44 in. Wide, 9.5 in. Deep

- FA and JDA circuit breakers with field installable ground fault kits may be mounted in type HCP, HCP-SU, and HCR-U panelboards as shown, and require L-frame mounting space.
- When RL main circuit breakers with equipment ground fault are applied on a 304W system, order solid neutral catalog number HCR12SNCT. The HCR12SNCT includes a neutral current transformer.
- PG, PJ, and PL circuit breakers are available with both thermalwith both thermal-magnetic equivalent and Micrologic trip. The Micrologic circuit breakers are available 80% and 100% rated. "C" suffix denotes a 100% rating.

Table 9.98: (1200 A Interiors Include solid neutral, all others without solid neutral, Order solid neutral from 9-23.)

Total		Max.	Complete Surface				Fro	nt △				
Circuit Breaker Mtg. Space	Mains Amp. Rating	No. of LC, MJ, PL, RL Circuit	\$ Price (4 Piece Trim) (Less Branch Breakers)	Interior Assen (Less Branch Circuit		4 Piece Trim Without Door □		Trim With D	oor	Box 〈	>	Box Height (In.)
(ln.)	Σ	Breakers	Type 1	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	
<b>HCP Ma</b>	in Lug	s Only—3-pole										
Suitable	for use	as service equi	pment when pro	vided with a main circu	iit breaker. 🤊	år .						
	400		2751.	HCP14504	1902.							
27	600	1PL	3513.	HCP14506	2664.	HCW50T( )	606.	HCW50T( )D	7/12	HC4250DB	243.	50
21	800	IFL	4521.	HCP14508	3672.	11000301( )	000.	TICWSOT( )D	743.	110423000	243.	30
	1200		6365.	HCP145012N	5516.							
	400		3212.	HCP23594	2298.							
45	600	2PL	3860.	HCP23596	2946.	HCW59T()	671.	HCW59T( )D	827.	HC4259DB	243.	59
75	800	21 L	4874.	HCP23598	3960.	11000331( )	071.	11011001( )B	027.	110423300	240.	55
	1200		7133.	HCP235912N	6219.							
	400		3795.	HCP32684	2706.							
63	600	3PL	4476.	HCP32686	3387.	HCW68T()	846.	HCW68T( )D	1052.	HC4268DB	243.	68
00	800	OI L	5309.	HCP32688	4220.	11000001( )	040.			12. TIC4200DD	240.	00
	1200		7763.	HCP326812N	6674.							
	400		4716.	HCP50864	3372.							
99	600	5PL	5208.	HCP50866	3864.	HCW86T()	1101.	HCW86T( )D	1344.	HC4286DB	243.	86
00	800	01 L	6194.	HCP50868	4850.	11011001()		11011001( )B	1011.	110-120000	0.	00
	1200		8529.	HCP508612N	7185.							
			Includes 3-pole									
Vertically	y mount	ted main circuit	breaker—Suitab	le for use as service ed	quipment.							
36	600	2LC	12179.	HCP18686M	11090.	HCW68T( )	846.	HCW68T( )D	1052.	HC4268DB	243.	68
30	800	ZLC	15399.	HCP18688M	14310.	HCVV001()	040.	HCW661( )D	1032.	HC4200DB	243.	00
72	600	4LC	12987.	HCP36866M	11643.	HCW86T( )	1101.	HCW86T( )D	1344.	HC4286DB	243.	86
12	800	410	16296.	HCP36868M	14952.	11000001( )	1101.	TICVV001( )D	1344.	110420000	243.	00
Suitable For Main For Main	for use Lugs p Circuit	as service equi panel, order sub t Breaker panel,	pment when pro -feed lug kit cata order plug-on I-	Breaker⊽—3-pole vided with a main circu alog number S33930 ar Line type PG, PJ, PL, I er solid neutral separat	nd back feed RGC, RJC, d		breakers	s from pages 9-2	7 throu	gh 9-29,		
108 *	1200	6PL or 3RLC	12557.	HCR548612U	11213.	HCR86T( )❖	1101.	HCR86T( )D	1344.	HC4486DB	243.	86

- Add "F" for flush mount "S" for surface mount
- Add-on door kit available. Example: For HCW50TS trim kit, order HCW50D door kit.
- See Digest page 9-23 for 42 in. wide weatherproof enclosures.
- Suitable for use as service equipment if equipped with an integral main circuit breaker or when not more than six main disconnecting means are provided and the panelboard is not used as a lighting and appliance branch circuit panelboard. ☆
- $\nabla$
- Circuit breaker interrupt ratings, starting on Digest page 7-2.

  When RL main circuit breakers with equipment ground fault are applied on a 3Ø4W system, order solid neutral catalog number HCR12SNCT. The HCR12SNCT includes a neutral current transformer.
- 15 in. of mounting space is taken up by the back fed main lug kit or RG, RJ, RL main circuit breaker, leaving 93 in. of branch circuit breaker mounting space. Add-on door kit available. Example: For HCR86TS trim kit, order HCW86D door kit.

Table 9.99: Circuit Breaker / Sub-feed Lug Kit Mounting Space Requirement

Type of Circuit Breaker	Maximum Ampacity	No. of Poles	Inch Mounting Requirements	Type of Circuit Breaker	Maximum Ampacity	No. of Poles	Inch Mounting Requirements
FY	30 A	1	1.5	QB, QD, QG, QJ	225 A	3	4.5
FA, FH		1	1.5	JD, JG, JJ, JL, KI, SL250	250 A		4.5
FA, FH	100 A	2	3	LA, LH, SL400	400 A		6
FA, FH, SL-100	100 A	3	4.5	LD, LG, LJ, LL	600 A		6
FI	1	2, 3	4.5	LC, LI, LXI	600 A	2.3	7.5
HD, HG		2	3	MG, MJ, MA, MH, SL800, PGC, PJC, PLC	800 A	2, 3	
HD, HG	150 A	3	4.5	IVIG, IVIJ, IVIA, IVIA, SLOOU, PGC, PJC, PLC	600 A		9
HJ, HL	1	2, 3	4.5	PG, PJ, PL, S33931	1200 A		
QB, QD, QG, QJ	225 A	2	3	RG, RJ, RL, RGC, RJC, RLC, S33930	1200 A		15

Table 9.100: Main Circuit Breaker Interiors —Standard Frame

Types	•	
Main Circuit Breaker Ampacity	Panelboard Type	Factory Supplied Main Circuit Breaker
100	HCN	FA36100
225	HCN, HCM	JDA36225
400	HCN	LAP36400MB
400	HCM	LAP36400MB
600 or 800	HCM, HCP	MGP36600 or MGP36800

Circuit breaker interrupt ratings, starting on Digest page 7-2.

Table 9.101: Standard Copper Bus Interiors

Туре	Main Ampacity
HCN	600
HCM, HCP-SU	800
HCP, HCR-U	800 and Above

Merchandised copper interiors are not available in all ampacities. For Note: example, if the application calls for a HCN 225 A copper bus interior, order an HCN 600 A interior

**o** 

Blank Fillers

Equipment Ground Bar

Solid Neutral

I-Line™ Merchandised

**Panelboards** 

## Table 9.102: I-Line Merchandised Panelboard Accessories

Description	Catalog No.	\$ Price
Blank Fillers—1.5 in. (minimum order 3) ▼	HNM1BL	14.30
Blank Fillers—4.5 in. (minimum order 5) ▼	HNM4BL	25.20
Solid Neutral Assemblies		
225 A	HC2SN	252.00
400 A	HC4SN▲, HCW4SN■	333.00
600 A	HC6SN▲, HCW6SN■	464.00
	HC8SN▲, HCW8SN■	717.00
800 A	HCPSU8SN◆	1151.00
	HCPSU8SNCT◆	1269.00
1200 A	HCW12SN■	843.00
1200 A, for use with HCR-U universal panel only	HCWM12SN★	1151.00
1200 A, Including neutral CT for 3Ø4W systems	HCR12SNCT★	1269.00
Equipment Ground Bar Kits—HCN	PK27GTA	33.80
HCM, HCP, HCR-U	PK32DGTA	104.00
Blank Extensions (For replacement purposes)		
1.5 in. for mounting on wide side of I-Line panelboard (minimum order 3) ▼	HLW1BL	14.30
4.5 in. for mounting on wide side of I-Line panelboard (minimum order 5) ▼	HLW4BL	25.20
1.5 in. for mounting on narrow side of I-Line panelboard (minimum order 3) ▼	HLN1BL	14.30
4.5 in. for mounting on narrow side of I-Line panelboard (minimum order 5) ▼	HLN4BL	25.20
4.5 in. for mounting on wide side of I-Line panelboard (minimum order 5) ▼	HLW4EBL	25.20
4.5 in. for mounting on narrow side of I-Line panelboard (minimum order 5) ▼	HLN4EBL	25.20

- Used on Type HCN, HCM.
- Used on 400 A, 600 A, 800 A, and 1200 A HCP (main lugs), and 600 A and 800 A (main circuit breaker).
- Used on Type HCR-U.
- Blank extension pricing is per unit. Multiply the list price by the quantity ordered. Note minimum order quantity.

### Table 9.104: Panelboard Adapter Kits

	Branch		Crimp Lug Adapter Kits △	I-Line Panelboard Type			
r g	Circuit	Catalog Number	Chilip Lug Adapter Kits A	HCN	HCM	HCP, HCR-U □	\$ Price
9	Side	Number	400 A	HCN400VCA	HCM400VCA	HCW400VCA	96.
		HLW1BL	600 A	HCN600VCA	HCM600VCA	HCW600VCA	197.
	Wide Side	HLW4BL	800 A	_	HCM800VCA	HCW800VCA	284.
			1200 A	_	_	HCW1200VCA	491.
	Narrow	HLN1BL	△ For use with MLO panel.	order VCEL lugs sen	oratoly		
	Sido	LILNIADI	A FOI USE WILLI MILO DALIEL.	Older VCEL luds seb	erateiv.		

- Not for use with P- or R-frame circuit breakers or sub-feed kits S33930 or S33931.

### Table 9.103: Blank Extensions

Application	Circuit Breaker Mounting Ht.	Branch Circuit Side	Catalog Number
All applications, except Powerpact H/J	1.5 in.	Wide Side	HLW1BL
with Micrologic trip unit 5/6	4.5 in.	Wide Side	HLW4BL
All applications, except Powerpact H/J with Micrologic trip unit 5/6	1.5 in.	Narrow	HLN1BL
with Micrologic trip unit 5/6	4.5 in.	Side	HLN4BL
Only Powerpact H/J circuit breakers with Micrologic trip unit 5/6	4.5 in.	Narrow Side	HLN4EBL
Only Powerpact H/J circuit breakers with Micrologic trip unit 5/6	4.5 in.	Wide Side	HLW4EBL



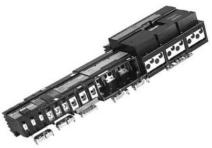
Cotolog Number	olog Number Interior Type \$ Price	¢ Drice	Dimensions (In.)			
Catalog Number		\$ FIICE	Н	W	D	
HC4250WP	HCP	4952.	50	42	12.95	
HC4259WP	HCP	4952.	59	42	12.95	
HC4268WP	HCP	4952.	68	42	12.95	
HC4286WP	HCP	4952.	86	42	12.95	
HC4486WP	HCR-U	4952.	86	44	14.50	

Table 9.106: Box Extensions



Catalog Number	interior type	Exterision	3 FIICE
HC2609DEX (F or S)	HCP-SU	9 in.	552.
HC2609EX (F or S)	HCN	9 in.	552.
HC3209EX (F or S)	HCM	9 in.	552.
HC4212DEX (F or S)	HCP	12 in.	641.
HC4406DEX (F or S)	HCR-U	6 in.	552.
HC4412DEX (F or S)	HCR-U	12 in.	641.

Blank Extensions



Sub-feed Lug Kits

For Surgelogic™ I-Line plug-on SPD unit pricing and information, see Digest pages 6-3 and 6-4.

For field-installable I-Line door kits, see the Supplemental and Obsolescence Digest, Section 4.

Table 9.107: Sub-feed Lug Kits ◊☆

Ampere	Ampere Height Catalo		Catalog	Max. Short Circuit System Ratings RMS Symmetrical Amperes			Protected by		
Rating	ln.	(mm)			240 Vac	480 Vac	600 Vac	Circuit Breaker	Panelboard Types
100 A	4.5	114	SL100	435.	65,000	25,000	18,000	FH	HCN, HCM, HCP, HCP-SU
250 A	4.5	114	SL250	435.	125,000	100,000	50,000	JL	HCM, HCP, HCP-SU
250 A	4.5	114	SL250	435.	200,000	200,000	100,000	KI	TICINI, FICE, FICE-30
400 A	6	152	SL400 ∇	585.	65,000	35,000	25,000	LH	HCP, HCP-SU
800 A	9	229	SL800	1731.	65,000	65,000	25,000	MJ	HCM, HCP, HCP-SU
000 A	9	223	SLOUU	1731.	125,000	100,000	50,000	LL	TICIVI, FICE, FICE-30
1200 A	9	229	S33931	3500.	100,000	65,000	25,000	MJ, PJ	HCP. HCP-SU. HCR-U
1200 A	15	381	S33930	3500.	125,000	100,000	50,000	RL	110F, 110F-30, FICH-0
									_

- Plug-on in same manner as a branch circuit breaker
  For other ratings, See the I-Line Information Manual, #80043-309-xx.
  SL400 cannot be used in HCM panelboards due to inadequate wire bending space.

### Table 9.108: Sub-feed Lug kit terminal data

Catalog No. (Prefix)	No. Poles	Ampere Rating	Std. Lug Kit Catalog No.	Standard Lug Wire Size ♀			
SL100	3	100 A	AL100FA	#14-1/0 AWG Cu or #12-1/0 AWG AI			
SL250	3	250 A	_	#4 AWG-300 kcmil			
SL400	3	400 A	AL400LA	one #1 AWG-600 kcmil or two #1 AWG-250 kcmil			
SL800	3	800 A	AL900MA	(3) #3/0 AWG-500 kcmil			
S33931	3	1200 A	AL1200P24K	(4) #3/0 AWG-500 kcmil			
S33930	3	1200 A	AL1200R53K	(4) #3/0 AWG-600 kcmil			

Unless otherwise specified, wire sizes apply to both aluminum and copper conductors.

SQUARE D

Table 9.109: QO™ Distribution Panel—240 Vac Max. Only Mounts in Type HCN, HCM, HCP, HCP-SU, or HCR-U I-Line panelboards, 30 A max. branch circuit breaker. Order QO plug-on circuit breakers from page 9-34.

Maximum No. 1-pole QO Circuit Breakers		se Heia		Mounting Height		2-pole Catalog	3-pole Catalog	\$ Price
GO Olicuit Breakers	Connection	ln.	mm	Number	Number			
6	AB	4.5	114	HQO206AB	_	369.		
6	BC	4.5	114	HQO206BC	_	369.		
6	AC	4.5	114	HQO206AC	_	369.		
6	ABC	4.5	114	_	HQO306	369.		

▲ Includes (5) QO1DB dummy circuit breakers.



FA/FH, 1-pole 1.5 in (38 mm) Mounting Height



FA/FH, 2-pole 3 in (76 mm) Mounting Height



FA/FH, 3-pole 4.5 in (114 mm) Mounting Height

Table 9.110: Example: FJA, 20 A 1-pole, 277 Vac and 70 A 2- and 3-pole QB 240 Vac. Use phase option number for HD, HG, HJ, HL, JD, JG, JJ, JL, MG, and MJ.

Phase Option Number	Phase Connection	1-pole	2-pole	3-pole
1	Α	FJA140201	_	_
3	В	FJA140203	_	_
5	С	FJA140205	_	_
1	AB	_	QBA220701	_
2	AC	_	QBA220702	_
3	BA	_	QBA220703	_
4	BC	_	QBA220704	_
5	CA	_	QBA220705	_
6	CB	_	QBA220706	_
Standard ■	ABC	_	_	QBA32070
6	CBA	_	_	QBA320706

The absence of a phase option number after a 3-pole catalog number will result in an ABC phase connection.

Table 9.111: Example: FA, 30 A, 480 Vac. Use phase option letters for FH, FI, KI, LA, LH, LC, and LI.

Phase Option Letter	1-pole	2-pole	3-pole
Α	FA14035A	_	_
В	FA14035B	_	
С	FA14035C	_	_
AB	_	FA24030AB	
AC	_	FA24030AC	
BC	_	FA24030BC	_
ABC	_	_	FA34030
CBA	_	_	FA34030CBA

Table 9.112: Interrupt Ratings (kA)

	FA (240 V)	FA (480 V)	FJ
240 V	10	18 (1P), 25 (2, 3P)	65
277 V	<del>-</del>	18	65
480 V	<del>-</del>	18	_
600 V	_	_	_

### PowerPact™ D-frame Mission Critical Circuit Breakers

When the D-frame Mission Critical circuit breaker is used as a main circuit breaker with QO branch circuit breakers, the D-frame MC will remain closed during any fault that occurs downstream of the QO circuit breaker up to 30kA at 208Y/120 Vac.

Table 9.113: PowerPact D-frame, 150-600 A-Mission Critical

ı	Circuit Breaker Cat.alog Number ◆	Continuous Current Rating	Terminal Wire Range (AWG/kcmil)	\$ Price
	DJA32150W	150 A		10867.
	DJA32250W	250 A	#2-600 Cu or #2-500 Al	10867.
	DJA32400W	400 A		10867.
	DJA32600W	600 A	(2) 2/0-350 Cu or (2) 2/0-500Al	17148.

<sup>♦</sup> D-frame circuit breakers 400 A and below are 100% rated.

D-frame accessories, lugs . . . . starting on Supplemental Digest page 3-27 D-frame dimensions . . . . . . . . . . . . Digest page 7-55

Table 9.114: F-frame—100 A, Thermal-magnetic (240 Vac)

Ampere Rating	AC Ma Trip So	ignetic ettings	Standard Inter	rupting	Terminal Wire
Haurig	Hold	Trip	Catalog Number	\$ Price	Range
2-pole, 24	0 Vac ★				
15 A			FA22015( )		
20 A	275	600	FA22020( )		AL50FA #14–#4 AWG Cu or
25 A	2/3	600	FA22025( )		#12-#4 AWG Cu of
30 A			FA22030( )		
35 A			FA22035( )	398.	
40 A	400	850	FA22040( )	1	
45 A	400	000	FA22045( )		
50 A			FA22050( )		AL100FA
60 A			FA22060( )		#14-#1/0 AWG Cu
70 A	800	1450	FA22070( )		or #12-#1/0 AWG AI
80 A			FA22080( )	617.	
90 A	900	0 1700 FA22090() FA22100()	617.		
100 A	900		FA22100( )		
3-pole, 24	0 Vac				
15 A			FA32015		
20 A	275	600	FA32020	572.	AL50FA #14–#4 AWG Cu or
25 A	213	000	FA32025	312.	#12-#4 AWG AI
30 A			FA32030		-
35 A			FA32035		
40 A	400	850	FA32040	572.	AL100FA #14#1/0 AWG Cu
45 A	400	030	FA32045	312.	or #12–#1/0 AWG AI
50 A			FA32050		
60 A			FA32060	572.	AL100FA
70 A	800	1450	FA32070	780	#14-#1/0 AWG Cu
80 A			FA32080	700.	or #12-#1/0 AWG Al
90 A	900	1700	FA32090	790	AL100FA
100 A	900	1700	FA32100	700.	#14-#1/0 AWG Cu
60 A 70 A 80 A 90 A	800 900	1450 1700	FA32060 FA32070 FA32080 FA32090	572. 780. 780.	#14-#1/0 AWG Cu or #12-#1/0 AWG AI

<sup>1-</sup> and 2-pole circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix.

### Table 9.115: F-frame—100 A, Thermal-magnetic (480 Vac)

Ampere		gnetic ettings	Standard Inter	rupting	Extra High Int	terrupting	Terminal V	Vire Range
Rating	Hold	Trip	Catalog Number	\$ Price	Catalog Number	\$ Price	FY/FA Lugs	FJ/FC Lugs
1-pole, 2	77 Vac,	125 Vd	lc ▼					
15 A 20 A 25 A 30 A	275	600	FY14015( )△ FY14020( )△ FY14025( )△ FY14030( )△	149.	FJA14015() FJA14020() FJA14025() FJA14030()	651.	AL50FA #14-#4 AWG Cu, or #12-#4 AWG AI	AL30FD #12-#6 AWG AI, or #14-#6 AWG Cu
35 A 40 A 45 A 50 A 60 A	400	850	FA14035()	302.	FJA14035() FJA14040() FJA14045() FJA14050() FJA14060()	651. 651.	AL100FA #14-#1/0 AWG Cu or	AL100FD #12-#2/0 AWG AI
70 A 80 A	800	1450	FA14070( )□ FA14080( )□	302.	FJA14070()	720.	#12–#1/0 AWG AI	or #14–#2/0 AWG Cu
90 A 100 A	900	1700	FA14090( ) □ FA14100( ) □	302.	_	_		
2-pole, 4	80 Vac,	250 Vd	lc ▼△□					
15 A 20 A 25 A 30 A	275	600	FA24015( ) FA24020( ) FA24025( ) FA24030( )	651.	_  		AL50FA #14-#4 AWG Cu or #12-#4 AWG AI	CU30FA4 one #14– #10 AWG Cu only
35 A 40 A 45 A 50 A	400	850	FA24035( ) FA24040( ) FA24045( ) FA24050( )	651.		  	AL100FA #14-#1/0	AL100FA4 one #14–#3 AWG Cu
60 A 70 A 80 A	800	1450	FA24060( ) FA24070( ) FA24080( )	651. 833.	<u> </u>		AWG Cu or #12–#1/0 AWG AI	or one #12–#1 AWG AI
90 A 100 A	900	1700	FA24090( ) FA24100( )	833.		_		
3-pole, 4	80 Vac,	250 Vd				,		
15 A 20 A 25 A 30 A	275	600	FA34015 FA34020 FA34025 FA34030	833.			AL50FA #14-#4 AWG Cu or #12-#4 AWG AI	CU30FA4 one #14– #10 AWG Cu only
35 A 40 A 45 A 50 A	400	850	FA34035 FA34040 FA34045 FA34050	833.			AL100FA #14#1/0	AL100FA4 one #14–#3
60 A 70 A 80 A	800	1450	FA34060 FA34070 FA34080	833. 996.		_ _ _	AWG Cu or #12–#1/0 AWG AI	AWG Cu or one #12–#1 AWG AI
90 A 100 A	900	1700	FA34090 FA34100	996.				

- 1- and 2-pole circuit breaker catalog numbers are completed by adding the required phase connection letters as a suffix.
- A Rated 277 Vac 15 and 20 A FY circuit breakers are rated for switching duty (SWD). 15, 20, 25, and 30 A FA I-Line circuit breakers are also available (no SWD rating).
- Rated 277 Vac, 125 Vdc, except FY circuit breakers, which have no dc rating.

  15–30 A circuit breakers suitable for use with 60 °C or 75 °C conductors. 35–100 A circuit breakers are suitable for use with 75 °C conductors.



# www.schneider-electric.us

Table 9.116: F-frame—100 A, Thermal-magnetic (600 Vac)

**Circuit Breakers** 



FI36100 2- and 3-pole 4.5 in (114 mm) Mounting Height



QB/QD/QG/QJ Mounting Height: 2-pole—3 in (76 mm) 3-pole—4.5 in (114 mm)

Ampere	AC Ma Trip Se	gnetic ettings	Standard Inter	rupting	High Interru	pting	Current Lin	niting	Terminal Wire
Rating	Hold	Trip	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Range
1-pole, 277 V	ac, 125 Vd	C A							
15 A	1			_	FH16015( )		-	_ 1	
20 A	275	600	_	_	FH16020( )	507.	_	_	AL50FA #14–#4 AWG Cu or
25 A	2/5	600	_	_	FH16025( )	507.	_	_	#12–#4 AWG Cu or
30 A	1		_	_	FH16030( )		_	_	#12 #47WO7W
35 A			_	_	FH16035( )		_	_	
40 A	400	850	_	_	FH16040( )	507.	_	_	
45 A	400	000	_	_	FH16045( )	307.	_	_	
50 A			_	_	FH16050( )		_	_	AL100FA
60 A			_	_	FH16060( )	507.	_	_	#14-#1/0 AWG Cu o
70 A	800	1450	_	_	FH16070( )	563.	_	_	#12-#1/0 AWG AI
80 A			_		FH16080( )		_		
90 A	900	1700	_		FH16090( )	563.	_		
100 A					FH16100( )				
2-pole, 600 V	ac, 250 Vd	C A							
15 A	1		FA26015( )		FH26015( )				AL50FA
20 A	275	600	FA26020( )	780.	FH26020( )	1214.	Fl26020( )	2763.	#14-#4 AWG Cu or
25 A			FA26025( )		FH26025( )		— FI00000/ \		#12-#4 AWG AI
30 A 35 A			FA26030( ) FA26035( )		FH26030( )		Fl26030( )	2/63.	
40 A	4		FA26035( )		FH26035( ) FH26040( )		FI26040( )	2763.	
40 A 45 A	400	850	FA26045( )	780.	FH26045( )	1214.	F120040( )	2/03.	
50 A	4		FA26050( )		FH26050( )		FI26050( )	2763.	AL100FA
60 A			FA26060( )	780.	FH26060( )	1214.	FI26060( )	2703.	#14-#1/0 AWG Cu oi
70 A	800	1450	FA26070( )		FH26070( )		FI26070( )	2763.	#12-#1/0 AWG AI
80 A	- 000	1400	FA26080( )	947.	FH26080( )	1452.	FI26080( )	2700.	
90 A			FA26090( )		FH26090( )		FI26090( )		
100 A	900	1700	FA26100( )	947.	FH26100( )	1452.	FI26100( )	2763.	
3-pole, 600 V	ac. 250 Vd	C					. , ,		
15 A	1		FA36015		FH36015			_ 1	
20 A			FA36020		FH36020		FI36020	3459.	AL50FA
25 A	275	600	FA36025	971.	FH36025	1446.	_	_	#14–#4 AWG Cu or #12–#4 AWG AI
30 A	1		FA36030		FH36030		FI36030	3459.	#12-#4 AVVG AI
35 A			FA36035		FH36035		_	_	
40 A	400	850	FA36040	971.	FH36040	1446.	FI36040	3459.	
45 A	400	850	FA36045	9/1.	FH36045	1446.	_	_	
50 A	1		FA36050		FH36050		FI36050	3459.	AL100FA
60 A			FA36060	971.	FH36060	1446.	FI36060		#14-#1/0 AWG Cu o
70 A	800	1450	FA36070	1163.	FH36070	1632.	Fl36070	3459.	#12-#1/0 AWG AI
80 A			FA36080	1103.	FH36080	1032.	FI36080		
90 A	900	1700	FA36090	1163.	FH36090	1632.	Fl36090	3459.	
100 A	7 300	1700	FA36100	1103.	FH36100	1032.	Fl36100	3433.	

▲ 1- and 2-pole circuit breaker catalog numbers are completed by adding the required connection letters as a suffix, See Digest page 9-24. **NOTE:** As of January 1st, FI breakers will only fit on the wide side of I-Line panelboards.

Table 9.117: PowerPact™ Q-frame ■— 225 A, Thermal-magnetic (240 Vac)

Ampere Rating	AC Ma Trip Se	gnetic ettings	"B" Interrup	oting	"D" Interrup	oting	"G" Interru	oting	"J" Interrup	oting
nating	Hold	Trip	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
2-pole, 240 \	ac ♦									
70 A	1		QBA22070( )		QDA22070( )		QGA22070( )		QJA22070( )	
80 A	1000	1800	QBA22080( )	600.	QDA22080( )	1202.		1593.	QJA22080( )	1992.
90 A			QBA22090( )		QDA22090( )		QGA22090( )		QJA22090( )	
100 A			QBA22100( )		QDA22100( )		QGA22100( )		QJA22100( )	
110 A			QBA22110( )		QDA22110( )		QGA22110( )		QJA22110( )	
125 A	1		QBA22125( )		QDA22125( )		QGA22125( )		QJA22125( )	
150 A	1200	2400	QBA22150( )	600.	QDA22150( )	1202.		1593.	QJA22150( )	1992.
175 A	1		QBA22175( )		QDA22175( )		QGA22175( )		QJA22175( )	
200 A			QBA22200( )		QDA22200( )		QGA22200( )		QJA22200( )	
225 A			QBA22225( )		QDA22225( )		QGA22225( )		QJA22225( )	
3-pole, 240 \	/ac ★									
70 A			QBA32070( )		QDA32070( )		QGA32070( )		QJA32070( )	
80 A	1000	1800	QBA32080( )	1913.	QDA32080( )	2069.		2835.	QJA32080( )	3245.
90 A			QBA32090( )		QDA32090( )		QGA32090( )		QJA32090( )	
100 A			QBA32100( )		QDA32100( )		QGA32100( )		QJA32100( )	
110 A			QBA32110( )		QDA32110( )		QGA32110( )		QJA32110( )	
125 A			QBA32125( )		QDA32125( )		QGA32125( )		QJA32125( )	
150 A	1200	2400	QBA32150( )	1913.	QDA32150( )	2069.		2835.	QJA32150( )	3245.
175 A	1		QBA32175( )		QDA32175( )	)	QGA32175( )	)	QJA32175( )	
200 A	]		QBA32200( )		QDA32200( )		QGA32200( )		QJA32200( )	
225 A			QBA32225( )		QDA32225( )		QGA32225( )		QJA32225( )	

- Replacement lugs are not available on QB, QD, QG, or QJ circuit breakers. Lugs for QB, QD, QG, or QJ circuit breakers accept one #4 AWG-300 kcmil. No accessories are available for PowerPact Q Frame breakers.
- 2-pole QB, QD, QG, and QJ circuit breakers are completed by adding the required phasing numbers as indicated in the parentheses, See Digest page 9-24.

  3-pole QB, QD, QG, and QJ circuit breakers for ABC phasing are complete without additional phasing number. For CBA phasing, complete the catalog number by inserting the number "6" in the parentheses.

Table 9.118: Interrupt Ratings (kA)

	-	= : :						
	FA	FH	FI	QB	QD	QG	QJ ▼	ı
240 V	25	25 (1P 35-100 A), 65 (1P 15-30 A, 2P, 3P)	200	10	25	65	100	٠.
480 V	18	25 (2, 3P)	200	_		_	_	
600 V	14	18 (2, 3P)	100	_	_	_	_	

3-pole QJ circuit breakers are rated at 208Y/120 Vac only.

F-frame accessories starting on Supplemental Digest page 3-24	Q-frame accessories
F-frame dimensions	
F-frame optional lugs	Q-frame dimensions Digest page 7-54
	Q-frame optional lugs Supplemental Digest page 3-29

Table 9.119: H-frame 150 A Thermal-Magnetic UL Current-Limiting ▲ Circuit Breakers (600 Vac, 250 Vdc) With Factory Sealed Trip Unit ■ Suitable for Reverse Connection =

	tting @ Trip 10° C Hold Trip			Interru	upting Rating (2nd Le	tter of Catalog Number	er)	
			0-1-11-1	D	G	J▲	LA	Terminal
20 A 25 A 30 A 35 A 40 A 45 A 50 A 60 A 70 A 80 A 90 A 100 A 110 A 125 A 150 A H-frame 150A 3P, 60 15 A 20 A 25 A 30 A 35 A 40 A	. "	mp	Cat. No.◆		\$ Pric	ce		Wire Range
	Hold	Trip		80% Rated	80% Rated	80% Rated	80% Rated	
frame, 150A	2P, 600 Vac 50	/60 Hz, 250 Vdc	<b>A</b>					
15 A	350 A	750 A	H()A26015()	899.	1338.	1589.	2364.	
20 A	350 A	750 A	H()A26020()	899.	1338.	1589.	2483.	
25 A	350 A	750 A	H()A26025()	899.	1338.	1589.	2483.	
30 A	350 A	750 A	H()A26030()	899.	1338.	1589.	2483.	
35 A	400 A	850 A	H()A26035()	899.	1338.	1589.	2483.	
40 A	400 A	850 A	H()A26040()	899.	1338.	1589.	2483.	
	400 A	850 A	H()A26045()	899.	1338.	1589.	2483.	AL150HD
	400 A	850 A	H()A26050()	899.	1338.	1589.	2483.	14–3/0 AWG
	800 A	1450 A	H()A26060()	899.	1338.	1589.	2483.	Al or Cu
70 A	800 A	1450 A	H()A26070()	1088.	1559.	1824.	2681.	Al Ol Cu
80 A	800 A	1450 A	H()A26080()	1088.	1559.	1824.	2681.	
90 A	800 A	1450 A	H()A26090()	1088.	1559.	1824.	2681.	
100 A	800 A	1700 A	H()A26100()	1088.	1559.	1824.	2681.	
110 A	900 A	1700 A	H()A26110()	2195.	3212.	4671.	5699.	
125 A	900 A	1700 A	H( )A26125( )	2195.	3212.	4671.	5699.	
150 A	900 A	1700 A	H()A26150()	2195.	3212.	4671.	5699.	
frame 150A 3	3P, 600 Vac 50/	60 Hz, 250 Vdc						
15 A	350 A	750 A	H()A36015	1124.	1575.	1988.	2993.	
20 A	350 A	750 A	H( )A36020	1124.	1575.	1988.	2993.	
25 A	350 A	750 A	H( )A36025	1124.	1575.	1988.	2993.	
30 A	350 A	750 A	H( )A36030	1124.	1575.	1988.	2993.	
35 A	400 A	850 A	H()A36035	1124.	1575.	1988.	2993.	
40 A	400 A	850 A	H( )A36040	1124.	1575.	1988.	2993.	
45 A	400 A	850 A	H( )A36045	1124.	1575.	1988.	2993.	AL150HD
50 A	400 A	850 A	H()A36050	1124.	1575.	1988.	2993.	14–3/0 AWG
60 A	800 A	1450 A	H( )A36060	1124.	1575.	1988.	2993.	Al or Cu
70 A	800 A	1450 A	H( )A36070	1361.	1772.	2225.	3243.	Al of Cu
80 A	800 A	1450 A	H( )A36080	1361.	1772.	2225.	3243.	
90 A	800 A	1450 A	H()A36090	1361.	1772.	2225.	3243.	
100 A	800 A	1700 A	H()A36100	1361.	1772.	2225.	3243.	
110 A	900 A	1700 A	H()A36110	2730.	3779.	5432.	6951.	
125 A	900 A	1700 A	H( )A36125	2730.	3779.	5432.	6951.	
150 A	900 A	1700 A	H()A36150	2730.	3779.	5432.	6951.	

A 2 pole circuit breaker catalog numbers are completed by adding the required phase connection number as a suffix see Table 9.128.

Table 9.120: J-frame 250 A Thermal-Magnetic UL Current-Limiting ▲ Circuit Breakers (600 Vac, 250 Vdc) With Factory Sealed Trip Unit ■ Suitable for Reverse Connection =

	•••••	••-							
	Authoritate	10 Manualia			Interrupting Ratir	ng (2nd Letter of Ca	italog Number)		
Current		AC Magnetic		D	G	J▲	LA	R▲	Terminal
Rating @ 40°C		ı.b	Cat. No.◆		·	\$ Price			Wire Range
40 0	Low	High		80% Rated	Rated 80% Rated 80% Rated 80% Rated		80% Rated	80% Rated	
J-frame 250A	l-frame 250A 2P, 600 Vac 50/60 Hz, 2		Vdc▲						
150 A	750 A	1500 A	J()A26150()	2283.	3372.	4904.	5985.	_ 1	AL175JD
175 A	875 A	1750 A	J( )A26175( )	2283.	3372.	4904.	5985.	_	4-4/0 AWG AI or Cu
200 A	1000 A	2000 A	J( )A26200( )	2283.	3372.	4904.	5985.	_	AL250JD
225 A	1125 A	2250 A	J( )A26225( )	2283.	3372.	4904.	5985.	_	3/0 AWG-350 kcmil
250 A	1250 A	2500 A	J( )A26250( )	3138.	4463.	6536.	7338.	_	Al or Cu
J-frame 250A	3P, 600 Vac	50/60 Hz, 250	Vdc						
150 A	750 A	1500 A	J()A36150	2867.	3968.	5705.	7299.	9676.	AL175JD
175 A	875 A	1750 A	J( )A36175	2867.	3968.	5705.	7299.	9676.	4-4/0 AWG AI or Cu
200 A	1000 A	2000 A	J()A36200	2867.	3968.	5705.	7299.	9676.	AL250JD
225 A	1125 A	2250 A	J()A36225	2867.	3968.	5705.	7299.	9676.	3/0 AWG-350 kcmil
250 A	1250 A	2500 A	J()A36250	3936.	5252.	7599.	9173.	11729.	Al or Cu

<sup>2</sup> pole circuit breaker catalog numbers are completed by adding the required phase connection number as a suffix see Table 9.128.

Table 9.121: H-frame 150 A and J-frame 250 A Electronic Trip UL Current-Limiting▲ Circuit Breakers (600 Vac) With Factory Sealed Trip Unit ■ Suitable for Reverse Connection \*

Elect	tronic Trip Uni	it			lr	nterrupting Rating	g (2nd Letter of Ca	atalog Number)		
			Sensor		D	G	J▲	LA	R▲	
Туре	Function	Trip Unit	Rating	Cat. No.♦			\$ Price			Terminal
.,,					80% Rated	80% Rated	80% Rated	80% Rated	80% Rated	
00 Vac, 50/60	) Hz, 3P									
			60 A	H()A36060U31X	1316.	1743.	2224.	3173.	4171.	
	Ш	3.2□	100 A	H( )A36100U31X	1569.	1962.	2382.	3490.	4591.	AL150HD▼
	Li	3.2⊔	150 A	H( )A36150U31X	2911.	3965.	5626.	7288.	9631.	
Micrologic			250 A	J()A36250U31X	3120.	4226.	5970.	7715.	10102.	AL250JD△
Standard			60 A	H( )A36060U33X	1512.	1939.	2420.	3370.	4393.	
	LSI	3.2S□	100 A	H( )A36100U33X	1765.	2159.	2578.	3686.	4813.	AL150HD▼
	LOI	3.230	150 A	H( )A36150U33X	3107.	4161.	5823.	7484.	9853.	
			250 A	J()A36250U33X	3398.	4505.	6249.	7994.	10420.	AL250JD△
			60 A	H( )A36060U43X	2143.	2570.	3051.	4001.	5185.	
Micrologic	LSI	5.2A	100 A	H( )A36100U43X	2396.	2789.	3209.	4317.	5653.	AL150HD▼
Ammeter	LOI	J.2A	150 A	H( )A36150U43X	3738.	4792.	6453.	8115.	10836.	
			250 A	J()A36250U43X	4299.	5406.	7150.	8895.	11561.	AL250JD△
			60 A	H( )A36060U53X	2523.	2950.	3431.	4380.	5883.	
Micrologic	LSI	5.2E	100 A	H( )A36100U53X	2776.	3169.	3589.	4697.	6333.	AL150HD▼
Energy	LOI	J.ZL	150 A	H( )A36150U53X	4118.	5172.	6833.	8495.	11342.	
			250 A	J()A36250U53X	4840.	5947.	7691.	9436.	12413.	AL250JD△
			60 A	H( )A36060U44X	2902.	3330.	3811.	4760.	6423.	
Micrologic	LSIG	6.2A	100 A	H( )A36100U44X	3156.	3549.	3969.	5077.	6873.	AL150HD▼
Ammeter	Loid	U.Z.A	150 A	H( )A36150U44X	4497.	5551.	7213.	8875.	11864.	
			250 A	J()A36250U44X	5381.	6487.	8231.	9976.	13157.	AL250JD△
·			60 A	H( )A36060U54X	3282.	3709.	4190.	5140.	6963.	
Micrologic	LSIG	6.2E	100 A	H( )A36100U54X	3535.	3929.	4349.	5456.	7413.	AL150HD▼
Energy	Loid	U.ZL	150 A	H( )A36150U54X	4877.	5931.	7593.	9254.	12386.	
			250 A	J()A36250U54X	5921.	7028.	8772.	10517.	13900.	AL250JD△

- Circuit breakers with J, L, and R interrupting ratings are UL certified as current limiting.

- See Supplemental Digest pages 3-2 and 3-3 for circuit breakers with field-interchangeable trip units

  To complete catalog number, replace the blank with the appropriate rating (D, G, J, L).

  For applications requiring communications, see Digest page 7-49.

  AL150HD wire range is 14-30 AWG AI or Cu.

  AL250JD wire range is 3/0 AWG-350 kcmil AI or Cu. For smaller wire range (4-4/0 AWG AI or Cu), replace the lug's wire binding screws with the larger binding screws provided.

  3P circuit breakers with this trip unit can be used for 2P applications. Δ



ത



www.schneider-electric.us

Table 9.122: K-frame—250 A, Thermal-magnetic, Current Limiting (600 Vac)

**Circuit Breakers** 



KI36250 2- and 3-pole 4.5 in (114 mm) Mounting Height

Ampere	AC Magnetic	Trip Settings	Current Limit	ing	Terminal
Rating	Low	High	Catalog Number	\$ Price	Wire Range
-pole, 600 Vac, 250	Vdc ▲				
110 A	550	1100	Kl26110( )	6633.	AL250KA
125 A	625	1250	Kl26125( )	6633.	one #4 AWG–
150 A	750	1500	Kl26150( )	6633.	350 kcmil
175 A	875	1750	Kl26175( )	6633.	Al or Cu
200 A	1000	2000	Kl26200( )	6633.	AL250KI
225 A	1125	2250	Kl26225( )	6633.	one #1/0 AWG–
250 A	1250	2500	Kl26250( )	7704.	350 kcmil Al or Cu
3-pole, 600 Vac, 250	Vdc			,	
110 A	550	1100	Kl36110	8375.	AL250KA
125 A	625	1250	Kl36125	8375.	one #4 AWG–
150 A	750	1500	Kl36150	8375.	350 kcmil
175 A	875	1750	Kl36175	8375.	Al or Cu
200 A	1000	2000	KI36200	8375.	AL250KI
225 A	1125	2250	KI36225	8375.	one #1/0 AWG–
250 A	1250	2500	KI36250	9267.	350 kcmil Al or Cu

2-pole circuit breaker catalog numbers are completed by adding required phase connection letters as suffix to catalog number. See Digest page 9-24.

### J-Frame Mission Critical Circuit Breaker

Table 9.123: J-frame 250 A Electronic Trip Mission Critical Circuit Breakers (480/277 Vac) With Factory Sealted Trip Units Suitable for Reverse Connection

Electronic Trip	Trip	Trip Unit	Current	D Interruptin	ıg	G Interruptin	g	J Interruptin	g	L Interruptin	ıg	Terminal
Unit Type	Function	mp ont	Current	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Terrinia
Standard	LI	3.2 W	250	JDA34250WU31X	3619.	JGA34250WU31X	4857.	JJA34250WU31X	6808.	JLA34250WU31X	8759.	AL250JD■
Standard	LSI	3.2S-W	250	JDA34250WU33X	3931.	JGA34250WU33X	5169.	JJA34250WU33X	7119.	JLA34250WU33X	9071.	AL250JD■
High Perf. Ammerter	LSI	5.2A-W	250	JDA34250WU43X	4939.	JGA34250WU43X	6176.	JJA34250WU43X	8127.	JLA34250WU43X	10079.	AL250JD■
High Perf. Energy	LSI	5.2E-W	250	JDA34250WU53X	5544.	JGA34250WU53X	6782.	JJA34250WU53X	8732.	JLA34250WU53X	10684.	AL250JD■
High perf. Ammerter	LSIG	6.2A-W	250	JDA34250WU44X	6148.	JGA34250WU44X	7386.	JJA34250WU44X	9336.	JLA34250WU44X	11288.	AL250JD■
High Perf. Energy	LSIG	6.2E-W	250	JDA34250WU54X	6753.	JGA34250WU54X	7991.	JJA34250WU54X	9942.	JLA34250WU54X	11893.	AL250JD■

- Standard rated (80%). Not available in 100% rated.
- AL250JD terminal wire range is (1) 3/0 AWG-350 kcmil Al or Cu.

### L-Frame Mission Critical Circuit Breaker

Table 9.124: L-frame 600 A Electronic Trip Mission Critical Circuit Breakers (480/277 Vac) With Factory Sealted Trip Units Suitable for Reverse Connection

Electronic Trip	Trip	Trip Unit	Continuous	D Interruptin	g	G Interruptin	g	J Interruptin	ıg	L Interruptin	ıg	Terminal	
Unit Type	Function	INP UNIT	Current	Cat. No.	\$ Price	Terminai							
			250	LDA34250WU31X	5991.	LGA34250WU31X	6291.	LJA34250WU31X	10299.	LLA34250WU31X	11998.	AL400L61K3■	
Standard	LI	3.3 W	400 600	LDA34400WU31X LDA34600WU31X	5991. 8684.	LGA34400WU31X LGA34600WU31X	6291. 9126.	LJA34400WU31X LJA34600WU31X	10299. 12733.	LLA34400WU31X LLA34600WU31X	11998. 14263.	AL600LF52K3◆	
		250	LDA34250WU33X	6656.	LGA34250WU33X	6990.	LJA34250WU33X	10999.	LLA34250WU33X	12698.	AL400L61K3■		
Standard	LSI 3.3S-	LSI 3.3S-W	.SI 3.3S-W	400 600	LDA34400WU33X LDA34600WU33X	6656. 9349.	LGA34400WU33X LGA34600WU33X	6990. 9826.	LJA34400WU33X LJA34600WU33X	10999. 13433.	LLA34400WU33X LLA34600WU33X	12698. 14962.	AL600LF52K3◆
High Perf. Ammeter	LSI	5.3A-W	400 600	LDA34400WU43X LDA34600WU43X	7674. 10366.	LGA34400WU43X LGA34600WU43X	8062. 10896.	LJA34400WU43X LJA34600WU43X	12070. 14503.	LLA34400WU43X LLA34600WU43X	13769. 16033.	AL600LF52K3◆	
High Perf. Energy	LSI	5.3E-W	400 600	LDA34400WU53X LDA34600WU53X	8791. 11485.	LGA34400WU53X LGA34600WU53X	9238. 12074.	LJA34400WU53X LJA34600WU53X	13247. 15681.	LLA34400WU53X LLA34600WU53X	14946. 17210.	AL600LF52K3◆	
High Perf. Ammeter	LSIG	6.3A-W	400 600	LDA34400WU44X LDA34600WU44X	9911. 12604.	LGA34400WU44X LGA34600WU44X	10417. 13251.	LJA34400WU44X LJA34600WU44X	14426. 17139.	LLA34400WU44X LLA34600WU44X	16125. 18388.	AL600LF52K3◆	
High Perf. Energy	LSIG	6.3E-W	400 600	LDA34400WU54X LDA34600WU54X	11029. 13722.	LGA34400WU54X LGA34600WU54X	11594. 14429.	LJA34400WU54X LJA34600WU54X	15602. 18036.	LLA34400WU54X LLA34600WU54X	17301. 19566.	AL600LF52K3◆	

- Standard rated (80%). Not available in 100% rated.

  AL400L61K3 terminal wire range is (1) #2 AWG–500 kcmil Al or #2 AWG–600 kcmil Cu..

  AL600LF52K3 terminal wire range is (2) #3/0 AWG–500 kcmil Al or Cu.

Table 9.125: PowerPact™ H-, J-, and L-frame Automatic Molded Case Switches, 600 Vac

Circuit		Ampere Rating	G Withstand			L Withstand			R Withstand					
Breaker	Poles		Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Cat. No.	\$ Price	Trip Point	Terminal	Wire Range	
H-frame	2▲	150 A 175 A 250 A	HGA26000S15( ) JGA26000S17( ) JGA26000S25( )	1827.	2250 A 3125 A 3125 A	HLA26000S15 JLA26000S17 JLA26000S25	1590. 1980. 1980.	2250 A 3125 A 3125 A	_ _ _	_ _ _	_	_ _ _	=	
J-frame	3	150 A 175 A 250 A	HGA36000S15 JGA36000S17 JGA36000S25	2286.	2250 A 3125 A 3125 A	HLA36000S15 JLA36000S17 JLA36000S25	1988. 2475. 2475.	2250 A 3125 A 3125 A	HRA36000S15 JRA36000S17 JRA36000S25	2295. 2860. 2860.	2250 A 3125 A 3125 A	AL150HD AL175JD AL250JD	14 AWG-3/0 AWG Al/Cu 4-4/0 AWG Al/Cu 3/0 AWG-350 kcmil Al/Cu	
L-frame	3	400 A 600 A	LGA36000S40X LGA36000S60X	4572. 5065.		LLA36000S40X LLA36000S60X	4972. 5465.	4800 A 6600 A	LRA36000S40X LRA36000S60X	5688. 6220.	4800 A 6600 A	AL150HD AL250JD	AL600LS52K3 (2) 2/0 AWG-500 kcmil Al/Cu	

35

65

100

Table 9.127: Interrupt Ratings (kA)

18

2-pole circuit breaker catalog numbers are completed by adding the required phase connection number as a suffix, see Table 9.128.

480 V

Table 9.126: KI Interrupt Ratings (kA)

V	KI
240	200
480	200
600	100

ioo	starting on Cumplemental Digest n	000
1	100	
)	200	
	200	

K-frame accessories starting or	Supplemental	Digest page 3-25
K-frame dimensions	. Supplemental	Digest page 3-33
K-frame optional lugs	. Supplemental	Digest page 3-28
H-, J-, and L-frame accessories	starting on	Digest page 7-36
H-, J-, and L-frame dimensions	starting on	Digest page 7-54
H-, J-, and L-frame optional lugs		Digest page 7-39

Table 9.128: Phase Options—Example HDA26150( )

	Phase Option Number	Phase Connection	2-pole	3-pole			
Ī	1	AB	HDA261501	_			
	2	AC	HDA261502	_			
	3	BA	HDA261503	_			
	4	BC	HDA261504	_			
Ξ	5	CA	HDA261505	_			
	6	CB	HDA261506	_			
	Standard	ABC	_	JDA34250WU31X			
	6	CBA	_	JDA34250WU31X6			

## LA Mission Critical Circuit Breakers

The LA High Magnetic Withstand MC Circuit Breakers are designed to trip at a higher magnetic trip level (18–20 times handle rating) than typical molded case circuit breakers (MCCBs) (which trip at 5–10 times the handle rating). The high magnetic withstand value of these LA circuit breakers allow the downstream branch circuit breaker to clear the fault.

Table 9.129: L-frame—400 A, I-Line™ LA/LH MC High Magnetic Withstand Circuit Breaker For Mission Critical Loads

Ampere AC Magnetic Level Factory Set ▲		Standard Inte	rrupting	High Interru	pting	Terminal			
naurig	Hold Trip		Cat. No.	\$ Price	Cat. No. \$ Price		Cat. No.	Wire Range	
LA/LH MC C	ircuit Breaker,								
200 A	3400 A	4000 A	LA34200MC	5571.	LH34200MC	8771.		///	
225 A	3825 A	4500 A	LA34225MC	5571.	LH34225MC	8771.	AL250LAMC	(1) 250–350 kcmil Al (1) 3/0 AWG–350 kcmil Cu	
250 A	4250 A	5000 A	LA34250MC	5681.	LH34250MC	8882.		(1) 3/0 AVVG=330 KCITIII CU	
400 A	6000 A	7200 A	LA34400MC	6941.	LH34400MC	10142.	AL400LA	(1) 1 AWG–600 kcmil Al or (2) 1 AWG–250 kcmil Al	

<sup>▲</sup> AC magnetic setting tolerances are +0 -25% from maximum value shown.

### Table 9.130: L-frame—400 A, Thermal-magnetic (600 Vac)

Ampere Rating	AC Magnetic Trip Settings		Standard Interr	upting	High Interru	Terminal Wire	
Haung	Low	High	Catalog Number	\$ Price	Catalog Number	\$ Price	Range
2-pole, 600 Va	c, 250 Vdc ■						
125 A	625	1250	LA26125( )	4053.	LH26125( )	6762.	
150 A	750	1500	LA26150( )	4053.	LH26150( )	6762.	
175 A	875	1750	LA26175( )	4053.	LH26175( )	6762.	
200 A	1000	2000	LA26200( )	4053.	LH26200( )	6762.	AL400LA
225 A	1125	2250	LA26225( )	4053.	LH26225( )	6762.	one #1 AWG-600 kcmil or two #1 AWG-250 kcmil
250 A	1250	2500	LA26250( )	4053.	LH26250( )	6762.	AL or Cu
300 A	1500	3000	LA26300( )	4053.	LH26300( )	6762.	
350 A	1750	3500	LA26350( )	4053.	LH26350( )	6762.	
400 A	2000	4000	LA26400( )	4053.	LH26400( )	6762.	
3-pole, 600 Va	c, 250 Vdc		,		,	,	
125 A	625	1250	LA36125	4944.	LH36125	8145.	
150 A	750	1500	LA36150	4944.	LH36150	8145.	
175 A	875	1750	LA36175	4944.	LH36175	8145.	
200 A	1000	2000	LA36200	4944.	LH36200	8145.	AL400LA
225 A	1125	2250	LA36225	4944.	LH36225	8145.	one #1 AWG-600 kcmil or two #1 AWG-250 kcmil
250 A	1250	2500	LA36250	4944.	LH36250	8145.	AL or Cu
300 A	1500	3000	LA36300	4944.	LH36300	8145.	
350 A	1750	3500	LA36350	4944.	LH36350	8145.	
400 A	2000	4000	LA36400	4944.	LH36400	8145.	



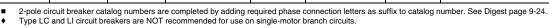
LA/LH 2- and 3-pole 6 in (152 mm) Mounting Height



LI 2- and 3-pole 7.5 in (190 mm) Mounting Height

Table 9.131: L-frame—600 A. Thermal-magnetic (600 Vac)

Ampere	AC Magnetic	Trip Settings	Extra High Inte	rrupting	Current Li	miting	Terminal	
Rating	Low	High	Catalog Number	\$ Price	Catalog Number	\$ Price	Wire Range	
2-pole, 600 Va	ic =							
300 A	1500		LC26300( )		LI26300( )			
350 A	1750	3200	LC26350( )	8312.	LI26350( )	9563.		
400 A	2000	1 1	LC26400( )	1	LI26400( )	1	AL600LI5 two #4/0 AWG-500 kcm	
450 A	2250		LC26450( )		LI26450( )		AL or Cu	
500 A	2500	4200	LC26500( )	8691.	LI26500( )	13949.		
600 A	3000	1	LC26600( )	1	LI26600( )			
3-pole, 600 Va	ic							
300 A	1500		LC36300		LI36300			
350 A	1750	3200	LC36350	9234.	LI36350	10673.		
400 A	2000	1	LC36400	1	LI36400		AL600LI5 two #4/0 AWG-500 kcm	
450 A	2250		LC36450		Ll36450		AL or Cu	
500 A	2500	4200	LC36500	9657.	LI36500	15498.		
600 A	3000	1 1	LC36600	1	LI36600	1		



L-frame acccessories	starting on Supplemental	Digest page	3-24
L-frame dimensions		Digest page	7-54
I -frame ontional lugs		Digest page	7-53

Table 9.132: Interrupt Ratings (kA)

		J- ( )					
	LA	LH	LC	LI			
240 V	42	65	100	200			
480 V	30	35	65	200			
600 V	22	25	35	100			



LC 2- and 3-pole 7.5 in (190 mm) Mounting Height



by Schneider Electric www.schneider-electric.us

Table 9.133: L-frame 600 A Circuit Breakers with Lugs and Factory-Sealed Electronic Trip Units Suitable for Reverse Connection▲

							Int	errupting R	ating (2nd L	etter of Cat	alog Numbe	r)			
Electro	onic Trip U	nit	Sensor	Cotolog	C	)	G	1	J.	•	L	•	R ·	<b>*</b>	Terminal
Time	Function	Trip Unit	Rating Catalog Number■		\$ Price										
Type	Function	Unit			80%	100%	80%	100%	80%	100%	80%	100%	80%	100%	
600 Vac, 53/60 Hz, 3P															
Miorologio			250 A	L( )A36250U31X	5122.	5943.	5376.	6240.	8773.	10214.	10213.	11899.	11745.	13745.	AL400L61K3▼
Micrologic Standard	LI	400 F	400 A 600 A	L( )A36400U31X L( )A36600U31X	5122. 7404.	5943. —	5376. 7779.	6240. —	8773. 10836.	10214. —	10213. 12132.	11899. —	11745. 13952.	13745. —	AL600LF52K3△
Micrologic			250 A	L( )A36250U33X	5686.	6506.	5969.	6833.	9366.	10808.	10806.	12493.	12427.	14449.	AL400L61K3▼
Standard	LSI	3.3S★	400 A 600 A	L( )A36400U33X L( )A36600U33X	5686. 7968.	6506. —	5969. 8372.	6833. —	9366. 11429.	10808. —	10806. 12725.	12493. —	12427. 14634.	14449. —	
Micrologic Ammeter	LSI	5.3A	400 A 600 A	L( )A36400U43X L( )A36600U43X	6548. 8830.	7368. —	6877. 9279.	7740. —	10274. 12336.	11715. —	11714. 13632.	13400. —	13471. 15677.	15523. —	
Micrologic Energy	LSI	5.3E	400 A 600 A	L( )A36400U53X L( )A36600U53X	7495. 9778.	8316. —	7874. 10277.	8738. —	11271. 13334.	12713. —	12711. 14630.	14398. —	14618. 16825.	16705. —	AL600LF52K3△
Micrologic Ammeter	LSIG	6.3A	400 A 600 A	L( )A36400U44X L( )A36600U44X	8444. 10726.	9264.	8873. 11275.	9736. —	12270. 14332.	13711. —	13710. 15628.	15396. —	15767. 17972.	17887. —	
Micrologic Energy	LSIG	6.3E	400 A 600 A	L( )A36400U54X L( )A36600U54X	9392. 11674.	10212. —	9870. 12273.	10734. —	13267. 15329.	14709. —	14707. 16626.	16394. —	16913. 19120.	19069. —	

- See Supplemental Digest page 3-4 for circuit breakers with field-interchangeable trip units.
- For 100% rated circuit breakers (250 A and 400 A only), add a "C" in the 9th character place (for example, LRA36400CU31X). Circuit breakers with J, L, and R interrupting ratings are UL certified as current limiting. 3P circuit breakers with this trip unit can be used for 2P applications.

**Circuit Breakers** 

- AL400L61K3 terminal wire ranges are (1) 2 AWG-600 kcmil Cu or (1) 2 AWG-500 kcmil Al.
- Δ AL600LFS52K3 terminal wire range is (2) 3/0 -500 kcmil.
- For applications requiring communications, see Digest page 7-43.

### Interrupt Ratings (kA)

Table 9.134: PowerPact M-frame: with ET1.0 Factory – sealed trip unit (not field adjustable)—800 A ▽

	G	J	L◊
240 V	65	100	125
480 V	35	65	100
600 V ☆	18	25	25

- Linterrupting rating is not available in M-frame.
- 600 V interrupt ratings not available for D-frame.

	Ampere	Adjustable Instanta	neous Trip Range 🛛	G Interrupting	J	J Interrupting		Terminal		
	Rating	Low	High	Catalog Number *	\$ Price	Catalog Number *	\$ Price	Wire Range		
	300 A	600	3000	MGA26300( )		MJA26300( )				
ύ	350 A	700	3500	MGA26350( )	1	MJA26350( )				
Vac,	400 A	800	4000	MGA26400( )	6633.	MJA26400( )	8253.	3-3/0		
9 C	450 A	900	4500	MGA26450( )	0033.	MJA26450( )	0233.	through 500		
9,6	500 A	1000	5000	MGA26500( )	1	MJA26500( )		kcmil		
2-pole, 600 V 50/60 Hz	600 A	1200	6000	MGA26600( )		MJA26600( )		Al or Cu		
2-1	700 A	1400	7000	MGA26700( )	8370.	MJA26700( )	10104.			
İ	800 A	1600	1400         7000           1600         8000           600         3000	MGA26800( )	6370.	MJA26800( )	10104.			
	300 A	600	3000	MGA36300		MJA36300				
Ú,	350 A	700	3500	MGA36350		MJA36350				
3-pole, 600 Vac, 50/60 Hz	400 A	800	4000	MGA36400	8168.	MJA36400	9929.	3-3/0		
8 0 1	450 A	900	4500	MGA36450	0100.	MJA36450	3323.	through 500		
9,6	500 A	1000	5000	MGA36500		MJA36500		kcmil		
20/06	600 A	1200	6000	MGA36600		MJA36600		Al or Cu		
6	700 A	1400	7000	MGA36700	10608.	MJA36700	12630.			
İ	800 A	1600	8000	MGA36800	10000.	MJA36800	12030.			

- The ET 1.0 trip unit cannot be field replaced, nor does it allow adjustment of the long-time trip point setting. It is considered an electronic equivalent of a thermal-magnet circuit breaker.
- UL magnetic trip setting tolerances are ±10% from the nominal values shown
- Fill in parentheses with the following phase connection options: (2) for AC and (5) for CA.

L-frame accessories starting on Supplemental Digest page 3-24	M-frame accessoriesstarting on Digest page 7-36
L-frame dimensions starting on Digest page 7-54	M-frame dimensions Digest page 7-55
L-frame optional lugs	M-frame optional lugs Digest page 7-39

Table 9.135: Automatic Molded Case Switches-600 Vac, 50/60 Hz

Ampere	2-pole		3-pole	Wit	hstand Ratin	g 🕈	Trip Point Amperes	Terminal			
Rating	Catalog Number	\$ Price	Catalog Number	\$ Price	240 Vac	480 Vac	600 Vac	AC	Wire Range		
600 A	PJA26000S60( )	6675.	PJA36000S60	7263.	100	65	25	10000	3-3/0 through		
800 A	PJA26000S80( )	7347.	PJA36000S80	7938.	100	65	25	10000	500 kcmil Al or Cu		
1000 A	PJA26000S10( )	8088.	PJA36000S10	8676.	100	65	25	10000	4-3/0 through		
1200 A	PJA26000S12( )	10895.	PJA36000S12	11766.	100	65	25	10000	500 kcmil Al or Cu		

- The withstand rating is the fault current, at rated voltage, that the molded case switch will withstand without damage when protected by a circuit breaker with an equal ampere rating.
- Fill in parentheses with the following phase connection options: (2) for AC or (5) for CA.

Table 9.136: PowerPact P- and R-frame Interrupt Ratings

Voltage		P-frame Inte	errupt Rating		R-frame Interrupt Rating							
voitage	G	J	K	L	G	J	K	L				
240 Vac	65 kA	100 kA	65 kA	125 kA	65 kA	100 kA	65 kA	125 kA				
480 Vac	35 kA	65 kA	50 kA	100 kA	35 kA	65 kA	65 kA	100 kA				
600 Vac	18 kA	25 kA	50 kA	25 kA	18 kA	25 kA	65 kA	50 kA				

P- and R-frame accessories ......starting on Digest page 7-36

... Digest page 7-55 P- and R-frame optional lugs ................................ Digest page 7-39

Table 9.137: PowerPact P-frame 1200 A (600 Vac, 50/60 Hz) 3P Circuit Breaker with Electronic Trip Unit

	by Schneider Electric
www	v.schneider-electric.us

Electronic Trip Unit					01.			\$ Pri					T						
			Sensor Rating	Cat. No.▲■		rupting 🛦		upting ▲		upting ▲		ıpting ▲ ♦	Terminal Wire Range						
Туре	Function	Code	riamig		80% Rated	100% Rated ■	80% Rated	100% Rated ■	80% Rated	100% Rated ■	80% Rated	100% Rated ■	Wile Hange						
			600 A	P()A36060		naiou –		riatou =		Tiatou =		riatou –	(3) 3/0 AWG-500 kcmil						
Basic Electronic Trip Unit	Fixed long-time,		800 A	P()A36080	14603.	_	15480.	_	15480.	_	16359.	_	Al or Cu AL800M23K						
(Not	Adjustable Instantaneous	ET1.0I	1000 A	P()A36100									(4) 3/0 AWG-500 kcmil						
Interchangeable)	ii iotai itai ioodo		1200 A	P()A36120	20003.	_	21207.	_	21207.	_	22410.	_	Al or Cu AL1200P24K						
			250 A	P()A36025(C)U31A									(3) 3/0 AWG-500 kcmil						
			400 A 600 A	P( )A36040(C)U31A P( )A36060(C)U31A	15390.	22479.	16268.	23897.	16268.	23897.	17147.	25314.	Al or Cu						
	LI	3.0	800 A	P( )A36080(C)U31A									AL800M23K						
Micrologic			1000 A	P()A36100U31A	20790.	_	21995.		21995.		23198.		(4) 3/0 AWG-500 kcmil Al or Cu						
Interchangeable			1200 A	P()A36120U31A	20730.		21333.		21333.		20130.		AL1200P24K						
Standard Trip Unit			250 A 400 A	P( )A36025(C)U33A P( )A36040(C)U33A									(3) 3/0 AWG-500 kcmil						
mp onit			600 A	P( )A36060(C)U33A	15729.	22794.	16608.	24231.	16608.	24231.	17487.	25668.	Al or Cu AL800M23K						
	LSI	5.0	800 A	P()A36080(C)U33A															
			1000 A	P( )A36100Ú33A	21131.		22334.	_	22334.	_	23538.	_	(4) 3/0 AWG-500 kcmil Al or Cu						
			1200 A	P()A36120U33A	21101.		22004.		22004.		20000.		AL1200P24K						
			250 A 400 A	P( )A36025(C)U41A P( )A36040(C)U41A									(3) 3/0 AWG-500 kcmil						
			600 A	P()A36060(C)U41A	16242.	23270.	17121.	24737.	17121.	24737.	17999.	26204.	Al or Cu AL800M23K						
	LI	3.0A	800 A 1000 A	P( )A36080(C)U41A									(4) 3/0 AWG-500 kcmil						
			1200 A	P( )A36100U41A P( )A36120U41A	21642.	_	22845.	_	22845.	_	24051.	_	`´ Al or Cu						
			250 A	P( )A36025(C)U43A									AL1200P24K						
Migralagia			400 A	P( )A36040(C)U43A	17700	04650	10010	00014	10010	00014	10407	07770	(3) 3/0 AWG-500 kcmil						
Micrologic Interchangeable			600 A	P()A36060(C)U43A	17739.	24659.	18618.	26214.	18618.	26214.	19497.	27770.	Al or Cu AL800M23K						
Ammeter	LSI	5.0A	800 A 1000 A	P()A36080(C)U43A P()A36100U43A									(4) 3/0 AWG-500 kcmil						
Trip Unit			1200 A	P()A36120U43A	23141.	_	24345.	_	24345.	_	25548.	_	Al or Cu						
			250 A	P( )A36025(C)U44A									AL1200P24K						
			400 A	P( )A36040(C)U44A	19607.	26393.	20486.	28058.	20486.	28058.	58. 21365.	29721.	(3) 3/0 AWG–500 kcmil Al or Cu						
	LSIG	6.0A	600 A 800 A	P( )A36060(C)U44A		20353.		20000.		20030.		29721.	AL800M23K						
	Loid	0.04	1000 A	P()A36080(C)U44A P()A36100U44A									(4) 3/0 AWG-500 kcmil						
			1200 A	P( )A36120U44A	25008.	_	26211.	_	26211.	_	27416.	_	`´ Al or Cu						
			250 A	P( )A36025(C)U63AE1									AL1200P24K						
			400 A	P()A36040(C)U63AE1	22151.	28754.	23030.	30566.	23030.	30566	23909.	32379.	(3) 3/0 AWG–500 kcmil Al or Cu						
	LSI	5.0P	600 A 800 A	P()A36060(C)U63AE1 P()A36080(C)U63AE1				-					AL800M23K						
			1000 A	P( )A36100U63AE1									(4) 3/0 AWG-500 kcmil						
Micrologic Interchangeable			1200 A	P()A36120U63AE1	27552.	_	28757.	_	28757.	_	29960.	_	Al or Cu AL1200P24K						
Power			250 A	P( )A36025(C)U64AE1									(3) 3/0 AWG-500 kcmil						
Trip Unit			400 A 600 A	P()A36040(C)U64AE1 P()A36060(C)U64AE1	23234.	29757.	24111.	31634.	24111.	31634.	24990.	33510.	`´ Al or Cu						
	LSIG	6.0P	800 A	P( )A36080(C)U64AE1									AL800M23K						
			1000 A	P()A36100Ú64AE1	28634.		29838.		29838.		31041.		(4) 3/0 AWG-500 kcmil						
			1200 A	P()A36120U64AE1	20034.	_	29030.	_	29030.		31041.	_	Al or Cu AL1200P24K						
			250 A	P( )A36025(C)U73AE1									(3) 3/0 AWG-500 kcmil						
			400 A 600 A	P( )A36040(C)U73AE1 P( )A36060(C)U73AE1	26234.	32541.	27113.	34593.	27113.	34593.	27992.	36645	`´ Al or Cu						
	LSI	5.0H	800 A	P()A36080(C)U73AE1									AL800M23K						
Micrologic			1000 A	P( )A36100U73AE1	31634.	_	32837.		32837.		34043.		(4) 3/0 AWG-500 kcmil Al or Cu						
Interchangeable			1200 A	P()A36120U73AE1	0.00		020011		020011		0 10 101		AL1200P24K						
Harmonic Trip Unit			250 A 400 A	P( )A36025(C)U74AE1 P( )A36040(C)U74AE1									(3) 3/0 AWG-500 kcmil						
			600 A	P( )A36060(C)U74AE1	27315.	33545.	28194.	35661.	28194.	35661.	29073.	37776.	Al or Cu AL800M23K						
	LSIG	6.0H	800 A	P()A36080(C)U74AE1	11 1														
		3.011	1000 A	P( )A36100U74AE1	32717.		33921.	33921. — 33921.	33921. — 3512	35124.	_	(4) 3/0 AWG-500 kcmil Al or Cu							
									1200 A	P()A36120U74AE1									AL1200P24K

Table 9.138: PowerPact R-frame 1200 A (600 Vac, 50/60 Hz) 3P Circuit Breaker with Electronic Trip Unit

Flootro	onic Trip Unit							\$ P	rice				Tamainal
Electro	onic mp onic		Sensor	Cat. No.	G Interru	pting▲♦	J Interrupting ▲ ♦		K Interrupting ▲ ♦		L Interrupting ▲ ♦ ★		Terminal Wire
Туре	Function	Code	Rating		80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	80% Rated	100% Rated	Range
Basic Electronic Trip Unit (Not Interchangeable)	Fixed Long-Time, Adjustable Instantaneous	ET1.01	1200 A	R()A36120	27080.	_	28777.	_	28777.	1	30533.	_	
Micrologic Interchangeable Standard	П	3.0	1000 A 1200 A	R()A36100CU31A R()A36120CU31A	_	33945.	_	36111.	1	36111.	_	38418.	
Trip Unit	LSI	5.0	1000 A 1200 A	R( )A36100CU33A R( )A36120CU33A	_	34401.	_	36599.	_	36599.	_	38934.	
Micrologic	LI	3.0A	1000 A 1200 A	R()A36100CU41A R()A36120CU41A	_	35141.	_	37383.	-	37383.	_	39770.	
Interchangeable Ammeter Trip Unit	LSI	5.0A	1000 A 1200 A	R()A36100CU43A R()A36120CU43A	_	36581.	_	38916.	_	38916.	_	41400.	AL1200R53K (4) 3/0-600 kcmi
mp onit	LSI	6.0A	1000 A 1200 A	R()A36100CU44A R()A36120CU44A	_	38378.	_	40829.	_	40829.	_	43434.	Al or Cu
Micrologic Interchangeable Power	LSI	5.0P		R()A36100CU63AE1 R()A36120CU63AE1	_	40826.	_	43431.	_	43431.	_	46205.	
Trip Unit	LSIG	6.0P		R()A36100CU64AE1 R()A36120CU64AE1	_	41867.	_	44540.	_	44540.	_	47382.	
Micrologic aterchangeable Harmonic Trip Unit	LSI	5.0H		R()A36100CU73AE1 R()A36120CU73AE1	_	44754.	_	47610.	-	47610.	_	50649.	
	LSIG	6.0H		R()A36100CU74AE1 R()A36120CU74AE1	_	45795.	_	48719.		48719.	_	51827.	

To complete the catalog number, replace the blank () with the appropriate interrupt rating (G, J, K, or L).

For 100% rated circuit breakers add a "C" in the 9th character place. For example, the catalog number for a 100% standard-type trip unit with LI trip functions at 250 A would be PGA36025©U31A.

The L interrupt rating is supplied in 480 V only. Change the 5<sup>th</sup> character (voltage rating) from a 6 (600 V) to a 4 (480 V); for example, PLA34025U31A.

See Table 9.136 on Digest page 9-29 for interrupt ratings.

P- and R-frame accessories. starting on Digest page 7-36
P- and R-frame dimensions Digest page 7-55
P- and R-frame trip unit options Digest page 7-44

P- and R-frame optional lugs . . . . Digest page 7-39
P- and R-frame alternate rating plugs . . . . Digest page 7-45

**o** 

## I-Line™ Factory **Assembled Panelboards**

### Table 9.139: Base \$ Price—Main Lugs ▲

Panel Type			Main Lugs		
ranei Type	225 A	400 A	600 A	800 A	1200 A
HCN	1356.	1866.	2276.	_	_
HCM	_	1866.	2276.	2512.	_
HCP-SU	_	-	2990.	3600.	_
HCP	_		2456.	3056.	3968.
HCR-U	_	_	_	_	4602.

When required, add the \$ Price of a solid neutral from Table 9.140.

### Table 9.140: Standard Solid Neutral

Ampere Rating	\$ Price
100/225 A	294.
400 A	384.
600 A	544.
800 A	764.
1200 A	1366.

Table 9.141: Base \$ Price—Main Circuit Breaker ■

Panel Type	No.		100 A		150 A							
railei Type	Poles	FA	FH	FI ♦	HD ♦	HG ♦	HJ ♦	HL ♦				
HCN	2	2100.	2100.	4642.	3360.	3860.	4540.	5550.				
TION	3	2418.	2958.	5864.	3770.	4210.	4890.	5900.				
HCM	2	_	_	_	3360. 3860.		4540.	5550.				
TICIVI	3	_	_	_	3770.	4210.	4890.	5900.				

				225 A			400 A							600 A								
Panel Type	No. Poles	Δſ	JG	JJ	JL	кі ♦	LD	LG	LJ	LL	LA	LH	LC +	11.4	LD	LG	LJ	LL	LC ♦	LI +	MG	MJ
2			33	JL.	Ki ¥	Electronic 100%			,	LA		LH  LC V	LI ¥	Electronic 80%			LC V	Li 🔻	IVIG	IVIJ		
HCN	2	3956.	4146.	7126.	7356.	8356.	_	_	_	_	6132.	9126.	_	_	_	_	_	_	_	_	_	_
TION	3	4440.	5550.	7466.	8676.	10148.	_	_	_	_	7136.	10666	_	_	_	_	_	_	_	_	_	_
HCM	2	3956.	4146.	7126.	7356.	8356.	_	_	_	_	6132.	9126.	_	_	_	_	_	_	_	_	8880.	11260.
TICIVI	3	4440.	5550.	7466.	8676.	10148.	_	_	_	_	7136.	10666.	_	_	_	_	_	_	_	_	10770.	13400.
HCP, HCP-SU	2	_	_	_	_	_	11865	12470	1/1705	15940.	_	_		11610.	15/125	16215	19235.	120725	11176.			11260.
1101,1101-30	3	_	_		_	_	1 1000.	12470.	17795.	13340.	_	_	11888.	13354.	15425.	10215. 1923	13233.	5. 20725.	12678.	18090.	10770.	13400.

Main Circuit Breaker

		800 A ★											
Panel Type	No. Poles	MG	MJ	PL ■	PG ♦	PJ ♦	PL ♦	PGC ♦	PJC ◆	PLC +			
			1110		Micro	ologic™	80%	Micrologic 100%					
HCN	2	_	_	_	_	_	_	_	_	_			
TION	3	_	_	_	_	_	_	_	_	_			
нсм	2	11846.	14778.	_	_	_	_	_	_	_			
ПСІVІ	3	14302.	17456.	_	_	_	_	_	_	_			
HCP, HCP-SU	2		14778.	19346.	15830.	16830.	21090.		18510.				
	3	14302.	17456.	23416.	18312.	20280.	24540.	20144.	22300.	28220.			

		1200 A ◆★▼											
Panel Type	No. Poles	PG	PJ	PL	PG	PJ	PL	RGC	RJC	RLC			
		FG		FL	Mic	rologic 8	30%	Micrologic 100%					
HCP, HCP-SU	2	22542.	24336.	26648.	22380.	24980.	27980.	24618.	24478.	32178.			
	3	24568.	26560.	29128.	28710.	31310.	35570.	31582.	34442.	40906.			
HCR-U	2	22542.	24336.		22380.								
	3	24568.	26560.	29128.	28710.	31310.	35570.	31582.	34442.	40906.			

- When required, add the \$ Price of a solid neutral from Table 9.140.
- Standard construction back-fed main.
- PG, PJ, PL circuit breakers are available with both thermal-magnetic equivalent and Micrologic trip. The Micrologic circuit breakers are available 80% and 100% rated. The "C" suffix denotes a 100% rating.
- For 1200 A frame thermal magnetic circuit breaker with 600 kcmil lugs, select an R-frame Thermal Magnetic circuit breaker in the Product Selector.

### Table 9.142: Electronic Trip Units for H-frame Circuit Breakers

	Standard \$ Price	Ammeter \$ Price	Energy \$ Price
LI (3.0)	Standard	_	_
LSI (5.0)	549.	2550.	3485.
LSIG (6.0) △	_	4577.	5979.

Table 9.143: Electronic Trip Units for J-frame Circuit Breakers

	Standard \$ Price	Ammeter \$ Price	Energy \$ Price
LI (3.0)	Standard	_	_
LSI (5.0)	785.	3643.	4978.
LSIG (6.0) △	_	6538.	8542.

Table 9.144: Electronic Trip Units (L-, P-, and R-frame Circuit Breakers)

	\$ Price											
	Standard	Ammeter	Energy № • ▼ :	Power	Harmonic							
LI (3.0)	Standard	_	_	_	_							
LSI (5.0)	1670.	4670.	7659.	21600.	32330.							
LSIG (6.0) △	_	9340.	13777.	31000.	37000.							

Δ When adding  $\mathbf{G}$ , requires current transformers and a box extension and is available factory assembled only.

Note:

Energy trip unit available for L-frame circuit breakers only.

PowerPact circuit breakers come with a standard LI trip unit. Use the above \$ Price adder for increase in trip functionality. See Digest page 7-43 for L- frame trip unit descriptions. See Digest page 7-44 for P- and R- frame trip unit descriptions.

			Branch Space Neutral To			erminals Quantity and Size	Type 1 Enclosure						
Panel Type	Ampacity	Туре	In.	mm	Main	Branch	Н		W		D		
7,00					Iviaiii	Diancii	ln.	mm	ln.	mm	ln.	mm	
	600 A	MLO	72	1829	(8) 750 kcmil		91	2311	32	813	8.25	210	
HCM	600 A (MG, MJ)	IG, MJ) M/B 72 1829 (8) 750 kcmil (35) 350 kcmil,		91	2311	32	813	9.50	241				
TICIVI	800 A	MLO	72	1829	(8) 750 kcmil	(9)#14-1/0, (17)#14-#4	91	2311	32	813	8.25	210	
	800 A (MG, MJ)	M/B	72	1829	(8) 750 kcmil		91	2311	32	813	9.50	241	
HCR-U◊	1200A	M/B, MLO	108	2743	(8) 750 kcmil	(8) 600 kcmil, (15) 350 kcmil (9) #14-1/0, (17)#14-#4	86	2184	44	1118	9.50	241	
HCP	600A	M/B, MLO	63	1600	(8) 750 kcmil	(35) 350 kcmil, (9)#14-1/0, (17)#14-#4	68	1727	42	1067	9.50	241	
1101	800A M/B, MLO 99 2515 (8) 750		(8) 750 kcmil	(35) 350 kcmil, (9)#14-1/0, (17)#14-#4	86	2184	42	1067	9.50	241			
HCP-SU☆	800A	M/B, MLO	54	1371	(8) 750 kcmil	(8) 750 kcmil, (21) 350 kcmil, (9) #14-1/0, (17) #14-#4	86	2184	26	660	9.5	241	

- Available in Type 1 enclosure only; for pricing, see Digest page 9-34. 6 in. enclosure extension is required for HCRU I-Line panelboard.
- 9 in. enclosure extension is required for HCP-SU I-Line panelboard.

Table 9.146: **Branch Circuit Breakers—Thermal Magnetic Circuit Breakers ▲** (See Digest pages 7-4 through 7-8 for interrupt rating, voltage ratings, Fed. Specs, etc.)

Carcillate Particle   Carcillate   Carcill	o: ::	o: ':			3-pole ▼				2	-pole ▼					1-pole ▼		
The first of the	Circuit Breaker Ampere Rating	Circuit Breaker	240 V		600 V			240 Vac		600 Vac		H (ln.)	120 V	277 V	277 Vac 125 Vdc		H (ln.)
70-100 A		` ,	-								82	3	_	_			
To-100 A		FA		1142. ■		98.	4.5		956.		UZ.	•	354.	384.			
17-10   17-		FH		_		98.	4.5		_	-	98.	3	_	_			
To-100				_		-			_				_	_			
20-100		FJ★				98.	3			_	98.	3	_				
Title   Titl				2470.	4054	00	4.5			0466 =	00	4.5	_	832.		72.	
The   The		FI		_	-	96.	4.5				90.	4.5					
110-150 A		ПD				00	4.5				00	2					
17-60 A		טוו				50.	4.5				50.	3					
The   The					-												
110-150 A		HG			-	98.	4.5				98.	3	_				
15-80 A						00.						Ū					$\vdash$
TO-100 A									_						_		
100-150 A		HJ				98.	4.5		_		98.	4.5			_		
70-100 A			_	_				_	_	3980.			_	_	_		-
70-100 A			_	_				_	_				_	_	_		
70-225 A	70–100 A	HL		_	4054.	98.	4.5		_	3402.	98.	4.5		_	_	_	
TO-225 A   CG   2870. — — 98. 4.5   1300. ■ — — 82. 3 — — — — — — — — — — — — — — — — — —	110-150 A		_	_	5530.			_	_	4600.			_	_	_		
TO-225 A   CG   2870. — — 98. 4.5   1300. ■ — — 82. 3 — — — — — — — — — — — — — — — — — —	70–225 A	QB	1696.	_	_	98.	4.5	560.	_	_	82.	3	_	_	_		=
70-225 A   OJ   3070.	70–225 A	QD	2208.	_	_	98.	4.5	1300. ■	_	_	82.	3	_	_	_	_	
150-225 A   JD	70–225 A	QG	2870.	_	_	98.	4.5	2800.	_	_	82.	3	_	_	_	_	$\overline{}$
280 A   JU		QJ	3070.		_	98.	4.5	3000.	_	_	82.	3	_	_	_	_	=
150-225 A		ID		_		00	15		_		00	15	_	_	_		
250 A		JD	_	_		50.	4.5		_		50.	4.5	_	_	_		
250 A		.IG		_		98	45		_		98	45	_	_	_		
250 A JL		υα	1	_		56.	?				30.	÷			_	1	
250 A JL		JJ		-		98.	4.5				98.	4.5		_	_		
250 A   Sign		00						4300.						_			
250 A   C   C   C   C   C   C   C   C   C		JL	_	_		98.	4.5	4300.			98.	4.5	_	_	_	_	
250 A		-		_										_	_		
300-400 A LA — — 4916. 300-400 A LH — — 5312. 300-400 A LH — — 5312. 300-400 A LC — 10156. 450-600 A — — 11622. 456. 7.5 — — 8820. 450-600 A — — 11622. 456. 7.5 — — 9878. ■ 456. 7.5 — — — — — — — — — — — — — — — — — — —		KI				98.	4.5				98.	4.5	_	_	_		
300-400 A LH									_	-			_	_		_	
300-400 A			_			252.	6		_		252.	6				_	<u>⊢</u>
450-600 A   LC   -   10422   456   7.5   -   8920   456   7.5   -   -   -   -   -   -   -   -   -		LH	-													_	
300-400 A		LC	5460.	_		456.	7.5	4550.			456.	7.5					
450-600 A   MG					-												
300-600 A MG		LI			-	456.	7.5				456.	7.5					
Toologo A   MG				<u> </u>						-							
300-600 A MJ		MG				662.	9				662.	9					
700-800 A         MJ         —         13306.         662.         9         —         10944.         662.         9         —<																	
600-800 A PL — 20360. — 662. 9 — 16290. — 662. 9 — — — — — — 600-1200 A PG — — 19966. 662. 9 — — 17940. 662. 9 — — — — — — — 600-1200 A PJ/PK — — 21960. 662. 9 — — 19724. 662. 9 — — — — — — — — — 1000-1200 A PL — 24526. — 662. 9 — 22046. — 662. 9 — — — — — — — — — 250-400 A PLC (100%) ▼ — 16940. — — 13550. — — 13550. — — — — — — — — — — — — — — — — — — —		MJ				662.	9		_		662.	9		_			
600-1200 A PG — — 19966. 662. 9 — — 17940. 662. 9 — — — — — — — — — — — — — — — — — —		PL		20360.	_	662.	9		16290.	_	662.	9					
600-1200 A PJ/PK - 21960. 662. 9 - 19724. 662. 9			_	_	19966.		-		_	17940.			_	_	_		
1000-1200 A   PL			_								662.	9	_	_	_	_	
250-400 A			_	24526.	_			_	22046.	_	662.	9	_	_	_	_	
450-600 A     PLC (100%) ▼     —     22620.     —     662.     9     —     18100.     —     662.     9     — <t< td=""><td></td><td></td><td>_</td><td></td><td>_</td><td></td><td></td><td>_</td><td></td><td>_</td><td></td><td></td><td>_</td><td>_</td><td>_</td><td>_</td><td></td></t<>			_		_			_		_			_	_	_	_	
700-800 A     —     24440.     —     —     19560.     —     —     —     —     —       1000-1200 A     RJ (80%) ▼     —     —     24460.     —     —     —     —     —     —       1000-1200 A     RJ (80%) ▼     —     —     26710.     662.     15     —     —     26710.     662.     15     —     —     —     —     —     —		PLC (100%) ▼	_	22620.	_	662.	9	_	18100.	_	662.	9	_	_	_	_	=
1000-1200 A RJ (80%) ▼ 26710. 662. 15 26710. 662. 15		`	_	24440.	_			_	19560.	_			_	_	_	_	_
		RG (80%) ▼	_	_	24460.			_	_	24460.			_	_	_	_	$\vdash$
	1000-1200 A	RJ (80%) ▼	_	_	26710.	662.	15	_	_	26710.	662.	15	_	_	_	_	$\overline{}$
		RL (80%) ▼	_	_	32580.			_	_	32580.			_	_	_	_	$\overline{}$

- See Digest pages 7-4 through 7-8 for additional dc ratings.
- ac only. FA, 1P.

- 480Y/27 Volt rated circuit breaker—Do not use on 480 Volt 3Ø3W Delta systems. See Table 9.144 on Digest page 9-31 for P- and R frame Micrologic trip unit price adders.

PANELBOARDS

## I-Line™ Factory **Assembled Panelboards**

 Table 9.147: Branch Circuit Breakers—Electronic Trip Circuit Breakers ▲

 (See Digest pages 7-4 through 7-8 for interrupt rating, voltage ratings, Fed. Specs, etc.)

(ccc zigeti pugeti	T am ought on a	3-pole★ 2-pole ★						1-pole ★								
Circuit Breaker	Circuit		400.14	3-pole x					z-poie x							
Ampere Rating	Breaker	240 V	480 Vac 250 Vdc	600 V	Space Only	H	240 Vac	480 Vac 250 Vdc	600 Vac	Space Only	н	120 V	277 V	277 Vac 125 Vdc	Space Only	H
1E CO A				1700		4.5		250 Vuc		Office						_
15–60 A 35–100 A	LID (000/) =		_	1790. 2102.	98. 98.	4.5 4.5	$\vdash =$					_	_		_	<u> </u>
50–150 A	HD (80%) ■			3756.	98.											
70–250 A	ID (000/) A		_	4013.	98.	4.5	_					_	_		_	
15–60 A	JD (80%) ◆			2110.	98.	4.5										
	HG (80%) ■		_	2380.	98.	4.5 4.5		_	_			_	_	_	_	
35–100 A 50–150 A	HG (60%) ■			4848.	98.	4.5		_					_			
70–250 A	IC (909/ ) A		_	5082.	98.	4.5						_	_		_	
15–60 A	JG (80%) ◆			2703.	98.	4.5										
35–100 A	HJ (80%) ■		_	2898.	98.	4.5		_				_	_	_		
50–150 A	⊓∪ (00%) ■			6895.	98.	4.5			_		_			_		
70–250 A	JJ (80%) ♦		-	7231.	98.	4.5	+=-		_							<del></del>
15–60 A	00 (00 /0) ♥		_	4027.	98.	4.5						_		_		
35–100 A	HL (80%) ■			4263.	98.	4.5									$\vdash$	
50–150 A	112 (00 /0) =			8943.	98.	4.5									$\vdash$	<del></del>
70–250 A	JL (80%) ♦		+ = -	9381.	98.	4.5										
70–250 A	0L (0070) ¥		_	5378.	252.	6	_			_		_	_	_	_	_
125–400 A	LD (80%) ★		+	5378.	252.	6	<del></del>									
200–600 A	LD (00 /0) A		<del>  _  </del>	7775.	252.	6	_	_	_		_	_	_	_	-	
70–250 A			_	5645.	252.	6			_					_	_	
125–400 A	LG (80%) ★		_	5645.	252.	6						_		_		
200–600 A			_	8167.	252.	6			_				_	_		
70–250 A			_	9212.	252.	6			_					_	-	
125–400 A	LJ (80%) ★		_	9212.	252.	6			_				_	_		
200–600 A	25 (55 75) 7		_	11378.	252.	6			_			_	_	_	_	_
70–250 A			t _	10724.	252.	6		_	_			_	_	_		
125–400 A	LL (80%) ★	_	t _	10724.	252.	6		_	_			_	_	_	_	_
200–600 A	(00,1)		t _	12738.	252.	6		_	_			_	_	_	_	_
70–250 A		_	_	6991.	252.	6		_	_	_	_	_	_	_	_	_
125-400 A	LDC (100%) ★	_	_	6991.	252.	6	_	_	_	_	_	_	_	_		_
70–250 A	11.0 (1000() 1	_	_	13941.	252.	6	_	_	_	_	_	_	_	_	_	_
125-400 A	LLC (100%) ★	_		13941.	252.	6	_	_	_	_		_	_	_	_	
70-250 A	1.00 (4000() 4		t —	7338.	252.	6	_	_	_	_		_	_	_	_	_
125-400 A	LGC (100%) ★	_	T —	7338.	252.	6	_	_	_	_		_	_	_	_	_
70–250 A	LIC (1000/) +	_	_	11975.	252.	6	_	_	_	_		_	_	_	_	_
125-400 A	LJC (100%) ★	_	T —	11975.	252.	6	_	_	_	_		_	_	_	_	_
60–400 A	DG (100%) ▼	_	5687.	_	252.	6	_	4550.	_	252.	6	_	_	_	_	_
600 A	DG (80%) ▼	_	8954.	_	252.	6	_	7163.	_	252.	6	_	_	_	_	_
60–400 A	DJ (100%) ▼	_	9118.	_	252.	6	_	7295.	_	252.	6	_	_	_	_	
600 A	DJ (80%) ▼	_	12385.	_	252.	6	_	9908.	_	252.	6	_	_	_	_	_
60–400 A	DL (100%) ▼	_	10573.	_	252.	6	_	8458.	_	252.	6	_	_	_	_	_
600 A	DL (80%) ▼	_	13839.	_	252.	6	_	11071.	_	252.	6	_	_	_	_	_
250–400 A		_	_	8900.			_	_	7120.			_	_	_		_
450–600 A	PG (80%) ★	1	_	13310.	662.	9	_	_	10648.	662.	9	_	_	_	_	_
700–800 A	(50 /6) /	_		14730.	002.			_	12402.	002.			_	_	_	
1000–1200 A				21240.					16992.			_	_	_		_
250–400 A	_	_		10400.					9240.							
450–600 A	PJ/PK (80%) ★	_	_	15570.	662.	9		_	12450.	662.	9		_	_	_	
700–800 A	1		_	17220.				_	13780.				_	_	_	
1000–1200 A			15400	24850.				10000	19880.			_		_		
250-400 A	4		15400.					12320.	_					_		
450–600 A	PL (80%) ★		20570.	_	662.	9		16450.	_	662.	9	_		_		
700–800 A	4		22220.	_				17780.	_				_	_	_	
1000–1200 A			29850.	0700				23880.	7000			_	_	_		
250–400 A	PGC (1000/) ±		_	9790.	660	9			7832.	660	9		_	_	_	
450–600 A	PGC (100%) ★			14642.	662.	9			11714.	662.	Э			_		<del></del>
700–800 A 250–400 A	1	_		16200.					13642.			_		_		
450–600 A	PJC/PKC (100%)			11960. 17900.	662.	9	_		9570. 14330.	662.	9					
700–800 A	<b>★</b> ` ′		_	19800.	002.	9		_	15840.	002.	9		_	_	_	
250–400 A	1		16940.				_	13550.	13040.						_	
450–600 A	PLC (100%) ★		22620.	_	662.	9		18100.	_	662.	9		_	_		
700–800 A	1°LO (100%) *		24440.		002.	Э	_	19560.	_	002.	9		_		_	
/ UU-0UU A	RG (100%) ★		24440.	29317.			$\vdash =$	19560.	29317.					_		
1000-1200 A	RJ (100%) ★	_	_	32159.	662.	15			32159.	662.	15		_		_	_
1000 - 1200 A	RL (100%) ★			39389.	002.				39389.	002.	.5			_		<del></del>
	1 IL (10070) X			55555.					00000.					_		<u> </u>

See Digest pages 7-4 through 7-8 for additional dc ratings.

See Digest pages 7-4 through 7-8 for additional or ratings.

See Table 9.142 on Digest page 9-31 for H-frame electronic trip unit price adders.

See Table 9.143 on Digest page 9-31 for J-frame electronic trip unit price adders.

See Table 9.144 on Digest page 9-31 for L-, P-, and R-frame electronic trip unit price adders.

See the Supplemental Digest for D-frame electronic trip unit price adders.

### Table 9.148: QO Plug-On Branch Circuit Breakers

	\$ Price
Transition Charge per 6 QO one-pole spaces (H=4.5 in. per 6 one-pole spaces)	328.
QO Branch circuit breakers	See Digest page 7-10

Table 9.149: Sub-feed/Feed-through Lugs ▲

Ampere Rating	\$ Price
225 A	368.
400 A	600.
600 A	858.
800 A	1490.
1200 A	1890.

▲ 2 or 3-pole Branch Mounted; SL Kit used for both SFL and TFL.

### Table 9.150: Ground Bars

	\$ Price
Equipment Ground Bar	180.
Copper Ground Bar	148.
Insulated/Isolated Ground Bar	\$ Price Additional Neutral Assembly

Add to equipment ground bar \$ Price.

### Table 9.151: Name Plates

	\$ Price
Standard white face/black letter laminated bakelite, 1 in. x 3.5 in., adhesive backed or screw mountable with screws in a bag assembly (\$ Price includes engraving)	78.

### Table 9.152: Copper Bus Bars

Ampere Rating	Туре	\$ Price
225 A	HCN, HCM	528.
400 A	HCN, HCM, HCP	720.
600 A	HCN	720.
600 A	HCM, HCP, HCR-U	1274.
800-1200 A	HCP, HCR-U	1274.

### Table 9.153: Neutrals

Ampere Rating	Туре	\$ Price Adder
100–400 A	Copper Neutral	868.
600 A	Copper Neutral	894.
800 A	Copper Neutral	1108.
1200 A	Copper Neutral	1352.

### Table 9.154: 200% Rated Neutrals

Ampere Rating	Туре	\$ Price Adder
225 A	Aluminum	820.
400 A	Aluminum	940.
600 A	Aluminum	1340.
800 A	Aluminum	1350.
1200 A	Aluminum	2020.
225 A	Copper	1210.
400 A	Copper	1300.
600 A	Copper	1980.
800 A	Copper	2500.
1200 A	Copper	2900.

### Table 9.155: Metal Directory Frame

Metal Directory Frame	\$ Price Adder
Frame attached to trim (not available on four piece trim)	140.

### Table 9.156: Door-in-Door Trim

Door-in-Door Trim	\$ Price Adder
Trim has piano hinge down one side.  Door opens by single latch; Entire trim opens by removing screws.	646.
Hinged Door-in-Door with Outer Door Lock Added	836.

### Table 9.157: Weatherproof or Dusttight Cabinets—Type 3R, 5, 12

Weatherproof or Dusttight Cabinets	\$ Price Adder
Maximum 26 in. wide box	2156.
Maximum 28 in. wide box	3312.
Maximum 32 in. wide box	3312.
Maximum 42 in. wide box	3312.
Maximum 44 in. wide box	3312.

### Table 9.158: Copper Mechanical Lugs

Ampere Rating	Main Lug Interiors	Main Circuit Breaker Interiors
Ampere name	\$ Pr	ice per Pole
100/125 A	70.	70.
250 A	108.	108.
400 A	148.	148.
600 A	168.	168.
800 A	196.	196.
1200 A	236.	236.

### Table 9.159: Copper Compression Lugs

Ampere Rating	Main Lug Interiors	Main Circuit Breaker Interiors						
Ampere nating	\$ Pı	rice per Pole						
100/125 A	70.	70.						
250 A	108.	108.						
400 A	148.	148.						
600 A	168.	168.						
800 A	316.	316.						
1200 A	836.	_						

### Table 9.160: Aluminum Compression Lugs VCEL

Ampere Rating	Main Lug Interiors	Main Circuit Breaker Interiors ◆
Ampère naung	\$ P	rice Per Pole
100 A	29.00	29.00
150 A	N/A	29.00
250 A	29.00	49.00
400 A	45.00	74.00
600 A	59.00	131.00
800 A	100.00	_
1200 A	118.00	<del>_</del>

Note: Additional factory modifications. See Digest page 9-38.

♦ Compression lugs are not available on LC, LI, LE, LX, and LXI circuit breakers.

## Surgelogic™ SPD

Surgelogic SPD unit in I-Line plug-on construction: An integrally mounted surge protection solution that mounts on to an I-Line Panelboard bus stack just like a J-Frame circuit breaker. Requires 13.5 in. of mounting height. Available as factory assembled and merchandised. For SPD unit pricing and information, see Digest pages 6-3 and 6-44.



I-Line Plug-On Unit with Surgelogic SPD

### Table 9.161: Surgelogic SPD Options

Surgelogic SPD Options	\$ Price
Dry Contacts	Standard
Remote Monitor	2588.

Note: Requires HCM interior minimum.

### Table 9.162: Surgelogic Branch Mounted I-Line SPD-Model IMA

					Surge Curre	nt Rating kA					
Voltage	100	kA	120	kA	160	kA	200	) kA	240	) kA	
	HL	FI	HL FI		HL	FI	HL	FI	HL	FI	
120/240 1P3W	18908.	20416.	20088.	21692.	23634.	25520.	29354.	30958.	34534.	36420.	
208Y/120 3P4W	19750.	21260.	20984.	20984. 22588. 24688. 2657		26574.	30740.	32342	36164.	38050.	
240/120 3P4W	19750.	21260.	20984.	22588.	24688.	26574.	30740.	32342.	36164.	38050.	
480Y/277 3P4W	20602.	22110.	21898.	23492.	25752.	27638.	32130.	33734.	37800.	39686.	
600Y/347 3P4W		23000.	_	24438.	_	28750.	_	35198.	_	41400.	



**QMB Fusible Branch Switches** 

Table 9.163: QMB Branch Switch Units

Table 9.103.		Dianon Switch			Class R Fuse K	its	Electrical Interlo	ck Kit					Horsepower Ratings☆															
Unit	Unit	Catalog	Catalog	Catalog	Catalog	Catalog	Catalog	Catalog	Catalon		<u> </u>	31433 TTT 430 TC		Licotrical interior	JK IKIL		240	Vac			480		lating		600	Vac		
Ampere Rating	Height (In.)	Number	\$ Price	No. Kits	Catalog	\$ Price	Catalog	\$ Price	S		Ma	ax.	St		Ma	ax.	S			Max. 2								
riumig	(,			Req'd.	Number		Number <b>▲</b>		1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø								
2-pole, 240 V	/ac																											
30 A-30 A	4.5	QMB221TW	608.	2	HRK30	25.50	QMB300EK(1 or 2)	357.	1.5	3	3	7.5	-	_	—	I —	l —	<b>—</b>	-	<b>—</b>	5							
30 A-Blank	4.5	QMB221HW■	425.	1		25.50	QIVIDSUUER(1 01 2)	337.	1.5	3	3	7.5	_	_	_	_	_	_	_	_	5							
60 A-60 A 60 A-Blank	4.5 4.5	QMB222TW ■	608. 425.	1	QMB36R	48.90	QMB300EK(1 or 2)	357.	3	7.5	10	15		_	_		_	_	_	_	10							
100 A-100 A	6	QMB223TW	990.		QMB100R									_							20							
100 A-Blank	6	QMB223HW ■	695.	1	GIVID TOOL	95.00	QMB610EK(1 or 2)	357.	7.5	15	15	30	_	_	_	_	_	_	_	_	20							
200 A	9	QMB224W	1200.	1	HRK1020	47.70	QMB200EK(1 or 2)	357.	_	25	15	60	_	_	_	_	_	_		_	40							
400 A	15	QMB225W	3072.	1	QMB4060R	111.00		_	_			_	_		_		_	_	_	_								
	9	QMB225WT3 ♦	<b>2981.</b> se 3-pole	- dovices		_	_	$\vdash$	=	=	=	=	_		_				=									
600 A			2-pole ap				_	_	_	_	_	_	_	_	_	_	_	_	_	_								
3-pole, 240 V	/ac										1					1	1											
30 A-30 A	4.5	QMB321TW	827.	2	HRK30	25.50		357.	_	3	l —	7.5	_	_	_	l —	l —	-	_	-	_							
30 A-Blank	4.5	QMB321HW■	587.	1		23.30	QMB300EK(1 or 2)	337.	-	3	_	7.5	_	_	-	_	_	_	-	_								
60 A-60 A	4.5	QMB322TW	827.	1	QMB36R	48.90	<u> </u>	357.	_	7.5	_	15	_	_	_		_	_	_	_								
60 A-Blank 100 A-100 A	4.5 6	QMB322HW ■ QMB323TW	587. 1265.		QMB100R				$\vdash$	7.5 15	_	15 30			=	$\vdash =$		-	$\vdash$									
100 A-Blank	6	QMB323HW ■	879.	1	GIVID TOOM	95.00	QMB610EK(1 or 2)	357.	-	15	<del>  -</del>	30	_		-	<del>  -</del>	<del>  -</del>	-	-	-								
200 A	9	QMB324W	1673.	1	HRK1020	47.70	QMB200EK(1 or 2)	357.	_	25	_	60	_	_	_	_	_	_	_	_	_							
400 A	15	QMB325W	4277.	1	QMB4060R	111.00	_		_	50	_	125	_	_	_	_	_	_	_	_								
	9 15	QMB325WT3 ◆ QMB326W	4143. 6249.	1	QMB4060R	111.00			_	50 75		150			_				_	_								
600 A	15	QMB326WT3 ◆	6249.	-	QIVID4000h	-		ΗΞ-	=	75									=									
800 A	15	QMB327WT3 ◆	12140.	_	_	_	_	_	_	75	_	_	_	_	_	_	_	_	_	_	_							
2-pole, 600 V	ac, 250 \	/dc <del>★</del>																										
30 A-30 A	4.5	QMB261TW	1050.	1	QMB36R	48.90	QMB300EK(1 or 2)	357.	1.5		3	_	3	5	7.5	15	3	_	10	_	5							
30 A-Blank	4.5	QMB261HW■	702.			40.00	QIVIDOUDEN(1 OF 2)	007.	1.0	_		_	Ü	Ü	7.0		Ľ	_	.0	_	<u> </u>							
60 A-60 A 60 A-Blank	6	QMB262TW ■	1050. 738.	1	QMB60R	48.90		357.	3	_	10		5	15	20	30	10		25		10							
100 A-100 A	7.5	QMB263TW	1536.	2	HRK1020	4= =0	QMB610EK(1 or 2)			-		_	- 10						- 40									
100 A-Blank	7.5	QMB263HW■	1083.	1		47.70		357.	7.5	_	15	_	10	25	30	60	15	_	40	_	20							
200 A	9	QMB264W	1791.	1	HRK1020	47.70	QMB200EK(1 or 2)	357.	15				25	50	50	125	30		50	_	40							
400 A 600 A▼			se 3-pole 2-pole ap				_	_	_	_	l —	_	_	_	_	l —	_	_	_	_	<b>—</b>							
3-pole, 600 V	lac*	101	z poic ap	phoduoi				<u> </u>			ļ					ļ	ļ	<u> </u>										
	4.5	QMB361TW	1241.	1	QMB36R	48.90			_	3	I —	7.5	_	5	_	15	I —	7.5	_	20								
30 A-30 A	4.5	QMJ361T	1293.	Ė	_	_	QMB300EK(1 or 2)	357.	_	_	_	_	_		_	_		_	_	20	5							
30 A-Blank	4.5	QMB361HW■	861.	1	QMB36R	48.90	QMB300EK(1 or 2)	357.	_	3	_	7.5	_	5	_	15	_	7.5	_	20								
60 A-60 A	6	QMB362TW	1241.	1	QMB60R	48.90	QMB610EK(1 or 2)	357.	_	7.5	_	15	_	15	_	30	_	15	_	50								
60 A-Blank	6	QMJ362T QMB362HW ■	1293. 861.	1	QMB60R	48.90	QMB610EK(1 or 2)	357.	_	7.5	_	15	_	15	_	30	=	15	=	50	10							
	6				QMB60R and	48.90	, ,		_	-		_	_	_	=	_		_		_	=							
60 A-30 A	6	QMB362T21W	1241.	1 ea.	QMB36R		QMB610EK(1 or 2)	357.						_														
100 A-100 A	7.5	QMB363TW	1961.	2	HRK1020	47.70	QMB610EK(1 or 2)	357.	-	15	-	30	-	25	_	60	-	30	-	75								
	6	QMJ363T	2013. 1373.	_	HRK1020	47.70	,		_	 15	_	30	_	25	_	<u>-</u>	_	30	_		20							
100 A-Blank	7.5 6	QMB363HW ■ QMJ363H ■	1424.	1 —	HINT 1020	47.70	QMB610EK(1 or 2)	357.	=	- 13	_		_	25	=		$\vdash$		=	75	20							
400 4 00 4	7.5			4	HRK1020 and	47.70	OMPO40EK(4 0)	057	_	_	_	_	_		_	_	_	_	_	_	_							
100 A-30 A	7.5	QMB363T31W	1961.	1 ea.	QMB36R	48.90	QMB610EK(1 or 2)	357.	_	_	_	_	_	_	_	_	_	_	_	_	_							
100 A-60 A	7.5	QMB363T32W	1961.	1 ea.	HRK1020 and	47.70	QMB610EK(1 or 2)	357.	_	_	_	_	_	_	_	_	_	_	_	_	_=_							
200 A	7.5 9	QMB364W	2306.	1	QMB60R HRK1020	48.90 47.70	QMB200EK(1 or 2)	357.	=	 25	$\vdash$	<u>-</u>	_	<del>-</del>	=	— 125		<u>-</u>	=	150								
200 A-200 A	7.5	QMJ364T	4712.	<u> </u>	— —	-	, ,			25		60		50		125		60		150	40							
200 A-Blank	7.5	QMJ364H■	2357.	_	_	_	QMB610EK(1 or 2)	357.	_	_	_	_	_	_	_	_	_	_	_	_	_							
400 A△	15	QMB365W	5445.	1	QMB4060R	111.00	_	_	_	_	_	_	_	100	_	250	_	125	_	350	50							
400 A	9	QMJ365	5561.		_	_	QMB200EK(1 or 2)	357.	_	50	_	125	_	100	_	250	_	125	_	350	50							
400 A△ 600 A▼△	9 15	QMB365WT6 ♦ QMB366W	5276. 6735.	1	 QMB4060R	111.00		<u> </u>	_	$\vdash$	_		_	150	=	400	_	250	_	500								
60 A0	15	QMJ366	6704.	<del>-</del>						75	H	150	_	_	Ē	-		250	H	_	<del>-</del>							
800 A□	15	QMB367W	12140.	_	_	_			_	Ė			_	150	-	400	_	250	_	500								
				•		•												•										

- "1" indicates one normally open and one normally closed contact.
  "2" indicates two normally open and two normally closed contacts.
- Blank units cannot be modified to accept a switch interior. Use 300 Vac Class T fuses only.
- Class J fuse provisions—to field modify switch, move load side fuse base to position indicated in switch. Not available on 100-30, 100-60, or 800 A switch units. To adapt switch for 600 Vac Class T fuses, order kit Catalog Number QMB600T6, \$ Price 194. (Use T6 fuses with standard horsepower ratings only).
- 250 Vdc rating.
- To adapt switch for 600 Vac Class T fuses, order kit Catalog Number QMB800T6, \$ Price 467. (Use T6 fuses with standard horsepower ratings only). Use 600 Vac Class T fuses only.

  Horsepower rating applicable to 480Y/277 V system only.

Note: See the Supplemental Digest for merchandised motor starter units, QMB RTI panelboards, and replacement switches for Series 1–4 and D2 QMB panelboards.

For series E1 and E2, QMJ switches may be used in 400 A-1200 A interiors in a NEMA 1 without door only. QMJ switches cannot be used in series E1 and E2, 225 A panelboards. QMJ switches cannot be used in NEMA 1 with door or any NEMA 3R/12 enclosure.

### Table 9.164: Base \$ Price

	Main Lugs			Main Switch ▲					Solid Neutral	
Mains	Maximum	Base	Mains	Maximum	240	Vac	600 \	Vac	(Main Lugs and	Main Switch)
Rating	Mounting Space	\$ Price	Rating	Mounting Space	Base \$	Price	Base \$	Price	Ampere	\$ Price
(Amperes)	(ln.)	(2- or 3-pole)	(Amperes)	(ln.)	2-pole	3-pole	2-pole	3-pole	Rating	\$111CC
_	_	_	100	51	2544.	3104.	3026.	3632.	100 A	294.
		_	200	51	2544.	3104.	3026.	3632.	200 A	294.
225	60	1098.	_	_	_	_	_	_	225 A	294.
400	60	1344.	400	45	4840.	6158.	5906.	7300.	400 A	384.
600	60	2066.	600	45	7298. ♦	8758. ♦	7968.★▼	9338.★	600 A	556.
800	60	2550.	800■	45	11098.	13704. ♦	11128.★	13724.★	800 A	786.
1200	45	3550.	_	_	_	_	_		1200 A	912.

- Pricing includes Class R or J Rejection Clips if requested at time of order. Class J fuses available only on 600 V switches. 800 A switch unit with provision for UL Class L fuses.
- Switches for use with 300 V Class T fuses are also available at no additional cost. For 600 Vac UL Class T fuse provision on main switch, add \$ 321.00 250 Vdc rating.

#### Table 9.165: Branch Switch \$ Price △

Unit Ampere	Switch		24	10 Vac			600 Vac			
Rating	Type	2-pole \$ Price	3-pole \$ Price	Space Only \$ Price	Unit Mounting Height (In.)	2-pole \$ Price	3-pole \$ Price	Space Only \$ Price	Unit Mounting Height (In.)	
Mounted Branch	Switches									
30 A-Blank	QMB	592.	784.	294.	4.5	852.	1012.	294.	4.5	
60 A-Blank	QMB	392.	704.	294.	4.5	052.		396.	6	
100 A-Blank	QMB	898.	1104.	392.	6	1276.	1592.	462.	7.5	
100 A-DIATIK	QMJ♦♦	_	_		_	1270.	1592.	396.	6	
200 A-Blank	QMJ♦♦	_	_		_	1984.	2576.	462.	7.5	
60 A-30 A	QMB	_	_	_	_	1216.	1446.	396.	6	
100 A-30 A	QMB	1822.	2274.	396.	6	1822.	2274.	462.	7.5	
100 A-60 A	QMB	1022.	2214.	390.	6	1022.	2214.			
30 A-30 A	QMB	826.	1120.	294.	4.5	1216. ◊		294.	4.5	
30 A-30 A	QMJ♦♦	_	_	_	_	1216.		294.		
60 A-60 A	QMB	826.	1120.	294.	4.5	1216. ◊	1446.	396.	6	
00 A-00 A	QMJ♦♦	_	_		_	1216.	1440.	396.	0	
100 A-100 A	QMB	1282.	1576.	396.	6	1822. ▽	2274.	462.	7.5	
100 A-100 A	QMJ♦♦	_	_	_	_	1822.	2214.	396.	6	
200 A-200 A		_	_		_	3970.	5154.	462.	7.5	
le Mounted Branc	h Switches	•				,			•	
200 A	QMB	1484.	2034.	580.	9	1984. ◊	2576.	580.	9	
400 A	QMB	3204.	4562.	878.	15	4300. ◊	5764.◊	878.	15	
400 A☆	QMB	3040.☆	4360.☆	580.	9	4098.◊☆	5552.◊☆	580.	9	
400 A	QMJ♦♦	_	_		_	4098.	5552.	300.	9	
600 A	QMB	4888.▽	6374. ◊ ▽	878.	15	5264. ◊ ⊖	6962.◊⊖			
600 A	QMJ♦♦	_	_		_	5264.	6962.	878.	15	
800 A*	QMB	10682.	10682. ▽	878.	15	10682. ♀	10682. ♀		1	

- Pricing includes Class R or J Rejection Clips if requested at time of order. Class J fuses available only on 600 V switches.

- Pricing includes Class H or J Hejection Clips in requested at anne of order. State 1 = 25.0 Vdc rating.

  5 Price is per twin switch.

  250 Vdc rating.

  For use with Class T fuses only. Use 300 V Class T fuses on 240 Vac max. systems and 600 V Class T fuses on 600 Vac max. systems. Switches for use with 300 V Class T fuses are also available at no additional cost.

  For 600 Vac UL Class T fuse provision on branch switch, add \$ 307.00

  800 A switch unit with provision for UL Class L fuses.

  QMJ switches are available in NEMA 1 enclosures only.

## Table 9.166: Accessories

Tubic 5.100. Access	01100						
	Electrical Interlocks						
Number of Contacts Branch Switches		Mains Ampere Sub-feed Lugs ◑ Rating for Main Lugs Interior ◑		Feed-through Lugs for Main Switch Interior	Copper Bus Bars		
Normally Open	Normally Closed	30-200 A \$ Price					
			200 A	_	_	488.	
			225 A	282.	_	488.	
1	1	472.	400 A	466.	872. ≎	720.	
2	2	7/2.	600 A	856.	1268. ≎	1148.	
			800 A	1150.	1512.0	1372.	
			1200 A	1440.	_	1428.	

- No extra box height required.
- Box height increases 6 in. Not available in Type 3R/5/12 construction.

### Table 9.167: Circuit Breakers, Twin Mounted H-frame— \$ Price Per Twin Unit

Circuit Breaker Ampere Rating						\$ Price—3-pol	le		
Left Unit	Right Unit	Unit Mounting Height (In.)	240	V	480	V	60	O V	Space Only
Left Offit	night offit	(***)	HD	HG	HD	HG	HD	HG	Space Only
15–150 A	15–150 A	6	2914.	3572.	3324.	3814.	3674.	4018.	396.

Note: See the Supplemental and Obsolescence Digest for merchandised motor starter units, QMB RTI panelboards, and replacement switches for Series 1-4 and D2 QMB panelboards.

### Table 9.168: Circuit Breaker, Single Mounted JD-LA- \$ Price Each

S. 115 .			\$ Price	≔3-pole	
Circuit Breaker Ampere Rating	Unit Mounting Height (In.)		600 V		Space Only
		JD	JG	LA	Opace Only
150–250 A	6	3800.	5814.	_	396.
225–400 A	7.5	_	_	5664.	462.

### Table 9.169: UL Listed Short Circuit Ratings

Starter Size	Fusible Switch—600 V Max. (w/Class R or J Fuses) RMS Sym. Amps	Thermal-magnetic Circuit Breaker 600 V Max. RMS Sym. Amps
0	100,000	5,000
1	100,000	5,000
2	100,000	5,000
3	100,000	5,000

## QMB Factory Assembled Panelboards

Class **4620** / Refer to Catalog **4620CT9601** 

**Common Features** 

Table 9.170: Ground Bar and Name Plates

Item	\$ Price
Equipment Ground Bar	180.
Copper Ground Bar	148. ▲
Insulated/Isolated Ground Bar	<b>A E</b>
Name Plates	78. ♦

- ▲ Add to Equipment Ground Bar \$ Price.
- \$ Price an additional Neutral Assembly from Table 9.164 on Digest page 9-36 for Al insulated ground bar or from Table 9.171 for Cu insulated ground bar.
- ground bar.

  ◆ Standard white face/black letter laminated bakelite, 1 in. x 3.5 in. adhesive backed or screw mountable with screws in a bag assembly. (\$ Price includes engraving.)

Table 9.171: Copper Neutral

	\$ Price
Copper Neutral	
125–400 A	868.
600 A	894.
800 A	1108.
1200 A	1352.
Hinged Trim	N/A
Weatherproof or Dusttight Cabinets—Type 3R, 5, 12; 800 A Max.	3054.
Mechanical Lugs 225 A-1200 A	Standard

Table 9.172: Copper Mechanical Lugs—Main Switch Interiors

Copper Mechanical Lugs	\$ Price
200 A	108.
400 A	148.
600 A	168.
800 A	196.

Table 9.173: Copper Compression Lugs—Main Lug Interiors

Copper Compression Lugs	\$ Price
225 A	108.
400 A	148.
600 A	168.
800 A	316.
1200 A	836.

Table 9.174: Aluminum Compression Lugs VCEL— Main Lug Interiors

Aluminum Compression Lugs VCEL	\$ Price
225 A	58.
400 A	90.
600 A	118.
800 A	200.
1200 A	236.

### Table 9.175: Aluminum Compression Lugs VCEL— Main or Branch Switches

Aluminum Compression Lugs VCEL	\$ Price
100 A #8–1/0 Al or Cu	58.
200 A #4–300 kcmil Al or Cu	98.
400 A 2/0–500 kcmil Al or Cu	128.
600 A 2/0–500 kcmil Al or Cu	246.
800 A 2/0–500 kcmil Al or Cu or 500 kcmil Cu or 500–750kcmil Al.	262.

Table 9.176: Copper Compression Lugs—Main Switch Interiors

Copper Compression Lugs	\$ Price
200 A	108.
400 A	148.
600 A	168.
800 A	196.

Table 9.177: Surgelogic<sup>™</sup> SPD for QMB  $\star$ 

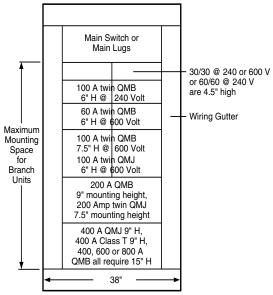
Surge	Voltage					
Current	120/240 V	208Y/120 V	240/120 Vac	480Y/277 Vac	600Y/347 Vac	
Rating kA	1Ø3W	3Ø4W	3Ø4W High Leg	3Ø4W	3Ø4W	
100	_	14310.	_	15410.	_	
120	_	15654.	_	16754.	_	
160	_	18586.	_	19686.	_	
200	19196.	23596.	23596.	26896.	26896.	
240	23760.	27440.	27440.	31460.	31460.	

<sup>★</sup> Requires 9 in. of mounting height.

Table 9.178: SPD Options

Surgelogic SPD Options	\$ Price
Surge Counter	Standard
Dry Contacts	Standard
Remote Monitor	2588.

### **QMB Layout Information**



To maximize the quantity of branch switches, use QMJ switches from Digest page 9-36. Class J fuses are available in time delay construction suitable for motor and transformer

### Table 9.179: NQ and NF Lighting Contactors—Mechanically Held

(Furnish a one-line power and control voltage connection diagram.)

		Mechanical	y Held
Ampacity	Туре	\$ Price	Minimum Additional Box Height Required ▲ H (In.)
quare D™ Bran	d PB ■		
30 A 2P	PBM10B	3772.	18
60 A 2P	PBP10B	4634.	18
75 A 2P	PBN10B	4986.	18
100 A 2P	PBQ10B	5072.	18
150 A 2P	PBR10B	7156.	18
200 A 2P	PBV10B	8692.	18
225 A 2P	PBW10B	9830.	18
30 A 3P	PBM11B	3740.	18
60 A 3P	PBP11B	4754.	18
75 A 3P	PBN11B	5628.	18
100 A 3P	PBQ11B	6454.	18
150 A 3P	PBR11B	8078.	18
200 A 3P	PBV11B	8736.	18
225 A 3P	PBW11B	10062.	18
SCO Type 920	•		
30 A 2P	9202030	4694.	18
60 A 2P	9202060	5954.	18
75 A 2P	9202075	5954.	18
100 A 2P	9202100	6194.	18
150 A 2P	9202150	9242.	18
200 A 2P	9202200	10882.	18
225 A 2P	9202225	11875.	18
30 A 3P	9203030	5436.	18
60 A 3P	9203060	7638.	18
75 A 3P	9203075	7638.	18
100 A 3P	9203100	9184.	18
150 A 3P	9203150	12998.	18
200 A 3P	9203200	14434.	18
225 A 3P	9203225	15750.	18

- NF panels require 18 in. of additional box height regardless of contactor ampacity or
- If two-wire control is required—Square D™ brand. Add 708. (No additional width or depth required)
- If two-wire control is required—ASCO type. Add 1412. (No additional width or depth required)

Table 9.180: Current Density Rated Panelboard Bus and Special Plating for Copper Bus

Ampacity	Copper Bus Special Plating \$ List Price Adder ★	Current Density Rated Bus \$ List Price Adder		
	Tin or Silver Plating	1000 A/in <sup>2</sup> Cu	750 A/in <sup>2</sup> Al	
100 A	1240.	510. ▼		
125 A	1240.	510. ▼	<b>340.</b> △	
225 A	1240.	610. ▼		
250 A	1240.	810. ▼	456. △	
400 A	2080.	830.	<b>572.</b> △	
600 A	2080.	1050. △	1080. △□	
800 A	2080.	1490.	<b>1244.</b> □	
1200 A	2080.	1710.	1432. □◊	

- Standard copper bus plating material

  NQ and NF: Silver plated bus/tin plated connectors

  I-Line and QMB: Tin.
- NQ available in 42 circuit only.
- Not available in NQ. Δ
- HCN 600 A and all 800–1200 A I-Line interiors available with copper bus only.
- 1200 A QMB with current density-rated bussing not available.

Table 9.181: NQ and NF Panelboard Split Bus Bars

Maximum Ampacity	\$ List Price Adder		Maximum Number of Pole Spaces Available		Box Height
MLO	1-phase	3-phase	Main	Split	(ft.)
NQ Panelboards—125 A Maximum Lugs on Split Bus Section ☆					
			18	30	
225 A	600. 900	900.	30	18	44
		ı		30	
NF Panelboards	—125 A Maxii	mum Lugs on	Split Bus Sect	tion ☆	
			18	30	56
250 A	250 A — 900. 30	30	18	56	
		30	30	62	

When greater than 125 A lugs are required on the split section of the bus, contact your local Schneider Electric representative or distributor for the box height.

Table 9.182: I-Line™ Panelboard Split Bus Bars

Ampacity MLO	\$ Price		Additional Mounting Height Required On Split Bus Section ▽
WILO	2-pole	3-pole	Split Bus
225 A	560.	662.	7.5 in.
400 A	662.	858.	9 in.
600 A	786.	858.	12 in.
800 A	1094.	1238.	12 in.
1200 A	1320.	1442.	18 in.

Note: For applications with main circuit breaker panelboards, contact your local Schneider Electric representative or distributor.

### Main Circuit Breaker Without Overload Trip (Automatic Molded Case Switch)

(Not UL Listed)

\$ Price as standard main circuit breaker, no \$ Price Adder.

## **Shunt Trip Circuit Breakers**

See Digest page 7-35 for pricing.

For molded case switch and automatic molded case switch short circuit current ratings, See Digest page 7-33.

### **Special Features**

For information on the following special features, please see the Supplemental and Obsolescence Digest.

- Powerlogic™ metering •
- Customer equipment space (NQ and NF) •
- Increased box depth •
- Increased gutters-top, bottom, and sides €
- Non-standard paint •
- Welded base channel •
- Type 1 gasketed €
- Type 2 drip hood €
- Type 3R/4/4X/5/12 stainless steel enclosure ●
- Type 4X fiberglass enclosure •
- Stainless steel trim front •
- Padlockable hasp •
- Special locks (Corbin, Yale, Best) •
- Equal height boxes •
- Common trim to cover two equal height boxes •
- Panelboard skirt-hides conduits feeding a panelboard •
- Panelboard wireway-for terminating conduit in wireway endwall •
- Keyed mechanical interlocking of two or more circuit breakers (I-Line and QMB) •
- Motor operators (I-Line only)
- Panelboard interiors and special fronts to fit existing boxes
- A standard panelboard box has one blank endwall and one with knockouts. Blank endwalls or knockouts in both endwalls are also
- Supported by the Panelboard Product Selector.

For I-Line panelboards, dimension includes height of "SL" sub-feed lug kit from Digest, plus 3 in. from available branch mounting space.



Panel Type	Ampere Rating	Lug Wire Range
	100 A	one #6-2/0 Al or Cu
	225 A	one #6-350 kcmil Al or Cu
NQ	400 A	one 1/0-750 kcmil or two 1/0-350 kcmil Al or Cu
	600 A	two 1/0-750 kcmil Al or Cu

Table 9.184: NQ Standard Aluminum Mechanical Lugs—Main Circuit Breaker

Panel Type	Ampere Rating	Circuit Breaker Type	Lug Wire Range ▲
	100 A	QOB	one #4-#2/0 Al or Cu
	100 A	FI	one #14#1/0 Al or Cu
	150 A	HD, HG, HJ, HL	one #14-#3/0 Al or Cu
	225 A	QB, QD, QG, QJ	one #4-300 kcmil Al or Cu
NQ		JD, JG, JJ, JL	one #3/0–350 kcmil Al or Cu ▲
	250 A	DJ	one #2-600 Cu or #2-500 Al
		KI	one #1/0-350 kcmil Al or Cu
4	400 A	LA, LH	one #1–600 kcmil Al or Cu or two #1–250 kcmil Al or Cu
	600 A	LC	two #4/0-500 kcmil Al or Cu

<sup>▲</sup> The lug range shown is for the highest amperage of the circuit breaker frame shown in the table.

Table 9.185: NF Standard Mechanical Lugs—Main Lugs

Panel Type	Ampere Rating	Lug Wire Range	
	125 A	one #6–2/0 Al or Cu	
	250 A	one #6–350 kcmil Al or Cu	
NF	400 A	one #1/0-750 kcmil or two #1/0-350 kcmil Al or Cu	
	600 A	two #1/0-600 kcmil Al or Cu	
	800 A	three #4/0–500 kcmil Al or Cu	

Table 9.186: NF Standard Mechanical Lugs-Main Circuit Breaker

Panel Type	Ampere Rating	Circuit Breaker Type	Lug Wire Range ■
	125 A	ED, EG, EJ	one #14–#2/0 Al or Cu
	100 A	FI	one #14-#1/0 Cu or one #12-#1/0 Al
	150 A	HD, HG, HJ, HL	one #14-#3/0 Al or Cu
NF	NF 250 A	JD, JG, JJ, JL	one #3/0–350 kcmil Al or Cu ■
		DJ	one #2-600 Cu or #2-500 Al
		KI	one #1/0–350 kcmil Al or Cu
	400 A	LA, LH	one #1-600 kcmil or two #1-250 kcmil Al or Cu
	600 A	LC, LI, LE, LX, LXI	two #4/0-500 kcmil Al or Cu

<sup>■</sup> The lug range shown is for the highest amperage of the circuit breaker frame shown in the table.

© 2012 Schneider Electric All Rights Reserved

## Class 2110, 4620 / Refer to Catalog 2110CT9701, 4620CT9601

Table 9.187: Standard Mechanical Lugs—Main Lugs

Panel Type	Ampere Rating	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	100 A	_	_
	225 A	one #6–300 kcmil Al or Cu	one #6–300 kcmil Al or Cu
I-Line	400 A	two #2-600 kcmil Al or Cu	one #2–600 kcmil Al or Cu
I-LINE	600 A	two #2-600 kcmil Al or Cu	two #2-500 kcmil Al or Cu
	800 A	(4) 3/0–750 kcmil Al or Cu	(3) 3/0–500 kcmil Al or Cu
	1200 A	(4) 3/0–750 kcmil Al or Cu	(4) 3/0–500 kcmil Al or Cu

Table 9.188: Standard Mechanical Lugs—Main Circuit Breaker

Panel Type	Ampere Rating	Circuit Breaker Type	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	100 A	FA, FH, FI	one #14-1/0 Al or Cu	one #14-1/0 Al or Cu
	150 A	HD, HG, HJ, HL	one #14-3/0 Al or Cu	one #14-3/0 Al or Cu
	225 A	KI	one #4-300 kcmil Al or Cu	one #4-300 kcmil Al or Cu
	250 A	JD, JG, JJ, JL	one #1/0-#4/0 Al or Cu	one #1/0-300 kcmil Al or Cu
I-Line	250 A	LX, LXI, LE	two #1-350 kcmil Al or Cu	two #1-350 kcmil Al or Cu
	400 A	LA, LH	one #1-600 or two #1-250 kcmil Al or Cu	one #1-600 kcmil Al or Cu
	600 A	LC, LI, LX, LXI, LE	two 4/0-500kcmil Al or Cu	two 4/0-500kcmil Al or Cu
	800 A	MG, MJ, PG, PJ, PL	three 3/0-500 kcmil Al or Cu	three 3/0-500 kcmil Al or Cu
	1200 A	PG, PJ, PL, RGC, RJC, RLC	four 3/0-500 kcmil Al or Cu	four 3/0-500 kcmil Al or Cu

Table 9.189: Standard Mechanical Lugs-Main Lugs

Panel Type	Mains Ampere Rating	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	225 A	one #6–300 kcmil Al or Cu	one #6–300 kcmil Al or Cu
	400 A	one #6–300 kcmil Al or Cu and, one 3/0–750 kcmil Al or Cu	one #6–300 kcmil Al or Cu and, one 3/0–750 kcmil Al or Cu
	600 A	two 3/0-500 kcmil Al or Cu	two 3/0-500 kcmil Al or Cu
QMB	800 A	(4) 3/0–750 kcmil Al or Cu	(3) 3/0–500 kcmil Al or Cu or two 3/0–750 kcmil Al or Cu
	1200 A	(4) 3/0–750 kcmil Al or Cu	(4) 3/0–500 kcmil Al or Cu or (4) 3/0–750 kcmil Al or Cu
	ression lugs Standard.		

Table 9.190: Standard Mechanical Lugs—Main Switch

Panel Type	Mains Ampere Rating	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	200 A	#4–300 kcmil Al or Cu	one #4–300 kcmil Al or Cu
QMB	400 A	3/0–600 kcmil Al or Cu	two 3/0-600 kcmil Al or Cu
QIVID	600 A	3/0-600 kcmil Al or Cu	two 3/0-600 kcmil Al or Cu
	800 A	3/0-600 kcmil Al or Cu	(3) 3/0–500 kcmil Al or Cu

Table 9.191: Standard Mechanical Lugs—QMB Branch Switch Units

Panel Type	Switch Ampere Rating	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	30 A	one #14–#2 Al or Cu	one #14–#2 Al or Cu
	60 A	one #14-#2 Al or Cu	one #14–#2 Al or Cu
	100 A	one #14–1/0 Al or Cu	one #14–1/0 Al or Cu
QMB	200 A	one #4–300 kcmil Al or Cu	one #4–300 kcmil Al or Cu
	400 A	two 3/0-600 kcmil Al or Cu	two 3/0-500 kcmil Al or Cu
	600 A	two 3/0-600 kcmil Al or Cu	two 3/0–500 kcmil Al or Cu
	800 A	(3) 3/0–600 kcmil Al or Cu	(3) 3/0–500 kcmil Al or Cu

## Table 9.192: Standard Mechanical Lugs—QMJ Branch Switch Units ■

Panel Type	Switch Ampere Rating	Lug Wire Range ▲	Wire Range Wire Bending Space per NEC Table 373-6 ▲
	30 A	one #14–#2 Al or Cu	one #14–#2 Al or Cu
	60 A	one #14-#2 Al or Cu	one #14-#2 Al or Cu
	100 A	one #14–1/0 Al or Cu	one #14–1/0 Al or Cu
QMJ	200 A	one #6–300 kcmil Al or Cu	one #6–300 kcmil Al or Cu
	400 A	one 1/0–750 kcmil Al or Cu	one 1/0-750 kcmil Al or Cu
	400 A	two 1/0-300 kcmil Al or Cu	two 1/0-300 kcmil Al or Cu
	600 A	two 3/0-600 kcmil Al or Cu	two 3/0-600 kcmil Al or Cu

- (#) = Number of conductors per phase. Use only 90  $^{\circ}$ C insulated conductors based on an ampacity of 75  $^{\circ}$ C conductors.

## I-Line™ Combo **Panelboard**

Table 9.193: Interior Boxes and Fronts — Includes Solid Neutral

I-Line Mounting Space	Part Number	Panelboard Ampacity	List \$ Price	Single/ Duplex	Lighting Section Type	Lighting Section Amperage	Lighting Section Circuits	Busing	Ground Bar	Вох	4 Piece Trim Without Door	Trim with Door	NEMA 3R/5/12 (Includes Fromnt)
18	CP18864N3Q2C	400	10334.00	S	NQ	225	30	Cu	PK32DGTACU	HC2686DB	HC2686T()4P	HC2686T()HR	HC2686WP
18	CP18864N3Q2	400	7650.00	S	NQ	225	30	Al	PK32DGTA	HC2686DB	HC2686T()4P	HC2686T()HR	HC2686WP
18	CP18864N4Q2C	400	10729.00	S	NQ	225	42	Cu	PK32DGTACU	HC2686DB	HC2686T()4P	HC2686T()HR	HC2686WP
18	CP18864N4Q2	400 400	8045.00	S S	NQ NF	225 250	42 30	Al	PK32DGTA PK32DGTACU	HC2686DB HC2686DB	HC2686T()4P HC2686T()4P	HC2686T()HR HC2686T()HR	HC2686WP HC2686WP
18 18	CP18864N3F2C CP18864N3F2	400	17549.00 14749.00	S	NF NF	250	30	Cu Al	PK32DGTACU PK32DGTA	HC2686DB	HC2686T( )4P	HC2686T()HR	HC2686WP
18	CP18864N4F2C	400	18147.00	S	NF	250	42	Cu	PK32DGTACU	HC2686DB	HC2686T( )4P	HC2686T()HR	HC2686WP
18	CP18864N4F2	400	15388.00	S	NF	250	42	Al	PK32DGTA	HC2686DB	HC2686T( )4P	HC2686T()HR	HC2686WP
18	CP18866N3Q4C	600	15032.00	Š	NQ	400	30	Cu	PK32DGTACU	HC2686DB	HC2686T( )4P	HC2686T()HR	HC2686WP
18	CP18866N4Q4C	600	15428.00	S	NQ	400	42	Cu	PK32DGTACU	HC2686DB	HC2686T()4P	HC2686T()HR	HC2686WP
18	CP18866N3F4C	600	21270.00	S	NF	400	30	Cu	PK32DGTACU	HC2686DB	HC2686T( )4P	HC2686T()HR	HC2686WP
18	CP18866N4F4C	600	21863.00	S	NF	400	42	Cu	PK32DGTACU	HC2686DB	HC2686T()4P	HC2686T()HR	HC2686WP
22.5	CP23734N3Q2C	400	10686.00	S	NQ	225	30	Cu	PK32DGTACU	HC3273DB9	HCM73T()V	HCM73T()VD	N/A
22.5	CP23734N3Q2	400	7942.00	S	NQ	225	30	AL	PK32DGTA	HC3273DB9	HCM73T()V	HCM73T()VD	N/A
22.5	CP23734N3F2C	400	18065.00	S S	NF	250	30	Cu	PK32DGTACU	HC3273DB9	HCM73T()V HCM73T()V	HCM73T()VD	N/A
22.5 22.5	CP23734N3F2 CP23736N3Q4C	400 600	15249.00 16159.00	S	NF NQ	250 400	30 42	AL Cu	PK32DGTA PK32DGTACU	HC3273DB9 HC3273DB9	HCM73T()V	HCM73T()VD HCM73T()VD	N/A N/A
22.5	CP23736N3C4C CP23736N3F4C	600	22539.00	S	NF NF	400	42	Cu	PK32DGTACO PK32DGTA	HC3273DB9	HCM73T()V	HCM73T()VD	N/A N/A
22.5	CP23914N4Q2C	400	11091.00	S	NQ	225	42	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N4Q2	400	8346.00	Š	NQ	225	42	Al	PK32DGTA	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N5Q2C	400	11604.00	Š	NQ	225	54	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N5Q2	400	8797.00	S	NQ	225	54	Al	PK32DGTA	HC3291DB9	HCM91T( )V	HCM91T()VD	N/A
22.5	CP23914N4F2C	400	18672.00	S	NF	250	42	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N4F2	400	15855.00	S	NF	250	42	Al	PK32DGTA	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N5F2C	400	19341.00	S	NF	250	54	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23914N5F2	400	16508.00	S	NF	250	54	Al	PK32DGTA	HC3291DB9 HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5 22.5	CP23916N4Q4C CP23916N5Q4C	600 600	16563.00 17076.00	S S	NQ NQ	400 400	42 54	Cu Cu	PK32DGTACU PK32DGTACU	HC3291DB9	HCM91T()V HCM91T()V	HCM91T()VD HCM91T()VD	N/A N/A
22.5	CP23916N3Q4C CP23916N4F4C	600	23145.00	S	NF	400	42	Cu	PK32DGTACU PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A N/A
22.5	CP23916N5F4C	600	23814.00	S	NF	400	54	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23916N44Q4C	600	26032.00	Ď	NQ	400	42/42	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
22.5	CP23916N53Q4C	600	26141.00	D	NQ	400	54/30	Cu	PK32DGTACU	HC3291DB9	HCM91T()V	HCM91T()VD	N/A
31.5	CP32866N44Q4C	600	26066.00	D	NQ	400	42/42	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32866N53Q4C	600	26170.00	D	NQ	400	54/30	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32866N4BQ4C	600	18362.00	D	NQ	400	42/0	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32866N44F4C	600	38703.00	D	NF	400	42/42	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32866N53F4C	600	38763.00	D D	NF	400	54/30	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5 31.5	CP32866N4BF4C CP32868N44Q6C	600 800	24681.00 36447.00	D	NF NQ	400 600	42/O 42/42	Cu Cu	PK32DGTACU PK32DGTACU	HC4486DB HC4486DB	HCR86T() HCR86T()	HCR86T()D HCR86T()D	HC4486WP HC4486WP
31.5	CP32868N53Q6C	800	36552.00	D	NQ NQ	600	54/30	Cu	PK32DGTACU PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N3BQ6C	800	23026.00	D	NQ NQ	600	30/O	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N4BQ6C	800	23415.00	D	NQ	600	42/O	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N5BQ6C	800	23300.00	D	NQ	600	54/O	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N44F6C	800	38744.00	D	NF	600	42/42	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N53F6C	800	38805.00	D	NF	600	54/30	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T( )D	HC4486WP
31.5	CP32868N3BF6C	800	23981.00	D	NF	600	30/O	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N4BF6C	800	24563.00	D	NF	600	42/0	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP
31.5	CP32868N5BF6C	800	24599.00	D	NF	600	54/O	Cu	PK32DGTACU	HC4486DB	HCR86T()	HCR86T()D	HC4486WP

Table 9.194: RTI Cabled Lighting Section Kit for I-Line Combo Panelboard

Part Number	Description	MLO Panelboard Ampacity	List \$ Price	Lighting Section Type	Lighting Section Circuits
NFICRT418L1C	NF Lighting Section Kit	125	1528.00	NF	18
NFICRT442L2C	NF Lighting Section Kit	250	1763.00	NF	42
NFICRT442L4C	NF Lighting Section Kit	400	2353.00	NF	42
NFICRT442L6C	NF Lighting Section Kit	600	2008.00	NF	42
NQICRT418L1C	NQ Lighting Section Kit	100	1564.00	NQ	18
NQICRT442L2C	NQ Lighting Section Kit	225	1373.00	NQ	42
NQICRT442L4C	NQ Lighting Section Kit	400	2156.00	NQ	42
NQICRT442L6C	NQ Lighting Section Kit	600	2332.00	NQ	42
NQICRT418C1C	Contactor with 18 Circuit NQ Lighting Section Kit	100	1225.00	NQ	18
NFICRT418C1C	Contactor with 18 Circuit NF Lighting Section Kit	125	1440.00	NF	18

This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the same enclosure or a remote main located in a separate enclosure. atad Civavit Brasker Batings (DMC C

Table 9.1	9.1: NQ Series Connected Circuit Breaker Ratings (RMS Symmetrical)									
Maximum System Voltage	Maximum Short Circuit	Square D™ Brand Integral or Remote Main Circuit Breakers	Square D™ E Catalog Desig		Allowable					
AC ▲ ■	Current Rating	and Remote Main Fuses	Туре	1 Pole	2 Pole	3 Pole				
AC Z	22,000	MG	QO (B)	15–30 A	_					
	25,000	LD, HD, JD	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–125 A 15–60 A 15–60 A 15–60 A —					
		HG, JG	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–125 A 15–60 A 15–60 A 15–60 A —					
	65,000	LG	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–125 A 15–60 A 15–60 A —	- - - -				
		LJ	QO (B) GFI QO (B) EPD	15–30 A 15–30 A	40–60 A 40–60 A	_				
120/240 1P/3W		HJ, JJ	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15-70 A 15-70 A 15-30 A 15-30 A 15-30 A 15-20 A 15-20 A	15–125 A 15–125 A 15–60 A 15–60 A 15–60 A					
	100,000	100,000	100,000	100,000	Ш	QO (B) QO(B) VH QO (B) H QO (B) GFI QO (B) EPD QO(B) AFI QO(B) CAFI	15–70 A 15–70 A — — — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–30 A 15–60 A		
								DJ 400 A	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–20 A 15–20 A
		a	QO (B) QO (B) AS QO (B) VH QO (B) PL QO (B) GFI QO (B) AFI QO (B) CAFI	15–70 A 15–30 A — 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–30 A 150 A 15–60 A 15–60 A					
	125,000	HL, JL	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–125 A 15–60 A 15–60 A 15–60 A					
	18,000	LA/LH (L) 34200MC LA/LH (L) 34225MC LA/LH (L) 34250MC LA/LH (L) 34400MC	QO (B)	15–30 A	15–30 A	15–30 A				
208Y/120	25,000	LD	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A 15–30 A 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A 15–125 A 15–60 A 15–60 A — —	15–150 A 15–30 A 15–30 A 15–30 A ————————————————————————————————————				
3P/4W 240/120 V 3P/4W		DJ-W 150 A MC	QO (B) QO (B) VH QO (B) GFI QO (B) AFI	15–70 A — 15–30 A 15–20 A	15–100 A 15–125 A 15–60 A —	 15–150 A  				
	30,000	DJ-W 250 A MC	QO (B) QO (B) VH QO (B) GFI QO (B) AFI	15–70 A — 15–30 A 15–20 A	15–100 A — 15–60 A —	15–150 A —				
		DJ-W 600 A MC	QO (B) QO (B) VH QO (B) GFI QO (B) AFI	15–70 A — 15–30 A 15–20 A	15–100 A — 15–60 A —	15–150 A —				

NQ Series Connected Circuit Breaker Ratings (RMS Symmetrical)

Maximum System Voltage	Maximum Short Circuit	Integral or Remote Main Circuit Breakers	Square D™ E Catalog Desig	Brand Bran Ination and Ranges 👀	Allowable	Breaker Ampere			
AC ▲■	Current Rating	and Remote Main Fuses	Туре	1 Pole	2 Pole	3 Pole			
					LG	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A — 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–60 A 15–60 A — —	 15–150 A  15–30 A 15–30 A 15–30 A 
	65,000	ы	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A 15–70 A — 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–60 A 15–60 A	15–150 A 15–30 A 15–30 A 15–30 A 15–30 A			
208Y/120		LL	QO (B) GFI QO (B) EPD QO (B) EPE	_ _ _	_ _ _	15–30 A 15–30 A 15–30 A			
3P/4W 240/120V 3P/4W		DJ 400 A	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A — 15–60 A 15–60 A —	15–150 A — — — —			
	100,000	Ø	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A — 15–60 A 15–60 A 15–60 A 15–60 A	15–30 A 15–150 A 15–30 A 15–50 A 15–50 A 15–50 A			
		LJ	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A — — — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–30 A 15–60 A	 15–150 A   			
240/120 V 3P/4W	22,000	QO (B) VH	QO (B) QO (B) GFI QO (B) EPD QO (B) EPE QO (B) PL QO (B) AFI QO (B) CAFI	15–70 A 15–30 A 15–30 A — 15–30 A 15–20 A 15–20 A	15–125 A 15–60 A 15–60 A — 15–60 A —	15–100 A 15–50 A 15–50 A 15–50 A — —			
		QD	QO (B) QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A — 15–60 A 15–60 A 15–60 A — —	15–30 A 35–150 A 15–30 A 15–50 A 15–50 A ————————————————————————————————————			
			ED, FD	QO (B) QO (B) GFI QO (B) AFI QO (B) CAFI	15-70 A 15-30 A 15-20 A 15-20 A	15–125 A 15–60 A —	15–100 A 15–50 A —		
240/120 V	25,000	KD	QO (B) QO (B) AS QO (B) GFI QO (B) AFI	15–70 A 15–30 A 15–30 A 15–20 A	15–125 A 15–30 A 15–60 A	15–100 A 15–30 A —			
3P/4W		HD, JD	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A — 15–100 A 15–60 A 15–60 A — —	15–100 A 35–150 A — 15–50 A 15–50 A 15–50 A —			
		LD	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A 15–30 A — 15–30 A 15–30 A — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–60 A 15–60 A — —	15–150 A 			

- For shown circuit breakers rated less than this maximum voltage, the indicated shor circuit current rating also applies, but at the voltage rating of the circuit breaker Short circuit tests are conducted at 100–105% of the maximum rated voltage of the

- Short circuit tests are conducted at 100–105% of the maximum rated voltage or the panelboard.

  Suffixes HID, and SWD may also be applied to the applicable branch circuit breakers shown above. Suffix SWN may not be applied in combination with LC main breakers. Where QO (B) circuit breakers are shown above, QO (B) HV, and QOH (B) circuit breakers may also be used.

  Where QO (B) GFI circuit breakers are shown above, QO (B) EPD and/or QO (B) EPE circuit breakers may also be used. QO–EPE only comes in 3 pole construction.

  Where QO (B) AFI circuit breakers are shown above, QO (B) CAFI circuit breakers may also he used.
- Δ
- while QO (b) Art circuit breakers are shown above, QO (b) CArt circuit breakers may also be used.

  To achieve selective coordination, the rating of the DJ main circuit breaker must be at least two times greater than the ampere rating of any branch circuit breaker.

  For complete series ratings for Delta Systems please reference NQ/NQM Panelboards Information Manual 80043–712–06.

by Schneider Electric www.schneider-electric.us

NQ Series Connected Circuit Breaker Ratings (RMS Symmetrical) Table 9.1:

**Series Ratings** 

Maximum	Maximum	Series Connected Ci Square D™ Brand	Square D™ E	Brand Bran	ch Circuit E	Breaker					
System Voltage	Short Circuit Current	Integral or Remote Main Circuit Breakers and Remote Main	Catalog Desig	nation and Ranges ♦	l Allowable ★▼△	Ampere					
AC A	Rating	Fuses	Туре	1 Pole	2 Pole	3 Pole					
		LA, MA	Q2L-H QDL	_	100-225 A 70-225 A	100-225 A 70-225 A					
	42,000	LC400A	QO (B) QO (B) VH QO (B) GFI QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–30 A 15–20 A 15–20 A	15–70 A 15–125A 15–60 A —	15–100 A 15–30 A —					
		LC600A	QO (B) VH QO (B) GFI QO (B) AFI QO (B) CAFI	15-70 A 15-30 A 15-20 A 15-20 A	15–125 A 15–60 A —	15–100 A 15–30 A —					
		MG	QO (B) VH	15–30 A	15–30 A	15–30 A					
		LC400A	QO (B) QO (B) VH QO (B) GFI QO (B) AFI QO (B) CAFI	15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–30 A 15–125 A 15–60 A —	15–100 A — — —					
		LC600A	QO (B) VH QO (B) GFI QO (B) AFI QO (B) CAFI	15–30 A — 15–20 A 15–20 A	15–125 A — — —	15–150 A 15–30 A — —					
		DJ400A	QO (B) QO (B) VH QO (B) H	15–70 A — —	15–125 A — 15–100 A	 15–150 A 					
		DJ_W	QO (B) QO (B) VH QO (B) GFI QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–20 A 15–20 A	15–150 A 110–125 A 15–60 A —	15–150 A — — —					
		DJ, DG, DL 150-600 A	QO (B) EPD	_	_	15–30 A					
		EG, FG, KG	QO (B) QO (B) GFI QO (B) AFI QO (B) CAFI	15–70 A 15–30 A 15–20 A 15–20 A	15–125 A 15–60 A — —	15–100 A — — —					
	65,000	QG	QO (B) QO (B) VH QO (B) GFI QO (B) PL QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A — 15–60 A 15–60 A —	15–30 A 35–150 A 15–50 A 15–30 A —					
240/120 V 3P/4W		HG, JG	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) EPE QO (B) PL QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A — 15–30 A 15–20 A 15–20 A	15–125 A — 15–100 A 15–60 A 15–60 A — 15–60 A	15–100 A 35–150 A — 15–50 A 15–50 A 15–30 A —					
		FC_ or KC_22 FC_ or KC_34	QO (B) QO (B) AS	15–70 A 15–30 A	15–100 A 15–30 A	15–100 A 15–30 A					
		LG	QO (B) VH QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A 15–70 A — 15–30 A 15–30 A 15–20 A	15–125 A 15–125 A 15–100 A 15–60 A 15–60 A	15–150 A 15–30 A 15–30 A					
								LJ	QO (B) QO (B) GFI QO (B) EPD QO (B) EPE	15–70 A 15–30 A 15–30 A	15–125 A 40–60 A 40–60 A —
		LL	QO (B) EPD QO (B) EPE	=		15–30 A 15–30 A					
		FC_ or KC_22 FC_ or KC_34	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	15–30 A	_					
		DJ400A	QO (B) QO (B) H QO (B) VH QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A — — 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–100 A — 15–60 A 15–60 A	15–150 A — — — — —					
		EJ	QO (B)	15–70 A	15–125 A	15–100 A					
	100,000	Ы	QO (B) QO (B) VH QO (B) H QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–70 A — — — 15–20 A 15–20 A	15–125 A 15–125 A 15–100 A 15–30 A 15–60 A	15–150 A — — — — —					
		HJ, JJ	QO (B) QO (B) H QO (B) PH QO (B) PH QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–100 A — 15–60 A 15–60 A 15–60 A —	15–100 A — 35–150 A 15–30 A 15–50 A 15–50 A					

NQ Series Connected Circuit Breaker Ratings (RMS Symmetrical)

Maximum System Voltage	System Circuit Main Circuit Breakers		Square D™ E Catalog Desig		Allowable	
AC A	Rating	Fuses	Туре	1 Pole	2 Pole	3 Pole
240/120 V 3P/4	125,000	HL, JL	QO (B) QO (B) H QO (B) VH QO (B) PL QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A — 15–30 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–100 A — 15–60 A 15–60 A 15–60 A —	15–100 A — 35–150 A 15–30 A 15–50 A — —
	200,000	FI, KI, HR, JR	QO (B) QO (B) GFI QO (B) EPD QO (B) AFI QO (B) CAFI	15–70 A 15–30 A 15–30 A 15–20 A 15–20 A	15–125 A 15–60 A 15–60 A —	15–100 A — — — —
208Y/120		200 A Max. Class T6, J Fuses	QO (B) QO (B) GFI QO (B) EPD	15–70 A — —	15–125 A — —	— 15–50 A 15–50 A
3P/4W	200,000	400 A Max. Class T3 Fuses	QO (B) QO (B) GFI QO (B) EPE QO (B) EPD	15–70 A 15–30 A — 15–30 A	15–125 A 15–60 A — 15–60 A	15–100 A 15–50 A 15–50 A 15–50 A
	42,000	400 A Max. Class T3 Fuses	QO (B) VH	15–30 A	15–125 A	1
	50,000	400 A Max. Class T3 Fuses	QO (B) VH	_		15–30 A
	65,000	400 A Max. Class J Fuses	QO (B) VH QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI	15–70 A — — 15–20 A 15–20 A	15–125 A — — — —	15–50 A 15–50 A — —
		400 A Max. Class T6 Fuses	QO (B) VH QO (B) AFI	15–70 A 15–20 A	15–125 A —	15–150 A —
240/120 V 3P/4W	100,000	200 A Max. Class T3 Fuses	QO (B) QO (B) VH QO (B) GFI QO (B) EPD QO (B) EPE QO (B) AFI QO (B) CAFI QOT	15–70 A — 15–30 A 15–30 A — 15–20 A 15–20 A 15–30 A	15–125 A — 15–60 A 15–60 A — — — 15–30 A	15–100 A 15–30 A — 15–50 A 15–50 A — —
		200 A Max. Class J or T6 Fuses	QO (B) EPD QO (B) EPE	_	_	15–50 A 15–50 A
	200,000	400 A Max. Class T3 Fuses	QO (B) QO (B) GFI QO (B) EPD QO (B) EPE	15–70 A 15–30 A 15–30 A —	15–125 A 15–60 A 15–60 A —	15–100 A — 15–50 A 15–50 A

- For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker. Short circuit tests are conducted at 100–105% of the maximum rated voltage of the
- panelboard.

  Suffixes HID, SWD, and SWN may also be applied to the applicable branch circuit breakers shown above. Suffix SWN may not be applied in combination with LC main breakers.
- Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.

  Where QO (B) GFI circuit breakers are shown above, QO (B) EPD circuit breakers may also be used.
- To acheive selective coordiantion, the rating of the DJ main circuit breaker must be at least two times greater than the ampere rating of any branch circuit breaker.

10-2

# Back to Product Index Section Listing

## Section 10

# Integrated Power and Control Solutions (IPaCS) Equipment



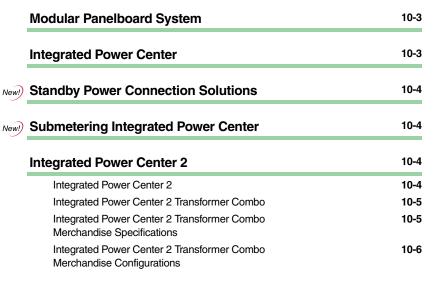
MPS, see page 10-3



IPC, see page 10-3



IPC2, see page 10-4



IPaCS™ Equipment Overview



## Integrated Power and Control Solutions Equipment Overview

For over 30 years, the Schneider Electric Integrated Power and Control Solutions (IPaCS™) business has been providing integrated equipment solutions for retail construction, commercial, and industrial projects. The Square D™ brand IPaCS family of integrated equipment combines electrical distribution, building controls, and automation into a single, factory-assembled and pre-wired enclosure/lineup. Our innovative, cost-effective, integrated solutions save valuable floor space, shorten construction cycle times, and reduce installation and material handling costs.

### Modular Panelboard System—Pre-Engineered Solution

The Modular Panelboard System (MPS) is tailored to customer specifications and may include panels, transformers, and lighting control equipment. Special Powerlink™ lighting control and column-width panel interiors are available. Additional options include power and control cable wiring, contactors, terminal blocks, surge protective devices (SPDs), equipment spaces, and power metering/monitoring solutions. Seismically qualified MPS sections are also available.

Tailored to customer specifications, MPS sections are:

- 86 in. (2184 mm) high,
- 9.5 in. (241 mm) deep, and
- vary in width depending on customer specifications

### Integrated Power Center—Custom-Designed Solution

For more complex applications, the Integrated Power Center (IPC) allows for the integration of a variety of components, including electrical distribution equipment, HVAC controls, lighting controls, power quality and power conditioning products, SPDs, building management systems and power metering/monitoring solutions. As with all IPaCS integrated solutions, the IPC is designed to meet applicable codes and standards and is available as seismically qualified. Factory-assembled, pre-wired (based on shipping splits), and tested in a controlled environment, IPC sections are:

- 84 in. (2134 mm) high,
- 10.5 in. (267 mm) deep, and
- vary in width depending on customer specifications

### Standby Power Connection Solutions—UL Listed

The new family of Standby Power Connection Solutions are designed, tested, manufactured and listed to the UL standards providing you with a reliable solution to quickly and safely connect to a portable generator for standby power. The SPQ cam-lock (SPQCL) tap box design incorporates cam-lock receptacles for generator connection and the capabilities to be wired back to the standby power disconnect in the electrical distribution equipment. The SPQ lug-lug (SPQTB) tap box provides the capabilities to connect to a portable generator and the generator breaker cables using mechanical lugs in lieu of the cam-lock connectors.

The SPQ Cam-Lock Box is:

- The SPQ Lug-Lug Box is:
- 36 in. (915 mm) high
- 36 in. (915 mm) high 30 in. (762 mm) wide
- 30 in. (762 mm) wide 16 in. (407 mm) deep
- 13 in. (330 mm) deep

### **Submetering Integrated Power Center**

The Submetering Integrated Power Center (IPC) is an ideal solution for multi-tenant or departmental metering applications within office towers, condominiums, apartment buildings, shopping centers, and other multi-user environments. The Submetering IPC combines the panel with breakers, the PowerLogic E4800 multi-circuit energy meter and the associated CTs in a factory-assembled and pre-wired solution saving significant space and on-site installation time. Submetering IPC sections are:

- 10.5 in. (267 mm) deep, and
- vary in width and height depending on the application

### **Integrated Power Center 2**

The newest addition to the family of Integrated solutions, the Integrated Power Center 2 (IPC2™) provides maximum flexibility to meet customers' specifications. Features include those found in the IPC and are provided in a free-standing enclosure that can be front and rear aligned when transformers are included. The IPC2 family is available as seismically-qualified. Enclosure options include NEMA 1, NEMA 1 with driphood and NEMA 3R. IPC2 sections are:

- 91.5 in. (2324 mm) high, and
- vary in width and depth depending on customer specifications

NOTE: Additional depths are available. Contact the Schneider Electric Integrated Power and Control Solutions business (1-800-868-9662) for more information.)

### **Integrated Power Center 2 Transformer Combo**

Ideally suited for projects having both 480Y/277V and 208Y/120V requirements. Available as a stand-alone solution or can be incorporated into an MPS, IPC or IPC2 lineup. The standard 42" wide x 24" deep footprint will decrease space requirements by 40% or more. A typical IPC2 Transformer Combo includes two panels in the upper cells and a transformer in the bottom cell. Other upper cell options include contactors, include contactors, include contactors, and include contactors, include contac

- 91.5 in. (2324 mm) high, and
- vary in width and depth depending on the transformer kVA

Additional savings are realized on installation, material costs and material handling, as shown in the table below.

#### Table 10.1: IPC2 Transformer Combo—Estimated Savings A

	Stick-Built	Transformer Combo	Savings Realized
Estimated Installation Hours	26–32	3–6	23–26
Materials	Associated pipe, wire and fittings	_	Associated pipe, wire and fittings
No. of Pieces Handled	20–30	1	19–29

Based on an NF 480 V panel, 75 kVA transformer, NQ 240 V panel installation.

The IPC2 Transformer Combo has been recognized by the electrical industry by winning the following awards:

- 2006 INNOVATION Award given by the Electrical Contracting Products magazine
- 2006 Product of the Year Gold Medal Award given by the Consulting/Specifying Engineer magazine

## SQUARE D

by Schneider Electric www.schneider-electric.us

## Modular Panelboard System and Integrated Power Center

Class 2210, 2220 / Refer to Documents 2010CT0001 and 2735CT0001

### Modular Panelboard System

The pre-engineered Modular Panelboard System (MPS) bundles electrical distribution equipment into a single factory-assembled and wired integrated system. This approach replaces the traditional method of independently mounting each panelboard and lighting control system. MPS allows for the integration of a variety of components including:

- Panelboards: I-Line, NF, NQ, and Column-width Surge Suppression: SPD integral to panel and/or separately mounted
- Lighting Controls: Powerlink™ or lighting contactors
- Monitoring/Metering: Powerlogic™ power meters, circuit monitors, branch circuit monitoring, and system display meters

Equipment spaces including factory-installed lighting contactors are available in three configurations:

- 1. Unwired: Mounted in cell only
- Line side wired: Line side of each pole is wired to a branch circuit breaker
- Fully wired: Line side of each pole is wired to a branch circuit breaker, load side of each pole is wired to a terminal block

Built on a panelboard platform, Modular Panelboard System sections are NEMA 1-rated and meet the requirements of UL 67. Individual MPS configurations include panel sections in full-height, stacked or side-by-side arrangements. Individual sections measure:

- 86 in. (2184 mm) high
- 10-44 in. (254-1118 mm) wide
- 9.5 in. (241 mm) deep



- Restaurants / Food service
- Office buildings / Public buildings
- Warehouses
- Schools / Universities

### Integrated Power Center

The custom-designed Integrated Power Center (IPC) combines electrical distribution equipment and building management controls into a single factory-assembled and wired integrated system. IPC has much greater design flexibility for producing a fully customized solution integrating a variety of distribution and control components, including:

- Panelboards: I-Line, NF, NQ, and Column-width
- Surge Suppression: SPD integral to panel and/or separately mounted
- Lighting Controls: Powerlink™ or lighting contactors
- Monitoring/Metering: Powerlogic™ power meters, circuit monitors, branch circuit monitoring, and system display meters
- Power quality and power conditioning
- **Building automation**
- **HVAC** controls

Equipment spaces including factory-installed lighting contactors are available in three configurations:

- Unwired: Mounted in cell only
- Line side wired: Line side of each pole is wired to a branch circuit breaker
- Fully wired: Line side of each pole is wired to a branch circuit breaker, load side of each pole is wired to a terminal block

Integrated Power Centers are NEMA 1 rated and meet the requirements of UL 891. As with all integrated solutions, IPCs are shipped to the site fully assembled, completely pre-tested and ready-to-install. Individual IPC configurations include panel sections in full height, stacked, or side-by-side arrangements. IPC sections measure:

- 84 in. (2134 mm) High
- 10.25 (260 mm) Deep
- Widths vary, depending upon customer specifications

Typical applications for IPC equipment include:

- Retail stores / Grocery stores
- Office buildings / Public buildings
- Shopping malls / Strip malls
- Schools/Universities
- Restaurants / Food service
- Hotels/Motels
- Warehouses
- Equipment rooms

## MPS and IPC Layout, Lead Time, and Pricing

Contact your local Schneider Electric representative or distributor.

## MPS and IPC Shipping

MPS and IPC lineups are shipped factory-assembled and pre-wired. Customers may specify single- or multiple-section shipping splits (some limitations apply). In addition, lineups may be ordered with or without factory-installed power cables.



**Modular Panelboard System** 



**MPS Interior** 



**Integrated Power Center** 



**IPC Interior** 

SPQ Cam-Lock Tap Box



**SPQ Lug-Lug Tap Box** 



**Submetering Integrated Power Center** 



**Integrated Power Center 2** 

### **Standby Power Connection Solutions**

The Standby Power Quick-Connect (SPQ) Tap Box provides a reliable solution to quickly and safely connect to a portable standby power generator. Two versions of the SPQ Tap Box have been designed and tested to the required UL standard and offer a wider range of solutions for our customers. All SPQ Tap Boxes are NEMA 3R-rated.

### SPQ Cam-Lock Tap Box

- UL listed UL 1008 SB
- NEMA Type 3R enclosure (can be used for NEMA Type 1 installations)
- Lockable door for safety and control access
- Mechanical lugs to standby power disconnect
  Color-coded cam-lock connectors for generator connection
- Hinged bottom access door for cam-lock connection
- Barriers over mechanical lugs for safety
- Application:
  - 400 A and 600 A available
  - 240 V and 480 V versions available
  - Three-phase + neutral + ground

### SPQ Lug-Lug Tap Box

- UL listed—UL 1773 (cUL listed also)
- NEMA Type 3R enclosure
- (can be used for NEMA Type 1 installations) Lockable door for safety and control access
- Mechanical lugs to standby power disconnect
- Generator connection lugs rated for Type W cable
  - Application:
  - 400 A and 800 A available
  - 600 V maximum
  - Three-phase + neutral + ground

- **SPQCL204RS** 400 A, 208Y/120 V 3-phase, 4-wire + ground wire
- **SPQCL404RS** 400 A. 480Y/277 V 3-phase, 4-wire + ground wire
  - **SPQCL206RS** 600 A, 208Y/120 V 3-phase, 4-wire + ground wire
- **SPQCL406RS** 600 A. 480Y/277 V 3-phase, 4-wire + ground wire
- **SPQTB604RS** 400 A, 600 V max. 3-phase, 4-wire + ground wire
- **SPQTB608RS** 800 A, 600 V max. 3-phase, 4-wire + ground wire

## **Submetering Integrated Power Center**

The Submetering Integrated Power Center (IPC) is an ideal solution for multi-tenant or departmental metering applications. It combines the ability to meter multiple feeder breakers inside a pre-wired enclosure. The Submetering IPC offers significant space and labor savings by replacing individually enclosed, mounted, and wired panels and metering components and providing an integrated solution in one enclosure/lineup including:

- Panelboards PowerLogic<sup>™</sup> E4800 Multi-Circuit Energy Meters and associated CTs
- Surge Suppression
- Factory-installed wiring between components

Submetering IPC width and height dimensions vary depending on the application. All sections are 10.5 in. (266.7 mm) deep.

Typical applications for Submetering IPC equipment include:

- Office towers
- Condominiums
- Apartment buildings
- Shopping centers
- Other multi-user environments
- Configurations with 2-PowerLogic E4800 meters plus Ethernet switch when required based on the number of metered points

### **Integrated Power Center 2**

The Integrated Power Center 2 (IPC2™) provides maximum design flexibility. In addition to the features found in the Integrated Power Center (IPC), IPC2 lineups are free-standing enclosures that can be front and rear-aligned. IPC2 has the ability to incorporate:

- Panelboards: I-Line, NF, and NQ Transformers: 300 Kva (max), EE
  - K-rated and HMT also available; may limit max kVA size of transformer
- Individually mounted circuit breakers
- Surge Suppression: SPD integral to panel and/or separately mounted

- Automatic Transfer Switch: Open type 400 A 3-pole maximum including a variety of options Lighting Controls: Powerlink<sup>TM</sup> or lighting contactors

  PowerLogic<sup>TM</sup> Monitoring / Metering: power meters, circuit monitors, branch circuit monitoring, and system display meters
- **Building Management Systems**

As a stand-alone solution, the IPC2 family provides the flexibility to enter and/or exit the section from either the top or bottom. IPC2 is offered in a variety of widths and depths:

- 24-48 in. (610-1219 mm) Wide 24-36 in. (610-915 mm) Deep

Typical applications for IPC2 equipment include:

- Schools/Universities
- Office buildings
- Data centers
- Industrial facilities
- Hotels
- Any project with panels and transformers

### ICP2 Layout, Lead Time, and Pricing

Contact your local Schneider Electric representative or distributor.

## **IPC2 Shipping**

IPC2 lineups are shipped fully assembled and ready-to-install. Customers may specify single- or multiple-section shipping splits (some limitations apply). In addition, lineups may be ordered with or without factory-installed power cables.

Class 2230 / Refer to Documents 2230HO0601 and 2230DB0601

by Schneider Electric www.schneider-electric.us

### **Integrated Power Center 2 Transformer Combo**

For projects having both 480Y/277 V and 208Y/120 V requirements, the Integrated Power Center 2 (IPC2) Transformer Combo is the perfect solution. One of the most popular members of the IPC2 product family, the IPC2 Transformer Combo has been recognized by the industry multiple times for its innovative design.

As a stand-alone solution, the IPC2 Transformer Combo is appropriate when panelboards and transformers are installed in close proximity to each other. It provides the flexibility to enter and/or exit the section from either the top or the bottom. Catalog numbers have been created for some of the more typical configurations (see Table 10.2).

All IPC2 sections can be close-coupled to QED switchboard, MPS, and IPC products. Enclosure options for IPC2 include NEMA 1, NEMA 1 with driphood, and NEMA 3R-rated, and all meet the requirements of UL 891. These sections are also seismically qualified to meet IBC and ASCE7 requirements.



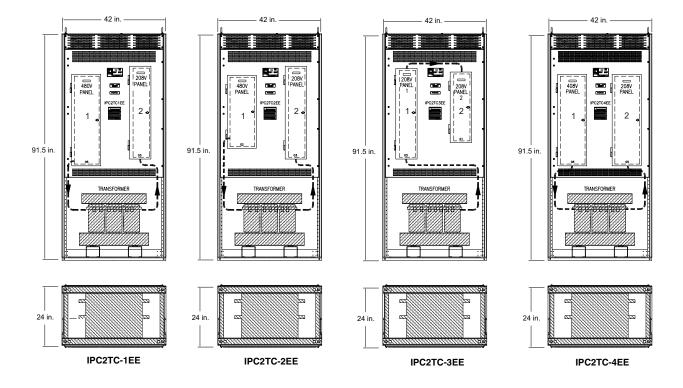
**IPC2 Transformer** Combo

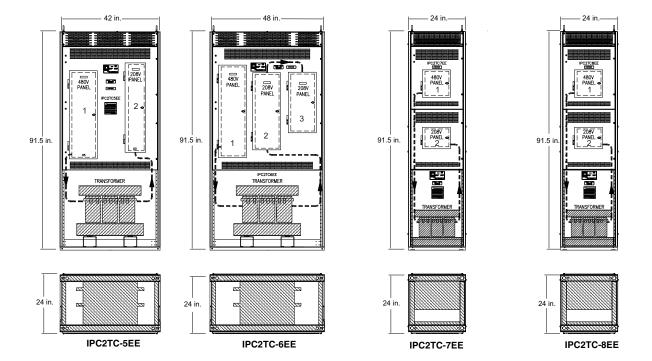
**IPaCS Equipment** 

Catalog No. IPC2TC-1EE			
NF Panelboard		NQ Panelboard	Transformer
480Y/277 V 3Ø 4W 225/3 MB 18 k AIC 1–125/3 (Transformer) 39-1PSO Copper Bus / Ground Bus SUSE		208Y/120 V 3Ø 4W     225/3 MB 10 k AIC     42-1PSO     Copper Bus / Ground Bus	<ul> <li>480 V-208Y/120 V 3Ø</li> <li>75 kVA</li> <li>Energy Efficient transformers in compliance with the 2005 Energy Act</li> <li>150 °C Temp Rise</li> <li>Aluminum Windings</li> <li>6-2.5% Taps; 2+ 4-</li> </ul>
Catalog No. IPC2TC-2EE			
NF Panelboard		NQ Panelboard	Transformer
480Y/277 V 3Ø 4W 400 A MLO 18 k AIC 1–125/3 (Transformer) 39-1PSO Copper Bus / Ground Bus SUSE		<ul> <li>208Y/120 V 3Ø 4W</li> <li>225/3 MB 10 k AIC</li> <li>42-1PSO</li> <li>Copper Bus / Ground Bus</li> </ul>	<ul> <li>480 V-208Y/120 V 3Ø</li> <li>75 kVA</li> <li>Energy Efficient transformers in compliance with the 2005 Energy Act</li> <li>150 °C Temp Rise</li> <li>Aluminum Windings</li> <li>6-2.5% Taps; 2+ 4-</li> </ul>
Catalog No. IPC2TC-3EE			
NQ Panelboard  208Y/120 V 3Ø 4W  225/3 MB 10 k AlC  42-1PSO Copper Bus / Ground Bus FT Lugs		208Y/120 V 3Ø 4W     225 A MLO 10 k AIC     42-1PSO     Copper Bus / Ground Bus	Transformer  • 480 V–208Y/120 V 3Ø  • 75 kVA  • Energy Efficient transformers in compliance with the 2005 Energy Act  • 150 °C Temp Rise  • Aluminum Windings  • 6-2.5% Taps; 2+ 4-
Catalog No. IPC2TC-4EE			
NF Panelboard		NQ Panelboard	Transformer
480Y/277 V 3Ø 4W 400 A MLO 18 k AIC 1–175/3 (Transformer) 30-1PSO Copper Bus / Ground Bus SUSE		<ul> <li>208Y/120 V 3Ø 4W</li> <li>400/3 MB 10 k AIC</li> <li>42-1PSO</li> <li>Copper Bus / Ground Bus</li> </ul>	<ul> <li>480 V-208Y/120 V 3Ø</li> <li>112½ kVA</li> <li>Energy Efficient transformers in compliance with the 2005 Energy Act</li> <li>150 °C Temp Rise</li> <li>Aluminum Windings</li> <li>6-2.5% Taps: 2+ 4-</li> </ul>
Catalog No. IPC2TC-5EE			
NF Panelboard		NQ Panelboard	Transformer
480Y/277V 3Ø 4W 400/3 MB 18k AIC 1-125/3 (Transformer) 27-1PSO Copper Bus/Ground Bus SUSE		<ul> <li>208Y/120V 3Ø 4W</li> <li>225/3 MB 10k AlC</li> <li>42-1PSO</li> <li>Copper Bus/Ground Bus</li> </ul>	<ul> <li>480V-208Y/120V 3Ø</li> <li>75kVA</li> <li>Energy Efficient transformers in compliance with the 2005 Energy Act</li> <li>150 °C Temp Rise</li> <li>Aluminum Windings</li> <li>6-2.5% Taps; 2+ 4-</li> </ul>
Catalog No. IPC2TC-6EE			
NF Panelboard	NQ Panelboard	NQ Panelboard	Transformer
480Y/277 V 3Ø 4W 225/3 MB 18 k AIC 1–125/3 (Transformer) 39-1PSO Copper Bus / Ground Bus SUSE	<ul> <li>208Y/120 V 3Ø 4W</li> <li>225/3 MB 10 k AlC</li> <li>42-1PSO</li> <li>Copper Bus / Ground Bus</li> <li>FT Lugs</li> </ul>	<ul> <li>208Y/120 V 3Ø 4W</li> <li>225 A MLO 10k AIC</li> <li>42-1PSO</li> <li>Copper Bus / Ground Bus</li> </ul>	<ul> <li>480 V-208Y/120 V 3Ø</li> <li>75 kVA</li> <li>Energy Efficient transformers in compliance with the 2005 Energy Act</li> <li>150 °C Temp Rise</li> <li>Aluminum Windings</li> <li>6-2.5% Taps; 2+ 4-</li> </ul>
Catalog No. IPC2TC-7EE		NO Panalhaard	Transformer
NF Panelboard  480Y/277 V 3Ø 4W  125 A MLO 18 k AIC 1–60/3 (Transformer) 15-1PSO Copper Bus / Ground Bus SUSE		NQ Panelboard  208Y/120 V 3Ø 4W  125/3 MB 10 k AIC  12-1PSO  Copper Bus / Ground Bus	Transformer  480 V-208Y/120 V 3Ø  45 kVA  Energy Efficient transformers in compliance with the 2005 Energy Act  150 °C Temp Rise  Aluminum Windings  6-2.5% Taps; 2+ 4-
Catalog No. IPC2TC-8EE		NO Develbeer	Transfermen
NF Panelboard  480Y/277 V 3Ø 4W 125 A MLO 18 k AIC 1–40/3 (Transformer) 15-1PSO Copper Bus / Ground Bus SUSE		208Y/120 V 3Ø 4W     100/3 MB 10 k AIC     15-1PSO     Copper Bus / Ground Bus	Transformer  480 V-208Y/120 V 3Ø  30 kVA  Energy Efficient transformers in compliance with the 2005 Energy Act  150 °C Temp Rise  Aluminum Windings  6-2-5% Taps; 2+ 4-

## Integrated Power Center 2 Transformer Combo Standard Merchandise Configurations

The IPC2™ Transformer Combo is available in eight standard merchandise configurations, as shown below (additional configurations are available; contact your local Schneider Electric representative or distributor).





NOTE: All sections have both top and bottom conduit entry/exit points.

## **Back to Product Index Section Listing**

## Section 11

## **Switchboards and Switchgear**



QED-2 Switchboard see page 11-2



Metalclad and HVL/cc Switchgear see pages11-8 and 11-16



Unit Substation see page 11-17



Model III Package Unit Substation see page 11-17



# SQUARE D

P	ower-Style™ Switchboards	
	QED-2 Switchboard (UL Listed)	11-2
	QED-6 Switchboard (UL Listed)	11-3
	Commercial Multi-Metering Switchboards	11-3
S	peed-D™ Switchboards	
	Speed-D SB/SF Switchboards (UL Listed)	11-4, 11-5
Lo	ow Voltage Switchgear	
	Power-Zone™ 4 Low Voltage Switchgear with Masterpact™ Circuit Breakers	11-6
	Micrologic™ Trip Units	11-6
M	edium Voltage Switchgear	
	MiniBreak™ Compact Height Switches— 5.5 kV—200 A	11-7
	HVL/cc Metal-Enclosed Load Interrupter Switchgear—Full Range	11-8
	HVL/cc Switchgear—Quick Ship Program—5–15 kV, 600 A	11-9, 11-10
	HVL Metal-Enclosed Load Interrupter Switchgear—Full Range	11-11
	HVL Switchgear—Quick Ship Program— 5 kV-15 kV, 600 A Features	11-11
	HVL Switches for Power-Dry II ™, Power-Cast II ™, and Uni-Cast II ™ Transformer Connections	11-12, 11-13
	Square D <sup>™</sup> brand DIN/E Fuse Selection Tables—HVL	11-14
	Fuse Selection Tables Boric Acid Fuses—HVL	11-14
w!)	DVCAS Switchgear for Wind Farm Applications	11-15
	Masterclad™ Medium Voltage Metalclad™ Switchgear (UL Listed)	11-16
	Arc Terminator™ Arc Extinguishing System	11-16
Uı	nit Substations	
	Unit Substations	11-17
w!)	Power-Zone™ Model III Package Unit Substations	11-17
M	V Controllers and Substation Circuit Breakers	
	Motorpact™ Medium Voltage Motor Controllers (UL Listed)	11-19
w!)	Vacuum Substation Circuit Breaker—Types FVR, EOX, and VOX (Not UL Listed)	11-19
M	V Overhead Distribution	
$\overline{}$	Automotic Circuit Dealesson	44.00

New! Automatic Circuit Recloser	11-20
New!) Load Break Switch/Sectionalizer	11-20
New! ADVC Controller Range	11-20

## Transparent Ready™ Equipment

Switchboards and switchgear with Powerlogic<sup>™</sup> circuit monitors and Web-enabled ethernet communication devices are part of the Transparent Ready power equipment family from Schneider Electric.

When specified as Transparent Ready, the power equipment is provided with a factory- configured "plug and play" communications system that allows the authorized user access to equipment status and monitoring information using only a standard Web browser. Ask your local Schneider Electric representative for details about Transparent Ready power distribution equipment.





QED-2 Switchboard

## Power-Style QED-2 Switchboards (UL Listed)

For solutions that bring people, products, and information together, Square D™ brand Power-Style QED-2 low voltage switchboards from Schneider Electric are built to last and feature design innovations that make these products easier to install and maintain. Supported by one of the largest distributor, sales, and service organizations in the industry, QED-2 switchboards are readily available to meet the needs of contractors, consultants, and end-users.

### Q = Quality—Built to Last

As one of the most trusted names in electrical distribution, Square D™ brand QED-2 switchboards are designed with the highest standards of quality. From sturdy frames, securely fastened thread-forming screws, and standard bolted, base channels, users will see the difference during installation, operation, maintenance, and expansion projects.

### E = Efficient and Innovative Designs

In 2010, Schneider Electric launched QED-2, Series 2 switchboard designs. Series 2 designs represent the next generation of our QED-2 switchboard offering, with new features based on extensive customer feedback. From improved branch neutral and ground bar access, to enhanced instrument compartments, Series 2 designs provide easier access for performing equipment installation and maintenance procedures.

QED-2 switchboards feature Schneider Electric's unique I-Line™ plug-on connections in group-mounted construction. With the I-Line design, a screwdriver is the only tool required to firmly ratchet the line end of a molded-case circuit breaker directly onto the I-Line bus assembly. This plug-on design allows quick installation and mounting flexibility of circuit breakers up to 1200 A.

### D = Delivery—Ready When You Are

To meet tight project schedules and budgets, our Square D™ brand QED-2 switchboard offering brings together standard designs for the most frequently requested ratings and options, providing immediate pricing for quick shipments from 11 to 30 business days.

### **Features**

- QED-2 Switchboards are designed, listed, and built to UL 891
- Switchboard ratings through 6000 A, 200 kA; higher amperages available
- Front accessible load connections
- Front and rear alignment standard
- Cable, busway, transformer, or remote QED switchboard incoming fed
- Hot or cold sequence utility metering
- Thermal-magnetic, PowerPact™ electronic, or Masterpact™ NW stored energy fixed or drawout circuit breakers used as mains and feeders
- Group-mounted circuit breaker and fusible switch mains and feeders
- Fixed-mounted fusible swThe itch mains and feeders
- Powerlogic customer metering, including option for custom communications capability and interwiring
- Networked communications capabilities provide direct access to energy management at main and feeder level
- Internally-mounted Surgelogic™ surge protective devices
- Quick Connect Generator option available
- Main devices in six sub-division or single main configurations
- Main and branch devices in single section configuration
- Multiple individual devices in single section configurations
- Custom engineering, including main-tie-mains, multiple sets of thru-bus, reduced heights, and engineered houses





QED-6 Switchboard (Class 2746)

## Power-Style QED-6 Switchboards (UL Listed)

# Masterpact™ NW and NT, and PowerPact™ H, J, and D Circuit Breakers

The QED-6 switchboard is designed to provide excellent distribution, protection, and power quality management in commercial electrical equipment. The circuit protection components of the switchboard are the Masterpact NW circuit breakers in 800–6000 A frame sizes, Masterpact NT circuit breakers in 800–1200 A frame sizes, and PowerPact H, J, and D circuit breakers in 15–600 A frame sizes. These circuit breakers deliver maximum system uptime, system selectivity, ease of maintenance, and reliable circuit protection.

QED-6 switchboard features include: Masterpact NW UL 489 Listed circuit breakers for main and feeder devices, Masterpact NT UL 489 Listed circuit breakers for feeder devices, PowerPact H, J, and D UL 489 Listed circuit breakers for feeder devices, and a wide range of designs and options. Highly flexible drawout/plug-in circuit breakers can meet a wide variety of power distribution requirements. Choices include plug-in or drawout construction in PowerPact H, J, and D circuit breakers, and optional prepared drawout or plug-in spaces that are equipped with all specified control functions. This capability allows quick additions for load upgrades.

- QED-6 switchboards are designed, listed, and built to UL 891; Masterpact and PowerPact circuit breakers are designed, listed, and built to UL 489
- Circuit breakers are individually mounted, rear connected; Masterpact NW and NT circuit breakers are drawout; PowerPact H, J, and D breakers are plug-in as standard, drawout as an option
- Family of field installable and upgradeable
   Micrologic<sup>™</sup> trip units with optional Powerlogic<sup>™</sup> data
   communications features
- Switchboard ratings up to 150 kA short-circuit current rating for services 1600–6000 A at 480 V and 100 kA at 600 V
- Up to (12) 250 A PowerPact H and J circuit breakers in a single 30-inch wide section
- Up to (8) 600 A frame PowerPact D or (8) 1200 A frame Masterpact NT circuit breakers in a single 30-inch wide section
- Flexible branch circuit breaker locations: Masterpact NW and NT and PowerPact H, J, and D circuit breakers can be mixed in a single 30-inch wide section (15–2000 A)
- Compartmentalization: separate compartments for circuit breakers, bussing, and load cabling
- Available in 54-, 60-, 72-, and 80-inch deep construction
- Available in NEMA 3R outdoor walk-in enclosures
- Masterpact and PowerPact circuit breakers are field maintainable

QED-6 switchboards are reliable power protection equipment when working with telecommunication facilities, e-business servers, or mainframes that perform critical business transactions. These types of facilities cannot afford downtime.

QED-6 rear-connected switchboards are designed as standalone switchboards or as an integral part of the low voltage equipment lineup in a user's power unit substation.

## Selection afford QED-(Frame) Circuit Breakers standard

**Breaker** 

(Frame)	Circuit Breakers
150-250	PowerPact H, J
400-600	PowerPact D
800-1200	Masterpact NT
800-6000	Masterpact NW

Table 11.1: Circuit

## **Specify QED-6 Switchboards**

When drawout construction is required for quick circuit breaker changeout; system requirements call for circuit breakers to close within five cycles; stored energy circuit breakers are required; front access to control wires is desired; ease of installation, maintenance, and upgrade of circuit breaker compartmentalization is required; system integrity and segregation of circuit breaker compartments from bus and cable compartments is required; equipment isolation is required.

### **Benefits/Values of Circuit Breaker Performance**

Masterpact NW and NT circuit breakers are designed to provide maximum protection and reliable operation with a long service life. They exceed all UL 489 endurance testing requirements and are certified to a minimum of 10,000 operations through the 3000 A frame.

### **System Coordination**

Short-time ratings are high, giving users excellent system coordination and selectivity with downstream breakers.

### **High Short-Circuit Current Ratings (SCCR)**

Up to 200 k AIR at 240 V, 150 k AIR at 480 V, and 100 k AIR at 600 V, which allows customers to design systems with high fault current and paralleling schemes.

### Arc Flash Limiting (LF) Feeder Breakers

High speed operation of Masterpact NW and NT circuit breakers (150 k AIR at 480 V) helps reduce arc flash incident energy (cal/cm2) on downstream equipment.

### **Ease of Installation and Maintenance**

Thru-the-door construction, an easy to operate drawout mechanism, and front access to all control wiring make this equipment easy to install, maintain, and upgrade. Load connections in the cable compartment are easily accessible in the rear of the switchboard. Remote racking of the Masterpact NW circuit breaker is also available with the optional remote racking tool, which, if required, is field installable.

### **Ability to Upgrade**

UL Listed, field-installable accessories include: motor operators, shunt trips, under voltage devices, trip units, and communication modules for trip units. Manually operated circuit breakers are field convertible to electrical operation.

### **Open Communication System**

The Micrologic trip units in Masterpact NW and NT circuit breakers use the Modbus™ protocol. This is a widely accepted protocol, which allows QED-6 to be integrated into new or many existing communication systems.

### Adaptable

Drawout and bolt-in circuit breakers, front access control wiring, and expandable lineups are quickly adaptable to changing load and control requirements.

### Expandable

Masterpact NW and NT circuit breakers have many control termination points, giving the equipment extensive flexibility and expandability for sophisticated control schemes.

# Power-Style Commercial Multi-Metering Switchboards (UL Listed)

- Designed, built, and listed to UL 891
- Lever bypass and EUSERC non-lever bypass
- Hot or cold sequence metering—EUSERC, NEMA, LOCAL
- Front and rear alignment standard
- Switchboard ratings through 4000 A, 100 kA
- Meter sections in either three- or six-socket section configuration
- Tenant mains either circuit breaker or fusible
- 60–200 A without lever bypass with self-contained meter sockets, 5- or 7-jaw, ring type and test block where required
- 60–200 A lever bypass with self-contained meter sockets, 7-jaw, ringless
- Factory-installed devices with completely wired from meter socket to disconnect
- Provisions for adding future tenants available, as well as future sections
- Sections in either NEMA 1 or NEMA 3R construction
- For use on 120/240 V, 120/208 V, and 277/480 V
- Integrated, front-accessible wireway for top exiting load cables
- Customer access area for top exiting load cables

Lever Bypass EUSERC



Classes 2755, 2756

© 2011 Schneider Electric All Rights Reserved

Class 2710 / Refer to Catalog 2700CT1101

by Schneider Electric

TI SQUARE D

### Speed-D SB/SF Switchboards (UL Listed)

- ULListed
- · Hot sequence utility compartment per EUSERC requirements
- Two types:
  - Utility–Service disconnect–distribution
  - Utility-Up to six service disconnects
- Single service disconnect, either circuit breaker or fusible rated 400, 600, or 800 A with either type of distribution interiors, NQ up to 240 Vac, I-Line™ through 480 Vac
- Six service disconnects, group-mounted fusible, QMB/QMJ, 30–400 A; utility compartment—400, 600, and 800 A
- Meter doors can be 15 inches high with one meter socket and test block, or 30 inches high with two meter sockets and test block
- Meter sockets can be 6-, 8-, 13-, or 15-jaw meter sockets with test block, based on application
- Accessories include:
  - Underground pull sections with and without lug landing
  - Loadside wireway
  - Bus links for donut-type current transformers
  - Double padlock hasp attachments
  - Plug-on distribution panel
  - Subfeed circuit breakers
- Full height add-on I-Line distribution section
- Stand-alone I-Line distribution section



EUSERC UCT, Single Main Circuit Breaker with I-Line Distribution Panel



EUSERC UCT, Fusible Multiple Mains

### **Application**

Suitable for use as service entrance equipment on ac systems. Sections contain metering compartment, barriers, main disconnects, distribution panel, neutral bus, and grounding provisions.

### Metering

C/T compartment with two 15-inch blank meter doors. (Order doors with meter socket from Table 11.6 on page 11-5.) Incoming cable lugs are for top feed with one twin conductor 2 AWG–600 kcmil lug per phase and neutral, suitable for aluminum or copper cables. Optional single conductor lug is available. Refer to Table 11.7 on page 11-5.

### Mains

Main circuit breaker types are either LH or MJ. Main fusible device is supplied with Class T fuses. Multiple main devices use plug-on fusible switches.

### Branches

NQ distribution bus is rated 400 A and provides mounting space for QO<sup>TM</sup>/QOB Type (150 A maximum) circuit breakers. Panel provides space for mounting 42 single pole circuit breakers. One or two individually mounted 225 A maximum circuit breakers can be added with bus connectors. (Order subfeed circuit breakers from Table 11.8 on page 11-5.)

I-Line<sup>™</sup> distribution bus is rated 400, 600, or 800 A and will accept 27 inches of I-Line circuit breakers on the left side with a maximum frame size of "J". The right side will accept either a QO plug-on distribution panel (240 V only) or LA or LH I-Line circuit breaker.

### **Enclosure**

Totally enclosed front accessible with ANSI 49 gray baked enamel finish. Dimensions are 90 in. (H) x 36 in. (W) x 14 in. (D) for indoor and 90 in. (H) x 36 in. (W) x 24.5 in. (D) for outdoor enclosures.

### EUSERC Utility Metering, Main Disconnects and Distribution Panel (UL Listed)

Table 11.2: Single Main Circuit Breaker with Distribution (Series E4)

_	Service Voltage	Mains Ratings (A)	<b>Distribution</b> Interior	SCCR 240 V Max.	SCCR 480 V	Circuit Breaker			
System						Indoor		Outdoor	
						Catalog No.	\$ Price	Catalog No.	\$ Price
1Ø3W	120/240	400	NQ I-Line None	65 65 65		SB124QS SB124IS SB124WS	7895.00 8700.00 6680.00	SB124QR SB124IR SB124WR	10645.00 11450.00 9430.00
		600	I-Line None	65 65		SB126IS SB126WS	10975.00 8016.00	SB126IR SB126WR	13726.00 10766.00
3Ø4W▲	208Y/120 240/120	400	NQ	65	_	SB324QS	8651.00	SB324QR	11401.00
3Ø4W▲	208Y/120 240/120	400	None	65	_	SB324WS	7281.00	SB324WR	10031.00
3Ø4W▲	208Y/120 240/120 480Y/277	400	I-Line	65	35	SB344IS	9673.00	SB344IR	12423.00
3Ø4W▲	208Y/120 240/120 480Y/277	400	None	65	35	SB344WS	7653.00	SB344WR	10403.00
3Ø4W▲	208Y/120 240/120 480Y/277	600	I-Line	65	50	SB346IS	12820.00	SB346IR	15570.00
3Ø4W▲	208Y/120 240/120 480Y/277	600	None	65	65	SB346WS	9860.00	SB346WR	13229.00
3Ø4W▲	208Y/120 240/120 480Y/277	800	I-Line	65	50	SB348IS	19569.00	SB348IR	22038.00
3Ø4W▲	208Y/120 240/120 480Y/277	800	None	65	65	SB348WS	18669.00	SB348WR	21137.00

<sup>▲</sup> Can be used on 3Ø3W Delta voltage systems (for example, 240 V Delta or 480 V Delta).

Table 11.3: Single Main Fusible Disconnect with Distribution (Series E4)

_		Mains Ratings (A)	<u>.</u> و	SCCR 240 V		Fusible Disconnect			
System	Service Voltage		Distribution Interior		SCCR 480 V	Indoor		Outdoor	
						Catalog No.	\$ Price	Catalog No.	\$ Price
1Ø3W	120/240	400	NQ I-Line None	65 100 200		SF124QS SF124IS SF124WS	8150.00 8995.00 6935.00	SF124QR SF124IR SF124WR	10900.00 11705.00 9685.00
		600	I-Line None	100 200		SF126IS SF126WS	11906.00 8946.00	SF126IR SF126WR	14656.00 11696.00
3Ø4W■	208Y/120 240/120	400	NQ	65	_	SF324QS	8929.00	SF324QR	11679.00
3Ø4W■	208Y/120 240/120	400	None	200	_	SF324WS	7559.00	SF324WR	10309.00
3Ø4W■	208Y/120 240/120 480Y/277	400	I-Line	100	65	SF344IS	9682.00	SF344IR	12432.00
3Ø4W■	208Y/120 240/120 480Y/277	400	None	200	200	SF344WS	7662.00	SF344WR	10412.00
3Ø4W■	208Y/120 240/120 480Y/277	600	I-Line	100	65	SF346IS	14453.00	SF346IR	17203.00
3Ø4W■	208Y/120 240/120 480Y/277	600	None	200	200	SF346WS	11493.00	SF346WR	14243.00
3Ø4W■	208Y/120 240/120 480Y/277	800	I-Line	100	65	SF348IS	25401.00	SF348IR	28782.00
3Ø4W■	208Y/120 240/120 480Y/277	800	None	200	200	SF348WS	24501.00		27881.00

<sup>■</sup> Can be used on 3Ø3W Delta voltage systems (for example, 240 V Delta or 480 V Delta).

Table 11.4: Multiple Mains—Fusible (Series E4) ◆

		Mains Rating (A)	240 V or 480 V Max. ★	Multiple Mains (6) Fusible				
System	Service Voltage			Indo	or	Outdoor		
				Catalog No.	\$ Price	Catalog No.	\$ Price	
1Ø3W	120/240	400	200	SF124FS	5565.00	SF124FR	8478.00	
1Ø3W	120/240	600	200	SF126FS	6678.00	SF126FR	8966.00	
3Ø4W <b>▼</b>	208Y/120 240/120 408Y/277	400	200	SF344FS	7025.00	SF344FR	10050.00	
3Ø4W <b>▼</b>	208Y/120 240/120 480Y/277	600	200	SF346FS	7319.00	SF346FR	10233.00	
3Ø4W <b>▼</b>	208Y/120 240/120 480Y/277	800	200	SF348FS	8283.00	SF348FR	11199.00	

- Multiple mains—provisions for mounting 30 inches of fusible devices. No more than six main devices permitted per NEC.
- ★ QMB/QMJ fusible switches, maximum 400 A, SCCR based on Class J, R, or T fuses. QMB plug-in circuit breaker rating is equal to the lowest rating of the circuit breaker.
- ▼ Can be used on 3Ø3W Delta voltage systems (for example, 240 V Delta or 480 V Delta).



I-Line™ Distribution Section (Series E4) Table 11.5:

	Service	Mains	Distribution	SCCR	SCCR		Indoor Outdoor		or	
System	Voltage		Catalog No.	\$ Price	Catalog No.	\$ Price				
3Ø4W	208Y/120 240/120 480Y/277	800	I-Line	65 k	65 k	Add-on distribution section, must be connected to an SB UCT and main section without distribution panel, such as SB348WS. An I-Line plug-on subfeed lug kit must be ordered to terminate the distribution section.	SBAD800	10260.00	SBAD800R	13305.00
3Ø4W	208Y/120 240/120 480Y/277	800	I-Line	125 k	100 k	Stand-alone distribution section not connected to an SB section. A back-fed main circuit breaker or I-Line plug-on subfeed lug kit must be ordered to terminate the distribution section. (Non-ULSE)	SBSAD800	10620.00	SBSAD800R	13770.00

#### Table 11.6: **Meter Door Selection**

Meter Socket	15-inch High Door With One Meter Socket and Test Block		30-inch High Door With Two Meter Sockets and Test Blocks	
Jaws	Catalog No.	\$ Price	Catalog No.	\$ Price
6▲	SBA15D6MS	923.00	_	_
8	SBA15D8MS	984.00	=	<del>-</del>
13	SBA15D13MS	1230.00	SBA30D13MS	2093.00
15	SBA15D15MS	1358.00	SBA30D15MS	2217.00
Blank	SBA15DBC	495.00	<u> </u>	_
•	SBA15DMS	617.00	=	_

- 6-jaw meter socket can also be used on 4- and 5-jaw applications.
- Door with provisions for mounting meter socket.

To order structure with meter door factory-installed, add door catalog number as suffix to structure (e.g. SF344IS-15D13MS) Note:

Description				Catalog No.	\$ Price
Indoor underground pull section (w/o lug landing)—26-in. (W) Order separate SA8LL lug kit below if required.				SA26PS	2217.00
Outdoor (3R) underground pull section (w/o lug landing)—26 in. (W) x 24.5 in. (D) Order separate SA8LL lug landing kit below when required.				SA26PSR	4559.00
Lug landing kit—800 A max. For terminating utility service cables in indoor or outdoor underground pull sections.				SA8LL◆	753.00
Single barrel lug kit —Kit provides single barrel lugs and pad in lieu of twin barrel lug provided with service section.  Mechanical lugs provided are sized to fit 1-3/0–750 kcmil cable. Two lugs per phase are supplied.				SA7PL	395.00
Loadside wireway—11.5 in. (W) x 14 in. (D)—indoor only				SA10LW	1052.00
Bus link kit—800 A max.—Order one kit per phase for 400, 600, and 800 A.				SA10BL	246.00
Double padlock hasp attachment—For mounting two padlocks on door handle of rainproof enclosure. Padlocks not included.				SS2PL	113.00
Plug-On Distribution Panel—mounts on right side of I-Line interior. Cannot be used with LA/LH branch circuit breaker.	System	Phase	Pole Spaces		
Panel rated 225 A for 240 V applications. For QO™ type plug-on circuit breakers only.	1Ø 3Ø 3Ø	AC ABC AB	12	SS212AC SS312 SS212AB★	2339.00 2957.00 2339.00

- All EUSERC Utilities (except Arizona Public Service and Salt River Project) require a lug landing kit SA8LL. To be used on 120/240 V, 3Ø4W delta applications.

#### Table 11.8: Subfeed Circuit Breakers (Series E4) ▼

		2-Pc	ole∆		3-P	ole	
Description	Rating (A)	Catalog No.		\$ Price	Catalog No.		\$ Price
		Left	Right		Left	Right	
	100	SASFBH100L()	SASFBH100R()	1480.00	SASFBH100L	SASFBH100R	1850.00
Subfeed Circuit Breaker Kit—	110	SASFBH110L()	SASFBH110R()	1480.00	SASFBH110L	SASFBH110R	1850.00
Price includes circuit breaker, connectors and mounting	125	SASFBH125L( )	SASFBH125R()	1480.00	SASFBH125L	SASFBH125R	1850.00
hardware. The complete kit, mounting hardware, circuit	150	SASFBH150L()	SASFBH150R()	1480.00	SASFBH150L	SASFBH150R	1850.00
breaker and connectors will be shipped direct from plant.  Delivery is stock to three days.	175	SASFBJ175L()	SASFBJ175R()	1644.00	SASFBJ175L	SASFBJ175R	2055.00
Delivery is stock to trifee days.	200	SASFBJ200L( )	SASFBJ200R()	1644.00	SASFBJ200L	SASFBJ200R	2055.00
	225	SASFBJ225L( )	SASFBJ225R()	1644.00	SASFBJ225L	SASFBJ225R	2055.00

- Cannot use subfeed circuit breaker kit with multiple mains service section switchboards.
- Two pole circuit breaker catalog numbers are completed by adding required phase connection letters as suffix (for example, SASFBH100LAC).

#### **Ordering Information**

- Service section: Order service section from either Table 11.2 on page 11-4 (single main circuit breaker with distribution), Table 11.3 on page 11-4 (single main fusible with distribution), or Table 11.4 on page 11-4 (multiple mains fusible), as determined by mains rating, voltage, and system.
- Meter doors: Order meter door from Table 11.6 (meter door selection) as determined by the height and utility metering requirements.
- Accessories and subfeeds: Order as required from Table 11.7 (accessories) and/or Table 11.8 (subfeed circuit breakers).
- Circuit breakers and switches: Order devices from pages listed below as determined by voltage, trip rating, AIR, and mounting space.

Multiple Mains and Branch Devices

- QO, QOB, QO-VH, QOB-VH: pages 7-10 and 9-10
- I-Line: pages 9-24 to 9-30
- QMB Switches: page 9-35

Power-Zone 4 Low Voltage Switchgear (Class 6037)

#### Power-Zone™ 4 Low Voltage Switchgear with Masterpact™ Circuit Breakers

Square D™ brand Power-Zone™ 4 low voltage metal-enclosed, drawout switchgear is designed to provide superior electrical distribution, protection, and power quality management. The prime components of the switchgear are the Masterpact™ NW and NT ANSI rated circuit breaker. Power-Zone 4 switchgear is designed to maximize the functionality of the Masterpact circuit breakers, which, in turn, deliver maximum uptime, system selectivity, ease of maintenance, and reliable circuit protection. All of these features are packed into the smallest footprint available for low voltage drawout switchgear.

- Power-Zone 4 is designed and built to ANSI® C37.20.1 and is Listed to UL 1558
- Masterpact NW and NT drawout low voltage power circuit breakers are designed and built to ANSI C37.13 and C37.16. Listed to UL 1066
- Short-circuit current rating up to 200 kA at 240 V and 480 V without fuses
- High short-time withstand ratings up to 100 kA for 1 second, minimum
- Arc flash limiting (L1F) Masterpact NW feeder breakers available in 800, 1600, and 2000 A ratings
- Family of field installable and upgradeable Micrologic™ trip units with optional Powerlogic™ data communications features
- Power-Zone 4 switchgear can offer optional data communications capability
- Smallest equipment footprint available in this product
- Front access to all control and communications wire connections
- Bolted copper bus provided as standard (up to 6000 A maximum)
- Large rear cable compartment pull area allowing maximum room for power cables
- Horizontal bus provision for future equipment expansion
- System designed for maximum uptime with low maintenance
- Modular circuit breaker designed for easy addition of control accessories
- Available in NEMA 3R outdoor walk-in enclosures

Masterpact NW circuit breakers are available in various levels of interrupting ratings from 42-200 kA at 480 V and 130 kA at 600 V

The Masterpact NT circuit breaker is available in an 800 A frame size and 42 kA at 480 V interrupting rating. Up to 8 Masterpact NT circuit breakers can be mounted in a 30-inch wide section. (Not available for

Circuit breakers of like frame sizes and interrupting ratings are interchangeable.

Table 11.9: **Masterpact Circuit Breaker Selection** 

Rating (A)	Catalog No.	Rating (A)	Catalog No.
Masterpact NW			
800	NW08N1 NW08H1 NW08H2 NW08H3 NW08L1 NW08L1F	4000	NW40H2 NW40H3 NW40L1
1600	NW16N1 NW16H1 NW16H2 NW16H3 NW16L1 NW16L1F	5000	NW50H2 NW50H3 NW50L1
2000	NW20H1 NW20H2 NW20H3 NW20L1 NW20L1F	6000	NW60H2 NW60H3 NW60L1
3200	NW32H1 NW32H2 NW32H3 NW32L1		
Masterpact NT			
800	NT08N1		

#### Micrologic™ Trip Units

A modern family of field-installable trip units is available with Masterpact NW and NT circuit breakers. The circuit breaker overcurrent protection consists of a microprocessor-based tripping device that requires no external power source. The complete tripping system has three main components: the air-core sensors, the trip device (with rating plug), and the trip actuator. The microprocessor-based trip unit uses true RMS current level sensing

The Metering and Communications system is used in conjunction with Micrologic Type A, Type P, and Type H trip units (see Digest pages 7-47 and 7-48) for the Masterpact NW and NT circuit breakers. Modbus™ industry standard data communications allow this system to replace discrete meters, multiple transducers, analog wires, and analog-to-digital conversion equipment. Extensive information can be transmitted over a single communications cable to a Powerlogic system display, a personal computer, programmable logic controller, or other host system.

Basic circuit information, such as amperes, can be monitored using Micrologic Type A trip unit. Circuit breaker remote operation is available using the Micrologic Type P and Type H trip units with Powerlogic functionality. In addition to its metering capabilities, the Micrologic trip unit system is available with optional status inputs and relay outputs for monitoring discrete contacts and remote control of devices by way of the data communications channel.

Micrologic trip unit metering functions include:

- Amperes and volts
- Frequency
- Power
- Power demand
- Energy
- Energy demand
- Power factor
- Power quality measurements
- Communications
- Waveform capture
- Data logging
- Programmable contacts
- Current unbalance
- Over/under voltage
- Over/under frequency
- Voltage unbalance
- Phase sequence
- Reverse power
- Long time imaging Contact wear indicator
- Masterpact circuit breaker maintenance information



MiniBreak™ Switch Enclosure with Door (Class 6042)



MiniBreak Switch Interior Showing Fuses (Class 6042)



Listed Metal-enclosed Interrupter Switchgear

#### **Medium Voltage Switchgear**

#### MiniBreak™ Compact Height Switches— 5.5 kV, 200 A

The Square D™ brand MiniBreak compact height switch enclosure is only 66-inches high and contains a single 3-pole load interrupter switch, rated 5.5 kV and 200 A. Enclosures are free-standing and suitable for both indoor (NEMA 1) and outdoor (NEMA 3R) applications. These switches are available unfused or with provisions for Square D™ brand current-limiting fuses rated from 10E A to 200E A. Factory-installed accessories include an auxiliary switch, strip heaters, and provisions for a "lock open" only key interlock. The door is mechanically interlocked with the switch operating handle. Set screw cable lugs for #14 solid—2/0 stranded aluminum or copper cable are provided for two line and one load connections. Fuses are not furnished with this equipment. For fuse information and pricing, see Table 11.12. The Fused switches and many of the fuses listed in Table 11.12 are available from stock.

#### Table 11.10: Ratings

May decime valtage (Id)	
Max. design voltage (kV)	5.5
BIL (kV)	60
Frequency (Hz)	60
Continuous amperes	200
Interrupting amperes	200
Momentary (amperes asymmetrical)	20,000
Fault close (amperes asymmetrical)	20,000
Capacitor switching (kVAR)	None
Short time, 2 seconds (amperes symmetrical)	12,500
Low frequency withstand (kV)	19
Fuse integrated (symmetrical)	63,000
NOTE: 1200 hp maximum.	

# Ordering Information

# Table 11.11: 5 kV-200 A Switch

Туре	Switch Catalog No.	\$ Price
Unfused	HVMB305200U	10274.00
Fused	HVMB305200	11844.00

- Select switch catalog number based on fused or unfused.
- Select catalog numbers for modifications from Factory Modifications table.
- If fused, select 5 kV, 200 A maximum current-limiting fuse from table below.
- Price switch and fuses separately. Switches are furnished with provisions only for fuses.
- Weight 450 lbs (204 kg).

Table 11.12: Current-Limiting Fuses, Non-Disconnect Type (Extended Travel Blown Fuse Indicator)

Continuous	Fuse Mou	nting Clip	·Catalog Number▲	\$ Price■		
Current	Size Centers Catalog Number		\$ FIICE			
5 kV Fuse						
10E 15E 20E 25E	D	12"	5GS010 5GS015 5GS020 5GS025	954.00		
30E 40E 50E 65E 80E 100E	D	12"	5GS030 5GS040 5GS050 5GS065 5GS080 5GS100	1980.00		
125E 150E 175E 200E	D	12"	5GS125 5GS150 5GS175 5GS200	3326.00		

- Contact your Schneider Electric representative for current stock
- Price includes one set of three fuses, packed in a single box.

#### Table 11.13: Factory Modifications

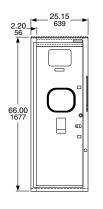
Catalog No.	Description	\$ Price
HVMX1	Auxiliary switch, 1-N.O. and 1-N.C. contacts	152.00
HVMK1	Provisions for lock open only key interlock (does not include the key cylinder—order separately)	341.00
HVMH1	Strip heater 100 W @ 120 V	1150.00
HVMH2	Strip heater with thermostat 100 W @ 120 V	1772.00
HVMSA3	Distribution class surge arrester (set of three arresters) 3 kV, 2.55 MCOV ◆	1618.00
HVMSA6	Distribution class surge arrester (set of three arresters) 6 kV, 5.10 MCOV ◆	1926.00

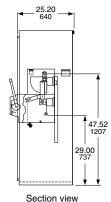
Arresters are line side connected.

#### Pricing Example

Price one (1), 5 kV, 200 A switch with 65E current-limiting fuses. Provide one auxiliary switch with 1-N.O. and 1-N.C. contact and with provision for installing a "lock open" key interlock on the switch operating mechanism.

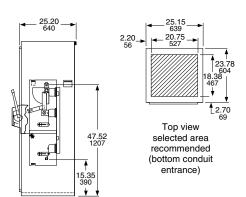
Order:	Catalog No.	\$ Price
Switch with enclosure	HVMB305200	11844.00
Auxiliary switch	HVMX1	152.00
Key interlock adapter	HVMK1	340.00
Fuses (set of three, from page 11-14)	5GS065	1980.00
	Total Dries	14016.00





Front view

(unfused)



Section view (fused)

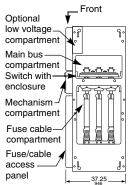
37.25

\_ \// Plan

View

# Class 6045 / Refer to Product Data 6040PD9601





Right Side

View

90.00

7

14.75

Front

View

# Switchgear—Full Range

switchgear provides switching, metering, and interrupting

Made up of modular units, the HVL/cc is easy to expand. Two main bus positions allow future extensions and connections to existing equipment.

HVL/cc switchgear is available in either single or multiple

The HVL/cc switch can be equipped with either an overtoggle mechanism (OTM), which is standard, or an optional stored energy mechanism (SEM). An option with both mechanisms is the Fuselogic™ system. The Fuselogic system offers fuse tripping (with SEM) to provide protection against single phasing loads when a fuse has blown. It also has a mechanical interlock to prevent inadvertent switching until fuses have been installed or blown fuses have been replaced.

considerable cost savings from the reduction of building or room sizes.

Table 11.14: HVL/cc Load Interrupter Switches— Full Range 600/1200 A Ratings

	_			-	
Switch (kV)— maximum design	5.5	17.5	17.5	25.8	38
BIL (kV)	60	95	110	125	150
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Withstand (kV)	19	36	36	50	80
Continuous current (A)	600/1200	600/1200	600/1200	600	600
Interrupting current (A)	600/1200	600/1200	600/1200	600	600
Fault close (kA asymmetrical)	40	40	40	32	32
Momentary current (kA asymmetrical)	40	40	40	32	32
Short time current (kA symmetrical)	25	25	25	25	25
Electrical endurance	100/600 A	100/600 A	100/600 A		
(number of operations at 80% P.F.)	26/1200 A	26/1200 A	26/1200 A	100	100
Mechanical endurance (number of operations)	1000	1000	1000	1000	1000

## **Switch Standard Features**

- Switch Positions: Closed, open, and internally grounded (optional) (connects switch contacts to ground)
- Enclosure: Epoxy
- Medium: Sulphur hexalfluoride
- Maintenance: Maintenance free sealed for life
- Pressure:
  - 5.8 PSI (≤17.5 kV)
  - 22 PSI (25.8-38 kV)
- View ports to show switch blade position

#### **Options**

- Internal ground switch: Has full fault making capability
- Fuselogic™ system
- Infrared viewing windows
- Class I, Division 2
- Fast auto transfers
- **Duplex configurations**
- Protective relaying
- Powerlogic™ metering
- 20-inch or 29.5-inch wide enclosures

# **HVL/cc Metal-Enclosed Load Interrupter**

Square D<sup>™</sup> brand HVL/cc metal-enclosed load interrupter capabilities for medium voltage electrical power distribution systems and is designed and tested per applicable ANSI/IEEE and NEMA standards.

bay units. The design is compact, with front accessibility.

The HVL/cc enclosure is designed for front access only and can be positioned against walls, in small rooms or in pre-fabricated buildings. The small footprint can result in

Switch (kV)— maximum design	5.5	17.5	17.5	25.8	38
BIL (kV)	60	95	110	125	150
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60
Withstand (kV)	19	36	36	50	80
Continuous current (A)	600/1200	600/1200	600/1200	600	600
Interrupting current (A)	600/1200	600/1200	600/1200	600	600
Fault close (kA asymmetrical)	40	40	40	32	32
Momentary current (kA asymmetrical)	40	40	40	32	32
Short time current (kA symmetrical)	25	25	25	25	25
Electrical endurance	100/600 A	100/600 A	100/600 A		
(number of operations at 80% P.F.)	26/1200 A	26/1200 A	26/1200 A	100	100
Mechanical endurance (number of operations)	1000	1000	1000	1000	1000

Grounded Position Switch Contact Positions



Listed Metal-enclosed Interrupter Switchgear

#### Fuselogic™

Fuselogic is a protection system that provides the ultimate in medium voltage fuse protection. This patented system utilizes Square D™ brand current-limiting fuses with mechanical sensors that function without any auxiliary power requirements. Several combinations of Fuselogic functions can be combined to provide simple blown fuse indication contacts with mechanical lockout to anti-single phasing protection. Anti-single phasing requires the optional stored energy mechanism (SEM). Fuselogic is available on both HVL/cc and HVL switches.

#### **Switchgear Standard Features**

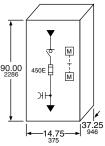
- Compartments: Switch, bus, fuse/cable, mechanism, and optional low voltage/control
- 11 gauge steel enclosure
- **Epoxy** insulators
- Fuse/cable access panel interlocked with switch
- Front access only
- Animated mechanism mimic bus
- Padlocking open or closed provision
- Top or bottom cable entry
- UL/CUL Listed
- Live line indicators on all incoming switch bays and outgoing feeder circuits
- Cable lugs included for one cable per phase
- Tin plated copper bus for lineups

#### Table 11.15: Surge Arresters

	•		
System L-L	. Voltage kV	Arre	ster MCOV-kV
Nominal	Maximum	Effectively Grounded Neutral Circuits	Impedance Grounded and Ungrounded Circuits
2.4 4.16 4.8 6.9 12.0	2.54 4.4 5.08 7.26 12.7	2.55 — — 7.65	2.55 5.1 5.1 7.65 12.70
12.47 13.2 13.8	13.2 13.97 14.52	7.65 8.4 8.4	12.70 — —



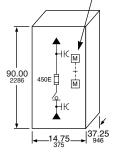
NOTE: Cable entry and exit must be opposite to maintain the minimum sections shown.



5 kV Indoor N1 Top Cable In/Bottom Cable Out Switch in Position A

Mechanical interlock between switch and fuse access panel.

**NOTE:** Mechanical interlock is standard on switches.



5 kV Indoor N1 Top Cable In/Bottom Cable Out Switch in Position B

#### HVL/cc Switchgear—Quick Ship Program— 5-15 kV, 600 A

**Medium Voltage** 

**Switchgear** 

The HVL/cc quick ship program provides basic fused and unfused load interrupter switch configurations for standalone or transformer primary applications. The Quick Ship program offers faster delivery, but with fewer options.

Three-pole, 600 A individual HVL/cc switches are available in free-standing indoor (NEMA 1) enclosures. These switches are available unfused or with provisions for Square D™ brand current-limiting DIN/E fuses. Factory optional accessories include auxiliary bays, main bus, auxiliary switches, extra cable terminating lugs, and distribution class surge arresters. The fuse access panel is mechanically interlocked with the switch mechanism. Key interlocks are not an available option with Digest-listed HVL/cc switches. (1) Set screw type lugs for (2) #2-350 kcmil copper or aluminum cables are provided for line and load connections. Fuses are not furnished with this equipment. For fuse information and pricing refer to page 11-10.

#### Provisions for Future Expansion

All "single" HVL/cc switches have provisions for future expansion on either side.

Order main bus kits for copper 600 A bus. Include sketch for factory-assembled parts or lineups.

#### 600 A Single Switch Unfused

Manual over-toggle mechanism, no grounding switch Includes (1) set screw for (2) #2-350 kcmil Cu or Al conductors per phase

Application A = Top entry (incoming—cable or main bus), bottom exit (load—cable or main bus)

Application B = Bottom entry (incoming—cable or main bus), top exit (load-cable or main bus)

Table 11.16: Unfused Switch Selection

Catalog	kV	Fuse	Application	Wic	\$ Price	
No.	Rating	Range	Application	in	mm	\$ FIICE
HVLCCA14305N	4.76	_	Α	14.75	375	17500.00
HVLCCA20305N	4.76	_	Α	20.00	508	18024.00
HVLCCA14315N	15	_	Α	14.75	375	19244.00
HVLCCA20315N	15	_	Α	20.00	508	19770.00
HVLCCB14305N	4.76	_	В	14.75	375	17500.00
HVLCCB20305N	4.76	_	В	20.00	508	18024.00
HVLCCB14315N	15	_	В	14.75	375	19244.00
HVLCCB20315N	15	_	В	20.00	508	19770.00

#### 600 A Single Switch Fused

(Provisions only for Square D™ brand current-limiting DIN/E fuses—order fuses separately)

Manual over-toggle mechanism, no grounding switch Includes (1) set screw lug for (2) #2-350 kcmil Cu or Al conductor per phase

Application A = Top entry (incoming—cable or main bus), bottom exit (load-cable or main bus)

Application B = Bottom entry (incoming—cable or main bus), top exit (load-cable or main bus)

Table 11.17: Fused Switch Selection

Catalog	kV	Fuse	Application	Wi	dth	\$ Price	
No.	Rating	Range	Арріісаціон	in	mm	\$ FIICE	
HVLCCA14305D	4.76	10-450E	Α	14.75	375	19392.00	
HVLCCA20305D	4.76	10-450E	Α	20.00	508	19916.00	
HVLCCA14315D	15	10-200E	Α	14.75	375	19858.00	
HVLCCA20315D	15	10-200E	Α	20.00	508	20382.00	
HVLCCB14305D	4.76	10-450E	В	14.75	375	19392.00	
HVLCCB20305D	4.76	10-450E	В	20.00	508	19916.00	
HVLCCB14315D	15	10-200E	В	14.75	375	19858.00	
HVLCCB20315D	15	10-200E	В	20.00	508	20382.00	

#### 600 A Incoming Line Auxiliary Bay

For top incoming cable to application A (bottom cable exit) switch(es), order 600 A tin plated Cu main bus to adjacent section from bus table. Includes (1) set screw lug for (2) #2-350 kcmil Cu or Al conductor per phase.

Table 11.18: Bays for Top Entry/Exit Cables

Catalog	kV	Fuse	Application	Wi	\$ Price	
No.	Rating	Range	дрисацоп	in	mm	\$111CC
HVLCCA14A	4.76/15	_	Α	14.75	375	1968.00
HVLCCA20A	4.76/15	_	Α	20.00	508	2492.00

For bottom incoming cable to application B (top cable exit) switch(es), order 600 A tin plated Cu main bus to adjacent section from main bus kits table. Includes (1) set screw lug for (2) #2-350 kcmil Cu or Al conductor per phase.

Table 11.19: Bays for Bottom Entry/Exit Cables

	Catalog	kV	Fuse	Application	Wie	\$ Price	
	No.	Rating	Range	Application	in	mm	\$ FIICE
Н	VLCCB14A	4.76/15	_	В	14.75	375	1968.00
H	VLCCB20A	4.76/15	_	В	20.00	508	2492.00

#### 600 A Tin Plated Copper Main Bus Kits

Table 11.20: Bus Kits

	(From)		dth	(jo	Width		
Catalog No.	Left (Fro Applicat	in	mm	Right (To) Application	in	mm	\$ Price
HVLCCMBA14A14	Α	14.75	375	Α	14.75	375	882.00
HVLCCMBA14A20	Α	14.75	375	Α	20.00	508	946.00
HVLCCMBA20A14	Α	20.00	508	Α	14.75	375	946.00
HVLCCMBA20A20	Α	20.00	508	Α	20.00	508	1008.00
HVLCCMBB14B14	В	14.75	375	В	14.75	375	882.00
HVLCCMBB14B20	В	14.75	375	В	20.00	508	946.00
HVLCCMBB20B14	В	20.00	508	В	14.75	375	946.00
HVLCCMBB20B20	В	20.00	508	В	20.00	508	1008.00

#### Ratings

HVL/cc Switch with manually operated type OTM mechanism in cubicle enclosure (does not include internal ground switch). Ratings are based on an X/R ratio of 1.6.

Table 11.21: HVL/cc Switch Ratings

Switch (kV)—maximum design	5.5	17.5
BIL (kV)	60	95
Frequency (Hertz)	50/60	50/60
Withstand (kV)	19	36
Continuous current (amperes)	600	600
Interrupting current (amperes)	600	600
Fault close (amperes asymmetrical)	40,000	40,000
Integrated switch and fuse rating (amperes	65,000	65,000
Momentary current (amperes asymmetrical)	40,000	40,000
Short time current, 2 seconds (amperes symmetrical)	25,000	25,000
Operations at Full Load	100	100
Mechanical Endurance (number of operations)	1000	1000

<sup>50,000</sup> for 630 A fuse

#### **Factory Modifications**

Table 11.22: Factory Modifications

Catalog No.	Description	\$ Price
HVLCC-X3	Auxiliary switch 2 N.O2 N.C. contact	762.00

#### **Distribution Class Surge Arresters**

(One Set of Three) Switch Load Side Connected or Incoming Line Bay)

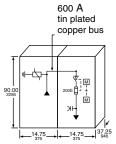
Table 11.23: Surge Arresters

Catalog No.	kV Rating	Section \ Minimum R	\$ Price	
INO.	, and the second	in	mm	
HVLCCDSA3	3 kV, 2.55 kV MCOV	14.75	375	1618.00
HVLCCDSA6	6 kV, 5.10 kV MCOV	14.75	375	1926.00
HVLCCDSA9	9 kV, 7.65 kV MCOV	14.75	375	2248.00
HVLCCDSA10	10 kV, 8.40 kV MCOV	14.75	375	2446.00
HVLCCDSA12	12 kV, 10.20 kV MCOV	14.75	375	2836.00
HVLCCDSA15	15 kV, 12.70 kV MVOV	20.00	508	3424.00
HVLCCDSA18	18 kV, 15.3 kV MCOV	20.00	508	3948.00





www.schneider-electric.us





Listed Metal-enclosed Interrupter Switchgear

600 A "Single" HVL/cc Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting, Non-Disconnect Type Fuses for Cable Connection to Power-Dry™, Power-Cast™, and Uni-Cast™ **Transformers** 

(FLC = 300 A MAXIMUM)

RH—Transformer on right, LH—Transformer on Left Application A = Top Entry (Incoming Cables)
Application B = Bottom Entry (Incoming Cables)

Table 11.24: 600 A "Single" HVL/cc Switch Selection

			ion	Wi	dth		
Catalog No.	kV Rating	Fuse Range	Application	in	mm	RH/ LH	\$ Price
HVLCCA14405DGR	4.76	10-450E	Α	14.75	375	RH	20134.00
HVLCCA20405DGR	4.76	10-450E	Α	20.00	508	RH	20660.00
HVLCCA14405DGL	4.76	10-450E	Α	14.75	375	LH	20134.00
HVLCCA20405DGL	4.76	10-450E	Α	20.00	508	LH	20660.00
HVLCCA14415DGR	15	10-200E	Α	14.75	375	RH	20614.00
HVLCCA20415DGR	15	10-200E	Α	20.00	508	RH	21138.00
HVLCCA14415DGL	15	10-200E	Α	14.75	375	LH	20614.00
HVLCCA20415DGL	15	10-200E	Α	20.00	508	LH	21138.00
HVLCCB14405DGR	4.76	10-450E	В	14.75	375	RH	20134.00
HVLCCB20405DGR	4.76	10-450E	В	20.00	508	RH	20660.00
HVLCCB14405DGL	4.76	10-450E	В	14.75	375	LH	20134.00
HVLCCB20405DGL	4.76	10-450E	В	20.00	508	LH	20660.00
HVLCCB14415DGR	15	10-200E	В	14.75	375	RH	20614.00
HVLCCB20415DGR	15	10-200E	В	20.00	508	RH	21138.00
HVLCCB14415DGL	15	10-200E	В	14.75	375	LH	20614.00
HVLCCB20415DGL	15	10-200E	В	20.00	508	LH	21138.00

NOTE: Switches with transformer connections are painted ANSI 49. Standalone switches are painted ANSI 61. Transformer connections in HVL/cc switches are based on standard Square D™ brand transformer connections. If these switches are used to connect to other manufacturers' transformers, then connections must match standard Square  $\mathsf{D}^{\mathsf{TM}}$  brand transformer connections. (Cable connections are furnished with the transformer.)

#### **General Purpose E-Rated Current-Limiting** Fuses:Type DIN/E for HVL/cc Switches

Integrated rating for 600 A HVL/cc switches with Square D™ brand DIN/E fuses listed below is 65 kA rms symmetrical amperes. (50 kA rms for 630 A fuse.)

Current-limiting fuses increase the integrated short-circuit current rating because of their energy-limiting capabilities.

To increase the short-circuit current rating of the entire lineup of switchgear, current-limiting fuses must be used in the entrance sections.

Table 11.25: Fuse Selection

Catalog No.	kV Rating	Fuse Rating	Set of Fuses ▲		\$ Price		
NO.	naurig	nauriy	ruses 🔺	Size	in	mm	
55DE010	5.5	10E	1	Actual	14.75	375	954.00
55DE015	5.5	15E	1	Actual	14.75	375	954.00
55DE020	5.5	20E	1	Actual	14.75	375	954.00
55DE025	5.5	25E	1	Actual	14.75	375	954.00
55DE030	5.5	30E	1	Actual	14.75	375	1980.00
55DE040	5.5	40E	1	Actual	14.75	375	1980.00
55DE050	5.5	50E	1	Actual	14.75	375	1980.00
55DE065	5.5	65E	1	Actual	14.75	375	1980.00
55DE080	5.5	80E	1	Actual	14.75	375	1980.00
55DE100	5.5	100E	1	Actual	14.75	375	3326.00
55DE125	5.5	125E	1	Actual	14.75	375	3326.00
55DE150	5.5	150E	1	Actual	14.75	375	3326.00
55DE175	5.5	175E	1	Actual	14.75	375	3326.00
55DE200	5.5	200E	1	Actual 14.75 375		375	3326.00
55DE250	5.5	250E	1	Actual	14.75	375	5742.00
55DE300	5.5	300E	1	Actual	14.75	375	5742.00
55DE350	5.5	350E	1	Actual	14.75	375	5742.00
55DE400	5.5	400E	1	Actual	14.75	375	6430.00
55DE450	5.5	450E	1	Actual	14.75	375	6430.00
175DE010	15.5	10E	1	Actual	14.75	375	3214.00
175DE015	15.5	15E	1	Actual	14.75	375	3214.00
175DE020	15.5	20E	1	Actual	14.75	375	3214.00
175DE025	15.5	25E	1	Actual	14.75	375	3214.00
175DE030	15.5	30E	1	Actual	14.75	375	3290.00
175DE040	15.5	40E	1	Actual	14.75	375	3290.00
175DE050	15.5	50E	1	Actual	14.75	375	3290.00
175DE065	15.5	65E	1	Actual	14.75	375	4446.00
175DE080	15.5	80E	1	Actual	14.75	375	4446.00
175DE100	15.5	100E	1	Actual	14.75	375	4446.00
175DE125	15.5	125E	1	Actual	14.75	375	6878.00
175DE150	15.5	150E	1	Actual	14.75	375	6878.00
155DE175	15.5	175E	1	Actual	14.75	375	6878.00
155DE200	15.5	200E	1	Actual	14.75	375	6878.00

Each (1) set of fuses contains three fuses. (E.g., (2) sets of fuses yield a total of six fuses.)

600 A "Duplex" HVL/cc Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting, Non-Disconnect Type Fuses for Cable Connection to Power-Dry, Power-Cast, and **Uni-Cast Transformers** 

(FLC = 300 A MAXIMUM)

RH—Transformer on Right, LH—Transformer on Left Includes Mechanical Interlock to Prevent Paralleling of Sources

Application A = Top Entry (Incoming Cables)

Application B = Bottom Entry (Incoming Cables)

Table 11.26: 600 A "Duplex" HVL/cc Switch

				Wic	ith		
Catalog No.	kV Rating	Fuse Range	Application	in	mm	RH/ LH	\$ Price
HVLCCA14505DGR	4.76	10-450E	Α	14.75	375	RH	54174.00
HVLCCA20505DGR	4.76	10-450E	Α	20.00	508	RH	56068.00
HVLCCA14505DGL	4.76	10-450E	Α	14.75	375	LH	54174.00
HVLCCA20505DGL	4.76	10-450E	Α	20.00	508	LH	56068.00
HVLCCA14515DGR	15	10-200E	Α	14.75	375	RH	57428.00
HVLCCA20515DGR	15	10-200E	Α	20.00	508	RH	59322.00
HVLCCA14515DGL	15	10-200E	Α	14.75	375	LH	57428.00
HVLCCA20515DGL	15	10-200E	Α	20.00	508	LH	59322.00
HVLCCB14505DGR	4.76	10-450E	В	14.75	375	RH	54174.00
HVLCCB20505DGR	4.76	10-450E	В	20.00	508	RH	56068.00
HVLCCB14505DGL	4.76	10-450E	В	14.75	375	LH	54174.00
HVLCCB20505DGL	4.76	10-450E	В	20.00	508	LH	56068.00
HVLCCB14515DGR	15	10-200E	В	14.75	375	RH	57428.00
HVLCCB20515DGR	15	10-200E	В	20.00	508	RH	59322.00
HVLCCB14515DGL	15	10-200E	В	14.75	375	LH	57428.00
HVLCCB20515DGL	15	10-200E	В	20.00	508	LH	59322.00

#### **Ordering Information**

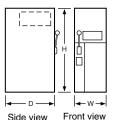
- Select switch catalog number based on fused or unfused and cable entry locations (top or bottom) from Table 11.16 or Table 11.17 on page 9.
- Select incoming line auxiliary bay from Table 11.18 or Table 11.19 on page 9, if required.
- Select main bus from Table 11.20 on page 9, if
- Select catalog numbers for factory modifications from Table 11.22 on page 9, if required.
- If fused, select DIN/E fuses from Table 11.25.

#### **Pricing Example**

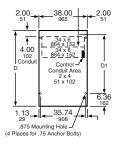
Order indoor 600 A, 5 kV, HVL/cc switch with bottom incoming and bottom outgoing cables (1) #2 AWG per phase, (1) set 200E fuses, and (1) set 6 kV surge arresters.

Order:	Catalog. No.	\$ Price
Switch w/fuse provisions and bottom exit load cables	HVLCCA14305D	19392.00
600 incoming line auxiliary bay (Application A—bottom entry)	HVLCCA14A	1968.00
Main Bus (Application A—14 in. to Application A–14 in.)	HVLCCMBA14A14	882.00
6 kV LAs	HVLCCDSA6	1926.00
Set 200E fuses	55DE200	3326.00
	Total Price	13747.00





Recommended power cable conduit area





Listed Metal-enclosed Interrupter Switchgear

#### HVL Metal-Enclosed Load Interrupter Switchgear—Full Range

HVL™ 5–38 kV Load Interrupter is the most popular ANSI-rated switchgear in its class in America. Among medium voltage interrupter switchgear, both the switch and the enclosure stand as industry benchmarks in the areas of design, manufacturing, and performance. Load interrupter switchgear must perform a number of critical functions in a unit substation - protecting equipment and disconnecting faulted lines and transformers. Designed and tested to the latest applicable standards, HVL has been engineered to provide superior protection for your distribution system. HVL switchgear is available for various applications and configurations, including:

- Individual service entrance bays
- Multiple-bay lineups incorporating HVL load interrupters and optional Visi/Vac™ circuit interrupters
- Substation primaries

**Medium Voltage** 

Switchgear

Square D<sup>™</sup> brand metal-enclosed switchgear has become an industry standard for its better system performance, lower maintenance cost, easier system expansion, and reduced system expense.

A full range of ratings and options are available but not listed in this publication. Contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

#### Table 11.27: Ratings

Maximum design voltage (kV)	4.76	15	17	25.8	29	38
BIL (kV)	60	95	95	125	125	150
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Continuous amperes	600/1200	600/1200	600	600/1200	600/1200	600
Interrupting amperes	600/1200	600/1200	600	600	400	400
Momentary (kA asymmetrical)	40/61/80	40/61/80	61	40/61	40/61	40
Fault close (kA asymmetrical)	40/61	40/61	40	40	40	20
Capacitor switching (kVAR)	2400	2400	-	-	-	-
Short time rating 2 seconds (kA symmetrical)	25/38/50	25/38/50	25	25	25	25
Low frequency withstand (kV)	19	36	36	60	60	60

#### Standard Features

- 11 gauge steel enclosure
- Direct drive mechanism
- Permanently attached operating handle
- Visible isolation viewing window
- Mechanical interlocked fuse access door
- Provision for padlock and key interlock
- Highly flexible design
- ANSI 61 paint

#### **Options**

- Outdoor construction
- Square D™ brand DIN-style current-limiting fuses
- Boric acid fuses
- Silver or tin plated copper bus
- 600, 1200, or 2000 A main bus
- · Heat shrink insulated bus
- Motor operator
- Shunt trip
- Fuselogic<sup>™</sup> tripping system
- Automatic load transfer schemes
- Roof bushings
- Key interlocks
- Surge arresters
- Utility metering baysLine selector switch
- Duplex switch
- Transformer connections
- Infrared windows for thermal scanning of connections

#### Fuselogic™

Fuselogic is a protection system that provides the ultimate in medium voltage fuse protection. This patented system utilizes the Square D<sup>TM</sup> brand current-limiting fuses with mechanical sensors that function without any auxiliary power requirements. Several combinations of Fuselogic functions can be combined to provide simple blown fuse indication contacts with mechanical lockout to anti-single phasing protection. Anti-single phasing requires the optional stored energy mechanism (SEM). Fuselogic is available on both HVL/cc<sup>TM</sup> and HVL switches.

#### HVL Switchgear—Quick Ship Program— 5 kV-15 kV, 600 A Features

The HVL quick ship program provides basic fused and unfused load interrupter switch configurations for stand-alone or transformer primary applications. The Quick Ship program offers faster delivery, but with fewer options.

Three-pole, 600 A individual HVL switches are available in free-standing indoor (NEMA 1) or outdoor (NEMA 3R) enclosures. The switches used in these enclosures are UL Recognized and are listed under Category WIQG2 in File E140591(M). These switches are available unfused or with provisions for 3-inch diameter Square D<sup>TM</sup> brand current-limiting fuses or for boric acid fuses. Factory optional accessories include auxiliary switches, extra cable terminating lugs and distribution class surge arresters. The door is mechanically interlocked with the switch operating handle and provisions for key interlocks are standard. Set screw type lugs for one #2 solid—600 kcmil copper or aluminum cables are provided for line and load connections. Other standard features include a bolted enclosure with a viewing window, ground pad, and space heater (NEMA 3R only). Control power for heater must be from external source. Fuses are not furnished with this equipment. For fuse information and pricing, refer to page 11-14. Switches are listed on pages 11-11 and 11-12, and many of the fuses listed on page 11-14 are available from stock.

Table 11.28: 600 A "Single" Switch Unfused

Catalog No.	kV Rating	Fuse Range	Enclosure Type	\$ Price
HVL305NG	4.76	_	NEMA 1	17500.00
HVL305NW	4.76	_	NEMA 3R	21524.00
HVL315NG	15	_	NEMA 1	19244.00
HVL315NW	15	_	NEMA 3R	23478.00

Table 11.29: 600 A "Single" Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting, Non-Disconnect Type Fuses

Catalog No.	kV Rating	Fuse Range	Enclosure Type	\$ Price
HVL305DEG	4.76	10-450E	NEMA 1	19392.00
HVL305DEW	4.76	10-450E	NEMA 3R	21636.00
HVL315DEG1	15	10-100E	NEMA 1	19858.00
HVL315DEG2	15	125-200E	NEMA 1	19858.00
HVL315DEW1	15	10-100E	NEMA 3R	23978.00
HVL315DEW2	15	125-200E	NEMA 3R	23978.00

Table 11.30: 600 A "Single" Switch with PROVISIONS
ONLY for S&C Boric Acid
Non-Disconnect Type Fuses

Catalog No.	kV Rating	Fuse Range	Enclosure Type	\$ Price
HVL305BG	4.76	10E-400E	NEMA 1	24936.00
HVL305BW	4.76	10E-400E	NEMA 3R	28606.00
HVL315BG	15	10E-400E	NEMA 1	26650.00
HVL315BW	15	10E-400E	NEMA 3R	30688.00
HVL317BG	17	10E-400E	NEMA 1	29610.00
HVL317BW	17	10E-400E	NEMA 3R	34098.00

Max. Design Voltage (kV)	4.76	15.0
BIL (kV)	60	95
Frequency (Hz)	50/60	50/60
Continuous amperes	600	600
Interrupting amperes	600	600
Momentary (amperes asymmetrical)	40,000	40,000
Fault close (amperes asymmetrical)	40,000	40,000
Capacitor switching (kVAR)	2,400	2,400
Short-time rating, 2 seconds (amperes symmetrical)	25,000	25,000
Low frequency withstand (kV)	19	36

Table 11.32: Distribution Class Surge Arresters

System L-I	L Voltage kV	Arrester MCOV-kV				
Nominal Maximum		Effectively Grounded Neutral Circuits	Impedance Grounded and Ungrounded Circuits			
2.4 4.16 4.8 6.9 12.0	2.54 4.4 5.08 7.26 12.7		2.55 5.1 5.1 7.65 12.70			
12.47 13.2 13.8	13.2 13.97 14.52	7.65 8.4 8.4	12.70			

Table 11.33: Enclosure Type

Time	W		D		H		Weight	
Туре	in	mm	in	mm	in	mm	lbs	kg
Indoor	38.00	965	54.50	1384	90.00	2286	1200	545
Outdoor	38.00	965	60.00	1524	97.50	2477	1400	636

#### **Provisions for Future Expansion**

All "single" Digest switches have provisions for future expansion on either side. Order kits HVMB for top crossover copper 600 A bus and HVLC for line connections to the top bus. (Refer to the Factory Modifications table on page 11-13.) Include sketch for factory-assembled parts or lineups.

#### HVL Switches for Power-Dry II ™, Power-Cast II ™, and Uni-Cast II ™ Transformer Connections

HVL switches can be configured for close coupling cable connections to listed dry type transformers for primary main switches of unit substations. These are listed in the tables below with current-limiting or boric acid fuses. Both single and duplex switch mains are included in this selection. Transformers are listed on page 14-20 and may not be suitable for close coupling. For transformer availability and specific configurations, contact your local Schneider Electric sales office. All connections in this digest are based on standard Square D™ brand transformer connections. If these switches are used to connect to other manufacturers' transformers, then connections must coordinate with standard Square D™ brand transformer connections. (Cable connections are furnished with the transformer.)

Table 11.34: 600 A "Single" Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting,
Non-Disconnect Type Fuses for Cable Connection to Power-Dry II, Power-Cast II, and Uni-Cast II Transformers
(FLC = 300 A max.) RH—Transformer on Right, LH—Transformer on Left

Catalog No.	kV Rating	Fuse Range	Enclosure Type	RH/LH	\$ Price
HVL405DEGR	4.76	10-450E	NEMA 1	RH	20134.00
HVL405DEGL	4.76	10-450E	NEMA 1	LH	20134.00
HVL405DEWRH	4.76	10-450E	NEMA 3R	RH	25322.00
HVL405DEWLH	4.76	10-450E	NEMA 3R	LH	25322.00
HVL415DEGR1	15	10-100E	NEMA 1	RH	20614.00
HVL415DEGR2	15	125-200E	NEMA 1	RH	20614.00
HVL415DEGL1	15	10-100E	NEMA 1	LH	20614.00
HVL415DEGL2	15	125-200E	NEMA 1	LH	20614.00
HVL415DEWR1H	15	10-100E	NEMA 3R	RH	28070.00
HVL415DEWR2H	15	125-200E	NEMA 3R	RH	28070.00
HVL415DEWL1H	15	10-100E	NEMA 3R	LH	28070.00

Table 11.34: 600 A "Single" Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting,
Non-Disconnect Type Fuses for Cable Connection to Power-Dry II, Power-Cast II, and Uni-Cast II Transformers
(FLC = 300 A max.) RH—Transformer on Right, LH—Transformer on Left

No.	Rating	Fuse Range	Type	RH/LH	\$ Price
HVL415DEWL2H	15	125-200E	NEMA 3R	LH	28070.00

Table 11.35: 600 A "Duplex" Switch with PROVISIONS ONLY for Square D™ brand Current-Limiting, Non-Disconnect Type Fuses for Cable Connection to Power-Dry II, Power-Cast II, and Uni-Cast II Transformers (FLC = 300 A max.) RH—Transformer on Right, LH—Transformer on Left

Catalog No.	kV Rating	Fuse Range	Enclosure Type	RH/LH	\$ Price
HVL505DEGR	4.76	10-450E	NEMA 1	RH	42028.00
HVL505DEGL	4.76	10-450E	NEMA 1	LH	42028.00
HVL505DEWRH	4.76	10-450E	NEMA 3R	RH	49484.00
HVL505DEWLH	4.76	10-450E	NEMA 3R	LH	49484.00
HVL515DEGR1	15	10-100E	NEMA 1	RH	43084.00
HVL515DEGR2	15	125-200E	NEMA 1	RH	43084.00
HVL515DEGL1	15	10-100E	NEMA 1	LH	43084.00
HVL515DEGL2	15	125-200E	NEMA 1	LH	43084.00
HVL515DEWR1H	15	10-100E	NEMA 3R	RH	54904.00
HVL515DEWR2H	15	125-200E	NEMA 3R	RH	54904.00
HVL515DEWL1H	15	10-100E	NEMA 3R	LH	54904.00
HVL515DEWL2H	15	125-200E	NEMA 3R	LH	54904.00

Table 11.36: 600 A "Single" Switch with PROVISIONS ONLY for S&C Boric Acid Non-Disconnect Type Fuses for Cable Connection to Power-Dry II, Power-Cast II, and Uni-Cast II Transformers ■ (FLC = 300 A max.) RH—Transformer on Right, LH—Transformer on Left

Catalog No.	kV Rating	Fuse Range	Enclosure Type	RH/LH	\$ Price
HVL405BGR	4.76	10E-400E	NEMA 1	RH	25666.00
HVL405BGL	4.76	10E-400E	NEMA 1	LH	25666.00
HVL405BWRH	4.76	10E-400E	NEMA 3R	RH	30674.00
HVL405BWLH	4.76	10E-400E	NEMA 3R	LH	30674.00
HVL415BGR	15	10E-400E	NEMA 1	RH	27390.00
HVL415BGL	15	10E-400E	NEMA 1	LH	27390.00
HVL415BWRH	15	10E-400E	NEMA 3R	RH	32476.00
HVL415BWLH	15	10E-400E	NEMA 3R	LH	32476.00

▲ Includes fuse holder only. See table on page 11-14 for fuse refills.

Table 11.37: 600 A "Duplex" Switch with PROVISIONS ONLY for S&C Boric Acid Non-Disconnect Type Fuses for Cable Connection to Power-Dry II, Power-Cast II, and Uni-Cast II Transformers ■ (FLC = 300 A max.) RH—Transformer on Right, LH—Transformer on Left

Catalog No.	kV Rating	Fuse Range	Enclosure Type	RH/LH	\$ Price
HVL505BGR	4.76	10E-400E	NEMA 1	RH	47470.00
HVL505BGL	4.76	10E-400E	NEMA 1	LH	47470.00
HVL505BWRH	4.76	10E-400E	NEMA 3R	RH	57742.00
HVL505BWLH	4.76	10E-400E	NEMA 3R	LH	57742.00
HVL515BGR	15	10E-400E	NEMA 1	RH	49540.00
HVL515BGL	15	10E-400E	NEMA 1	LH	49540.00
HVL515BWRH	15	10E-400E	NEMA 3R	RH	60514.00
HVL515BWLH	15	10E-400E	NEMA 3R	LH	60514.00

Includes fuse holder only. See table on page 11-14 for fuse refills.

NOTE: Switches with transformer connections are painted ANSI 49. Standalone switches are painted ANSI 61.



#### Medium Voltage Switchgear

#### **Fuse Selection**

The rule of thumb method for selecting fuses for transformer protection is 1.33 times the self-cooled full load current of the transformer or the next higher fuse rating. Selection of the fuse is the customer's responsibility and should be based on transformer and system characteristics.

#### Maximum Fuse Size:

Maximum fuse size should be determined by comparing the fuse total clearing curve to the transformer damage curve. Contact Schneider Electric for transformer overload and short-circuit withstand capability.

#### Minimum Fuse Size:

Minimum fuse size shall carry the transformer magnetizing inrush current of 12 times full load amperes for 0.1 second.

Table 11.38: Factory Modifications

Catalog No.	Description	\$ Price		
HVMB	Main Bus Kit, 600 A copper	2288.00		
HVLC	Line side connector kit (main bus) 600 A with 2–1/0=500 MCM lugs (bottom entry only)			
HVLC	Provisions for key interlocks (does not include key cylinders—order separately	0.00		
HVLX3	Auxiliary switch 2 N.O.—2 N.C. contact	762.00		
HVLC2	Set screw type lugs 1/0—500 kcmil (qty. 3)	196.00		
Distribution C	class Surge Arresters ▲			
HVDSA3	3 kV, 2.55 MCOV	1618.00		
HVDSA6	6 kV, 5.10 MCOV	1926.00		
HVDSA9	9 kV, 7.65 MCOV	2248.00		
HVDSA10	10 kV, 8.40 MCOV	2446.00		
HVDSA12	12 kV, 10.20 MCOV	2836.00		
HVDSA15	15 kV, 12.70 MCOV	3424.00		

<sup>▲</sup> Load side connected

#### **Standard Features**

- Switches for transformer primaries are cable connected only.
- Key interlocks must be ordered and coordinated by customer.
- Standard color is ANSI 61 for standalone units; ANSI 49 for switches connecting to transformers.
- If switches are purchased to coordinate with Square D<sup>™</sup> brand transformers, composite drawings and shipment coordination will not be available.
- Switches are not designed for any special dimensions for retrofit purposes. For dimensions other than shown, contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

#### **Ordering Information**

- Select switch catalog number based on fused or unfused and enclosure type.
- Select catalog numbers for factory modifications from the table above.
- 3. If fused, select fuse from table on page 11-14.
- 4. Price switch and fuses separately. Switches are furnished with provisions only for current-limiting fuse or boric acid fuse.

#### **Pricing Example**

Price one (1) indoor (NEMA 1), 15 kV, 600 A switch with 80E SM-5S boric acid fuses and 10 kV distribution class surge arresters for a 7.62/13.2 kV grounded wye system.

Order:	Catalog No.	\$ Price
Switch with indoor enclosure	HVL315BG	26650.00
Surge arrester, 10 kV	HVDSA10	2446.00
Boric acid fuse (set of three, from page 11-14	15SM5080	1508.00
	Total Price	30634.00

# Square D™ Brand DIN/E Fuse Selection Tables—HVL

Table 11.39: DIN/E Current-Limiting Fuses, Non-Disconnecting Type ▲ ■ ♦

(Extended Travel Blown Fuse Indicator)

	Fuse Mou	nting Clip ★		
Continuous	Centers	Diameter	Catalog	\$ Price △
Current	(in)	(mm)	No. ▼	
5 kV Fuse				
10E	17.4	51	55DE010	954.00
15E	17.4	51	55DE015	
20E	17.4	51	55DE020	
25E	17.4	51	55DE025	
30E	17.4	51	55DE030	1980.00
40E	17.4	51	55DE040	
50E	17.4	51	55DE050	
65E	17.4	51	55DE065	
80E	17.4	51	55DE080	
100E	17.4	51	55DE100	
125E	17.4	76	55DE125	3326.00
150E	17.4	76	55DE150	
175E	17.4	76	55DE175	
200E	17.4	76	55DE200	
250E	17.4	76	55DE250	5742.00
300E	17.4	76	55DE300	
350E	17.4	76	55DE350	
400E	17.4	76	55DE400	6430.00
450E	17.4	76	55DE450	
15 kV Fuse				
10E	17.4	51	175DE010	3214.00
15E	17.4	51	175DE015	
20E	17.4	51	175DE020	
25E	17.4	51	175DE025	
30E	17.4	51	175DE030	3290.00
40E	17.4	76	175DE040	
50E	17.4	76	175DE050	
65E	17.4	76	175DE065	4446.00
80E	17.4	76	175DE080	
100E	17.4	88	175DE100	
125E	21.14	88	175DE125	6878.00
150E	21.14	88	175DE150	
175E	21.14	88	155DE175	
200E	21.14	88	155DE200	

- Square D™ brand DIN/E fuses are shown in this table. For fuses produced by other manufacturers, contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.
- Current-limiting fuses will increase the integrated short-circuit ratings beyond the non-fusible units. Contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.
- Caution—These fuses will not work for the MiniBreak. See page 11-7 for the appropriate MiniBreak fuses.
- All fuses are single barrel arrangement with ferrule diameters per the chart.
- Contact your Schneider Electric representative for current stock quantities.

  Price includes one set of three fuses, packed in a single box.

# Boric Acid Fuse Selection Tables □-HVL

Table 11.40: Boric Acid Fuses

Continuous Current	Fuse Type≎	Catalog No.	\$ Price	Fuse Type ☆	Catalog No. ▽	\$ Price ⊖
5 kV F	use Refill					
10E 15E 20E 25E 30E 40E 50E 65E 80E 100E	SM-5S SM-5S SM-5S SM-5S SM-5S SM-5S SM-5S SM-5S SM-5S	5SM5010 5SM5015 5SM5020 5SM5025 5SM5030 5SM5040 5SM5050 5SM5065 5SM5080 5SM5100	1472.00	RBA400 RBA400 RBA400 RBA400 RBA400 RBA400 RBA400 RBA400 RBA400 RBA400	405WBAF010 405WBAF025 405WBAF025 405WBAF030 405WBAF040 405WBAF050 405WBAF065 405WBAF080 405WBAF080	1692.00
125E 150E 175E	SM-5S SM-5S SM-5S	5SM5125 5SM5150 5SM5175		RBA400 RBA400	405WBAF125 405WBAF150	
200E 250E 300E 400E	SM-5S SM-5S SM-5S SM-5S	5SM5200 5SM5250 5SM5300 5SM5400	1528.00	RBA400 RBA400 RBA400 RBA400	405WBAF200 405WBAF250 405WBAF300 405WBAF400	1758.00
15 kV	Fuse Refill	l				
10E 15E 20E 25E 30E	SM-5S SM-5S SM-5S SM-5S SM-5S	15SM5010 15SM5015 15SM5020 15SM5025 15SM5030		RBA400 RBA400 RBA400 RBA400 RBA400	415WBAF010 415WBAF015 415WBAF020 415WBAF025 415WBAF030	
40E 50E 65E 80E 100E	SM-5S SM-5S SM-5S SM-5S SM-5S	15SM5040 15SM5050 15SM5065 15SM5080 15SM5100	1508.00	RBA400 RBA400 RBA400 RBA400 RBA400	415WBAF040 415WBAF050 415WBAF065 415WBAF080 415WBAF100	1732.00
125E 150E 175E	SM-5S SM-5S SM-5S	15SM5125 15SM5150 15SM5175		RBA400 RBA400	415WBAF125 415WBAF150	
200E 250E 300E 400E	SM-5S SM-5S SM-5S SM-5S	15SM5200 15SM5250 15SM5300 15SM5400 Acid Fuses	1554.00	RBA400 RBA400 RBA400 RBA400	415WBAF200 415WBAF250 415WBAF300 415WBAF400	1788.00

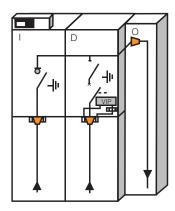
- S&C Boric Acid Fuses
  Type SM-5S fuses are manufactured by the S&C Electric Company.
  SM-5S has a 25.0 kA symmetrical short-circuit rating from 2.4 kV to
  17.0 kV. For 16.5 kV ratings, only S&C boric acid fuses can be used.
  Cutler-Hammer Westinghouse Fuses
  Type RBA-400 fuses are manufactured by Cutler-Hammer EATON Corporation. RBA-400 has a 37.5 kA symmetrical ampere
  short-circuit rating from 2.4 kV to 4.8 kV and 29.4 kA symmetrical
  from 12 kV to 13.8 kV.
- Caution—These fuses will not work for the MiniBreak. See page 11-7 for the appropriate MiniBreak fuses.
- Contact your Schneider Electric representative for current stock
- Price includes one set of three fuses, packed in a single box.



#### Medium Voltage Switchgear



Typical IDO Configuration



#### New DVCAS Switchgear for Wind Farm Applications

DVCAS medium voltage (MV) switchgear from Schneider Electric is designed to meet the electrical switching, protection, and connection needs of wind farm applications up to 38 kV. Three different modules are available:

- Transformer protection module D
- Outgoing line module O
- Incoming line module I

For standard wind power applications, a maximum of four modules can be connected in various configurations to provide the most commonly used wind power functions.

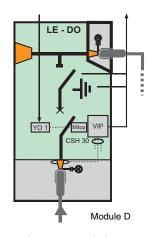
DVCAS switchgear is designed, manufactured, and tested in accordance with the following standards:

- C37.20.3
- C37.54
- CAN/CSA C22.2 No.31-M89

#### **Transformer Protection Module D**

DVCAS switchgear module D provides transformer protection. Construction features include:

- Metal base frame
- Operating mechanism and relay compartment
  - disconnector operating mechanism
  - operating mechanism of the circuit breaker
  - protection relay VIP
  - zero sequence current transformer CSH 30
- MV cable compartment
  - bushings for cable connection
  - Three ČRc current sensors per phase
- Stainless steel, gas-tight tank
  - busbar system
  - three position disconnector
  - circuit breaker



#### **Outgoing Line Module O**

DVCAS switchgear module O functions as an outgoing line to a downstream wind generator. There are two medium voltage cables per phase. Construction features include:

- Metal base frame
- Voltage presence indicator
- MV cable compartment
  - bushings for cable connection
  - clamps for MV cable connection

#### **Recommended Configurations**



**D + O**Transformer protection + Outgoing line



(I + D + O)

Incoming line + Transformer protection + Outgoing line



(I+I+D+O)
Two Incoming lines + Transformer protection + Outgoing line

#### **Incoming Line Module I**

DVCAS switchgear module I is a three-position switch-disconnector. It is recommended for the incoming line function from an upstream wind generator for the following reasons:

- · Reduces downtime caused by faults
- Helps with fault detection
- Reduces interruptions due to maintenance work
- Improves energization works

Module I is always connected to module D on the right with single-phase, coupling bushings. Construction features include:

- Metal base frame
- Operating mechanism compartment
  - operating mechanism of the switch-disconnector
  - motor for the operating mechanism (optional)
- MV cable compartment
  - bushings for cable connection
  - Stainless steel, gas-tight tank
  - busbar system
  - three position disconnector

# Remote operation Remote control Motor power supply RE - I Module I

#### Table 11.41: Ratings

_			
Туре	Rating	Туре	Rating
Frequency (Hz)	50/60	Short circuit breaking current capacity (kA)	20
Rated voltage (kV)	38	Short circuit making capacity, peak (kA)	50
Insulation level		Internal arc withstand IAC AFL (kA/1s)	20
Power frequency withstand voltage (kV)	70	Degree of protection (NEMA/IP)	
Lightning impulse withstand voltage, peak (kV)	170	HV compartment	6/67
Rated current of the main busbar (A)	600	LV and operating mechanism compartment	6P/3X
Short time withstand current (kA/s)	20/3	SF6 gas pressure at 20 °C (PSI/bar)	4.35/0.3



Two-high, Masterclad 5-27 kV Indoor, Metalclad Switchgear



Vacuum VR Circuit Breaker for Masterclad Switchgear



Masterclad 27 kV Outdoor Non Walk-in, Metalclad Switchgear



Arc-Terminator™ Arc Extinguishing System



Two-high, Masterclad 5-15 kV Metalclad, Arc-Resistant Switchgear

# Masterclad™ Medium Voltage Metalclad Switchgear (UL Listed)

#### The Reliability of a Quality Design

Class 6055 / Refer to Catalog 6055CT9901 or Handouts 6055HO0901, 6000HO1001

The quality of Square D™ brand Masterclad medium voltage metalclad switchgear stems from a design and manufacturing process that focuses on long-term switchgear performance with the highest degree of reliability.

Based on specific customer application needs, Schneider Electric engineers and technicians select the appropriate standard sections and bus configurations, with the ability to customize where needed. After the specified circuit breakers, instrument and control power transformers, relays, meters and other components are selected and approved. All are factory-assembled, wired, and tested as a complete assembly.



Table 11.42: Ratings

Nominal voltage (kV)	4.16			7.2		13.8			24.9	
Maximum voltage (kV)		4.76		8.25		15	5.0		27	7.0
BIL (kV)	60			95	95				125	
Frequency (Hz)	50/60									
Continuous amperes (A)	1200–3000 1200–20				-2000					
MVA (reference only)	250	350	500	500	500	750	1000	1500	1250	2000
Short-time rating (kA) 3 seconds	40	50	63	50	25	40	50	63	25	40
Close and latch rating (kA) (peak)	104	130	164	130	65	104	130	164	68	108

#### Type VR Vacuum Circuit Breaker

The VR breaker is a horizontal drawout type designed to provide long life, reduced maintenance, and ease of handling. The Type RI advanced design motor-charged stored energy mechanism is a model of reliability with simplicity-with an operating life exceeding ANSI requirements. The VR circuit breaker is UL labeled and includes a permanently mounted manual charging handle.

#### **Switchgear Construction**

- Floor mounted breaker racking mechanism
- Standard epoxy supports or optional porcelain supports
- Aluminum or copper main bus
- Indoor NEMA 1
- Outdoor NEMA 3R
- Walk-in
- Non walk-in

## **Active, Arc-Resistant** Arc Terminator™ Arc Extinguishing System

Active system detects and controls the effects of internal arcing faults. It complies with ANSI C37.20.7 requirements for arc-resistant switchgear for Type 1, Type 2B, and Type 2C enclosures.

## **Benefits**

- Prevents pressure buildup
- Reduces release of toxic materials
- Eliminates need for reinforced switchgear
- Elimnates special requirements for buildings or plenums
- Minimizes equipment damage
- Reduces operating downtime

# Passive, Arc-Resistant Masterclad™ Medium Voltage Switchgear

This switchgear and all its components meet the IEEE C37.20.7 arc-resistant test guideline for Type 2B enclosures as well as all other applicable ANSI, UL, and CSA standards for metalclad switchgear.

#### **Benefits**

- 50 kA arc containment for 0.5 seconds
- Voltage ratings from 2.4 kV to 15 kV up to 3,000 A
- Type 2B construction, one- and two-high structures
- Custom exhaust plenum available

#### Power-Zone Load Center: Power-Zone™ Model III

Classes 6010, 6020 / Refer to Catalog 6020CT9401 or Data Bulletin 6010DB1001

#### Power-Zone Load Center Unit Substations

#### Table 11.42: Complete Close Coupled Unit Substations Available

Product Type	Class Nos.	Product Section No.		
Primary Section				
Medium voltage load interrupter switchgear	6040, 6045			
Metalclad switchgear	6055	11-1		
Low voltage Power-Style™ QED switchboard	2741-2744	11-1		
Air terminal chamber	7421-23, 7310, 7240, 7320			
Transformer Section				
Open, ventilated dry—Power-Dry™	7421-23			
Open, ventilated dry/cast resin combination—Uni-Cast™	7320	14-1		
Open, ventilated cast resin—Power-Cast™	7310	14-1		
Mineral oil or high fire point fluid—liquid	7240			
Secondary Section				
Medium voltage load interrupter switchgear	6040			
Metalclad switchgear	6055			
Medium voltage motor control center	8198	11-1		
Low voltage Power-Style QED switchboard	2741-2744	11-1		
Air terminal chamber	7421,23, 7310, 7240, 7320			
Low voltage drawout switchgear	6037			
Low voltage Model 6 motor control centers	8998	17-1		



Unit Substation

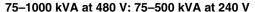
#### New!) Power-Zone Model III Package Unit Substations

Power-Zone Model III package unit substations combine a primary switch, dry-type transformer, and I-Line™ distribution section into a single, compact unit. All components are engineered, manufactured, and tested by Schneider Electric. The substation is available with a UL listing.

The Model III is only 49 inches deep and 90 inches high, which allows the entire substation to pass through standard size doorways and narrow hallways.

The Model III is front accessible; the transformer taps are accessible from the side. For proper ventilation, a minimum distance of 12 inches should be maintained on the transformer side of the equipment.

Model III package unit substations are ideal for renovations and high rise applications requiring increased customer electrical demand as well as new construction requiring multiple zones and a small footprint.



Available with primary voltages of 2400-13800 V. Forced air cooling (AA/FA) provides an additional 33%. Features 220 °C insulation and 150 °C, 115 °C, or 80 °C temperature rise. Largest 80 °C or 115 °C rise unit available is 750 kVA.

The secondary circuit breaker distribution section may be equipped with an individually mounted secondary main breaker or an I-Line distribution panelboard. Branch circuit breakers from 15 A FY to PowerPact RLC 1200 A may be installed. PowerPact™ molded case circuit breakers M, P, and R frame are available with electronic trip units.

Additional options include CM 3000 and CM 4000 series circuit monitors, PM-800 series power meters, surge arresters, and I-Line plug-on unit with a Surgelogic™ Surge Protective Device (SPD).

#### **Incoming Line Section**

Most Model IIIs are supplied with a Square D™ brand fused HVL/cc 600 A load interrupter switch. The HVL/cc offers the smallest footprint in the industry and is an exclusive sealed interruption type compartmentalized switch. Where switching and overcurrent protection are provided elsewhere, a full-height air-filled terminal chamber can be provided in place of the switch.

Table 11.43: Primary Switch Ratings, Type HVL/cc

Nominal Voltage	4.16	13.8
BIL	60	95
Continuous amperes	600	600
Interrupting amperes	600	600
Fault close (kA asymmetrical)	40	40
Momentary current (kA asymmetrical 10 cycles)	40	40
Duty-cycle-fault-close (number of operations)	4	4
Grounding switch fault close (kA asymmetrical)	40	40
Short-time rating (kA asymmetrical 2 seconds)	25	25
Dielectric withstand (kV 1 minute)	19	36
Electrical endurance (close-open)	100	100
Mechanical endurance (close-open)	1000	1000



Model III Package Unit Substation with HVL/cc Load Interrupter Switch (on left)

#### **Transformer Section**

Special barrel wound dry-type transformers employing resin encapsulated VPI (Vacuum Pressure Impregnation) techniques are used to achieve the low-loss, compact design necessary for the space-saving package substation concept. Class H, 220 °C insulation is used throughout. Temperature rise is 150 °C as standard, although 80°C or 115 °C low temperature premium transformers are available through 750 kVA. Aluminum windings are standard with copper as an option. Four full capacity 2-1/2 percent taps are provided-two above nominal voltage and two below.

Class 6010 / Refer to Catalog 6020CT9401

Fan cooling is optional. When selected, it increases the capacity rating of the transformer an additional 33 percent. The Model 98 digital controller is employed. This system provides precision control through the use of three high accuracy thermocouple type sensors—one in each phase of the windings.

The controller has a membrane front panel for displaying the temperature of all three phases with individual readings. The hottest phase is automatically displayed. The Model 98 digital controller features simple three-button operation with fan, alarm and trip function settings and is Powerlogic™ compatible.

Table 11.44: Transformer Basic Insulation Levels

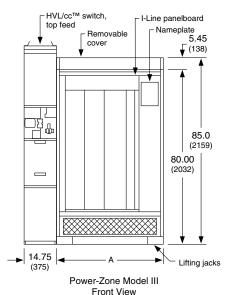
KV Class	Primary Voltages	Primary Voltages BIL	
1.2	< 600 V Secondary	10	4 kV
2.5	2400	20	10 kV
5.0	4160, 4800	30	12 kV
7.2	6900, 7200	30	12 kV
8.7	8320	45	19 kV
15.0	12, 12.47, 13.2, 13.8	60	31 kV

#### **Distribution Section**

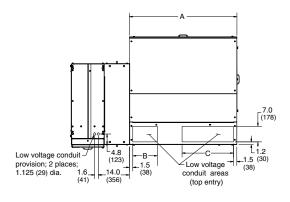
#### I-Line™ Mounted Molded Case Circuit Breakers

Molded case circuit breakers are group mounted in an I-Line panelboard section offering the inherent ease of installation for which the plug-on I-Line circuit breaker has become known. All circuit breakers are quick-make, quick-break, thermal magnetic, permanent trip type and are factory-calibrated and sealed for accurate overcurrent response and maximum short-circuit strength. PowerPact™ P and R circuit breakers are available with solid-state Micrologic™ trip units. Current limiting high interrupting capacity FI, KI, and LI circuit breakers are also available. Circuit breakers may be safely back-fed for use as main circuit breakers. All circuit breakers are UL listed and carry integrated equipment rating when used exclusively with other Square D™ brand circuit breakers in intended assemblies.

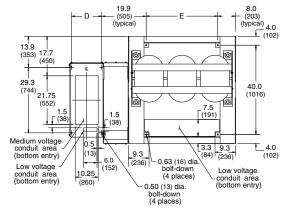
I-Line panel is available in 1200 A. Maximum mounting space is 108 inches. Tin-plated copper bus is standard.



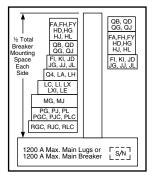
Dimensions shown in Inches (mm). See Table 11.45 for A, B, C D F dimensions



Top Conduit Entrances



**Bottom Conduit Entrances** 



HCR-U 1200 A I-Line panelboards can be used for up to 600 Vac. They are UL Listed under File E33139.

Table 11.45: Substation Dimensions and Approximate Weights

kVA	Temperature		Estimated				
KVA	Rise ° C			С	D	E	Weight
75							
112.5	80, 115, 150		11.0 23.0 13.	ĺ			3600
150		48		13.5	13.5 32.0		
225	80, 115, 150	40	11.0	23.0	13.5	32.0	4500
300	60, 115, 150					4500	
500	150						6000
500	80, 115						6200
750	80, 115, 150	60	18.5	27.0	18.75	44.0	6700
1000	150						7500

Contact your nearest Schneider Electric sales office for pricing assistance.

# Motorpact™ Medium Voltage Motor Controllers (UL Listed)

Square D™ brand Motorpact medium voltage motor controllers from Schneider Electric are designed and manufactured to tackle the toughest power and process control challenges. Our motor controllers feature industry-first innovations that provide unmatched performance, high reliability, low maintenance and exclusive technologies. Motorpact medium voltage motor controllers are designed to provide the most efficient means to control and protect a wide range of applications and may be configured for motor starting, transformer feeders, capacitor feeders, or future spaces. The design has fewer losses inside the controller, providing more efficient use of power for the connected load.

Motorpact controllers are designed to meet or exceed the standards for NEMA ICS3 Part 2, UL Standard 347, and IEC 60470. UL and cULus labels are standard.

Starting application for squirrel cage induction motors:

- Full voltage non-reversing
- Full voltage reversing
- 2-speed, 2-winding, 2-speed, 1-winding
- Reduced voltage non-reversing
  - Auto transformers
  - Solid state soft start
  - Sequential soft start (S3) multi-motor starting

Enclosures are available in NEMA Type 1, 1A, and 3R and feature the smallest footprint in the industry at 14.75 inches wide. Enclosures that are 20 inches and 29.5 inches wide are also available for FVNR.

Optional arc resistant enclosures are available that meet IEEE C37.20.7.

Units are designed as one-high construction for ease of use with a optimum height for the operator controls and isolation switch disconnect handle.

Full front and or front and rear accessibility are provided. A full height cable pulling area is

Controller voltage ratings range from 2.3-7.2 kV vacuum contactors feature a drawout design and have ratings of 200, 400, 450, and 720 A.

Options include live line indicators, blown fuse tripping, solid state protective relays, power factor correction capacitors, surge arresters, surge capacitors and a cable grounding switch.

## Vacuum Substation Circuit Breakers—Types FVR, EOX, VOX (Not UL Listed)

By combining the latest developments in circuit breaker technology with world-renowned quality, vacuum substation circuit breakers from Schneider Electric are the most advanced medium voltage circuit breakers available. Type FVR Powersub™ circuit breakers include arc-resistant construction and are built to comply with ANSI standards. Type EOX substation circuit breakers are available with a magnetic or spring actuator. Type VOX includes a vacuum circuit breaker housed in a tank filled with SF6 (sulfur hexafluoride) for added environmental benefits and reduced space requirements.



Туре	Voltage (kV)	Amperage (A)	BIL	Short-time Rating kA (3 seconds)
EOX ▲	15	1200, 2000	110	12–31.5 ■
FVR	15	600-4000	110	12-40
EOX ♦	27	1200, 2000	125 (150)	25–31.5
FVR	21	1200, 2000	125 (150)	12-25@125; 31.5@150
VOX		1200, 2000	150 (200)	12-40
FVR	38	1200, 2000	150	12–31.5
FVN		1200	200	12–25

- Spring- and magnetic-actuated
- 31.5 for spring-actuated; maximum magnetic-actuated = 25.
- Spring- actuated.

The arc-resistant design of Type FVR circuit breakers takes safety to the next level. In the event of an arc, the arc-resistant construction provides increased safety for personnel working in proximity of the breaker by venting resultant arc by-products and ionized gases upward and away from exterior panels that otherwise may not remain intact and in place. Type FVR circuit breakers also provide superior protection as a result of their high speed operation. You can expect long life from the product as the vacuum interrupter contacts are protected from corroding elements and contamination.

Type EOX magnetic circuit breakers contain a magnetic actuator, electronic controller, and capacitors to store energy for circuit breaker operation. Our innovative design uses only one coil for opening and closing the circuit breaker. There are no critical friction parts, which increases the reliability and life of the mechanism. The tripping energy required is also lower than that of other products available on the market. In emergency situations, the circuit breaker can be easily tripped mechanically.

Type VOX circuit breaker vacuum interrupters are housed in a fully welded, sealed-for-life, stainless steel tank, providing a controlled gas insulated environment totally immune to external ambient conditions. A spring-charged mechanism provides manual or motorized circuit breaker operation.



**MV Controllers and** 

Substation Circuit

**Breakers** 





Type FVR





N-series



#### New!) Automatic Circuit Recloser

#### Overview

The Automatic Circuit Recloser combines state-of-the-art vacuum arc interruption with integrated voltage and current measurement. These features are encased in a fully welded and sealed, 316 grade, stainless steel tank. Three types of reclosers are available: N-series (three-phase), U-series (three-phase), and W-series (single phase).

#### **Applications**

- Feeder automatic circuit recloser
- Substation automatic circuit recloser
- Loop automation
- Automatic change-over
- Smart grid

W-series



#### New Load Break Switch/Sectionalizer

# RL-series

#### Overview

The RL-series Load Break Switch/Sectionalizer is a switch used in conjunction with an upstream recloser or circuit breaker. It counts the interruptions created by a recloser during a fault sequence. On a preset count, the sectionalizer trips during the dead time of the up stream recloser and isolates the faulty network section.

#### **Applications**

- Manual load-break switch
- Motorized load-break switch
- Fully automated sectionalizer
- Normally-open tie point

#### Table 11.47: Ratings

Assistance	Auto	matic Circuit Rec	Load Break Switch/Sectionalizer	
Attribute	N-series	U-series	W-series         RL-series           1         3           15, 24         15, 27, 38           400         630           6         12.5/16	RL-series
Phases	3	3	1	3
Nominal Voltage (kV)	15, 27, 38	15, 27	15, 24	15, 27, 38
Continuous amperes (A)	800	630	400	630
Short-time rating (kA)	12.5/16	12.5	6	12.5/16
Insulation	Gas	Ероху	Epoxy	Gas
Interruption		Vacuum		Gas
Operations (elec/mech)		10000/10000		600/5000

#### New!) ADVC Controller

#### Overview

The ADVC controller offers advanced protection, measurement, diagnostic, and communication features in a reliable package. Designed around the user, the controller offers flexibility and choice. Users have a choice of two cubicle sizes (ULTRA and COMPACT) and two operator interfaces (flexVUE and setVUE).

All the protection, monitoring, communication, diagnostic, and automation features are included as standard in all models:

- ULTRA—large 316SS controller cubicle with two accessory mounting areas
- COMPACT—smaller 304SS controller cubicle with one accessory mounting area
- flexVUE—interface with 20 configurable status lamps and 12 quick action keys
- setVUE—large 4 x 40 LCD with familiar menu-driven operation

#### **Applications**

The ADVC controller interfaces with the following:

- N-series recloser
- U-series recloser
- W-series recloser
- RL-series load break switch/sectionalizer



**Busway** 

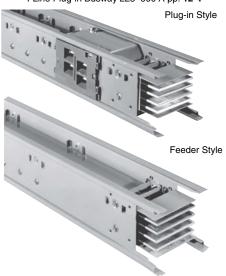


# Section Listing

Powerbus 100-400 A pp. 12-2



I-Line Plug-in Busway 225-600 A pp. 12-4



I-Line II Busway 800-5000 A pp. **12-5** 



I-Line Plug-In Units pp. 12-9



Power-Zone Busway pp.12-16



400 Ampere—600 Volt	12-2
225 Ampere—600 Volt	12-2
100 Ampere—600 Volt	12-2
Powerbus Plug-In Units	12-3, 12-20

#### I-Line<sup>™</sup>/ I-Line II Busway

I-Line Busway Standard Components	12-4
I-Line II Busway Standard Components	12-5
I-Line II Pricing Instructions	12-6, 12-7
Accessories	12-8
Plug-In Units (Fusible and Circuit Breaker Types)	12-9, 12-10
PowerPact <sup>™</sup> H- and J-Frame Plug-in Units	12-11
Newl PowerPact <sup>™</sup> H-, J-, and L-Frame Plug-in Units with Electronic Trip	12-12
PowerPact™ M-Frame Plug-in Units	12-13
Newl) PowerPact™ P-Frame Plug-in Units	12-14
PowerPact™ R-Frame Plug-in Units	12-15

# Power-Zone<sup>™</sup> Busway

Non-Segregated Busway	12-16
Footage and Fittings	12-17
Options and Accessories	12-18

#### Distinct service advantages make your Busway installation "hassle-free"

- Missing Link program guarantees shipment in a maximum of 5 working days of a small quantity
  of indoor feeder straight lengths and fittings. Orders for outdoor busway or for international
  destinations may require 2 extra days for processing.
- Measurement Services are offered for your critical and complex projects. Schneider Electric
  will assist with field measurement and assume responsibility for the layout and exact fit of all
  components. Contact your local Schneider Electric sales office for exact details.
- Emergency Service; we are on call 24 hours a day, 7 days a week, 365 days a year. For emergencies, call 1-888-SquareD (1-888-778-2733).
- Quick Ship program provides product availability for time sensitive orders. The program is
  available through the product selectors and offers a limited selection of I-Line busway footage and
  fittings. Contact your local Schneider Electric sales office for exact details.







#### **Powerbus Busway**

#### Construction

Powerbus busway construction consists of a light-weight electrical grade all-aluminum housing with up to five (5) silver-plated copper conductor bars for maximum electrical efficiency. The total product offer includes straight sections, fittings, accessories, and plug-in units for a total installation. This busway is available in 400 A, 225 A and 100 A ratings. A 50% integral ground is standard.

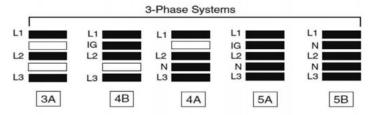
#### **Straight Sections**

Straight sections of busway are available in 10 ft. and 4 ft. lenghts in a painted black finish. The Enhanced busway offer includes 10 plug-in openings on each side of a 10 ft. section and 3 plug-in openings on each side of a 4 ft. section.

#### **Metering and Communications Options**

Powerbus busway tap boxes and plug-in units are available with optional metering and communication capabilities, which include an integrated display and the ability to remotely monitor the busway.





NOTE: Single phase sysstems are also available. Contact your local Schneider Electric representative.

Table 12.1: 3Ø3W—Powerbus Straight Lengths and Fittings ▲ —600 V Maximum

A	Component	Configuration	3A	Configuration 4B		
Amperage	Component	Catalog No.	\$ Price	Catalog No.	\$ Price	
100 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■ ◆	PBCE3A100AST120B PBCE3A100AST48B PBCF3A100ALLB PBCF3A100ALRB PBCF3A100ACRB PBCF3A100ATBB PBCF3A100ATBB	1556.00 887.00 1344.00 1344.00 1574.00 1962.00 5207.00	PBCE4B100AST120B PBCE4B100AST148B PBCF4B100ALLB PBCF4B100ACRB PBCF4B100ACRB PBCF4B100ATBB PBCF4B100ATBM()B	1860.00 1105.00 1406.00 1406.00 1660.00 2152.00 5397.00	
225 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■	PBCE3A225AST120B PBCE3A225AST48B PBCF3A225ALLB PBCF3A225ALRB PBCF3A225ACRB PBCF3A225ATBB PBCF3A225ATBM()B	2896.00 1208.00 2044.00 2044.00 2510.00 2600.00 5845.00	PBCE4B225AST120B PBCE4B225AST148B PBCF4B225ALLB PBCF4B225ACRB PBCF4B225ACRB PBCF4B225ATBB PBCF4B225ATBM()B	3570.00 1475.00 2490.00 2490.00 3060.00 2954.00 6199.00	
400 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■	PBCE3A400AST120B PBCE3A400AST48B PBCF3A400ALLB PBCF3A400ALRB PBCF3A400ACRB PBCF3A400ATBB PBCF3A400ATBM()B	4690.00 1976.00 2867.00 2867.00 3760.00 4275.00 7520.00	PBCE4B400AST120B PBCE4B400AST48B PBCF4B400ALLB PBCF4B400ACRB PBCF4B400ACRB PBCF4B400ATBB PBCF4B400ATBM()B	5850.00 2340.00 3595.00 3595.00 4694.00 4750.00 7995.00	

Table 12.2: 3Ø4W—Straight Lengths and Fittings ▲ —600 V Maximum

A	Component	Configuration	4A	Configuration	5A	Configuration	5B
Amperage	Component	Catalog No.	\$ Price	Catalog No.	\$ Price	Configuration  Catalog No.  PBCE5B100AST120B PBCF5B100AST48B PBCF5B100ALB PBCF5B100ALB PBCF5B100ACB PBCF5B100ATBM()B PBCF5B100ATBM()B PBCF5B100ATBM()B PBCF5B225AST120B PBCF5B225AST49B PBCF5B225ALB PBCF5B225ATBB PBCF5B225ATBB PBCF5B225ATBB PBCF5B225ATBB PBCF5B400ALBB PBCF5B400ALBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB PBCF5B400ATBB	\$ Price
100 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■◆	PBCE4A100AST120B PBCE4A100AST48B PBCF4A100ALLB PBCF4A100ALRB PBCF4A100ACRB PBCF4A100ATBB PBCF4A100ATBM ()B	1860.00 1105.00 1406.00 1406.00 1660.00 2152.00 5397.00	PBCE5A100AST120B PBCE5A100AST148B PBCF5A100ALLB PBCF5A100ACRB PBCF5A100ACRB PBCF5A100ATBB PBCF5A100ATBM()B	2319.00 1219.00 2212.00 2212.00 2984.00 2502.00 5747.00	PBCE5B100AST48B PBCF5B100ALLB PBCF5B100ALRB PBCF5B100ACRB PBCF5B100ATBB	2319.00 1219.00 2212.00 2212.00 2984.00 2502.00 5747.00
225 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■	PBCE4A225AST120B PBCE4A225AST48B PBCF4A225ALLB PBCF4A225ALRB PBCF4A225ACRB PBCF4A225ATBB PBCF4A225ATBB	3570.00 1475.00 2490.00 2490.00 3060.00 2954.00 6199.00	PBCE5A225AST120B PBCE5A225AST48B PBCF5A225ALLB PBCF5A225ALRB PBCF5A225ACRB PBCF5A225ATBB PBCF5A225ATBB	4650.00 2456.00 3920.00 3920.00 5408.00 4570.00 7815.00	PBCE5B225AST48B PBCF5B225ALLB PBCF5B225ALB PBCF5B225ACRB PBCF5B225ATBB	4650.00 2456.00 3920.00 3920.00 5408.00 4570.00 7815.00
400 A	Enhanced Straight 10 ft. Enhanced Straight 4 ft. Elbow – Left Elbow – Right Cross Fitting Tap Box Tap Box w/Meter■	PBCE4A400AST120B PBCE4A400AST48B PBCF4A400ALLB PBCF4A400ALRB PBCF4A400ACRB PBCF4A400ATBB PBCF4A400ATBM()B	5850.00 2340.00 3595.00 3595.00 4694.00 4750.00 7995.00	PBCE5A400AST120B PBCE5A400AST148B PBCF5A400ALLB PBCF5A400ACRB PBCF5A400ACRB PBCF5A400ATBB PBCF5A400ATBM()B	7150.00 2860.00 5145.00 5145.00 6565.00 6705.00 9950.00	PBCE5B400AST48B PBCF5B400ALLB PBCF5B400ALRB PBCF5B400ACRB PBCF5B400ATBB	7150.00 2860.00 5145.00 5155.00 6705.00 9950.00

Note: Also suitable for DC applications.

- ▲ Busway catalog numbers shown include a black painted finish. Contact your local Schneider Electric representative for a natural aluminum finish option.
- Replace the ( ) in the Tap Box w/Meter catalog number with the meter suffix number in the table below. The meter will be configured based on the system voltage.
- For 100 A busway only, add an additional (L) for top cable access or a (U) for bottom cable access.

Table 12.3: Accessories

December	100 A	1	225 A	<b>\</b>	400 A	
Description	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
Standard Hanger	PB100FH	50.00	PB225FH	80.00	PB400FH	100.00
Side Mount Hanger	PB100HFW	120.00	PB225HFW	120.00	PB400HFW	120.00
Vertical Sway Brace	PB100VSB	50.00	PB225VSB	80.00	PB400VSB	100.00
End Closure	PB100AEC	120.00	PB225AEC	226.00	PB400AEC	298.00
Wall Flange	PB100WF	140.00	PB225WF	196.00	PB400WF	244.00
Plug-in Opening Cover	PBPIOCVR	60.00	PBPIOCVR	60.00	PBPIOCVR	60.00

Meter Suffix	System Voltage
1	208Y/120 V 3Ø4W
2	240 V 3Ø3W
4	415/240 V 3Ø4W
5	480Y/277 V 3Ø4W

#### **Three-Phase Systems**











8

Type 4

#### **Powerbus Plug-in Units**

Powerbus<sup>™</sup> Busway

Powerbus plug-in units are rated maximum 100 A and may be offered as field installable or factory assembled units. All units conform to NEMA type 1. An optional kit is available for FA and QO units to raise the protection to IP54. This kit raises the QOR unit to moisture protection of IPX3.

Table 12.4: Plug-In Units— Circuit breakers not included

_			Space for One (1 3 Phase FA Circuit B		3 Spaces for QO/QOB Circuit Bre		3 Spaces for QO/QOB Circu 3 Openings for Receptacle		
Busbar onfiguration	Tap Box		FA Unit		QO Unit				
රි							QOR Unit		
	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	
3A 4B 4A 5A	PBPTB3A100 PBPTB4B100 PBPTB4A100 PBPTB5A100	614.00 670.00 670.00 782.00	PBPFA4B100 PBPFA4A100	832.00 870.00 870.00 946.00	PBPQO4B100 PBPQO4A100	424.00 452.00 452.00 466.00	PBPQOR4B100 PBPQOR4A100	566.00 586.00 586.00 604.00	

Note: Plug-in tap box to be installed on 100 A and 225 A busways only.

▲ Certain NEMA receptacles can be field installed in this unit. Consult your local Schneider Electric representative.

Table 12.5: Factory Assembled Units with FA Circuit Breakers—600 V max

Circuit Breaker	3A Configuration		4A Configuration▲		5A Configuration		5B Configuration	
Rating	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
15 20 30 40 50 60	PBPFA3A100A015 PBPFA3A100A020 PBPFA3A100A030 PBPFA3A100A040 PBPFA3A100A050 PBPFA3A100A060	1780.00 1780.00 1780.00 1780.00 1780.00 1780.00	PBPFA4A100A015 PBPFA4A100A020 PBPFA4A100A030 PBPFA4A100A040 PBPFA4A100A050 PBPFA4A100A060	1820.00 1820.00 1820.00 1820.00 1820.00 1820.00	PBPFA5A100A020 PBPFA5A100A030 PBPFA5A100A040 PBPFA5A100A050	1978.00 1978.00 1978.00 1978.00 1978.00 1978.00	PBPFA5B100A020 PBPFA5B100A030 PBPFA5B100A040 PBPFA5B100A050	1978.00 1978.00 1978.00 1978.00 1978.00 1978.00
70 80 90 100	PBPFA3A100A070 PBPFA3A100A080 PBPFA3A100A090 PBPFA3A100A100	1912.00 1912.00 1912.00 1912.00	PBPFA4A100A070 PBPFA4A100A080 PBPFA4A100A090 PBPFA4A100A100	1954.00 1954.00 1954.00 1954.00	PBPFA5A100A080 PBPFA5A100A090	2124.00 2124.00 2124.00 2124.00	PBPFA5B100A080 PBPFA5B100A090	2124.00 2124.00 2124.00 2124.00

Note: See Digest Section 7 for FA circuit breaker information.

▲ The 4B configuration catalog numbers are also available and are priced the same as the 4A configuration.

#### Table 12.6: 120 V Factory Assembled Units

1-pole QO/QOB circuit breakers with NEMA 5-15R or 5-20R receptacles▲

Circuit E	Breaker	4A Configuration		5A Configuration		5B Configuration	
Rating	Туре	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
Туре	e 1	(3 circuit breakers w. 3 duplex re	ceptacles)				
15	QO	PBPQOR4A100M115	850.00	PBPQOR5A100M115	950.00	PBPQOR5B100M115	950.00
15	QOB	PBPQOR4A100M115B	886.00	PBPQOR5A100M115B	986.00	PBPQOR5B100M115B	986.00
20	QO	PBPQOR4A100M120	850.00	PBPQOR5A100M120	950.00	PBPQORBA100M120	950.00
20	QOB	PBPQOR4A100M120B	886.00	PBPQOR5A100M120B	986.00	PBPQOR5B100M120B	986.00
Туре	e 2	(3 circuit breakers w. 2 duplex/1 lo	cking recpt.)				
15	QO	PBPQOR4A100M215	862.00	PBPQOR5A100M215	962.00	PBPQOR5B100M215	962.00
15	QOB	PBPQOR4A100M215B	898.00	PBPQOR5A100M215B	998.00	PBPQOR5B100M215B	998.00
20	QO	PBPQOR4A100M220	862.00	PBPQOR5A100M220	962.00	PBPQOR5B100M220	962.00
20	QOB	PBPQOR4A100M220B	898.00	PBPQOR5A100M220B	998.00	PBPQOR5B100M220B	998.00
Туре	e 3	(3 circuit breakers w. 1 duplex/2	locking recpt	<b>.</b> )			
15	QO	PBPQOR4A100M315	874.00	PBPQOR5A100M315	974.00	PBPQOR5B100M315	974.00
15	QOB	PBPQOR4A100M315B	910.00	PBPQOR5A100M315B	1010.00	PBPQOR5B100M315B	1010.00
20	QO	PBPQOR4A100M320	874.00	PBPQOR5A100M320	974.00	PBPQOR5B100M320	974.00
20	QOB	PBPQOR4A100M320B	910.00	PBPQOR5A100M320B	1010.00	PBPQOR5B100M320B	1010.00
Туре	e 4	(3 circuit breakers w. 3 locking re	eceptacles)				•
15	QO	PBPQOR4A100M415	886.00	PBPQOR5A100M415	986.00	PBPQOR5B100M415	986.00
15	QOB	PBPQOR4A100M415B	922.00	PBPQOR5A100M415B	1022.00	PBPQOR5B100M415B	1022.00
20	QO	PBPQOR4A100M420	886.00	PBPQOR5A100M420	986.00	PBPQOR5B100M420	986.00
20	QOB	PBPQOR4A100M420B	922.00	PBPQOR5A100M420B	1022.00	PBPQOR5B100M420B	1022.00

Note: See Digest Section 7 for QOU circuit breaker information.

Many more factory assembled units are available using combinations of 1P/2P/3P circuit breakers with other NEMA receptacles. Maximum of 3 breaker spacess available. Consult your local Schneider Electric representative.

#### Table 12.7: Factory Assembled Units

One (1) QOU circuit breaker and one (1) drop cord with connector

Circuit E	Breaker	NEMA	Drop Cord	4A Configuration	l de la company	5A Configuration		5B Configuration	
Rating	Poles	Connector	Length (ft)	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
15 A 20 A 30 A	1 1 1	L5-15 L5-20 L5-30	3 3 3	PBPQOU4A100COOL515 PBPQOU4A100COOL520 PBPQOU4A100COOL530	886.00	PBPQOU5A100COOL515 PBPQOU5A100COOL520 PBPQOU5A100COOL530	986.00 986.00 996.00	PBPQOU5B100COOL520	986.00 986.00 996.00
15 A 20 A 30 A	2 2 2	L6-15 L6-20 L6-30	3 3 3	PBPQOU4A100COOL615 PBPQOU4A100COOL620 PBPQOU4A100COOL630	948.00	PBPQOU5A100COOL615 PBPQOU5A100COOL620 PBPQOU5A100COOL630	1048.00 1048.00 1058.00	PBPOOU5B100COOL620	1048.00 1048.00 1058.00
20 A 30 A	3	L21-20 L21-30	3 3	PBPQOU4A100COOL2120 PBPQOU4A100COOL2130		PBPQOU5A100COOL2120 PBPQOU5A100COOL2130	1252.00 1262.00	PBPQOU5B100COOL2120 PBPQOU5B100COOL2130	1252.00 1262.00
15 A 20 A 30 A	1 1 1	L5-15 L5-20 L5-30	6 6 6	PBPQOU4A100FOOL515 PBPQOU4A100FOOL520 PBPQOU4A100FOOL530	946.00	PBPQOU5A100FOOL515 PBPQOU5A100FOOL520 PBPQOU5A100FOOL530	1046.00 1046.00 1056.00	PBPQOU5B100FOOL515 PBPQOU5B100FOOL520 PBPQOU5B100FOOL530	1046.00 1046.00 1056.00
15 A 20 A 30 A	2 2 2	L6-15 L6-20 L6-30	6 6 6	PBPQOU4A100FOOL615 PBPQOU4A100FOOL620 PBPQOU4A100FOOL630	1008.00	PBPQOU5A100FOOL615 PBPQOU5A100FOOL620 PBPQOU5A100FOOL630	1108.00 1108.00 1118.00	PBPQOU5B100FOOL615 PBPQOU5B100FOOL620 PBPQOU5B100FOOL630	1108.00 1108.00 1118.00
20 A 30 A	3	L21-20 L21-30	6 6	PBPQOU4A100FOOL2120 PBPQOU4A100FOOL2130		PBPQOU5A100FOOL2120 PBPQOU5A100FOOL2130	1312.00 1322.00		1312.00 1322.00

Note: See Digest Section 7 for QOU circuit breaker information. Catalog numbers shown have the breaker in the top slot in the front cover and the drop cord in the left position in the base of the unit. Other combinations are available.

▲ Factory assembled units are available using combinations of 1P/2P/3P circuit breakers with other NEMA and IEC type receptacles. Maximum of three drop cords with six breaker spaces available. Consult your local Schneider Electric representative.

NOTE: Factory Assembled Units with Metering for Powerbus has been moved to page 12-20.

Aluminum													
		Front 10'-0"	G PH PH PH N	Front 6'-0"	G PH PH PH N	1'-6"	G PH PH PH N	1'-6" Fro	G PH PH PH N	Top 1	G PH PH PH N		G PH PH PH N
Number	Rating	10'-0" Le	ngth	6'-0" Ler	igth	Front Elb	ow▲	Top Elbo	w▲	Plug-In	Tee	Plug-In Ta <sub>l</sub>	р Вох
of Poles and Voltage	(A) J	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
3Ø3W	225 400 600	AP30210 AP30410 AP30610	1900.00 2320.00 2920.00	AP3046	1140.00 1392.00 1752.00	AP304LF()	2048.00 2174.00 2354.00	AP302LT( ) AP304LT( ) AP306LT( )	2048.00 2174.00 2354.00	PTT33WG	3060.00 3060.00 3060.00	PTB302G PBTB306G PBTB306G	2134.00 4036.00 4036.00
3Ø4W	225 400 600	AP50210 AP50410 AP50610	2320.00 2920.00 3980.00	AP5046	1392.00 1752.00 2388.00	AP504LF()	2496.00 2676.00 2994.00	AP502LT( ) AP504LT( ) AP506LT( )	2496.00 2676.00 2994.00	PTT34WG	3726.00 3726.00 3726.00	PTB502G PBTB506G PBTB506G	2588.00 4566.00 4566.00
3Ø3W + Integral Ground Bus	225 400 600	AP302G10 AP304G10 AP306G10	2520.00 2940.00 3580.00	AP304G6	1512.00 1764.00 2148.00	AP304GLF()	2234.00 2360.00 2552.00	AP302GLT( ) AP304GLT( ) AP306GLT( )	2234.00 2360.00 2552.00	PTT33WG	3060.00 3060.00 3060.00	PTB302G PBTB306G PBTB306G	2134.00 4036.00 4036.00
3Ø4W + Integral Ground Bus	225 400 600	AP502G10 AP504G10 AP506G10	2940.00 3540.00 4640.00	AP504G6	1764.00 2124.00 2784.00	AP504GLF()	2682.00 2862.00 3192.00	AP502GLT( ) AP504GLT( ) AP506GLT( )	2682.00 2862.00 3192.00	PTT34WG	3726.00 3726.00 3726.00	PTB502G PBTB506G PBTB506G	2588.00 4566.00 4566.00

Table 12.9: Standard Components—Copper

Aluminum													
		Front 10'-0"	G PH PH PH N	Front 6'-0"	G PH PH PH N	1'-6"	G PH PH PH N	1'-6" Fro	G nt PH PH PH N	Top 1'	G PH PH PH N		G PH PH PH N
Number	Rating	10'-0" Lei	ngth	6'-0" Ler	igth	Front Elb	ow▲	Top Elbo	w▲	Plug-In	Tee	Plug-In Ta <sub>l</sub>	р Вох
of Poles and Voltage	(A)	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
3Ø3W	225 400 600	CP30210 CP30410 CP30610	2280.00 3460.00 4460.00	CP3026 CP3046 CP3066	1368.00 2076.00 2676.00	CP302LF ( ) CP304LF ( ) CP306LF ( )	2162.00 2516.00 2816.00	CP304LT()	2162.00 2516.00 2816.00	PTT33WG	3060.00 3060.00 3060.00	PBTB306G	2134.00 4036.00 4036.00
3Ø4W	225 400 600	CP50210 CP50410 CP50610	3060.00 5080.00 5780.00	CP5026 CP5046 CP5066	1836.00 3048.00 3468.00	CP502LF ( ) CP504LF ( ) CP506LF ( )	2718.00 3324.00 3468.00	CP504LT()	2718.00 3324.00 3534.00	PTT34WG	3726.00 3726.00 3726.00	PBTB506G	2588.00 4566.00 4566.00
3Ø3W + Integral Ground Bus	225 400 600	CP302G10 CP304G10 CP306G10	3260.00 4440.00 5480.00	CP302G6 CP304G6 CP306G6	2664.00	CP302GLF ( ) CP304GLF ( ) CP306GLF ( )	2456.00 2810.00 3122.00	CP304GLT()	2456.00 2810.00 3122.00	PTT33WG	3060.00 3060.00 3060.00	PBTB306G	2134.00 4036.00 4036.00
3Ø4W + Integral Ground Bus	600	CP502G10 CP504G10 CP506G10	4040.00 6060.00 6800.00	CP502G6 CP504G6 CP506G6	3636.00	CP502GLF ( ) CP504GLF ( ) CP506GLF ( )	3012.00 3618.00 3840.00	CP504GLT( )	3012.00 3618.00 3840.00	PTT34WG	3726.00 3726.00 3726.00	PBTB506G	2588.00 4566.00 4566.00

Add "I" for inside elbow; add "O" for outside elbow.

Table 12.10: Common Accessories

Ampere	Rating			Hanger				End Clo	osure	Wall Flange		Floor Flange	
Aluminum	Copper	Flatwise	Vertical	Edgewise	\$ Price	Seismic▲	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
225 400	225 400	HP2F HP3F	HP2V HP3V	HP3E HP3E	64.00 64.00		96.00 96.00		446.00 446.00		418.00 418.00		418.00 418.00
600	600	HP3F HP5F	HP3V HP4V	HP3E HP5E	64.00 64.00		96.00 96.00		446.00 446.00		418.00 418.00		418.00 418.00

<sup>▲</sup> For seismic applications, seismic hangers must be used with horizontal mount flatwise or edgewise busway. Vertical mount busway may use standard fixed or spring hangers.

#### "Footage and Fittings" Method of Pricing

NOTE: For fast estimates not requiring catalog numbers, use these charts.

Table 12.11: Footage

		А	luminum Busway Footag	ge	Copper Busway Footage					
Number of Poles and Voltage	Ampere Rating	Standard	High Short Circuit	Ground Bus	Standard	High Short Circuit	Ground Bus			
g-		\$ Price Per Foot	\$ Price Per Foot	\$ Price Per Foot Adder	\$ Price Per Foot	\$ Price Per Foot	\$ Price Per Foot Adder			
3Ø3W 600 V	225 400 600	190.00 232.00 292.00	292.00		228.00 346.00 446.00	404.00				
3Ø4W 277/480 V	225 400 600	232.00 292.00 398.00	346.00		306.00 508.00 578.00	582.00				

#### Table 12.12: Fittings

	90									
Number of Poles			Elbow Right Angle	Тар Вох	Tee	Unfused Reducer	Expansion Fitting	Adapter Cubicle C/B or Fus.	End Closures	Fire Barriers
and Voltage	Rating	\$ Price Labor Only	\$ Price Labor Only	\$ Price Labor Only	\$ Price Labor Only	\$ Price Labor Only	\$ Price Labor Only	\$ Price Each	\$ Price Each	\$ Price Each
3Ø3W 600 V	225 400 600	954.00 1098.00 1408.00	1478.00	4036.00	1800.00 1800.00 1800.00	930.00	2486.00 2800.00 3038.00	12312.00	446.00 446.00 446.00	764.00 764.00 764.00
3Ø4W 277/480 V	225 400 600	982.00 1128.00 1454.00	1800.00	4566.00	2098.00 2098.00 2098.00		2936.00 3186.00 3634.00	12700.00	446.00 446.00 446.00	764.00 764.00 764.00

Table 12.13: Straight Lengths (10 ft.) and Plug-in Tap Box

			Alumi	num		Both Aluminum and	Both Aluminum and Copper Copper				
Number of Poles	Ampere Rating	<b>1</b>	G PH PH PH N	Top P P I	H H		G PH PH PH N	10'0"	G PH PH PH N	Top	G PH PH PH N
			10'0" L	ength		Plug-In Tap Box	**		10'0" Le	ength	
		Feeder Style	<b>A</b>	Plug-In Style	•■	riag in Tap Dox	· · ·	Feeder Style	<b>A</b>	Plug-In Styl	e■
		Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
	800 1000	AF2308G10ST AF2310G10ST	3940.00 4400.00	AP2308G10ST AP2310G10ST	3940.00 4400.00		4664.00 4664.00	CF2308G10ST CF2310G10ST	6440.00 6820.00	CP2308G10ST CP2310G10ST	6440.00 6820.00
3Ø3W + Integral Ground Bus	1200 1350 1600 2000	AF2312G10ST AF2313G10ST AF2316G10ST AF2320G10ST	5920.00 6820.00 8380.00 10040.00	AP2312G10ST AP2313G10ST AP2316G10ST AP2320G10ST	5920.00 6820.00 8380.00 10040.00	PTB316G ( ) PTB316G ( )	4664.00 4664.00 4664.00	CF2312G10ST CF2313G10ST CF2316G10ST CF2320G10ST	8840.00 10320.00 11860.00 15140.00	CP2312G10ST CP2313G10ST CP2316G10ST CP2320G10ST	8840.00 10320.00 11860.00 15140.00
Ground Bus	2500 3000 4000 5000	AF2325G10ST AF2330G10ST AF2340G10ST	12220.00 13980.00 19120.00	AP2325G10ST AP2330G10ST AP2340G10ST	12220.00 13980.00 19120.00	_		CF2325G10ST CF2330G10ST CF2340G10ST CF2350G10ST	19220.00 22880.00 29600.00 35700.00	CP2325G10ST CP2330G10ST CP2340G10ST CP2350G10ST	19220.00 22880.00 29600.00 35700.00
	800 1000	AF2508G10ST AF2510G10ST	4780.00 5780.00	AP2508G10ST AP2510G10ST	4780.00 5780.00		5324.00 5324.00	CF2508G10ST CF2510G10ST	8340.00 9860.00	CP2508G10ST CP2510G10ST	8340.00 9860.00
3Ø4W + Integral Ground Bus	1200 1350 1600 2000	AF2512G10ST AF2513G10ST AF2516G10ST AF2520G10ST	7220.00 8260.00 10000.00 12220.00	AP2512G10ST AP2513G10ST AP2516G10ST AP2520G10ST	7220.00 8260.00 10000.00 12220.00	PTB516G ( ) PTB516G ( )	5324.00 5324.00 5324.00	CF2512G10ST CF2513G10ST CF2516G10ST CF2520G10ST	11800.00 13180.00 15940.00 19620.00	CP2512G10ST CP2513G10ST CP2516G10ST CP2520G10ST	11800.00 13180.00 15940.00 19620.00
- CIOUNU BUS	2500 3000 4000 5000	AF2525G10ST AF2530G10ST AF2540G10ST	15000.00 17440.00 23420.00	AP2525G10ST AP2530G10ST AP2540G10ST —	15000.00 17440.00 23420.00		_ _ _	CF2525G10ST CF2530G10ST CF2540G10ST CF2550G10ST	24040.00 30620.00 38720.00 46900.00	CP2525G10ST CP2530G10ST CP2540G10ST CP2550G10ST	24040.00 30620.00 38720.00 46900.00

- Feeder style also available in lengths from 16 to 119 inches.
  Plug-in style also available in 4, 6, and 8 foot lengths.
  Add "(H)" or "(V)" to catalog number based on horizontal or vertical mounting arrangement.
  Cannot be used for 800 A copper busway.

Table 12.14: Fittings (All Feeder Style)

		<u> </u>		• •									
				Aluminun	n					Copper			
Number of Poles	Ampere Rating		ð										
		End Tap B	ΟX	Edgewise El	bow	Flatwise Elb	ow	End Tap Bo	Х	Edgewise El	bow	Flatters Elb	ow
		Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
зøзw	800 1000 1200 1350 1600	AF2308GETBMB AF2310GETBMB AF2312GETBMB AF2313GETBMB AF2316GETBMB	5253.00 5444.00	AF2310GLEM11 AF2312GLEM11 AF2313GLEM11	2186.00 2271.00 3051.00 3216.00 3502.00	AF2312GLFM12	2186.00 2344.00 3150.00 3444.00 3782.00	CF2308GETBMB CF2310GETBMB CF2312GETBMB CF2313GETBMB CF2316GETBMB	5497.00 5736.00	CF2308GLEM11 CF2310GLEM11 CF2312GLEM11 CF2313GLEM11 CF2316GLEM11	3587.00 3858.00	CF2308GLFM11 CF2310GLFM11 CF2312GLFM12 CF2313GLFM12 CF2316GLFM12	2645.00 2714.00 3734.00 4030.00 4338.00
with Integral Ground Bus	2000 2500 3000 4000 5000	AF2320GETBMB AF2325GETBMB AF2330GETBMB AF2340GETBMB	7430.00 8003.00	AF2330GLEM11	3807.00 4206.00 4529.00 5983.00	AF2320GLFM15 AF2325GLFM17 AF2330GLFM18 AF2340GLFM22	4476.00 5428.00 6160.00 9489.00	CF2325GETBMB CF2330GETBMB CF2340GETBMB	8014.00 8745.00 10260.00	CF2320GLEM11 CF2325GLEM11 CF2330GLEM11 CF2340GLEM11 CF2350GLEM11		CF2325GLFM15	5246.00 6771.00 8067.00 12901.00 14973.00
3Ø4W	800 1000 1200 1350 1600	AF2508GETBMB AF2510GETBMB AF2512GETBMB AF2513GETBMB AF2516GETBMB	5712.00 6052.00 6286.00	AF2512GLEM11 AF2513GLEM11	2668.00 2852.00 3802.00 3992.00 4311.00	AF2510GLFM12 AF2512GLFM12 AF2513GLFM13	2668.00 2948.00 3922.00 4268.00 4645.00	CF2508GETBMB CF2510GETBMB CF2512GETBMB CF2513GETBMB CF2516GETBMB	6052.00 6433.00 6696.00	CF2510GLEM11	4641.00 4894.00	CF2510GLFM11 CF2512GLFM12	3321.00 3600.00 4838.00 5114.00 5666.00
with Integral Ground Bus	2000 2500 3000 4000 5000	AF2520GETBMB AF2525GETBMB AF2530GETBMB AF2540GETBMB	9006.00 9921.00	AF2525GLEM11 AF2530GLEM11	4718.00 5228.00 5675.00 7212.00	AF2525GLFM17 AF2530GLFM18	5533.00 6728.00 7710.00 11505.00	CF2540GETBMB	9759.00 11020.00 12903.00		8092.00 10017.00	CF2525GLFM15	6729.00 8488.00 10643.00 16470.00 19333.00

Table 12.15: Accessories

Ampere	e Rating				Hangers			End Closure		Wall Fla	Wall Flange	
Al	Cu	Horizontal N	lount Busway	Vertical	Mount Busway	Ĉ Dvine	Calamia	\$ Price	Catalan Na	\$ Price	Catalan Na	\$ Price
Ai	Cu	Flatwise	Edgewise	Fixed	Spring	\$ Price	Seismic▲	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
_	800	HF38F	HF43E	HFV		64.00	HF38SH	96.00	ACF38EC	446.00	ACF38WF	418.00
800	1000	HF43F	HF43E	HFV		64.00	HF43SH	96.00	ACF43EC	446.00	ACF43WF	418.00
1000	1200	HF53F	HF58E	HFV		64.00	HF53SH	96.00	ACF53EC	446.00	ACF53WF	418.00
_	1350	HF58F	HF58E	HFV		64.00	HF58SH	96.00	ACF58EC	446.00	ACF58WF	418.00
1200	_	HF63F	HF67E	HFV		64.00	HF63SH	96.00	ACF63EC	446.00	ACF63WF	418.00
_	1600	HF67F	HF67E	HFV		64.00	HF67SH	96.00	ACF67EC	446.00	ACF67WF	418.00
1350	_	HF73F	HF78E	HFV		64.00	HF73SH	96.00	ACF73EC	446.00	ACF73WF	418.00
_	2000	HF78F	HF78E	HFV	See Table 12.18 on	64.00	HF78SH	96.00	ACF78EC	446.00	ACF78WF	418.00
1600	_	HF88F	HF88E	HFV	page 12-8	64.00	HF88SH	96.00	ACF88EC	446.00	ACF88WF	418.00
2000	2500	HF13F	HF13E	HFV		64.00	HF13SH	96.00	ACF13EC	578.00	ACF13WF	418.00
_	3000	HF15F	HF15E	HFV		64.00	HF15SH	96.00	ACF15EC	578.00	ACF15WF	418.00
2500	3200	HF16F	HF16E	HFV		64.00	HF16SH	96.00	ACF17EC	578.00	ACF17WF	418.00
3000	_	HF19F	HF19E	HFV		64.00	HF19SH	96.00	ACF19EC	578.00	ACF19WF	606.00
4000	_	HF26F	HF26E	HFV		64.00	HF26SH	96.00	ACF26EC	732.00	ACF26WF	606.00
_	4000	HF24F	HF24E	HFV		64.00	HF24SH	96.00	ACF24EC	732.00	ACF24WF	606.00
_	5000	HF25F	HF26E	HFV		64.00	HF25SH	96.00	ACF25EC	732.00	ACF25WF	606.00

For seismic applications, seismic hangers must be used with horizontal mount flatwise or edgewise busway. Vertical mount busway may use standard fixed or spring hangers.

5156.00

5622.00

5732.00

ř				ı
i	8		r	c
ı	١	۱	Ð	1
ł			۰	

#### Aluminum Busway Copper Busway Drip Resistant Feeder/ Plug-in/Riser Drip Resistant Feeder/ Plug-in/Riser Indoor Feeder/ Plug-In/Riser Indoor Feeder/ Plug-in Riser Outdoor Feeder Outdoor Feeder Number of Poles and Voltage Standard Short Circuit High Short Circuit High Short Circuit High Short Circuit Ampere Rating Standard Short Circuit Standard Circuit \$ Price Per Foo \$ Price Per Foo \$ Price Per Foot \$ Price Per Foo \$ Price Per Foo \$ Price Per Foo \$ Price Per Foot \$ Price Per Foot \$ Price Per Foot \$ Price Per Foot \$ Price Per Foot 394.00 428.00 488.00 654.00 752.00 800 440.00 478.00 462.00 514.00 644.00 708.00 712.00 784.00 778.00 860.00 1000 1200 1350 440.00 592.00 682.00 496.00 644.00 732.00 548.00 710.00 808.00 536.00 714.00 822.00 598.00 774.00 884.00 682.00 884.00 1032.00 736.00 942.00 1088.00 814.00 1036.00 1182.00 826.00 1062.00 1204.00 754.00 974.00 892.00 1130.00 1118.00 3Ø3W 1274.00 600 V 1600 838.00 894.00 926.00 990.00 1014.00 1084.00 1186.00 1282.00 1310.00 1416.00 1434.00 1550.00 50% 2000 2500 1004.00 1062.00 1282.00 1100.00 1350.00 1164.00 1416.00 1194.00 1478.00 1264.00 1550.00 1514.00 1922.00 1594.00 1972.00 1670.00 2112.00 1756.00 2168.00 1824.00 1916.00 2362.00 Integra 2300.00 Ground 3000 1398.00 1464.00 1540.00 1612.00 1682.00 1760.00 2288.00 2362.00 2520.00 2602.00 2752.00 2842.00 1925.00 2106.00 3240.00 3200 1748.00 1912.00 1830.00 2015.00 2103.00 2200.00 2608.00 2692.00 2872.00 3274.00 2966.00 3137.00 4000 2008.00 2212.00 2300.00 2416.00 2978 00 3070.00 3376 00 3570.00 3682 00 3570.00 3686.00 3928.00 4054.00 4284.00 4420.00 5000 800 478.0 528.00 584.00 640.00 834.00 918.00 932.00 1024.00 1028.00 1130.00 520.0 562.00 578.00 722.00 826.00 632.00 796.00 914.00 1256.00 1504.00 1680.00 1000 628.00 686.00 686.00 744.00 986.00 1046.00 1084.00 1152.00 1182.00 1200 1350 772.00 884.00 852.00 978.00 870.00 1000.00 930.00 1070.00 1180.00 1318.00 1252.00 1394.00 1298.00 1452.00 1378.00 1538.00 1416.00 1584.00 3Ø4W 277/480 V 50% 1600 1000.00 1046.00 1094.00 1144.00 1186.00 1240.00 1594.00 1680.00 1754.00 1846.0 2012.00 1478.00 1796.00 2000 1222.00 1282.00 1350.00 1416.00 1550.00 1962.00 2024.00 2162.00 2648.00 2230.00 2362.00 2434.00 Integral Ground 2500 1500.00 1546.00 1648.00 1698.00 1848.00 2404.00 2482.00 2734.00 2892.00 2986.00 3000 3200 4000 1744.00 1810.00 1914.00 1986.00 2084.00 2162.00 3062 00 3124.00 3368 00 3436.00 3672 00 3746.00 3917.00 4340.00 5258.00 3561.00 3950.00 3840.00 4256.00 2342.00 2430.00 2572.00 2672.00 2802.00 2912.00 3872.00 4730.00

#### Pricing Instructions For "Factory Assembled" Busway Systems (or Components)

#### Standard Straight Lengths

The basic component of a busway system is a straight section with a "joint pak" factory-affixed to one end. Plug-in busway is available in standard lengths of 4, 6, 8, and 10 feet. Feeder busway is available in lengths from 16" to 120" in increments of 1".

#### Riser Busway

We also offer a "Riser" Plug-In busway with openings on one side only for riser installations. This busway offers the same short circuit ratings as our standard plug-in busway.

#### Indoor Drip Resistant and IP54 Splash Resistant Busway

These water resistant features are available as an option for indoor plug-in and feeder busway. Price the drip resistant busway using the appropriate per foot price. Price the IP54 splash resistant busway using the outdoor per foot price.

#### Outdoor Construction (Feeder Busway Only)

Besides the additional charge for outdoor busway, you must also add a charge for a weather seal if the busway passes through a building wall or roof from an interior to an exterior space (found under Miscellaneous Additions and Accessories on page 12-8). Please indicate the thickness of the wall, roof or floor when entering order. Add the "labor only" price for fittings and special features per general pricing instruction.

#### **High Short Circuit Bracing**

I-Line busway is available with either standard short circuit bracing or high short circuit bracing. Table 12.19 on 12-8 lists maximum short circuit ratings for each busway type and rating.

#### **General Pricing Instructions**

- Prepare a layout sketch of the busway run showing:
  - All dimensions in feet and inches
  - All wall and floor locations and thicknesses
  - All fittings (use top of page 12-7 as a checklist)
- Add all dimensions together. Round up to the next foot.
- Multiply this total by the appropriate price per foot according to the tables above.
- To this, add the "labor only" charges for all fittings from page 12-7.
- Add hangers per page 12-8 (quantities explained below)
- Add for any other unit price items such as end closures, wall flanges, or special lug requirements from page 12-8.

Hangers for the I-Line II busway should be priced from the table on page 12-8. Indoor horizontal busway requires one hanger for every 10 feet of busway. Vertical indoor busway requires one hanger for every 16 feet. Outdoor feeder busway requires one hanger for every 5 feet in either vertical or horizontal mounting.

The elbow "labor only" charge applies to all types of 90° elbows within a particular rating of busway. The charge does not include any busway footage (i.e. a charge for the appropriate amount of busway footage would have to be added to the "labor only" charge to obtain a "complete device" charge). If elbow is other than 90°, double the labor only charge.

The labor charge for tees shown in applies to all factory assembled types of 90° tee fittings within a given rating. Dimensions and catalog number suffix of flatwise tee fittings will be found in the Class 5600 Manual. Refer to factory for edgewise tee dimensions. Crosses are also available.

Table 12.17: Fittings

					" <u>l</u>	_abor Only"	Charges for E	ach Compo	nent (Copper	or Aluminun	n)			
Number of	Ampere						T D						Transforr	ner Taps
Poles and Voltage	Rating	Elbow Right Angle	Elbow Other Than 90 <sup>0</sup>	Tee	Cross	Flanged End	Tap Box or Service Head	Unfused Reducer	Fused or C/B Cubicle	Expansion FTG.	Phase Transition	Bussed XFMR Conn.	One 3Ø XFMR Y or ▲	Three 1Ø XFMRS Y or ▲
2001	800 1000 1200 1350	1464.00 1464.00 1966.00 1966.00	2928.00 3932.00	1792.00 1792.00 2482.00 2482.00	3584.00 3584.00 4964.00 4964.00	1512.00 1722.00 1900.00 2016.00	4552.00 4760.00	1334.00 1512.00 2514.00 3256.00	24108.00 28938.00	4214.00	11158.00 11274.00	12112.00 13270.00	1968.00 2284.00 2492.00 2636.00	6440.00 6636.00 6944.00 7112.00
3Ø3W 600 V 50% Ground	1600 2000 2500	1966.00 1966.00 1966.00	3932.00	2482.00 2482.00 2482.00	4964.00 4964.00 4964.00	2202.00 2624.00 3134.00	5420.00	3610.00 4578.00 4768.00	41174.00		13404.00	15816.00	2918.00 3342.00 3966.00	7420.00 7904.00 9144.00
	3000 3200 4000 5000	1966.00 2478.00 2478.00 2478.00	4956.00 4956.00	2482.00 2918.00 2918.00 2918.00	4964.00 5836.00 5836.00 5836.00	3706.00 4447.00 4606.00 5384.00	7612.00 7778.00	7094.00 8512.00 8954.00 11084.00	_	8704.00 10229.00 10556.00 11092.00	17172.00 17500.00	23474.00 25188.00	4652.00 5304.00 5444.00 5950.00	10602.00 11891.00 12168.00 14072.00
	800 1000 1200 1350	1792.00 1792.00 2478.00 2478.00	3584.00 4956.00	2084.00 2084.00 2918.00 2918.00	4168.00 4168.00 5836.00 5836.00	1598.00 1908.00 2046.00 2144.00	5230.00 5450.00	1722.00 2024.00 3454.00 4404.00	24854.00 30526.00	4958.00	11902.00 12858.00	13700.00 15076.00	2066.00 2458.00 2668.00 2806.00	6684.00 6982.00 7278.00 7470.00
3Ø4W 277/480 V 50% Ground	1600 2000 2500	2478.00 2478.00 2478.00	4956.00	2918.00 2918.00 2918.00	5836.00 5836.00 5836.00	2482.00 2880.00 3486.00	6394.00	4778.00 6422.00 7932.00	43144.00		15380.00	17996.00	3186.00 3606.00 4326.00	7802.00 8532.00 9960.00
C. Sund	3000 3200 4000 5000	2478.00 2918.00 2918.00 2918.00	5836.00	2918.00 3412.00 3412.00 3412.00	5836.00 6824.00 6824.00 6824.00	4130.00 4956.00 5136.00 6416.00	9463.00 9676.00	9538.00 11445.00 12754.00 14984.00	_	11978.00 13457.00 13774.00 14484.00	20397.00 20714.00	26820.00 29248.00	5074.00 5795.00 5950.00 7420.00	11622.00 13139.00 13464.00 15216.00

#### **Indoor Tap Boxes**

Feeder cable tap boxes are used at the end (-ETBMB) or center (-CTB) of a busway run and incorporate a short section of busway into their construction. See Catalog Class 5600 for the length of the tap box then add the "labor only" charges shown above to complete the price.

Plug-in cable tap boxes are plugged into the side of the busway (at any opening except the very last opening of a run). The price shown in the table on page 12-5 is the complete device price. No "labor only" charge is required.

Lugs other than standard mechanical lugs may be selected from the table on page 12-8.

#### **Service Heads**

Service heads are of outdoor construction and include Square D<sup>™</sup> brand standard lugs. Price footage to end of busway run including dimension of service head. Add service head labor charge.

#### Unfused Reducer

Unfused reducers are used to reduce from a higher amperage busway to a lower amperage. Price each rating of busway to the centerline of reducer and include the "labor only" price of the higher rating.

**NOTE:** The National Electric Code does not allow the use of unfused reducers in vertical riser installations. Refer to the NEC for restrictions in industrial installations.

#### **Fused or Circuit Breaker Cubicle**

These are used as in-line overcurrent protection devices. They can be used in conjunction with an unfused reducer to offer a device which reduces a run of busway in ampacity and offers overcurrent protection.

#### I-Line to I-Line II Adapter

This adapter is used to join I-Line II busway (800 A–5000 A) to existing installations of original I-Line busway. If connecting to an existing "slot end" of original I-Line, use a "bolt end" adapter (-12B), and vice versa. Price as four feet of busway for 800 through 5000 A busway.

#### **Expansion Fittings**

Expansion fitting labor only charge does not include busway footage. The expansion fitting is built into a 3 ft. - 4 in. straight length for 800 A–5000 A and a 5 feet - 0 inch straight length for 225 A–600 A. Limit of expansion or contraction is  $\pm 1$ -1/2 inches. Not available in outdoor construction.

#### **Bussed Transformer Connection**

A bussed transformer connection is used when the busway physically attaches (other than cable) to a three phase transformer. Price busway footage to the edge of transformer L.V. or H.V. terminal. To this, add labor only charge for a "bussed transformer connection." For power company vault termination charges, consult the factory.

#### **Transformer Taps**

Transformer taps are used to make cable connection to transformers. Calculate footage price to end of busway. Use standard dimensions. Price of taps includes lugs; if lugs other than standard Square D brand lugs are required, add charges from page 12-8. Note that taps need **NOT** be located directly above transformers for cable connections.

#### **Finger Protection to IP2X**

This feature provides improved protection from accidental contact with live parts during insertion and removal of plug-in units. This feature meets the IP2X rating as defined by IEC529 standard. (Pricing on page 12-8.)

#### Connection to Competitive Busway

Consult your nearest Schneider Electric sales office.

#### **Miscellaneous Additions and Accessories**

#### Table 12.18: Additions and Accessories

Description			\$ Price
Integral Weather Seal Vapor Barrier (Required when busway passes through an exterior wall or roof)			764.00
Roof Collar			
(Required when busway penetrates an exterior roof)			870.00
Roof Flange Kit (Optional when busway penetrates an exterior roof)			2346.00
Hanger, Horizontal Flatwise and Edgewise (See "Table 12.15: Accessories" on page 5.)			64.00
Hangers, Vertical Fixed (HF-V)			64.00
Hangers, Vertical Spring			
Aluminum Busway	Copper Busway		
<ul> <li>800 A through 1200 A</li> </ul>	<ul> <li>800 A through 1200 A</li> </ul>	HFVS1	148.00
<ul> <li>2000 A through 2500 A</li> </ul>	<ul> <li>1350 A through 2000 A</li> </ul>	HFVS2	292.00
3000 A through 4000 A	<ul> <li>2500 A through 5000 A</li> </ul>	HFVS8	292.00
Lugs – Other than Square D Standard		each lug	70.00
Lugs – Square D Standard added to flanged end		each lug	70.00
Sway Brace Collar HP1SBC			82.00
Assembly Tool AT2			N/C
Finger Protection to IP2X (For each plug-in opening) Plug-in Busway only		per foot	17.00

#### **Electrical Data for I-Line II Busway**

Standards:	UL857 (File Number E22182); CSA C22.2 No. 27-1994 (File Number LL-61778); IEC 439 Part 2
Systems:	AC-3Ø3W, 3Ø4W, 1Ø2W, 1Ø3W. DC-2-pole. All neutrals are 100% capacity.
Voltage:	600 volts AC/DC, 50 Hz and 60 Hz
Integral Ground:	50% capacity as standard for 800 A to 5000 A, as an option on 225 A to 600 A
Enclosure:	Indoor, indoor drip resistant and outdoor (indoor drip resistant and outdoor are available in I-Line II [800–5000 A] busway only)

#### Table 12.19: Short Circuit Ratings: UL 3 Cycle ▲ Test (KA, RMS Symmetrical)

A		Alum	inum		Copper					
Ampere Rating	AOF2 AF2	AOFH2 AFH2	AP AP2/AR2	APH APH2/ARH2	COF2 CF2	COFH2 CFH2	CP CP2/CR2	CPH CPH2/CRH2		
225	_	_	22	_	_	_	22	_		
400	_	_	22	42	_	_	22	42		
600	_	_	22	42	_	_	22	42		
800	50	85	50	75	50	85	50	75		
1000	50	100	50	100	50	85	50	75		
1200	50	100	50	100	50	100	50	100		
1350	50	100	50	100	50	100	50	100		
1600	50	100	50	100	50	100	50	100		
2000	100	100	125	150	50	100	65	100		
2500	100	150	125	150	100	150	125	150		
3000	100	150	125	150	100	150	125	150		
3200	_	_	_	_	100	150	125	150		
4000	150	200	200	_	150	200	200	_		
5000	_	_	_	_	150	200	200	_		

▲ 6 cycle and 30 cycle ratings are available. Please reference Catalog **5600CT9101**.





"Hook-Swing" Mounting

#### Table 12.20: Fusible Plug-In Units

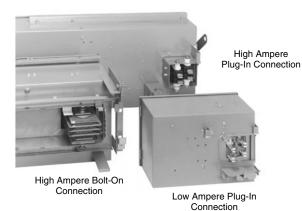
Ampere Rating	Type of Connection	240 Vac 3-Pole, 3 Fuse + G		120/208 Vac, (240 Vac Max.) 4-Pole, 3 Fuse + G		600 Vac 3-Pole, 3 Fuse + G		277/480 Vac, (600 Vac Max.) 4-Pole, 3 Fuse + G	
Haung		Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
30 60 100 200 200▲ 400 600	Plug-in	PQ3203G PQ3206G PQ3210G PQ3220G PS3220G ▲ PBQ3640G ■ PBQ3660G ■	972.00 1042.00 1478.00 2462.00 2462.00 6442.00 9224.00	PQ4206G PQ4210G PQ4220G PS4220G ▲ PBQ4640G ■	1136.00 1182.00 1604.00 2728.00 2728.00 6996.00 10090.00	PQ3606G PQ3610G PQ3620G PS3620G ▲ PBQ3640G ■	1042.00 1110.00 1512.00 2566.00 2566.00 6442.00 9224.00	PQ4606G PQ4610G PQ4620G PS4620G ▲ PBQ4640G ■	1182.00 1230.00 1734.00 2866.00 2866.00 6996.00 10090.00
800 1000 1200	Bolt-on	_ _ _	_	_ _ _		PTQ36080G() ◆ PTQ36100G() ◆ PTQ36120G() ◆	16014.00 18810.00 30042.00	PTQ46080G() ♦ PTQ46100G() ♦ PTQ46120G() ♦	19312.00 19436.00 30168.00

Class J Fuses - Provisions for installing Class J fuses are included in 30 through 600 A fusible devices. Conversion to Class J fuse spacing requires relocating the load side fuse base assembly from standard Class H fuse location to an alternate position in the enclosure.

- For use on vertical riser applications only.
- For vertical riser applications order auxiliary mounting kit—Catalog Number PBQ4060RMK. (Price \$300.)
- This device uses bolt-on connection. It may be used only on plug-in busway with same number of poles. Add suffix (H) for horizontal applications and suffix (V) for vertical applications. Not for use on 800 A copper busway.

  Note: For IP54 splash resistant construction, add "M54" suffix. IP54 price adder is 15%.

Table 12.21: Class R Fuse Kits★



Switch Size (A) Voltage Rating Kit★ Catalog No. 250 V▼ 600 V▼ QMB30R QMB36R 31.20 32.60 30 250 V▼ 600 V▼ QMB36R QMB60R 32.60 32.60 60 100 ΑII HRK1020 31.80 200 400 600 QMB4060R 74.00

Class R Fuse Kits when installed reject all but class R fuses.

★ Kit must be field installed.

- Contains parts to convert two units.

Table 12.22: Hooksticks

1						
	Length	Catalog No.	\$ Price	Length	Catalog No.	\$ Price
	8'	515608	452.00	14'	515614	778.00

#### Table 12.23: F-Frame Circuit Breaker Plug-in Units

Circuit Trip Breaker Rating		240 Vac 3-Pole + G		120/208 Vac (240 Vac Max.) 3Ø4W + G		480 Vac 3-Pole + G		600 Vac 3-Pole + G		277/480 Vac (600 Vac Max.) 3Ø4W + G	
Frame	(A)	Catalog No.	Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
FA	15 20 30 40 50 60 70 80 90	PFA32015G PFA32020G PFA32030G PFA32040G PFA32050G PFA32060G PFA32080G PFA32090G PFA32090G PFA32100G	1456.00 1456.00 1456.00 1456.00 1456.00 1456.00 1706.00 1706.00 1706.00	PFA32020GN PFA32030GN PFA32040GN PFA32050GN PFA32060GN PFA32070GN PFA32080GN PFA32090GN	1640.00 1640.00 1640.00 1640.00 1640.00 1640.00 1894.00 1894.00 1894.00	PFA34020G PFA34030G PFA34040G PFA34050G PFA34060G PFA34070G PFA34080G PFA34090G	1776.00 1776.00 1776.00 1776.00 1776.00 1776.00 1942.00 1942.00 1942.00 1942.00	PFA36020G PFA36030G PFA36040G PFA36050G PFA360600G PFA36070G PFA36080G PFA36090G	1930.00 1930.00 1930.00 1930.00 1930.00 1930.00 2132.00 2132.00 2132.00 2132.00	PFA36020GN PFA36030GN PFA36040GN PFA36050GN PFA36060GN PFA36070GN PFA36080GN PFA36090GN	2111.00 2111.00 2111.00 2111.00 2111.00 2111.00 2317.00 2317.00 2317.00 2317.00
FH	15 20 30 40 50 60 70 80 90				11111111			PFH36015G PFH36020G PFH36030G PFH36040G PFH36050G PFH36060G PFH36080G PFH36090G PFH36100G	2394.00 2394.00 2394.00 2394.00 2394.00 2582.00 2582.00 2582.00 2582.00	PFH36020GN PFH36030GN PFH36040GN PFH36050GN PFH36070GN PFH36070GN PFH36080GN PFH36090GN	2578.00 2578.00 2578.00 2578.00 2578.00 2578.00 2784.00 2784.00 2784.00 2784.00

All these devices use plug-in connections.

Discount Schedule

#### Table 12.24: Current Limiting Circuit Breaker Plug-in Units

Breaker	Trip Rating	480 Vac 3-Pole + G		277/480 Vac 3Ø4W + G			
Frame	Ampere	Catalog No. ▲	\$ Price	Catalog No. ▲	\$ Price		
FI	20 30 40 50 60 70 80 90	PFI34020G PFI34030G PFI34040G PFI34050G PFI34060G PFI34070G PFI34080G PFI34100G	5982.00 5982.00 5982.00 5982.00 5982.00 5982.00 5982.00 5982.00	PFI34030GN PFI34040GN PFI34050GN PFI34060GN PFI34070GN PFI34080GN PFI34090GN	6152.00 6152.00 6152.00 6152.00 6152.00 6152.00 6152.00 6152.00		
кі	125 150 175 200 225 250	PKI34125G PKI34150G PKI34175G PKI34200G PKI34225G PKI34250G	12438.00 12438.00 12438.00 12438.00 12438.00 14274.00	PKI34150GN PKI34175GN PKI34200GN PKI34225GN	12920.00 12920.00 12920.00 12920.00 12920.00 14826.00		
LI	300 350 400 500 600	PBLI34300G PBLI34350G PBLI34400G PBLI34500G PBLI34600G	17430.00 17430.00 17430.00 25224.00 25224.00	PBLI34350GN PBLI34400GN PBLI34500GN	18078.00 18078.00 18078.00 26154.00 26154.00		
LXI■	300 350 400 500 600	PBLXI36300G PBLXI36350G PBLXI36400G PBLXI36500G PBLXI36600G	26606.00 26606.00 26606.00 37712.00 37712.00	PBLXI36350GN PBLXI36400GN PBLXI36500GN	27254.00 27254.00 27254.00 27254.00 38642.00 38642.00		

<sup>▲</sup> All these devices use plug-in connections.

#### **Surge Protective Device Plug-In Units**

All Busway SPD Plug-In Units include as standard:

- Individually Fused Modules
- Circuit Breaker Disconnect
- Cover Mounted Diagnostic Panel
- EMI/RFI Filter
- Audible Alarm with Test/Disable/Enable

Table 12.25: Surge Capacity

System Voltage	60,000 Amperes P	er Phase	240,000 Amperes Per Phase				
System voltage	Catalog Number	\$ Price	Catalog Number	\$ Price			
208Y/120 Vac, 3Ø4W/Grd.	PIU2IMA16	4472.00	PIU2IMA24	6407.00			
240Y/120 Vac, 3Ø4W/Grd.	PIU3IMA16	4472.00	PIU3IMA24	6407.00			
480Y/277 Vac, 3Ø4W/Grd.	PIU4IMA16	4740.00	PIU4IMA24	6792.00			
600Y/347 Vac, 3Ø4W/Grd.	PIU8IMA16	4919.00	PIU8IMA24	7048.00			
Note: For IP54 splash resistant construction, add an "M54" suffix. The IP54 price adder							

#### Table 12.26: Options

Description	When Required Add Suffix to Catalog Number	\$ Price
Surge Counter and Dry Contacts	_	STD.
Remote Monitor with Dry Contacts	M	788.00

LXI circuit breakers are rated up to 600 Vac max. and are supplied with -LSI (long time, short time, instantaneous pickup) adjustable trip unit functions. Contact your local Schneider Electric field office for pricing if alternate trip unit functions are required.

Table 12.27: H-Frame Circuit Breaker Plug-in Units—Standard (80%) Rated—3Ø3W

			-					
Trip Rating	D Interrupting		G Interrup	oting	J Interrupting		L Interrup	oting
Ampere	Catalog No.	\$ Price						
3Ø3W + G, 600 V	ac 50/60 Hz							
15 20 30 40	PHD36015G PHD36020G PHD36030G PHD36040G	1930.00 1930.00 1930.00 1930.00	PHG36015G PHG36020G PHG36030G PHG36040G	2394.00 2394.00 2394.00 2394.00	PHJ36015G PHJ36020G PHJ36030G PHJ36040G	3184.00 3184.00 3184.00 3184.00	PHL36015G PHL36020G PHL36030G PHL36040G	5171.00 5171.00 5171.00 5171.00
50 60 70 80	PHD36050G PHD36060G PHD36070G PHD36080G	1930.00 1930.00 2132.00 2132.00	PHG36050G PHG36060G PHG36070G PHG36080G	2394.00 2394.00 2582.00 2582.00	PHJ36050G PHJ36060G PHJ36070G PHJ36080G	3184.00 3184.00 3718.00 3718.00	PHL36050G PHL36060G PHL36070G PHL36080G	5171.00 5171.00 5715.00 5715.00
90 100 125 150	PHD36090G PHD36100G PHD36125G PHD36150G	2132.00 2132.00 4246.00 4246.00	PHG36090G PHG36100G PHG36125G PHG36150G	2582.00 2582.00 6031.00 6031.00	PHJ36100G PHJ36125G	3718.00 3718.00 8266.00 8266.00	PHL36090G PHL36100G PHL36125G PHL36150G	5715.00 5715.00 9987.00 9987.00

Table 12.28: H-Frame Circuit Breaker Plug-in Units—Standard (80%) Rated—3Ø4W

Trip Rating	D Interrup	ting	G Interrup	oting	J Interrupting		L Interrupting	
Ampere	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
3Ø4W + G, 277/48	30 Vac (600 Vac Max	c.) 50/60 Hz						
15 20 30 40	PHD36015GN PHD36020GN PHD36030GN PHD36040GN	2111.00 2111.00 2111.00 2111.00	PHG36015GN PHG36020GN PHG36030GN PHG36040GN	2578.00 2578.00 2578.00 2578.00	PHJ36020GN PHJ36030GN	3428.00 3428.00 3428.00 3428.00	PHL36020GN PHL36030GN	5318.00 5318.00 5318.00 5318.00
50 60 70 80	PHD36050GN PHD36060GN PHD36070GN PHD36080GN	2111.00 2111.00 2317.00 2317.00	PHG36050GN PHG36060GN PHG36070GN PHG36080GN	2578.00 2578.00 2784.00 2784.00	PHJ36060GN PHJ36070GN	3428.00 3428.00 4008.00 4008.00	PHL36060GN PHL36070GN	5318.00 5318.00 5878.00 5878.00
90 100 125 150	PHD36090GN PHD36100GN PHD36125GN PHD36150GN	2317.00 2317.00 4478.00 4478.00	PHG36090GN PHG36100GN PHG36125GN PHG36150GN	2784.00 2784.00 6267.00 6267.00	PHJ36100GN PHJ36125GN	4008.00 4008.00 8510.00 8510.00	PHL36100GN PHL36125GN	5878.00 5878.00 10254.00 10254.00

Table 12.29: J-Frame Circuit Breaker Plug-in Units—Standard (80%) Rated—3Ø3W

Trip Rating	D Interrupting		G Interrupting		J Interrupting		L Interrupting					
Ampere	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price				
3Ø3W + G, 600 Va	3Ø3W + G, 600 Vac 50/60 Hz											
175 200 225 250	PJD36175G PJD36200G PJD36225G PJD36250G	4618.00 4618.00 4618.00 6380.00	PJG36200G PJG36225G	8056.00 8056.00 8056.00 9834.00	PJJ36200G PJJ36225G	9424.00 9424.00 9424.00 10816.00	PJL36200G PJL36225G	11581.00 11581.00 11581.00 13292.00				

Table 12.30: J-Frame Circuit Breaker Plug-in Units—Standard (80%) Rated—3Ø4W

Trip Rating	D Interrupting		G Interrupting		J Interrupting		L Interrupting			
Ampere	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price		
3Ø4W + G, 277/48	3Ø4W + G, 277/480 Vac (600 Vac Max.) 50/60 Hz									
175 200 225 250	PJD36175GN PJD36200GN PJD36225GN PJD36250GN	4950.00 4950.00 4950.00 6712.00	PJG36200GN PJG36225GN	8366.00 8366.00 8366.00 10144.00	PJJ36200GN PJJ36225GN	9788.00 9788.00 9788.00 11158.00	PJL36200GN PJL36225GN	11910.00 11910.00 11910.00 13669.00		

<sup>▲</sup> All these devices use plug-in connections.

Note: For IP54 splash resistant construction, add an "M54" suffix. The IP54 price adder is 15%.

Table 12.31: Circuit Breaker Interrupting Ratings

		-	_	_
Interrupting Ratings (kA)	D	G	J	L
240 V	25	65	100	125
480 V	18	35	65	100
600 V	1/	10	25	50

Table 12.32: H- and J-Frame Circuit Breaker Plug-in Units with Electronic Trip—Standard (80%) Rated—3Ø3W Newl

Trip Rating			D Interrupting	D Interrupting			J Interruptin	g	L Interrupting		
	Function <b>▲</b>	Irip Unit -	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price	
Micrologic Sta	ndard Trip	Unit									
3Ø3W + G, 600	Vac 50/60	Hz									
60 100 150 250	LI	3.2	PHD36060GU31X PHD36100GU31X PHD36150GU31X PJD36250GU31X	2113.00 2315.00 4429.00 6641.00	PHG36100GU31X PHG36150GU31X	2577.00 2765.00 6214.00 10095.00	PHJ36060GU31X PHJ36100GU31X PHJ36150GU31X PJJ36250GU31X	3367.00 3901.00 8449.00 11077.00	PHL36060GU31X PHL36100GU31X PHL36150GU31X PJL36250GU31X	5354.00 5898.00 10170.00 13553.00	
60 100 150 250	LSI	3.2 S	PHD36060GU33X PHD36100GU33X PHD36150GU33X PJD36250GU33X	2309.00 2511.00 4625.00 6920.00	PHG36100GU33X PHG36150GU33X	2773.00 2961.00 6410.00 10374.00	PHJ36060GU33X PHJ36100GU33X PHJ36150GU33X PJJ36250GU33X	3563.00 4097.00 8645.00 11356.00	PHL36060GU33X PHL36100GU33X PHL36150GU33X PJL36250GU33X	5550.00 6094.00 10366.00 13832.00	
Micrologic Am	meter Trip	Unit									
3Ø3W + G, 600	Vac 50/60	Hz									
60 100 150 250	LSI	5.2 A	PHD36060GU43X PHD36100GU43X PHD36150GU43X PJD36250GU43X	2968.00 3170.00 5284.00 7860.00	PHG36100GU43X PHG36150GU43X	3432.00 3620.00 7069.00 11314.00	PHJ36060GU43X PHJ36100GU43X PHJ36150GU43X PJJ36250GU43X	4222.00 4756.00 9304.00 12296.00	PHL36060GU43X PHL36100GU43X PHL36150GU43X PJL36250GU43X	6209.00 6753.00 11025.00 14772.00	

# Table 12.33: H- and J-Frame Circuit Breaker Plug-in Units with Electronic Trip—Standard (80%) Rated—3Ø4W

Trip Rating	Trip	Trip Unit	Trip Unit D Interrupting		G Interrupti	ng	J Interrupting	g	L Interrupting	
Ampere	Function ▲	Irip Unit	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price
Micrologic Sta	ndard Trip	Unit								
3Ø4W + G, 600	Vac 50/60	Hz								
60 100 150 250	LI	3.2	PHD36060GNU31X PHD36100GNU31X PHD36150GNU31X PJD36250GNU31X	2500.00 4661.00	PHG36060GNU31X PHG36100GNU31X PHG36150GNU31X PJG36250GNU31X	2761.00 2967.00 6450.00 10405.00	PHJ36060GNU31X PHJ36100GNU31X PHJ36150GNU31X PJJ36250GNU31X	3611.00 4191.00 8693.00 11419.00	PHL36060GNU31X PHL36100GNU31X PHL36150GNU31X PJL36250GNU31X	5501.00 6061.00 10437.00 13930.00
60 100 150 250	LSI	3.2 S	PHD36060GNU33X PHD36100GNU33X PHD36150GNU33X PJD36250GNU33X	2696.00 4857.00	PHG36060GNU33X PHG36100GNU33X PHG36150GNU33X PJG36250GNU33X	2957.00 3163.00 6646.00 10684.00	PHJ36060GNU33X PHJ36100GNU33X PHJ36150GNU33X PJJ36250GNU33X	3807.00 4387.00 8889.00 11698.00	PHL36060GNU33X PHL36100GNU33X PHL36150GNU33X PJL36250GNU33X	5697.00 6257.00 10633.00 14209.00
Micrologic Am	meter Trip	Unit								
3Ø4W + G, 600	Vac 50/60	Hz								
60 100 150 250	LSI	5.2 A	PHD36060GNU43X PHD36100GNU43X PHD36150GNU43X PJD36250GNU43X	3355.00 5516.00	PHG36060GNU43X PHG36100GNU43X PHG36150GNU43X PJG36250GNU43X	3616.00 3822.00 7305.00 11624.00	PHJ36060GNU43X PHJ36100GNU43X PHJ36150GNU43X PJJ36250GNU43X	4466.00 5046.00 9548.00 12638.00	PHL36060GNU43X PHL36100GNU43X PHL36150GNU43X PJL36250GNU43X	6356.00 6916.00 11292.00 15149.00

If alternate trip functions are required, contact your local Schneider Electric field office for pricing. All these devices use plug-in connections.

For IP54 splash resistant construction, add an "M54" suffix. The IP54 price adder is 15%.

Table 12.34: L-Frame Circuit Breaker Plug-in Units with Electronic Trip—Standard (80%) Rated—3Ø3W Newl

Trip Rating	Trip	Trip Unit	D Interrupting		G Interrup	ting	J Interrup	ting	L Interrupt	ing
Ampere	Function▲	Irip Unit	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price
Micrologic S	tandard Trip	Unit								
3Ø3W + G, 6	00 Vac 50/60	) Hz								
400 600	LI	3.3	PBLD36400GU31X PBLD36600GU31X		PBLG36400GU31X PBLG36600GU31X	12846.00 16975.00	PBLJ36400GU31X PBLJ36600GU31X		PBLL36400GU31X PBLL36600GU31X	17030.00 21326.00
400 600	LSI	3.3 S	PBLD36400GU33X PBLD36600GU33X		PBLG36400GU33X PBLG36600GU33X		PBLJ36400GU33X PBLJ36600GU33X		PBLL36400GU33X PBLL36600GU33X	18049.00 22344.00
Micrologic A	mmeter Trip	Unit								
3Ø3W + G, 6	00 Vac 50/60	) Hz								
400 600	LSI	5.3 A	PBLD36400GU43X PBLD36600GU43X		PBLG36400GU43X PBLG36600GU43X		PBLJ36400GU43X PBLJ36600GU43X		PBLL36400GU43X PBLL36600GU43X	19608.00 23902.00
400 600	LSIG	6.3 A	PBLD36400GU44X PBLD36600GU44X		PBLG36400GU44X PBLG36600GU44X	19686.00 23904.00	PBLJ36400GU44X PBLJ36600GU44X		PBLL36400GU44X PBLL36600GU44X	23536.00 27329.00

# Table 12.35: L-Frame Circuit Breaker Plug-in Units with Electronic Trip—Standard (80%) Rated—3Ø4W Newl)

Trip Rating	Trip	Trip Unit	D Interrupti	ng	G Interrupt	ing	J Interrupt	ing	L Interrupting	
Ampere	Function▲	Trip Unit	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price	Catalog Number■	\$ Price
Micrologic S	tandard Trip	Unit							·	
3Ø4W + G, 6	00 Vac 50/60	) Hz								
400 600	LI	3.3	PBLD36400GNU31X PBLD36600GNU31X		PBLG36400GNU31X PBLG36600GNU31X		PBLJ36400GNU31X PBLJ36600GNU31X		PBLL36400GNU31X PBLL36600GNU31X	17910.00 22375.00
400 600	LSI	3.3 S	PBLD36400GNU33X PBLD36600GNU33X		PBLG36400GNU33X PBLG36600GNU33X		PBLJ36400GNU33X PBLJ36600GNU33X		PBLL36400GNU33X PBLL36600GNU33X	18716.00 23130.00
Micrologic A	mmeter Trip	Unit								
3Ø4W + G, 6	00 Vac 50/60	) Hz								
400 600	LSI	5.3 A	PBLD36400GNU43X PBLD36600GNU43X		PBLG36400GNU43X PBLG36600GNU43X		PBLJ36400GNU43X PBLJ36600GNU43X		PBLL36400GNU43X PBLL36600GNU43X	20334.00 24748.00
400 600	LSIG	6.3 A	PBLD36400GNU44X PBLD36600GNU44X		PBLG36400GNU44X PBLG36600GNU44X	20485.00 24216.00	PBLJ36400GNU44X PBLJ36600GNU44X		PBLL36400GNU44X PBLL36600GNU44X	24385.00 28294.00

If alternate trip functions are required, contact your local Schneider Electric field office for pricing. All these devices use plug-in connections.

For IP54 splash resistant construction, add an "M54" suffix. The IP54 price adder is 15%.

The 250 A with Standard Trip Unit is also available. Contact your local Schneider Electric field office for ordering information.

Table 12.36: M-Frame Circuit Breaker Plug-in Units with Basic Electronic Trip Unit (ET 1.0)—3Ø3W Newl

Trin Detine America	G Interrupting		J Interrupting				
Trip Rating Ampere	Catalog Number▲ ■ ♦	\$ Price	Catalog Number▲ ■ ♦	\$ Price			
3Ø3W + G, 600 Vac 50/60	Hz						
300 350 400 450	PTMG36300G() PTMG36350G() PTMG36400G() PTMG36450G()	16014.00 16014.00 16014.00 16014.00	PTMJ36350G( ) PTMJ36400G( )	17918.00 17918.00 17918.00 17918.00			
500 600 700 800	PTMG36500G() PTMG36600G() PTMG36700G() PTMG36800G()	16014.00 16014.00 18810.00 18810.00	PTMJ36600G( ) PTMJ36700G( )	17918.00 17918.00 20368.00 20368.00			

Table 12.37: M-Frame Circuit Breaker Plug-in Units with Basic Electronic Trip Unit (ET 1.0)—3Ø4W

Trin Deting Amount	G Interrupting		J Interrupting				
Trip Rating Ampere —	Catalog Number▲ ■ ♦	\$ Price	Catalog Number▲ ■ ♦	\$ Price			
3Ø4W + G, 600 Vac 50/60 Hz		·					
300 350 400 450	PTMG36300GN() PTMG36350GN() PTMG36400GN() PTMG36450GN()	16640.00 16640.00 16640.00 16640.00	PTMJ36300GN() PTMJ36350GN() PTMJ36400GN() PTMJ36450GN()	18536.00 18536.00 18536.00 18536.00			
500 600 700 800	PTMG36500GN() PTMG36600GN() PTMG36700GN() PTMG36800GN()	16640.00 16640.00 19436.00 19436.00	PTMJ36500GN() PTMJ36600GN() PTMJ36700GN() PTMJ36800GN()	18536.00 18536.00 22082.00 22082.00			

- The ET 1.0 trip unit cannot be field replaced or have the long-time trip point setting adjusted.

  All these devices use bolt-on connection. It may be used only on busway with same number of poles. Not for use on 800 A copper busway. To complete the catalog number, replace the blank with an "H" for horizontal applications and "V" for vertical applications.

Note: For IP54 splash resistant construction, add "M54" suffix. IP54 price adder is 15%.

www.schneider-electric.us

Table 12.38: P-Frame Circuit Breaker Plug-in Units—3Ø3W New!)

by Schneider Electric

			Interrupting Rating							
Trin Detiny Assurance	Trip	Trip		G			J			
Trip Rating Ampere	Function	Unit	Catalog Number▲■◆	\$ P	rice	Catalog Number▲ ■ ♦	\$ P	rice		
			Catalog Number -	80 % Rated	100 % Rated	Catalog Number	80 % Rated	100 % Rated		
Micrologic Standard	Trip Unit									
3Ø3W + G, 600 Vac 5	50/60 Hz									
400 600 800 1000 1200	LI	3.0	PTPG36040G()U31A PTPG36060G()U31A PTPG36080G()U31A PTPG36100G()U31A PTPG36120G()U31A	26760.00 26760.00 26760.00 34637.00 34637.00	37560.00 37560.00 37560.00 45366.00	PTPJ36040G( )U31A PTPJ36060G( )U31A PTPJ36080G( )U31A PTPJ36100G( )U31A PTPJ36120G( )U31A	27995.00 27995.00 27995.00 35929.00 35929.00	38745.00 38745.00 38745.00 46502.00		
400 600 800 1000 1200	LSI	5.0	PTPG36040G()U33A PTPG36060G()U33A PTPG36080G()U33A PTPG36100G()U33A PTPG36120G()U33A	27300.00 27300.00 27300.00 27300.00 35064.00 35064.00	37900.00 37900.00 37900.00 46168.00	PTPJ36040G( )U33A PTPJ36060G( )U33A PTPJ36080G( )U33A PTPJ36100G( )U33A PTPJ36120G( )U33A	28532.00 28532.00 28532.00 28532.00 36328.00 36328.00	39400.00 39400.00 39400.00 47934.00		
Micrologic Ammeter	Trip Unit			•						
3Ø3W + G, 600 Vac 5	50/60 Hz									
400 600 800 1000 1200	Ш	3.0 A	PTPG36040G()U41A PTPG36060G()U41A PTPG36080G()U41A PTPG36100G()U41A PTPG36120G()U41A	28072.00 28072.00 28072.00 35826.00 35826.00	38560.00 38560.00 38560.00 46435.00	PTPJ36040G( )U41A PTPJ36060G( )U41A PTPJ36080G( )U41A PTPJ36100G( )U41A PTPJ36120G( )U41A	29295.00 29295.00 29295.00 37055.00 37055.00	40068.00 40068.00 40068.00 48856.00		
400 600 800 1000 1200	LSI	5.0 A	PTPG36040G()U43A PTPG36060G()U43A PTPG36080G()U43A PTPG36100G()U43A PTPG36120G()U43A	30300.00 30300.00 30300.00 38010.00 38010.00	40430.00 40430.00 40430.00 49424.00	PTPJ36040G()U43A PTPJ36060G()U43A PTPJ36080G()U43A PTPJ36100G()U43A PTPJ36120G()U43A	31520.00 31520.00 31520.00 39124.00 39124.00	41695.00 41695.00 41695.00 50342.00		
400 600 800 1000 1200	LSIG	6.0 A	PTPG36040G()U44A PTPG36060G()U44A PTPG36080G()U44A PTPG36100G()U44A PTPG36120G()U44A	33052.00 33052.00 33052.00 40725.00 40725.00	42760.00 42760.00 42760.00 50824.00	PTPJ36040G( )U44A PTPJ36060G( )U44A PTPJ36080G( )U44A PTPJ36100G( )U44A PTPJ36120G( )U44A	34250.00 34250.00 34250.00 41700.00 41700.00	44330.00 44330.00 44330.00 51910.00		

Table 12.39: P-Frame Circuit Breaker Plug-in Units—3Ø4W New!

					Interrupting	Rating		
Trin Detine America	Trip	Trip		G			J	
Trip Rating Ampere	Function	Unit	Catalan Number 4 W A	\$ P	rice	Catalan Number 4 T A	\$ P	rice
			Catalog Number ▲ ■ ♦	80 % Rated	100 % Rated	Catalog Number▲■◆	80 % Rated	100 % Rated
Micrologic Standard	Trip Unit						·	
3Ø4W + G, 600 Vac 5	50/60 Hz							
400 600 800 1000 1200	LI	3.0	PTPG36040GN()U31A PTPG36060GN()U31A PTPG36080GN()U31A PTPG36100GN()U31A PTPG36120GN()U31A	27760.00 27760.00 27760.00 35637.00 35637.00	38560.00 38560.00 38560.00 46366.00	PTPJ36040GN()U31A PTPJ36060GN()U31A PTPJ36080GN()U31A PTPJ36100GN()U31A PTPJ36120GN()U31A	28995.00 28995.00 28995.00 36929.00 36929.00	39745.0 39745.0 39745.0 47502.0
400 600 800 1000 1200	LSI	5.0	PTPG36040GN()U33A PTPG36060GN()U33A PTPG36080GN()U33A PTPG36100GN()U33A PTPG36120GN()U33A	28300.00 28300.00 28300.00 36064.00 36064.00	38900.00 38900.00 38900.00 47168.00	PTPJ36040GN()U33A PTPJ36060GN()U33A PTPJ36080GN()U33A PTPJ36100GN()U33A PTPJ36120GN()U33A	29532.00 29532.00 29532.00 37328.00 37328.00	40400.0 40400.0 40400.0 48934.0
Micrologic Ammeter	Trip Unit							
3Ø4W + G, 600 Vac 5	50/60 Hz							
400 600 800 1000 1200	Ц	3.0 A	PTPG36040GN() U41A PTPG36060GN() U41A PTPG36080GN() U41A PTPG36100GN() U41A PTPG36120GN() U41A	29072.00 29072.00 29072.00 36826.00 36826.00		PTPJ36040GN() U41A PTPJ36060GN() U41A PTPJ36080GN() U41A PTPJ36100GN() U41A PTPJ36120GN() U41A	30295.00 30295.00 30295.00 38055.00 38055.00	41068.0 41068.0 41068.0 49856.0
400 600 800 1000 1200	LSI	5.0 A	PTPG36040GN() U43A PTPG36060GN() U43A PTPG36080GN() U43A PTPG36100GN() U43A PTPG36120GN() U43A	31300.00 31300.00 31300.00 39010.00 39010.00	41430.00 41430.00 41430.00 50424.00	PTPJ36040GN( )U43A PTPJ36060GN( )U43A PTPJ36080GN( )U43A PTPJ36100GN( )U43A PTPJ36120GN( )U43A	32520.00 32520.00 32520.00 40124.00 40124.00	42695.0 42695.0 42695.0 51342.0
400 600 800 1000 1200	LSIG	6.0 A	PTPG36040GN()U44A PTPG36060GN()U44A PTPG36080GN()U44A PTPG36100GN()U44A PTPG36120GN()U44A	34052.00 34052.00 34052.00 41725.00 41725.00	43760.00 43760.00 43760.00 51824.00	PTPJ36040GN() U44A PTPJ36060GN() U44A PTPJ36080GN() U44A PTPJ36100GN() U44A PTPJ36120GN() U44A	35250.00 35250.00 35250.00 42700.00 42700.00	45330.0 45330.0 45330.0 52910.0

- The standard rating plug supplied with a trip unit will be the "A" rating plug. To specify an alternative rating plug, replace the "A" at the end of the catalog number with the applicable suffix letter. See the chart on page 7-45 for rating plug catalog suffix letters.

  All these devices use bolt-on connection. It may be used only on busway with same number of poles. Not for use on 800 A copper busway. To complete the catalog number, replace the blank with an "H" for horizontal applications and "V" for vertical applications. Eisted catalog numbers are for 80% rated circuit breakers. For 100% rated circuit breakers, replace the blank with an "HC" for horizontal applications and "VC" for vertical applications. For example, the catalog number for a 100% standard trip unit with standard LI trip functions at 800 A 3Ø3W for a horizontal application would be PTPG36080GHCU31A.

#### Notes:

For IP54 splash resistant construction, add a "M54" suffix. IP54 price adder is 15%.

PE8

The 250 A is available as a special device. Contact your local Schneider Electric field office for ordering information.

by Schneider Electric www.schneider-electric.us

#### Table 12.40: R-Frame Circuit Breaker Plug-in Units—3Ø3W

						Interrupting Rating							
Trip Rating	Trip	Today I I a fa		G			J			L			
Ampere	Trip Function	Irip Unit	Catalog Number▲ ■ ♦	\$ P	rice	Catalog Number▲■◆	\$ F	Price	Catalog Number▲■◆	\$ P	rice		
			Catalog Number •	80 % Rated	100 % Rated	Catalog Number •	80 % Rated	100 % Rated	Catalog Number▲■◆	80 % Rated	100 % Rated		
Micrologic Sta	ndard Trip	Unit											
3Ø3W + G, 600	Vac 50/6	) Hz											
800 1000 1200 1600	LI	3.0	PTRG36080G()U31A PTRG36100G()U31A PTRG36120G()U31A PTRG36160G()U31A	42232.00 42232.00 42232.00 42232.00	48472.00 48472.00	PTRJ36080G()U31A PTRJ36100G()U31A PTRJ36120G()U31A PTRJ36160G()U31A	43800.00 43800.00 43800.00 43800.00	50040.00 50040.00 50040.00	PTRL36080G()U31A PTRL36100G()U31A PTRL36120G()U31A PTRL36160G()U31A	45366.00 45366.00 45366.00 45366.00	51606.00 51606.00 51606.00		
800 1000 1200 1600	LSI	5.0	PTRG36080G()U33A PTRG36100G()U33A PTRG36120G()U33A PTRG36160G()U33A	42686.00 42686.00 42686.00 42686.00	48772.00 48772.00	PTRJ36080G()U33A PTRJ36100G()U33A PTRJ36120G()U33A PTRJ36160G()U33A	44254.00 44254.00 44254.00 44254.00	50340.00 50340.00 50340.00	PTRL36080G()U33A PTRL36100G()U33A PTRL36120G()U33A PTRL36160G()U33A	45820.00 45820.00 45820.00 45820.00	51906.00 51906.00 51906.00		
Micrologic Am	meter Trip	Unit											
3Ø3W + G, 600	Vac 50/6	) Hz											
800 1000 1200 1600	LI	3.0 A	PTRG36080G( )U41A PTRG36100G( )U41A PTRG36120G( )U41A PTRG36160G( )U41A	43368.00 43368.00 43368.00 43368.00	49342.00 49342.00	PTRJ36080G()U41A PTRJ36100G()U41A PTRJ36120G()U41A PTRJ36160G()U41A	44936.00 44936.00 44936.00 44936.00	50910.00 50910.00 50910.00	PTRL36080G()U41A PTRL36100G()U41A PTRL36120G()U41A PTRL36160G()U41A	46502.00 46502.00 46502.00 46502.00	52476.00 52476.00 52476.00		
800 1000 1200 1600	LSI	5.0 A	PTRG36080G()U43A PTRG36100G()U43A PTRG36120G()U43A PTRG36160G()U43A	45366.00 45366.00 45366.00 45366.00	51184.00 51184.00	PTRJ36080G()U43A PTRJ36100G()U43A PTRJ36120G()U43A PTRJ36160G()U43A	46934.00 46934.00 46934.00 46934.00	52752.00 52752.00 52752.00	PTRL36080G()U43A PTRL36100G()U43A PTRL36120G()U43A PTRL36160G()U43A	48500.00 48500.00 48500.00 48500.00	54318.00 54318.00 54318.00		
800 1000 1200 1600	LSIG	6.0 A	PTRG36080G( )U44A PTRG36100G( )U44A PTRG36120G( )U44A PTRG36160G( )U44A	47856.00 47856.00 47856.00 47856.00	53426.00 53426.00	PTRJ36080G()U44A PTRJ36100G()U44A PTRJ36120G()U44A PTRJ36160G()U44A	49424.00 49424.00 49424.00 49424.00	54994.00 54994.00 54994.00	PTRL36080G()U44A PTRL36100G()U44A PTRL36120G()U44A PTRL36160G()U44A	50990.00 50990.00 50990.00 50990.00	56560.00 56560.00 56560.00		

#### Table 12.41: R-Frame Circuit Breaker Plug-in Units—3Ø4W

Trip Rating	Trip	Trin Hait		G			J			L	
Ampere	Trip Function	irip Unit	Catalog Number▲■◆	\$ Pi	ice	Catalog Number▲ ■ ♦	\$ Price		Catalog Number▲ ■ ♦	\$ F	rice
			Catalog Number▲■◆	80 % Rated	100 % Rated	Catalog Number▲■▼	80 % Rated	100 % Rated	Catalog Number▲ ■ ♦	80 % Rated	100 % Rated
Micrologic Sta	ındard Tri	Unit									
3Ø4W + G, 277	7/480 Vac	(600 Vac	Max.) 50/60 Hz								
800 1000 1200 1600	LI	3.0	PTRG36080GN( )U31A PTRG36100GN( )U31A PTRG36120GN( )U31A PTRG36160GN( )U31A	43232.00 43232.00 43232.00 43232.00	49472.00	PTRJ36080GN()U31A PTRJ36100GN()U31A PTRJ36120GN()U31A PTRJ36160GN()U31A	44800.00 44800.00 44800.00 44800.00	51040.00 51040.00 51040.00 —	PTRL36080GN( )U31A PTRL36100GN( )U31A PTRL36120GN( )U31A PTRL36160GN( )U31A	46366.00 46366.00 46366.00 46366.00	52606.00 52606.00 52606.00
800 1000 1200 1600	LSI	5.0	PTRG36080GN( )U33A PTRG36100GN( )U33A PTRG36120GN( )U33A PTRG36160GN( )U33A	43686.00 43686.00 43686.00 43686.00	49772.00	PTRJ36080GN()U33A PTRJ36100GN()U33A PTRJ36120GN()U33A PTRJ36160GN()U33A	45254.00 45254.00 45254.00 45254.00	51340.00 51340.00 51340.00 —	PTRL36080GN( )U33A PTRL36100GN( )U33A PTRL36120GN( )U33A PTRL36160GN( )U33A	46820.00 46820.00 46820.00 46820.00	52906.00 52906.00 52906.00
Micrologic Am	meter Tri	Unit									
3Ø4W + G, 277	7/480 Vac	(600 Vac	Max.) 50/60 Hz								
800 1000 1200 1600	LI	3.0 A	PTRG36080GN( )U41A PTRG36100GN( )U41A PTRG36120GN( )U41A PTRG36160GN( )U41A	44368.00 44368.00 44368.00 44368.00	50342.00	PTRJ36080GN( )U41A PTRJ36100GN( )U41A PTRJ36120GN( )U41A PTRJ36160GN( )U41A	45936.00 45936.00 45936.00 45936.00	51910.00 51910.00 51910.00 —	PTRL36080GN( )U41A PTRL36100GN( )U41A PTRL36120GN( )U41A PTRL36160GN( )U41A	47502.00 47502.00 47502.00 47502.00	53476.00 53476.00 53476.00
800 1000 1200 1600	LSI	5.0 A	PTRG36080GN( )U43A PTRG36100GN( )U43A PTRG36120GN( )U43A PTRG36160GN( )U43A	46366.00 46366.00 46366.00 46366.00	52184.00	PTRJ36080GN()U43A PTRJ36100GN()U43A PTRJ36120GN()U43A PTRJ36160GN()U43A	47934.00 47934.00 47934.00 47934.00	53752.00 53752.00 53752.00 —	PTRL36080GN( )U43A PTRL36100GN( )U43A PTRL36120GN( )U43A PTRL36160GN( )U43A	49500.00 49500.00 49500.00 49500.00	55318.00 55318.00 55318.00
800 1000 1200 1600	LSIG	6.0 A	PTRG36080GN()U44A PTRG36100GN()U44A PTRG36120GN()U44A PTRG36160GN()U44A	48856.00 48856.00 48856.00 48856.00	54426.00	PTRJ36080GN()U44A PTRJ36100GN()U44A PTRJ36120GN()U44A PTRJ36160GN()U44A	50424.00 50424.00 50424.00 50424.00	55994.00 55994.00 55994.00 —	PTRL36080GN( )U44A PTRL36100GN( )U44A PTRL36120GN( )U44A PTRL36160GN( )U44A	51990.00 51990.00 51990.00 51990.00	57560.00 57560.00 57560.00

- The standard rating plug supplied with a trip unit will be the "A" rating plug. To specify an alternative rating plug, replace the "A" at the end of the catalog number with the applicable suffix letter. See the chart on page 7-45 for rating plug catalog suffix letters.

  All these devices use bolt-on connection. It may be used only on busway with same number of poles. Not for use on 800 A copper busway. To complete the catalog number, replace the blank with an "H" for horizontal applications and "V" for vertical applications.

  Listed catalog numbers are for 80% rated circuit breakers. For 100% rated circuit breakers, replace the blank with an "HC" for horizontal applications and "VC" for vertical applications. For example, the catalog number for a 100% standard trip unit with standard LI trip functions at 800 A 3Ø3W for a horizontal application would be PTRG36080GHCU31A.

- For IP54 splash resistant construction, add a "M54" suffix. IP54 price adder is 15%.
   The 600 A is available as a special device. Contact your local Schneider Electric field office for ordering information.

- Non-segregated phase bus
- 600 V through 15 kV (1200 A–4000 A) <sup>1</sup>
- Aluminum, steel or stainless steel housing
- Aluminum or copper bus bars
- Insulated with fluidized bed epoxy (5 kV–15 kV)
- Complete line of fittings provides for any configuration
- Indoor trapeze and outdoor column supports
- For use in utilities, industrial and commercial facilities

Power-Zone bus is custom designed, manufactured and tested per ANSI C37.23 standards to meet customer specifications. The 600 V product is also UL Listed. It is a completely coordinated package of equipment with all the auxiliary material and supports for connecting transformers, switchgear, MCCs, and motors, in all types of utility, industrial, and commercial facilities.

General Pricing Instruction – Prepare a layout sketch (if applicable) of the run(s) showing all dimensions in feet and inches, all wall and floor locations and thicknesses and all fittings such as elbows, tees, flanged ends, cable tap boxes, expansion fittings, transformer connections, etc. Add all dimensions together using the center line of the bus and adjust the total to the higher whole foot. Multiply this total by the per foot price as determined by the type (indoor or weatherproof) (aluminum or copper) and the number of poles and any optional accessories (aluminum or steel enclosures, fiberglass or porcelain conductor supports, etc.). To this add the charges for each of the elbows, tees, flanged ends, cable tap boxes, expansion fittings, transformer connections, etc. The sum of these items plus the sum of any optional accessory is the price of the entire bus run. NOTE: Because the bus run is custom designed and built there are no "Complete Device" prices.

**Bus Footage** – The per foot price of the bus may be a combination of several prices depending on the job specifications and requirements. Some of these options are special momentary rating, special housing material and/or finish, special conductor supports, heaters and thermostats, and ground bus. The prices for these options are shown on page 12-17. They should be added to the per foot prices shown on page 12-17.

Weatherproof Bus – Priced the same as indoor. In addition, all weatherproof runs must be equipped with strip heaters to eliminate condensation and, if applicable, a thermostat. A heater should be priced for every seven (7) foot of bus and no more than 20 heaters can be controlled by one thermostat. Also, each bus run should have its own thermostat. The heaters are rated 240 V, 500 watts and operate at 120 V, 125 watts.

Flanged Ends – A flanged end is used to terminate the bus into switchgear, motor control centers, switchboards, or any rigid bus-to-bus connection. It consists of a gasketed equipment flange, up to 1'-0" of 3Ø3W conductor (3Ø4W as applicable), necessary insulation tapes, and required bolting hardware. If additional conductor length is required, add to the footage price on a per foot basis.

Cable Tap Box – A cable tap box includes a gasketed and accessible termination box, lugs, necessary insulation tape (between bus and lugs only), and required bolting hardware. Lug sizes and quantity should be specified by purchaser.



Transformer/Generator Connection – This type of termination should be priced whenever the bus is connecting to a transformer, generator, motor, switch or any connection where the bus bars are connecting to porcelain mounted equipment terminals. It will include the same components as a flanged end plus one set of flexible braid type connectors and a terminal box (if required).

Bushing Box (Weatherhead) – A bushing box is used on service entrance run where the cable connection to the bus must be made via porcelain bushings. It is comprised of the same components as a transformer connection plus 3 through stud type apparatus bushings, bushing stud connectors (lug pads) and a strip heater.

Ground Bus – The bus housing is designed and constructed to provide an electrically continuous ground path. The side rails of the bus housings are capable of carrying the full rated phase current continuously and, under short circuit conditions, are capable of carrying up to 60 kA RMS asymmetrical fault current for 3 seconds. Consequently, a separate ground bus is not necessary unless specified.

**Wall Entrance Seal** – A wall entrance seal consists of a wall throat, wall flange (one side of wall only), and a barrier which prevents air or vapor from passing from one room to another or from outdoors to indoors. It also carries a 1/2 hour fire rating. Consult factory for higher fire ratings. If additional wall flanges are required, they should be added at the prices given on page 12-19.

**Equipment Entrance Seal** – An equipment entrance seal should be priced whenever a barrier is required to prevent the passing of flame and/or gasses between the bus housing and the terminating equipment.

**Expansion Fittings** – An expansion fitting is used to counteract the strain placed on the bus due to the expansion and contraction of the building or the bus itself. One should be priced whenever the bus run crosses a building expansion joint and whenever a straight run of bus exceeds 60 feet.

Flexible Housing (Misalignment) Collar – Required at terminations or wall penetrations when vibrations due to seismic forces may cause damage to the bus. It may also be used to adjust for the "settling" of terminating equipment after installation.

**Supporting Steel (Hangers)** – Supports are not included in the "per foot" price of the bus and should be added on the basis of one for every 10 ft. for indoor and one for every 12 ft. for outdoor. Indoor supports are a trapeze type hanger while outdoor supports are a single or double column type support. Consult factory for other type supports.

**Hazardous or Seismic Locations** – Consult factory for bus runs which are to be installed in a location which is classified as hazardous or in a seismic location.

**Standard Construction** – The prices on this page are based on standard Power-Zone construction. Page 12-19 should be used to add any options or accessories. Standard construction is as follows:

- Conductor (plating): Copper (silver) or Aluminum (tin)
- Conductor Insulation (5 kV and 15 kV only): epoxy
- Conductor Supports: Glass reinforced polyester blocks
- Housing Material: Extruded Aluminum (1/8-inch Nominal)
- Housing Construction: Totally Enclosed Non-ventilated
- Joint Insulation: EPR and PVC tape
- BIL Rating: 25 kV (600 V), 60 kV (5 kV) and 95 kV (15 kV)
- Momentary (Short Circuit) Rating: 75 kA (600 V) and 60 kA (5 kV, 15 kV)
- Ground Conductor: Housing (100% rated)

Table 12.42: Footage and Fittings

Cond. Mtl.	No. of Poles, Wires	Current Rtg.	\$ Price Per Foot ▲	Flanged End	Vert. Elb.	Horz. Elb.	Cable Tap Box	Vert. Tee	Horz. Tee	Indr. Exp. Ftg.	Outdr. Exp. Ftg.	Wall Entr. Seal	Equip. Entr. Seal	Phase Phase Trans.	Xfrm Conn.	Porc. Bshg. Box
600 V																
		1200 A	1235.	4430.	4885.	4195.	14348.	6740.	6740.	6595.	13905.	5400.	3970.	8825.	15725.	34275.
		1600 A	1315.	4535.	5005.	4265.	14838.	6760.	6760.	8075.	15610.	5410.	3975.	9150.	17265.	37510.
	3P, 3W	2000 A	1485.	4905.	5160.	4340.	17165.	7020.	7020.	8635.	16395.	5435.	3985.	9840.	19450.	42687.
		2500 A	1635.	5120.	5420.	4390.	17777.	7190.	7190.	10895.	18950.	5450.	3995.	10145.	21755.	47865.
Aluminum		3200 A 1200 A	1845. 1605.	5310. 5759.	5470. 6351.	4435. 5454.	18736. 18652.	7195. 8762.	7195. 8762.	12835. 8574.	20885. 18077.	5475. 7020.	4005. 5161.	10525. 11473.	23880. 20443.	54800. 44558.
Alu	00 444	1600 A	1710.	5759. 5895.	6507.	5545.	19290.	8788.	8788.	10498.	20293.	7020.	5161.	11895.	20445. 22445.	44556. 48763.
-	3P, 4W 100%	2000 A	1930.	6376.	6708.	5642.	22315.	9126.	9126.	11226.	21314.	7066.	5181.	12792.	25285.	53417.
	Neutral	2500 A	2125.	6656.	7046.	5707.	23110.	9347.	9347.	14164.	24635.	7085.	5194.	13189.	28282.	62225.
		3200 A	2399.	6903.	7111.	5766.	24357.	9354.	9354.	16686.	27151.	7104.	5207.	13683.	31044.	71240.
		1200 A	1785.	5115.	5030.	4195.	15101.	6885.	6885.	6890.	14200.	5400.	3970.	10085.	16555.	34960.
		1600 A	1985.	5320.	5192.	4230.	15702.	7007.	7007.	8310.	15615.	5410.	3975.	10505.	18180.	38250.
		2000 A	2665.	6190.	5355.	4265.	18579.	7130.	7130.	8815.	16350.	5435.	3985.	12205.	20840.	41220.
	3P. 3W	2500 A	2950.	6645.	5455.	4340.	19454.	7320.	7320.	11160.	18920.	5450.	3995.	13105.	23410.	49420.
	01,011	3200 A	4125.	8995.	6172.	4390.	22789.	8007.	8007.	16120.	24175.	5475.	4005.	16740.	29205.	59385.
		4000 A	5970.	10680.	6890.	4435.	26693.	8695.	8695.	19690.	28680.	5527.	4050.	20215.	35905.	72125.
₩.		5000 A	6470.	11585.	7570.	4620.	29178.	9330.	9330.	24950.	34705.	5580.	4190.	22400.	42035.	80380.
Copper		6000 A	7335.	13895.	9815.	4590.	33649.	11060.	11060.	32305.	42055.	5610.	4235.	25960.	50735.	96635.
රි		1200 A	2320.	6650.	6539.	5454.	19632.	8951.	8951.	8957.	18460.	7020.	5161.	13111.	21522.	45448.
		1600 A 2000 A	2580. 3464.	6916. 8047.	6750. 6962.	5501. 5595.	20413. 24153.	9110. 9269.	9110. 9269.	10803. 11460.	20300. 21255.	7033. 7066.	5168. 5181.	13657. 15867.	23634. 27092.	49725.
	3P, 4W	2500 A 2500 A	3464. 3835.	8639.	7092.	5642.	24153. 25291.	9269. 9516.	9269. 9516.	14508.	21255. 24596.	7085.	5191. 5194.	17037.	30433.	53586. 64246.
	100%	3200 A	5362.	11694.	7779.	5707.	29626.	11492.	11492.	20956.	31428.	7104.	5207.	21762.	37967.	77201.
	Neutral	4000 A	7760.	13884.	9153.	5766.	34701.	11810.	11810.	25597.	37284.	7129.	5265.	26280.	46677.	93763.
		5000 A	8411.	15061.	9841.	6006.	37932.	12129.	12129.	32435.	45117.	7254.	5447.	29120.	54646.	104494.
		6000 A	9535.	18064.	12760.	6246.	43744.	14378.	14378.	41997.	54672.	7293.	5506.	33748.	65956.	125626.
5 kV						,	,		,	,			,			
_		1200 A	1410.	4550.	4495.	4175.	14480.	6730.	6730.	6635.	14690.	5500.	4265.	9385.	15835.	52874.
Aluminum		1600 A	1500.	4655.	4570.	4275.	14971.	6760.	6760.	8105.	16635.	5515.	4285.	9575.	17385.	56289.
Ē	3P, 3W■	2000 A	1690.	5020.	4640.	4405.	17292.	7020.	7020.	8635.	17625.	5525.	4315.	10065.	19560.	62104.
₹		2500 A	1840.	5185.	4690.	4505.	17849.	7080.	7080.	10680.	19205.	5540.	4370.	10355.	21715. 24070.	68579.
		3000 A 1200 A	2120. 1815.	5505.	4760.	4685.	18951.	7195.	7195.	12835.	21825.	5590.	4425.	10910.		76874.
		1200 A			4405	422E	15002	C00E	C00E	6040	14005			10220		E2400
		1600 A		5025. 5445	4495. 4532	4325. 4330	15003. 15840	6885. 7000	6885. 7000	6940. 8360	14995. 16415	5500. 5515	4265. 4285	10230. 11070	16465.	53499. 57384
Эeг		1600 A	2185.	5445.	4532.	4330.	15840.	7000.	7000.	8360.	16415.	5515.	4285.	11070.	16465. 18305.	57384.
Copper		2000 A	2185. 2870.	5445. 6300.	4532. 4570.	4330. 4615.	15840. 18700.	7000. 7115.	7000. 7115.	8360. 8825.	16415. 17350.	5515. 5525.	4285. 4310.	11070. 12620.	16465. 18305. 20935.	57384. 62494.
0	3P, 3W■	2000 A 2500 A	2185. 2870. 3165.	5445. 6300. 6755.	4532. 4570. 4640.	4330. 4615. 4695.	15840. 18700. 19576.	7000. 7115. 7320.	7000. 7115. 7320.	8360. 8825. 11160.	16415. 17350. 20150.	5515. 5525. 5540.	4285. 4310. 4370.	11070. 12620. 13325.	16465. 18305. 20935. 23525.	57384. 62494. 71284.
	3P, 3W■	2000 A	2185. 2870.	5445. 6300.	4532. 4570.	4330. 4615.	15840. 18700.	7000. 7115.	7000. 7115.	8360. 8825.	16415. 17350.	5515. 5525.	4285. 4310.	11070. 12620.	16465. 18305. 20935.	57384. 62494.
	3P, 3W■	2000 A 2500 A 3000 A	2185. 2870. 3165. 4340.	5445. 6300. 6755. 9180.	4532. 4570. 4640. 4715.	4330. 4615. 4695. 5493.	15840. 18700. 19576. 22993.	7000. 7115. 7320. 8840.	7000. 7115. 7320. 8840.	8360. 8825. 11160. 16120.	16415. 17350. 20150. 25110.	5515. 5525. 5540. 5590.	4285. 4310. 4370. 4425.	11070. 12620. 13325. 17115.	16465. 18305. 20935. 23525. 29395.	57384. 62494. 71284. 83604.
	3P, 3W■	2000 A 2500 A 3000 A 4000 A	2185. 2870. 3165. 4340. 6375.	5445. 6300. 6755. 9180. 10875.	4532. 4570. 4640. 4715. 6340.	4330. 4615. 4695. 5493. 6426.	15840. 18700. 19576. 22993. 26908.	7000. 7115. 7320. 8840. 9085.	7000. 7115. 7320. 8840. 9085.	8360. 8825. 11160. 16120. 19690.	16415. 17350. 20150. 25110. 28680.	5515. 5525. 5540. 5590. 5640.	4285. 4310. 4370. 4425. 4471.	11070. 12620. 13325. 17115. 20605.	16465. 18305. 20935. 23525. 29395. 36100.	57384. 62494. 71284. 83604. 98519.
15 kV	3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175.	5445. 6300. 6755. 9180. 10875. 11825. 14275.	4532. 4570. 4640. 4715. 6340. 7435. 10095.	4330. 4615. 4695. 5493. 6426. 7519. 8797.	15840. 18700. 19576. 22993. 26908. 29448. 34068.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	8360. 8825. 11160. 16120. 19690. 24950. 32315.	16415. 17350. 20150. 25110. 28680. 34705. 42065.	5515. 5525. 5540. 5590. 5640. 5740. 5840.	4285. 4310. 4370. 4425. 4471. 4590. 4610.	11070. 12620. 13325. 17115. 20605. 22880. 26715.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120.	57384. 62494. 71284. 83604. 98519. 110539. 133414.
	3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A 6000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175.	5445. 6300. 6755. 9180. 10875. 11825. 14275.	4532. 4570. 4640. 4715. 6340. 7435. 10095.	4330. 4615. 4695. 5493. 6426. 7519. 8797.	15840. 18700. 19576. 22993. 26908. 29448. 34068.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	8360. 8825. 11160. 16120. 19690. 24950. 32315.	16415. 17350. 20150. 25110. 28680. 34705. 42065.	5515. 5525. 5540. 5590. 5640. 5740. 5840.	4285. 4310. 4370. 4425. 4471. 4590. 4610.	11070. 12620. 13325. 17115. 20605. 22880. 26715.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120.	57384. 62494. 71284. 83604. 98519. 110539. 133414.
		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175.	5445. 6300. 6755. 9180. 10875. 11825. 14275.	4532. 4570. 4640. 4715. 6340. 7435. 10095.	4330. 4615. 4695. 5493. 6426. 7519. 8797.	15840. 18700. 19576. 22993. 26908. 29448. 34068.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	8360. 8825. 11160. 16120. 19690. 24950. 32315.	16415. 17350. 20150. 25110. 28680. 34705. 42065.	5515. 5525. 5540. 5590. 5640. 5740. 5840.	4285. 4310. 4370. 4425. 4471. 4590. 4610.	11070. 12620. 13325. 17115. 20605. 22880. 26715.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618.
	3P, 3W■ 3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 1600 A 2000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160.	7000. 7115. 7320. 8840. 9085. 9330. 11065.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900.	5515. 5525. 5540. 5590. 5640. 5740. 5840. 5500. 5515.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590. 19865.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879.
Aluminum Aluminum		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 1600 A 2000 A 2500 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4690.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970.	5515. 5525. 5540. 5590. 5640. 5740. 5840. 5500. 5515. 5525.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590. 19865. 21525.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639.
		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 1600 A 2000 A 2500 A 3000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1900. 2205.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4690. 4760.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4685.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095.	5515. 5525. 5540. 5590. 5640. 5740. 5840. 5500. 5515. 5525. 5540. 5590.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410. 4485.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590. 19865. 21525. 24405.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938.
		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 1600 A 2500 A 3000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1900. 2205.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4760. 4495.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4685.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165.	7000. 7115. 7320. 8840. 9085. 9330. 11065.  6820. 6850. 7160. 7245. 7330.	7000. 7115. 7320. 8840. 9085. 9330. 11065.  6820. 6850. 7160. 7245. 7330.	8360. 8825. 11160. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095.	5515. 5525. 5540. 5590. 5640. 5740. 5840. 5500. 5515. 5525. 5540. 5590.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410. 4485.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590. 19865. 24405.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938. 70854.
		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 2500 A 2500 A 3000 A 1200 A 1600 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1900. 2205.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700. 5130.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4690. 4760.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4505. 4508. 4325.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165. 15118. 15961.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975.	7000. 7115. 7320. 8840. 9085. 9330. 11065.  6820. 6850. 7160. 7245. 7330. 6975.	8360. 8825. 11160. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125. 8545.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095. 15180. 16600.	5515. 5525. 5540. 5590. 5640. 5740. 5840.  5500. 5515. 5525. 5540. 5590. 5515.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410. 4485. 4280. 4305.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170.	16465. 18305. 20935. 23525. 239395. 36100. 42280. 51120. 16035. 17590. 19865. 21405. 16660. 18505.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938. 70854. 76139.
Aluminum	3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 2000 A 2500 A 2500 A 1200 A 1600 A 2000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1900. 2205. 2225. 2915.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700. 5130. 5555. 6415.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4495. 4570. 4640.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4685. 4330. 4330.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165. 15118.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125. 8545.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095. 15180. 16600. 17535.	5515. 5525. 5540. 5590. 5640. 5590. 5590. 5590. 5505. 5595. 5595. 5595. 5525.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4280. 4305. 4345. 4280. 4305.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170.	16465. 18305. 20935. 23935. 36100. 42280. 51120. 16035. 17590. 19865. 21525. 24405. 18505. 21140.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938. 70854. 76139. 83152.
Aluminum		2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 2500 A 3000 A 1200 A 1200 A 1600 A 2500 A 2500 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 2205. 1850. 2225. 2915. 3220.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700. 5130. 5555. 6415. 6925.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4690. 4495. 4570.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4685. 4325. 4330. 4615.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165. 15118. 15961. 18827.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7245. 7330. 6975. 7092. 7210.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125. 8545. 9005. 11430.	16415. 17350. 20150. 25110. 26880. 34705. 42065. 14870. 16815. 17900. 18970. 22095. 15180. 16600. 17535. 20420.	5515. 5525. 5540. 5590. 5640. 5515. 5525. 5540. 5590. 5515. 5525. 5540. 5590. 5515.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410. 4485. 4345. 4345. 4345.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170. 10350. 11195. 12756.	16465. 18305. 20935. 23525. 29395. 36100. 42280. 51120. 16035. 17590. 19865. 21525. 24405. 18505. 21140.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938. 70854. 76139. 83152. 95223.
	3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 2000 A 2500 A 2500 A 1200 A 1600 A 2000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1900. 2205. 2225. 2915.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700. 5130. 5555. 6415.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4495. 4570. 4640.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4275. 4405. 4505. 4685. 4330. 4330.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165. 15118.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125. 8545.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095. 15180. 16600. 17535.	5515. 5525. 5540. 5590. 5640. 5590. 5590. 5590. 5505. 5595. 5595. 5595. 5525.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4280. 4305. 4345. 4280. 4305.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170.	16465. 18305. 20935. 23935. 36100. 42280. 51120. 16035. 17590. 19865. 21525. 24405. 18505. 21140.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 89639. 102938. 70854. 76139. 83152.
Aluminum	3P, 3W■	2000 A 2500 A 3000 A 4000 A 5000 A 6000 A 1200 A 2500 A 3000 A 2500 A 2000 A 2500 A 3000 A	2185. 2870. 3165. 4340. 6375. 6965. 8175. 1445. 1550. 1745. 1990. 2205. 2205. 2215. 3220. 4385.	5445. 6300. 6755. 9180. 10875. 11825. 14275. 4655. 4765. 5190. 5445. 5700. 5130. 5555. 6415. 6925.	4532. 4570. 4640. 4715. 6340. 7435. 10095. 4495. 4570. 4640. 4495. 4570. 4640. 4690. 4760.	4330. 4615. 4695. 5493. 6426. 7519. 8797. 4175. 4405. 4505. 4325. 4330. 4615. 4695. 5493.	15840. 18700. 19576. 22993. 26908. 29448. 34068. 14596. 15092. 17479. 17772. 19165. 15118. 15961. 18827. 19763. 23213.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210. 7455. 8975.	7000. 7115. 7320. 8840. 9085. 9330. 11065. 6820. 6850. 7160. 7245. 7330. 6975. 7092. 7210. 7455.	8360. 8825. 11160. 16120. 19690. 24950. 32315. 6815. 8290. 8910. 10445. 13105. 7125. 8545. 9005. 11430. 16395.	16415. 17350. 20150. 25110. 28680. 34705. 42065. 14870. 16815. 17900. 18970. 22095. 15180. 16600. 17535. 20420. 25385.	5515. 5525. 5540. 5590. 5640. 5740. 5840.  5500. 5515. 5525. 5540. 5590. 5590.	4285. 4310. 4370. 4425. 4471. 4590. 4610. 4280. 4305. 4345. 4410. 4485. 4305. 4345. 4345. 4345. 4345. 4345. 4345. 4345.	11070. 12620. 13325. 17115. 20605. 22880. 26715. 9510. 9710. 10265. 10325. 11170. 10350. 11195. 12756. 13525. 17370.	16465. 18305. 20935. 23525. 23939. 36100. 42280. 51120. 16035. 17590. 19865. 21525. 24405. 18505. 21140. 23825. 29725.	57384. 62494. 71284. 83604. 98519. 110539. 133414. 70042. 74618. 82879. 9639. 102938. 70854. 76139. 83152. 95223. 111960.

<sup>▲</sup> Hangers, supports and heater prices not included. See page 12-18 for pricing.

Add 30% for 3Ø4W (half-neutral): add 45% for 3Ø4W (full-neutral).

#### **Space Heaters/Thermostats**

Space heaters must be priced for all weatherproof applications. One heater should be priced for every 7 feet of outdoor bus. If a thermostat is specified to control the heaters, at least one should be priced for each bus run. No more than 20 heaters can be controlled by each thermostat.

Table 12.43: Thermostats/Space Heaters

Description	\$ Price Each
Thermostat	800.00
120 V, 125 W space heater (240 V, 500 W rated)	680.00

#### Hangers/Supports

Hangers and supports are not included in prices on page 12-17. Price one indoor hanger for every 10 feet (maximum) of indoor bus and one outdoor support for every 12 feet (maximum) of outdoor bus (if required).

Table 12.44: Hangers/Supports

Support Description	Maximum Height	\$ Price Each
Indoor Trapeze Hanger	_	820.00
Outdoor, Single Column Support	6 feet 8 feet 10 feet 12 feet	5709.00 6524.00 7340.00 8155.00
Outdoor, Double Column Support	14 feet 16 feet 18 feet 20 feet 22 feet	14995.00 16495.00 17994.00 19494.00 20993.00

#### **Construction Options**

Table 12.45: Momentary (Asymmetrical Short Circuit) Ratings

Voltage Class	Amperes	\$ Price Per Foot ♦ Multiplier
600 V	75 KA 100 KA 150 KA	Standard 1.25 1.50
5 kV	60 KA 80 KA 100 KA	Standard 1.05 1.25
15 kV	60 KA 80 KA 100 KA 150 KA	Standard 1.05 1.25 1.50

<sup>♦</sup> Include base price (page 12-17) plus all options.

#### Table 12.46: Bus Enclosures

Material and Finish	Per Foot \$ Price Adder
Painted Aluminum (1/8" Nominal)	Standard
Painted 14 Gauge Steel	680.00
Painted 11 Gauge Steel	800.00
Unpainted 14 Gauge 304 Stainless Steel	1600.00
Unpainted 14 Gauge 316 Stainless Steel	2160.00



# **Miscellaneous Terminating Accessories**

Miscellaneous terminating accessory prices should be added only if not already included in the price of the termination (see pricing instruction for further information).

Table 12.47: Bushing Stud Connectors (Lug Pads)★

Amperes	\$ Price Each
1200 A	5607.00
1600 A	5904.00
2000 A	6315.00
2500 A	7221.00
3000 A	8202.00
4000 A	9528.00

<sup>★</sup> If not included on terminating equipment.

#### Table 12.48: Flexible Connectors

Voltage	\$ Price Per Three Phase Connection ▼								
Class	1200 A	1600 A	2000 A	2500 A	3000 A	4000 A			
600 V 5 kV 15 kV	7550.00 7706.00 7922.00	9175.00 9300.00 9405.00	10045.00 10155.00 10265.00	12535.00	16705.00 16890.00 17085.00	22245.00 22440.00 22635.00			

<sup>▼</sup> Add 45% for 3Ø4W (100%) connection. Add 30% for 3Ø4W (50%).

#### Table 12.49: Terminal Boxes

Box Size	11 Gauge Steel	3/16" Aluminum
3' x 2' x 3' 3' x 3' x 4' 4' x 3' x 4' 4' x 4' x 5' 5' x 4' x 5' 5' x 5' x 5'	8350.00 9895.00 11195.00 11935.00 12740.00 14020.00	13853.00 15673.00 16709.00 17836.00

#### Table 12.50: Miscellaneous Additions

Description	\$ Price
PVC insulating boots: (optional)▲ Splice (joint) (3Ø3W) Termination (3Ø3W)	2000.00 2000.00
Wall Flange: (optional) (in addition to wall entrance seal) Aluminum 14 Gauge Steel 14 Gauge 304 Stainless Steel 14 Gauge 316 Stainless Steel	1750.00 1250.00 2000.00 2600.00
Optional Conductor Support High Alumina Porcelain■	1150.00
Flexible Housing (Misalignment) Collar (optional)	3560.00

<sup>▲</sup> Add 45% for 3Ø4W (100%) connection. Add 30% for 3Ø4W (50%).

Per foot

#### **Powerbus Plug-in Units With Metering**

Powerbus plug-in units with metering are rated maximum 100 A and are offered as factory assembled units. All units conform to NEMA type 1.

#### Table 12.51: Factory Assembled Units with Metering

One (1) ED circuit breaker, one (1) drop cord with connector A, and one (1) PM5350 meter

Circuit E	reaker	NEMA	Drop Cord	4A Configuration		5A Configuration		5B Configuration	
Rating	Poles	Connector	Length (ft)	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
15 A	1	L5-15	3	PBPEDU4A100COOL515M( )	1961.00	PBPEDU5A100COOL515M( )	2061.00	PBPEDU5B100COOL515M( )	2061.00
20 A	1	L5-20	3	PBPEDU4A100COOL520M( )	1971.00	PBPEDU5A100COOL520M()	2071.00	PBPEDU5B100COOL520M()	2071.00
30 A	1	L5-30	3	PBPEDU4A100COOL530M( )	1986.00	PBPEDU5A100COOL530M()	2086.00	PBPEDU5B100COOL530M()	2086.00
15 A	2	L6-15	3	PBPEDU4A100COOL615M( )	2268.00	PBPEDU5A100COOL615M( )	2368.00	PBPEDU5B100COOL615M( )	2368.00
20 A	2	L6-20	3	PBPEDU4A100COOL620M( )	2278.00	PBPEDU5A100COOL620M()	2378.00	PBPEDU5B100COOL620M()	2378.00
30 A	2	L6-30	3	PBPEDU4A100COOL630M( )	2293.00	PBPEDU5A100COOL630M()	2393.00	PBPEDU5B100COOL630M()	2393.00
20 A	3	L21-20	3	PBPEDU4A100COOL2120M( )	2482.00	PBPEDU5A100COOL2120M( )	2582.00	PBPEDU5B100COOL2120M( )	2582.00
30 A	3	L21-30	3	PBPEDU4A100COOL2130M( )	2497.00	PBPEDU5A100COOL2130M( )	2597.00	PBPEDU5B100COOL2130M( )	2597.00
15 A	1	L5-15	6	PBPEDU4A100FOOL515M( )	2021.00	PBPEDU5A100FOOL515M( )	2121.00	PBPEDU5B100FOOL515M( )	2121.00
20 A	1	L5-20	6	PBPEDU4A100FOOL520M( )	2031.00	PBPEDU5A100FOOL520M( )	2131.00	PBPEDU5B100FOOL520M( )	2131.00
30 A	1	L5-30	6	PBPEDU4A100FOOL530M( )	2046.00	PBPEDU5A100FOOL530M( )	2146.00	PBPEDU5B100FOOL530M( )	2146.00
15 A	2	L6-15	6	PBPEDU4A100FOOL615M( )	2328.00	PBPEDU5A100FOOL615M( )	2428.00	PBPEDU5B100FOOL615M( )	2428.00
20 A	2	L6-20	6	PBPEDU4A100FOOL620M( )	2338.00	PBPEDU5A100FOOL620M()	2438.00	PBPEDU5B100FOOL620M()	2438.00
30 A	2	L6-30	6	PBPEDU4A100FOOL630M( )	2353.00	PBPEDU5A100FOOL630M()	2453.00	PBPEDU5B100FOOL630M( )	2453.00
20 A	3	L21-20	6	PBPEDU4A100FOOL2120M( )	2542.00	PBPEDU5A100FOOL2120M( )	2642.00	PBPEDU5B100FOOL2120M( )	2642.00
30 A	3	L21-30	6	PBPEDU4A100FOOL2130M( )	2557.00	PBPEDU5A100FOOL2130M( )	2657.00	PBPEDU5B100FOOL2130M( )	2657.00

See Digest Section 9 for ED circuit breaker information. Catalog numbers shown have the breaker in the top slot in the front cover and the drop cord in the left position in the base of the unit.

Other combinations are available. The Power Meter display will be located below the breaker specs.

For remote monitoring capabilities, an EGX gateway is required. The EGX is located in the tap box with metering or in a separate EGX plug-in unit listed below. The units with metering can be daisy-chained together back to the EGX gateway. A maximum of 30 units should be daisy-chained together to one EGX.

Factory assembled units are available using combinations of 1P/2P/3P circuit breakers with other NEMA and IEC type receptacles. Maximum of three drop cords with three breaker spaces available. Consult your local Schneider Electric representative.

#### Table 12.52: EGX Plug-in Unit (480 V Max)

4A Configura	tion	5A Configura	tion	5B Configurat	tion
Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
PBPEGX4A100T	2687.00	PBPEGX5A100T	2787.00	PBPEGX5B100T	2787.00

Note: For remote monitoring capabilities, an EGX gateway is required. The EGX is located in the tap box with metering or in a separate EGX plug-in unit listed above. Units with metering can be daisy-chained together back to the EGX gateway. A maximum of 30 units should be daisy-chained together to one EGX.

Table 12.53: NEMA Receptacles and Connectors

Mada a	Voltage	NEMA Non-Locking			NEMA Locking		
Wring	Voltage	15 A	20 A	30 A	15 A	20 A	30 A
2-pole, 3-wire grounding	120	5–15	5–20	5–30	L5-15	L5-20	L5-30
2-pole, 3-wire grounding	240	6–15	6–20	6–30	L6-15	L6-20	L6-20
3-pole, 4-wire grounding	120/240	14–15	14–20	14–30	_	L14-20	L14-30
3-pole, 4-wire grounding	3Ø 240	15–15	15–20	15–30	_	L15-20	L15-30
4-pole, 5-wire grounding	3ØY 120/208	_	_	_	_	L21-20	L21-30

Note: Additional NEMA and IEC type receptacles and connectors are available.

Meter Suffix	System Voltage
1	208Y/120 V 3Ø4W
2	240 V 3Ø3W
4	415/240 V 3Ø4W
5	480Y/277 V 3Ø4W

Replace ( ) in above table with the appropriate meter suffix number. Connectors must be rated for appropriate voltages.



## **Section 13**

## **Wire Management**



Wireway pp. 13-2



Wall Duct pp. 13-4



Trench Duct pp. 13-5

## Wireway

General Purpose Wireway	13-2
Oiltight Wireway	13-3
Raintight Wireways	13-3
Raintight Troughs	13-3

#### **Wall Duct**

General Description	13-4
Components and Accessories	13-4, 13-5

### **Trench Duct**

General Description	13-5
Straight Sections and Fittings	13-6
Accessories and Components	13-6





### General Purpose—NEMA Type 1

#### **Standards**

Square-Duct wireway is Underwriters Laboratories listed as steel enclosed wireway and auxiliary gutter. CSA listing is also available.

2-1/2", 4", and 6" sizes are manufactured from 16 gauge steel. Straight lengths are available with or without knockouts. Knockouts are of various sizes in sides and bottom of wireway. 8", 10", and 12" sizes are made of 14 gauge steel and are furnished without knockouts.



Painted Hinge-Cover★ Type LDB-ANSI 49 Gray Polyester Powder Finish

Table 13.1: (Connectors not supplied; order separately▲)

	2-1	/2" x 2-1/2"			4" x 4"			6" x 6"		8" x	8"	10" x 1	0"	12" x 12	2"★
Component	Catalog I	Number		Catalog	Number		Catalog	Number		Cat. No.		Cat. No.		Cat. No.	
Component	With Knockouts	Without Knockouts	\$ Price	With Knockouts	Without Knockouts	\$ Price	With Knockouts	Without Knockouts	\$ Price	Without Knockouts	\$ Price	Without Knockouts	\$ Price	Without Knockouts	\$ Price
1' Length	LDB21KO	LDB21	24.00	LDB41KO	LDB41	26.10	LDB61KO	LDB61	48.20	LDB81	76.00	LDB101	97.00	LDB121	107.00
2' Length	LDB22KO	LDB22	34.80	LDB42KO	LDB42	38.50	LDB62KO	LDB62	59.00	LDB82	116.00	LDB102	160.00	LDB122	206.00
3' Length	LDB23KO	LDB23	44.20		LDB43	54.00	LDB63KO	LDB63	84.00	LDB83	177.00	LDB103	226.00	LDB123	308.00
4' Length	LDB24KO	LDB24	61.00	LDB44KO	LDB44	75.00	LDB64KO	LDB64	111.00	LDB84	215.00	LDB104	294.00	LDB124	371.00
5' Length	LDB25KO	LDB25	75.00		LDB45	80.00	LDB65KO	LDB65	120.00	LDB85	240.00	LDB105	362.00	LDB125	427.00
6' Length	_	_	_	LDB46KO	LDB46	96.00	LDB66KO	LDB66	151.00	LDB86	284.00	LDB106	428.00	_	_
10' Length	LDB210KO	LDB210	151.00	LDB410KO	LDB410	167.00	LDB610KO	LDB610	284.00	LDB810	507.00		693.00	LDB1210	882.00
90° L	_	LDB290L	54.00	_	LDB490L	61.00	_	LDB690L	69.00	LDB890L	111.00	LDB1090L	158.00	LDB1290L	202.00
90° Sweep L	_	LDB290LS	95.00	_	LDB490LS	107.00	_	LDB690LS	155.00		200.00		308.00	LDB1290LS	410.00
45° L	_	LDB245L	54.00	_	LDB445L	66.00		LDB645L	69.00	LDB845L	111.00		158.00	LDB1245L	202.00
Tee	_	LDB2T	62.00	_	LDB4T	75.00	_	LDB6T	84.00	LDB8T	155.00	LDB10T	206.00	LDB12T	292.00
Junction Box	_	LDB2J	69.00	_	LDB4J	84.00	_	LDB6J	104.00	LDB8J	164.00	LDB10J	208.00	LDB12J	292.00
Telescope Ftg.	_	LDB2TF	101.00	_	LDB4TF	111.00	_	LDB6TF	131.00	LDB8TF	218.00	LDB10TF	271.00	LDB12TF	317.00
Connector▲	_	LDB2C	7.70	_	LDB4C	9.50	_	LDB6C	11.40		23.10	LDB10C	33.60	LDB12C	46.30
Drop/Brkt Hgr.	_	LDB2H	14.80	_	LDB4H	17.10	_	LDB6H	30.80	LDB8H	44.60	LDB10H	75.00	LDB12H	118.00
Support Hanger	_	LDB2SH	9.20	_	LDB4SH	12.60	_	LDB6SH	22.10		31.50		43.10	LDB12SH	58.00
Closing Plate	LDB2CPKO	LDB2CP	7.70	LDB4CPKO	LDB4CP	9.50	LDB6CPKO	LDB6CP	11.40		15.50		25.20	LDB12CP■	34.80
Panel Adapter	_	LDB2A	23.00	_	LDB4A	27.10	_	LDB6A	35.40	LDB8A	48.20	LDB10A	71.00	LDB12A	80.00
Open Adapter		LDB2OA	30.50		LDB4OA	45.20	_	LDB6OA	59.00	LDB8OA	74.00		108.00	LDB12OA	142.00
Reducer	_	_	_	_	LDB42R	39.80	_	LDB64R	69.00	LDB86R	80.00	LDB108R	100.00	LDB1210R	109.00
			_			_		_	_		_		_	LDB128R	116.00
Adapter to "LD" ◆	_	LDB2GASK	23.00	_	LDB4GAS	29.10	_	LDB6GAS	36.50	LDB8GASK	44.20	LDB10GASK	88.00	_	
Barrier Kit—5 ft. long w/hardware	_	_	_	_	LJB45B	34.80		LJB65B	70.00	LJB85B	87.00		_	_	
5 pc. Barrier Pack—5 ft. long	_		_	_	LJB45BKM	79.00		LJB65BKM	120.00	_	_	-	_	-	_
5 pc. Barrier Bracket— 2 compartment	_	_	_	_	LJB4BB2C	23.10		LJB6BB2C	80.00		_	_	_	_	_
5 pc. Barrier Bracket— 3 compartment	_	_	_	_	LJB4BB3C	49.40		LJB6BB3C	96.00	_	_	_	_	_	_

- Add connectors for all lengths and fittings, except closing plates, reducers, and adapters. These closing plates also available with knockout. Add "KO" to cat #; price is the same.
- Adapters to competitors' wireways also available. Contact your nearest Schneider Electric sales office for price and availability.
- Painted 12" x 12" wireway is not furnished with hinge-cover (screw-cover only).

NOTE: For wireway fill information, see NEC 376.



by Schneider Electric www.schneider-electric.us

### Oiltight—NEMA Type 12

Type LJB Oiltight lay-in wireway is fully gasketed and used to protect runs of electrical wiring from oil, water, coolants, dirt, or dust as well as physical damage. This wireway is manufactured to exceed oiltight and NFPA standards for industrial control equipment.



Lengths and fittings are made of 14 gauge steel with 10 gauge end flanges. Straight lengths and fittings have hinged covers with oil resistant gasket all around and are held closed with pull-down latches. All lengths and fittings are without knockouts. Type LJB lay-in Wireway is finished with ANSI-49 gray polyester powder finish over a corrosion resistant phosphate preparation. All Type LJB oiltight wireway is UL listed as steel enclosed wireway and auxiliary gutter. Conforms to NEMA Type 12.

Table 13.2: Type LJB Lay-in■

	2-1/2" x 2-1	/2"	4" x 4"		6" x 6"		8" x 8"		12" x 6	5"
Description	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
1" Nipple	LJB201	74.00	LJB401	76.00	LJB601	95.00	_		_	<u> </u>
2" Nipple	LJB202	80.00	LJB402	81.00	LJB602	100.00	_	_	_	_
3" Nipple	LJB203	84.00	LJB403	85.00	LJB603	106.00	_	_	_	_
6" Length	LJB206	92.00	LJB406	99.00	LJB606	123.00	LJB806	170.00	LJB12606	251.00
1' Length	LJB21	99.00	LJB41	110.00	LJB61	135.00	LJB81	202.00	LJB1261	325.00
2' Length	LJB22	129.00	LJB42	135.00	LJB62	184.00	LJB82	271.00	LJB1262	518.00
3' Length	LJB23	147.00	LJB43	168.00	LJB63	230.00	LJB83	330.00	LJB1263	624.00
4' Length	LJB24	186.00	LJB44	201.00	LJB64	280.00	LJB84	391.00	LJB1264	741.00
5' Length	LJB25	201.00	LJB45	227.00	LJB65	332.00	LJB85	452.00	LJB1265	846.00
10' Length▲	LJB210	352.00	LJB410	439.00	LJB610	637.00	LJB810	842.00	LJB12610	1523.00
45° Top Opening	LJB245LT	201.00	LJB445LT	182.00	LJB645LT	234.00	LJB845LT	332.00	LJB12645LT	410.00
45° Inside Opening	LJB245LI	159.00	LJB445LI	182.00	LJB645LI	234.00	LJB845LI	332.00		_
45° Outside Opening	LJB245LO	159.00	LJB445LO	182.00	LJB645LO	234.00	LJB845LO	332.00	_	_
90° Inside Opening	LJB290LI	159.00	LJB490LI	182.00	LJB690LI	234.00	LJB890LI	332.00	LJB12690LI	410.00
90° Outside Opening	LJB290LO	159.00	LJB490LO	182.00	LJB690LO	234.00	LJB890LO	332.00	LJB12690LO	410.00
90° Outside Top Opening	_	_	LJB490LOT	182.00	LJB690LOT	234.00	LJB890LOT	332.00	_	_
90° Top Opening	LJB290LT	159.00	LJB490LT	182.00	LJB690LT	234.00	LJB890LT	332.00	LJB12690LT	410.00
Tee—Top Opening	LJB2TT	188.00	LJB4TT	238.00	LJB6TT	285.00	LJB8TT	365.00	LJB126TT	572.00
Tee—Outside Opening	LJB2TO	221.00	LJB4TO	273.00	LJB6TO	328.00	LJB8TO	421.00		
Cross	LJB2X	259.00	LJB4X	318.00	LJB6X	383.00	LJB8X	530.00	LJB126X	683.00
Junction Box	LJB2JB	247.00	LJB4JB	289.00	LJB6JB	351.00	LJB8JB	431.00	L0D120X	
Telescopic Fitting	LJB2TF	144.00	LJB4TF	155.00	LJB6TF	177.00	LJB8TF	257.00	LJB126TF	464.00
Closing Plate	LJB2CP	29.70	LJB4CP	32.80	LJB6CP	43.40	LJB8CP	61.00	LJB126CP	81.00
Panel Adapter	LJB2A	29.00	LJB4A	39.80	LJB6A	47.80	LJB8A	76.00	LJB126A	107.00
Bracket Hanger	LJB2BH	15.50	LJB4BH	18.80	LJB6BH	25.10	LJB8BH	66.00	LODIZOA	107.00
Drop Hanger	LJB2DH	19.20	LJB4DH	25.10	LJB6DH	39.50	LJB8DH	75.00		
Extra Connector Kit■	LJB2C	21.20	LJB4C	27.10	LJB6C	29.10	LJB8C	38.50	LJB126C	46.30
90° Connector	LJB290C	21.20	LJB490C	27.10	LJB690C	29.10	LJB890C	38.50	LJB12690C	79.00
Reducer to 2"			LJB490C LJB42R	97.00		25.10			LJD12090C	79.00
Reducer to 4"	_				LJB64R	132.00			LJB1264R	144.00
Reducer to 6"	_	_	_	_			LJB86R	167.00	LJB1266R	144.00
Cut-off fitting—not Lay-in	LJB2CF	84.00	LJB4CF	100.00	LJB6CF	124.00	LJB8CF	181.00	LJB126CF	211.00
Cut-off fitting—Lay-in	LJB2CFL	150.00	LJB4CFL	166.00	LJB6CFL	190.00	LJB8CFL	266.00	LJB126CFL	318.00
Transposition Fitting—CCW (Str)	LJB21CCW	159.00	LJB41CCW	177.00	LJB61CCW	234.00		_		- 0.0.00
Transposition Fitting—CW (Str)	LJB21CW	140.00	LJB41CW	177.00	LJB61CW	211.00	_		_	
Transposition Elbow—CCW	LJB290LCCW	159.00	LJB490LCCW	182.00	LJB690LCCW	234.00	LJB890LCCW	315.00	_	
Transposition Elbow—CW	LJB290LCW	159.00	LJB490LCW	182.00	LJB690LCW	234.00	LJB890LCW	315.00	_	_
Swivel fitting—Wireway to Wireway	LJB2S	171.00	LJB4S	184.00	LJB6S	254.00	LJB8S	340.00		
Swivel fitting—Wireway to Wireway Swivel fitting—Wireway to Box	LJB2S LJB2SB	171.00	LJB4SB	184.00	LJB6SB	254.00	LJB8SB	340.00	_	_
Flex Fitting—Feed Through	LJB2FF	212.00	LJB45B	299.00	LJB65B	385.00	LJB8FF	418.00		
Barrier Kit—5 ft. long w/hardware		l I	LJB4FF LJB45B	34.80	LJB65B	70.00	LJB8FF LJB85B	418.00 87.00	LJB65B	70.00
5 pc. Barrier Pack—5 ft. long		_	LJB45B LJB45BKM	79.00	LJB65BKM	120.00	LJD83D	67.00	LJD00D	70.00
5 pc. Barrier Pack—5 π. long 5 pc. Barrier Bracket—2 compartment	_		LJB45BKM LJB4BB2C	79.00 23.10	LJB65BKM LJB6BB2C	80.00	_		_	_
		-					_		_	_
5 pc. Barrier Bracket—3 compartment			LJB4BB3C	49.40	LJB6BB3C	99.00		-		

- 10 foot straight lengths UL listed for up to 10 foot hanger spacing.
- Connector kit furnished with each length and fitting.

#### Raintight Wireway—NEMA Type 3R

**Outdoor raintight** wireway is used to protect electrical wiring against rain, sleet, and physical damage. Unique drip shield cover protects wiring from weather and maintains the "lay-in" feature for ease of wiring installation. Lengths and fittings are constructed of 16 gauge galvanized steel with ANSI-49 gray polyester powder finish over a corrosion resistant phosphate preparation. Underwriters Laboratories Listed as steel enclosed wireway and auxiliary gutter (horizontal mounting only). Conforms to NEMA Type 3R.

Table 13.3: Raintight Wireway

	4" x 4	."	6" x 6		8" x 8"	
Description▲	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
1' Length 5' Length 10' Length 90° L 30° Sweep L	LDRB41M LDRB45M LDRB410M LDRB490L LDRB430SE	99.00 198.00 487.00 148.00 302.00	LDRB61M LDRB65M LDRB610M LDRB690L LDRB630SE	150.00 291.00 641.00 198.00 431.00	LDRB81M LDRB85M LDRB810M LDRB890L LDRB830SE	226.00 474.00 641.00 278.00 546.00
Tee Junction Box Panel Adapter Connector▲ Closing Plate Drop Hanger Wall Hanger Reducer	LDRB4T LDRB4J LDRB44A LDRB4C LDRB4CP LDRB4DH LDRB4WH	186.00 257.00 87.00 21.00 48.20 23.10 53.00	LDRB66A LDRB6C LDRB6CP LDRB6DH	347.00 296.00 88.00 31.50 58.00 32.60 84.00 132.00	LDRB8T LDRB8J LDRB88A LDRB8C LDRB8CP LDRB8DH LDRB8WH LDRB86R	317.00 439.00 126.00 42.00 67.00 63.00 116.00 164.00

<sup>▲</sup> Add connectors for all lengths and fittings.

#### Raintight Trough—NEMA Type 3R

Raintight trough is designed for ganging meter devices, panelboards, switches, and circuit breaker enclosures. Each length is a completely enclosed section with a removable cover that has provisions for sealing.

**Design:** 4" and 6" wireway is constructed of 16 gauge galvanized steel. 8", 10", and 12" wireway is constructed of 14 gauge galvanized steel. All raintight troughs conform to NEMA Type 3R.

**Finish:** ANSI-49 gray polyester powder finish over a corrosion resistant phosphate preparation. All raintight troughs are Underwriters Laboratories listed as steel enclosed wireway and auxiliary gutter (horizontal mounting only).

Table 13.4: Raintight Trough

ength	4" x	4"	6" x	6"	8" x	8"	10" x	10"	12" x	12"
Fe	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
1'	RDB41	84.00	RDB61	109.00	_	_	_	_	_	_
2'	RDB42	120.00	RDB62	162.00	RDB82	215.00	RDB102	289.00	RDB122	366.00
3'	RDB43	151.00	RDB63	212.00	RDB83	287.00	RDB103	382.00	RDB123	440.00
4'	RDB44	188.00	RDB64	266.00	RDB84	360.00		_	-	_
5'	RDB45	224.00	RDB65	318.00	RDB85	427.00	RDB105	527.00	RDB125	626.00
6'	_	_	RDB66	372.00	RDB86	589.00	RDB106	632.00	RDB126	673.00

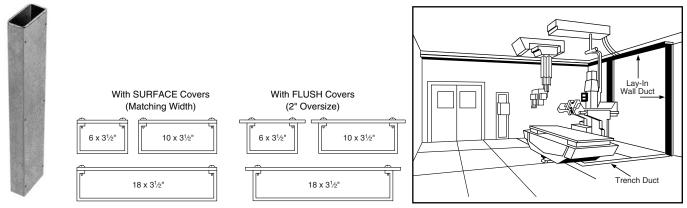
# by Schneider Electric

#### General Notes:

# Class 5250—Wall Duct UL Listed, File E65247, for Enclosure of Wiring to X-Ray Machines. Also available in aluminum for MRI application.

Wall duct is used as the continuation for standard trench duct in the floor. Wall duct can be routed up the wall and across the ceiling or under the finished floor (in ceiling space below) to provide a continuous lay-in raceway system from control consoles and floor equipment to overhead apparatus. Devices are furnished complete with covers and are available for either flush or surface mounted installations.

- Standard construction is 14 gauge steel with gray electrodeposition paint.
   Alternate construction is painted aluminum.
- 2. Covers and coupling devices are furnished with each device.
- 3. Wire retainers are furnished with each device.
- 4. Straight lengths are field cut to length.
- 5. Partitions and tunnels are to be field modified and installed where required.
- 6. Hangers or other mounting devices to be furnished by others.



#### **Components and Accessories**

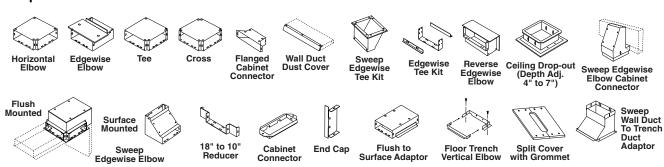


Table 13.5: Lay-In Wall Duct Components

Commonwell	F	lush Cover		Surface Cover			
Component	Catalog Number	\$ Price	Weight Lbs.	Catalog Number	\$ Price	Weight Lbs.	
5'-0" Straight Length With Cover 6"W	RWT06S60	668.00	22.5	RWT06S60S	668.00	20.4	
10"W	RWT10S60	668.00	39.2	RWT10S60S	668.00	36.4	
18"W	RWT18S60	836.00	62.2	RWT18S60S	836.00	59.4	
1'-6" Straight Length With Cover 6"W	RWT06S18	334.00	12.6	RWT06S18S	334.00	12.6	
10"W	RWT10S18	334.00	16.4	RWT10S18S	334.00	16.3	
18"W	RWT18S18	418.00	23.3	RWT18S18S	418.00	23.3	
Horizontal Elbow With Cover—90° 6"W	RWT06HE	534.00	6.5	RWT06HES	534.00	6.0	
10"W	RWT10HE	534.00	9.3	RWT10HES	534.00	8.1	
18"W	RWT18HE	668.00	24.9	RWT18HES	668.00	23.7	
Horizontal Elbow With Cover—45° 6"W	_	_	=	RWT06HE45S	534.00	6.0	
10"W	_	_		RWT10HE45S	534.00	8.1	
18"W	_	_		RWT18HE45S	668.00	23.7	
Edgewise Elbow With Cover 6"W	RWT06EE	534.00	5.5	RWT06EES	534.00	5.5	
10"W	RWT10EE	534.00	7.5	RWT10EES	534.00	7.4	
18"W	RWT18EE	668.00	11.1	RWT18EES	668.00	11.0	
Tee With Cover 6"W	RWT06TE	534.00	6.2	RWT06TES	534.00	5.9	
10"W	RWT10TE	534.00	8.5	RWT10TES	534.00	7.3	
18"W	RWT18TE	668.00	24.1	RWT18TES	668.00	22.9	
Cross With Cover 10"W	RWT10XE	534.00	1.3	RWT10XES	534.00	6.2	
18"W	RWT18XE	668.00	1.8	RWT18XES	668.00	21.8	
Flanged Cabinet Connector With Cover 10"W	RWT10CUC	334.00	8.0	RWT10CUCS	334.00	7.8	
Reverse Edgewise Elbow With Cover 6"W	RWT06REE	534.00	5.8	RWT06REES	534.00	5.7	
10"W	RWT10REE	534.00	7.5	RWT10REES	534.00	7.4	
18"W	RWT18REE	668.00	11.1	RWT18REES	668.00	11.0	
Sweep Edgewise Elbow With Cover 6"W 10"W 18"W	RWT10SFEE RWT18SFEE	534.00 668.00	10.0 12.0 16.5	RWT06SSEES RWT10SSEES RWT18SSEES	534.00 534.00 668.00	4.8 11.8 16.3	
Sweep Edgewise Elbow Cabinet Connector 10"W 18"W		_	=	RWT10SWEECC RWT18SWEECC	668.00 878.00	14.0 20.0	

Note: All devices available in aluminum. Add "A" suffix to the catalog number. Contact your local Schneider Electric sales office for pricing.

13-5



#### **Wall Duct Accessories**

#### Table 13.6: Lay-In Wall Duct Accessories

Accessories	Catalog Number	\$ Price	Weight Lbs.
5'-0" Partition	RWTP60	100.00	5.4
Straight through tunnel for tees ▲ 10"W 18"W	RWT10ST	100.00	2.9
	RWT18ST	124.00	3.8
90° Elbow tunnel for crosses ▲ 10"W 18"W	RWT10ET	150.00	3.2
	RWT18ET	222.00	5.1
3 compartment tunnel for tees 10"W	RWT10PTE	368.00	5.0
18"W	RWT18PTE	420.00	6.0
3 compartment tunnel for crosses 10"W	RWT10PXE	526.00	8.0
18"W	RWT18PXE	630.00	9.0
Edgewise Tee Kit 10"W	RWT10ETK	150.00	1.3
18"W	RWT18ETK	222.00	2.1
Sweep Edgewise Tee Kit 10"W	RWT10SWET	822.00	8.0
18"W	RWT18SWET	990.00	8.0
Flush to Surface Adaptor 10"W	RWT10FS	418.00	11.9
18"W	RWT18FS	522.00	16.4
Ceiling Drop-Out 12x12 Flush Cover 8"x8"	RWTCDO	584.00	15.0
Extra Coupling Device 10"W	RWT10COUP	40.80	.4
18"W	RWT18COUP	64.00	.5
Extra Straight Cover—30" long (Order 2 pcs. for 5 ft. of duct.) Flush 10"W 18"W Surface 10"W 18"W	RWT10SCOV RWT18SCOV RWT10SCOVS RWT18SCOVS	100.00 130.00 69.00 130.00	7.2 13.0 6.1 11.8

<sup>▲</sup> Tunnels form a 3" wide compartment.

Note: All devices available in aluminum. Add "A" suffix to the catalog number. Contact your local Schneider Electric sales office for pricing.

#### Table 13.7: Wall Duct Accessories

Accessories	Catalog Number	\$ Price	Weight Lbs.
Reducer Coupling— 18" to 10"	RWTRC	150.00	2.1
10" to 6"	RWT06RC	150.00	1.6
Cabinet Connector 6"W	RWT06CC	150.00	1.0
10"W	RWT10CC	150.00	1.3
18"W	RWT18CC	222.00	2.4
End Cap 6"W	RWT06EC	84.00	1.0
10"W	RWT10EC	84.00	1.3
18"W	RWT18EC	104.00	1.8
Vertical Elbows for: 6" Trench to 6" Wall Duct 12" Trench to 10" Wall Duct 12" Trench to 18" Wall Duct	RWT06FTVE06 RWT10FTVE12 RWT18FTVE12	160.00 160.00 280.00	1.1 1.2
18" Trench to 10" Wall Duct	RWT10FTVE18	200.00	1.2
18" Trench to 18" Wall Duct	RWT18FTVE18	250.00	1.3
Sweep Trench Duct to Wall Duct Adapter (available in surface cover only)			
12" Trench to 10" Wall Duct	RWT10SWFTVE12	348.00	10.0
18" Trench to 18" Wall Duct	RWT18SWFTVE18	522.00	14.0
Split Cover with Grommet 12" long-3"x 8" Opening Flush 6"W 10"W 18"W	RWT06ACP RWT10ACP RWT18ACP	94.00 94.00 104.00	2.6 3.1 4.8
Surface 6"W	RWT06ACPS	74.00	2.0
10"W	RWT10ACPS	74.00	2.7
18"W	RWT18ACPS	93.00	4.0
Dust Cover—5 ft. long	RWTDCOV60	150.00	5.5
Grommet—100 ft. roll	RWTBG100	440.00	

Note: All devices available in aluminum. Add "A" suffix to the catalog number. Contact your local Schneider Electric sales office for pricing.

#### **Trench Duct**

- STANDARD LENGTH of trench duct is 10 ft. Gasketed cover plates are ordered and shipped separately.
- 2. FEATURES of trench duct:
  - -Trench duct width is cover plate width.
    - -Tub width is trench duct width less 1.8".
    - —Overall width (bottom flange to flange) is 3" wider than trench duct width.
    - —Standard depth is adjustable from 2-3/8" to 3-3/8". Also available as standard is depth adjustable from 3" to 4". To order, change "2" to "3". Ex. RSV063100120. Applies to trench duct, elbows, crosses, tees, and reducers. Same price as standard device. Other depths available.
    - —Tees, crosses, horizontal elbows, and reducers are shipped complete with cover plates assembled.
    - —Grey vinyl tile trim is furnished as standard. Aluminum is available when requested.
  - —All compartments over 17" wide must be supported with dividers or posts.
- 3. PRICES for additions and special features:
  - —For each foot of adjustable partition, add \$64.00 per foot of partition.
  - —For each 1" of depth beyond range of 3" to 4", add \$32.00 per foot of trench duct.
  - —For double tile trim on two sides of cover plate, ONLY add \$120.00 per foot of trench duct.
  - —For double tile trim on all four sides of cover plate, add \$400.00 per foot of trench duct.
  - —For support post, add \$64.00 per foot of trench duct for each row of posts required.

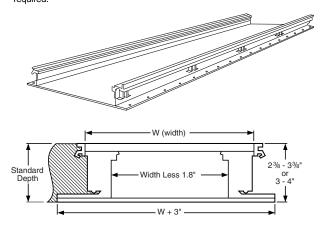


Table 13.8: Assembled Trench Duct

All part numbers listed below are for 2 3/8"-3 3/8" deep, one compartment trench with vinyl tile trims.

Straight			Trench Duct		Complet	te Device
Sections	Length	Width	Catalog Number	\$ Price	Per 10' Length	Per Foot
	10'-0"	6" 9" 12" 18" 24" 30"	RSV062100120 RSV092100120 RSV122100120 RSV182100120 RSV242100120 RSV302100120	1840.00 1840.00 2220.00 2640.00 3160.00 3800.00	3920.00 4740.00	392.00 474.00 566.00
	C	overs Only	(5 Plates per 10' Lengti	h) <b>■</b>		
Full Length	24"	6" 9" 12" 18" 24" 30"	RCP0624 RCP0924 RCP1224 RCP1824 RCP2424 RCP3024	280.00 280.00 340.00 420.00 500.00 660.00	3240.00 3920.00	392.00 474.00
	12"	12" 18"	RCP1212 RCP1812	268.00 334.00	_	=
Factory Cut-to-	6'-0"L 4'-3-1/2"L 3'-3-1/2"L 2'-0"L 1'-0"L 0'-3-1/2"L	12" 12" 12" 12" 12" 12"	RSV122100072 RSV122100051.5 RSV122100039.5 RSV122100024 RSV122100012 RSV122100003.5	1654.00 1102.00 1102.00 550.00 550.00 268.00	_	-
Length (12" Wide Only)	1–24" & 1– 1–24" & 1– 1–24" Long	g Covers & -12" Long ( g Cover ♦	1 – Wall Duct Vertical Elb Cover & 1—Wall Duct Vert	oow ♦ tical Elbow ♦	}	All ordered separately

Straight length cover plates are shipped separately and must be ORDERED SEPARATELY.

Covers and/or vertical elbows for connecting trench duct to lay-in wall duct—ORDER

Class 5200 / Refer to Catalog 5230CT9601

#### Table 13.9: **Trench Duct Fittings**

	Item	Width	Catalog No.	\$ Price
	End Closures <b>▲</b>	6" 9" 12" 18" 24" 30"	REC06 REC09 REC12 REC18 REC24 REC30	116.00 116.00 140.00 168.00 202.00 242.00
	Vertical Elbows	6" 9" 12" 18" 24" 30"	RVE06 RVE09 RVE12 RVE18 RVE24 RVE30	398.00 398.00 440.00 570.00 646.00 762.00
	Riser and Cabinet Connector (Removable Front)	6" 9" 12" 18" 24" 30"	RRC06 RRC09 RRC12 RRC18 RRC24 RRC30	500.00 500.00 602.00 722.00 866.00 1038.00
	RZD60	252.00		
Тар	oe for Trench Duct (180 ft. r	rolls)	G1414	132.00
	Marker for Cellular Floor		G1426	20.60

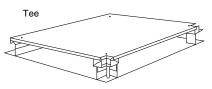
For 3" to 4" trench duct, add a "3" to end of catalog number.

All devices through 18" width are available in aluminum. Height is factory-set to customer specifications from 2-1/2 to 4 inches. (Non-Adjustable)

#### Table 13.10: Trench Duct Elbows, Tees, and Crosses

lians.		Complete Device	
Item	Width	Catalog Number	\$ Price
90º Horizontal ▲ Elbows	6" 9" 12" 18" 24" 30"	RHV062100009 RHV092100012 RHV122100015 RHV182100011 RHV242100021 RHV242100027 RHV302100033	1168.00 1168.00 1462.00 1670.00 2284.00 2854.00
45° Horizontal Elbow ▲	12"	RHV12245	1446.00
Tees▲	6" 9" 12" 18" 24" 30"	RTV062100011 RTV092100014 RTV122100017 RTV182100023 RTV242100029 RTV302100035	1168.00 1168.00 1462.00 1828.00 2284.00 2854.00
Crosses▲	6" 9" 12" 18" 24" 30"	RXV062100012 RXV092100015 RXV122100018 RXV182100024 RXV242100030 RXV302100036	1670.00 1670.00 2086.00 2610.00 3262.00 4076.00

Includes cover; shipped attached.



Note: All cover plate corner notches are 1-1/2" deep.

## **Accessories and Components**

Table 13.11: Trench Duct Accessories

	Item/Catalog Number		\$ Price	Ite	m/Catalog Number		\$ Price
<b>←</b> -12"	Right Hand Reducer 18" to 12" Cover Included	RRV182100012RR	1670.00		U-Compartment 5'-0" Long x 3 -1/2" Wide with Adjustable Height Sides	RUC60	500.00
<b>←</b> 12"→	Left Hand Reducer 18" to 12" Cover Included	RRV182100012LR	1670.00	Leveling Legs	9" and 12" wide trench 18" and 24" wide trench 30" wide trench Support Channel Leveling Legs Not Included	G1500T12 G1500T24 G1500T36	84.00 84.00 84.00
				Legs	5/16 x 18 x 3"	G19103	17.00
15"	Reducing Tee 18" to 12" Cover Included	RTV182100017	1754.00		Cover Lifter (Suction Cup Device)	G1735S	836.00
	Spacer Bar and Barrier Adjustment Gage	6" RSB06 9" RSB09 12" RSB12 18" RSB18 24" RSB24 30" RSB30	200.00 200.00 252.00 312.00 392.00 470.00	Tunnels for Trench Duct Elbows (Tee or Cross)  Straight through 90° elbow tunnel	90° tunnel for 12" trench 90° tunnel for 18" trench Straight tunnel for 12" trench Straight tunnel for 18" trench	RSV122ET RSV182ET RSV122ST RSV182ST	200.00 280.00 116.00 118.00

#### Table 13.12: Grommets

13-6

Grommet Material (50 ft. rolls)	RG50	152.00
---------------------------------	------	--------

# Back to Product Index Section Listing

## **Section 14**

## **Transformers**



General Purpose Transformer, see page 14-2





Sealed Transformer, see page 14-8

Industrial Control Transformer, see page 14-14





Mini Power-Zone™ Unit Substation, see page 14-12

Transformer Disconnect, see page 14-18

## General Purpose, Dry Type, 600 Volts and Below

Overview	14-2
EE Three-Phase Transformers	14-4
EE Single-Phase Transformers	14-5
EE Single- and Three-Phase, Watchdog™ Low Temperature Rise Transformers	14-5
EE NL and NLP Series Transformers	14-6
NEMA Premium Transformers	14-7
Sealed Single- and Three-Phase Transformers	14-8
Sealed Single-Phase, Export Model Transformers	14-8
Sealed Single-Phase, Buck and Boost Transformers	14-8
Sealed Single- and Three-Phase, Stainless Steel Enclosed Transformers	14-9
Non-Ventilated Single- and Three-Phase Transformers	14-9
Transformer Enclosures	14-9
Miscellaneous	
Enclosures and Accessories	14-10
Lug and Terminal Block Cover Kits; Weathershields; Wall and Ceiling Mounting Brackets	14-11
Unit Substation, 600 Volts and Below	
Sealed, Mini Power-Zone™ Unit Substations	14-12
Industrial Control	
Type T and Type TF Transformers	14-14
MultiTap™ Transformers	14-15
Accessories	14-17
Transformer Disconnects	
NEMA Type 1 and Type 12 Enclosures	14-18
Instrument, 600 Volt Class	
Voltage and Current Transformers	14-19
Energy Efficient, Dry Type, 2.4, 5, and 15 kV	
lewl) 1201-15,000 V, Three-Phase, Indoor Transformers	14-20
1201–15,000 V, Single-Phase, Indoor Transformers	14-20



Public Law 109-58 of the Energy Policy Act of 2005 requires the manufacturing of energy efficient transformers after January 1, 2007 for all low-voltage distribution transformers.

According to Department of Energy Federal Registry Final Rule 10 CFR Part 429, 430, and 431, Low-Voltage Dry-Type Distribution Transformers, the efficiency of a low-voltage, dry-type, distribution transformer manufactured on or after January 1, 2007, shall be no less than that required for its kVA rating in the table below.

Table 14.1: Required Efficiency Ratings of Low-Voltage Distribution Transformers

Sing	le-Phase	Three-Phase			
kVA	Efficiency (%) ▲	kVA	Efficiency (%) ▲		
15	97.7	15	97		
25	98	30	97.5		
37.5	98.2	45	97.7		
50	98.3	75	98		
75	98.5	112.5	98.2		
100	98.6	150	98.3		
167	98.7	225	98.5		
250	98.8	300	98.6		
333	98.9	500	98.7		
	•	750	98.8		
		1000	98.9		

Efficiencies are determined at the following reference conditions:
(1) for no-load losses, at the temperature of 20 °C;
(2) for load-losses, at the temperature of 75 °C and 35 percent of nameplate load.

(Source: Table 4–2 of National Electrical Manufacturers Association (NEMA) Standard TP–1–2002, *Guide for Determining Energy Efficiency for Distribution Transformers.*)

The following family of products meets these requirements.

## General Purpose, Three-Phase (15–2000 kVA) and Single-Phase (15–333 kVA)

General Purpose transformers provide the most economical solution.

- Aluminum or copper windings
- Isolation transformer
- 150 °C rise design on 220 °C insulation systems.

## Watchdog, Three-Phase (15–1500 kVA) and Single-Phase (15–333 kVA)

Watchdog transformers, by design, reduce energy consumption at loads greater than 50% loading, giving fewer BTUs/hour at those loading levels. The life expectancy is greater than that of 150 °C rise General Purpose units.

- Aluminum or copper windings
- Isolation transformer
- Two temperature rise options:
  - 115 °C rise on 220 °C insulation systems (15% continuous emergency overload capacity)
  - 80 °C rise on 220 °C insulation systems (30% continuous emergency overload capacity)

#### K-Rated, Three-Phase (15-1000 kVA)

K-rated transformers mitigate Triplen harmonics via a Delta-Wye configuration.

- · Aluminum or copper windings
- Isolation transformer with electrostatic shield
- K-4 and K-13 levels

### Harmonic Mitigating, Three-Phase (15-1000 kVA)

Harmonic Mitigating transformers mitigate Triplen harmonics via electromagnetic phase relations. They remove 5th and 7th harmonics when using dual devices with a  $0^\circ$  and a  $+30^\circ$  phase shift. They further reduce 11th and 13th harmonics when a  $+15^\circ$  or  $-15^\circ$  shift is added to the dual devices. Available with:

- Aluminum or copper windings
- Isolation transformer

The following products are **not** included in the definition of Low Voltage, Dry-Type Distribution Transformers and are not required to comply with the efficiency table.

## Sealed, General Purpose, Three-Phase (3–30 kVA) and Single-Phase (.050–25 kVA)

Core and coils encapsulated in a sand and resin mixture allows for a more compact design.

- Copper windings
- Isolation transformer

## Non-Ventilated, Three-Phase (15–500 kVA) and Single-Phase (15–250 kVA)

Non-Ventilated transformers are designed to operate in harsh environmental conditions: dust, airborne contaminants, metal particles, or where weather conditions make ventilated openings impractical.

#### **Drive Isolation Transformers**

Square D<sup>TM</sup> brand drive isolation transformers from Schneider Electric meet the special requirements for both adjustable frequency drives and dc motor drive power isolation. They cover the allowance for high surges, harmonics, and offset currents.

Drive isolation transformers are not shielded isolation transformers, but act to lessen transient generation into the supply power and act as a buffer for SCR current surges.

Available Voltages:

- Primary: 230 Delta, 460 Delta, 575 Delta
- Secondary: 230Y/133, 460Y/265, 5575Y/332

#### Available kVA

• 7.5, 11, 15, 20, 27, 34, 40, 51, 63, 75, 93,118, 145, 175, 220, 275, 330, 440, 550 kVA

For part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.

### **Motor Starting Auto Transformers**

Auto transformers' design matches starter requirements.

- Open core and coil available
- Two-winding and three-winding
- Available in the following voltages:
  - 208, 240, 480, or 600 V
- Available in the following horsepower:
  - 10, 20, 30, 50, 75, 100, 125, 150, 200, 250, 300, 400 hp

For part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.

#### **IP00 Core and Coil Transformers**

All Type 2 distribution devices are available as IP00 Core and Coil. These units are compliant with the 2005 Energy Act, as well as the excluded items.

For part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.



### General Purpose Dry Type 600 Volts and Below

#### **NEMA Premium**

New!

NEMA Premium is the only third-party standard that defines a complete range of efficiency levels that exceeds 2005 Energy Act requirements.

As a partner in the NEMA Premium Transformer Program, Schneider Electric has determined that this product meets the NEMA Premium efficiency specifications for premium energy efficiency.

NOTE: NEMA Premium is a trademark of the National Electrical Manufacturers Association.

Table 14.2: Efficiency Ratings of NEMA Premium Transformers

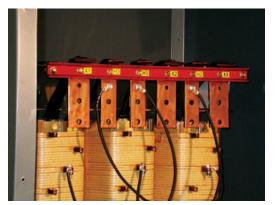
Singl	e phase	Three phase			
kVA	Efficiency (%)	kVA	Efficiency (%)		
15	98.39	15	97.90		
25	98.60	30	98.25		
37.5	98.74	45	98.39		
50	98.81	75	98.60		
75	98.95	112.5	98.74		
100	99.02	150	98.81		
167	99.09	225	98.95		
250	99.16	300	99.02		
333	99.23	500	99.09		
	•	750	99.16		
		1000	99.23		

#### Schneider Electric Premium 30 Transformers Family

- K-rated, Three-Phase (15–1000 kVA). Available with:
  - Copper windings
  - K-9 and K-13 levels
- Harmonic Mitigating, Three-Phase (15–1000 kVA)
- Watchdog, Three-Phase (15–1000 kVA) and Single-Phase (15–333 kVA)

## Features of Distribution and NEMA Premium Transformers

- Provide an adequate wire bending radius for multiple cable options, per NEC 312.6(A) (called out in NEC 450.12 Terminal Wire Space)
- 200% cable landing on all X0 or H0 terminals
- Required ventilation clearance marked on all units in accordance with NEC Section 450.9.
  - All ventilated transformers from Schneider Electric require only a three-inch clearance—50% smaller than the industry average
- Terminals are sized for overcurrent and wire size, not for nameplate current rating
  - Primary terminals are sized to accept lugs up to 250% of nameplate current rating
  - Secondary terminals are sized to accept lugs up to 125% of nameplate current rating



Square D™ brand transformers from Schneider Electric feature the largest terminals in the industry.

#### **Sound Levels**

Square  $D^{\text{\tiny TM}}$  brand transformers meet the NEMA standards for sound level shown in Table 14.3.

Table 14.3: NEMA Standards for Sound Levels

kVA Rating	Sound Level
0–9	40 dB
10–50	45 dB
51–150	50 dB
151–300	55 dB
301–500	60 dB
501–700	62 dB
701–1000	64 dB

For an additional charge, any Square D<sup>™</sup> brand transformer can be built with a sound level that is 3 or 6 dB below the NEMA standard.

For part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.

EE Three-Phase Transformers; 60 Hz; Table 14.4: 208Y/120 Secondary; cULus Listed

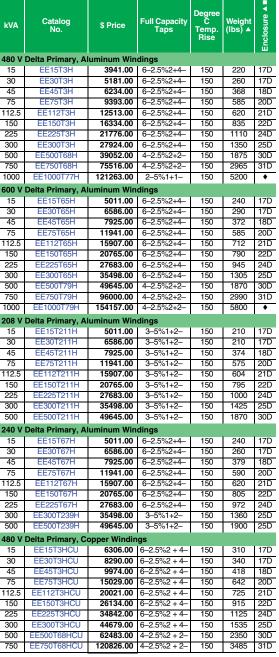


Table 14.5: EE Three-Phase Transformers; 60 Hz; 480Y/277 Secondary; cULus Listed

kVA	Catalog No.	\$ Price	Full Capacity Taps	Deg. C Temp. Rise	Weight (lbs) ▲	Enclosure ▲■
208 V I	Delta Primary, Alu	ıminum Wind	lings			
15	EE15T212H	5011.00	3-5%1+2-	150	230	17D
30	EE30T212H	6586.00	3-5%1+2-	150	260	17D
45	EE45T212H	7925.00	3-5%1+2-	150	375	18D
75	EE75T212H	11941.00	3-5%1+2-	150	550	20D
112.5	EE112T212H	15907.00	3-5%1+2-	150	615	21D
150	EE150T212H	20765.00	3-5%1+2-	150	800	22D
225	EE225T212H	27683.00	3-5%1+2-	150	991	24D
300	EE300T212H	35498.00	3-5%1+2-	150	1425	25D
500	EE500T212H	49645.00	3-5%1+2-	150	1919	30D
480 V I	Delta Primary, Alu	ıminum Wind	lings			
15	EE15T1814H	5011.00	6-2.5%2+4-	150	215	17D
30	EE30T1814H	6586.00	6-2.5%2+4-	150	260	17D
45	EE45T1814H	7925.00	6-2.5%2+4-	150	385	18D
75	EE75T1814H	11941.00	6-2.5%2+4-	150	660	20D
112.5	EE112T1814H	15907.00	6-2.5%2+4-	150	615	21D
150	EE150T1814H	20765.00	6-2.5%2+4-	150	820	22D
225	EE225T1814H	27683.00	6-2.5%2+4-	150	998	24D
300	EE300T1814H	35498.00	6-2.5%2+4-	150	1500	25D
500	EE500T76H	49645.00	4-2.5%2+2-	150	2040	30D

Table 14.6: EE Three-Phase Transformers; 60 Hz; 240 Delta Secondary; cULus Listed

-	kVA	Catalog No.	\$ Price	Full Capacity Taps	Deg. C Temp. Rise	Weight (lbs) ▲	Enclosure ▲■			
-	480 V I	Delta Primary, Alu	ıminum Wind	lings						
-	15	EE15T6H	5011.00	6-2.5%2+4-	150	220	17D			
-	30	EE30T6H	6586.00	6-2.5%2+4-	150	260	17D			
-	45	EE45T6H	7925.00	6-2.5%2+4-	150	368	18D			
	75	EE75T6H	11941.00	6-2.5%2+4-	150	585	20D			
	112.5	EE112T6H	15907.00	6-2.5%2+4-	150	620	21D			
-	150	EE150T6H	20765.00	6-2.5%2+4-	150	835	22D			
	225	EE225T6H	27683.00	6-2.5%2+4-	150	1110	24D			
-	300	EE300T6H	35498.00	6-2.5%2+4-	150	1350	25D			
	500	EE500T63H	49645.00	4-2.5%2+2-	150	1875	30D			
-	750	EE750T63H	96000.00	4-2.5%2+2-	150	2965	31D			
-	1000	EE1000T78H	154157.00	2-5%1+1-	150	5200	+			
-	480 V Primary with 120 Center Tap, Aluminum Windings									

240 Delta with 120 center taps have historically been limited to 5% capacity on the center tap. The units from Schneider Electric offer greater limits on 120 V center tap. Limits are determined by the total transformer loading and the following formula used to size new 120 V center tap units:

(240 V balanced loads) +	25 x (120 V	loads) = kVA required
(= 10 · Daiai100a 10aa0) .	O x ( O .	ioddo) — itti tioquiiod

15	EE15T151HCT	5117.00	2–5%–	150	220	17D
30	EE30T151HCT	6726.00	2–5%–	150	295	17D
45	EE45T151HCT	8093.00	2–5%–	150	385	18D
75	EE75T151HCT	12193.00	2–5%–	150	590	19D
112.5	EE112T151HCT	16243.00	2–5%–	150	635	21D
150	EE150T151HCT	21202.00	2–5%–	150	783	22D
225	EE225T151HCT	28266.00	2–5%–	150	1080	24D
300	EE300T151HCT	36247.00	2–5%–	150	1355	25D
 500	EE500T151HCT	50691.00	2–5%–	150	2137	30D
750	EE750T151HCT	98020.00	2–5%–	150	2982	31D
1000	EE1000T151HCT	149905.00	2–5%–	150	5800	•

- Not for construction. Contact your local Schneider Electric representative for certified prints.
- For enclosure styles, see Table 14.19 on page 14-10.
- Contact factory.

NOTE: FCBN = full capacity below normal Lugs are furnished by custome

Refer to www.squared.com/eexfmr for additional information.

Other Primary and Secondary combinations are available via the Schneider Electric Product Configurator. Contact your local Schneider Electric representative for more information.

14-5



### General Purpose Dry Type 600 Volts and Below

Table 14.7: EE Single-Phase Transformers

		- 3				
kVA	Catalog No.	\$ Price	Full Capacity Taps	Degree C Temp. Rise	Weight (lbs) ▲	Enclosure ▲■
			ary; 120/240 V Se	econdary; 6	60 Hz;	
	s Listed through					
15	EE15S3H	3072.00	6–2.5%2+4−♦	150	215	17D
25	EE25S3H	4151.00	6-2.5%2+4-♦	150	275	17H
37.5	EE37S3H	5534.00	6-2.5%2+4-◆	150	340	18H
50 75	EE50S3H	6731.00 9128.00	6-2.5%2+4-◆ 6-2.5%2+4-◆	150 150	395 619	18H 21D
100	EE75S3H	15091.00	6-2.5%2+4-◆ 6-2.5%2+4-◆	150	682	21D
	EE100S3H					i
167 250	EE167S3H EE250S3H	17333.00 35837.00	6-2.5%2+4-◆ 6-2.5%2+4-◆	150 150	982 1060	24D 25D
333	EE333S3H	44586.00	6-2.5%2+4-◆	150	1854	31D
						310
	e-Phase—600 V s Listed throug		20/240 V Secon	dary; 60 H	z;	
15	EE15S3534H	3733.00	6–2.5%2+4−♦	150	215	17D
25	EE25S3534H	5044.00	6-2.5%2+4-♦	150	275	17H
37.5	EE37S3534H	6723.00	6-2.5%2+4-♦	150	400	18H
50	EE50S3534H	8177.00	6-2.5%2+4-♦	150	450	18H
75	EE75S3534H	11089.00	6-2.5%2+4-♦	150	605	21D
100	EE100S3534H	18332.00	6-2.5%2+4-♦	150	795	22D
167	EE167S3534H	21056.00	6–2.5%2+4−♦	150	985	24D
250	EE250S3534H	43535.00	6–2.5%2+4−♦	150	1065	25D
333	EE333S3534H	50383.00	6–2.5%2+4−♦	150	1865	31D
			20/240 V Secon			0.5
	s Listed throug		20/240 V Secon	iuary, ou n	۷,	
15	EE15S60H	4506.00	2-5%FCBN	150	200	17D
25	EE25S60H	5866.00	2-5%FCBN	150	275	17H
37.5	EE37S60H	7818.00	2-5%FCBN	150	397	18H
50	EE50S60H	9508.00	2-5%FCBN	150	420	18H
75	EE75S60H	12890.00	2-5%FCBN	150	621	21D
100	EE100S60H	19613.00	2-5%FCBN	150	795	22D
167	EE167S60H	24484.00	2-5%FCBN	150	985	24D
Single	e-Phase—277 V	Primary: 1	20/240 V Secon	darv: 60 H	z:	
	s Listed throug			,,	_,	
15	EE15S61H	4506.00	2-5%FCBN	150	225	17D
25	EE25S61H	5866.00	2-5%FCBN	150	285	17H
37.5	EE37S61H	7818.00	2-5%FCBN	150	410	18H
50	EE50S61H	9508.00	2-5%FCBN	150	460	18H
75	EE75S61H	12890.00	2-5%FCBN	150	630	21D
100	EE100S61H	19613.00	2-5%FCBN	150	695	22D
167	EE167S61H	24484.00	2-5%FCBN	150	995	24D

## Energy Efficient Single-Phase; Watchdog™

Class 7400 / Refer to Catalog 7400CT0601

## **EE Three- and Single-Phase Watchdog Low Temperature Rise Transformers**

Designed to maximize energy efficiency, supplies highest efficient levels for 24 hour loading greater than 50%. Extra long life expectancy using 220 °C insulation system designed for full load operation at a maximum temperature rise of 115 °C or 80 °C instead of 150 °C. Continuous emergency overload capability of 15% on 115 °C rise and 30% on 80 °C rise.

Table 14.8: EE Watchdog Transformers

kVA	Catalog No.	\$ Price	Full Capacity Taps	Weight (lbs) ▲	Enclosure
	Rise Three-Phas	se—480 V D	elta Primary; 208	Y/120 V	Secondary;
15	EE15T3HF	4861.00	6-2.5%2 + 4-	220	17D
30	EE30T3HF	7292.00	6-2.5%2 + 4-	368	18D
45	EE45T3HF	8777.00	6-2.5%2 + 4-	585	20D
75	EE75T3HF	13222.00	6-2.5%2 + 4-	620	21D
112.5	EE112T3HF	17614.00	6-2.5%2 + 4-	835	22D
150	EE150T3HF	22993.00	6-2.5%2 + 4-	980	24D
225	EE225T3HF	30652.00	6-2.5%2 + 4-	1349	25D
300	EE300T68HF	39094.00	6-2.5%2 + 4-	2050	30D
500	EE500T68HF	54673.00	6-2.5%2 + 2-	2330	30D
115 °C	Rise Three-Phas	e—480 V D	elta Primary; 208	Y/120 V	Secondary:
60 Hz	; cULus Listed. Co		ngs		
15	EE15T3HFCU	7778.00	6-2.5%2 + 4-	260	17D
30	EE30T3HFCU	11667.00	6-2.5%2 + 4-	420	18D
45	EE45T3HFCU	14043.00	6-2.5%2 + 4-	642	20D
75	EE75T3HFCU	21155.00	6-2.5%2 + 4-	675	20D
112.5	EE112T3HFCU	28182.00	6–2.5%2 + 4–	741	21D
150	EE150T3HFCU	36789.00	6-2.5%2 + 4-	1050	22D
225	EE225T3HFCU	49043.00	6–2.5%2 + 4–	1220	24D
300	EE300T68HFCU	62551.00	6-2.5%2 + 4-	2300	30D
500	EE500T68HFCU	87477.00	6-2.5%2 + 2-	2409	30D
80 °C 60 Hz:	Rise Three-Phase ; cULus Listed	480 V De	Ita Primary; 208Y	/120 V S	econdary;
15	EE15T3HB	5304.00	6-2.5%2 + 4-	220	17D
30	EE30T3HB	7956.00	6-2.5%2 + 4-	368	18D
45	EE45T3HB	9574.00	6-2.5%2 + 4-	585	20D
75	EE75T3HB	14424.00	6-2.5%2 + 4-	620	21D
112.5	EE112T3HB	19215.00	6-2.5%2 + 4-	835	22D
150	EE150T3HB	24641.00	6-2.5%2 + 4-	980	24D
225	EE225T3HB	33438.00	6-2.5%2 + 4-	1349	25D
300	EE300T68HB	43282.00	6-2.5%2 + 4-	2400	30D
500	EE500T68HB	60531.00	6-2.5%2 + 2-	2964	31D
80 °C	Rise Three-Phase	-480 V De	Ita Primary; 208Y	/120 V S	econdary;
15	; cULus Listed. Co EE15T3HBCU	8486.00	6-2.5%2 + 4-	260	17D
30	EE30T3HBCU	12730.00		418	17D 18D
45			6–2.5%2 + 4– 6–2.5%2 + 4–		-
45 75	EE45T3HBCU EE75T3HBCU	15318.00 23078.00	6-2.5%2 + 4-	642 725	20D 21D
112.5	EE112T3HBCU	30744.00	6-2.5%2 + 4-	910	21D 21D
150	EE11213HBCU	39426.00	6-2.5%2 + 4-	1125	21D 24D
225	EE225T3HBCU	53501.00	6-2.5%2 + 4-	1425	24D 24D
300	EE300T68HBCU	69251.00	6-2.5%2 + 4-	2400	30D
500	EE500T68HBCU	96850.00	6-2.5%2 + 2-	2578	30D
	Rise Single-Phase		) V Primary; 120/		
Hz; cl	JLus Listed	2408400	7 V Filliary, 120/	240 V 36	condary, oo
15	EE15S3HF	4453.00	6–2.5%2 + 4−♦	275	17H
25	EE25S3HF	5797.00	6–2.5%2 + 4−♦	340	18H
37.5	EE37S3HF	7726.00	6–2.5%2 + 4−♦	395	18H
50	EE50S3HF	9396.00	6–2.5%2 + 4−♦	620	21D
75	EE75S3HF	12738.00	6–2.5%2 + 4−♦	685	22D
100	EE100S3HF	19381.00	6–2.5%2 + 4−♦	985	24D
80 °C	Rise Single-Phase cULus Listed	e—240x480	V Primary; 120/2	40 V Se	condary;
15	EE15S3HB	4918.00	6–2.5%2 + 4−♦	280	17H
25	EE25S3HB	6403.00	6-2.5%2 + 4-♦	345	17H
37.5	EE37S3HB	8533.00	6-2.5%2 + 4-♦	400	18H
50	EE50S3HB	10378.00	6-2.5%2 + 4-♦	625	21D
75	EE75S3HB	14069.00	6-2.5%2 + 4-♦	690	21D 22D
100	EE100S3HB	21406.00	6-2.5%2 + 4-♦	995	24D
100	EL 1000011D	21-30.00	5 L.070L T T	555	2-70

- Not for construction. Contact your local Schneider Electric representative for certified prints.
- For enclosure styles, see Table 14.19 on page 14-10.
- ♦ When 240 V tap is used, there will be 3–5% taps: 1 above and 2 below.

NOTE: FCBN = full capacity below normal Lugs are furnished by customer

 $\label{lem:recombined} \textbf{Refer to www.squared.com/eexfmr for additional information}.$ 

Class 7400 / Refer to Catalogs 7400CT0601, 7400CT0301

#### **EE NL and NLP Series Transformers**

- Three-phase dry type transformers, 480 Delta to 208Y/120
- Aluminum or copper windings
- Electrostatic shield
- Class 220 insulation
- Double size neutral terminal for additional customer neutral cables
- Additional coil capacity to compensate for higher non-linear load loss
- cULus Listed

Table 14.9: 480 Delta Primary, 208Y/120 Primary

i abie	14.9: 460 Dell	a Pililiai	y, 2061/1201	Primar	у
kVA	Catalog No.	\$ Price	Taps	Weight (lbs)	Enclosure ▲■
NL Ser	ies for Typical Non-Lir	near Load S	ervice; K-4 Rate	d;	
Alumir 15	num Windings; 115 °C EE15T3HFISNL	5834.00	6–2.5% 2+4–	256	17D
30	EE30T3HFISNL	8751.00	6-2.5% 2+4-	320	17D
45	EE45T3HFISNL	10533.00	6-2.5% 2+4-	515	20D
75	EE75T3HFISNL	15866.00	6-2.5% 2+4-	535	21D
112.5	EE112T3HFISNL	21137.00	6-2.5% 2+4-	800	22D
150	EE150T3HFISNL	27592.00	6-2.5% 2+4-	1110	24D
225	EE225T3HFISNL	38389.00	6-2.5% 2+4-	1349	25D
300	EE300T68HFISNL	53179.00	4-2.5% 2+2-	1750	30D
500	EE500T68HFISNL	73483.00	4–2.5% 2+2–	2295	31D
NI Sor	ies for Typical Non-Lir	near Load S	ervice: K-// Bate	d.	
	r Windings; 115 °C Ris		civice, it-4 mate	ч,	
15	EE15T3HFISCUNL	9334.00	6-2.5% 2+4-	260	17D
30	EE30T3HFISCUNL	14002.00	6-2.5% 2+4-	395	18D
45	EE45T3HFISCUNL	16853.00	6-2.5% 2+4-	730	20D
75	EE75T3HFISCUNL	25386.00	6-2.5% 2+4-	640	20D
112.5	EE112T3HFISCUNL	33819.00	6-2.5% 2+4-	935	22D
150	EE150T3HFISCUNL	44147.00	6-2.5% 2+4-	1300	24D
225	EE225T3HFISCUNL	61422.00	6-2.5% 2+4-	1450	25D
300	EE300T68HFISCUNL	85086.00	4-2.5% 2+2-	2450	25D
	eries for More Severe I num Windings; 115 °C		Load Service; K-	-13 Rated	i;
15	EE15T3HFISNLP	6636.00	6-2.5% 2+4-	256	17D
30	EE30T3HFISNLP	9954.00	6-2.5% 2+4-	375	18D
45	EE45T3HFISNLP	11981.00	6-2.5% 2+4-	500	20D
75	EE75T3HFISNLP	18048.00	6-2.5% 2+4-	560	21D
112.5	EE112T3HFISNLP	24043.00	6-2.5% 2+4-	800	22D
150	EE150T3HFISNLP	31386.00	6-2.5% 2+4-	1110	24D
225	EE225T3HFISNLP	42764.00	6-2.5% 2+4-	1335	25D
300	EE300T68HFISNLP	56966.00	4-2.5% 2+2-	2350	30D
500	EE500T68HFISNLP	79157.00	4–2.5% 2+2–	3200	31D
	eries for More Severe I r Windings; 115 °C Ris		Load Service; K-	·13 Rated	i;
15	EE15T3HFISCUNLP	10618.00	6-2.5% 2+4-	260	17D
30	EE30T3HFISCUNLP	15926.00	6-2.5% 2+4-	430	18D
45	EE45T3HFISCUNLP	19170.00	6-2.5% 2+4-	730	20D
75	EE75T3HFISCUNLP	28877.00	6-2.5% 2+4-	640	20D
112.5	EE112T3HFISCUNLP	38469.00	6-2.5% 2+4-	985	22D
150	EE150T3HFISCUNLP	50218.00	6-2.5% 2+4-	1135	24D
225	EE225T3HFISCUNLP	68422.00	6-2.5% 2+4-	1477	25D
300	EE300T68HFISCUNLP	91146.00	4-2.5% 2+2-	2650	30D
		1			

Table 14.10: Harmonic Mitigating, 480 Primary to 208zz/120 Secondary—UL Listed

kVA Catalog \$ Price Tap	Weight end (lbs)
0° Phase Shift; Copper Windings; 130 °C Rise	
15 HM15T208NCU <b>12670.00</b> 6–2.5%	
30 HM30T208NCU <b>19416.00</b> 6–2.5%	
45 HM45T208NCU <b>23364.00</b> 6–2.5%	
75 HM75T208NCU <b>35204.00</b> 6–2.5%	
112.5 HM112T208NCU <b>46900.00</b> 6–2.5%	
150 HM150T208NCU <b>61226.00</b> 6–2.5%	
225 HM225T208NCU <b>81616.00</b> 6–2.5%	
300 HM300T208NCU <b>104664.00</b> 6–2.5%	2+4- 1535 25D
30° Phase Shift; Copper Windings; 130 °C Rise	
15 HM15T255NCU <b>12670.00</b> 3-5%1	-2- 310 17D
30 HM30T255NCU <b>19416.00</b> 3-5%1	-2- 340 17D
45 HM45T255NCU <b>23364.00</b> 3-5%1	-2- 418 18D
75 HM75T255NCU <b>35204.00</b> 3-5%1	-2- 642 20D
112.5 HM112T255NCU <b>46900.00</b> 3-5%1	-2- 725 21D
150 HM150T255NCU <b>61226.00</b> 3-5%1	-2- 915 22D
225 HM225T255NCU <b>81616.00</b> 3-5%1	-2- 1125 24D
300 HM300T255NCU <b>104664.00</b> 3-5%1	-2- 1535 25D
+15° Phase Shift; Copper Windings; 130 °C Rise	
15   HM15T251NCU   <b>12670.00</b>   6–2.5%	2+4-   310   17D
30 HM30T251NCU <b>19416.00</b> 6–2.5%	2+4- 340 17D
45 HM45T251NCU <b>23364.00</b> 6–2.5%	2+4- 418 18D
75 HM75T251NCU <b>35204.00</b> 6–2.5%	2+4- 642 20D
112.5 HM112T251NCU 46900.00 6-2.5%	2+4- 725 21D
150 HM150T251NCU <b>61226.00</b> 6–2.5%	2+4- 915 22D
225 HM225T251NCU <b>81616.00</b> 6–2.5%	2+4- 1125 24D
300 HM300T251NCU <b>104664.00</b> 6–2.5%	2+4- 1535 25D
15° Phase Shift; Copper Windings; 130 °C Rise	
15   HM15T259NCU   <b>12670.00</b>   6–2.5%	2+4-   310   17D
30 HM30T259NCU <b>19416.00</b> 6–2.5%	
45 HM45T259NCU <b>23364.00</b> 6–2.5%	
75 HM75T259NCU <b>35204.00</b> 6–2.5%	
112.5 HM112T259NCU <b>46900.00</b> 6–2.5%	
150 HM150T259NCU <b>61226.00</b> 6–2.5%	
225 HM225T259NCU <b>81616.00</b> 6–2.5%	

- Not for construction. Contact your local Schneider Electric representative for certified prints. For enclosure styles, see Table 14.19 on page 14-10.

Additional temperature rises are available; for part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.



New!



As a partner in the NEMA Premium Transformer Program, Schneider Electric has determined that this product meets the NEMA Premium Efficiency specifications for premium energy efficiency.

## **General Purpose Dry** Type 600 Volts and Below

Table 14.11: 480 V Delta Primary, 208Y/120 Secondary

kVA	Catalog No.	\$ Price	Taps	Weight (lbs)	Enclosure ▲■
NP Ser Windin	ies for Typical Non-Li igs; 130 °C Rise	inear Load S	ervice— K-9 Rat	ted—Cop	per
15	EP15T3HNISCUNP	16395.00	6-2.5% 2+4-	310	17D
30	EP30T3HNISCUNP	24925.00	6-2.5% 2+4-	340	18D
45	EP45T3HNISCUNP	28425.00	6-2.5% 2+4-	418	20D
75	EP75T3HNISCUNP	44590.00	6-2.5% 2+4-	642	21D
112.5	EP112T3HNISCUNP	57863.00	6-2.5% 2+4-	725	22D
150	EP150T3HNISCUNP	74683.00	6-2.5% 2+4-	915	24D
225	EP225T3HNISCUNP	104646.00	6-2.5% 2+4-	1125	25D
300	EP300T3HNISCUNP	136718.00	4-2.5% 2+2-	1535	30D
NP Ser Windin	ies for Typical Non-Li gs; 115 °C Rise	inear Load S	ervice— K-9Rate	ed—Cop	per
15	EP15T3HFISCUNP	21313.00	6-2.5% 2+4-	310	17D
30	EP30T3HFISCUNP	32402.00	6-2.5% 2+4-	340	18D
45	EP45T3HFISCUNP	36952.00	6–2.5% 2+4–	418	20D
75	EP75T3HFISCUNP	57967.00	6-2.5% 2+4-	642	20D
112.5	EP112T3HFISCUNP	75222.00	6-2.5% 2+4-	725	22D
150	EP150T3HFISCUNP	97088.00	6-2.5% 2+4-	915	24D
225	EP225T3HFISCUNP	136040.00	6-2.5% 2+4-	1125	25D
300	EP300T3HFISCUNP	177733.00	4–2.5% 2+2–	1535	25D
	eries for More Severe r Windings; 150 °C Ri		Load Service—K	(-13 Rate	d—
15	EP15T3HISCUNLP	17451.00	6-2.5% 2+4-	260	17D
30	EP30T3HISCUNLP	26527.00	6-2.5% 2+4-	430	18D
45	EP45T3HISCUNLP	30253.00	6-2.5% 2+4-	730	20D
75	EP75T3HISCUNLP	47459.00	6-2.5% 2+4-	640	20D
112.5	EP112T3HISCUNLP	61585.00	6-2.5% 2+4-	985	22D
150	EP150T3HISCUNLP	79488.00	6-2.5% 2+4-	1135	24D
225	EP225T3HISCUNLP	110288.00	6-2.5% 2+4-	1477	25D
300	EP300T68HISCUNLP	141419.00	4–2.5% 2+2–	2650	30D



Table 14.12: Harmonic Mitigating, 480 Primary to 208zz/120 Secondary; Copper Windings

			,,  -		3
kVA	Catalog \$ Price Taps		Taps	Weight (lbs)	Enclosure ▲■
0° Pha	se Shift				
15	HM15T208HNCUEP	20822.00	6-2.5% 2+4-	310	17D
30	HM30T208HNCUEP	32341.00	6-2.5% 2+4-	340	17D
45	HM45T208HNCUEP	36872.00	6-2.5% 2+4-	418	18D
75	HM75T208HNCUEP	57857.00	6-2.5% 2+4-	642	20D
112.5	HM112T208HNCUEP	75082.00	6-2.5% 2+4-	725	21D
150	HM150T208HNCUEP	96912.00	6-2.5% 2+4-	915	22D
225	HM225T208HNCUEP	131554.00	6-2.5% 2+4-	1125	24D
300	HM300T208HNCUEP	162393.00	6-2.5% 2+4-	1535	25D
30° Ph	ase Shift				
15	HM15T255HNCUEP	20822.00	3-5%1+2-	310	17D
30	HM30T255HNCUEP	32341.00	3-5%1+2-	340	17D
45	HM45T255HNCUEP	36872.00	3-5%1+2-	418	18D
75	HM75T255HNCUEP	57857.00	3-5%1+2-	642	20D
112.5	HM112T255HNCUEP	75082.00	3-5%1+2-	725	21D
150	HM150T255HNCUEP	96912.00	3-5%1+2-	915	22D
225	HM225T255HNCUEP	131554.00	3-5%1+2-	1125	24D
300	HM300T255HNCUEP	162393.00	3-5%1+2-	1535	25D
+15° P	hase Shift				
15	HM15T251HNCUEP	20822.00	6-2.5% 2+4-	310	17D
30	HM30T251HNCUEP	32341.00	6-2.5% 2+4-	340	17D
45	HM45T251HNCUEP	36872.00	6-2.5% 2+4-	418	18D
75	HM75T251HNCUEP	57857.00	6-2.5% 2+4-	642	20D
112.5	HM112T251HNCUEP	75082.00	6-2.5% 2+4-	725	21D
150	HM150T251HNCUEP	96912.00	6-2.5% 2+4-	915	22D
225	HM225T251HNCUEP	131554.00	6-2.5% 2+4-	1125	24D
300	HM300T251HNCUEP	162393.00	6-2.5% 2+4-	1535	25D
-15° Pł	nase Shift				
15	HM15T259HNCUEP	20822.00	6-2.5% 2+4-	310	17D
30	HM30T259HNCUEP	32341.00	6-2.5% 2+4-	340	17D
45	HM45T259HNCUEP	36872.00	6-2.5% 2+4-	418	18D
75	HM75T259HNCUEP	57857.00	6-2.5% 2+4-	642	20D
112.5	HM112T259HNCUEP	75082.00	6-2.5% 2+4-	725	21D
150	HM150T259HNCUEP	96912.00	6-2.5% 2+4-	915	22D
225	HM225T259HNCUEP	131554.00	6-2.5% 2+4-	1125	24D
300	HM300T259HNCUEP	162393.00	6-2.5% 2+4-	1535	25D

- Not for construction. Contact your local Schneider Electric representative for certified prints. For enclosure styles, see Table 14.19 on page 14-10.

Additional temperature rises are available; for part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.

### Sealed Three- and Single-Phase **Transformers**

Table 14.13: Sealed Transformers

I abic	14.10.	ocaica	i i ali 3i Oi ili c	13		
kVA	Catalog No.	\$ Price	Full Capacity Taps	Degree C Temp. Rise	Weight (lbs) ▲	Enclosure ▲■
Three-	Phase—480 Listed; Cop	V Delta Pri	mary; 208Y/120	V Seconda	ıry; 60 Hz;	
3	3T2F	2016.00	2–5%FCBN	115	120	12C
6	6T2F	2310.00	2–5%FCBN	115	145	12C
9	9T2F	3088.00	2–5%FCBN	115	235	14C
15	15T2F	4644.00	2–5%FCBN	115	300	14C
30	30T2F	8536.00	2–5%FCBN	115	660	16C
			rimary; 240 V D			
	Listed; Cop			Cita Ocoon	iddi y, oo i	-,
3	3T5F	2016.00	2-5%FCBN	115	120	12C
6	6T5F	2310.00	2-5%FCBN	115	145	12C
9	9T75F	3088.00	4-2.5%FCBN	115	235	14C
15	15T75F	4644.00	4-2.5%FCBN	115	300	14C
30	30T75F	8536.00	4-2.5%FCBN	115	660	16C
Single	-Phase—240	X 480 V Pr	rimary; 120/240	V Seconda	ry; 60 Hz;	
cULus	Listed					
0.05	50SV1A	182.00	None	55	4.2	1A
0.10	100SV1A	214.00	None	55	4.5	2A
0.15	150SV1A	254.00	None	55	6.2	3A
0.25	250SV1B	270.00	None	80	10.5	4A
0.50	500SV1B	386.00	None	80	13.8	5A
0.75	750SV1F 1S1F	460.00 602.00	None None	115 115	15.5 21.2	6A 7A
1.5	1.5S1F	724.00	None	115	30.1	7A 8A
2	2S1F	896.00	None	115	39.1	9A
3	3S1F	1144.00	None	115	60	10A
5	5S1F	1556.00	None	115	115	13B
7.5	7S1F	2188.00	None	115	135	13B
10	10S1F	2712.00	None	115	165	13B
			y; 120/240 V Se			.02
	Listed	U V FIIIIlai	y, 120/240 V 36	condary, c	112,	
0.05	50SV51A	182.00	None	55	4.2	1A
0.10	100SV51A	214.00	None	55	4.5	2A
0.15	150SV51A	262.00	None	55	6.2	3A
0.25	250SV51B	290.00	None	80	10.5	4A
0.50	500SV51B	408.00	None	80	13.8	5A
0.75	750SV51F	486.00	None	115	15.5	6A
1	1S51F	634.00	None	115	21.2	7A
1.5	1.5S51F	758.00	None	115	30.1	8A
2	2S51F	940.00	None	115	39.1	9A
3	3S4F	1240.00	2–5%FCBN	115	60	10A
5	5S4F 7S4F	1676.00	2–5%FCBN 2–5%FCBN	115	115	13B
7.5	754F 10S4F	2348.00 2922.00	2–5%FCBN 2–5%FCBN	115 115	135 165	13B 13B
						130
	-Pnase—120 Listed	1X240 V Pri	mary; 120/240	v Seconda	ry; 60 HZ;	
1	1S6F	1090.00	None	115	21.2	7A
1.5	1.5S6F	1558.00	None	115	30.1	8A
2	2S6F	1746.00	None	115	39.1	9A
3	3S6F	1892.00	None	115	60	10A
5	5S6F	2418.00	None	115	110	13B
7.5	7S6F	3216.00	None	115	135	13B
10	10S6F	3992.00	None	115	150	13B
Single	-Phase—208	V Primary	r; 120/240 V Se	condary; 6	0 Hz;	
	Listed	1 4000 00	NI-	44-	04.0	7,
1	1S7F	1090.00	None	115	21.2	7A
1.5	1.5S7F	1558.00	None	115	30.1	8A
3	2S7F	1746.00	None None	115	39.1 60	9A 10A
5	3S7F 5S7F	1892.00 2418.00	None	115 115	110	13B
7.5	7S7F	3216.00	None	115	135	13B
10	10S7F	3992.00	None	115	150	13B
	-Phase—277		r; 120/240 V Se			
cULus	Listed		,	Jonaan y, O	J 112,	
1	1S8F	1090.00	None	115	21.2	7A
1.5	1.5S8F	1558.00	None	115	30.1	8A
2	2S8F	1746.00	None	115	39.1	9A
3	3S8F	1892.00	None	115	60	10A
5	5S8F	2418.00	None	115	110	13B
7.5	7S8F	3216.00	None	115	135	13B
10	10S8F	3992.00	None	115	150	13B

NOTE: FCBN = full capacity below normal

#### Sealed Single-Phase Export Model **Transformers**

These general purpose transformers accommodate voltage systems worldwide. Export model transformers 10 kVA and smaller, certified by TUV (File no. E9571881.01) to meet EN61558-1, are CE marked in addition to being cULus Listed. For CE marked transformers in other ratings, contact your local Schneider Electric representative for CE marked transformers up to 300 kVA, single and three phase. See page 14-11 for optional Fingersafe™ terminal block cover kit.

Table 14.14: Sealed Export Model Transformers

kVA	Catalog No.	\$ Price	Deg. C Temp. Rise	Weight (lbs) ▲	Enclosure
Single-Pha 110/220 V	se—190/200 Secondary; 5	/208/220/380 50/60 Hz; cU	0/400/416/440 Lus Listed ★	V Primary;	
1	1S67F	1180.00	115	21.2	7A
2	2S67F	1716.00	115	39.1	9A
3	3S67F	2290.00	115	55.2	10A
5	5S67F	2554.00	115	135	13B
7.5	7S67F	3314.00	115	165	13B
10	10S67F	4004.00	115	165	13B

### Sealed Single-Phase Buck and Boost Transformers—cULus Listed

When buck and boost transformers are interconnected as an autotransformer, they can supply small changes in voltage. Wiring diagrams and sizing are available from catalog 7414CT0201 or www.buckboostcalculator.com.

Units can also be used as isolation transformers for 120 x 240 to 12/24 or 16/32 by connecting using the directions located on the transformer's name plate.

NOTE: When used to supply a 3-phase, 4-wire load, the source must be 3-phase, 4-wire.

Table 14.15: Sealed Buck and Boost Transformers

	120 x 24	0 V Primary	60 Hz	240 x 480 V 60 H	e C Rise	ヹ◀	re ▲∎	
kVA	12/24 V Secondary	16/32 V Secondary	\$ Price	24/48 V Secondary	\$ Price	Degree Temp. Ri	Weight (Ibs) ▲	Enclosure
.05	50SV43A	50SV46A	206.00	50SV82A	284.00	55	4.2	1A
.10	100SV43A	100SV46A	246.00	100SV82A	344.00	55	4.5	2A
.15	150SV43A	150SV46A	276.00	150SV82A	386.00	55	6.2	ЗА
.25	250SV43B	250SV46B	328.00	250SV82B	460.00	80	10.5	4A
.50	500SV43B	500SV46B	420.00	500SV82B	588.00	80	13.8	5A
.75	750SV43F	750SV46F	552.00	750SV82F	774.00	115	15.5	6A
1.0	1S43F	1S46F	676.00	1S82F	948.00	115	21.2	7A
1.5	1.5S43F	1.5S46F	830.00	1.5S82F	1162.00	115	30.1	8A
2.0	2S43F	2S46F	1072.00	2S82F	1500.00	115	39.1	9A
3.0	3S43F	3S46F	1480.00	3S82F	2072.00	115	60	•

- Not for construction. Contact your local Schneider Electric representative for certified prints.
- For enclosure styles, see Table 14.19 on page 14-10. Dimensions: 14.50 (H) x 8.60 (W) x 6.50 (D).
- May be used for 240 x 480 to 120/240 at 60 Hz only.

NOTE: Refer to www.us.squared.com/buckboost for additional information.

Class **7432** 



### **General Purpose Dry** Type 600 Volts and Below

#### Stainless Steel Enclosed

The transformers listed below have an epoxy-resin encapsulated core and coil assembly inside a non-ventilated, #316 stainless steel enclosure that meets NEMA Type 3R or Type 4X requirements. All units are painted ANSI 49 gray to give an extra layer of protection and improve the cosmetic appearance of the device.

Table 14.16: Stainless Steel Enclosed Transformers

kVA	Catalog No.	\$ Price	Full Capacity Taps	Degree C Temp. Rise	Weight (lbs)	Enclosure				
	Three-Phase—480 V Delta Primary; 208Y/120 V Secondary; 60 Hz; cULus Listed; NEMA Type 3R									
3	3T2FSS	4116.00	2-5% FCBN	115	120	12C				
6	6T2FSS	4924.00	2-5% FCBN	115	145	12C				
9	9T2FSS	6072.00	2-5% FCBN	115	234	14C				
15	15T2FSS	7726.00	2-5% FCBN	115	300	14C				
30	30T2FSS	13022.00	2-5% FCBN	115	660	16C				
	Phase—480 V Listed; NEM	/ Delta Prima A Type 4X	ary; 208Y/120 V	/ Secondar	y; 60 Hz;					
3	4X3T2FSS	13377.00	2-5% FCBN	115	165	54X				
6	4X6T2FSS	16003.00	2–5% FCBN	115	195	54X				
9	4X9T2FSS	19734.00	2–5% FCBN	115	290	54X				
15	4X15T2FSS	25110.00	2–5% FCBN	115	350	54X				
30	4X30T2FSS	42322.00	2-5% FCBN	115	850	55X				
Single cULus	-Phase—240x Listed; NEM/	480 V Prima A Type 3R	ry; 120/240 V S	Secondary;	60 Hz;					
1	1S1FSS	1274.00	None	115	21	7A				
1.5	1.5S1FSS	1778.00	None	115	30	8A				
_ 2	2S1FSS	1914.00	None	115	39	9A				
3	3S1FSS	2684.00	None	115	60	10A				
5	5S1FSS	3880.00	None	115	110	13B				
7.5	7S1FSS 10S1FSS	4164.00 4764.00	None None	115 115	135 150	13B 13B				
15	15S1FSS	7036.00	None	115	225	15B				
25	25S1FSS	9606.00	None	115	300	15B				
_0			ry; 120/240 V S			100				
	Listed; NEM		iry, 120/240 V s	secondary,	60 п2,					
1	4X1S1FSS	9555.00	None	115	48	51X				
1.5	4X1.5S1FSS	9779.00	None	115	55	51X				
2	4X2S1FSS	10527.00	None	115	55	51X				
3	4X3S1FSS	14762.00	None	115	75	52X				
5	4X5S1FSS	12610.00	None	115	125	52X				
7.5	4X7S1FSS	13533.00	None	115	150	52X				
10	4X10S1FSS	15483.00	None	115	180	52X				
15	4X15S1FSS	22867.00	None	115	390	53X				
25	4X25S1FSS	31220.00	None	115	450	53X				
Single cULus	-Phase—480 \ Listed; NEM/	V Primary; 1 A Type 3R	20/240 V Seco	ndary; 60 H	lz;					
3	3S40FSS	2684.00	2-5% FCBN	115	60	10A				
5	5S40FSS	3880.00	2-5% FCBN	115	110	13B				
7.5	7S40FSS	4164.00	2-5% FCBN	115	135	13B				
10	10S40FSS	4764.00	2-5% FCBN	115	150	13B				
15	15S40FSS	7036.00	2–5% FCBN	115	225	15B				
25	25S40FSS	9606.00	2-5% FCBN	115	300	15B				
Single cULus	-Phase—480 \ Listed; NEM/	V Primary; 1 A Type 4X	20/240 V Seco	ndary; 60 H	lz;					
3	4X3S40FSS	14762.00	2-5% FCBN	115	75	52X				
5	4X5S40FSS	12610.00	2-5% FCBN	115	125	52X				
7.5	4X7S40FSS	13533.00	2-5% FCBN	115	150	52X				
10	4X10S40FSS	15483.00	2-5% FCBN	115	180	52X				
15	4X15S40FSS	22867.00	2-5% FCBN	115	390	53X				
25	4X25S40FSS	31220.00	2-5% FCBN	115	450	53X				

#### Non-Ventilated

Non-ventilated enclosures meet the IP55 protection code (dust and jetting water protection) per the IEC 60529 standard. This makes the product ideal for environments where large quantities of dust, airborne contaminants, spraying water, or any other environmental conditions (for example, drifting snow) that a ventilated Type 3R enclosed device would be impractical.

Table 14.17: Non-Ventilated Transformers

kVA	Catalog No.	\$ Price	Full Capacity Taps	Degree C Temp. Rise	Weight (lbs)	Enclosure
Three	e-Phase—480	V Delta Pri	mary; 208Y/120	/ Seconda	ry; 60 Hz	
30	30T3HNV	8090.00	6-2.5%2 + 4-	150	340	19E
45	45T3HNV	12396.00	6-2.5%2 + 4-	150	510	19E
75	75T3HNV	19118.00	6-2.5%2 + 4-	150	1025	22E
112.5	112T3HNV	25848.00	6-2.5%2 + 4-	150	1250	24E
150	150T3HNV	33348.00	6-2.5%2 + 4-	150	2000	25E
225	225T3HNV	50238.00	6-2.5%2 + 4-	150	2100	30E
300	300T3HNV	55152.00	6-2.5%2 + 4-	150	3950	31E
Singl	e-Phase—24	0X480 V Pri	mary; 120/240 V	Secondary	; 60 Hz	
15	15S3HNV	5042.00	6–2.5%2 + 4−♦	150	230	17E
25	25S3HNV	7562.00	6–2.5%2 + 4−♦	150	310	18E
37.5	37S3HNV	11248.00	6–2.5%2 + 4−♦	150	350	18E
50	50S3HNV	14384.00	6–2.5%2 + 4−♦	150	450	21E
75	75S3HNV	17600.00	6–2.5%2 + 4−♦	150	880	24E
100	100S3HNV	22286.00	6–2.5%2 + 4−♦	150	975	25E

- Not for construction. Contact your local Schneider Electric representative for certified prints.
- For enclosure styles, see Table 14.19 on page 14-10.
- When 240 V tap is used, there will be 3-5% taps: 1 above and 2 below.

NOTE: FCBN = full capacity below normal Lugs are furnished by customer



#### **Transformer Enclosures**

Designed to allow energy efficient products to be installed in environments requiring more protection. These are Type 3R enclosures constructed of #304 stainless steel for corrosive protection.

Transformer enclosures are shipped separately from transformers so they can be pre-installed on the job site. Three standard enclosures are available for installation of enclosure types D, H, or F.

Table 14.18: Transformer Enclosures

Catalog No.	\$ Price	Enclosure ▲■
7400SS3R18D22D	8444.00	18D, 18H, 19D, 20D, 21D, 22D
7400SS3R24D38D	15118.00	24D, 25D, 26D, 28D, 29D, 30D, 31D, 36D, 37D, 38D
7400SS3R31D35F	24622.00	31D, 32F, 33F, 34F, 35F, 36D, 37D, 38D



Style A-NEMA 3R Rated

Style B-NEMA 3R Rated



Style C-NEMA 3R Rated



Styles D and H-NEMA 2 Rated Converts to NEMA 3R with Weathershield



Style E—IP55 Rated



Style F-NEMA 1 Rated

### **Enclosures and Accessories**

Table 14.19: Enclosure Dimensions and Accessories ▲

		19: I		Wic		Der		7.000	ssories			
Nun	osure nber/ yle	ln.	mm	ln.	mm	In.	mm	Mounting	Weathershield	Wall Mounting Bracket	Ceiling Mounting Bracket	Insulation Class <sup>o</sup> C
1	Α	5.00	127	4.47	114	3.44	87	Wall	•	•	_	105
2	Α	5.50	140	4.47	114	3.44	87	Wall		•	_	105
3	A	5.00	127	4.85	123	3.75	95	Wall	•	•		105
4 5	A	5.50 6.19	140 157	5.23 6.19	133 157	4.06 4.69	103 119	Wall Wall	-	*		130 130
6	A	6.69	170	6.19	157	4.69	119	Wall	-	·		180
7	Α	8.13	270	6.94	176	5.31	135	Wall	•	•		180
8	Α	8.25	210	8.68	220	6.56	167	Wall	•	•	_	180
9	A	9.56	243	8.68	220	6.56	167	Wall	•	•		180
10 11	A	10.50 12.56	267 319	8.62 8.62	219 219	6.50 6.50	165 165	Wall Wall	-	*		180 180
12	C	13.50	343	14.75	375	9.00	229	Wall	-	·		180
13	В	14.75	375	9.75	248	11.75	298	Wall	•	•		180
14	С	14.75	375	19.10	485	12.25	311	Wall	•	•	_	180
15	В	20.00	508	15.00	381	13.50	343	Wall		•	_	180
16	С	22.00	559	25.00	635	13.50	343	Wall	14/0000	<b>•</b>	— OLIDOOD	180
17	D E	27.00 27.00	686 686	20.00	508 508	16.00 16.00	406 406	Floor	WS363	WMB361362 WMB361362	CMB363 CMB363	220 220
17	H	37.00	940	20.00	508	16.00	406	Floor	WS363	WMB361362	CMB363	220
	D	30.00	762	20.00	508	20.00	508	Floor	WS363	WMB363364	CMB363	220
18	E	30.00	762	20.00	508	20.00	508	Floor	▼	WMB363364	CMB363	220
	Н	37.00	940	20.00	508	20.00	508	Floor	WS363	WMB363364	CMB363	220
19	D	30.00	762	30.00	762	20.00	508	Floor	WS364	WMB363364	CMB364	220
	E	30.00	762	30.00	762	20.00	508	Floor	<b>▼</b>	WMB363364	CMB364	220
20	D	37.00	940	30.00	762	20.00	508	Floor	WS364	WMB363364	CMB364	220
	E D	37.00 37.00	940 940	30.00	762 762	20.00	508 610	Floor	₩S364	WMB363364	CMB364 CMB364	220 220
21	E	37.00	940	30.00	762	24.00	610	Floor	▼	_	CMB364	220
00	D	43.75	1111	32.00	813	27.00	686	Floor	WS380	_	CMB380	220
22	Е	43.75	1111	32.00	813	27.00	686	Floor	▼	_	CMB380	220
23	Е	48	1219	48	1219	29.5	749	Floor	•	_	_	220
24	D	49.5	1257	35	889	28.5	724	Floor	WS381	_	CMB381	220
	E D	49.5 49.5	1257 1257	35 41	889 1041	28.5 32	724 813	Floor	Note 5 WS382	_	CMB381	220 220
25	E	49.5	1257	41	1041	32	813	Floor	₩3302	_		220
26	D	57.5	1461	41	1041	32	813	Floor	WS382	_		220
28	D	60	1524	56	1422	36	914	Floor	WS370A	_		220
	Е	60	1524	56	1422	36	914	Floor	•	_		220
29	D	68	1727	56	1422	36	914	Floor	WS370A	_	_	220
30	D E	71 71	1803 1803	48 48	1219 1219	36 36	914 914	Floor	WS383	_		220 220
	D	71	1880	56	1422	40.5	1029	Floor	₩S384			220
31	E	74	1880	56	1422	40.5	1029	Floor	▼	_		220
32	F	91.5	2388	56	1422	54	1372	Floor	*	_		220
33	F	94	2388	72	1829	54	1372	Floor	*	_	_	220
34	F	94	2388	84	2134	54	1372	Floor	*	_		220
35	F	94	2388	96	2438	54	1372	Floor	*	_	_	220
36 37	D D	40.5 51.5	1031	36.5 40.5	916 1031	21.75 26.5	553 674	Floor	*			220 220
38	D	66	1679	50.5	1285	32	814	Floor	*	<del>-</del>		220
39	F	90	2290	80	2036	50	1272	Floor	*	_		220
40	F	90	2290	90	2290	50	1272	Floor	*	_	_	220
41	F	100	2545	100	2545	60	1527	Floor	*			220
42	F	108	2748	108	2748	60	1527	Floor	*			220
43 44	F	90	2290	64	1628	44 50	1120	Floor	*	_		220
44	D	90 80	2290 2036	72 64	1832 1628	50 44	1272 1120	Floor	*			220 220
51	X	9.5	24	10	25	7.75	20	Wall	Δ	•		180
52	X	12	30	13.75	35	13.75	35	Wall	Δ	•	_	180
53	Х	24	61	21.5	55	16.38	42	Wall	Δ	•	_	180
54	Х	23	58	25.5	65	13.75	35	Wall	Δ	•	_	180
55	X	31.5	80	31.5	80	16.25	41	Wall	Δ	•	_	180
61 62	HX				Conto	at vour la	ool Cob	noider El-	notrio ronra	contative for detail		
63	HX				Cornac	ı your 10	cai och	ieluel Ele	sourc repres	sentative for details	э.	
00	11/											

- These dimensions are not for construction. Contact your local Schneider Electric representative for certified prints. Transformer is NEMA Type 3R Standard. Weathershield not required for outdoor use.
- Wall mounting brackets are a standard part of transformer enclosure. Accessory not required.
- Special outdoor construction required for NEMA Type 3R applications. Contact your local Schneider Electric representative for details.
- Indoor/outdoor enclosure standard. Weathershield not required.
  Transformer is NEMA Type 4X Standard. Weathershield not required.

NOTE: Wall mounting brackets are used with units weighing no more than 700 lbs. Ceiling mounting brackets are used with units weighing no more than 1200 lbs.

Weathershields are available for units 600 Volts and below. For 2.4, 5, and 15 kV units suitable for outdoor use, contact the factory.



**Miscellaneous** 

Lugs are not supplied with transformer units. They must be purchased separately.

Table 14.20: Mechanical Lug Kits

Catalog No. ▲	\$ Price Per Kit	Lugs Per Kit	Wire Range	Cap Screws	Current Range	Grounding Lugs per Kit	Wire Range	Bonding Lugs per Kit	Wire Range	
Single-Phase	Primary,	Single-P	hase Secondary, Thre	e-Phase Del	ta Primary, Thr	ee-Phase De	Ita Secondary			
DASKP100	28.00	3	1/0-14 STR.	1/4 x 1 in	Up to 100 A					
DASKP250	51.00	3	350 kcmil–6 STR.	3/8 x 2 in	101 to 250 A			Not	Not applicable	
DASKP400	91.00	3	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	201 to 400 A	Not	Not			
DASKP600	182.00	6	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	601 to 800 A	applicable	applicable	applicable		
DASKP1000	272.00	9	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A					
DASKP1200	363.00	12	600 kcmil–2 STR.	3/8 x 2 in	801 to 1200 A					
Single-Phase	Primary a	nd Seco	ndary, Three-Phase V	Vye Seconda	ry, Three-Phas	e Delta with	Center Tap			
DASKGS100	79.00	5	1/0-14 STR.	1/4 x 1 in	Up to 100 A	1	(4) 2/0 to 14 STR	1	2 to 14 STR	
DASKGS250	118.00	5	350 kcmil–6 STR.	3/8 x 2 in	101 to 250 A	1	(4) 2/0 to 14 STR	1	2 to 14 STR	
DASKGS400	184.00	5	600 kcmil–4 STR. (2) 250 kcmil–1/0 STR.	3/8 x 2 in	201 to 400 A	1	(4) 2/0 to 14 STR	1	1/0 to 14 STR	
DASKGS600	370.00	10	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.	
DASKGS1000	521.00	15	600 kcmil–2 STR.	3/8 x 2 in	601 to 800 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.	
DASKGS1200	672.00	20	600 kcmil–2 STR.	3/8 x 2 in	801 to 1200 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.	
DASKGS2000	824.00	25	600 kcmil–2 STR.	3/8 x 2 in	1201 to 2000 A	1	(4) 350 kcmil to 6 STR.	1	250 kcmil to 6 STR.	

Subject to minimum billing and freight charges when not ordered with transformer.

Table 14.21: Compression Lug Kits

T (	Kit Ostala a Na	O Dales Dear Kit		Terminal Lugs	Aluminum or Copper	Hardware Included	
Transformer kVA Sizes	Kit Catalog No.	\$ Price Per Kit	Qty.	Catalog No.	Conductor Range (AWG or kcmil)	Qty.	Cap Screws
15–37 ½ 1Ø 15–45 3Ø	VCELSK1	261.00	8 5	VCEL02114S1 VCEL030516H1	#8–1/0 #4–300 kcmil	8 1	1/4 x 1 in 1/4 x 2 in
50–75 1Ø 75–112 ½ 3 Ø	VCELSK2	424.00	13	VCEL030516H1	#4-300 kcmil	8 8	1/4 x 1 in 1/4 x 2 in
100–167 1Ø			3	VCEL030516H1	#4-300 kcmil	3	1/4 x 3/4 in
150–300 3Ø	VCELSK3	2407.00	26	VCEL07512H1	500–750 kcmil Al 500 kcmil Cu	16	3/8 x 2 in
500 3Ø	VCELSK4	<b>2619.00</b> 34 VCEL07512H1		500–750 kcmil Al 500 kcmil Cu	21	3/8 x 2 in	

Fingersafe<sup>™</sup> terminal block cover kits for encapsulated transformers can be used to meet touch-safe requirements of EN60-204.

Table 14.22: Fingersafe Terminal Block Cover Kits

_		
Fits Enclosure	Kit Catalog No.	\$ Price
7A (1 kVA)	7400ENT9	200.00
9A (2 kVA)	7400ENT11	200.00
10A (3 kVA)	7400ENT11	200.00
13B (5-10 kVA)	7400ENT13	284.00

Table 14.23: Weathershields; Wall and Ceiling Mounting Brackets

Weathershields		Ceiling Mountir	ng Brackets ♦	Wall Mounting Brackets ■			
Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price		
WS363	299.00	CMB363	300.00	WMB361362	663.00		
WS364	299.00	CMB364	300.00	WMB363364	663.00		
WS370A	2325.00	CMB380	748.00				
WS380	682.00	CMB381	748.00				
WS381	682.00						
WS382	1160.00						
WS383	2184.00						
WS384	2464.00						

- Wall mounting brackets may be prohibited in some California areas requiring 12-inch spacing from wall. Wall mounting brackets can only be used with units weighing no more than 700 lbs.

  Base channels are supplied for ceiling mounting; trapeze hangers must be furnished by customer. Ceiling mounting brackets can only be used with units weighing no more than 1200 lbs.

All ventilated units are now available with factory-installed, thermo-viewing windows. The windows allow completion of yearly maintenance requirements without removing the front cover and accessing the transformers.

Available on all enclosures 17D through 35D. For more information, refer to Data Bulletin 7400DB1101 or contact your local Schneider Electric representative or distributor.

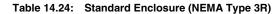
The Square D™ brand Mini Power-Zone™ unit substation from Schneider Electric provides the answer to requirements for a portable, compact power supply for small loads. This complete package yields considerable savings in installation time and costs. Its NEMA Type 3R enclosure is suitable for both indoor and outdoor use. The transformer is 115 °C rise and epoxy-resin encapsulated. The panel section uses Square D™ brand QO™ style circuit breakers.

NOTE: Mini Power-Zone unit substations are UL 1062 File E92978 Listed.

Mini Power-Zone unit substations include factory-installed primary main and secondary main circuit breakers. Circuit breaker ratings are selected to meet National Electrical Code requirements and coordinate with transformer magnetizing inrush current. Order feeder circuit breakers (QO™ plug-on type) from your local Schneider Electric distributor. Use Qwik-Gard™ breakers for required ground fault protection. Tandem breakers are not permitted.

If bolt-on circuit breakers are required instead of plug-on, change the Mini Power-Zone part number from MPZ to MPZB. The MPZB product line leverages the NQ interior for application requirements.

The Mini Power-Zone unit substation uses a separate transformer and panel section. This allows the panel section to be removed and wired first if desired. Also the transformer can be replaced without disturbing the panel section and associated wiring. The new transformer simply slides into the top of the panel section and primary and secondary leads are reconnected to the main circuit breakers.





442 13.5 343

Dimensions: DO NOT use for construction. Contact your local Schneider Electric representative for certified prints

NOTE: Other input voltages are available. Contact your local Schneider Electric representative for part numbers and quotations. Available input voltages: 600, 240, and 208, single- and three-phase. FCBN = full capacity below normal





25

MP7R25S40F

11950.00

480

2-5% FCRN

100

125



### Unit Substation 600 Volts and Below

Table 14.25: Standard Enclosure (NEMA Type 3R) (continued)

					Weight			Dimen	ions 🛦			Primary	Secondary		
kVA	Catalog No.	\$ Price	Input	Full Capacity		Н		W		D		Main Circuit	Main Circuit	Feeder Breal	kers
No.		Voltage	Taps	(lbs)	ln.	mm	ln.	mm	ln.	mm	Breaker Rating (A)	Breaker Rating (A)			
Outp	out Three-Phase P	anel Rated	d 208Y/12	20										Max. No. 1- or 3-Pole	Max. A
15	MPZB15T2F25K	14917.00	480	2-5% FCBN	710	48.6	1234	27.4	696	13.6	345	40	60		40
22.5	MPZB22T2F25K	17931.00	480	2-5% FCBN	725	48.6	1234	27.4	696	13.6	345	70	80	24 or 8	60
30	MPZB30T2F25K	21483.00	480	2-5% FCBN	755	48.6	1234	27.4	696	13.6	345	90	100	1 [	80
Outp	out Single-Phase F	Panel Rate	d 120/240	)										Max. No. 1- or 2-Pole	Max. A
3	MPZB3S40F25K	6843.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	302	10	20		20
5	MPZB5S40F25K	7168.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	302	15	30	10 or 5	20
7.5	MPZB7S40F25K	7987.00	480	2-5% FCBN	200	41.0	1041	12.0	305	11.9	302	20	40	10 01 0	30
10	MPZB10S40F25K	8478.00	480	2-5% FCBN	215	41.0	1041	12.0	305	11.9	302	30	60		40
-		10317.00	480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	343	60	80	28 or 13	60
25	MPZB25S40F25K	14257.00	480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	343	100	125	20 01 10	100
Outp	out Three-Phase P	anel Rated	1 208Y/12	20										Max. No. 1- or 3-Pole	Max. A
15	MPZB15T2F65K	15638.00	480	2-5% FCBN	710	48.6	1234	27.4	696	13.6	345	40	60		40
22.5	MPZB22T2F65K	18652.00	480	2-5% FCBN	725	48.6	1234	27.4	696	13.6	345	70	80	24 or 8	60
30	MPZB30T2F65K	22204.00	480	2-5% FCBN	755	48.6	1234	27.4	696	13.6	345	90	100		80
Outp	out Single-Phase F	Panel Rate	d 120/240	)										Max. No. 1- or 2-Pole	Max. A
3	MPZB3S40F65K	7564.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	302	10	20		20
5	MPZB5S40F65K	7889.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	302	15	30	10 or 5	20
7.5	MPZB7S40F65K	8708.00	480	2-5% FCBN	200	41.0	1041	12.0	305	11.9	302	20	40	10 01 5	30
10	MPZB10S40F65K	9799.00	480	2-5% FCBN	215	41.0	1041	12.0	305	11.9	302	30	60		40
-	MPZB15S40F65K		480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	343	60	80	28 or 13	60
25	MPZB25S40F65K	14978.00	480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	343	100	125	20 01 10	100

Table 14.26: Painted 316 Stainless Steel Enclosure (NEMA Type 3R)

						Dimensions ▲							Secondary		
kVA	Catalog	\$ Price	Input	Full Capacity	Weight	ı	1	١	٧		)	Main Circuit	Main Circuit	Feeder Breal	kers
	No.	<b>VIII.</b>	Voltage	Taps	(lbs)	ln.	mm	ln.	mm	ln.	mm	Breaker Rating (A)	Breaker Rating (A)		
Outp	ut Three-Phase F	Panel Rate	d 208Y/1	20										Max. No. 1- or 3-Pole	Max. A
15		20108.00	480	2-5% FCBN	710	44.6	1133	27.4	696	13.6	345	40	60		40
22.5		23122.00	480	2-5% FCBN	725	44.6	1133	27.4	696	13.6	345	70	80	24 or 8	60
30	MPZ30T2FSS	24376.00	480	2-5% FCBN	755	44.6	1133	27.4	696	13.6	345	90	100		80
Outp	ut Single-Phase	Panel Rate	ed 120/24	10										Max. No. 1- or 2-Pole	Max. A
3	MPZ3S40FSS	10705.00	480	2-5% FCBN	175	32.7	831	12.0	305	11.9	302	10	20		20
5		11030.00	480	2-5% FCBN	175	32.7	831	12.0	305	11.9	302	15	30	10 or 5	20
7.5		12428.00	480	2-5% FCBN	200	32.7	831	12.0	305	11.9	302	20	40	10 01 0	30
10		12920.00	480	2-5% FCBN	215	32.7	831	12.0	305	11.9	302	30	60		40
15		14758.00	480	2-5% FCBN	390	42.9	1090	17.4	442	13.5	343	60	80	28 or 13	60
25	MPZ25S40FSS	17266.00	480	2-5% FCBN	390	42.9	1090	17.4	442	13.5	343	100	125		100
Outp	ut Three-Phase F	Panel Rate	d 208Y/1	20										Max. No. 1- or 3-Pole	Max. A
15	MPZB15T2FSS	25135.00	480	2-5% FCBN	710	48.6	1234	27.4	696	13.6	48.6	40	60		40
22.5		28896.00	480	2-5% FCBN	725	48.6	1234	27.4	696	13.6	48.6	70	80	24 or 8	60
30	MPZB30T2FSS	30476.00	480	2-5% FCBN	755	48.6	1234	27.4	696	13.6	48.6	90	100		80
Outp	ut Single-Phase	Panel Rate	ed 120/24	10										Max. No. 1- or 2-Pole	Max. A
3	MPZB3S40FSS	13455.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	302	10	20		20
5		13780.00	480	2-5% FCBN	175	41.0	1041	12.0	305	11.9	41.0	15	30	10 or 5	20
7.5	MPZB7S40FSS		480	2-5% FCBN	200	41.0	1041	12.0	305	11.9	41.0	20	40	10 01 3	30
10	MPZB10S40FSS		480	2-5% FCBN	215	41.0	1041	12.0	305	11.9	41.0	30	60		40
15	MPZB15S40FSS		480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	51.0	60	80	28 or 13	60
25	MPZB25S40FSS	21583.00	480	2-5% FCBN	390	51.0	1295	17.4	442	13.5	51.0	100	125	20 31 10	100

<sup>▲</sup> Dimensions: DO NOT use for construction. Contact your local Schneider Electric representative for certified prints.

NOTE: FCBN = full capacity below normal

#### **Industrial Control**

Type T and Typ

Class 9070 / Refer to Catalog 90700

ретг	BQUARE D
CT9901	by Schneider Electric
	www.schneider-electric.us

Type T transformers are designed with low impedance windings for excellent voltage regulation and can accommodate the high inrush current associated with contactors, starters, solenoids, and relays. Type T transformers are manufactured using the most advanced insulating materials and are the best choice if size and cost are of concern.
Type TF transformers include factory-installed primary and secondary fuse blocks. Type TF transformers consist of two primary fuse blocks and one secondary fuse block. The primary includes rejection-style clips to increase the AlC ratings for the fuses. Since the fuse blocks are mounted on the top of the transformer, Type TF transformers are interchangeable with Type T transformers except for their increased height.
Table 14 27: Type T and TF Transformers

Table 14.27: Type T and TF Transformers

VA	VA	Type T Trans	formers	Type TF Transformers			
UL/CSA/ NOM	CE	Catalog No.	\$ Price	Catalog No.	\$ Price	Weight (lbs)	
240 V x 48 220 V x 44	30 V Prima 10 V Prima	ry, 120 V Second ry, 110 V Second	ary; 230 V x	460 V Primary,	115 V Seco	ndary;	
25	25	9070T25D1	111.00	9070TF25D1	160.00	2.5	
50	50	9070T50D1	116.00	9070TF50D1	165.00	2.5	
75	75	9070T75D1	138.00	9070TF75D1	185.00	3.8	
100	100	9070T100D1	155.00	9070TF100D1	201.00	3.8	
150	150	9070T150D1	165.00	9070TF150D1	213.00	5.5	
200	200	9070T200D1	204.00	9070TF200D1	255.00	5.5	
250	160	9070T250D1	239.00	9070TF250D1	287.00	7.1	
300	200	9070T300D1	264.00	9070TF300D1	312.00	8.5	
350	250	9070T350D1	281.00	9070TF350D1	330.00	10.5	
500	300	9070T500D1	350.00	9070TF500D1	395.00	11.9	
750	500	9070T750D1	483.00	9070TF750D1	531.00	11.0	
1000	630	9070T1000D1	585.00	9070TF1000D1	639.00	20.6	
1500	1000	9070T1500D1	837.00	9070TF1500D1	884.00	34.0	
2000	1500	9070T2000D1	1017.00	9070TF2000D1	1065.00	47.0	
3000	2000	9070T3000D1	1412.00	_		60.0	
5000	3000	9070T5000D1 / Secondary	2373.00	_	_	89.0	
50	50	9070T50D3	135.00	9070TF50D3	185.00	2.5	
75	75	9070T75D3	162.00	9070TF75D3	230.00	3.8	
100	100	9070T100D3	182.00	9070TF100D3	276.00	3.8	
150	150	9070T150D3	230.00	9070TF150D3	287.00	5.5	
200	200	9070T200D3	293.00	9070TF200D3	347.00	5.5	
250	160	9070T250D3	363.00	9070TF250D3	417.00	7.1	
300	200	9070T300D3	372.00	9070TF300D3	426.00	8.5	
350	250	9070T350D3	432.00	9070TF350D3	522.00	10.5	
500	300	9070T500D3	471.00	9070TF500D3	696.00	11.9	
750	500	9070T750D3	665.00	9070TF750D3	716.00	11.0	
1000	630	9070T1000D3	837.00	9070TF1000D3	906.00	20.6	
1500	1000	9070T1500D3	1170.00	9070TF1500D3	1221.00	34.0	
2000	1500	9070T2000D3	1358.00	9070TF2000D3	1409.00	47.0	
3000	2000	9070T3000D3	1914.00	_	_	60.0	
5000	3000	9070T5000D3	3015.00	_	_	89.0	
600 V Prin	nary, 120 \	/ Secondary; 575	V Primary,	115 V Secondar	y; 550 V Pri	mary,	
110 V Sec		007075005	405.00	0070755005	405.00	0.5	
50 75	50 75	9070T50D5 9070T75D5	135.00 162.00	9070TF50D5	185.00 230.00	2.5 3.8	
	100			9070TF75D5 9070TF100D5	276.00		
100	150	9070T100D5 9070T150D5	182.00 230.00	9070TF100D5	287.00	3.8	
200	200	9070T200D5	293.00	9070TF130D5	347.00	5.5 5.5	
250	160	9070T250D5	363.00	9070TF250D5	417.00	7.1	
300	200	9070T300D5	372.00	9070TF300D5	426.00	8.5	
350	250	9070T350D5	432.00	9070TF350D5	522.00	10.5	
500	300	9070T500D5	471.00	9070TF500D5	696.00	11.9	
750	500	9070T750D5	665.00	9070TF750D5	716.00	11.0	
1000	630	9070T1000D5	837.00	9070TF1000D5	906.00	20.6	
1500	1000	9070T1500D5	1170.00	9070TF1500D5	1221.00	34.0	
2000	1500	9070T2000D5	1358.00	9070TF2000D5	1409.00	47.0	
3000	2000	9070T3000D5	1914.00	_	-	60.0	
5000	3000	9070T5000D5	3015.00	_		89.0	
		/ Secondary		l			
50	50	9070T50D4	135.00			2.5	
75	75	9070T75D4	162.00	_		3.8	
100	100	9070T100D4	182.00	_		3.8	
150	150	9070T150D4	230.00	_		5.5	
200	200	9070T200D4	293.00	_		5.5	
250	160	9070T250D4	363.00	_		7.1	
300	200	9070T300D4	372.00	_		8.5	
350	250	9070T350D4	432.00	_		10.5	
500	300	9070T500D4	471.00	_		11.9	
750	500	9070T750D4	665.00	_	_	11.0	
1000	630	9070T1000D4	837.00	_		20.6	
1500	1000	9070T1500D4	1170.00	_		34.0	
2000	1500	9070T2000D4	1358.00	=	_	47.0	
3000	2000	9070T3000D4	1914.00	_	_	60.0	
5000	3000	9070T5000D4	3015.00	_	_	89.0	

VA	VA VA Type T Transformers			Type TF Trans	sformers	
UL/CSA/ NOM	CE	Catalog No.	\$ Price	Catalog No.	\$ Price	Weight (lbs)
240 V x 48	0 V Primar	y, 120/240 V Seco y, 110/220 V Seco	ondary; 230	V x 460 V Primar	y, 115/230 V	Secondary;
50 75	50 75	9070T50D31 9070T75D31	188.00 197.00	9070TF50D31	372.00	2.5
				9070TF75D31	384.00	3.8
100 150	100 150	9070T100D31	207.00 273.00	9070TF100D31	394.00 452.00	3.8
200	200	9070T150D31 9070T200D31	353.00	9070TF150D31	498.00	5.5 5.5
250	160	9070T250D31	381.00	9070TF250D31	564.00	7.1
300	200	9070T300D31	435.00	9070TF300D31	570.00	8.5
350	250	9070T350D31	455.00	9070TF350D31	630.00	10.5
500	300	9070T500D31	509.00	9070TF500D31	638.00	11.9
750	500	9070T750D31	710.00	9070TF300D31	795.00	11.9
1000	630	9070T1000D31	837.00	9070TF1000D31	920.00	20.6
1500	1000	9070T1500D31	1224.00	9070TF1500D31	1524.00	34.0
2000	1500	9070T2000D31	1854.00	9070TF2000D31	2154.00	47.0
3000	2000	9070T3000D31	2741.00	907011 2000D31	2134.00	60.0
5000	3000	9070T5000D31	3368.00			89.0
				115/020 V C		05.0
	**	40 V Secondary				0.5
50 75	50 75	9070T50D37	135.00 162.00	9070TF50D37	372.00 384.00	2.5 3.8
100	100	9070T75D37 9070T100D37	182.00	9070TF75D37 9070TF100D37	394.00	3.8
150						5.5
200	150 200	9070T150D37 9070T200D37	230.00 293.00	9070TF150D37	452.00 498.00	5.5
250	160	9070T250D37	363.00	9070TF250D37	564.00	7.1
300	200	9070T300D37	372.00	9070TF250D37	570.00	8.5
350	250	9070T350D37	432.00	9070TF300D37	630.00	10.5
500	300	9070T500D37	432.00	9070TF350D37	638.00	11.9
750	500	9070T750D37	665.00	9070TF300D37	795.00	11.9
1000	630	9070T1000D37	837.00	9070TF1000D37	920.00	20.6
1500	1000	9070T1500D37	1170.00	9070TF1500D37	1524.00	34.0
2000	1500	9070T2000D37	1358.00	9070TF2000D37	2154.00	47.0
3000	2000	9070T3000D37	1914.00	907011 2000D37	2134.00	60.0
5000	3000	9070T5000D37	3015.00	_		89.0
						05.0
		ry, 115/230 V Sec		0070TE50D00	270.00	2.5
50 75	50 75	9070T50D33	188.00 197.00	9070TF50D33 9070TF75D33	372.00 384.00	3.8
100	100	9070T75D33	207.00		394.00	
150	150	9070T100D33 9070T150D33	273.00	9070TF100D33 9070TF150D33	452.00	3.8 5.5
200 250	200 160	9070T200D33 9070T250D33	353.00 381.00	9070TF200D33 9070TF250D33	498.00 564.00	5.5
300	200	9070T250D33	435.00	9070TF250D33	570.00	7.1 8.5
	250	9070T350D33	435.00 455.00		630.00	10.5
350 500	300	9070T500D33	455.00 509.00	9070TF350D33 9070TF500D33	638.00	11.9
750	500	9070T750D33	710.00	9070TF500D33	795.00	11.9
1000	630	9070T1000D33	837.00	9070TF1000D33	920.00	20.6
1500	1000	9070T1500D33	1224.00	9070TF1000D33	1524.00	34.0
2000	1500	9070T2000D33	1854.00	9070TF1500D33	2154.00	47.0
3000	2000	9070T3000D33	2741.00	90101F2000D33	2134.00	60.0
5000	3000	9070T5000D33	3368.00			89.0
5000	3000	907019000D33	3300.00			09.0



by Schneider Electric

Table 14.28: Type T and TF Transformers (continued)

Type T Transformers Type TF Transformers Weight (lbs) UL/CSA/ NOM 208/230/460 V Prim ry, 115 V Secondar 9070T50D20 188.00 9070TF50D20 270.00 197.00 293.00 100 207.00 9070TF100D20 360.00 5.5 150 9070T150D20 273.00 9070TF150D20 443.00 5.5 150 200 200 9070T200D20 353.00 9070TF200D20 497.00 8.5 250 160 9070T250D20 381.00 9070TF250D20 548.00 10.5 300 435.00 563.00 200 9070T300D20 9070TF300D20 10.5 455.00 9070TF350D20 350 250 9070T350D20 585.00 11.9 300 509.00 608.00 500 9070T500D20 9070TF500D20 750 500 9070T750D20 710 00 9070TE750D20 951 00 20.6 1000 630 9070T1000D20 837.00 9070TF1000D20 1320.00 34 1500 1000 9070T1500D20 1224.00 9070TF1500D2 1524.00 47 2000 1500 9070T2000D20 1854.00 2154.00 60 3000 2000 9070T3000D20 2741.00 89 ary; 230/460/575 V Primary, 115 V Secondary; 188.00 372.00 9070T75D32 197.00 9070TF75D32 384.00 100 100 9070T100D32 207.00 9070TF100D32 394.00 5.5 273.00 9070TF150D32 452.00 150 150 9070T150D32 5.5 200 200 9070T200D32 353.00 9070TF200D32 498.00 250 160 381.00 9070TF250D32 564.00 9070T250D32 8.5 435.00 9070TF300D32 300 200 9070T300D32 570.00 10.5 250 350 455.00 9070T350D32 9070TF350D32 630.00 11.9 500 300 9070T500D32 509.00 9070TF500D32 638.00 11.0 750 500 9070T750D32 710.00 9070TF750D32 795.00 20.6 1000 630 9070T1000D32 837.00 9070TF1000D3 920.00 34.0 1500 1000 9070T1500D32 1224.00 9070TF1500D32 1524.00 47.0 2000 1500 9070T2000D32 1854.00 9070TF2000D32 2154.00 60 O 3000 2000 9070T3000D32 2741.00 89.0 240/416/480/600 V Primary, 99/120/130 V Secondary; 230/400/460/575 V Primary, 95/115/125 V Secondary; 220/380/440/550 V Primary, 90/110/120 V Secondary; 208/360/416/520 V Primary, 85/104/115 V Secondary 315.00 9070TF50D50 502.00 9070T50D50 9070T75D50 9070TF75D50 341.00 528.00 75 7.2 100 100 9070T100D50 350.00 9070TF100D50 537.00 7 1 150 9070T150D50 366.00 9070TF150D50 553.00 8.5 150 200 200 9070T200D50 417.00 9070TF200D50 604.00 10.5 250 160 9070T250D50 455.00 9070TF250D50 642.00 10.5 300 200 9070T300D50 497.00 9070TF300D50 684.00 11.9 350 250 9070T350D50 512.00 9070TF350D50 699.00 500 300 9070T500D50 656.00 9070TF500D50 843.00 750 500 9070T750D50 761.00 9070TF750D50 948.00 20.6 1000 630 9070T1000D50 996.00 9070TF1000D5 1183.00 34 1500 1000 1352.00 1524.00 9070T1500D50 9070TF1500D5 2000 1500 9070T2000D50 1854.00 60.0 2154.00 3000 2000 2741.00 9070T3000D50 89.0 dary (24 limited to 20% Capacity) 135.00 9070T50D15 162.00 9070T75D15 3.8 100 100 9070T100D15 207.00 3.8 150 150 230.00 9070T150D15 5.5 293.00 200 200 9070T200D15 5.5 250 160 381.00 7.1 9070T250D15 300 200 9070T300D15 435.00 8.5 350 250 9070T350D15 455.00 10.5 300 9070T500D15 500 509.00 11.9 750 500 9070T750D15 710.00 11.0 1000 630 9070T1000D15 837.00 20.6 1500 1000 9070T1500D15 1224.00 34 N 2000 1500 9070T2000D15 1854.00 47.0 3000 2000 9070T3000D15 2229.00 60.0 5000 3000 9070T5000D15 3015.00 89.0

Table 14.29: Type T Transformers

VA	VA			
UL/CSA/ NON		Catalog No.	\$ Price	Weight (lbs
		dom		
50	imary, 24 V Second		125.00	2.5
	50	9070T50D2	135.00	2.5
75	75	9070T75D2	162.00	3.8
100	100	9070T100D2	182.00	3.8
150	150	9070T150D2	230.00	5.5
200	200	9070T200D2	293.00	5.5
250	160	9070T250D2	363.00	7.1
300	200	9070T300D2	372.00	8.5
350	250	9070T350D2	432.00	10.5
500	300	9070T500D2	471.00	11.9
750	500	9070T750D2	665.00	11.0
1000	630	9070T1000D2	837.00	20.6
208 V Primary, 2	4 V Secondary		· ·	
50 50	50	9070T50D14	135.00	2.5
75	75	9070T75D14	162.00	3.8
100	100	9070T100D14	182.00	3.8
150	150	9070T150D14	230.00	5.5
200	200	9070T200D14	293.00	5.5
250	160	9070T250D14	363.00	7.1
300	200	9070T300D14	372.00	8.5
350	250	9070T350D14	432.00	10.5
500	300	9070T500D14	471.00	11.9
750	500	9070T750D14	665.00	11.0
1000	630	9070T1000D14	837.00	20.6
	imary, 24 V Second		105.00	
50	50	9070T50D23	135.00	2.5
75	75	9070T75D23	162.00	3.8
100	100	9070T100D23	182.00	3.8
150	150	9070T150D23	230.00	5.5
200	200	9070T200D23	293.00	5.5
250	160	9070T250D23	363.00	7.1
300	200	9070T300D23	372.00	8.5
350	250	9070T350D23	432.00	10.5
500	300	9070T500D23	471.00	11.9
750	500	9070T750D23	665.00	11.0
1000	630	9070T1000D23	837.00	20.6
		007011000020	007.00	20.0
•	2/24 V Secondary			
50	50	9070T50D13	135.00	2.5
75	75	9070T75D13	162.00	3.8
100	100	9070T100D13	182.00	3.8
150	150	9070T150D13	230.00	5.5
200	200	9070T200D13	293.00	5.5
250	160	9070T250D13	363.00	7.1
300	200	9070T300D13	372.00	8.5
350	250	9070T350D13	432.00	10.5
500	300	9070T500D13	471.00	11.9
750	500	9070T750D13	665.00	11.0
1000	630	9070T1000D13	837.00	20.6
lultiTap 24 Volt	Control Primary			
08/240/277/380/	480 V Primary, 24 \	/ Secondary		
50	50	9070T50D19	188.00	4.0
75	75	9070T75D19	197.00	7.2
100	100	9070T100D19	207.00	7.2
150	150	9070T150D19	273.00	7.1
200	200	9070T200D19	353.00	8.5
250	160	9070T250D19	381.00	10.5
	200	9070T300D19	435.00	11.9
300	OFO	9070T350D19	455.00	11.9
350	250			
	300	9070T500D19	509.00	11.0
350				11.0 20.6

## Table 14.30: Type T Dimensions

Type	Time	Voltage Cada	He	ght	Wi	dth	Depth		Accessory
The color of the	Туре	voltage Code	ln.	mm	ln.	mm	ln.	mm	Key
T500   D15, D3, D4, D31, D33, D37   2.58   73   3.38   86   3.34   85   11   11   11   11   11   11   11	T25	D1	2.58	66	3.00	76	3.09	79	
D1, D50	T50	D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37	2.58	66	3.00	76	3.09	79	I
T100	150	D20, D32		-	3.38	86		85	II
T150		-,	2.89	73	3.38	86	4.43	113.0	III, IV
T100	T75	D15, D3, D4, D31, D33, D37,	2.58	66	3.00	76	3.09	79	ı
T100		D19, D50	3.20	81	3.75	95	4.7	119.4	III, IV
D1, D32	T100		2.89	73	3.38	86	3.34	85	I
T1500  T150  D1, D5, D2, D23, D14, D13, D20  D19, D32  D1, D5, D2, D23, D14, D13, D30, D15, D3, D4, D31, D33, D37  T200  D1, D5, D2, D23, D14, D13, D20  D19, D32  D10, D32  D33, D4, D31, D33, D37  D34, D31, D33, D37  D35, D4, D31, D33, D37  D35, D4, D31, D33, D37  D36, D40, D31, D33, D37  D37, D30, D40, D31, D33, D37  D38, D40, D31, D33, D37  D38, D40, D31, D33, D37  D39, D20, D32, D30  D32, D50  D32, D50  D32, D50  D33, D4, D31, D33, D37  D34, D31, D33, D37  D35, D30, D4, D31, D33, D37  D36, D4, D31, D33, D37  D37, D30, D4, D31, D33, D37  D38, D4, D31, D33, D37  D39, D20, D32, D30  D39, D20, D32, D30  D39, D20, D32, D30  D39, D20, D32, D30  D39, D20, D32, D30  D30, D30, D30, D30, D30, D30, D30, D30,	1100	,							
T1500   D15, D3, D4, D31, D33, D37, D20   S1   S75   S5   S5   S5   S7			3.20	81	3.75	95	4.7	119.4	III, IV
T200	T150	D15, D3, D4, D31, D33, D37, D20		•					
T200    D1, D5, D2, D23, D14, D13, D33, D37   D19, D32, D30, D4, D31, D33, D37   D15, D3, D4, D31, D33, D37   D20, D32, D50   D1, D5, D15, D3, D4, D31, D33, D37   D20, D32, D50   D1, D5, D15, D3, D4, D31, D33, D37   D20, D32, D50   D1, D5, D15, D3, D4, D31, D33, D37   D33, D37   D33, D37   D34, D31, D33, D37   D34, D31, D33, D37   D35, D4, D31, D33, D37   D35, D4, D31, D33, D37   D35, D35, D4, D31, D33, D37   D35, D35, D4, D31, D33, D37   D35, D35, D4, D31, D33, D37   D35, D35, D35, D35, D35, D35, D35, D35,		,						-	
T200    D15, D3, D4, D31, D33, D37   S.20   S.30   S.30   S.30   S.30   S.30   D19, D32   D19, D32   D15, D2, D23, D14, D13, D15, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D19, D20, D32, D50   D20, D32, D50   D20, D32, D50   D20, D32, D50   D20, D32, D50   D20, D32, D50   D32, D50   D33, D37   D33, D37   D33, D37   D34, D31, D33, D37   D34, D31, D33, D37   D		= =	3.84	98.0	4.50	114.3	4.74	120.4	III, IV
Table   D19, D32   3.84   98.0   4.50   114.3   4.74   120.4   II   D50   3.84   98.0   4.50   114.3   5.11   129.8   III, IV   D11, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   3.21   82   3.75   95   5.30   135   I   D19, D32, D50   3.84   98.0   4.50   114.3   5.11   129.8   III, IV   D19, D32, D50   3.84   98.0   4.50   114.3   5.11   129.8   III, IV   D19, D32, D4, D31, D33, D37   3.84   98.0   4.50   114.3   5.11   129.8   III, IV   D19, D32, D4, D31, D33, D37   3.84   98.0   4.50   114.3   5.11   129.8   II   D19, D20   D32, D50   3.84   98.0   4.50   114.3   5.11   129.8   II   D32, D50   D32, D50   3.84   98.0   4.50   114.3   5.11   129.8   II   D32, D32, D32, D32, D32, D32, D33, D34, D31, D33, D37   3.84   98.0   4.50   114.3   5.11   129.8   II   D32, D32, D32, D32, D32, D32, D32, D32,		D15, D3, D4, D31, D33, D37							
T2500    T2500   D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D20, D32, D50   D3, D4, D31, D33, D37   D3, D3, D3, D3, D3, D3, D3, D3, D3, D3,	T200							-	
T250    D1, D5, D2, D23, D14, D13, D37, D15, D3, D4, D31, D33, D37   S.21   S.2   S.25   S.30						-		-	
T250    D15, D3, D4, D31, D33, D37   S.21   S.2   S.75   S.9   S.30   S.5   I		= =	3.84	98.0	4.50	114.3	5.11	129.8	III, IV
T300    D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D15, D15, D15, D3, D4, D31, D33, D37   D15, D15, D15, D3, D4, D31, D33, D37   D15, D15, D15, D15, D15, D15, D15, D15,	T250	D15, D3, D4, D31, D33, D37		-					
T300    D1, D5, D2, D23, D14, D13, D37, D15, D3, D4, D31, D33, D37   D19, D20, D32, D50   A.51   114.3   5.49   139.4   III, IV	1200	The second secon				-			
T300    D15, D3, D4, D31, D33, D37   3.84   98.0   4.50   114.3   5.11   129.8   II   II   II   II   II   II   II			3.84	98.0	4.50	114.3	5.11	129.8	III, IV
Times	T300	D15, D3, D4, D31, D33, D37							
T350    D1, D5, D2, D23, D14, D13, D30, D37   D19, D20, D32, D50   D20, D32, D50   D20, D32, D50   D20, D32, D50   D33, D37   D33, D37   D33, D37   D33, D37   D34, D31, D33, D37   D34, D31, D33, D37   D32, D30   D32, D30   D32, D30   D32, D30   D32, D33, D33   D34, D31, D33, D37   D32, D34, D31, D33, D37   D32, D34, D31, D33, D37   D32, D35   D32, D34, D31, D33, D37   D32, D34, D31, D33, D37   D32, D35   D32, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31,	.000					-			
T350    D19, D20, D32   3.84   98.0   4.50   114.3   5.49   139.4   II		D1, D5, D2, D23, D14, D13,				_			
T500    D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37   D19, D20, D32, D50   A.51   114.6   5.25   133.4   5.61   142.5   III, IV	T350					1110			
T500 D1, D5, D2, D23, D14, D13, D19, D20, D32, D50 d.51 114.6 5.25 133.4 5.61 142.5 III, IV  T750 D19, D20, D32, D50 d.51 114.6 5.25 133.4 5.61 142.5 III, IV  D19, D20, D32, D50 d.51 114.6 5.25 133.4 5.61 142.5 III, IV  D19, D20, D32, D50 d.51 114.6 5.25 133.4 6.30 160.0 III, IV  D19, D20, D32, D50 d.51 114.6 5.25 133.4 6.30 160.0 III, IV  D19, D20, D32, D50 d.51 114.6 5.25 133.4 6.30 160.0 III, IV  D19, D20, D32, D50 d.51 114.6 5.25 133.4 6.30 160.0 III, IV  D19, D20, D32, D50 d.617 156.7 7.06 179.3 5.92 150.4 III, IV  D1, D5, D15, D3, D4, D31, D33, D37 d.617 156.7 7.06 179.3 5.92 150.4 III, IV  D1, D5, D15, D3, D4, D31, D33, D37 d.617 156.7 7.06 179.3 7.17 182.1 III, IV  D1, D5, D15, D3, D4, D31, D33, D37 d.617 156.7 7.06 179.3 7.17 182.1 III, IV  D1, D5, D15, D3, D4, D31, D33, D37 7.63 193.8 9.00 228.6 6.38 162.1 III, IV  D32, D50 7.63 193.8 9.00 228.6 6.38 162.1 III, IV  D32, D50 8.75 222 9.00 229 9.15 232 III, IV  T5000 D3, D4, D15, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D32, D50 8.75 222 9.00 229 9.15 232 III, IV  T5000 D1, D5, D3, D4, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D33, D4, D15, D3, D4, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D33, D4, D15, D3, D4, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D32, D50 8.75 222 9.00 229 9.15 232 III, IV  D33, D4, D15, D3, D4, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D32, D50 B3, D4, D15, D31, D33, D4, D31, D33, D37 7.63 194 9.00 229 8.31 211 III  D33, D33, D4, D15, D31, D33, D4, D31, D33, D37 7.63 194 9.00 229 9.15 232 III, IV									
D19, D20, D32, D50	TEOO	D1, D5, D2, D23, D14, D13,							
T750    D1, D5, D2, D23, D14, D13, D37, D15, D3, D4, D31, D33, D37   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D20, D32, D50   D19, D33, D37   D19, D33, D37   D19, D33, D37   D19, D33, D37   D19, D33, D37   D19, D33, D39, D4, D31, D33, D37   D19, D32, D32, D32, D32, D33, D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D33, D34, D31, D33, D37   D34, D31, D33, D37   D34, D31, D33, D37   D34, D31, D33, D37   D34, D31, D34, D31, D33, D37   D34, D31, D35, D35, D35, D35, D35, D35, D35, D35	1300		4 51	1146	5.25	133 4	5.61	142 5	III IV
D19, D20, D32, D50	T750	D1, D5, D2, D23, D14, D13,		_					
T1000	.,,,,		4.51	114.6	5.25	133.4	6.30	160.0	III, IV
T1500 D1, D5, D15, D3, D4, D31, D33, D37 D33, D37 D33, D37 D33, D37 D33, D37 D33, D37 D33, D37 D33, D37 D33, D37 D34, D31, D33, D37 D34, D31, D33, D37 D34, D31, D33, D37 D34, D35, D36, D36, D36, D36, D36, D36, D36, D36	T1000	D1, D5, D2, D23, D14, D13, D15, D3, D4, D31, D33, D37	4.51	114.6	5.25	133.4	6.30	160.0	I
T1500 D33, D37		D19, D20, D32, D50	6.17	156.7	7.06	179.3	5.92	150.4	III, IV
T2000 D1, D5, D15, D3, D4, D31, D33, D37 D34, D35, D35, D35, D35, D35, D35, D35, D35	T1500		6.17	156.7	7.06	179.3	5.92	150.4	I
T2000 D33, D37 0.17 199.7 7.06 179.3 7.17 182.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		D20, D32, D50	6.17	156.7	7.06	179.3	7.17	182.1	III, IV
T3000 D3, D4, D15, D31, D33, D37 7.63 193.8 9.00 228.6 6.38 162.1 1	T2000	D33, D37							
T3000 D20 7.63 194 9.00 229 8.31 211 II D1, D5, 8.75 222 9.00 229 7.24 184 I D32, D50 8.75 222 9.00 229 9.15 232 III, IV  D3, D4, D15, D31, D33, D37 7.63 194 9.00 229 8.31 211 I D1, D5, 8.75 222 9.00 229 9.15 232 III, IV  D1, D5, D15, D3, D4, D31, 7.46 189.5 7.06 179.3 7.17 182.1 I									
T3000 D1, D5, 8.75 222 9.00 229 7.24 184 I D32, D50 8.75 222 9.00 229 9.15 232 III, IV  T5000 D3, D4, D15, D31, D33, D37 7.63 194 9.00 229 8.31 211 I D1, D5, 8.75 222 9.00 229 9.15 232 I  TF2000 D1, D5, D15, D3, D4, D31, D4, D31, D33, D37 7.46 189.5 7.06 179.3 7.17 182.1 I									<u> </u>
TF2000 D1, D5, D3, D4, D31, D3, D37 D7, D6 D33, D37 D7, D6 D33, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D3, D4, D31, D4, D4, D4, D4, D4, D4, D4, D4, D4, D4	T3000			-					
T5000 D3, D4, D15, D31, D33, D37 7.63 194 9.00 229 8.31 211 1 D1, D5, 8.75 222 9.00 229 9.15 232 1  TF2000 D1, D5, D15, D3, D4, D31, D33, D37 7.46 189.5 7.06 179.3 7.17 182.1 1	13000					-		-	<u> </u>
TF2000 D1, D5, 8.75 222 9.00 229 9.15 232 I  TF2000 D1, D5, D15, D3, D4, D31, D33, D37 7.46 189.5 7.06 179.3 7.17 182.1 I						-		_	
TF2000 D1, D5, D15, D3, D4, D31, D4, D31, D33, D37 7.46 189.5 7.06 179.3 7.17 182.1 I	T5000			-		-			<u> </u>
	TE0000	D1, D5, D15, D3, D4, D31,							
	1 1 2 0 0 0				9.00	228.6	6.38	162.1	III, IV

Table 14.31: Type TF Dimensions

Time	Voltage Code	Hei	ight	Wi	dth	De	pth	Accessory
Туре	voltage Code	ln.	mm	ln.	mm	ln.	mm	Key
TF25	D1	4	101.6	3.00	76	3.09	79	I
	D1, D5, D3, D4, D31, D33, D37	4	101.6	3.00	76	3.09	79	
TF50	D20, D32	4.25	107.9	3.38	86	3.34	85	II
	D50	4.25	107.9	3.38	86	4.43	113.0	III, IV
TF75	D1, D5, D3, D4, D31, D33, D37, D20, D32	4.25	107.9	3.00	76	3.09	79	I
	D50	4.55	115.6	3.75	95	4.7	119.4	III, IV
	D1, D5,D3, D4, D31, D33, D37	4.25	107.9	3.38	86	3.34	85	ı
TF100	D20, D32	4.55	115.6	3.75	95	3.59	91	ll l
	D50	4.55	115.6	3.75	95	4.7	119.4	III, IV
TF150	D1, D5, D3, D4, D31, D33, D37, D20	4.55	115.6	3.75	95	3.59	91	I
11150	D32	4.55	115.6	3.75	95	4.7	119.4	II
	D50	5.1	129.6	4.50	114.3	4.74	120.4	III, IV
	D1, D5, D3, D4, D31, D33, D37	4.55	115.6	3.75	95	3.59	91	1
TF200	D20	5.1	129.6	3.75	95	4.7	119.4	ll l
11 200	D32	5.1	129.6	4.50	114.3	4.74	120.4	II
	D50	5.1	129.6	4.50	114.3	5.11	129.8	III, IV
	D1, D5, D3, D4, D31, D33, D37	4.55	115.6	3.75	95	5.30	135	1
TF250	D20	5.1	129.6	4.50	114.3	4.74	120.4	II
	D32, D50	5.1	129.6	4.50	114.3	5.11	129.8	III, IV
	D1, D5, D3, D4, D31, D33, D37	5.1	129.6	4.50	114.3	4.74	120.4	-
TF300	D20	5.1	129.6	4.50	114.3	5.11	129.8	II
	D32, D50	5.1	129.6	4.50	114.3	5.49	139.4	III, IV
	D1, D5, D3, D4, D31, D33, D37	5.1	129.6	4.50	114.3	5.11	129.8	l l
TF350	D20, D32	5.1	129.6	4.50	114.3	5.49	139.4	II
	D50	5.73	145.6	5.25	133.4	5.61	142.5	III, IV
TF500	D1, D5, D3, D4, D31, D33, D37	5.1	129.6	4.50	114.3	5.49	139.4	1
	D20, D32, D50	5.73	145.6	5.25	133.4	5.61	142.5	III, IV
TF750	D1, D5,D3, D4, D31, D33, D37	5.73	145.6	5.25	133.4	5.61	142.5	I
	D20, D32, D50	5.73	145.6	5.25	133.4	6.30	160.0	III, IV
TF1000	D1, D5, D3, D4, D31, D33, D37	5.73	145.6	5.25	133.4	6.30	160.0	l l
	D20, D32, D50	7.46	189.5	7.06	179.3	5.92	150.4	III, IV
TF1500	D1, D5, D15, D3, D4, D31, D33, D37	7.46	189.5	7.06	179.3	5.92	150.4	1
	D20, D32, D50	7.46	189.5	7.06	179.3	7.17	182.1	III, IV
TF2000	D1, D5, D15, D3, D4, D31, D33, D37	7.46	189.5	7.06	179.3	7.17	182.1	1
	D20, D32, D50			9.00	228.6	6.38	162.1	III, IV



by Schneider Electric www.schneider-electric.us

#### **Accessories**

The Type T control transformers offer multiple field installable accessories:

Table 14.32: Fingersafe™ Covers (Not Supplied with Unit)

	Tyrno	Туре	Accessory Ke	ey 🛦	Description	Price Each	ž š	ice ice
	Туре	1	II	III, IV	Description	S P	Order Otty	Order \$ Price
Ī	FSC1	T25-T200	T25-T150	_	2 covers per kit	21.00	10	210.00
_	FSC2	T250-T5000	T250-T5000	_	2 covers per kit	30.00	10	300.00
	FSC23	_	_	T25-T5000	2 covers per kit	30.00	10	300.00

Kits must be ordered separately. Also supplied in bulk packages of 100 individual covers. Add "B" to Type number (available only on FSC1B and FSC2B).

Table 14.33: Separate NEMA Type 1 Enclosures for Transformers

Class 9991 Type	For Use With
UE7	EO1, EO17, T50
LG1	EO2, EO3, EO4, EO15, EO16, EO18, EO19, T75, T100, T150, T200, T250, T300, T350, T500
SDG4	EO51, EO61, T750, T1000, EO71

NOTE: User must drill mounting holes. See pages 16-106 and 16-107 for dimensions.

Table 14.34: Jumper Kits

Catalog	Туре	e Accessory K	(еу	Description	Price Each	Order Otty.	ice de
No.	1	II III, I		Description	S Ea	ŏō	Order \$ Price
3003302753	T25-T200	T25-T150	_	Two jumpers per bag	8.00	50	400.00
3003302754	T250-T5000	T200-T3000	T25-T3000	Minimum order of 50 kits	5.00	50	250.00

NOTE: Jumpers are supplied with voltage codes that require them. If additional kits are required, order per above chart.

Table 14.35: Fuse Pullers (For Use on TF and FB Accessory)

Catalog No.	\$ Price	Order	Order
	Each	Qty.	\$ Price
9070FP1	33.00	10	330.00

#### **Field Installed Fuse Options**

Table 14.36: Primary and Secondary Fusing

Time	Туре	e Accessory Key		Description	<u> </u>	Order Otty.	<u> </u>
Туре	I	II	III, IV	Description	\$ Price Each	Şē	Order \$ Price
FB3A	25–200	25–150	_	Three pole fuse block for primary and secondary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (2 rejection and 1 non-rejection)	87.00	1	87.00
FB3B	250–2000	200–2000	25–2000	Three pole fuse block for primary and secondary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (2 rejection and 1 non-rejection)	87.00	1	87.00

Table 14.37: Primary Fusing

<b></b>	Type Accessory Key			Beautistics.	음년	× er	<u>i e</u>
Туре	I	I II III, IV		Description	\$ Price Each	Order Otty.	Order \$ Price
FB2A	25–200	25–150	_	Two pole fuse block for primary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (2 rejection)	75.00	1	75.00
FB2B	250–2000	200–2000	25–2000	Two pole fuse block for primary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (2 rejection)	75.00	1	75.00

Table 14.38: Field-Installable Secondary Fuse Clips

Type	Туре	Accessory K	Key ♦	Description	유	Order Otty.	de rice
Туре	- 1	II	III, IV	Description	\$ Price Each	çe	Order \$ Price
SF25A	25–200	25–150	_	Secondary fuse block accommodates 1-1/4 x 1/4 inch fuse	21.00	10	210.00
SF25B	250–2000	200–2000	25–2000	Secondary fuse block accommodates 1-1/4 x 1/4 inch fuse	21.00	10	210.00
SF41A ■	25–200	25–150	_	Secondary fuse clip accommodates 1-1/2 x 13/32 inch midget fuse	18.00	10	180.00
SF41B ■	250–2000	200–2000	25–2000	Secondary fuse clip accommodates 1-1/2 x 13/32 inch midget fuse	18.00	10	180.00
FB1A	25–200	25–150	_	One pole fuse block for secondary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (1 non-rejection)	53.00	1	53.00
FB1B	250–2000	200–2000	25–2000	One pole fuse block for secondary fusing, accommodates 1-1/2 x 13/32 inch midget fuse (1 non-rejection)	53.00	1	53.00

- SF41 can be installed on the following voltage codes: D1, D5, D24, D3, D4, D51, D2, D23, D14, D25, D20, D95, D19, D22, D36.
- I = voltage codes D1, D2, D3, D4, D5, D12, D13, D14, D15, D23, D24, D25, D31, D32, D33, D36, D5
   II = voltage codes D18, D20
   III, IV= voltage codes D19, D50

#### **Selection Guide**

- Determine the inrush and sealed VA of each coil in the control circuit and the VA of all other components.
- Total the sealed VA of all operating coils and the VA of all other loads. (This determines the minimum VA size required for the circuit.)
- 3. Total the **inrush** VA of all coils that are starting at the same time and all loads and coils that are running.
- Locate a value in the VA column of Table 14.39 that is equal to or greater than the value calculated in step 2.
- In the VA row selected in step 4, find the inrush value under the appropriate voltage regulation column of Table 14.39. If this value is greater than the calculated value from step 3, this is the correct transformer VA rating.

If the inrush value on the selected VA row is **not greater than** the calculated value from step 3, use the next higher transformer VA rating, that is, the rating on the next row.

If your supply voltage is stable and fluctuates less than 5%, Schneider Electric recommends you use the 90% secondary voltage column. If your supply voltage is not stable and fluctuates more than 10% we recommend you use the 95% secondary voltage column. We recommend that you never use the 85% secondary voltage column since magnetic devices lose life expectancy if they are continuously started at 85% of rated voltage.

Table 14.39: Regulation Chart for Type T

	Inrush V	/A @ 20% pow	er factor	Inrush VA @ 40% power factor				
VA	95% Secondary Voltage	90% Secondary Voltage	85% Secondary Voltage	95% Secondary Voltage	90% Secondary Voltage	85% Secondary Voltage		
50	193	266	339	151	215	282		
75	271	396	20	210	318	430		
100	339	499	659	266	404	549		
150	666	893	1120	529	731	942		
200	588	815	1041	459	659	866		
250	1416	1910	2388	1057	1494	1936		
300	1634	2184	2709	1194	1681	2169		
350	1894	2592	3261	1392	2005	621		
500	3197	4104	4981	2374	3195	4019		
750	3770	5515	7231	2887	4391	5945		
1000	6587	9079	11430	4706	6886	9051		
1500	19324	23983	28607	15066	19361	23756		
2000	31384	38777	6161	24794	31630	38667		
3000	26539	39934	52713	19355	30721	42216		
5000	53111	85265	116277	39368	66309	93882		



Transformer disconnects are available in NEMA Type 1 Standard, NEMA Type 12 Standard, and NEMA Type 1 Mini.

## Transformer Disconnects for NEMA Type 1 and Type 12 Enclosures

Class 9070 / Refer to Catalog 9070CT0301

Square D™ brand transformer disconnects mount inside or outside a control system enclosure. The transformer disconnect being connected directly to the 480 V system controls power for auxiliary, single-phase loads when the main three-phase disconnect is either ON or OFF. The transformer disconnect is normally wired to the line side of the control panel's main disconnect.

This convenient source of 120 V power can be used for auxiliary or isolated loads, such as panel lighting, portable power tools, and programmable controller equipment.

Units consist of copper-wound transformers, a disconnect switch, and primary and secondary fuse blocks. All blocks are installed in NEMA Type 1 or Type 12 enclosures.

Transformer disconnects are UL Listed. Use Square D™ brand Type TF industrial control transformers and Square D™ brand disconnect switches.

Multiple enclosure options and accessories are available. See catalog 9070CT0301 or contact your local Schneider Electric representative or distributor.

- Standard NEMA Type 1
- Mini NEMA Type 1
- Compact NEMA Type 1
- NEMA Type 12

Table 14.40: Transformer Disconnects

VA	Catalog No.	\$ Price	Catalog No.	\$ Price	Enclosure		н		w		,	Weight
	Without Outlet		With Outlet			ln.	mm	ln.	mm	ln.	mm	(lbs)
NEMA Type 1 Er	nclosure, 240 x 480 V Prin	nary, 120 V Seco	ndary (Compact Design)									
100	9070MN100G0D1	1338.00	9070MN100G0D1G13	1551.00	G0	7.00	178	11.30	287	7.81	198	16
250	9070MN250G0D1	1488.00	9070MN250G0D1G13	1701.00	G0	7.00	178	11.30	287	7.81	198	21
500	9070MN500G0D1	1640.00	9070MN500G0D1G13	1853.00	G0	7.00	178	11.30	287	7.81	198	24
750	9070SK750G3D1	1721.00	9070SK750G3D1G13	1934.00	G3	13.40	340	14.80	376	10.21	259	47
1000	9070SK1000G3D1	2259.00	9070SK1000G3D1G13	2472.00	G3	13.40	340	14.80	376	10.21	259	51
1500	9070SK1500G3D1	3351.00	9070SK1500G3D1G13	3564.00	G3	13.40	340	14.80	376	10.21	259	65
2000	9070SK2000G3D1	4257.00	9070SK2000G3D1G13	4470.00	G3	13.40	340	14.80	376	10.21	259	71
3000	9070SK3000G3D1	5696.00	9070SK3000G3D1G13	5909.00	G3	13.40	340	14.80	376	10.21	259	85
NEMA Type 1 Er	nclosure, 240 x 480 V Prin	nary, 120 V Seco	ndary									
250	9070SK250G1D1	1353.00	9070SK250G1D1G13	1566.00	G1	9.40	239	11.80	300	8.96	228	26
500	9070SK500G1D1	1488.00	9070SK500G1D1G13	1701.00	G1	9.40	239	11.80	300	8.96	228	28
750	9070SK750G1D1	1674.00	9070SK750G1D1G13	1887.00	G1	9.40	239	11.80	300	8.96	228	33
1000	9070SK1000G1D1	2199.00	9070SK1000G1D1G13	2412.00	G1	9.40	239	11.80	300	8.96	228	37
1500	9070SK1500G2D1	3255.00	9070SK1500G2D1G13	3468.00	G2	13.40	340	14.80	376	12.21	310	67
2000	9070SK2000G2D1	3699.00	9070SK2000G2D1G13	3912.00	G2	13.40	340	14.80	376	12.21	310	73
3000	9070SK3000G2D1	4955.00	9070SK3000G2D1G13	5168.00	G2	13.40	340	14.80	376	12.21	310	87
NEMA Type 1 Er	nclosure, 480 V Primary, 1	20 V Secondary										
5000	9070SK5000G4D9	7748.00	9070SK5000G4D9G13	7961.00	G4	16.90	429	18.20	462	14.50	368	125
NEMA Type 12 E	Enclosure, 240 x 480 V Pri	mary, 120 V Seco	ondary			,		,				
250	9070SK250A2D1	3281.00	9070SK250A2D1G13	3494.00	A2	16.50	419	14.50	368	13.50	343	46
500	9070SK500A2D1	3417.00	9070SK500A2D1G13	3630.00	A2	16.50	419	14.50	368	13.50	343	49
750	9070SK750A2D1	3621.00	9070SK750A2D1G13	3834.00	A2	16.50	419	14.50	368	13.50	343	53
1000	9070SK1000A2D1	3723.00	9070SK1000A2D1G13	3936.00	A2	16.50	419	14.50	368	13.50	343	58
1500	9070SK1500A2D1	4095.00	9070SK1500A2D1G13	4308.00	A2	16.50	419	14.50	368	13.50	343	79
2000	9070SK2000A2D1	4364.00	9070SK2000A2D1G13	4577.00	A2	16.50	419	14.50	368	13.50	343	85
3000	9070SK3000A2D1	5448.00	9070SK3000A2D1G13	5661.00	A2	16.50	419	14.50	368	13.50	343	99
NEMA Type 12 E	Enclosure, 240 x 480 V Pri	mary, 120 V Seco	ondary, Flange Switch			,		,				
250	9070SK250A3D1	3281.00	9070SK250A3D1G13	3494.00	A3	15.50	394	17.00	432	10.00	254	48
500	9070SK500A3D1	3417.00	9070SK500A3D1G13	3630.00	A3	15.50	394	17.00	432	10.00	254	53
750	9070SK750A3D1	3621.00	9070SK750A3D1G13	3834.00	A3	15.50	394	17.00	432	10.00	254	57
1000	9070SK1000A3D1	3723.00	9070SK1000A3D1G13	3936.00	A3	15.50	394	17.00	432	10.00	254	61
1500	9070SK1500A3D1	4095.00	9070SK1500A3D1G13	4308.00	A3	15.50	394	17.00	432	10.00	254	75
2000	9070SK2000A3D1	4364.00	9070SK2000A3D1G13	4577.00	A3	15.50	394	17.00	432	10.00	254	86

#### **Voltage Transformers**

Schneider Electric offers three models of voltage transformers, each suited for a particular application:

- Model 450R
  - Applications requiring accurate voltage measurement within the 0.3% accuracy class
  - Switchboards with 1% instrumentation
- Model 460R
  - Applications with less critical accuracy and low burden requirements
  - Transducers and other panelboard monitoring
- Model E470
  - Extremely accurate voltage measurement
  - Low burden applications, such as PLC modules and similar, high-impedance electronic devices

#### Table 14.41: Voltage Transformers

Application	Model Number	Accuracy/Burden and Thermal Rating	Primary Voltages (120 V Secondary)
Large Burden	450R	0.3 W, X, M, Y; 500 VA Thermal	120-600 V
Small Burden	460R	0.6 W, 1.2X; 150 VA Thermal	120–600 V
Small Burden	470R	0.3W, 1.2X; 150 VA Thermal	120–600 V

#### **Current Transformers**

Current transformers are low cost, compact units that offer good electrical performance in a general purpose transformer.

- They are very easy to mount on the conductors.
- All current transformers feature permanent polarity marks molded into the case.

The following types of current transformers are available:

- General purpose
- Toroidal (single ratio)
- Rectangle window (single ratio)
- Split core
- Bushing (single ratio) (multi-ratio)

For part numbers, see Section 6 of the Supplemental Digest or see the Schneider Electric Product Configurator.

Contact your local Schneider Electric representative for other available features.

Table 14.42: Current Transformers

Window	Diameter			Usual Application			UL Recognized	
ln.	mm	Model Number	Metering	Metering or Control Relaying	High Output Relaying	Primary Range in Amperes ▲	Product	
1.3	28	2NR	Х			50–300		
1.56	40	5NR	Х			100–600		
1.50	40	54R	X			100–600		
1.94	49	64R	X			100–750		
1.54	43	66R		X		100–750		
		7RL				50–1500		
2.25	57	7RT				50–1500 150–1500 ■		
2.34	59	74R	Х			200-1500		
2.34	59	76R		Х		200-1500		
		74RFT				_		
2.50	63	180R		Х		100-1500		
		200R		X		100–600		
3.50	89	201R		X		100-800		
4.00	102	100R		X		200–2000	Yes	
4.00	102	110R		X		200–2000		
4.25	108	170R		X		200–2000		
4.50	114	312R			X	600–4000		
		202R		Х	X	100–1000		
5.25	133	203R		X		100–3000		
5.75	146	120R		Х		200–3000		
6.25	159	210R		Х	X	200–3000		
6.88	175	151R			Х	600–4000		
	_	152R		Х	X	50–4000		
8.13	206	140R		X	X	50–6000		
2.12 x 4.25	54 x 108	260R	Х			100–4000		
3.50 x 6.25	89 x 159	273	X			200–4000		
3.56 x 8.81	90 x 224	270R	X		•	400–5000		
7.45 x 3.75	189 x 95	560R	Х			400–5000		

- With a 5 A secondary.
- With a 1 A secondary.

Ť

Ordering

Information To complete the threeor single-phase catalog numbers on this page:

> In Table 14.44 or Table 14.46, find your required voltage rating. Note the voltage

code for that rating.

In Table 14.43 or

Table 14.45, find

Replace the () in the catalog number of that transformer with the voltage code noted in step 2. Example 1: 1000 kVA, 3Ø, 60 Hz, 150 °C temp. rise, 60 kV BIL, NEMA sound level, ventilated indoor enclosure, 13.2 kV delta 480Y/277, 2-2.5%

full capacity taps. 2AN and 2BN = catalog no. EE1000T51H.

Example 2: 750 kVA 3Ø. 60 Hz

Example 2: 750 kVA 30, 60 Hz, 80 °C temp. rise, 60 kV BIL, NEMA sound level, ventilated indoor enclosure, 4160 V Delta, 480Y/277, 2-2.5% full capacity taps. 2AN and 2BN = catalog no. EE750T19HB. Add 20% to

Example 3: 167 kVA, 2400/4160Y-120/240, 1Ø, 60 Hz = catalog no. EE167513H. The unit would be supplied with 2–2.5% above and 2–2.5% till capacity below normal taps on the primary.

listed price.

the transformer with the required voltage rating.

## New!

#### 1201-15,000 V, Three-Phase, Indoor **Transformers**

All transformers are built with 220 °C insulation and 150 °C temperature rise. For 115 °C rise add 10% to price and F to catalog number. For 80 °C rise add 20% to price and B to catalog number. Check with your local Schneider Electric representative to verify dimensional changes and weights and for copper windings.

Standard high voltage taps: 4-2.5%, 2AN and 2BN. For 4-2.5% FCBN, add BN to catalog number.

Table 14.43: Three-Phase Transformers

kVA	Catalog No.	\$ Price	Weight (lbs)	Enclosure ▲
2.4 kV an	d 5 kV Voltage C	lass, 60 Hz, 150	°C Rise	
112.5	EE112T()H	51125.00	1540	36D
150	EE150T()H	62805.00	1760	37D
225	EE225T()H	84500.00	2090	37D
300	EE300T()H	101965.00	2310	38D
500	EE500T()H	119077.00	3520	38D
750 ■	EE750T()H	149110.00	4290	39F
1000 ■	EE1000T()H	185080.00	8140	40F
1500 ■	EE1500T()H	222440.00	9900	40F
2000 ■	EE2000T()H	255265.00	11990	41F
2500 ■	EE2500T()H	308692.00	13420	42F
15 kV Vo	Itage Class, 60 H	z,150 °C Rise		
112.5	EE112T()H	58586.00	2200	38D
150	EE150T()H	72309.00	2420	38D
225	EE225T()H	98125.00	3080	45D
300	EE300T()H	137445.00	3630	45D
500	EE500T()H	139650.00	5500	44F
750 ■	EE750T()H	165870.00	6600	39F
1000 ■	EE1000T()H	210915.00	8140	40F
1500 ■	EE1500T()H	241298.00	9900	40F
2000 ■	EE2000T()H	282852.00	11990	41F
2500 ■	EE2500T()H	327549.00	13420	42F
3000 ■	EE3000T()H	421833.00	16940	42F

- See 14-10 for enclosures. Enclosures are for indoor use only Transformers suitable for outdoor use are available on special order. Adding a weather shield will not make medium voltage transformer suitable for outdoor use.
- Dimensions and prices listed for 480 volt secondary only. For 240 V or 208 V, contact your local Schneider Electric representative.

Table 14.44: Three-Phase Voltage Codes

kV Class	Code	Primary	Secondary
2.4 30 kV BIL	13 14 15 16 17	2400 Delta 2400 Delta 2400 Delta 2400 Delta 2400 Delta	208Y/120 480Y/277 240 Delta 480 Delta 600 Delta
5 30 kV BIL	18 19 20 21 22 23 25 26 27 28 29 30 31	4160 Delta 4160 Delta 4160 Delta 4160 Delta 4160 Delta 4160 V/2400 4160V/2400 4800 Delta 4800 Delta 4800 Delta 4800 Delta 4800 Delta	208V/120 480Y/277 240 Delta 480 Delta 480 Delta 240 Delta 240 Delta 280 Delta 208V/120 480Y/277 240 Delta 480 Delta 600 Delta 600 Delta 600 Delta
15 60 kV BIL	32 33 34 35 37 38 39 40 41 42 43 44 45 46 47 48 49 51 52 53 54 55 56 57 58 59 60 61 62	7200 Delta 7200 Delta 7200 Delta 7200 Delta 7200 Delta 7200 Delta 7200 Delta 7200 Delta 12000 Delta 12000 Delta 12000 Delta 12000 Delta 12000 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 12470 Delta 13200 Delta	208V/120 480V/277 240 Delta 480 Delta 600 Delta 208Y/120 480Y/277 240 Delta 480 Delta 480 Delta 208Y/120 480Y/277 240 Delta 480 Delta 600 Delta 208V/120 480Y/277 240 Delta 480 Delta 600 Delta 240 Delta 480 Delta 600 Delta 208V/120 480Y/277 240 Delta 480 Delta 600 Delta 240 Delta 600 Delta 240 Delta 600 Delta 480 Delta 600 Delta 480 Delta 600 Delta 480 Delta 600 Delta 480 Delta 600 Delta 600 Delta

#### 1201-15,000 V, Single-Phase, Indoor **Transformers**

All transformers are built with 220 °C insulation and 150 °C temperature rise. For 115 °C rise add 10% to price and F to catalog number. For 80 °C rise add 20% to price and B to catalog number, and check with your local Schneider Electric representative for dimensional changes.

Standard high voltage taps: 4-2.5%, 2AN and 2BN. For 4-2.5% FCBN, add BN to catalog number.

Table 14.45: Single-Phase Transformers

kVA	Catalog No.	\$ Price	Weight (lbs)	Enclosure ◆
2.4 kV V	oltage Class, 60 H	z, 150 °C Rise		
167	EE167S()H	45444.00	1650	38D
250	EE250S()H	59253.00	2420	38D
333	EE333S()H	72783.00	3300	45D
5 kV Volt	age Class, 60 Hz,	150 °C Rise		
167	EE167S()H	48777.00	1650	38D
250	EE250S()H	63312.00	2420	38D
333	EE333S()H	77478.00	3520	45D
15 kV Vo	Itage Class, 60 Hz	z, 150 °C Rise		
167	EE167S()H	56136.00	2640	38D
250	EE250S()H	72705.00	3740	45D
333	EE333S()H	86835.00	5500	45D

See 14-10 for enclosures. Enclosures are for indoor use only. Transformers suitable for outdoor use are available on special order. Adding a weather shield will not make medium voltage transforme suitable for outdoor use.

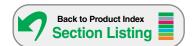
Table 14.46: Single-Phase Voltage Codes

kV Class	Code	Primary	Secondary
2.4 30 kV BIL	14 25	2400 Delta 2400 Delta	120/240 277
5 30 kV BIL	13 15 16 24 26 27	2400/4160Y 4800 Delta 4160 Delta 2400/4160Y 4800 Delta 4160 Delta	120/240 20/240 20/240 277 277 277
15 60 kV BIL	17 18 28 29 19 20 21 22 23 30 31 32 32 33 33	4160/7200Y 7200 4160/7200Y 7200 4160/12470Y 7620/13200Y 12470 13800 4160/12470Y 7620/13200Y 12470 13200 13800	120/240 120/240 277 277 277 120/240 120/240 120/240 120/240 277 277 277 277 277 277

### **Special Notes**

- Distribution class lightning arresters are recommended as good practice, but are not included in the above prices. Arrester addition may affect dimensions. Contact your local Schneider Electric representative.
- For 15 kV transformers requiring bottom entrance or exit, a separate compartment is required for adequate termination space and clearance. Transformers 1500 kVA and above with top entrance or exit may require a separate compartment to provide adequate wiring space. Contact your local Schneider Electric representative for special requirements.
- If the transformer requires a 94-inch high enclosure for a switchgear line-up, or if a special enclosure is required, contact your local Schneider Electric representative.
- For 95 kV BIL, consult your local Schneider Electric representative. (May affect dimensions.)

2.



## **Section 15**

## **Medical Products**

## Operating Room Isolated Power Panel (see page 15-2)



Iso-Gard Series 6 LIM (see page 15-4)



Iso-Gard IGR Nurses' Station Indicator (see page **15-5**)



	Isolated Power Panels	15-2
	Operating Room Panels	15-2
	ICU/CCU Panels	15-2
	Controlled Panels	15-3
	X-ray and Laser Receptacles	15-3
	Duplex Panels	15-3
	Dual Output Voltage Panels	15-3
	Line Isolation Monitor (LIM)	15-4
New	Iso-Gard™ Series 6	15-4
	Remote Indicators/Displays	15-4
Neu	Remote Alarm Indicators	15-4
Nev	Nurses' Station Indicators/Alarm Annunciator	15-5
Neu	IGT Dual Clock/Timer	15-5
Neu	IGT1550 Remote Control	15-5
	Accessories	15-6
	Power/Ground Modules	15-6
	Hospital Ground Cords and Jacks	15-6

All Square  $\mathsf{D}^{\mathsf{TM}}$  brand Isolated Power Panels meet or exceed  $\mathsf{UL}^{\textcircled{\$}}$  1022 and 1047 and are cUL Listed.

All products listed in this section are available through standard ordering procedures from authorized Schneider Electric distributors. For more information, contact your nearest Schneider Electric sales office or distributor. Call 1-888-778-2733 or visit www.schneider-electric.us.





#### Life Safety from Schneider Electric Medical Products

Schneider Electric has been deeply involved in isolated power systems since 1944. The current Iso-Gard™ brand of isolated power panels has evolved over the years and will continue to do so. With the ever-changing needs of the health care industry, Schneider Electric is the leader in innovation and design.

Recent updates to some of our current panels include the ability to use bolt-on or plug-on circuit breakers in all panels. With the growing need for X-ray and laser use, the controlled power panel solves many difficult situations where both of these technologies are required, but at different ampere ratings.

Mixing and matching components is easier today than ever before, with panels that can serve up to 16 circuits. The Iso-Gard Series 6 line isolation monitor (LIM) has communication capabilities and the ability to monitor the transformer temperature and current flow.

Schneider Electric can work with facility managers, design engineers, contractors, or anyone else trying to design an isolated power system. We can provide custom configurations to fit your needs. Simply configure the panel desired by starting with the basic operating room (OR) panel and adding the intensive care unit (ICU)/critical care unit (CCU) or controlled power panel options you need.

- Panels are field expandable to 16 circuits for all panels by adding Square D<sup>™</sup> brand QO<sup>™</sup> or QOB circuit breakers from Schneider Electric.
- Panels come with a main circuit breaker.
- Panels are 5 mA and field adjustable to 2mA.
- Six-inch deep panels are not available for all kVA ratings.

Orders can be automatically configured on the Schneider Electric brand ordering system available from your nearest Schneider Electric distributor.

To request drawings and/or product design and availability information, send an e-mail to: medical\_products@us.schneider-electric.com

#### **Operating Room Panels**

First introduced in the 1960s, but newly redesigned in 2011, this standard unit is most often used to supply 120 V service to the receptacles in an operating room. However, its use is not restricted to that application; it can also be used in critical care areas. This panel incorporates the following Schneider Electric components:

- Primary circuit breaker
- Isolation transformer
  - low-leakage
  - electrostatically shielded
  - 180 °C insulat ion system
  - 115 °C temperature rise
  - 30 dB sound level
- Reference ground bus bar
- Iso-Gard LIM
- · NQ panelboard interior

Operating room panels are non-ventilated and are supplied with a #304 stainless steel trim with a brushed finish. Under continuous full load and normal hospital ambient conditions, the surface temperature of the front trim panel will be no greater than 50 °C. The panels are UL Listed under Section 1047, *Isolated Power Systems Equipment* 

Table 15.1: Operating Room Panel Ordering Information

Catalog No.	kVA Rating	Backbox Depth (in inches)	Width/Height (in inches)
SIP	3 and 5	6	24 W x 43 H
SIP	7.5 and 10	8	

#### **ICU/CCU Panels**

Redesigned in 2011, these panels incorporate the same components and features as the operating room panels, but have the added feature of eight power receptacles and six approved grounding jacks connected to a ground bus for attaching fixed equipment and building structural grounds.

The power receptacles are "hospital only," locking-type receptacles. Duplex or single receptacles are available on request. Although the panel is designed to serve the needs of a coronary care or intensive care bed, it has been widely applied to provide power within special procedure rooms, cardiovascular laboratories, and general operating rooms.

Table 15.2: ICU/CCUPanel Ordering Information

Catalog No.	kVA Rating	Backbox Depth (in inches)	Width/Height (in inches)
SIP	3, 5, 7.5 and 10	8	24 W x 45 H



MEDICAL PRODUCTS











#### **Controlled Panels**

Controlled isolated power panels from Schneider Electric are designed to provide power for portable equipment outlets. In the past, most equipment operated on 60 A circuits. Today, these loads vary from 20 to 60 A and multiple pieces of equipment are being used. By applying the proper kVA loading, a panel can now provide power to multiple rooms and maintain safe operating conditions. All these panels are available in both one-phase and three-phase configurations with 5 to 25 kVA ratings.

The type of controls applied depends on the need. Schneider Electric has a variety of control schemes from push buttons to switches located in the operating room. The NEC requires that an audible and visual indication of alarm be available wherever isolated power is used. We use a receptacle module with a remote alarm indicator built into it for this purpose. A receptacle module without a remote alarm indicator is also available. The control of these circuits is important not only for the safety of turning them on and off, but they also turn the remote alarm indicators on and off at the same time. This reduces any confusion caused by an alarm going off in the operating room from circuits that don't need to be energized.

The basic control scheme is the mechanical interlock panel. The panel will serve various locations within the hospital. Interlocking circuitry allows predetermined locations to be used at any given time. Consequently, the line isolation monitor (LIM) monitors only the wiring and its inherent leakage to that receptacle. Remote indicator alarm stations must be located at the receptacle location. A push button station located in the panel controls the interlocking system. If the panel location is inaccessible or inconvenient for operating personnel, the push button station is available in a separate module that can be installed at the nurses' station or any other convenient location. This can be an inconvenience since this type of control system requires someone to select which room will be turned on. It also poses a potential problem in that someone could easily push a button to turn the power on in another room, thus turning off the power in a room that may actually be using a piece of equipment.

Table 15.3: Controlled Panel Ordering Information

Catalog No.	kVA Rating	Backbox Depth (in inches)	Width/Height (in inches)
SIP	15	12	30 W x 51 H
Oii	25	14	30 W X 31 11

#### **Receptacle Modules for Controlled Panels**

X-ray/laser power receptacle modules from Schneider Electric provide a convenient source of power for portable X-ray and laser equipment. The receptacle provided in each module is matched to the NEMA plug configuration of the equipment with which it will be used, and is mounted behind the door on the stainless steel face plate. The door features a concealed hinge and a touch latch.

#### **Duplex Panels**

The Duplex Isolation Power Panel is a single enclosure containing two complete hospital isolation systems. A divider in the unit's backbox separates the systems from top-to-bottom and front-to-back.

Each system has its own set of equipment, all of which is manufactured by Schneider Electric:

- Primary circuit breaker
- Isolation transformer
- Reference ground bus bar
- Iso-Gard™ line isolation monitor (LIM)
- NQ panelboard interior

Table 15.4: Duplex Isolation Panel Ordering Information

Catalog No.	kVA Rating ▲	Backbox Depth (in inches)	Width/Height (in inches)
SIX	3–10	8	34 W x 71 H

<sup>▲</sup> Panels are available in any combination of two kVA ratings.

#### **Dual Output Voltage Panels**

The dual output voltage, hospital isolated power panel is a single, ungrounded panel that can supply two different output voltages simultaneously. Similar to a standard distribution panel or load center, it can supply both 120/208 V or 120/240 V of ungrounded, isolated, single-phase power using only one isolation transformer. Other hospital isolation panels can supply only one output voltage.

Typically, the 208 or 240 V circuits of the dual output voltage panel supply power to operating room equipment such as mobile X-ray machines or surgical lasers. At the same time, the panel's 120 V circuits can supply power to convenience receptacles, surgical lights, X-ray film illuminators, sterilizers, and other 120 V appliances commonly found in operating rooms. This panel is ideally suited as a power supply for power/ground modules and X-ray indicator/receptacle modules.

Table 15.5: Dual Output Panel Ordering Information

	rable 13.3. Buai Gutput i anci Gracinig information					
	Catalog No.	Output Voltage Rating (in Vac)	Backbox Depth (in inches)	Width/Height (in inches)		
	SIDV	120/208	14 34 W x	34 W x 51 H		
SIDV		120/240	' <del>'</del>	04 W X 31 11		

### **Line Isolation Monitor, Remote Alarm Indicators**

Class 4800 / Refer to Catalog 4800CT9801





#### New Iso-Gard™ Series 6 Line Isolation Monitor—UL Recognized

The Square D brand, Iso-Gard Series 6, microprocessor-controlled, line isolation monitor (LIM) is included as standard equipment in all Schneider Electric hospital isolation panels. This LIM is also available as a replacement unit for older LIMs, is a direct replacement for all previous Schneider Electric LIMs, and is electrically compatible with all hospital isolated power systems.



- Automatic and manual self-test and self-calibration that reduces the frequency of required periodic testing
- Digital and analog display
- Unique audible alarm that will not be confused with other equipment
- UL component recognized and CSA classified
- Microprocessor-controlled circuitry for highest accuracy and stability

#### Iso-Gard LIM Ordering Information and Specifications Table 15.6:

Catalog No.	Operating Voltage	Hazard Current Alarm Level	Mode	Monitor Hazard Current
IG6	85–265 Vac, 50 or 60 Hz	2 or 5 mA (selectable)	Single-phase	25 μA or less

#### **Remote Alarm Indicators**

The National Electrical Code  $^{(8)}$  (NEC  $^{(8)}$ ) requires audible and visual alarm indication where isolation power is used (NEC 517-160). Schneider Electric offers the IG2000P and RA1 remote alarm indicators for this purpose.











### New!) Nurses' Station Indicators/Alarm Annunciators

Nurses' station indicators are available by combining the standard IG2000P remote onto a ganged plate or by using the new IGR or IGRD indicators/alarm annunciators. The IGR unit can support up to 199 panels on a single, twisted-pair connector. The IGRD unit has a larger capacity.







## New!) Iso-Gard™ IGT Dual Clock/Timer

The IGT unit displays both time of day and elapsed time information. The top, four-digit display shows the current time. It can operate in both 12- and 24-hour time modes. The bottom, four-digit display is an elapsed time counter controlled by the Count/Reset and Hold/Resume buttons.

- Bright-red LED display for enhanced readability under the intense lighting conditions found in hospital operating rooms
- 12/24 hour selectable mode
- Power outage backup for at least 24 hours without batteries
- Designed for flush wall mounting

A multi-display unit is available by combining the IGT unit into a four display unit and utilizing an IGT 1550 four-point remote control.

### New!) Iso-Gard™ IGT1550 Remote Control

The IGT1550 remote control provides the ability to control a clock/elapsed timer, such as the IGT, from a more convenient location.









#### **Power/Ground Modules**

When both ground jacks and power receptacles are required, these UL Listed modules offer convenience and save labor in field wiring. The units include four power receptacles, four twist-to-lock ground jacks, and a ground bus with a generous number of lugs for external ground connections.

The main ground connection in the module accommodates up to a #1/0 cable. The units are completely factory wired; only field power connections and ground connections are necessary. They are furnished with Type 304, brushed stainless steel face plates.

4 Red Duplex Receptacles and 4 Ground Jacks



4 Locking Receptacles and 4 Ground Jacks



#### **Hospital Ground Cords and Jacks**

Schneider Electric provides hospital-grade devices for the supply and grounding of portable equipment.

- Hospital ground cords
  - Highly flexible wire with a heavy duty lug or clip end
  - Ground cord with lug end is UL Listed (UL 467)
  - Various lengths available
- Hospital ground jacks

Ground Cord with Lug End



Ground Jack



Ground Cord with Clip End









Manual Starters and Switches (p. 16-4)



**Definite Purpose Contactors and Starters** (p. 16-70)





NEMA Style Type S Contactors and Starters (p. 16-14)





Lighting Contactors (p. 16-59)





**Pump Panel** (p. 16-75)

**Combination Starters** (p. 16-31)





**NEMA Style TeSys N Contactors and Starters** (p. 16-139)

# **NEMA AC Magnetic Contactors and Starters**

**NEMA Contactors and Starters** 

Catalog Numbering System	16-13
Combination Starters—NEMA Style	
Non-Reversing	
Non-Fusible Disconnect Class 8538	16-32, 16-34
Fusible Disconnect Class 8538	16-31, 16-33, 16-34
Electronic Motor Circuit Protector (MCP) Class 8539	16-35, 16-36, 16-37
Thermal Magnetic Circuit Breaker Class 8539 Reversing	16-38, 16-39
Non-Fusible Disconnect Class 8738	16-52
Fusible Disconnect Class 8738, 8739	16-51, 16-52
Electronic Motor Circuit Protector (MCP) Class 8739	16-53
Thermal Magnetic Circuit Breaker Class 8739	16-55
Contactors—NEMA Style	
Non-Reversing Class 8502	16-14
Reversing Class 8702	16-44
Vacuum, Low Voltage, Non-Reversing Class 8502	16-28
Vacuum, Low Voltage, Reversing Class 8702	16-50
Definite Purpose Contactors and Starters	16-70
Class 8910, 8965	16.79
Duplex Motor Starters Class 8941	16-78
Enclosures Class 9991	16-93
External Reset Mechanisms Class 9065	16-92
Factory Modifications (Forms)	16-100
Lighting Contactors Class 8903	16-59
Panel Board (PB) Lighting Contactors	See Supplemental Digest
Manual Starters and Switches Class 2510, 2511, 2512	16-4
Multispeed Starters Class 8810	See Supplemental Digest
Overload Relays	
Bimetallic Class 9065	16-89
Melting Alloy Class 9065	16-82
Motor Logic/Motor Logic Plus Class 9065	16-83
TeSys T Motor Management System  Pump Panels	16-84
Full Voltage Class 8940	16-75
Reduced Voltage Starters	
Electro-Mechanical Class 8600	See Supplemental Digest
Starters, Full Voltage—NEMA Style	
Non-Reversing Class 8536	16-18
Reversing Class 8736	16-46
TeSys U Simple Motor Starter	16-12
Vacuum, Low Voltage, Non-Reversing Class 8536	16-29
Additional Products	
Accessories Class 9998, 9999	16-108
Renewal Parts Class 9998	16-105
They mad I I laite	10 110



Thermal Units

Reversing Drum Switches Class 2601

New!) TeSys N Contactors and Starters

16-116

16-139

See Supplemental Digest









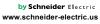








			4.9		
Class	2510, 2511, 2512	8502 & 8702	8536 & 8736	8538 & 8738	8539 & 8739
	Manual Starters and Switches, Non-Reversing, Reversing and Two Speed	NEMA Style Full Voltage Non-Reversing and Full Voltage Reversing Magnetic Contactors	NEMA Style Full Voltage Non-Reversing and Full Voltage Reversing Magnetic Starters	NEMA Style Full Voltage Non-Reversing and Full Voltage Reversing Combination (Disconnect Switch) Magnetic Starters	NEMA Style Full Voltage Non-Reversing and Full Voltage Reversing Combination (PowerPact <sup>TM</sup> Circuit Breaker) Magnetic Starters
	16-4	8502 16-14	8536 16-18	8538 16-31	8539 16-35
Page		8702 16-44	8736 16-46	8738 16-51	8739 16-53
		T		T	
	Type F = N/A	00 to 7	00 to 7	8538 = 0 to 6	8539 = 0 to 7
NEMA Sizes	Type K = N/A			8738 = 0 to 5	8739 = 0 to 6
	Type M = 0 & 1				
-	Type F = 277 V	600 Vac Max.	600 Vac Max.	600 Vac Max.	600 Vac Max.
Load Voltage	Types K & M = 600 Vac	000 vac iviax.	000 Vac Iviax.	000 Vac IVIAX.	000 vac iviax.
	19900 R & W = 000 V & 0				
Current Ratings	Type F = 16 A			8538 = 18 A to 540 A	8539 = 18 A to 810 A
(Continuous)	Types K & M = 30 A	9A to 810 A	9 A to 810 A	8738 = 18 A to 270 A	8739 = 18 A to 540 A
		l			
Horsepower	Type F = 1	1/2 to 600	1/2 to 600	8538 =1/2 to 400	8539 = 1/2 to 600
Ratings	Type K = 20			0700 1/0 to 000	0700 1/0 to 400
(Maximum)	Type M = 10			8738 = 1/2 to 200	8739 = 1/2 to 400
				T	
	Type F = Melting Alloy	N/A	Melting Alloy	Melting Alloy	Melting Alloy
Overload Relay	Type K = N/A		Bi-Metalic	Bi-Metalic	Bi-Metalic
	Type M = Melting Alloy		Solid State	Solid State	Solid State
		T		Τ	
Enclosure Types	1, Flush Mount, 3R, 4, 4X, 7 & 9 and Open	1, 3R, 4, 4X, 12/3R, 7 & 9 and Open	1, 3R, 4, 4X, 12/3R, 7 & 9 and Open	1, 4, 4X, 12/3R	1, 4, 4X, 12/3R
	UL File E42243 NLRV	UL File E78351 NLDX	UL File E78351 NLDX	UL File E152395 NKJH7	UL File E152395 NKJH7
Approvals	UR File E42243 NLRV2	CSA 60905 Class 3211-04	CSA 60905 Class 3211-04	CSA LR584 Class 3211 04	CSA LR584 Class 3211 04
	CSA File LR 25490	CE IEC 947-4-1 Sizes 00–5 Only	CE IEC 947-4-1 Sizes 00–5 Only		

















8903L & 8903S	8903	8910, 8911, 8965	8940	8941
	Combination Devices			
Multipole electrically held and nechanically held contactors available n 30 A configurations to 12 poles and 800 A configurations to 3 poles.	Type S lighting contactors electrically held and mechanically held available with disconnect switches or PowerPact™ circuit breakers	Definite Purpose non- reversing contactors available as compact 1 or 2 pole to 40 A and 2 to 4 pole to 90 A. Reversing and Starter Configurations also available.	Well-Guard Control™ Pumping Plant Panels available with disconnect switches or PowerPact™ circuit breakers.	NEMA Style AC Duplex Motor Controllers available as a combination starter or without disconnecting means.
16-59	16-61	8910 16-70	16-75	16-78
		8911 16-74		
		8965 16-81		
N/A	N/A	N/A	1 to 7	1 to 4
	T			
600 Vac Max.	600 Vac Max.	600 Vac Max.	600 Vac Max.	600 Vac Max.
8903L to 30 A	300 A (Disconnect)	20 A to 40 A (Compact)	27 A to 810 A	27 A to 135 A
8903S to 800 A	600 A (Circuit Breaker)	20 A to 40 A (Compact)	27 A 10 610 A	27 A to 135 A
03030 to 000 A	OOO A (Olicuit Dicator)	20 A 10 30 A		
N/A	N/A	1/2 to 50	1/2 to 600	1/2 to 100
·				
				<u> </u>
N/A	N/A	Melting Alloy (8911)	Melting Alloy	Melting Alloy
			Bi-Metallic	Bi-Metallic
			Solid State	Solid State
1, 3R, 4, 4X, 12/3R and Open	1, 4,4X,12/3R	1	3R	1, 4, 4X, 12/3R and Open
UL File E78427 NRNT	UL File E16151 NRNT	UR E3190 NLDX2	UL/cUL 152395 NKJH	UL File E152395 NKJH7
CSA LR60905 Class 3231 01	cUL File E16151 NRNT	CSA LR25490 Class 3211 04		

## Fractional Horsepower Manual Starters with Melting Alloy Type Thermal Overload Relay

Table 16.1: Single-Unit Types—Class 2510—Rated 16 A — Thermal Units
Prices shown do not include thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

			NEMA 1 General Purpose Enclosure Surface Mounting		General Purpose Flush Mounting (Without Pull Box)					NEMA Type 4▲		NEMA Types 3R, 7 & 9 Hazardous Locations							
Type of Operator	No. of Poles	Features	Star	ndard	Over	sized	FI	ray ush late	Stai S	ndard nless teel n Plate	Stair St	nbo nless eel ı Plate	Wate a Dus	rtight nd ttight osure	Div. 1 & 2 Class I Groups B, C, & D & Class II Groups E, F & G Enclosure		77		Number of Thermal Units Required
			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
Basic S	Basic Starter—Class 2510																		
Togglo	1	Standard With Red Pilot Light◆	FG1 FG1P	86.00 129.00		99.00 143.00	FF1 FF1P	78.00 122.00	FS1 FS1P	83.00 129.00	 FSJ1P	149.00		_	_	_	FO1 FO1P	71.00 116.00	1
Toggle	2	Standard With Red Pilot Light◆	FG2 FG2P	99.00 143.00	FGJ2 FGJ2P	116.00 158.00	FF2 FF2P	93.00 120.00	FS2 FS2P	99.00 143.00	FSJ2P	165.00		_	_	_	FO2 FO2P	86.00 129.00	1
Key		Standard With Red Pilot Light◆	FG3 FG3P	116.00 158.00	FGJ3 FGJ3P	129.00 171.00	FF3 FF3P	107.00 149.00	FS3 FS3P	114.00 158.00	FSJ3P	179.00		_	_	_	FO3P	99.00 143.00	1
Key	2	Standard With Red Pilot Light◆	FG4 FG4P	129.00 171.00		143.00 185.00	FF4 FF4P	122.00 165.00	FS4 FS4P	129.00 171.00	FSJ4P	192.00	_	_	_	_	FO4 FO4P	114.00 158.00	1
Starter	Starter with Handle Guard/Lock-Off—Class 2510																		
Toggle	1	Standard With Red Pilot Light ◆	FG5 FG5P	99.00 143.00	FGJ5 FGJ5P	114.00 158.00	Order basic starter plus				FW1 FW1P	320.00 435.00	FR1	350.00 —	•	=	1		
		Standard With Red Pilot Light◆	FG6 FG6P	116.00 158.00		129.00 171.00				ındle guar			FW2 FW2P	336.00 449.00		363.00	•	_	1

Furnished with one 3/4" pipe tap in bottom (reversible for top feed). To obtain 3/4" pipe tap top and bottom, add suffix letter "H" to type number and add \$19.10 to price.

Table 16.2: Duplex Units—Class 2510

			NE		Ger						
Type of Operator	No. of Poles	Features	NEMA 1 General Purpose Enclosure Surface Mounting		Gray Flush Plate for Wall or Cavity Mounting		Stainless Steel Flush Plate for Wall or Cavity Mounting		Replacement Starter Class 2510		Number of Thermal Units Required
			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
One Starter in	<b>Duplex Enclos</b>	ure—Class 2510									
Toggle	2	Standard With Red Pilot Light ♦	FG02 FG02P	158.00 201.00	=	_	_	_	_	_	1
Key	2	With Red Pilot Light ◆	FG04P	201.00	_	_	_	_	_	_	1
Two Starters i	n One Enclosur	e—Class 2510									
Toggle	2 Each Str.	Standard With Red Pilot Light on Each◆	FG22 FG22P	243.00 399.00	FF22 FF22P	228.00 386.00	FS22P	399.00		_	2
Key	2 Each Str.	With Red Pilot Light on Each◆	FG44P	458.00	FF44P	441.00	FS44P	458.00	_	_	2
Starter and "A	UTO-OFF-HAN	D" SPDT Selector Switch (AC Only)—Class 2510									
Toggle	1	Standard With Red Pilot Light ◆	FG71 FG71P	221.00 264.00	FF71 FF71P	207.00 251.00	FS71P	264.00	_	_	1
loggie	2	Standard With Red Pilot Light ◆	FG72 FG72P	234.00 278.00	FF72 FF72P	221.00 264.00	FS72P	278.00	_	_	1
Key	2	With Red Pilot Light◆	FG74P	306.00	FF74P	293.00	FS74P	306.00	_	_	1
Two Speed Sta	rters (AC Only)	—Class 2512							Re	eplacement Class 25	
	1	With Mechanical Interlock: Standard With 2 Red Pilot Lights ◆ With HIGH-OFF-LOW Selector Switch: With 2 Red Pilot Lights ◆	FG11 FG11P	314.00 471.00	FF11 FF11P	300.00 458.00	 _ FS101P	_ _ 471.00	FO1T FO1PT	86.00 129.00 129.00	2
Toggle	2	With Mechanical Interlock: Standard With 2 Red Pilot Lights With HIGH-OFF-LOW Selector Switch: With 2 Red Pilot Lights With 2 Red Pilot Lights With 2 Red Pilot Lights	FG22 FG22P	342.00 500.00	FF22 FF22P	329.00 485.00	— — FS202P	500.00	FO2T FO2PT	99.00 143.00	2

For green pilot light, add the letter "G" to the catalog number (i.e. 2510FG2PG).

Table 16.3: Horsepower Ratings Type F

	Maximum Horsepower						
Volts	AC Single	DC					
	1-Pole	2-Pole	2-Pole Only				
115–230	1	1	3/4				
277	1	1	_				

Table 16.4: Approvals—2510 Type F and K

Enclos	ed	Open					
(UL Listed)	File E42243	(UL Component Recognized)	File E42243				
	CCN NLRV		CCN NLRV2				
CSA Certified File LR25490 Class 3211-05							

Table 16.5: How to Order

	To Order Specify:	Catalog Number				
•	Class Number Type Number	Class	Type			
•		2510	FG1			



Type FO2

16 NEMA/DEFINITE PURPOSE TYPE
CONTACTORS AND STARTERS

Type FG2P

For replacement starter, order open type above. For NEMA 4 with pilot light, retain pilot light mounting bracket from original device.

Table 16.6: Non-Reversing—Class 2510

			Ger	neral Purp	MA 1 ose Encl Mounting			Genera	al Purpo (Withou	se Flush N ut Pull Box	Mounting ()		Typ	EMA ne 4 ▲	Types Hazardo	NEMA 3R, 7 & 9 ▲ ous Locations v. 1 & 2		
Type of Operator	No. of Poles	Features	Stan		Standard Oversized		Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate		Watertight and Dusttight Enclosure		Class I Groups B, C & D & Class II Groups E, F, and G Enclosure		Open Type	
			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Type	\$ Price
		Standard	KG1	66.00	KGJ1	81.00	KF1	59.00	KS1	66.00	_	_	KW1	314.00	KR1	342.00	KO1	52.00
	2	With Pilot Light ♦ 115 Vac 230 Vac	KG1A KG1B	138.00 138.00	KGJ1A KGJ1B	153.00 153.00		131.00 131.00		138.00 138.00	KSJ1A KSJ1B	161.00 161.00		428.00 428.00	_	_	KO1A ■ KO1B ■	125.00 125.00
	3	Standard With Pilot Light◆	KG2	149.00	KGJ2	165.00	KF2	143.00	KS2	149.00	_	_	KW2	386.00	KR2	442.00	KO2	120.00
Towale		208-277 Vac 440-600 Vac	KG2B KG2C	221.00 221.00	KGJ2B KGJ2C	234.00 234.00	KF2B KF2C	215.00 215.00		221.00 221.00	KSJ2B KSJ2C	243.00 243.00	KW2B KW2C	500.00 500.00	_	_	KO2B ■ KO2C ■	207.00 207.00
Toggle		Standard	KG5	78.00	KGJ5	93.00	_	_	_	_	_	_	KW5	327.00	_	_	KO5	64.00
	2	With Pilot Light ♦ 115 Vac 230 Vac	KG5A KG5B	149.00 149.00	_	_	_	_	=	=		_	KW5A KW5B	440.00 440.00	_	_	KO5A■ KO5B■	120.00 120.00
		Standard With Pilot Light◆	KG6	162.00	KGJ6	176.00	_	_	_	_	_	_	KW6	396.00	_	_	KO6	147.00
	3	208-277 Vac 440-600 Vac	KG6B KG6C	233.00 233.00	_	_	_	_	_	=		_	KW6B KW6C	512.00 512.00	_	_	KO6B■ KO6C■	219.00 219.00
		Standard With Pilot Light◆	KG3	95.00	KGJ3	110.00	KF3	89.00	KS3	95.00	_	_	_	_	_		KO3	81.00
Key	2	115 Vac 230 Vac	KG3A KG3B	167.00 167.00	KGJ3A KGJ3B	179.00 179.00	KF3A KF3B	161.00 161.00	KS3A KS3B	167.00 167.00	KSJ3A KSJ3B	185.00 185.00	_	_	_	_	KO3A KO3B	153.00 153.00
Ney		Standard With Pilot Light◆	KG4	179.00	KGJ4	192.00	KF4	171.00	KS4	179.00	_	_	_	_	_	_	KO4	165.00
	3	208-277 Vac 440-600 Vac	KG4B KG4C		KGJ4B KGJ4C	264.00 264.00		243.00 243.00		251.00 251.00	KSJ4B KSJ4C	270.00 270.00		_	=	_	KO4B KO4C	234.00 234.00

Furnished with one 3/4" pipe tap in bottom (reversible for top feed). To obtain 3/4" pipe tap top and bottom, add suffix letter "H" to type number and add \$28.70 to price. When replacing starter with pilot light in NEMA 4 enclosure, retain pilot light mounting bracket from original device.

Table 16.7: Reversing—Class 2511

Type of Operator	Number of Poles	Motor Types for Which Suitable	Features (Including Mechanical Interlock)	NEMA General Purpose Surface Mo	Enclosure	With Flush Cavity Mo (Without P	unting	Replacement Switch Class 2510	
Орегасог	FUICS			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
	2	Single Ø 3-Lead Repulsion-Induction	Standard With Pilot Light: ♦ 115 Vac 230 Vac	KG11 KG11A KG11B	287.00 399.00 399.00	KF11 KF11A KF11B	270.00 386.00 386.00	KO1T KO1AT KO1BT	66.50 138.00 138.00
Toggle	3	Three Ø; Also Single Ø Capacitor, Split Ø, or 4-Lead Repulsion-Induction	230 Vac Standard With Pilot Light: ◆ 110–120 Vac 208–220 Vac 440–600 Vac	KG22 KG22A KG22B KG22C	557.00 557.00 557.00	KF22 KF22A KF22B KF22C	428.00 543.00 543.00 543.00	KO2T  KO2AT  KO2BT  KO2CT	149.00 221.00 221.00 221.00

Table 16.8: Two Speed—Class 2512

Type of Operator	Number of Poles	Motor Types for Which Suitable	Features (Including Mechanical Interlock)	NEMA General Purpose Surface Mo	Enclosure	With Flush Cavity Mo (Without Pull Bo	unting out	Replacement Switch Class 2510	
				Type	\$ Price	Туре	\$ Price	Туре	\$ Price
	2	Single Ø Two Winding (3-Lead)	Standard With 2 Pilot Lights: ♦ 115 Vac 230 Vac	KG11 KG11A KG11B	287.00 513.00 513.00	KF11 KF11A KF11B	270.00 500.00 500.00	KO1T KO1AT KO1BT	66.50 138.00 138.00
Toggle	3	Three Ø Separate Winding (Wye-Connected)	Standard With 2 Pilot Lights: ♦ 208–240 Vac 440–600 Vac	KG22 KG22B KG22C	441.00 671.00 671.00	KF22 KF22B KF22C	428.00 656.00 656.00	KO2T KO2BT KO2CT	152.00 221.00 221.00

For green pilot light, add the letter "G" to the catalog number (i.e. 2510KW2CG).

Table 16.9: **Class 2510 Horsepower Ratings** 

Class	No. of	Motor		Maxim	um Hp	DC Rating			
2510	Poles	Type AC	115 Volts	230 Volts	460 Volts	575 Volts	90 Volts	115 Volts	230 Volts
KO1 KO3	2	Single Ø	2	2	3	3	1	2	1-1/2
KO2 KO4	3	Three Ø	2	7-1/2	10	10	1	2	1-1/2
KO5	2	Single Ø	2	3	7-1/2	10	1	2	1-1/2
KO6	3	Three Ø	2	7-1/2	15	20	1	2	1-1/2

Note: Continuous current rating 30 A at 600 Vac maximum.

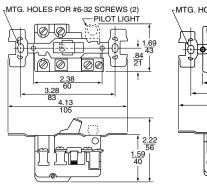
Table 16.10: How to Order

Class Number Class Type     Type Number 2510 KO2	To Order Specify:	Catalog Number					
Type Number 2510 KO2	Class Number	Class	Type				
2510 102	Type Number	2510	KO2				

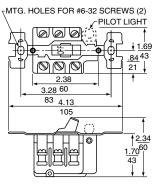
Table 16.11: Class 2511 and 2512 Horsepower Ratings Type K

	No.	Mateu Tuna	M	aximu	m Hp	DC Ratings			
Device	of Poles	Motor Type AC	115 Volts	230 Volts	460-575 Volts	90 Volts	115 Volts	230 Volts	
Class	2	Single Ø	2	2	3	1	2	1-1/2	
2511	3	Three Ø	2	7-1/2	10	1	2	1-1/2	
	2	Single Ø	2	2	3	1	2	1-1/2	
Class 2512	3	3 Ø, Constant or Variable Torque	2	7-1/2	10	1	2	1-1/2	
	3	3 Ø, Constant Horsepower	2	7-1/2	10	1	2	1-1/2	

#### **Open Type**



Types FO1, 1P, 2 Fractional Hp Starter



Types KO1, 1A, 1B, 2, 2B, 2C Types KO5, 5A, 5B, 6, 6B, 6C Motor Starting Switch

### **NEMA 4 Watertight Die Cast Zinc Enclosure**

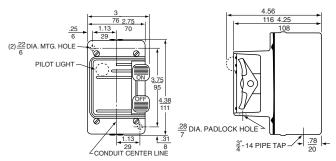


Table 16.12:

Device	Class	Туре
Fractional Hp Starter	2510	FW1, 1P, 2, 2P
Motor Starting Switch	2510	KW1, 1A, 1B, 2, 2B, 2C

### **NEMA 1 General Purpose Enclosure (Flush Mount)**

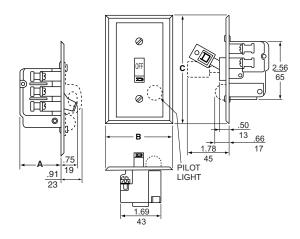
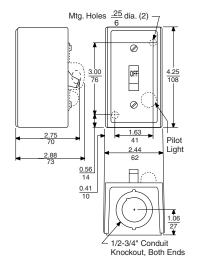


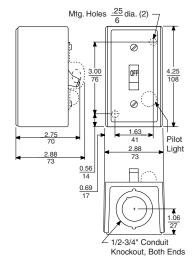
Table 16.13:

Device	Type of	Class 2510 Type	[	Dimension	5
Device	Operator	Class 2510 Type	Α	В	С
	Toggle	FF1, 1P, 2, 2P FS1, 1P, 2, 2P	1-7/16	2-3/4	4-1/2
Fractional	loggie	FSJ1P, 2P	1-7/16	3-1/2	5-1/4
Hp Starter	Key	FF3, 3P, 4, 4P FS3, 3P, 4, 4P	1-7/16	2-3/4	4-1/2
	Ney	FSJ3P, 4P	1-7/16	3-1/2	5-1/4
	Toggle	KF1, 1A, 1B, 2, 2B, 2C KS1, 1A, 1B, 2, 2B, 2C	1-3/4	2-3/4	4-1/2
Motor Starting	loggie	KSJ1A, 1B, 2B, 2C	1-3/4	3-1/2	5-1/4
Switch	Key	KF3, 3A, 3B, 4, 4B, 4C KS3, 3A, 3B, 4, 4B, 4C	1-3/4	2-3/4	4-1/2
	Ney	KSJ3A, 3B, 4B, 4C	1-3/4	3-1/2	5-1/4

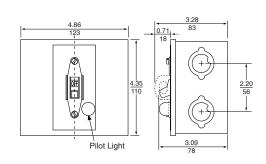
#### **NEMA 1 General Purpose Enclosure (Surface Mount)**



Standard (Class 2510 Types FG & KG, Single Unit)



Oversized (Class 2510 Types FGJ & KGJ, Single Unit)



Jumbo (Class 9991Type KE2, see page 16-11)

#### NEMA 3R, 7, and 9 Aluminum Enclosure for Hazardous Locations

**Switches** 

**Manual Starters and** 

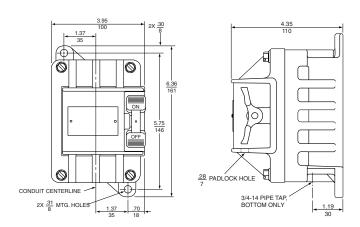


Table 16.14: NEMA 3R, 7, and 9 Aluminum Enclosure for **Hazardous Locations** 

Device	Class	Туре
Fractional Hp Starter	2510	FR1, 2
Motor Starting Switch	2510	KR1, 2

#### **Dimensions for Duplex Devices**

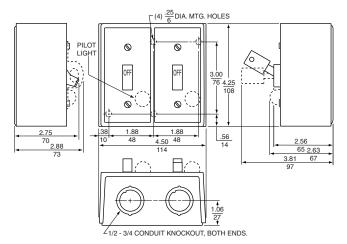
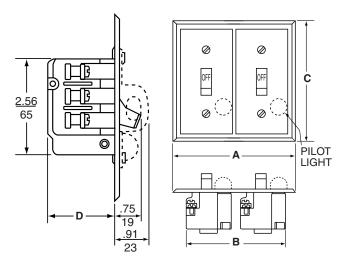


Table 16.15: NEMA 1 General Purpose Surface Mount Enclosure for Duplex Devices

Device	Type of Operator	Class	Туре
One Starter	Toggle	2510	FGO2, 02P
One Starter	Key	2510	FGO4P
Two Starters	Toggle	2510	FG22, 22P
IWO Starters	Key	2510	FG44P
One Starter and	Toggle	2510	FG71, 71P, 72, 72P
One Selector Switch▲	Key	2510	FG74P
Reversing Switch■	Toggle	2511	KG11, 11A, 11B, 22, 22A, 22B, 22C
Two Speed Starter	Toggle	2512	FG11, 11P, 22, 22P
Two Speed Switch	Toggle	2512	KG11, 11A, 11B, 22, 22B, 22C

- Selector switch is on left, increases overall depth to 3-1/2".
- Only one pilot light (located on right) is used on Class 2511 switches.



**General Purpose Flush Mounting Plate for** Table 16.16: **Duplex Devices** 

Device	Type of	Class	Time		Dimens	ions 🕈	
Device	Operator	Class	Туре	Α	В	С	D
	Toggle	2510	FF22, 22P	5-1/4	3-3/4	5-1/4	1-7/16
Two	roggie	2510	FS22P	4-9/16	3-1/2	4-1/2	1-7/16
Starters	Key	2510	FF44P	5-1/4	3-3/4	5-1/4	1-7/16
	Key	2510	FS44P	4-9/16	3-1/2	4-1/2	1-7/16
One	Togglo	2510	FF71, 71P, 72, 72P	5-1/4	3/4	5-1/4	2
Starter and One	Toggle	2510	FS71P, 72P	4-9/16	3-1/2	4-1/2	2
Selector	Key	2510	FF74P	5-1/4	3-3/4	5-1/4	2
Switch★	Key	2510	FS74P	4-9/16	3-1/2	4-1/2	2
Reversing Switch	Toggle	2511	KF11, 11A, 11B KF22, 22A KF22B, 22C	5-1/4	3-3/4	5-1/4	1-3/4
Two Speed Starter	Toggle	2512	FF11, 11P, 22, 22P	5-1/4	3-3/4	5-1/4	1-7/16
Two Speed Switch	Toggle	2512	KF11, 11A, 11B, KF22, 22B, 22C	5-1/4	3-3/4	5-1/4	1-3/4

- Dimensions include factory wired power connections
- Selector Switch is on left, extends 1-5/8" from mounting surface.

Class 2510, 2511, 2512 / Refer to Catalog 2510CT9701





Types M and T integral horsepower manual starters provide convenient "On-Off" operation of small single phase, polyphase or DC motors. Typical applications include small machine tools, pumps, fans and conveyors.

- Push button (M) or toggle (T) operators
- Reliable overload protection
- Pilot light and auxiliary contact available

#### Table 16.17: Integral Horsepower Manual Starters

Note that the prices shown do not include thermal units. Standard trip thermal units are \$21.50 each; see page 16-116 for selection information.

				N	on-Reversii	ng		Class 251	0			Ma	ax. Voltag	e: 600 Vac	:			
			Ratings		Surf	NEMA 1 ace Mounti	ing	NEMA		NEMA Water		NEMA			A 12	(	Open Type	
No. of Poles	NEMA Size	Motor Voltage	Max	. Нр	Square P.B. Operator	Toggle Operator	\$ Price	Watertig Dusttight E Brusl Stainles	nclosure ned	Dusttig Corrosion- Glass-Po Enclo	ht and Resistant olyester	For Haze Locations – Group Class Groups B	Class I s C, D II –	Dust and Dr Industr Encl	iptight ial Use	Square P.B. Operator	Toggle Operator	\$ Price
			Poly- Phase	Single Phase	Ту	ре		Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Ту	pe	
	M-0	115 230	_	1 2	MBG1	TBG1	264.00	MBW11■	720.00	MBW1■	720.00	MBR1■	1004.00	MBA1■	363.00	MBO1	TBO1	234.00
2- Pole	M-1	115 230	_	2	MCG1	TCG1	336.00	MCW11	891.00	MCW1	891.00	MCR1	1197.00	MCA1	435.00	MCO1	TCO1	306.00
	M-1P	115 230	_	3 5	MCG2	TCG2	491.00	MCW12	1089.00	MCW2	1089.00	MCR2	1382.00	MCA2	593.00	MCO2	TCO2	309.00
3-	M-0	115 200-230 380-575			MBG2	TBG2	314.00	MBW12■	770.00	MBW2■	770.00	MBR2■	1062.00	MBA2■	414.00	MBO2	TBO2	287.00
Pole	M-1	115 200-230 380-575	7-1/2 10		MCG3	TCG3	386.00	MCW13	941.00	MCW3	941.00	MCR3	1254.00	MCA3	485.00	MCO3	TCO3	356.00
DC 2-	M-0	115 230		p–D.C. hp–D.C.	MBG4	TBG4	264.00	MBW14	720.00	MBW4	720.00	_	_	MBA4	363.00	MBO4	TBO4	234.00
Pole	M-1	115 230	1-1/2 2 h	hp-D.C p-D.C.	MCG5	TCG5	336.00	MCW15	891.00	MCW5	891.00	MCR5	1188.00	MCA5	435.00	MCO5	TCO5	306.00

NEMA 7 & 9 enclosures are cast-iron. NEMA 7 & 9 enclosures (cast aluminum) are available for outdoor use; to order these type of enclosures, replace the "R" in the catalog number with a "T". For additional information, contact Schneider Electric Customer Care Center.

Approved for group motor installations per NEC 430-53(c).

#### All Except NEMA 7 & 9





File LR60905 Class 3211-05

#### NEMA 7 & 9 Only





File LR26817 Class 3218-04

Table 16.18: How to Order

	To Order Specify:	Catalog	Number
•	Class Number	Class	Type
•	Type Number	2510	MCA1

#### Reversing and Two Speed

Class 2511 reversing and Class 2512 two-speed manual starters consist of two mechanically interlocked Class 2510 Types M or T manual starters.

Table 16.19: Reversing Class 2511

Class	Description	Description	Description	Number	Number	Number	Number	Number	NEMA	Ratings		NEMA 1 Surface Mounting			Open Type		
		of Poles	Size	Motor Voltage	Maximum Hp	Square P.B. Operator	Toggle Operator	\$ Price	Square P.B. Operator	Toggle Operator	\$ Price						
	Standard	M-0 M-1					MO	200-230	3	MBG1	TBG1	984.00	MBO1	TBO1	899.00		
2511			IVI-U	380-575	5	MIDGT	IBGI	904.00	964.00	IVIBOT	1601	899.00					
2311	Stariuaru		M_1	200-230	7-1/2	MCG1	MCC1 TCC1	MCC1 TCC1	TCG1 1197.00	MCO1	TCO1	1112.00					
				IVI-I	380-575	10	WICGT	1001	1197.00	IVICOT	1001	1112.00					

Table 16.20: Two Speed (Wye-Connected Separate Winding Motors Only) Class 2512

Class	Description	Number n of Poles	Number	Number	Number		Ratings		NEMA 1 Surface Mounting			Open Type				
			NEMA Size	Motor Voltage	Constant Hp	Constant Torque or Variable Torque	Square P.B. Operator	Toggle Operator	\$ Price	Square P.B. Operator	Toggle Operator	\$ Price				
	Standard	dord 2 Polo	M-0 3-Pole	МО	200-230	2	3	MBG1	TBG1	984.00	MBO1	TBO1	899.00			
2512				2 Polo	2 Polo	2 Polo	IVI-U	380-575	3	5	MBGT	IBGI	904.00	IVIBOT	1601	099.00
2312	Stariuaru	3-1-016	M-1	200-230	5	7-1/2 MCG1 TCG1 1197.00	MCO1	TCO1	1112.00							
								IVI-I	380-575	7-1/2	10	WICGT	TOGT	1197.00	WICO1	1001

#### **Thermal Units**

Starters will not operate without properly installed thermal units and device reset. Thermal unit must be installed so that markings face the front of starter.

#### **Application Data**

Size-Available in NEMA Sizes M-0, M-1, and M-1P.

Poles-Two poles single phase; three poles polyphase; 2 poles DC

Voltage-600 volts AC max.; 250 volts DC max.

**Overload Relays**—Melting alloy thermal overload relays have provisions for one Type B thermal unit for single phase starters and three Type B thermal units for three phase starters. All thermal units must be installed and the device reset before the starter contacts will operate. After overload relays have tripped, allow one or two minutes for the alloy to solidify before resetting.

**Operator**–Available with a push button or toggle operator in open and NEMA 1 versions. NEMA 4/4X (stainless) and 12 versions utilize a direct acting push button only NEMA 4/4X (polyester) and 7/9 versions utilize an external toggle to actuate a push button device inside.

#### Maintenance of Equipment

For proper performance, all equipment should be periodically inspected and maintained. Replacement contacts and interlocks are available in kit form to facilitate servicing and stocking. In addition, the service bulletin contains an exploded view of the device with components clearly marked for easy identification by description and part number.

Mechanism Lock Off-Both open devices and starters in NEMA 1 surface and flush mounting, and NEMA 4, 4X, 7 & 9 and 12 enclosures can be locked in the OFF or STOP position. The NEMA 1 surface mounting, 4, 4X, 7 & 9 and 12 enclosures can also be locked closed to prevent unauthorized entry.

Table 16.21: Terminal information and Replacement Contact Kits

	Power Terminals		Auxilia	ry Interlock Terminals			Replacement Contact Kit	
NEMA Size	Type of Lug	Wire Size (Solid or Stranded Copper Wire) MinMax.	Type of Lug	Wire Size (Solid or Stranded Copper Wire) MinMax.	Number of Poles	Service Bulletin	Class	Туре
M-0	Pressure Wire	#14–#8	Pressure Wire	#16-#12	2 or 3	312AS	9998	ML1
M-1	Pressure Wire	#14–#8	Pressure Wire	#16-#12	2 or 3	312AS	9998	ML2
M-1P	Box Lug	#14–#6	Pressure Wire	#16-#12	2	312AS	9998	ML2

#### Accessories and Modification Kits

One auxiliary contact, either N.O. or N.C. can easily be added internally to any open or enclosed Type M or T manual starter. It occupies the space provided in either the upper right hand or left hand corners of the device. These contacts are for AC loads only. For electrical ratings, refer to page 16-110, Class 9999 Types SX11 or SX12.

A unique red **pilot light** assembly that clips into place is available **factory installed** on NEMA 1, 4, 4X, 12 and flush enclosures or as a field modification kit on the NEMA 1 surface or flush mounting enclosures. See page 16-11. The color cap assembly snaps into a knockout in the enclosure cover on the NEMA 1 enclosures. Pilot light kits are available for use on Various voltages (110-600 volts). Pilot light assemblies are not available for NEMA 7 & 9 enclosures

Class 2510, 2511, 2512 / Refer to Catalog 2510CT9701





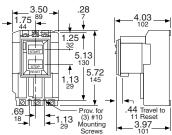
NEMA 1 General Purpose Surface Mounting



NEMA 4/4X Watertight and Dusttight Stainless Steel



NEMA 12 Dusttight and Driptight Industrial Use



Class 2510 Type M Sizes M-0, M-1 and M-1P, Open Type Approximate Shipping Weight—3 lb

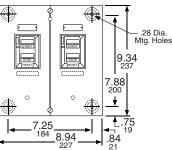
(3) .5 -.75 K.O. Top and Bottom

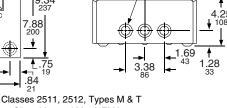


NEMA 4/4X Watertight, Dusttight and Corrosion Resistant Glass Polyester

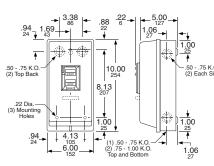


NEMA 7 & 9 Hazardous Locations Cast Iron

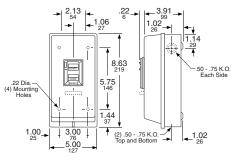




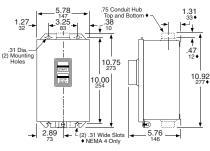
Classes 2511, 2512, Types M & T Sizes M-0 and M-1 NEMA 1 General Purpose Enclosure Approximate Shipping Weight—9 lb



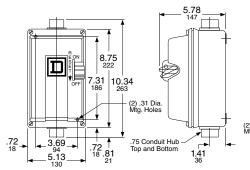
Class 2510 Type M & T Size M-1P NEMA 1 General Purpose Enclosure Approximate Shipping Weight—5 lb



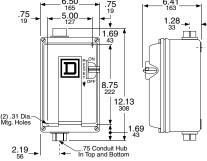
Class 2510 Types M & T Sizes M-0 and M-1 NEMA 1 General Purpose Enclosure Approximate Shipping Weight—5 lb



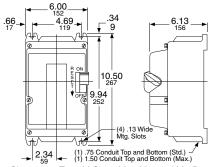
Class 2510 Type M Sizes M-0, M-1 and M-1P NEMA 4/4X Watertight Stainless Steel Enclosure NEMA 12 Dusttight Industrial Use Enclosure Approximate Shipping Weight—9 lb



Class 2510 Type M Size M-0 (AC–DC) and Size M-1 (DC) NEMA 4/4X Watertight Corrosion-Resistant Glass Polyester Enclosure Approximate Shipping Weight—6 lb



Class 2510 Type M Sizes M-1 and M-1P (AC) NEMA 4/4X Watertight Corrosion-Resistant Glass Polyester Enclosure Approximate Shipping Weight—6 lb



Class 2510 Type M Sizes M-0, M-1 and M-1P NEMA 7 & 9 Hazardous Location Cast Iron Enclosure Approximate Shipping Weight—18 lb

Class 2510, 2511, 2512 / Refer to Catalog 2510CT9701

Table 16.22: Accessories—Class 2510 Types F and K

Description	Class & Type	\$ Price
Handle Guard Kit with Padlock Provision ▲	2510FL1	14.30
Emergency Off Actuator	2510PB1	35.60
Additional Key for Key Operated Devices	2510FK1	4.80

Standard on Type K devices.

#### Table 16.23: Pilot Light Kits—Class 2510 Types F and K

	Application	Voltage	Red Pilot Light	Green Pilot Light	\$ Price	
			Class & Type	Class & Type		
Туре		110-120 Vac	9999PL11	9999PL11G	71.00	
	Type KF, KG, KW■	208-277 Vac	9999PL12	9999PL12G	71.00	
		440-600 Vac	9999PL13	9999PL13G	71.00	
	Type FF. FG. FW■	115-240 Vac/dc	9999PL10	9999PL10G	42.80	

Lens cannot be replaced. Pilot light kits for NEMA 4 Enclosed Units are for replacement purposes only.

Table 16.24: Replacement Nameplates—Class 2510 Types F and K

			Nameplate Type Number—Class 2510					
Description	Application	Nameplate	For Type K Switch		For Type F Starter (Includes "Reset" Indication)			
		Marking	Without Pilot Light	With Pilot Light	Without Pilot Light	With Pilot Light	\$ Price	
1-3/4" x 2-13/16" Nameplate with Embossed Mounting Holes for #6 Oval Head Screws	Standard commercial switch box cover or flush plate, including Square D stainless steel plates	(Blank) (Special marking – Specify marking desired.)	FN1 FN5	_	FN2 FN6	_	21.50 42.80	
1-29/32" x 3-27/32" Flat Nameplate with Mounting Holes for #6 Pan Head Screws	Square D NEMA 1 surface mounted enclosure or gray flush plate	(Blank) High Low Forward Reverse (Special marking— Specify marking desired.)	FN10 FN11 FN12 FN13 FN14	FN20 FN21 FN22 	FN30 FN31 FN32 — — FN35	FN40 FN41 FN42 —	21.50 21.50 21.50 21.50 21.50 21.50	

#### **Contact Kits**

See page 16-107 for Class 9998 Replacement Contact Kits.

Table 16.25: Modifications (Types M & T only)

Description	Factory Modif Fori		Field Modifications			
Description	Form Number	Price Addition	Kit Class & Type	\$ Price		
Red Pilot Light ♦	P11∆	116.00	9999MP1 (110-120 V) 9999MP2 (208-240 V) 9999MP3 (440-600 V)	140.00		
Auxiliary Contacts★	X1 (1 N.O.) X2 (1 N.C.)	158.00	9999SX11 (N.O.) 9999SX12 (N.C.)	99.00		
Jumper Straps ▼	N/A	_	9998SO31	14.30		
Contactor	Y76	No Charge	N/A	_		

- May only be field-added to NEMA 1 enclosures. For green pilot light, order 9999SPG1 additionally. For proper operation, only one auxiliary contact kit per device may be added.
- Used to control a single phase motor utilizing a three phase starter.

  - Used to control a single phase motor utilizing a the P11 Pilot Light Voltage Codes:
    120 V—V02
    200/208 V—V08
    230 V—V03
    460 V—V06
    575 V—V07
    The pilot light Form P11 requires a voltage code.
    Catalog number example: 2510MBG1V02P11.

Table 16.26: How to Order

To Order Specify:	Catalog Number				
Class Number	Class	Туре			
Type Number	9991	KE1			

#### Table 16.27: Replacement Parts

Description	Class and Type	\$ Price
Replacement Toggle Kits: Type FW and KW (NEMA 4) Type FR and KR (NEMA 7 & 9)	9998HW1 9998HR2	29.30 30.90
Replacement Handle Kits: NEMA 12 (Ser. B) Type MBA, MCA NEMA 4/4X (Stainless) (Ser. A & B) Type MBW, MCW NEMA 4/4X (Stainless) (Ser. C) Type MBW, MCW NEMA 4/4X (Polyester) Type MBW, MCW NEMA 7 and 9 Type MBR, MCR	9998HWA1 9998HWA1 31085-381-50 9998HWA1 9998HR3	57.00 57.00 57.00 57.00 57.00
Internal Lever	9998IL1	14.30

#### Table 16.28: Enclosures

	For use with Class 2510 Type	Enclosure	Catalog Number	\$ Price
	F and K		9991EN1	29.30
	M-Sizes M0 & M1	NEMA 1 Standard	9991MG1	57.00
	M-Size M1P		9991MG2	57.00
	FO1, FO1P, FO2, FO2P, FO3, FO3P, FO4, FO4P	NEMA 1 Oversized	9991FE1	42.80
} } }	KO1, KO1A, KO1B, KO2, KO2B, KO2C,	NEMA 1 Oversized	9991KE1	42.80
	KO2, KO2B, KO2C, KO3, KO3A, KO3B, KO4, KO4B, KO4C, KO5, KO5A, KO5B.	NEMA 1 Jumbo	9991KE2	86.00
	KO5, KO5A, KO5B, KO6, KO6B, KO6C	NEMA 3R	9991KE3	215.00

NEMA style TeSys U motor starter is integrated, simple to choose and to install, consisting of a control unit snapped in a powerbase. NEMA style TeSys U can be configured to fit specific applications as well. The NEMA style TeSys U uses the same optional accessories: reverser, current limiter, predictive maintenance options and communication options as the IEC TeSys U.

To get detailed information about TeSys U, visit our website at www.schneider-electric.us.com.



#### Selecting a NEMA TeSys U Motor Starter in Three Steps

#### Table 16.29: Step 1. Select Power Base

Control		Three Phase (HP max.)			Single Phase (HP max.)	Power Bases		
Connection	NEMA Size	200/208 V	220/240 V	460 V	575/600 V	240 V	Catalog Number	\$ Price
With screw terminations	1	7.5	7.5	10	10	3	LUB32NR	488.00

#### Table 16.30: Step 2. Select Control Unit ■

Setting Range A	Standard 3-phase Class 10 trip ▲	\$ Price	Advanced 3-phase Class 10 trip ▲	\$ Price	Advanced single-phase Class 10 trip ▲	\$ Price	Advanced 3-phase Class 20 trip ▲	\$ Price
0.15-0.6	LUCAX6●●	120.00	LUCBX6●●	150.00	LUCCX6●●	150.00	LUCDX6●●	150.00
0.3-1.4	LUCA1X●●	120.00	LUCB1X●●	150.00	LUCC1X ••	150.00	LUCD1X●●	150.00
1.25-5.0	LUCA05●●	120.00	LUCB05●●	150.00	LUCC05●●	150.00	LUCD05●●	150.00
3-12	LUCA12●●	120.00	LUCB12●●	150.00	LUCC12 ••	150.00	LUCD12●●	150.00
4.5-18	LUCA18●●	120.00	LUCB18●●	150.00	LUCC18●●	150.00	LUCD18●●	150.00
8–32	LUCA32	120.00		150.00	LUCC32●●	150.00	LUCD32●●	150.00

- Complete catalog number by adding appropriate code from voltage code table below. For example: LUCAX6FU.

  The control unit contains solid state overload relay and control power source for TeSys U. For more details on the different control units, their functions, and placement on the power base see page 18-29.

#### Table 16.31: Voltage Codes

Volts	24	48-72	110-240
DC	BL♦	_	_
AC	В	_	_
DC or AC	_	ES★	FU

- DC voltage with range of 0.90 to 1.10 of nominal.
- 48-72 Vdc: 48 Vac

#### Table 16.32: Step 3. Select Auxiliary Contacts (optional)

<b>Auxiliary Cont</b>	act Blocks									
					Contact	State for Each	Mode▼			
Terminals	Contact Indicates	Contact Normal Status	Off	Ready	Run	Short Circuit Trip	Overload Trip (Manual Reset)	Overload Trip (Remote/ Auto Reset)△	Catalog Number	\$ Price
Screw	Ready condition	N.O.	0	I	ı	0	0	I	LUA1C11	
Screw	Fault condition	N.C.	ı	_		0	0	-		34.50
Screw	Ready condition	N.O.	0	-		0	0	I	LUA1C20	34.50
Sciew	Fault condition	N.O.	0	0	0	I	1	0		
<b>Auxiliary Cont</b>	act Function Modul	es								
Screw	Power pole status	2 N.O.	_	_	_	_	_	_	LUFN20	
Screw	Power pole status	1 N.O. and 1 N.C.	_	_	_	_	_	_	LUFN11	34.50
Screw	Power pole status	2 N.C.	_	_	_	_	_	_	LUFN02	

- I-indicates closed contact; O-indicates open contact
- Requires multifunction or advanced control unit plus fault differentiation module LUFDDA10.

Accessories for LUB32/LUB32NR	Quick Description	For details & selection, see pages:
Current Limiter	Increases the breaking capacity to 130kA @ 460 V	18-30
Reverser	Stacked or side mounted (LU6MB0 ●	18-30
Line phase barrier	Required for use as a self-protected combination starter (UL508E)	18-30
Multifunction Control Unit	Has functions for monitoring and predictive maintenance	18-30
Function modules	Fault differentiation, Thermal overload, Motor load indication	18-30
Communication modules	Integrates into existing networks, major protocols available	18-31
Soft Starter + TeSys U	Use Altistart U01Soft Starter with TeSys U	18-32
Powerbus	Use TeSys U with a prewired system	18-31
Configuration and connection accessories	PowerSuite software, busbar, external handle	18-31

Complete catalog number by adding appropriate code from voltage code table below. For example: LUCAX6FU.

Accessories . . . . . pages 18-29 to 18-31



Power Base



Control Unit



**Auxiliary Contact** 



16 NEMA/DEFINITE PURPOSE CONTACTORS AND START

E164862 CCN NLDX



LR43364 Class 3211 08



#### Type S C G - 3 V02 **Class 8536**

Form S

Gener	General Classification									
8502	Contactor Page 16-14									
8536	Starter Page 16-18									
8538	Combination Starter with Disconnect Switch Page 16-31									
8539	Combination Starter with Circuit Breaker Page 16-35									
8702	Reversing Contactor Page 16-44									
8736	Reversing Starter Page 16-46									
8738	Reversing Combination Starter with Disconnect Switch Page 16-54									
8739	Reversing Combination Starter with Circuit Breaker									
8810	Two Speed Starter ▲									
8903	Type S Lighting Contactors Page 16-60 ▲									

Pumping Plant Panel 8940

8941 Duplex Controller Page 16-78 ▲

Design

Type S NEMA Contactors and Starters

_	(only)	NEMA Size		
			Size 00	A
	30 Amperes	М	Size 0	В
	60 Amperes	Р	Size 1	С
	100 Amperes	Q	Size 2	D
	200 Amperes	٧	Size 3	E
	300 Amperes	Х	Size 4	F
	400 Amperes	Υ	Size 5	G
	600 Amperes	Z	Size 6	Н
	800 Amperes	J	Size 7	J
	60 Amperes 100 Amperes 200 Amperes 300 Amperes 400 Amperes 600 Amperes	P Q V X Y	Size 0 Size 1 Size 2 Size 3 Size 4 Size 5 Size 6	B C D E F G

#### Enclosure

- Α NEMA 12 Industrial Use
- F NEMA 1 Flush Mounting General Purpose
- G NEMA 1 General Purpose Surface Mounting
- Н NEMA 3R Rainproof
- 0 Open Style Device (no enclosure)
- R NEMA 7 & 9 Hazardous Environments, Spin Top
- Т NEMA 7 & 9 Hazardous Environments, Bolted
- W NEMA 4 Watertight, 4X Corrosion Resistant

Used to designate specific, physical arrangements, such as number of poles, fuse clip size, etc.; but the numbering varies with Class of equipment. Consult Digest listings for specific device numbers.

#### Voltage Code

AC operated devices without control transformer									
Code	Voltage/Frequency								
V01	24/60								
V02	120/60 or 110/50								
V06	480/60 or 440/50								
V07	600/60 or 550/50								
V08	208/60								

V81 - 480V Primary, 120V Secondary for units using a fused transformer control circuit Form (F4T).

This is only a partial listing consult Digest pages 16-14 and 16-101 for more information.

#### Common Forms (factory modifications) Page 16-100

Α	"Start-Stop" pushbuttons in the enclosure cover
В■	Bimetallic overload relays
С	"Hand-Off-Auto" selector switch in the enclosure cover
F4T	Fused transformer control circuit (primary fuses only)
FF4T	Fused transformer control circuit (primary & secondary fuses)
Н	Solid state overload relay
P1	Red ON pilot light in the enclosure cover
P2	Green OFF pilot light in cover
S	Separate control circuit
X01	One "normally closed" auxiliary contact N.C.
X10	One "normally open" auxiliary contact N.O.

Consult Digest pages 16-100 to 16-104 for additional form letters, When more than one form is applied to a single device, arrange Forms in alphabetical order.

- Combination two speed starters will replace the "S" with a "C", "U" or "D". Pumping plant panels have Various leading characters. Not all use Type S contactors. Duplex controllers use "N", "C", "U", and "D".
- May also designate Motor Logic Plus overload relay

#### Table 16.33: How to Order

To Order Specify:	Catalog Number						
<ul><li>Class Number</li><li>Type Number</li></ul>	Class	Туре	Voltage Code	Form(s)			
<ul><li>Voltage Code</li><li>Form(s) see pages 16-100–16-104</li></ul>	8539	SCG44	V06	AH20P1X11			

Description: NEMA Size 1, (10 Hp) Electronic Motor Circuit Protector (MCP) Combo Starter in a NEMA Type 1 enclosure with a 480V coil, start/stop pushbutton (A), class 20 SSOLR (H20), red pilot light (P1), 1 N.O. and 1 N.C. auxiliary contact (X11)

IMPORTANT - This information is intended for general interpretation of catalog numbers. Do not use to create catalog numbers for this product line.

Note: The terms Type and Form do not appear in the catalog number.

Devices are wired from factory according to customer preference as follows:

- Common control
- Separate control (Form S)
- Control power transformer (CPT)

Class 8502 / Refer to Catalog 8502CT9701

by Schneider Electric

www.schneider-electric.us



Type SCO2 Size 1, 3-Pole Contactor

Class 8502 Type S magnetic contactors are used to switch heating loads, capacitors, transformers, and electric motors where overload protection is provided separately. Class 8502 contactors are available in NEMA sizes 00 through 7. Type S contactors are designed for operation at 600 Vac, 50 to 60 Hz.

Table 16.34: 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

	NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type		Open Type		NEMA 1 General Purp Enclosure	oose	NEMA 4 & Watertight, Dust Brushed Stair Steel Enclos (Size 0-5)	sttight nless sure
					Туре	\$ Price	Туре	\$ Price	Туре	\$ Price		
	00	9	200 230 460 575	1-1/2 1-1/2 2 2	SAO12■	329.00	SAG12■	360.00	Use Size 0			
	0	18	200 230 460 575	3355	SBO2■	414.00	SBG2■	446.00	SBW12■	945.00		
	1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO2■	485.00	SCG2■	518.00	SCW12■	1031.00		
•	2	45	200 230 460 575	10 15 25 25	SDO2■	882.00	SDG2■	1031.00	SDW12■	1391.00		
٠	3	90	200 230 460 575	25 30 50 50	SEO2■	1425.00	SEG2■	1715.00	SEW12■	3167.00		
	4	135	200 230 460 575	40 50 100 100	SFO2■	3419.00	SFG2■	4022.00	SFW12■	6501.00		
	5	270	200 230 460 575	75 100 200 200	SGO2■	7451.00	SGG2■	8550.00	SGW12■	11685.00		
٠	6	540	200 230 460 575	150 200 400 400	SHO2■	20339.00	SHG2■	25172.00	SHW2■	32378.00		
•	7	810	200 230 460 575	 300 600 600	SJO2■	29028.00	SJG2■	33875.00	SJW2■	40995.00		

- Size 6 and 7 are rated NEMA 4 only, painted sheet steel
- Coil voltage code must be specified to order this product. Refer to standard voltage codes shown below.

Table 16.35: Coil Voltage Codes

Vol	age	Code	\$ Price Adder		
60 Hz	50 Hz	Code			
24 ♦ 120 ★ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60		

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8502SBO2V01S).

  120 Volt Polyphase contactors are wired for separate control Form S must be specified (i.e., order as 8502SCO2V02S).

  For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

..... page 16-24 Factory Modifications (Forms) page 16-100
Separate Enclosures (Class 9991) page 16-93 Replacement Parts (Class 9998). . . . . . . . . page 16-105 Type S Accessories (Class 9999) . . . . . page 16-108



#### Full Voltage Contactors— NEMA Style

Table 16.36: 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

NEMA	Continuous Current	Motor	Max.	NEMA 4 Watertight, Du Corrosion-Re Glass-Polyester	usttight, esistant		Hazardous L Class I.	EMA 7 & 9 Locations D Groups C & Groups E, F,	iv. 1 & 2 k D & G		NEMA 12 Dusttight & Industria Enclos	Driptight I Use
Size	Ratings	Voltage	Нр	Туре	\$ Price	Bolte	Туре	\$ Price	SPIN TOP™	\$ Price	Туре	\$ Price
				Турс	\$ FIICE	Cast Iron ■	Cast Aluminum★	FILE	Туре	\$ FIICE	Турс	\$ FIICE
00	9	200 230 460 575	1-1/2 1-1/2 2 2	Use Size 0		Use Size 0			Use Size 0		Use Size 0	
0	18	200 230 460 575	3 3 5 5	SBW22◆	945.00	SBT2◆	SBT42◆	2070.00	SBR2◆	2591.00	SBA2◆	617.00
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCW22◆	1031.00	SCT2◆	SCT42◆	2163.00	SCR2◆	2705.00	SCA2◆	689.00
2	45	200 230 460 575	10 15 25 25	SDW22◆	2057.00	SDT2 <b>♦</b>	SDT42◆	3482.00	SDR2♦	4350.00	SDA2♦	1344.00
3	90	200 230 460 575	25 30 50 50	SEW22◆	3959.00	_	SET42◆	5205.00	SER2∳	2007.00	SEA2∳	2084.00
4	135	200 230 460 575	40 50 100 100	SFW22◆	8123.00	_	SFT42◆	8415.00	SFR2∳	10524.00	SFA2∳	5247.00
5	270	200 230 460 575	75 100 200 200	_		_	SGT42◆	18542.00	SGR2◆	23178.00	SGA2◆	11685.00
6	540	200 230 460 575	150 200 400 400	_	_	_	_	_	_	_	SHA2∳	29016.00
7	810	200 230 460 575	300 600 600	_	_	_	_	_	_	_	SJA2∳	37719.00

- ▲ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

   Limited to one Pilot Light and a Selector Switch or Start-Stop Push Button
- Limited to one Pilot Light and a Selector Switch or Start-Stop Push Button.
   Coil voltage code must be specified to order this product. Refer to voltage codes shown on page 16-14.
- ★ NEMA 7 and 9 bolted cast aluminum are not UL listed.

#### **Auxiliary Units**

Auxiliary contacts and power poles can be added by the factory or in the field on all Type S starters and contactors. The table below shows the maximum number of auxiliary units (in addition to the holding circuit contact) that can be added to a given size starter or contactor. In addition, it is possible to add a second internal contact on NEMA Size 0, 1, and 2 contactors and starters.

#### Table 16.37:

NEMA Size	Туре	No. of Poles of Basic Contactor	Maximum Number of External Auxiliary Units (In addition to holding circuit contact)						
00	SA	2–3	4 single circuit auxiliary contacts (N.O. or N.C.) if second internal auxiliary contact is not used.						
	SB	1, 2 or 3	4 single circuit auxiliary contacts (N.O. or N.C.)						
0, 1 and 2 SC SD		1, 2 or 3	2 single circuit auxiliary contacts (N.O. or N.C.) plus 1 power pole adder (1 or 2 poles, N.O. or N.C.)						
	SD	4 or 5	2 single circuit auxiliary contacts (N.O. or N.C.)						
0.415	SE	2-5 (Size 3 and 4)	3 single circuit auxiliary contacts (N.O. or N.C.)						
3, 4 and 5	SF SG	2-3 (Size 5)	2 single circuit auxiliary contacts (N.O. or N.C.) plus 1 NEMA Size 0-1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)						
C and 7	SH	2–3	3 single circuit auxiliary contacts (N.O. or N.C.)						
o and 7	6 and 7 SJ	2-3	2 single circuit auxiliary contacts (N.O. or N.C.) plus 1 NEMA Size 0–1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)						

 Dimensions
 .page 16-24

 Factory Modifications (Forms)
 .page 16-100

 Separate Enclosures (Class 9991)
 .page 16-93

 Replacement Parts (Class 9998)
 .page 16-105

 Type S Accessories (Class 9999)
 .page 16-108

NEMA Size	Continuous Current	Motor Voltage	Max. Hp	Орег	า Туре	NEM/ General Purpos	1 se Enclosure	NEMA 4 & 4) Dusttight, Brush Enclosure	( –Watertight, ed Stainless Steel (Size 0-5)▲
	Ratings	romage	1	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
1-Pole Single P	1	115	1						I
0	18	230 115	2 2	SBO5■	329.00	SBG5■	360.00	SBW15■	860.00
1	27	230	3	SCO5■	399.00	SCG5■	432.00	SCW15■	945.00
2-Pole Single P	Ì	115	1/3						
00	9	230	1	SAO11■	287.00	SAG11■	318.00	Use Size 0	
0	18	115 230	1 2	SBO1■	372.00	SBG1■	404.00	SBW11■	903.00
1	27	115 230	2 3	SCO1■	441.00	SCG1■	476.00	SCW11■	989.00
2	45	115 230	3 7-1/2	SDO1■	827.00	SDG1■	975.00	SDW11■	1998.00
3	90	=	=	SEO1■	1310.00	SEG1■	1601.00	SEW11■	3054.00
4	135	-	_	SFO1■	3162.00	SFG1■	3765.00	SFW11■	6245.00
5	270	-	_	SGO1■	6852.00	SGG1■	7952.00	SGW11■	11087.00
6	540	_	_	SHO1■	17433.00	SHG1■	22266.00	SHW1■	29388.00
7	810	_	_	SJO1■	25452.00	SJG1■	30285.00	SJW1■	37407.00
4-Pole Polypha	ise								
0	18	200 230 460 575	3 3 5 5	SBO3■	527.00	SBG3■	561.00	SBW13■	1074.00
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO3■	599.00	SCG3■	633.00	SCW13■	1146.00
2	45	200 230 460 575	10 15 25 25	SDO3■	1139.00	SDG3■	1287.00	SDW13■	2712.00
3	90	200 230 460 575	25 30 50 50	SEO3■	1823.00	SEG3■	2114.00	SEW13■	3965.00
4	135	200 230 460 575	40 50 100 100	SFO3■	4757.00	SFG3■	5360.00	SFW13■	8864.00
5-Pole Polypha	ise								
0	18	200 230 460 575	3 3 5 5	SBO4■	684.00	SBG4■	719.00	SBW14■	1229.00
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO4■	755.00	SCG4■	788.00	SCW14■	1301.00
2	45	200 230 460 575	10 15 25 25	SDO4■	1710.00	SDG4■	1857.00	SDW14■	3281.00
3	90	200 230 460 575	25 30 50 50	SEO4■	2735.00	SEG4■	3024.00	SEW14■	4877.00

<sup>200</sup> 230 460 575

135

SFO4■

6579.00

SFG4■

7182.00

SFW14■

..... page 16-24 
 Dimensions.
 page 10-24

 Factory Modifications (Forms)
 page 16-100

 Separate Enclosures (Class 9991)
 page 16-93

 Replacement Parts (Class 9998)
 page 16-105

 Type S Accessories (Class 9999)
 page 16-108

For How to Order Information, see page 16-13.

10688.00

Size 6 and 7 are rated NEMA 4 only, painted sheet steel.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed on page 16-14.



#### Full Voltage Contactors— **NEMA Style**

www.schneider-electric.us

Table 16.39: 600 Vac Maximum—50-60 Hz

NEMA	Continuous Current	Motor	Max.	Watertight Corrosion	A 4X , Dusttight -Resistant ter Enclosure		Hazardo Class I, G	& 9, Div. 1 & 2 us Locations Groups C & D roups E, F & G			NEMA 12/3R ▲ Dusttight & Driptight Industrial Use Enclosure	
Size	Ratings	Voltage	Нр	Туре	\$ Price		Bolted Type	<b>-</b>	SPIN TOP™	\$ Price	Туре	\$ Price
. D. I. O	in also Disease			Турс	\$11100	Cast Iron ■	Cast Aluminum★	\$ Price	Туре	\$11100	Турс	\$ 1 11CC
0	ingle Phase	115	1	_	_	SBT5◆	SBT45♦	1979.00	SBR5♦	2475.00	SBA5◆	531.00
1	27	230 115	2	<u> </u>	_	SCT5♦	SCT45♦	2070.00	SCR5♦	2591.00	SCA5♦	603.00
	ingle Phase	230	3	_		00107	301407	2070.00	001107	2001.00	00/10*	000.00
00	9	115 230	1/3 1	Use S	Size 0		Use Size 0		Use S	Size 0	Use S	Size 0
0	18	115 230	1 2	SBW21♦	903.00	SBT1◆	SBT41◆	2021.00	SBR1◆	2528.00	SBA1◆	575.00
1	27	115 230	2	SCW21♦	989.00	SCT1◆	SCT41◆	2100.00	SCR1◆	2627.00	SCA1◆	647.00
2	45	115 230	3 7-1/2	SDW21♦	1998.00	SDT1◆	SDT41◆	3402.00	SDR1♦	4257.00	SDA1♦	1287.00
3	90	_	_	Cor Schneider Fl	nsult ectric CCC at	=	SET41♦	5076.00	SER1◆	6344.00	SEA1◆	1971.00
4	135	ı	ı	(1-888-7	78-2733)	_ _	SFT41◆	8139.00	SFR1◆	10175.00	SFA1◆	4991.00
5	270	ı	ı	-	_	_ _		_	SGR1♦	22350.00	SGA1♦	11087.00
6	540	ı	ı	-	_	_ _		_	-	_	SHA1◆	26112.00
7	810	_	_	_	_	_	_	_	_	_	SJA1◆	34131.00
-Pole Po	olyphase											
0	18	200 230 460 575	3 3 5 5	SBW23◆	1074.00	SBT3◆		2199.00	SBR3◆	2748.00	SBA3◆	732.00
1	27	200 230 460 575	7-1/2 7-1/2 10 19	SCW23♦	1146.00	SCT3◆		2291.00	SCR3♦	2867.00	SCA3♦	804.00
2	45	200 230 460 575	10 15 25 25	SDW23♦	2712.00	SDT3◆	Consult Schneider Electric CCC at (1-888-778-2733)	4199.00	SDR3◆	5255.00	SDA3◆	1601.00
3	90	200 230 460 575	25 30 50 50		Consult			_	SER3♦	7604.00	SEA3◆	2484.00
4	135	200 230 460 575	40 50 100 100	S	ichneider Electr at (1-888-778-2	ic CCC 2733)		_	SFR3♦	14283.00	SFA3◆	7011.00
-Pole Po	olyphase											
0	18	200 230 460 575	3 3 5 5			_	_	_	_	_	SBA4◆	890.00
1	27	200 230 460 575	7-1/2 7-1/2 10 10			_	_	-	_	_	SCA4◆	959.00
2	45	200 230 460 575	10 15 25 25	Schneider Ele	nsult ectric CCC at 78-2733)	_	_	_	_	_	SDA4◆	2169.00
3	90	200 230 460 575	25 30 50 50			_	_	_	_	_	SEA4◆	3396.00
4	135	200 230 460 575	40 50 100 100			_	_	_	_	_	SFA4◆	8837.00

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. • Limited to 1 pilot light and a selector switch or Start-Stop push button.

Coil Voltage Codes and page number reference for additional information are shown on page 16-14. For How to Order Information, see page 16-13.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown on page 16-14. NEMA 7 and 9 bolted cast aluminum are not UL listed.

TI SQUARE D



as that!



Type SCO3 Size 1, 3-Pole Starter

Bor5 Davs

Schneider Electric offers express shipping for factory modified NEMA Type 1 and Type 12/3R Enclosed Starters. When you need them fast, our Laser™ Delivery program is the answer to getting your product when you need it most. Ask for Laser™ Delivery, then select the product and the modifications you need when you place your order. It's as easy

Laser Delivery

#### **General Information**

Type S magnetic starters are used for full-voltage starting and stopping of AC squirrel cage motors. Motor overload protection is provided via melting alloy type thermal overload relays. Type S starters are available in NEMA Sizes 00 through 7, and are designed for operation at 600 Vac, 50 to 60 Hz.

#### Solid State Overload Relay Protection (Motor Logic

These ambient insensitive overload relays are available on Sizes 00 through 6 and standard on size 7. They provide phase loss, phase unbalance protection. To order, add Form **H30** (for selectable trip class 10 or 20 protection). For more information about Motor Logic, see pages 16-83 and 16-102.

#### New! Adapted Bimetal (NEMA Sizes 00-1)

The Adapted Bimetal motor starter consists of a specially designed adapter that attaches with bus bars to the NEMA Type S contactor and holds the LRD or LR3D (IEC Style) bimetal overload relay. This starter configuration can be ordered by adding Form E (adapater only) to the standard catalog number. Once the FLA of the motor has been determined, the LRD or LR3D bimetal overload can be purchased separately and installed in the field at a later date. For more information see Table 16.421.

#### New TeSys T Motor Management System (NEMA Sizes 1–6)

TeSys T is a flexible system that integrates seamlessly into your automation system through five major communication protocols. TeSys T can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. For additional information about TeSys T Motor Management System, see pages 16-84 to 16-88 and page 16-103.

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

	NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open	Туре	NEM General Enclo	Purpose	NEMA Watertight Brushed Sta Enclosure (	Dusttight inless Steel	NEM. Watertight, Corrosion Glass-Polyest	Dusttight, Resistant
					Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
	00	9	200 230 460 575	1-1/2 1-1/2 2 2	SAO12■	386.00	SAG12■	419.00	Use Size 0		Use Size 0	
v	0	18	200 230 460 575	3355	SBO2■	485.00	SBG2■	518.00	SBW12■	1017.00	SBW22■	1017.00
V	1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO3■	557.00	SCG3■	590.00	SCW13■	1103.00	SCW23■	1103.00
	2	45	200 230 460 575	10 15 25 25	SDO1■	1013.00	SDG1■	1160.00	SDW11■	2186.00	SDW21■	2186.00
	3	90	200 230 460 575	25 30 50 50	SEO1■	1638.00	SEG1■	1929.00	SEW11■	3380.00	SEW21■	4226.00
	4	135	200 230 460 575	40 50 100 100	SFO1■	3747.00	SFG1■	4350.00	SFW11■	6827.00	SFW21■	8535.00
	5	270	200 230 460 575	75 100 200 200	SGO1■	9152.00	SGG1■	10254.00	SGW11■	15795.00	_	_
	6	540	200 230 460 575	150 200 400 400	SHO2■	21756.00	SHG2■	28881.00	SHW2■	36003.00	_	_
	7	810	200 230 460 575	300 600 600	SJO2■	31256.00	SJG2■	38381.00	SJW2■	45503.00	_	_
	A C	izo 6 and 7 ard	rated NEA	AA A only n	ainted cheet	ctool					•	•

- Size 6 and 7 are rated NEMA 4 only, painted sheet steel.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

#### Full Voltage Starters— **NEMA Style**

#### Table 16.41: 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA Size	Continuous Current	Motor Voltage	Max. Hp		NEMA 7 & 9 For Hazardous Locations Div. 1 & 2 Class I⊸Groups C, D Class II⊸Groups E, F, & G				NEMA 12/3R ▲ Dusttight & Driptight Industrial Use Enclosure			
3126	Ratings	voitage	ПР		Bolted Type		SPIN TOP™		_			
				Cast Iron■	Cast Aluminum★	\$ Price	Туре	\$ Price	Туре	\$ Price		
00	9	200 230 460 575	1-1/2 1-1/2 2 2		Use Size 0		Use \$	Size 0	Use S	Size 0		
0	18	200 230 460 575	თთ 5 5	SBT2∳	SBT42◆	2150.00	SBR2♦	2690.00	SBA2♦	689.00		
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCT3◆	SCT43◆	2241.00	SCR3◆	2804.00	SCA3◆	761.00		
2	45	200 230 460 575	10 15 25 25	SDT1◆	SDT41◆	3623.00	SDR1◆	4527.00	SDA1 ◆	1472.00		
3	90	200 230 460 575	25 30 50 50	-	SET43◆	5439.00	SER3∳	6800.00	SEA1∳	2298.00		
4	135	200 230 460 575	40 50 100 100	_	SFT41♦	8778.00	SFR1♦	10971.00	SFA1∳	5574.00		
5	270	200 230 460 575	75 100 200 200	-	SGT41◆	20970.00	SGR1 ♦	26211.00	SGA1◆	13386.00		
6	540	200 230 460 575	150 200 400 400	_	_	_	_	_	SHA2◆	32727.00		
7	810	200 230 460 575	300 600 600	_	_	_	_	_	SJA2♦	42227.00		

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Limited to 1 Pilot Light and Selector Switch or Start-Stop Push-Button.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection Table 16.41 shown on page 16-18. NEMA 7 and 9 bolted cast aluminum are not UL listed.

Table 16.42: Coil Voltage Codes

Volt	age	Code	\$ Price Adder		
60 Hz	50 Hz	Code	5 Frice Adder		
24▼	_	V01	No Charge		
120△	110	V02	No Charge		
208	_	V08	No Charge		
240	220	V03	No Charge		
277	_	V04	No Charge		
480	440	V06	No Charge		
600	550	V07	No Charge		
Specify	Specify	V99	35.60		

- 24 V coils are not available on Sizes 4–7. On Sizes 00-3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8536SBO2V01S).
- 120 Volt Polyphase contactors are wired for separate control. Form S (separate control) must be specified (i.e., order as 8536SCO2V02S).

For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions		 page 16-24
Factory Modifications (F	forms)	 page 16-100
Separate Enclosures (C	lass 9991)	 page 16-93
Replacement Parts (Cla	ıss 9998)	 page 16-105
Type S Accessories (Cla	ass 9999)	 page 16-108

For How to Order Information, see page 16-13.



Schneider Electric offers Note: express shipping for factory modified NEMA Type 1 and Type 12/3R Enclosed Starters. When you need them fast, our Ĺaser™ Delivery program is the answer to getting your product when you need it most. Ask for Laser™ Delivery, then select the product and the modifications you need when you place your order. It's as easy as that!



#### 2-Pole Single Phase—600 Vac Maximum—50-60 Hz

#### Table 16.43:

Note that prices shown do not include thermal units. Devices require 1 thermal unit. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open	Туре	NEMA 1 General Purpose Enclosure		Watertight Brushed Sta	4 & 4X t, Dusttight ainless Steel osure	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure	
				Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
00	9	115 230	1/3 1	SAO11▲	386.00	SAG11▲	419.00	Use Size 0		Use Size 0	
0	18	115 230	1 2	SBO1▲	435.00	SBG1▲	468.00	SBW11▲	966.00	SBW21▲	966.00
1	27	115 230	2 3	SCO1▲	507.00	SCG1▲	539.00	SCW11▲	1052.00	SCW21▲	1052.00
1P	36	115 230	3 5	SCO2▲	662.00	SCG2▲	696.00	SCW12▲	1209.00	SCW22▲	1209.00
2	45	115 230	3 7-1/2	SDO6▲	918.00	SDG6▲	1067.00	SDW16▲	2091.00	SDW26▲	2091.00

#### 4-Pole, 2-Phase—600 Vac Maximum—50-60 Hz

#### Table 16.44:

Note that prices shown do not include thermal units. Devices require 2 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116

ioi seiec	ilon inionnai	1011.										
NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open	туре	NEN General Enclo	//A 1 Purpose osure	Watertight Brushed Sta	4 & 4X t, Dusttight ainless Steel osure	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure		
				Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
0	18	200 230 460 575	3 3 5 5	SBO3▲	629.00	SBG3▲	675.00	SBW13▲	1229.00	SBW23▲	1229.00	
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO4▲	714.00	SCG4▲	761.00	SCW14▲	1301.00	SCW24▲	1301.00	
2	45	200 230 460 575	10 15 25 25	SDO2▲	1283.00	SDG2▲	1430.00	SDW12▲	2910.00	SDW22▲	2910.00	
3	90	200 230 460 575	25 30 50 50	SEO2▲	2096.00	SEG2▲	2357.00	SEW12▲	4206.00		nsult	
4	135	200 230 460 575	40 50 100 100	SFO2▲	5142.00	SFG2▲	5715.00	SFW12▲	9221.00		lectric CCC at 778-2733)	

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed below.

#### Table 16.45: Coil Voltage Codes

Volt	tage	Code	\$ Price Adder		
60 Hz	50 Hz	Code	\$ Frice Adder		
24 ■ 120 ♦ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60		

- 24 V coils are not available on Sizes 4–7. On sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8536SBO2V01S).

  120 Volt Polyphase starters are wired for separate control. Form S (separate control) must be specified (i.e., order as 8536SC9V02S).

  For voltage codes used with control transformers, see 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

..... page 16-24 Factory Modifications (Forms) page 16-100
Separate Enclosures (Class 9991) page 16-93 Replacement Parts (Class 9998).....page 16-105 Type S Accessories (Class 9999) . . . . . page 16-108

#### 2-Pole Single Phase—600 Vac Maximum—50-60 Hz

#### Table 16.46:

Note that prices shown do not include thermal units. Devices require 1 thermal unit. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA	Continuous Current	Motor	Max.		C	NEMA 7 & 9 dous Locations, Div Class I, Groups C & I ass II, Groups E, F, &	D		Dusttight	12/3R■ & Driptight se Enclosure
Size	Ratings	Voltage	Нр		Bolted Type		SPIN TOP™			
				Cast Iron <b>♦</b>	Cast Aluminum▲	\$ Price	Type	\$ Price	Туре	\$ Price
00	9	115 230	1/3 1		Use Size 0		Use Size 0		Use Size 0	
0	18	115 230	1 2	SBT1★	SBT41	2091.00	SBR1★	2619.00	SBA1★	639.00
1	27	115 230	2 3	SCT1★	SCT41	2186.00	SCR1★	2732.00	SCA1★	710.00
1P	36	115 230	3 5	SCT2★	SCT42	2363.00	SCR2★	2952.00	SCA2★	867.00
2	45	115 230	3 7-1/2	SDT6★	SDT46	3513.00	SDR6★	4400.00	SDA6★	1380.00

NEMA 7 and 9 bolted cast aluminum are not UL listed.

#### 4-Pole 2-Phase—600 Vac Maximum—50-60 Hz

#### Table 16.47:

Note that prices shown do not include thermal units. Devices require 2 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA	Continuous Current	Motor	Max.	Coil		H Cl Cla	Dusttight 8	NEMA 12/3R ■ Dusttight & Driptight Industrial Use Enclosure																			
Size	Ratings	Voltage	Hp	Voltage		Bolted Type		SPIN TOP™																			
					Cast Iron ◆	Cast Aluminum	\$ Price	Type	\$ Price	Туре	\$ Price																
0	18	200 230 460 575	3 3 5 5	208 240 480 600	SBT3★		2348.00	SBR3★	2939.00	SBA3 <b>★</b>	846.00																
1	27	200 230 460 575	7-1/2 7-1/2 10 10	208 240 480 600	SCT4★		2433.00	SCR4★	3047.00	SCA4★	932.00																
2	45	200 230 460 575	10 15 25 25	208 240 480 600	SDT2★	Consult Schneider Electric CCC at (1-888-778-2733)	4797.00	SDR2★	6002.00	SDA2★	1742.00																
3	90	200 230 460 575	25 30 50 50	208 240 480 600	Consult Schneider	,									(1-000-770-2733)	(1-000-770-2703)	(1-888-778-2733)	(1-888-778-2733)	(1-888-778-2733)	(1-888-778-2733)	(1-888-778-2733)		_	SER2★	8679.00	SEA2★	2726.00
4	135	200 230 460 575	40 50 100 100	208 240 480 600	Electric CCC at (1-888-778-2733)					_	_	_	SFA2★	7370.00													

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. Limited to 1 Pilot Light and Selector Switch or Start-Stop Push-Button.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed on page 16-20.

Dimensions Factory Modifications (Forms) .....page 16-100 Separate Enclosures (Class 9991).....page 16-93 



#### Types SB-SD With Auxiliary Load Terminals

It is sometimes desirable to use capacitors in motor branch circuits to improve power factor. The Size 0-2 Type SB-SD starters listed below include three auxiliary terminals to allow easy connection of power factor correction capacitors. When capacitors are connected using these terminals, no adjustment to the selection of thermal units is necessary. The auxiliary terminals accept #12-16 solid or stranded wire. NEMA Size 3 & 4 starters have provisions for auxiliary connections. User must supply lugs as necessary.

The Type S starters with auxiliary load terminals may also be used to control two motors simultaneously from a single starter. However, this application is tightly restricted by Section 430-53 of the National Electrical Code. Refer to the NEC for restrictions regarding overload protection, size of controller and motor branch circuit protection.

#### Table 16.48: 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA Size	Motor Voltage	Max. Hp	Open Type	\$ Price
0	200 230 460 575	3 3 5 5	SBTO2▲	485.00
1	200 230 460 575	7-1/2 7-1/2 10 10	SCTO3▲	557.00
2	200 230 460 575	10 15 25 25	SDTO1▲	1011.00

#### Extra Capacity Single Phase Starters (Not NEMA Style) 2-Pole Single Phase—250 Vac Maximum—50-60 Hz

#### Table 16.49:

Note that prices shown do not include thermal unit. Devices require 1 thermal unit. Standard trip thermal unit is \$21.50 each. See page 16-116 for selection information.

Motor Voltage			Туре	General	MA 1 Purpose osure	Rain Sleet R Outdo	IA 3R proof, esistant, oor Use osure	NEMA 4 Watertight, Brushed S Steel End	Dusttight Stainless	NEM/ Water Corrosion Glass-Po Enclo	tight Resistant blyester	NEMA 12 Dusttight and Industria Enclos	Driptight Use
			\$ Price	Type \$ Price		Type \$ Price		Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
115 230	5 10	SDO8▲■	1304.00	-	_	SDH8▲■	1787.00	1	_	-	1	-	_
115 230	7-1/2 15	SEO6▲	1431.00	SEG6▲	1722.00	SEH6▲	2091.00	SEW16▲	3176.00	SEW26▲	3969.00	SEA6▲	2091.00

- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.
- Uses a Size 3 overload relay.
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

#### Table 16.50: Coil Voltage Codes

Volt	age	Code	\$ Price Adder
60 Hz	50 Hz	Code	5 Frice Adder
24★	_	V01	No Charge
120▼	110	V02	No Charge
208	_	V08	No Charge
240	220	V03	No Charge
277	_	V04	No Charge
480	440	V06	No Charge
600	550	V07	No Charge
Specify	Specify	V99	35.60

- 24 V coils are not available on Sizes 4-7. On Sizes 00-3, where 24 V coils 24 V Colls are not available on Sizes 4-7. On Sizes 60-5, which 24 V Care are available, **Form S** (separate control) must be specified.

  120 Volt Polyphase starters are wired for separate control and must be ordered with Form S (i.e., 8536SCO2V02S).

  For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions	page 16-24
Factory Modifications (Forms)	page 16-100
Separate Enclosures (Class 9991)	page 16-93
Replacement Parts (Class 9998)	page 16-105
Type S Accessories (Class 9999)	page 16-108

by Schneider Electric www.schneider-electric.us

#### **Application Data for Selection**

#### Table 16.51:

		Maxi H	p	Maxi H Rati	р	Continuous	Service—	Tungsten and	Resis Hea Loads	tance ting		ransformer	for Switchin Primaries a Cycles		3Ø
NEMA Size	Load Voltage	Ratii Nonplu ar Nonjo Du	ugging id gging	ar Jog Di	ging	Current Rating, (A) 600 Volt Max.	Limit Current Rating, (A)	Infrared Lamp Load, (A) 250 Volts Max.	other Infra	than ared Loads	(Worst Ca ? 20 Tim	es Peak inuous	Inrush ( (Worst Ca > 20-40 T of Cont Current	ase Peak) imes Peak tinuous	Rating for Switching Capacitors
		Single Phase	Poly- Phase	Single Phase	Poly- Phase			•	Single Phase	Poly- Phase	Single Phase	Poly- Phase	Single Phase	Poly- Phase	KVAR
00	115 200 230 380 460 575	1/2 — 1 — —	1-1/2 1-1/2 1-1/2 1-1/2 2 2			999999	11 11 11 11 11	5 5 — —	_ _ _ _ _		_ _ _ _ _		- - - - -	_ _ _ _ _	_ _ _ _
0	115 200 230 380 460 575	1 2 —	33555	1/2 — 1 — —	1-1/2 1-1/2 1-1/2 1-1/2 2 2	18 18 18 18 18	21 21 21 21 21 21 21	10 10 10 ——————————————————————————————			0.6  1.2  2.4 3.0	1.8 2.1 — 4.2 5.2	0.3  0.6  1.2 1.5	0.9 1.0 — 2.1 2.6	_ _ _ _
1	115 200 230 380 460 575	2 3 —	7-1/2 7-1/2 10 10 10	1 2 - -	33555	27 27 27 27 27 27 27	32 32 32 32 32 32 32	15 15 15 — —	3 — 6 — 12 15	5 9.1 10 16.5 20 25	1.2 — 2.4 — 4.9 6.2	3.6 4.3 — 8.5 11.0	0.6  1.2  2.5 3.1	1.8 2.1 — 4.3 5.3	_ _ _ _ _
1P	115 230	3 5	_	1-1/2 3	_	36 36	42 42	24 24	_	_	=	_	=	_	_
2	115 200 230 380 460 575	3 7-1/2 — —	10 15 25 25 25	2 5 —		45 45 45 45 45 45 45	52 52 52 52 52 52 52	30 30 30 — —	5 — 10 — 20 25	8.5 15.4 17 28 34 43	2.1 4.1 — 8.3 10.0	6.3 7.2 — 14 18	1.0 — 2.1 — 4.2 5.2	3.1 3.6 — 7.2 8.9	8 — 16 20
3	115 200 230 380 460 575		25 30 50 50 50	  -  -	15 20 30 30 30 30	90 90 90 90 90 90	104 104 104 104 104 104	60 60 60 —	10 — 20 — 40 50	17 31 34 56 68 86	4.1 8.1 — 16 20	12 14 — 28 35	2.0 4.1 8.1 10	 6.1 7.0  14 18	27  53 67
4	200 230 380 460 575	1111	40 50 75 100 100		25 30 50 60 60	135 135 135 135 135	156 156 156 156 156	120 120 — — —	— 30 — 60 75	45 52 86.7 105 130	14  27 34	20 23 — 47 59	 6.8  14 17	10 12 — 23 29	40 — 80 100
5	200 230 380 460 575		75 100 150 200 200		60 75 125 150 150	270 270 270 270 270 270	311 311 311 311 311	240 240 — — —	60 — 120 150	91 105 173 210 260	27 — 54 68	41 47 — 94 117	14  27 34	20 24 — 47 59	80 — 160 200
6△	200 230 380 460 575		150 200 300 400 400	_ _ _ _	125 150 250 300 300	540 540 540 540 540	621 621 621 621 621	480 480 — — —	120 — 240 300	182 210 342 415 515	54 — 108 135	81 94 — 188 234	27 — 54 68	41 47 — 94 117	160 — 320 400
7∆	230 460 575	— — — are taken fro	300 600 600 m NEMA St	— — — andards		810 810 810	932 932 932 932		180 360 450	315 625 775	_ _ _	  -  -	_ _ _	_ _ _	240 480 600 vailable fault

Tables and footnotes are taken from NEMA Standards

- Ratings shown are for applications requiring repeated interruptions of stalled motor current or repeated closing of high transient currents encountered in rapid motor reversal, involving more than five openings or closings per minute and more than ten in a ten-minute period, such as plug-stop, plug-reverse or jogging duty. Ratings apply to single speed and multi-speed controllers.
- Speed and multi-speed controllers.

  Per NEMA Standards paragraph ICS 2-321.20, the service-limit current represents the maximum rms current, in Amperes, which the controller may be expected to carry for protracted periods in normal service. At service-limit current ratings, temperature rises may exceed those obtained by testing the controller at its continuous current rating. The ultimate trip current of over-current (overload) relays or other motor protective devices shall not exceed the service-limit current ratings of the controller.
- shall not exceed the service-limit current ratings of the controller. FLUORESCENT LAMP LOADS—300 VOLTS AND LESS—The characteristics of fluorescent lamps are such that it is not necessary to derate Class 8502 contactors below their normal continuous current rating. Class 8903 contactors may also be used with fluorescent lamp loads. For controlling tungsten and infrared lamp loads, and resistance heating loads, Class 8903 AC lighting contactors are recommended. These contactors are specifically designed for such loads and are applied at their full rating as listed in the Class 8903 Section.
- Ratings apply to contactors which are employed to switch the load at the utilization voltage of the heat producing element with a duty which requires continuous operation of not more than five openings per minute. Class 8903 Types L and S lighting contactors are rated for resistance heating loads.

  When discharged, a capacitor has essentially zero impedance. For repetitive switching by postutions of the control of the cont
- a contactor, sufficient impedance should be connected in series to limit inrush current to not more than 6 times the contactor rated continuous current. In many installations, the impedance of connecting conductors may be sufficient for this purpose. When switching to connect additional banks, the banks already on the line may be charged and can supply additional available short-circuit current which should be considered when selecting the impedance to limit the current.

The ratings for capacitor switching above assume the following maximum available fault

- NEMA Size 00-3: 5,000 A RMS Sym.
- NEMA Size 4-5: 10,000 A RMS Sym.
- NEMA Size 6: 18,000 A RMS Sym.
- NEMA Size 7: 30,000 A RMS Sym.

Note: If available fault current is greater than these values, connect sufficient impedance in series as noted in the previous paragraph.

For NEMA Size 6 & 7, the operation rate is as follows: Continuous operation rate is 3 operations per minute maximum; Jogging or Plugging Duty operation rate is 15 operations per minute for a maximum of three minutes.

The motor ratings in Table 16.51 are NEMA standard ratings and apply only when the code letter of the motor is the same as or occurs earlier in the alphabet than is shown in the Table 16.52. Motors having code letters occurring later in the alphabet may require a larger controller. Consult Schneider Electric CCC at (1-888-778-2733).

Table 16.52:

Motor Hp Rating	Maximum Allowable Motor Code Letter
1-1/2-2 3-5 7-1/2 and above	L K H

#### **Approximate Dimensions**

#### Table 16.53: Dimensions for Class 8502 Open Type

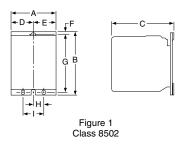
		No.			Di	mensions-	-Inches	(Refer to	Appropri	iate Figure	)		Wt
NEMA Size	Туре	of	Fig. No.	Α	В	С	D	E	F	G	Н	I	WL
		Poles		IN	IN	IN	IN	IN	IN	IN	IN	IN	(lb)
00	SAO	2–3	1	3-7/32	4-11/32	4-7/32	1-5/8	1-5/8	7/32	3-15/16	_	_	4
0	SBO	1–3	,	3-7/32	4-11/32	4-7/32	1-5/8	1-5/8	7/32	3-15/16	_	_	4
1	SCO	4–5	'	4-1/4	4-11/32	4-7/32	1-5/8	2-5/8	7/32	3-15/16	_	_	4-1/2
2	SDO	2–3		4-5/16	5-1/8	4-15/16	2-5/32	2-5/32	7/32	4-19/32	17/32	1-1/16	6-3/4
2	200	4–5	'	5-5/8	5-1/8	4-15/16	2-5/32	3-15/32	7/32	4-19/32	17/32	1-1/16	8-1/4
3	SEO	2–3	,	5-15/32	7-3/32	6-1/2	1-7/8	3-17/32	5/16	6-1/32	3-1/4	4-3/4	14
3	SEU	4–5	'	9-3/4	7-7/8	6-1/2	3-15/16	5-13/16	5/16	7	4-17/32	9-1/16	22
4	SFO	2–3		6	8-3/16	6-1/2	2-1/16	3-15/16	5/16	7	3-19/32	5-5/16	18
4	SFU	4–5	'	9-3/4	8-3/16	6-1/2	3-15/16	5-13/16	5/16	7	4-17/32	9-1/16	22
5	SGO	2–3	1	8-2/3	12-5/16	8-3/4	3-1/4	5-13/16	5/8	11-1/8	4-3/4	7-1/4	45
6	SHO	2–3	1	10-35/64	28-1/16	9	3-17/32	7-1/32	5-1/16	18-9/16	4-3/4	7-1/4	80
7	SJO	2–3	1	10-35/64	37-1/4	10-7/8	3-17/32	7-1/32	7-7/32	22-3/8	4-3/4	7-1/4	135

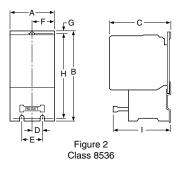
Table 16.54: Dimensions for 8536 Open Type

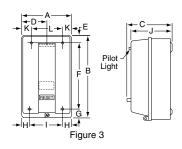
		No.			D	imensions	-Inches	(Refer to	Appropri	iate Figure)	)		Wt
NEMA Size	Туре	of	Fig. No.	Α	В	С	D	Е	F	G	Н	I	Wt
		Poles		IN	IN	IN	IN	IN	IN	IN	IN	IN	(lb)
00, 0, 1, 1P	SAO- SCO	2–3	2	3-1/2	6-49/64	4-7/32	1/2	1	1-39/64	13/64	6-1/4	3-31/32	5
0, 1	SBO- SCO	4	2	4-17/32	6-49/64	4-7/32	1/2	1	2-2/3	13/64	6-1/4	3-31/32	5-1/2
2	opo	2–3		4-5/16	7-13/16	4-15/16	1/2	1	2-5/32	13/64	7-11/32	4-1/16	7-3/4
2	SDO 4	4	2	5-5/8	7-13/16	4-15/16	1/2	1	3-15/32	13/64	7-11/32	4-1/16	9-1/4
3	SEO	2–3		5-15/32	11-3/32	6-1/2	7/8	1-3/4	3-19/32	5/16	10-3/16	5-3/4	17
3	SEU	4	2	9-3/4	12-1/8	6-1/2	1-13/16	1-3/4	5-13/16	5/16	11-3/16	5-3/4	25
	050	3		6	12-7/8	6-1/2	1-13/16	1-3/4	3-15/16	5/16	11-3/16	5-3/4	22
4	SFO	4	2	9-3/4	12-7/8	6-1/2	1-13/16	1-3/4	5-29/32	5/16	11-3/16	5-3/4	25
5	SGO	3	2	8-9/16	17-9/16	8-3/4	4-3/4	7-1/4	5-12/32	5/8	16-3/8	6	62
6	SHO	3	2	12-11/32	28-1/16	9	4-3/4	7-1/4	5-25/32	5-1/16	18-9/16	8-11/16	85
7	SJO	3	2	12-11/32	37-1/4	10-7/8	4-3/4	7-1/4	5-25/32	7-7/32	22-3/8	9	140

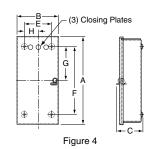
Table 16.55: Dimensions for NEMA 1 General Purpose Enclosure

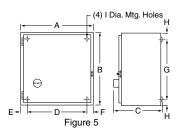
		No.	Fig.					Din	nensions	-Inch	es					
NEMA Size	Туре	of	Fig. No.	Α	В	(	;	D	Е	F	G	н			К	L
		Poles		^	Ь	8502	8536	,	_	-	G		'	J	^	_
00 0 1	SAG SBG SCG	All All All	3 3 3	6	10	5-9/32	5-9/16	3	7/8	8-1/8	1	15/16	4-1/8	5	_	_
2	SDG	All	3	7-13/16	12-11/16	6-1/32	6-5/16	_	1-3/32	10-1/2	1-3/32	1-3/32	5-5/8	5-3/4	1-3/32	5-5/8
3	SEG	All	3	11-7/16	21-13/16	8	8-3/8	_	1-17/32	18-3/4	1-17/32	1-17/32	8-3/8	7-3/4	1-17/32	8-3/8
4	SFG	All	5	11-1/4	25-5/32	9	9	8-19/32	1-1/4	1-1/4	22-5/16	1-7/16	7/16	_	_	_
5	SGG	All	5	17-7/32	44-7/32	12-13/16	12-15/16	13	2-1/8	2-1/8	40	2-1/8	9/16	_	_	
6	SHG	All	4	65-3/4	20-7/32	13-1/8	13-1/8	_	11	64-1/2	2-5/16	5-1/2	_	_	_	
7	SJG	All	4	93	34-1/2	23-1/2	23-1/2	1/2 Floor Mounting								











#### **Approximate Dimensions**

Table 16.56: NEMA 4 & 4X—Stainless Steel Watertight Enclosures▲

NEMA Size	Class	Туре	No. of					Di	mensio	ns—Inc	ches					Bot. Hub Only	Top & Bot. Hub	A		
			Poles	Α	В	С	D	E	F	G	Н	1	J	K	L	W	Х	FG C		
0 and	8502	SBW SCW	All	6-3/8	7-1/8	13-3/16	1-9/16	3-1/4	12	19/32	1-3/16	11-25/32	1-5/8	2-5/16	5/16	3/4" Dia.	1" Dia.	<b>●</b>		
1	8536	SBW	All	6-3/8	7-13/16	13-3/16	1-9/16	3-1/4	12	19/32	1-7/8	11-25/32	1-5/8	2-5/16	5/16	Hub	Hub			
2	8502	SDW	All	8-1/8	7-7/8	16-3/16	1-9/16	5	15	1-3/32	1-15/16	14-3/4	2	2-5/8	5/16	3/4" Dia.	1-1/2" Dia.			
_	8536	SDW	All	8-1/8	8-9/16	16-3/16	1-9/16	5	15	1-3/32	2-7/8	14-3/4	2	2-5/8	5/16	Hub	Hub			
3	8502	SEW SFW	All	18-5/32	8-3/4	32-7/32	3-5/64	12	30-1/2	7/8	3-11/16	26-23/32	2-9/16	3-3/16	7/16	3/4" Dia. Hub	2-1/2" Dia. Hub	LG LG		
and 4	8536	SEW SFW	All	18-5/32	9-9/16	32-7/32	3-5/64	12	30-1/2	7/8	4-1/2	26-23/32	2-9/16	3-3/16	7/16	3/4" Dia. Hub	2-1/2" Dia. Hub	(4) "L" DIA. MTG.HOLES		
5	8502 & 8536	SGW	All	17-7/32	12-5/8	47-7/32	4-1/8	9	46	5/8	4-19/32	28-5/16	3-1/8	5-3/4	9/16	3/4" Dia. Hub	3-1/2" Dia. Hub	, was		
6▲	8502 & 8536	SHW	All	20-7/32	12-1/8	65-7/32	4-1/8	12	64	5/8	4-19/32	30-13/16	2-11/16	4-1/2	9/16	3/4" Dia. Hub	(2) 3" Dia. Hub	+++-		
7▲	8502 & 8536	SJW	All	34-1/2				•		•		Floor Moun	ting	•	·	•		——  к-  NEMA 4 & 4X		
<b>A</b> S	Size 6 and	7 are s	sheet ste	el enclo	sures, a	nd are ra	are rated NEMA 4 only.											Watertight Enclosure		

Size 6 and 7 are sheet steel enclosures, and are rated NEMA 4 only.

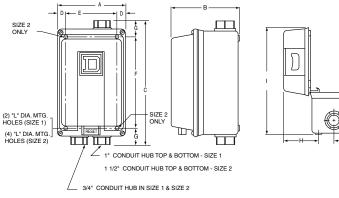
Table 16.57: NEMA 4 & 4X—Stainless Steel Watertight Enclosures with Form F4T■

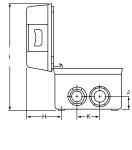
NEMA	Class	Time	No.					Dir	nension	s—Inch	es				
Size	Class	Туре	of Poles	Α	В	С	D	E	F	G	Н	I	J	K	L
	8502	SBW	All	12-5/8	7-1/8	14-11/16	2-9/16	7-1/9	13-1/2	19/32	3-3/16	18-13/16	1-21/32	2-5/16	5/16
0 and	6302	SCW	All	12-5/6	7-1/6	14-11/10	2-9/10	7-1/2	10-1/2	19/32	3-3/10	10-13/10	1-21/32	2-3/10	3/10
1	8536	SBW	All	12-5/8	7-13/16	14-11/16	2-9/16	7-1/2	13-1/2	19/32	3-7/8	18-13/32	1-21/32	2-5/16	5/16
	8550	SCW	All	12-3/0	7-13/10	14-11/10	2-3/10	7-1/2	10-1/2	19/32	3-7/0	10-13/32	1-21/32	2-3/10	3/10
2	8502	SDW	All	14-7/8	7-9/16	16-5/16	2-9/16	9-3/4	15	21/32	3-3/16	20-7/8	2	2-5/8	5/16
2	8536	SDW	All	14-7/8	8-1/4	16-5/16	2-9/16	9-3/4	15	21/32	3-7/8	20-7/8	2	2-5/8	5/16
	8502	SEW	2–3	Same as Standard NEMA 4 dimension					oiono oo	and about					
3 and	6302	SFW	2–3			36	anie as c	olariuari	J INCIVIA	4 ullilen	510115, 56	e above.			
4	8536	SEW	2–3			c,	nma aa 6	tondor	4 VIEWA	1 dimon	oiono oo	o obovo			
	8536 SFW 2–3 Same as Standard NEMA 4 dimensions, see above.														
5	8502 & 8536	SGW	All			Sa	ame as S	Standar	NEMA	4 dimen	sions, se	e above.			
6■	8502 & 8536	SHW	All												
7■	8502 & 8536	& 8536 SJW All Form F4T is supplied as standard. Refer to page 16-101.													

Size 6 and 7 are sheet steel enclosures, and are rated NEMA 4 only.

Table 16.58: NEMA 4X—Watertight & Corrosion Resistant Glass Polyester Enclosures

Size	Туре	No. of Poles				Dime	ensi	ons—Inc	hes (see	the figur	e below)				Bot. Hub Only	Top & Bot. Hub	Weight (lb)
		rules	Α	В	С	D	Е	F	G	Н	1	J	K	L	w	Х	
0, 1	SBW	All	6-1/2	6-7/16	12-1/8	3/4	5	8-3/4	1-11/16	3-11/32	10-1/16	1-5/16	2-1/8	5/16	3/4	1	17
2	SDW	All	8-1/2	7-1/16	13-7/8	3/4	7	10-1/2	1-11/16	3-29/32	11-15/16	1-5/8	2-3/8	5/16	3/4	1-1/2	22





## **Approximate Dimensions**

Table 16.59: NEMA 4X—Watertight & Corrosion Resistant Glass Polyester Enclosures

NEMA	<b>T</b>	No.		Dimensions-	-Inches (see F	igure 1)	
Size	Туре	of Poles	A	В	С	E	F
	SBW						
0-2▲	SCW	All	16-7/8	9-25/32	22-3/4	10-1/8	21-1/2
	SDW						
3-4■	SEW	All	25-13/16	11-15/16	33-1/2	18-1/2	32-1/4
3-4■	SFW	All	25-15/10	11-13/10	33-1/2	10-1/2	32-1/4

With control power transformer (Form F4T).

Note: Devices with Form F4T may use larger enclosure. Consult Schneider Electric CCC at (1-888-778-2733) for dimensions.

# Figure 1 NEMA 4X

#### NEMA 7 & 9—Bolted Cover, Cast Iron

See Figure 2 for dimensions for NEMA size 0 and 1 (weight is 59 pounds). See Figure 3 for NEMA size 2 (weight is 75 pounds).

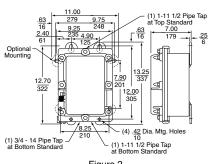


Figure 2 Size 0 and 1

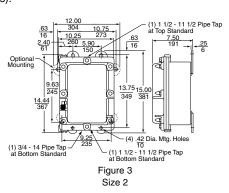
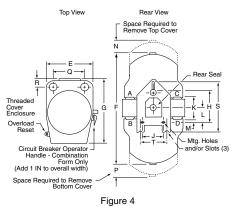


Table 16.60: NEMA 7 & 9—SPIN TOP™ Enclosure

	it Sizes B, C & D				Dimensions—Inches (See Figure 4)												Wt.
NEMA Size	Std.	Туре	E	F	G	Н	J	K	L	M	N	Р	Q	R	S	T	(lb)
0–1	1-1/4	SBR SCR	10-5/8	26	15-1/4	8	4-3/4	5-3/8	3-3/4	1-1/16	7-1/2	11	7-5/16	2-1/16	_	_	70
2	1-1/2	SDR	13-7/8	30-1/2	19-1/4	8	4-3/4	5-1/4	3-3/4	1-1/16	7	18	9-3/8	2-3/4	_	_	100
3–4	2-1/2	SER SFR	13-3/8	39-1/2	20-1/4	8	4-3/4	7-1/2	3-3/4	_	7-3/4	23	8-5/8	3	_	_	165 195
5	4	SGR	19	53-1/2	27-3/4	_	_	11-1/4	5-3/4	1/8	16	20-5/8	11-3/8	4-5/16	12	6-1/2	375



NEMA 7 & 9 SPIN TOP™ Enclosure

Dimensions also for Form F4T.

#### **Approximate Dimensions**

Table 16.61: NEMA 7 & 9—Bolted Cover, Cast Aluminum

NEMA					z	Wt.						
Size	туре	G	Н	J	K	L	N	Р	Q, R	S, T, U, V	Dia.	(lb)
0–1	SBT SCT	14-1/4	17-1/4	9-1/2	12-1/4	8-7/8	4-1/2	11	2-3/8	3-1/8	1-1/2	75
2	SDT	13-5/8	27-5/8	9-1/2	12-1/4	19-1/4	9-5/8	11	2-3/8	3-1/8	1-1/2	115
3–4	SET SFT	18-1/8	31-5/8	10	16-1/4	19-1/4	9-5/8	12-5/8	2-3/8	3-3/4	2-1/2	180
5	SGT	24-1/2	45-5/8	13-3/4	22-1/2	27-1/2	13-3/4	15-3/8	3-7/16	4	4	500

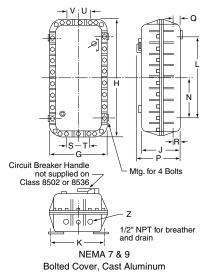


Table 16.62: NEMA 12/3R—Dusttight Enclosure

NEMA		No.				Dim	ensions	—Inches	s				Weight (lb)			
Size	Туре	of Poles	A	В	С	D	Е	F	G	н	1	J	Class 8502	Class 8536		
0	SBA	All	6-3/8	8-17/32	12-3/4	1-9/16	3-1/4	12	3/8	3-9/16	12-1/4	5/16	15	16		
1	SCA	All	0-3/6		12-3/4	1-9/10	3-1/4	12	3/0	3-9/10	12-1/4	5/16	15	16		
2	SDA	All	8-1/8	9-9/32	16	1-9/16	5	15	1/2	3-9/16	15-3/8	5/16	22	23		
3	SEA	All	18-5/32 9-9/16	31-1/2	3-5/64	12	30-1/2	1/2	4-1/2	26-23/32	7/16	65	68			
4	SFA	All	18-5/32	9-9/16	9-9/16	9-9/16	31-1/2	3-5/64	12	30-1/2	1/2	4-1/2	20-23/32	//16	69	73
5	SGA	All	17-7/32	13-7/16	47	4-1/8	9	46	1/2	5-13/32	28-5/16	9/16	160	177		
6	SHA	All	20-7/32	13	65	4-1/8	12	64	1/2	6-7/16	30-7/8	11/16	228	233		
7	SJA	All	34-1/2	23-1/2	93	Floor Mounting						·	_			

Table 16.63: NEMA 12/3R—Dusttight Enclosure With Form F4T

NEMA	Time	No. of	Dimensions—Inches										
Size	Туре	Poles	Α	В	С	D	E	F	G	Н	I	J	
0	SBA	All	11 7/0	0	10.1/0	0.10/10	0.0/4	10.0/4	3/8	0.00/00	10.0/0	5/16	
1	SCA	All	11-7/8	8	13-1/2	2-13/16	6-3/4	12-3/4	3/8	3-29/32	18-3/8	5/16	
2	SDA	All	14-7/8	8-1/8	16	2-9/16	9-3/4	15	3/8	3-21/32	21-1/2	5/16	
3	SEA	2–3			Same as Standard NEMA 12 dimensions, see above.								
4	SFA	2–3			Same	as Siailuait	JINEIVIA 12	ulliension	15, 566	above.			
5	SGA	All	Same as Standard NEMA 12 dimensions, see above.										
6	SHA	All	Form F4T is supplied as standard. Refer to page 16-101.										
7	SJA	All											

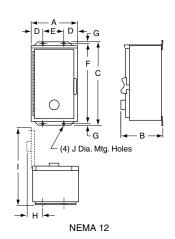


Table 16.64: NEMA 3R—Rainproof and Sleet Resistant Enclosures

		No.			Dimensions—Inches																	
Size	Туре	of Poles	A	В	С	D1	D2	E	F	G1	G2	H1	H2	J	к	L	M	N	Р	K.O. X	K.O. Y	 
0, 1	SBH SCH	All	8-27/32	12-9/32	7-1/8	1-3/8	1-7/16	6	7-1/2	2-19/32	2-3/16	2-1/16	2-5/8	14-9/32	1-3/8	1-3/8	1-7/8	4-3/8	1-27/32	1/2 3/4 1	1/2 3/4 1	+P+ +N+
2	SDH	All	9-27/32	16-9/32	8-5/8	1-3/8	1-7/16	7	11-1/2	2-19/32	2-3/16	2-1/16	2-5/8	16-25/32	1-5/16	1-3/4	2-1/8	4-7/8	1-27/32	1 1-1/4 1-1/2	1/2 3/4	
3	SEH	All	12-27/32	25-9/32	8-5/8	1-3/8	1-7/16	10	20-1/2	2-19/32	2-3/16	2-1/16	2-5/8	19-25/32	1-5/16	1-15/16	2-7/16	6-3/8	1-27/32	1 1-1/4 2 2-1/2	1/2 3/4	(3) CI
4	SFH	All	12-27/32	40-9/32	9-1/8	1-3/8	1-7/16	10	35-1/2	2-19/32	2-3/16	2-1/16	2-5/8	20-9/32	1-5/16	2-5/16	2-11/16	6-3/8	1-27/32	1 1-1/4 2 2-1/2	1/2 3/4	NEMA 3



Class 8502 Type WH

#### **General Information**

Class 8502 Type W non-reversing vacuum contactors used to switch capacitors, transformers and electric motors where overload protection is separately provided. Type W vacuum contactors are designed for operation at 600 Volts, 50/60 Hz. (See page 16-50 for Class 8702 Reversing Vacuum Contactors.)

Table 16.65: Class 8502—Full Voltage 3 Pole Vacuum Contactors

NUTRA	Enclosed	Locked			Open	Туре
NEMA Size	Ampere Rating	Rotor Current (A)	Motor Voltage	Max. Hp	Туре	\$ Price
4	135	1080	200 230 460 575	40 50 100 100	WFO3 <b>▲</b>	3965.00
5	270	2160	200 230 460 575	75 100 200 200	WGO3 <b>▲</b>	8004.00
6	540	4320	200 230 460 575	150 200 400 400	WHO3 <b>▲</b>	22383.00

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection table below.

#### Table 16.66: Class 9998—Replacement Coils for Class 8502 and 8702 Vacuum Contactors (Includes Rectifier)

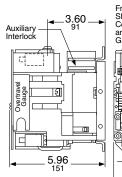
Size	Туре	Poles	Class and		Suffix I Complete Coil No and Type Follo			\$ Price
			Туре	120 V 110 V	240 V 220 V	480 V 440 V	600 V 550 V	
4 5 6	WF WG WH	3 3 3	9998WF 9998WG 9998WH	120 120 120	240 240 240	480 480 480	600 600 600	732.00 1724.00 1904.00

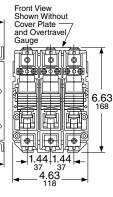
#### Table 16.67: Class 9999—Vacuum Contactor Kits

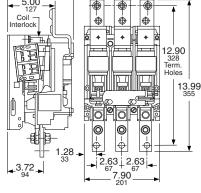
For Use	With	Kit Description	Class 9999	\$ Price
Туре	Size	Kit Description	Туре	\$ FIICE
WF-WG WH	4–5 6	Auxiliary Contacts, Non-Convertible 1-N.O. & 1-N.C. Isolated Contacts	WX11	116.00
WF WG–WH	4 5–6	Coil Circuit Auxiliary Contacts 1-N.O. & 1-N.C. Isolated Contacts, Delayed Break 1-N.C. Isolated Contact	WCX11 WLX01	153.00 476.00
WG	5	Lug Kits (6) lugs included	LUW5	261.00
WH	6	Lug Kits (6) lugs included	LUW6	270.00

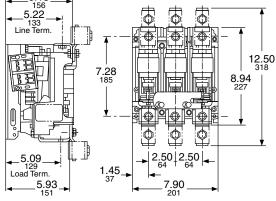
#### Table 16.68: Coil Voltage Codes

	Volts	110	120	220	240	440	480	550	600
Ī	50 Hz	V02		V03		V06		V07	
	60 Hz		V02		V03		V06		V07









Dimensions for Class 8502 Type WF Size 4

Dimensions for Class 8502 Type WH Size 6

Dimensions for Class 8502 Type WG Size 5

# Full Voltage Vacuum Contactors

#### **General Information**

The Class 8502 Type V vacuum contactor is a three-pole, 1500 V rated device which meets UL508 (1.5 kV) and CSA. Vacuum technology offers long life and low maintenance in a compact, lightweight design. The contactor is suitable for contaminated atmospheres because the main contacts are sealed in vacuum bottles. Also, since gravity is not used to assist contactor operation, the Class 8502 contactor may be mounted in any plane without special modifications. Type V vacuum contactors are designed for the control of inductive or non-inductive loads at voltages between 200 and 1500 Vac.

Table 16.69: Class 8502—Full Voltage 3 Pole Vacuum Contactors

	NEMA	Enclosed	Locked Rotor	Motor	Max.	Open Typ	е
1	Size	Ampere Rating	Current (A)	Voltage	мах. Нр	Туре	\$ Price
	4	160	1080	200 230 460 575 800 1000 1500	50 60 125 150 200 250 400	VFO3 <b>▲</b>	3965.00
-	5	320	2160	200 230 460 575 800 1000 1500	100 125 250 300 400 — 800	VGO3 <b>▲</b>	8004.00
-	6	540	4320	200 230 460 575 800 1000 1500	150 200 400 400 — — — 1300	VHO3 <b>▲</b>	22383.00

<sup>▲</sup> Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection table below.

#### Table 16.70: Class 9998—Replacement Coils for Class 8502 and 8702 (Contains Rectifier)

Size	Туре	Poles	Class and		Complete Coil No	Number umber Consists o ved by Suffix Nui		\$ Price
			Туре	120 Volts 110 Volts	240 Volts 220 Volts	480 Volts 440 Volts	600 Volts 550 Volts	
4 5 6	VF VG VH	3 3 3	9998WF 9998WG 9998WH	120 120 120	240 240 240	480 480 480	600 600 600	732.00 1724.00 1904.00

Table 16.71: Class 9999—Vacuum Starter Kits

For Use	With	Kit Description	Class 9999	\$ Price
Туре	Size	Kit Description	Туре	\$ FIICE
VF-VG VH	4–5 6	Auxiliary Contacts, Non-Convertible 1 N.O. & 1 N.C. Isolated Contacts	WX11	116.00
VF VG–VH	4 5–6	Coil Circuit Auxiliary Contacts 1 N.O. & 1 N.C. Isolated Contacts, Delayed Break 1 N.C. Isolated Contact	WCX11 WLX01	153.00 476.00
VG	5	Lug Kits (6) lugs included	LUW5	261.00
VH	6	Lug Kits (6) lugs included	LUW6	1715.00

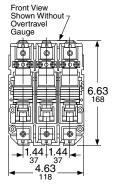
Table 16.72: Coil Voltage Codes

Volts	110	120	220	240	440	480	550	600
50 Hz	V02		V03		V06		V07	
60 Hz		V02		V03		V06		V07

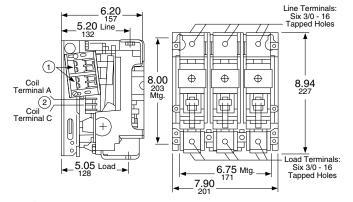


Class 8502 Type VH





Dimensions for Class 8502 Type VF Size 4

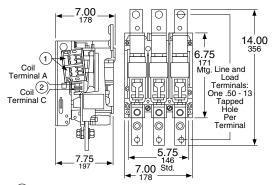


- 1 Two Dual Circuit Auxiliary Contacts can be located on both sides of contactor.
- 2 Coil Terminals B and D located on opposite side of contactor.

Dimensions for Class 8502 Type VG Size 5

For How to Order Information, see page 16-13.

CP1



- 1) Two Dual Circuit Auxiliary Contacts can be located on both sides of contactor.
- (2) Coil Terminals B and D located on opposite side of contactor.

Dimensions for Class 8502 Type VH Size 6

#### **General Information**

Class 8536 Type W non-reversing vacuum starters are used to switch electric motors where overload protection is not separately provided.

Type W vacuum starters are designed for operation at 600 Volts, 50/60 Hz. Starters are available exclusively with Motor Logic™ Feature Base Solid State Overload Relays.

Table 16.73: Class 8536—Full Voltage Vacuum Starters

NEMA	Enclosed	Locked Rotor	Motor	Max.	Open Type		
Size	Ampere Rating	Current (A)	Voltage	Нр	Туре	\$ Price	
4	135	1080	200 230 460 575	40 50 100 100	WFO3 <b>▲</b>	4433.00	
5	270	2160	200 230 460 575	75 100 200 200	WGO3 <b>▲</b>	10125.00	
6	540	4320	200 230 460 575	150 200 400 400	WHO3 <b>▲</b>	24008.00	

<sup>▲</sup> Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection table at left.

Table 16.74: Class 9998—Replacement Coils for Class 8536 Vacuum Starters

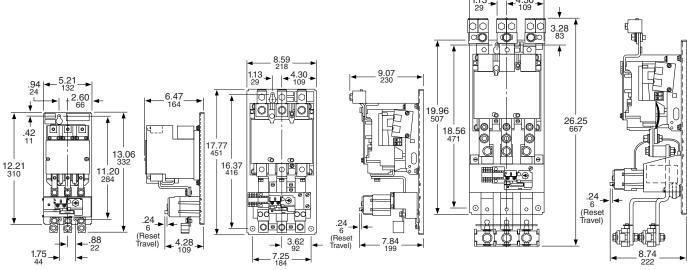
Size	Туре	Poles	Class and		Suffix I Complete Coil Nu s and Type Follow	ımber Consists o		\$ Price
		Туре		240 Volts 220 Volts	480 Volts 440 Volts	600 Volts 550 Volts		
4 5 6	WF WG WH	All All All	9998WF 9998WG 9998WH	120 120 120	240 240 240	480 480 480	600 600 600	732.00 1724.00 1904.00

Table 16.75: Class 9999—Vacuum Starter Kits

For Use	With	Kit Description	Class 9999	\$ Price
Туре	Size	Kit Description	Туре	\$ FIICE
WF-WG WH	4–5 6	Auxiliary Contacts, Non-Convertible 1 N.O. & 1 N.C. Isolated Contacts	WX11	122.00
WF WG–WH	4 5–6	Coil Circuit Auxiliary Contacts 1 N.O. & 1 N.C. Isolated Contacts, Delayed Break 1 N.C. Isolated Contact	WCX11 WLX01	114.00 503.00
WG	5	Lug Kits (6) lugs included	LUW5	275.00

Table 16.76: Coil Voltage Codes

Volts	110	120	220	240	440	480	550	600
50 Hz	V02		V03		V06		V07	
60 Hz		V02		V03		V06		V07



Dimensions for Class 8536 Type WF Size 4

Dimensions for Class 8536 Type WG Size 5

Dimensions for Class 8536 Type WH Size 6

3or5 Days

Schneider Electric offers express shipping for factory modified NEMA Combo Starters. When you need them fast, our Laser™ Delivery program is the answer to getting your product when you need it most. Ask for Laser™ Delivery, then select the product and the modifications you need when you place your order. It's as

easy as that!

#### Combination Starters— NEMA Style

#### **General Information**

Class 8538 and 8539 Type S combination starters combine the requirements of motor overload and short circuit protection into one package. These starters are manufactured in accordance with NEMA standards and are UL Listed (although some Form numbers may not be listed—contact Schneider Electric Customer Care Center for information). Class 8538 and 8539 combination starters are designed to operate at 600 Vac maximum, 50 to 60 Hz—and are supplied with melting alloy overload relays as standard.

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information. For class J fuse clip, use Form Y1072 (no charge).

Table 16.77: Fusible Full Voltage Type (Class H Fuse Clips), with Melting Alloy Overload Relays

ı	Ratings		Fuse	NEM General		Wate and Di	4 & 4X ertight usttight	NEMA Water Dusttig	tight,	Dustt	IEMA 12/3R■ ight and Dripti rial Use Enclo	
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Clip Size (A)	Enclo		Stainless	Enclosure Stainless Steel (304) (Sizes 0-5)♦		Resistant Enclosure	With External Reset	Without External Reset	\$ Price
Voltage)	phase			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Type	Туре	
	3	0	30	SBG12▲	1344.00	SBW12▲	2712.00	SBW22▲	3123.00	SBA22▲	SBA12▲	1686.00
	5		30	SCG12▲	1416.00	SCW12▲	2781.00	SCW22▲	3195.00	SCA22▲	SCA12▲	1758.00
	7-1/2	1	60	SCG13▲	1443.00	SCW13▲	2811.00	SCW23▲	3239.00	SCA23▲	SCA13▲	1785.00
000	10	2	60	SDG12▲	2228.00	SDW12▲	4334.00	SDW22▲	4778.00	SDA22▲	SDA12▲	2712.00
200 (208)	20	•	100	SEG15▲	3752.00	SEW15▲	7425.00	SEW25▲	8166.00	SEA25▲	SEA15▲	4377.00
(200)	25	3	200	SEG12▲	4064.00	SEW12▲	7739.00		_	SEA22▲	SEA12▲	4692.00
	40	4	200	SFG15▲	7199.00	SFW15▲	11898.00		_	SFA25▲	SFA15▲	8936.00
	75	5	400	SGG15▲	16122.00	SGW15▲	28112.00	_	_	SGA25▲	SGA15▲	20336.00
	150	6	600	SHG13▲	42305.00	SHW13▲	54077.00	_	_	SHA23▲	SHA13▲	47219.00
	3	0	30	SBG12▲	1344.00	SBW12▲	2712.00	SBW22▲	3123.00	SBA22▲	SBA12▲	1686.00
	5		30	SCG12▲	1416.00	SCW12▲	2781.00	SCW22▲	3195.00	SCA22▲	SCA12▲	1758.00
	7-1/2	1	60	SCG13▲	1443.00	SCW13▲	2811.00	SCW23▲	3239.00	SCA23▲	SCA13▲	1785.00
000	15	2	60	SDG12▲	2228.00	SDW12▲	4334.00	SDW22▲	4778.00	SDA22▲	SDA12▲	2712.00
230 (240)	25	25 3	100	SEG15▲	3752.00	SEW15▲	7425.00	SEW25▲	8166.00	SEA25▲	SEA15▲	4377.00
(= :=)	30	3	200	SEG12▲	4064.00	SEW12▲	7739.00	_	_	SEA22▲	SEA12▲	4692.00
	50	4	200	SFG15▲	7199.00	SFW15▲	11898.00	_	_	SFA25▲	SFA15▲	8936.00
	100	5	400	SGG15▲	16122.00	SGW15▲	28112.00	_	_	SGA25▲	SGA15▲	20336.00
	200	6	600	SHG13▲	42305.00	SHW13▲	54077.00	_	_	SHA23▲	SHA13▲	47219.00
·-	5	0	30	SBG13▲	1344.00	SBW13▲	2712.00	SBW23▲	3123.00	SBA23▲	SBA13▲	1686.00
	10	1	30	SCG14▲	1443.00	SCW14▲	2811.00	SCW24▲	3239.00	SCA24▲	SCA14▲	1785.00
	15	2	30	SDG16▲	2241.00	SDW16▲	4350.00	SDW26▲	4791.00	SDA26▲	SDA16▲	2712.00
460	25	2	60	SDG14▲	2271.00	SDW14▲	4377.00	SDW24▲	4820.00	SDA24▲	SDA14▲	2754.00
(480)	50	3	100	SEG13▲	3824.00	SEW13▲	7497.00	SEW23▲	8244.00	SEA23▲	SEA13▲	4449.00
	100	4	200	SFG13▲	7254.00	SFW13▲	11955.00		_	SFA23▲	SFA13▲	8991.00
	200	5	400	SGG13▲	16122.00	SGW13▲	28112.00	_	_	SGA23▲	SGA13▲	20336.00
	400	6	600	SHG12▲	42305.00	SHW12▲	54077.00	_	_	SHA22▲	SHA12▲	47219.00
	5	0	30	SBG13▲	1344.00	SBW13▲	2712.00	SBW23▲	3123.00	SBA23▲	SBA13▲	1686.00
	10	1	30	SCG14▲	1443.00	SCW14▲	2811.00	SCW24▲	3239.00	SCA24▲	SCA14▲	1785.00
	15	2	30	SDG16▲	2241.00	SDW16▲	4350.00	SDW26▲	4791.00	SDA26▲	SDA16▲	2712.00
575	25	_	60	SDG14▲	2271.00	SDW14▲	4377.00	SDW24▲	4820.00	SDA24▲	SDA14▲	2754.00
(600)	50	3	100	SEG13▲	3824.00	SEW13▲	7497.00	SEW23▲	8244.00	SEA23▲	SEA13▲	4449.00
	100	4	200	SFG13▲	7254.00	SFW13▲	11955.00	_	_	SFA23▲	SFA13▲	8991.00
	200	5	400	SGG13▲	16122.00	SGW13▲	28112.00	_	_	SGA23▲	SGA13▲	20336.00
	400	6	600	SHG12▲	42305.00	SHW12▲	54077.00	_	_	SHA22▲	SHA12▲	47219.00

- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown on page 16-32.
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.

Note: Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

Table 16.78: Fusible Disconnect Switch Type (Class H Fuse Clips), Single Phase v△

		0.11			NEMA 1 Fuse Clip General Purpose		noral Purpose and Duettight		ht Dusttight and		Dusttig	MA 12/3R★ ht and Driptig al Use Enclos		
Motor Voltage	Max. Hp	Coil Voltage	NEMA Size	Poles	Size (A)	Enclosi		Enclosu Stainless Ste	ıre	Corrosion Re Polyest Enclosu	er	With External Reset	Without External Reset	\$ Price
						Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре	
120	1 2 3	120	0 1 2	2	30 30 60	SBG62V02 SCG62V02 SDG62V02	1344. 1416. 2228.	SBW62V02 SCW62V02 SDW62V02	2712. 2781. 4334.	SBW65V02 SCW65V02 SDW65V02	3123. 3195. 4778.	SBA65V02 SCA65V02 SDA65V02	SBA62V02 SCA62V02 SDA62V02	1686. 1758. 2712.
240	2 3 7-1/2	240	0 1 2	2	30 30 60	SBG62V03 SCG62V03 SDG62V03	1344. 1416. 2228.	SBW62V03 SCW62V03 SDW62V03	2712. 2781. 4334.	SBW65V03 SCW65V03 SDW65V03	3123. 3195. 4778.	SBA65V03 SCA65V03 SDA65V03	SBA62V03 SCA62V03 SDA62V03	1686. 1758. 2712.

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
   Single phase units require one thermal unit and are not available with Form Hxx—Solid State Overload Relays.
- Not included in Laser™ Delivery program.

**3**or5 Davs

Refer to page 16-31 for details.

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.79: Non-Fusible Full Voltage Type, Non-Reversing, with Melting Alloy Overload Relays

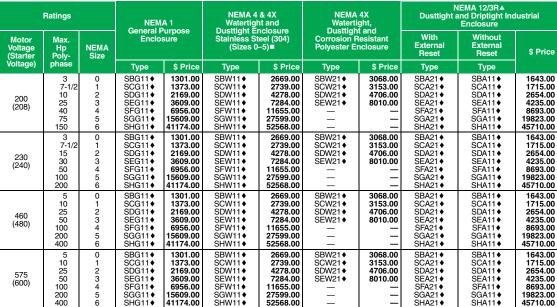




Table 16.80: Non-Fusible Disconnect Switch Type, Single Phase★▼

or ige	×	ii ige	ĕ Ā	SS	NEMA General P		NEMA 4 & 4X Watertight and Dusttight Enclosure  NEMA 4X Watertight, Dusttight and Corrosion Resistant		NEMA 12/3R▲ Dusttight and Driptight Industrial Enclosure				
Motor Voltage	Мах. Нр	Coil Voltage	NEMA Size	Poles	Enclos	ure	Stainless Sta		Polyester E		With External Reset	Without External Reset	\$ Price
					Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре	
120	1 2 3	120	0 1 2	2	SBG61V02 SCG61V02 SDG61V02	1301.00 1373.00 2169.00	SBW61V02 SCW61V02 SDW61V02	2669.00 2739.00 4278.00	SBW64V02 SCW64V02 SDW64V02	3068.00 3153.00 4706.00	SBA64V02 SCA64V02 SDA64V02	SBA61V02 SCA61V02 SDA61V02	1643.00 1715.00 2654.00
240	2 3 7-1/2	240	0 1 2	2	SBG61V03 SCG61V03 SDG61V03	1301.00 1373.00 2169.00	SBW61V03 SCW61V03 SDW61V03	2669.00 2739.00 4278.00	SBW64V03 SCW64V03 SDW64V03	3068.00 3153.00 4706.00	SBA64V03 SCA64V03 SDA64V03	SBA61V03 SCA61V03 SDA61V03	1643.00 1715.00 2654.00

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- NEMA Size 6 starters are NEMA 4 painted sheet steel enclosure.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.
- Single phase units require one thermal unit and are not available with Form Hxx—Solid State Overload Relays
- Not included in Laser™ Delivery program.

Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

#### Table 16.81: Coil Voltage Codes

	-		
Volt	age	Code	\$ Price Adder
60 Hz	50 Hz		***************************************
24□△ 120□ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified(i.e., order as 8538SBG11V01S).
- These voltage codes must include Form S (supplied at no charge) When specifying Form S, please supply motor voltage when ordering (i.e., order as 8538SCG11V02S).

For voltage codes used with control transformers, see page 16-101 Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

SHA42■

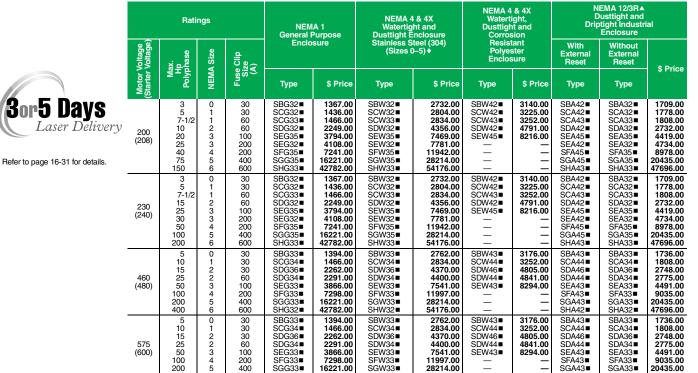
SHA32■

47696.00

#### 3-Pole Polyphase - 600 Vac Maximum - 50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Table 16.82: Fusible (with Class R Fuse Clips) Full Voltage Type, Non-Reversing, with Melting Alloy Overload Relays—(100,000 AIC Rated)



▲ NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information

54176.00

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below
 NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.

42782.00

ote: Some control transformers may require the use of oversized enclosures. Refer to the control transformer selection table on page 16-41.

SHW32■

#### Table 16.83: Fusible Disconnect Switch Type (Class R Fuses), Single Phase⋆▼

tor age	ž a	Max. Hp Coil Oltage MA Size Poles sse Clip Size (A)					NEMA 1 NEMA 4 & 4X  S O S ← C Enclosure  NEMA 1 Watertight and Dustright  G O S ← C Enclosure  NEMA 1 Watertight  General Purpose Enclosure  Enclosure				NEMA Watertight, I	usttight	NEMA 12/3R Dusttight and Driptight Industrial Use Enclosure		
Motor Voltage	Мах. Нр	Volta	NEMA	윤	Fuse Siz (A	Enclos	sure		Enclosure Polyester Enclosure		With	Without External Reset	\$ Price		
			-			Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре		
120	1 2 3	120	0 1 2	2	30 30 60	SBG63V02 SCG63V02 SDG63V02	1367.00 1436.00 2249.00	SBW63V02 SCW63V02 SDW63V02	2732.00 2804.00 4356.00	SBW66V02 SCW66V02 SDW66V02	3140.00 3225.00 4791.00	SBA66V02 SCA66V02 SDA66V02	SBA63V02 SCA63V02 SDA63V02	1709.00 1178.00 2732.00	
240	2 3 7-1/2	240	0 1 2	2	30 30 60	SBG63V03 SCG63V03 SDG63V03	1367.00 1436.00 2249.00	SBW63V03 SCW63V03 SDW63V03	2732.00 2804.00 4356.00	SBW66V03 SCW66V03 SDW66V03	3140.00 3225.00 4791.00	SBA66V03 SCA66V03 SDA66V03	SBA63V03 SCA63V03 SDA63V03	1709.00 1178.00 2732.00	

- ★ Single phase units require one thermal unit and are not available with Form Hxx—Solid State Overload Relays.
- ▼ Not included in Laser™ Delivery program.

#### Table 16.84: Coil Voltage Codes

400

600

SHG32■

Volt	age	Code	S Price Adder	
60 Hz	50 Hz	Code	\$ Price Adder	
24□△ 120□ 208 240 277 480 600 Specify	110 220 440 550 Specify	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60	

- 24 V coils are not available on Sizes 4–7. On Sizes 00-3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8538SBG32V01S).
- These voltage codes must include Form S (supplied at no charge).
   When specifying Form S, please supply motor voltage when ordering (i.e., order as 8538SCG32V02S).

Note: For voltage codes used with control transformers, see page 16-101.
Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

For How to Order Information, see page 16-13.

16-33

CP1

#### SQUARE D by Schneider Electric www.schneider-electric.us

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

#### Full Voltage Type With Melting Alloy Overload Relays

Note that prices shown do not include thermal units. Devices require 3 thermal units, standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

#### Table 16.85:

	Ratings	s		NEMA 1 General Purp	000	NEMA 4 & 4X Watertight an Dustight	C d	Dusti	NEMA 12/3R▲ tight and Driptight trial Use Enclosure	
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Fuse Clip Size	Enclosure		Enclosure Stainless Steel (:		With External Reset	Without External Reset	\$ Price
Voltage)	phase		(A)	Туре	\$ Price	Туре	\$ Price	Туре	Туре	
Class 8538 Non-Fus		ct Switch Type	e—NEMA Size							_
200 (208)	3 7-1/2 10	0 1 2	N/A N/A N/A	SBG11S8♦ SCG11S8♦ SDG11S8♦	1656.00 1728.00 2528.00	SBW11S8♦ SCW11S8♦ SDW11S8♦	3738.00 3807.00 3564.00	SBA21S8♦ SCA21S8♦ SDA21S8♦	SBA11S8♦ SCA11S8♦ SDA11S8♦	2285.00 2327.00 2178.00
230 (240)	3 7-1/2 15	0 1 2	N/A N/A N/A	SBG11S8♦ SCG11S8♦ SDG11S8♦	1656.00 1728.00 2528.00	SBW11S8♦ SCW11S8♦ SDW11S8♦	3738.00 3807.00 3564.00	SBA21S8♦ SCA21S8♦ SDA21S8♦	SBA11S8♦ SCA11S8♦ SDA11S8♦	2285.00 2327.00 2178.00
460 (480)	5 10 25	0 1 2	N/A N/A N/A	SBG11S8♦ SCG11S8♦ SDG11S8♦	1656.00 1728.00 2528.00	SBW11S8♦ SCW11S8♦ SDW11S8♦	3738.00 3807.00 3564.00	SBA21S8♦ SCA21S8♦ SDA21S8♦	SBA11S8♦ SCA11S8♦ SDA11S8♦	2285.00 2327.00 2178.00
575 (600)	5 10 25	0 1 2	N/A N/A N/A	SBG11S8♦ SCG11S8♦ SDG11S8♦	1656.00 1728.00 2528.00	SBW11S8♦ SCW11S8♦ SDW11S8♦	3738.00 3807.00 3564.00	SBA21S8♦ SCA21S8♦ SDA21S8♦	SBA11S8♦ SCA11S8♦ SDA11S8♦	2285.00 2327.00 2178.00
Class 8538 Fusible	Disconnect Sv	vitch Type—N	EMA Size 0-2■	10						
	3	0	30	SBG12S8♦	1700.00	SBW12S8◆	3780.00	SBA22S8♦	SBA12S8♦	2327.00
200 (208)	5 7-1/2	1 1	30 60	SCG12S8♦ SCG13S8♦	1772.00 1800.00	SCW12S8 ◆ SCW13S8 ◆	3851.00 3879.00	SCA22S8♦ SCA23S8♦	SCA12S8♦ SCA13S8♦	2370.00 2399.00
	10	2	60	SDG12S8♦	2583.00	SDW12S8♦	5403.00	SDA22S8♦	SDA12S8♦	3324.00
·	3	0	30	SBG12S8♦	1700.00	SBW12S8♦	3780.00	SBA22S8♦	SBA12S8♦	2327.00
230 (240)	5 7-1/2	1 1	30 60	SCG12S8♦ SCG13S8♦	1772.00 1800.00	SCW12S8 ♦ SCW13S8 ♦	3851.00 3879.00	SCA22S8 ♦ SCA23S8 ♦	SCA12S8 ◆ SCA13S8 ◆	2370.00 2399.00
	15	2	60	SDG12S8♦	2583.00	SDW12S8♦	5403.00	SDA22S8♦	SDA12S8♦	3324.00
400	5	0	30	SBG13S8♦	1728.00	SBW13S8◆	3807.00	SBA23S8♦	SBA13S8♦	2357.00
460 (480)	10 15	1 2	30 30	SCG14S8♦ SDG16S8♦	1800.00 2597.00	SCW14S8♦ SDW16S8♦	3879.00 5418.00	SCA24S8♦ SDA26S8♦	SCA14S8♦ SDA16S8♦	2399.00 3338.00
(100)	25	2	60	SDG1658♥ SDG14S8♦	2627.00	SDW1658♥ SDW14S8♦	5445.00	SDA26S8♥ SDA24S8♦	SDA1658♥ SDA14S8♦	3366.00
	5	0	30	SBG13S8♦	1728.00	SBW13S8♦	3807.00	SBA23S8♦	SBA13S8♦	2357.00
575	10	1	30	SCG14S8♦	1800.00	SCW14S8♦	3879.00	SCA24S8♦	SCA14S8♦	2399.00
(600)	15 25	2 2	30 60	SDG16S8♦ SDG14S8♦	2597.00 2627.00	SDW16S8♦ SDW14S8♦	5418.00 5445.00	SDA26S8 ♦ SDA24S8 ♦	SDA16S8♦ SDA14S8♦	3338.00 3366.00
Class 8538 Fusible	Disconnect Sv	vitch Type witl	h Class R Fuse	Clips—NEMA Size 0	<b>–2</b> ■□					
	3	0	30	SBG32S8♦	1722.00	SBW32S8♦	3753.00	SBA42S8♦	SBA32S8♦	2348.00
200 (208)	5 7-1/2	1 1	30 60	SCG32S8♦ SCG33S8♦	1794.00 1821.00	SCW32S8 ♦ SCW33S8 ♦	3873.00 3900.00	SCA42S8♦ SCA43S8♦	SCA32S8 ◆ SCA33S8 ◆	2390.00 2420.00
	10	2	60	SDG32S8♦	2604.00	SDW32S8♦	5426.00	SDA42S8♦	SDA32S8♦	3344.00
	3	0	30	SBG32S8♦	1722.00	SBW32S8♦	3753.00	SBA42S8♦	SBA32S8♦	2348.00
230 (240)	5 7-1/2	1 1	30 60	SCG32S8♦ SCG33S8♦	1794.00 1821.00	SCW32S8 ♦ SCW33S8 ♦	3873.00 3900.00	SCA42S8♦ SCA43S8♦	SCA32S8 ◆ SCA33S8 ◆	2390.00 2420.00
	15	2	60	SDG32S8♦	2604.00	SDW32S8♦	5426.00	SDA42S8♦	SDA32S8♦	3344.00
,	5	0	30	SBG33S8♦	1751.00	SBW33S8◆	3830.00	SBA43S8♦	SBA33S8◆	2376.00
460 (480)	10 15	1	30 30	SCG34S8♦	1821.00 2619.00	SCW34S8♦ SDW36S8♦	3900.00 5439.00	SCA44S8♦	SCA34S8♦	2420.00 3360.00
(100)	15 25	2 2	30 60	SDG36S8♦ SDG34S8♦	2619.00 2646.00	SDW36S8 ♦ SDW34S8 ♦	5439.00 5468.00	SDA46S8 ♦ SDA44S8 ♦	SDA36S8 ♦ SDA34S8 ♦	3360.00
-	5	0	30	SBG33S8♦	1751.00	SBW33S8◆	3830.00	SBA43S8 ♦	SBA33S8♦	2376.00
575	10	1	30	SCG34S8♦	1821.00	SCW34S8◆	3900.00	SCA44S8♦	SCA34S8♦	2420.00
(600)	15 25	2 2	30 60	SDG36S8♦ SDG34S8♦	2619.00 2646.00	SDW36S8♦ SDW34S8♦	5439.00 5468.00	SDA46S8♦ SDA44S8♦	SDA36S8♦ SDA34S8♦	3360.00 3387.00

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. For NEMA Size 3–5 starters in oversized NEMA 1, 4 or 12 enclosures, contact factory for pricing and TAG number.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown to the right.

Some control transformers may require the use of oversized enclosures. Refer to the control transformer selection table on page 16-41.

Table 16.86: Class 8538 Fusible Disconnect Switch Type for Horizontal Mounting

	Ratir	ngs		Dustt	EMA 12/3R▲ ight and Driptight rial Use Enclosure	
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Fuse Clip Size	With External Reset	Without External Reset	\$ Price
Voltage)	phase		(A)	Туре	Туре	
200 (208)	2 7-1/2	1	30 60	SCA22S1★ SCA23S1★	SCA12S1★ SCA13S1★	1754.00 1781.00
230 (240)	2 7-1/2	1	30 60	SCA22S1★ SCA23S1★	SCA12S1★ SCA13S1★	1754.00 1781.00
460 (480)	10	1	30	SCA24S1★	SCA14S1★	1781.00
575 (600)	10	1	30	SCA24S1★	SCA14S1★	1781.00

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection Table 16.87.

Table 16.87: Coil Voltage Codes

Volt	age	Code	6 Duine Adden
60 Hz	50 Hz	Code	\$ Price Adder
24△▼ 120△ 208 240 277 480 600 Specify	110 220 440 550 Specify	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8538SBG1158V01S).
- These voltage codes must include **Form S** (supplied at no charge). When specifying **Form S**, supply motor voltage when ordering (i.e., order as 8538SCG1158V02S). Not included in Laser™ Delivery program.

Note: For voltage codes used with control transformers, see page 16-101.

#### **Electronic Motor Circuit Protector (MCP)**

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.88: Full Voltage Type, Non-Reversing, with Melting Alloy Overload Relay

		Ratings		NEM General Enclo	Purpose	NEMA 4 Watertight and Enclos Stainless St (Sizes 0-	nd Dusttight State (304) NEMIA 4 & 4X Matertight, Dustight and Corrosion Resistant Polyester Enclosure Indus		esistant Dusttight and Driptigh		iight osure	
Motor Voltage (Starter Voltage)	Hp Range Polv-	NEMA Size	Circuit Breaker (See Page 7-32 for Breaker	Туре	\$ Price	Туре	\$ Price	Type	\$ Price	With External Reset	Without External Reset	\$ Price
Motor (Starte	phase	3126	Adjustment Range)								Туре	
	1/4–3	0	HLL36030M71	SBG43♦	1814.00	SBW43♦	3182.00	\SBW53♦	3653.00	SBA53♦	SBA43♦	2156.00
	1/4–5 7-1/2	1	HLL36030M71 HLL36050M72	SCG44 ♦ SCG45 ♦	1886.00	SCW44♦ SCW45♦	3252.00	SCW54 ♦ SCW55 ♦	3738.00	SCA54♦ SCA55♦	SCA44♦ SCA45♦	2228.00
	1-1/2–5 7-1/2–10	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	2669.00	SDW42♦ SDW43♦	4778.00	SDW52♦ SDW53♦	5255.00	SDA52♦ SDA53♦	SDA42♦ SDA43♦	3153.00
	15–25	3	HLL36100M73	SEG42♦	3879.00	SEW42♦	7554.00	SEW52♦	8310.00	SEA52♦	SEA42♦	4505.00
200 (208)	30–40	4	JLL36250M75	SFG44♦	8508.00	SFW44♦	13208.00	SFW54♦	14534.00	SFA54♦	SFA44♦	10245.00
	50–60 70	5	JLL36250M75 LJL36400M36	SGG44 ♦ SGG45 ♦	19724.00	SGW44♦ SGW45♦	31716.00	_	_	SGA54♦ SGA55♦	SGA44♦ SGA45♦	22859.00
	100 125–150	6	LJL36400M36 LJL36600M42	SHG43♦ SHG45♦	42825.00	SHW43♦ SHW45♦	49946.00	_	_	SHA53♦ SHA55♦	SHA43♦ SHA45♦	46670.00
	1/4–3	0	HLL36030M71	SBG43♦	1814.00	SBW43♦	3182.00	SBW53♦	3653.00	SBA53♦	SBA43♦	2156.00
	1/4-7-1/2	1	HLL36030M71	SCG44◆	1886.00	SCW44◆	3182.00	SCW54◆	3738.00	SCA54♦	SCA44◆	2228.00
	1-1/2-7-1/2 10 15	2	HLL36030M71 HLL36050M72 HLL36100M73	SDG42♦ SDG43♦ SDG44♦	2669.00	SDW42♦ SDW43♦ SDW44♦	4778.00	SDW52 ♦ SDW53 ♦ SDW54 ♦	5255.00	SDA52♦ SDA53♦ SDA54♦	SDA42♦ SDA43♦ SDA44♦	3153.00
230	15–30	3	HLL36100M73	SEG42♦	3879.00	SEW42♦	7554.00	SEW52◆	8310.00	SEA52♦	SEA42♦	4505.00
(240)	40–50	4	JLL36250M75	SFG44♦	8508.00	SFW44♦	13208.00	SFW54♦	14534.00	SFA54♦	SFA44◆	10245.00
	60 75–100	5	JLL36250M75 LJL36400M36	SGG44♦ SGG46♦	19724.00	SGW44♦ SGW45♦	31716.00	=	_	SGA54♦ SGA55♦	SGA44♦ SGA45♦	22859.00
	125–150 200	6	LJL36600M42 PLL34080M68	SHG45♦ SHG46♦	42825.00	SHW45♦ SHW46♦	49946.00	_	_	SHA55♦ SHA56♦	SHA45♦ SHA46♦	46670.00
	250-300	7	PLL36100M69	SJA43♦	57837.00	SJW43♦	64958.00	_	_	SJA53♦	_	61682.00

- NEMA Size 6 and 7 starters are NEMA 4 painted sheet steel enclosures.

  NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

Table 16.89: Coil Voltage Codes

Volt	age	Code	\$ Price Adder
60 Hz	50 Hz	Code	\$ Frice Adder
24▼★ 120▼ 208 240 277 480 600 Specify		V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8539SBG41V01S). These voltage codes must include Form S (supplied at no charge). When specifying Form S, please supply motor voltage when ordering (i.e., order as 8539SCG41V02S). For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions . .....page 16-42 Factory Modifications (Forms). . . . . . . . . page 16-100 Replacement Parts (Class 9998) . . . . . page 16-105 





NEMA Type 1 Enclosure with 30 mm Operators

#### **Electronic Motor Circuit Protector (MCP)** 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.90: Full Voltage Type, Non-Reversing, with Melting Alloy Overload Relays

	R	atings		NEMA General Pu Enclos	ırpose	NEMA 4 Watertight and Enclosi Stainless Ste (Sizes 0-	Dusttight ure eel (304)	NEMA 4 Watertight, I and Corrosion Polyester Er	Ousttight Resistant	Dustt	IEMA 12/3R■ ight and Driptig rial Use Enclosi	ht ure
Motor Voltage (Starter	Hp Range Poly-	NEMA Size	Circuit Breaker (See Page 7-32 for Breaker	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset	Without External Reset	\$ Price
Voltage)	phase		Adjustment Range)							Type	Туре	
	1/4–5	0	HLL36030M71	SBG43♦	1814.	SBW43♦	3182.	SBW53♦	3653.	SBA53♦	SBA43♦	2156.
	1/4–10	1	HLL36030M71	SCG44♦	1886.	SCW44♦	3252.	SCW54♦	3738.	SCA54♦	SCA44♦	2228.
	5–15 20–25	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	2669.	SDW42♦ SDW43♦	4778.	SDW52♦ SDW53♦	5255.	SDA52♦ SDA53♦	SDA42♦ SDA43♦	3153.
460	20–25 30–50	3	HLL36050M72 HLL36100M73	SEG41 ♦ SEG42 ♦	3879.	SEW41♦ SEW42♦	7554.	SEW51♦ SEW52♦	8310.	SEA51♦ SEA52♦	SEA41♦ SEA42♦	4505.
(480)	60-100	4	JLL36250M75	SFG44♦	8508.	SFW44♦	13208.	SFW54♦	14534.	SFA54♦	SFA44♦	10245.
(100)	125 150–200	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	19724.	SGW44♦ SGW45♦	31716.	_	_	SGA54♦ SGA55♦	SGA44♦ SGA45♦	22859.
	250–350 400	6	LJL36600M42 PLL34080M68	SHG45♦ SHG46♦	42825.	SHW45♦ SHW46♦	49946.	_	_	SHA55♦ SHA56♦	SHA45♦ SHA46♦	46670.
	500 600	7	PLL36080M68 PLL36100M69	SJA42♦ SJA43♦	57837.	SJW42♦ SJW43♦	64958.	_	_	SJA52♦ SJA53♦	_	61682.
	1/4–5	0	HLL36030M71	SBG43♦	1814.	SBW43♦	3182.	SBW53♦	3653.	SBA53♦	SBA43♦	2156.
	1/4-10	1	HLL36030M71	SCG44♦	1886.	SCW44◆	3252.	SCW54♦	3738.	SCA54♦	SCA44♦	2228.
	5–20 25	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	2669.	SDW42♦ SDW43♦	4778.	SDW52♦ SDW53♦	5255.	SDA52♦ SDA53♦	SDA42♦ SDA43♦	3153.
575	25–30 40–50	3	HLL36050M72 HLL36100M73	SEG41 ♦ SEG42 ♦	3879.	SEW41♦ SEW42♦	7554.	SEW51♦ SEW52♦	8310.	SEA51♦ SEA52♦	SEA41♦ SEA42♦	4505.
(600)	60–100	4	JLL36250M75	SFG44♦	8508.	SFW44♦	13208.	SFW54♦	14534.	SFA54♦	SFA44♦	10245.
	125–150 200	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	19724.	SGW44♦ SGW45♦	31716.	_	_	SGA54 ♦ SGA55 ♦	SGA44♦ SGA45♦	22859.
	250 300–400	6	LJL36400M36 LJL36600M42	SHG43♦ SHG45♦	42825.	SHW43♦ SHW45♦	49946.	_	_	SHA53♦ SHA55♦	SHA43♦ SHA45♦	46670.
	500–600	7	PLL34100M69	SJG41♦	57837.	SJW41♦	64958.	_	_	SJA51♦	_	61682.

NEMA Size 6 and 7 starters are NEMA 4 painted sheet steel enclosures.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below

Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

Table 16.91: Coil Voltage Codes

Volt	age	Code	\$ Price Adder
60 Hz	50 Hz	Code	\$ Frice Adder
24▼★ 120▼ 208 240 277 480 600 Specify	110 220 440 550 Specify	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60



24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8539SBG41V01S).

These voltage codes must include Form S (supplied at no charge). When specifying Form S, please supply motor voltage when ordering (i.e., order as 8539SCG41V02S).

For voltage codes used with control transformers, see page 16-101. Form S (separate control) is used when a separate source of power is available for

the control (coil) voltage. Form S is supplied at no charge. Factory Modifications (Forms) . . . . . page 16-100 Replacement Parts (Class 9998) . . . . . page 16-105 Type S Accessories (Class 9999) . . . . . page 16-108

For How to Order Information, see page 16-13.



Refer to page 16-31 for details.

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

#### **Electronic Motor Circuit Protectors (MCP) in Oversized Enclosure** 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Table 16.92: Electronic Motor Circuit Protectors (MCP) in Oversized Enclosure, NEMA Size 0-2 ■ △ Full Voltage Type, Non-Reversing with Melting Alloy Overload Relays

		Ratings		NEMA		NEMA 4 8 Watertight and	Dusttight	Dustt	IEMA 12/3R▲ ight and Driptig rial Use Enclosu	
Motor Voltage (Starter	Hp Range Poly-	NEMA Size	Circuit Breaker (See Page 7-32 for Breaker		General Purpose Enclosure Enclosure Stainless Steel (304)		With External Reset	Without External Reset	\$ Price	
Voltage)	phase		Adjustment Range)	Туре	\$ Price	Туре	\$ Price	Туре	Туре	
	1/4-3	0	HLL36030M71	SBG43S8♦	2169.00	SBW43S8 ♦	4248.00	SBA53S8♦	SBA43S8♦	2798.00
200 (208)	1/4–5 71/2	1	HLL36030M71 HLL36050M72	SCG44S8♦ SCG45S8♦	2241.00	SCW44S8 ♦ SCW45S8 ♦	4320.00	SCA54S8 ♦ SCA55S8 ♦	SCA44S8♦ SCA45S8♦	2867.00
(200)	1-1/2-5 71/2-10	2	HLL36030M71 HLL36050M72	SDG42S8♦ SDG43S8♦	3024.00	SDW42S8♦ SDW43S8♦	5844.00	SDA52S8 ♦ SDA53S8 ♦	SDA42S8♦ SDA43S8♦	3794.00
	1/4-3	0	HLL36030M71	SBG43S8♦	2169.00	SBW43S8 ♦	4248.00	SBA53S8♦	SBA43S8♦	2798.00
230	1/4-7-1/2	1	HLL36030M71	SCG44S8♦	2241.00	SCW44S8♦	4320.00	SCA54S8♦	SCA44S8♦	3867.00
(240)	1-1/2–7-1/2 10 15	2	HLL36030M71 HLL36050M72 HLL36100M73	SDG42S8 ◆ SDG43S8 ◆ SDG44S8 ◆	3024.00	SDW42S8 ♦ SDW43S8 ♦ SDW44S8 ♦	5844.00	SDA52S8 ♦ SDA53S8 ♦ SDA54S8 ♦	SDA42S8 ♦ SDA43S8 ♦ SDA44S8 ♦	3794.00
	1/4–5	0	HLL36030M71	SBG43S8♦	2169.00	SBW43S8 ♦	4248.00	SBA53S8♦	SBA43S8♦	2798.00
460	1/4-10	1	HLL36030M71	SCG44S8♦	2241.00	SCW44S8♦	4320.00	SCA54S8♦	SCA44S8♦	2867.00
(480)	5–15 20–25	2	HLL36030M71 HLL36050M72	SDG42S8♦ SDG43S8♦	3024.00	SDW42S8♦ SDW43S8♦	5855.00	SDA52S8 ♦ SDA53S8 ♦	SDA42S8♦ SDA43S8♦	3794.00
	1/4–5	0	HLL36060M71	SBG43S8♦	2169.00	SBW43S8 ♦	4248.00	SBA53S8♦	SBA43S8♦	2798.00
575	1/4-10	1	HLL36030M71	SCG44S8♦	2241.00	SCW44S8♦	4320.00	SCA54S8♦	SCA44S8♦	3867.00
(600)	5–20 25	2	HLL36030M71 HLL36050M72	SDG42S8♦ SDG43S8♦	3024.00	SDW42S8♦ SDW43S8♦	5844.00	SDA52S8 ♦ SDA53S8 ♦	SDA42S8♦ SDA43S8♦	3794.00

- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- For NEMA Size 3-5 starters in oversized NEMA 1, 4 or 12 enclosures, contact factory for pricing and TAG number.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

Table 16.93: Coil Voltage Codes

Volt	age	Code	S Price Adder
60 Hz	50 Hz	Code	9 FIICE Addel
24▼★ 120▼ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8539SBG41S8V01S). These voltage codes must include Form S (supplied at no charge). When specifying Form S, please supply motor voltage when ordering (i.e., order as 8539SCG41S8V02S). Not included in Laser™ Delivery program.

For voltage codes used with control transformers, see page 16-101. Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions	2
Factory Modifications (Forms) page 16-100	0
Replacement Parts (Class 9998) page 16-109	5
Type S Accessories (Class 9999)page 16-10	8

by Schneider Electric

#### 3-Pole Polyphase—600 Vac Maximum—50–60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 0-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.94: Full Voltage Type, Non-Reversing, with Melting Alloy Overload Relays

					-		_	-		-			
				NEMA 1 General Purpose Enclosure				NEMA 4 & 4X Watertight, Dusttight and Corrosion Resistant Polyester Enclosure		Dusttig Inc	NEMA 12/3R ■ Dusttight and Driptight Industrial Use Enclosure		
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Circuit Bre	eaker	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset	Without External Reset	\$ Price
Voltage)	phase	0.23	Туре	Ampere Rating							Туре	Туре	
	2 3	0	HLL36015 HLL36020	15 20	SBG1 ♦ SBG3 ♦	1400.	SBW1 ♦ SBW3 ♦	2768.	SBW11♦ SBW13♦	3182.	SBA11♦ SBA13♦	SBA1 ♦ SBA3 ♦	1742.
	5 7-1/2	1	HLL36035 HLL36050	35 50	SCG5♦ SCG2♦	1472.	SCW5♦ SCW2♦	2840.	SCW15♦ SCW12♦	3267.	SCA15♦ SCA12♦	SCA5♦ SCA2♦	1814.
	10	2	HLL36060	60	SDG1♦	2255.	SDW1♦	4364.	SDW11♦	4805.	SDA11♦	SDA1♦	2739.
200 (208)	8) 25	3	HLL36100 HLL36125 HLL36150	100 125 150	SEG3♦ SEG1♦ SEG5♦	3879.	SEW3♦ SEW1♦ SEW5♦	7554.	SEW13♦ SEW11♦ SEW15♦	8310.	SEA13♦ SEA11♦ SEA15♦	SEA3♦ SEA1♦ SEA5♦	4505.
	30 40	4	JLL36200 JLL36250	200 250	SFG3♦ SFG4♦	8508.	SFW3♦ SFW4♦	13208.	SFW13♦ SFW14♦	14534.	SFA13♦ SFA14♦	SFA3♦ SFA4♦	10245.
	50 60–75	5	JLL36250 LLL36400E20	250 400	SGG6♦ SGG4♦	19724.	SGW6♦ SGW4♦	31716.	_	_	SGA16♦ SGA14♦	SGA6♦ SGA4♦	22859.
	100–125 150	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	42825.	SHW4♦ SHW5♦	49946.	1 1	_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	46670.
	2 3	0	HLL36015 HLL36020	15 20	SBG1♦ SBG3♦	1400.	SBW1 ♦ SBW3 ♦	2768.	SBW11♦ SBW13♦	3182.	SBA11♦ SBA13♦	SBA1 ♦ SBA3 ♦	1742.
	5 7-1/2	1	HLL36035 HLL36045	35 45	SCG5♦ SCG6♦	1472.	SCW5♦ SCW6♦	2840.	SCW15♦ SCW16♦	3267.	SCA15♦ SCA16♦	SCA1 ♦ SCA6 ♦	1814.
	10 15	2	HLL36060 HLL36090	60 90	SDG1♦ SDG7♦	2255.	SDW1♦ SDW7♦	4364.	SDW11♦ SDW17♦	4805.	SDA11♦ SDA17♦	SDA1♦ SDA7♦	2739.
230	20 25–30	3	HLL36100 HLL36150	100 150	SEG3♦ SEG5♦	3879.	SEW3♦ SEW5♦	7554.	SEW13♦ SEW15♦	8310.	SEA13♦ SEA15♦	SEA3♦ SEA5♦	4505.
(240)	40 50	4	JLL36225 JLL36250	225 250	SFG1♦ SFG4♦	8508.	SFW1♦ SFW4♦	13208.	SFW11♦ SFW14♦	14534.	SFA11♦ SFA14♦	SFA1 ♦ SFA4 ♦	10245.
	60 75 100	5	JLL36250 LLL36400E20 LLL36600E20	250 400 600	SGG6♦ SGG4♦ SGG2♦	19724.	SGW6♦ SGW4♦ SGW2♦	31716.			SGA16♦ SGA14♦ SGA12♦	SGA6♦ SGA4♦ SGA2♦	22859.
	125 150–200	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	42825.	SHW4♦ SHW5♦	49946.		_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	46670.
	250-300	7	PKL36100	1200	SJG3♦	57837.	SJW3♦	64958.		_	SJA13♦		61682.

- NEMA Size 6 & 7 starters are NEMA 4 painted sheet steel enclosures.

  NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed below.

Note: Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

#### Table 16.95: Coil Voltage Codes

60 Hz 50 Hz  24▼★	C Duine Adden	age	Volt
120 <b>v</b> 110 V02 208 — V08 240 220 V03 277 — V04 480 440 V06	\$ Price Adder	50 Hz	60 Hz
600 550 V07 Specify Specify V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60	220 — 440 550	120▼ 208 240 277 480 600



Refer to page 16-31 for details.

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8539SBG1V01S).
  These voltage codes must include Form S (supplied at no charge). When specifying Form S, please supply motor voltage when ordering (i.e., order as 8539SCGSV02S).
  For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensionspage 16-2	42
Factory Modifications (Forms) page 16-10	00
Replacement Parts (Class 9998)page 16-10	05
Type S Accessories (Class 9999) page 16-10	08



#### Combination Starters— NEMA Style

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that prices shown do not include thermal units. Devices require 3 thermal units (Sizes 00-6). Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.96: Line Voltage Type, Non-Reversing, with Melting Alloy Overload Relays

	Ratings					NEMA 1 General Purpose Enclosure		NEMA 4 & 4X Watertight and Dusttight Enclosure Stainless Steel (304) (Sizes 0–5)▲		NEMA 4 & 4X Watertight, Dusttight and Corrosion Resistant Polyester Enclosure		NEMA 12/3R■ Dusttight and Driptight Industrial Use Enclosure		
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Circuit Bre	eaker	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With Without External External Reset Reset	\$ Price		
Voltage)	phase	3120	Туре	Ampere Rating							Туре	Туре		
	5	0	HLL36015	15	SBG1♦	1814.	SBW1 ♦	3182.	SBW11♦	3653.	SBA11♦	SBA1♦	2156.	
	7-1/2 10	1	HLL36025 HLL36030	25 30	SCG3♦ SCG7♦	1886.	SCW3♦ SCW7♦	3252.	SCW13♦ SCW17♦	3738.	SCA13♦ SCA17♦	SCA3♦ SCA7♦	2228.	
	15 20 25	2	HLL36045 HLL36060 HLL36070	45 60 70	SDG3 ♦ SDG1 ♦ SDG5 ♦	2669.	SDW3♦ SDW1♦ SDW5♦	4778.	SDW13♦ SDW11♦ SDW15♦	5255.	SDA13♦ SDA11♦ SDA15♦	SDA3♦ SDA1♦ SDA5♦	3153.	
460 (480)	30 40 50	3	HLL36080 HLL36100 HLL36150	80 100 150	SEG7 ♦ SEG3 ♦ SEG5 ♦	3879.	SEW7♦ SEW3♦ SEW5♦	7554.	SEW17♦ SEW13♦ SEW15♦	8310.	SEA17♦ SEA13♦ SEA15♦	SEA7♦ SEA3♦ SEA5♦	4505.	
(400)	60 75 100	4	JLL36150 JLL36200 JLL36250	150 200 250	SFG5♦ SFG3♦ SFG4♦	8508.	SFW5♦ SFW3♦ SFW4♦	13208.	SFW15♦ SFW13♦ SFW14♦	14534.	SFA15♦ SFA13♦ SFA14♦	SFA5♦ SFA3♦ SFA4♦	10245.	
	125–150 200	5	LLL36400E20 LLL36600E20	400 600	SGG4♦ SGG2♦	19724.	SGW4♦ SGW2♦	31716.	_	_	SGA14♦ SGA12♦	SGA4♦ SGA2♦	22859.	
	250 300–400	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	42825.	SHW4♦ SHW5♦	49946.	_	_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	46670.	
	500-600	7	PLL36120	1200	SJG3♦	57837.	SJW3♦	64958.	_	_	SJA13♦	_	61682.	
	5	0	HLL36015	15	SBG1♦	1814.	SBW1 ♦	3182.	SBW11♦	3653.	SBA11♦	SBA1 ♦	2156.	
	7-1/2 10	1	HLL36020 HLL36025	20 25	SCG8♦ SCG3♦	1886.	SCW8♦ SCW3♦	3252.	SCW18♦ SCW13♦	3738.	SCA18♦ SCA13♦	SCA8♦ SCA3♦	2228.	
	15 20 25	2	HLL36035 HLL36045 HLL36060	35 45 60	SDG8♦ SDG3♦ SDG1♦	2669.	SDW8♦ SDW3♦ SDW1♦	4778.	SDW18♦ SDW13♦ SDW11♦	5255.	SDA18♦ SDA13♦ SDA11♦	SDA8♦ SDA3♦ SDA1♦	3153.	
575 (600)	30 40 50	3	HLL36070 HLL36090 HLL36100	70 90 100	SEG4♦ SEG6♦ SEG3♦	3879.	SEW4♦ SEW6♦ SEW3♦	7554.	SEW14♦ SEW16♦ SEW13♦	8310.	SEA14♦ SEA16♦ SEA13♦	SEA4♦ SEA6♦ SEA3♦	4505.	
, ,	60–75 100	4	JLL36150 JLL36250	150 250	SFG5♦ SFG4♦	8508.	SFW5♦ SFW4♦	13208.	SFW15♦ SFW14♦	14534.	SFA15♦ SFA14♦	SFA5♦ SFA4♦	10245.	
	125–150 200	5	JLL36250 LLL36400E20	250 400	SGG6♦ SGG4♦	19724.	SGW6♦ SGW4♦	31716.	_	_	SGA16♦ SGA14♦	SGA6♦ SGA4♦	22859.	
	250–350 400	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	42825.	SHW4♦ SHW5♦	49946.	_	_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	46670.	
	500-600	7	PKL36100	1200	SJG2♦	57837.	SJW2◆	64958.	_	_	SJA12♦	_	61682.	

Table 16.97: Thermal Magnetic Circuit Breaker Type, Single Phase★▼

Motor	Max.	Max. Coil NE	Coil	Coil NEMA			Circuit	Ampere	NEMA General Pu	ırpose	NEMA 4 Watertight and Enclos	l Dusttight ure	watertight, Du	sttight and	Dustt	IEMA 12/3R■ ight and Driptigh rial Use Enclosur	
Voltage	Нр	Voltage	Size	Poles	Breaker (Type)	Rating	Enclosure Stainless Stool (204)		Corrosion Resistant Polyester Enclosure		With External Reset	Without External Reset	\$ Price				
							Type	\$ Price	Туре	\$ Price	Type	\$ Price	Туре	Туре			
120	1 2 3	120	0 1 2	2	HLL26030 HLL26050 HLL26080	30 50 80	SBG72V02 SCG72V02 SDG71V02	1400.00 1474.00 2255.00	SBW72V02 SCW72V02 SDW71V02	2768.00 2840.00 4364.00	SBW75V02 SCW75V02 SDW74V02	3182.00 3267.00 4805.00	SCA75V02	SBA72V02 SCA72V02 SDA71V02	1742.00 1814.00 2739.00		
240	2 3 7.5	240	0 1 2	2	HLL26025 HLL26035 HLL26080	25 35 80	SBG71V03 SCG71V03 SDG71V03	1400.00 1474.00 2255.00	SBW71V03 SCW71V03 SDW71V03	2768.00 2840.00 4364.00	SBW74V03 SCW74V03 SDW74V03	3182.00 3267.00 4805.00	SCA74V03	SBA71V03 SCA71V03 SDA71V03	1742.00 1814.00 2739.00		

- ▲ NEMA Size 6 and 7 starters are NEMA 4 painted sheet steel enclosures
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed on page 16-38.
- ★ Single phase units require one thermal unit and are not available with Form Hxx—Solid State Overload Relays.

▼ Not included in Laser™ Delivery program.

Note: Some control transformers may require the use of oversized enclosures. Refer to control transformer selection table on page 16-41.

For How to Order Information, see page 16-13.



Refer to page 16-31 for details.

CP1

#### **Application Data**

Table 16.98: Class 8539—UL Listed Short Circuit Ratings

Motor Circuit Protector Type									
NEMA Size	Enclosure	AIC at 480 Vac (RMS)	AIC at 600 Vac (RMS)						
0, 1	Standard▲	100,000	35,000						
2 thru 5	Standard▲	100,000	50,000						
6	Standard▲	65,000	18,000						
7	Standard▲	65,000	30,000						

Standard enclosure includes: NEMAs 1, 4 & 4X stainless and 12/3R.

Table 16.99: Electronic Motor Circuit Protector (MCP)
Selection by HP Ratings of Induction-type
Squirrel-Cage Motors

	3Ø 60 H	Full-Load	Suffix		
200 Vac	230 Vac	460 Vac	575 Vac	(A)	Sullix
.5–5	.5–7.5	.75–15	1–20	1.5–25	M71
5–10	5–15	10–30	15–40	14-42	M72
10–25	15–30	25–60	30–75	30–80	M73
20-40	25-50	50-100	60-125	58-130	M74
40–60	50-75	100-150	125-200	114–217	M75

Note: The MCP adjustable trip range is determined by the suffix of the circuit breaker catalog number. Table 16.99 indicates the trip range which corresponds to a given suffix number. The MCP Motor Circuit Protector should be adjusted to a level just above Locked-Rotor Current of the motor. This setting will provide optimum overcurrent protection for the motor. For more information on MCP instantaneous trip circuit breakers, refer to the MCP circuit breaker section of this Catalog.

Table 16.100: UL Listed Short Circuit Ratings

Thermal Magnetic Circuit Breaker Type										
NEMA Size	Enclosure	AIC at 480 Vac (RMS)	AIC at 600 Vac (RMS)							
0, 1	Standard ■	100,000	35,000							
2 thru 5	Standard ■	100,000	50,000							
6	Standard ■	65,000	18,000							
7	Standard ■	65,000	30,000							

Standard enclosure includes: NEMAs 1, 4 & 4X stainless and 12/3R.

#### Table 16.101: Class 8538—UL Listed Short Circuit Ratings

NEMA Size	NEMA Fuse Enclosure		Available Amperes RMS Symmetrical
0–3	Class H or K	Standard ◆	5,000
0–3	Class R/J	Standard ◆	100,000
0–2	Class H or K	Oversize	5,000
0–2	Class R/J	Standard	100,000
4–5	Class H or K	Standard ◆	10,000
4–5	Class R/J	Standard ◆	100,000
6	Class H or K	Standard ◆	18,000
6	Class R/J	Standard♦	100,000

<sup>♦</sup> Standard enclosure includes non-oversize NEMAs 1, 4 & 4X Stainless, and 12.

Table 16.102: Table 2: Motor Code Letter Table

Horsepower	Motor Code Letters
1/2 or less	A-L
3/4–1-1/2	A-K
2–3	A-J
5–25	A-H
30–125	A-G
150 or more	A-F

Note: The combination starter selection tables on pages 16-36–16-37 are suitable for motors with Locked-Rotor Current letters per NEC Table 430-7(b) as listed in Table 16.102. For other motors a special thermal magnetic circuit breaker with adjustable magnetic trip settings for the specific motor is required. When ordering for these special applications, specify the motor horsepower, voltage, frequency, full load current and code letter (or locked rotor current) to assure proper protection.

#### Table 16.103: Terminals

			Lin	e Terminals on Disconnect	Power Ter	minals On Magnetic S	Control Terminals On Magnetic Starter			
NEMA Size	Туре	Type of	pe of Wire Range		Type of	Wire Range	Wires Per	Type of	Wire Range	Wires Per
		Lug	Switch	Circuit Breaker	Lug	Wire halige	Terminal	Lug	Wife halige	Terminal
0 & 1	SB & SC	Box Lug	#14-1/0 Cu/Al	(1) 14-3/0 Al or Cu	Pressure Wire	#14–#8 Cu	1 or 2	Pressure Wire	#16-#12 Cu	2
2	SD	Box Lug	#14-1/0 Cu/Al	(1) 14-3/0 Al or Cu	Box Lug	#14–#4 Cu	1	Pressure Wire	#16-#12 Cu	2
3	SE	Box Lug	#14-1/0 Cu/Al	(1) 14-3/0 Al or Cu	Box Lug	#14-#0 Cu	1	Pressure Wire	#16-#12 Cu	2
4	SF	Box Lug	#6-300 MCM Cu/Al	(1) 4-4/0 Al or Cu ( JLL Breaker 150 A - 175 A ) (1) 3/0 - 350 MCM Al or Cu ( JLL Breaker 200 A - 250 A )	Box Lug	#8-250 MCM Cu	1	Pressure Wire	#16-#12 Cu	2
5	SG	Box Lug	One #4–500 MCM Cu	(1) 2 - 500 MCM AI or (1) 2 - 350 MCM Cu (DJL36400 Breaker) (2) 2/0 - 500 MCM AI or (2) 2/0 - 350 MCM Cu (DLL36600 Breaker) (1) 3/0 - 350 MCM AI or (1) 3/0 - 350 MCM Cu (JLL36250 Breaker)	Box Lug	#4–500 MCM Cu	1	Pressure Wire	#16–#12 Cu	2
6	SH	Box Lug	-	(2) 2/0 - 500 MCM AI or (2) 2/0 - 350 MCM Cu (DJL36600 Breaker, DLL Breaker) (1) 2 - 600 MCM AI or (1) 2 - 350 MCM Cu (DJL36400 Breaker) (3) 3/0 - 500 MCM AI or (3) 3/0 - 350 MCM Cu (MJL36800 Breaker) (3) 3/0 - 500 MCM AI or (3) 3/0 - 350 MCM Cu (PLL34080M68 Breaker)	Parallel Groove	250–500 MCM Cu★	1 or 2	Pressure Wire	#16–#12 Cu▼	2
7	SJ	Box Lug	_	(4) 3/0 - 300 MCM AI or CU (PJL, PKL, PLL Breaker)	Parallel Groove	250-500 MCM Cu	1–4	Pressure Wire	#16-#12 Cu	2

<sup>★</sup> Order Class 9999 Type SCU6 parts kit to convert power terminals to accept sizes 2/0–300 MCM wire.

Terminal block range limited to #16-#14.



#### **Accessories**

#### **Interlocks and Control Transformers**

A one or two pole electrical interlock can be added to the disconnect switch or circuit breaker. Thus, if a separate control circuit is used, the magnetic starter can be de-energized when the disconnect is switched to the OFF position. See Table 16.104 for proper interlock selection. For electrical ratings of disconnect and circuit breaker interlocks, see Table 16.105 below.

An electrical interlock may also be factory installed in either a disconnect switch or circuit breaker combination starter. Specify Form Y74 for single pole, or Form Y75 for two pole interlocks. For pricing see factory modifications (Forms).



Table 16.104: Disconnect Switch and Breaker Interlocks

	SPDT	(Y74)	DPDT	(Y75)
Туре	Class 9999 Type	\$ Price	Class 9999 Type	\$ Price
SB▲, SC▲, SD▲ (Series B)	R6	116.00	R7	221.00
SD (Series C)	R43	116.00	R44	221.00
SB, SC (Series C)	R45	107.00	R46	207.00
SE, SF (Series A)	R8	131.00	R9	243.00
SE (Series B & C)	R41	131.00	R42	243.00
SF (Series B & C)	R39	135.00	R40	243.00
SG	R35	435.00	R36	521.00
SB, SC, SD, SE, SF, SG (Series K)	R26	131.00	R27	243.00
SBA, SCA, SBG, SCG (Series D and above)	TC11	120.00	TC21	239.00
SBAS8, SCAS8, SBGS8, SCGS8 (Series D and above)	TC10	120.00	TC20	239.00
SBAS8, SCAS8, SBGS8, SCGS8 (Series E and above)	TC10	120.00	TC20	239.00
SBA, SCA, SBG, SCG (Series E and above)	TC11	120.00	TC21	239.00
SDA, SDA▲, SDG, SDG▲ (Series D and above)	TC10	120.00	TC20	239.00
SDA, SDG (Series E and above)	TC10	120.00	TC20	239.00
SEA, SEG (Series D and above)	TC10	120.00	TC20	239.00
	SD (Series C) SB, SC (Series C) SE, SF (Series A) SE (Series B & C) SF (Series B & C) SG SB, SC, SD, SE, SF, SG (Series K) SBA, SCA, SBG, SCG (Series D and above) SBASB, SCASB, SBGSB, SCGSB (Series D and above) SBASB, SCASB, SBGSB, SCGSB (Series E and above) SBA, SCA, SBG, SCG (Series E and above) SBA, SCA, SBG, SCG (Series E and above) SDA, SDA , SDA , SDG, SDG A (Series D and above) SDA, SDA , SDG, SDG A (Series D and above) SDA, SDG (Series E and above)	Type         Class 9999 Type           SB A, SC A, SD A (Series B)         R6           SD (Series C)         R43           SB, SC (Series C)         R45           SE, SF (Series A)         R8           SE (Series B & C)         R41           SF (Series B & C)         R39           SG         R35           SB, SC, SD, SE, SF, SG (Series K)         R26           SBA, SCA, SBG, SCG (Series D and above)         TC11           SBASB, SCASB, SBGSB, SCGSB (Series D and above)         TC10           SBASB, SCASB, SBGSB, SCGSB (Series E and above)         TC11           SDA, SDA , SDG, SDG A (Series D and above)         TC10           SDA, SDA SDG, SDG SQ (Series D and above)         TC10           SDA, SDA SDG (Series E and above)         TC10	SBA, SCA, SDA (Series B)         R6         116.00           SD (Series C)         R43         116.00           SB, SC (Series C)         R45         107.00           SE, SF (Series A)         R8         131.00           SE (Series B & C)         R41         131.00           SF (Series B & C)         R39         135.00           SG         R35         435.00           SB, SC, SD, SE, SF, SG (Series K)         R26         131.00           SBAS, SCA, SBG, SCG (Series D and above)         TC11         120.00           SBAS8, SCAS8, SBGS8, SCGS8 (Series D and above)         TC10         120.00           SBAS8, SCAS8, SBGS8, SCGS8 (Series E and above)         TC11         120.00           SBA, SCA, SBG, SCG (Series D and above)         TC11         120.00           SDA, SDA, SDA, SDA (Series D and above)         TC10         120.00           SDA, SDA, SDA (Series E and above)         TC10         120.00           SDA, SDA (Series E and above)         TC10         120.00           SDA, SDG (Series E and above)         TC10         120.00	Type         Class 9999 Type         \$ Price         Class 9999 Type           SB A, SC A, SD A (Series B)         R6         116.00         R7           SD (Series C)         R43         116.00         R44           SB, SC (Series C)         R45         107.00         R46           SE, SF (Series A)         R8         131.00         R9           SE (Series B & C)         R41         131.00         R42           SF (Series B & C)         R39         135.00         R40           SG         R35         435.00         R36           SB, SC, SD, SE, SF, SG (Series K)         R26         131.00         R27           SBA, SCA, SBG, SCG (Series D and above)         TC11         120.00         TC21           SBAS8, SCAS8, SBGS8, SCGS8 (Series D and above)         TC10         120.00         TC20           SBAS, SDA SB, SC, SBG, SCG (Series E and above)         TC11         120.00         TC20           SBA, SDA SDA SDG, SCG (Series E and above)         TC10         120.00         TC21           SDA, SDA SDG, SCG (Series E and above)         TC10         120.00         TC20           SDA, SDA SDG (Series E and above)         TC10         120.00         TC20

Class 8538 type numbers ending in suffix "S8".

Table 16.105: Disconnect Switch and Breaker Interlock Electrical Ratings

Class 999	9 Type R6, 8, 26, 35	5, 39, 41, 43, 45, TC	10, & TC11		Class 99	99 Type R7, 9, 27,	36, 40, 42, 44, 46 & T	°C 20, 21	
	AC—50	or 60 Hz				AC-50	or 60 Hz		
		Maximum Current					<b>Maximum Current</b>		
Volts	Make	Break	Continuous	Volts	Ma	ıke	Bre	Continuous	
	(A)	(A)	Carrying Current (A)		(A)	VA	(A)	VA	Carrying Current (A)
120 240 480 600	40 15 15 20 10 15 10 6 15 8 5 15		15 15	120 240 480 600	30 15 7.5 6	3450 3450 3450 3450	3 1.5 .75 .6	345 345 345 345	10 10 10 10

Table 16.106: Control Transformer Selection

NEMA Size	Starter Type	Standard★ Capacity (Form F4T)	50 VA★ Additional Capacity (Form F4T10)	100 VA★ Additional Capacity (Form F4T11)	200 VA★ Additional Capacity (Form F4T12)	
		Class 9070 Type	Class 9070 Type	Class 9070 Type	Class 9070 Type	
0 & 1	SB & SC	TF100	TF150	TF200	TF300■	
2	SD	TF100	TF150	TF200	TF300◆	
3	SE	TF150	TF200	TF300	TF500	
4	SF	TF300	TF300	TF500	T500	
5	SG	TF100 and 8501XO20	TF100 and 8501XO20	TF150 and 8501XO20	TF300 and 8501XO20	
6	SH	EO3S2 is standard	N/A	EO3FS2 and T100	EO3S2 and TF200	
7	SJ	EO19S2 is standard	N/A	EO19S2 and TF100	EO3S2 and TF200	

Note: 9070TF transformers are now standard in Series K combination starters.

- Requires oversized enclosure. (Size 2 reversing enclosure.)
  Available in standard enclosure with Mag-Gard™ circuit breaker and non-fusible disconnect switch. Requires oversized enclosure with thermal-magnetic circuit breakers and fusible disconnect switches. (Size 2 reversing enclosure.)
- Complete the contactor or starter Class and Type with Voltage Code, see page 16-101.

Internal Auxiliary Switch—Circuit breakers can be supplied with a factory installed auxiliary switch for remote indication of an open and/or tripped or a closed breaker. One (specify Form Y741) or two (specify Form Y751) auxiliary switches can be supplied. The switches are supplied with normally open and normally closed circuits with a common connection. Contacts must be used on the same polarity and are rated 15 A at 240 Vac. The auxiliary switches are located internally and are furnished with 19-20 inch long leads.

Alarm Switch—The alarm switch only operates when the breaker is tripped. It is used to actuate bell alarms and warning lights. The alarm switch is factory installed only (specify **Form Y742**) and consists of a single pole single throw switch which is normally open except when the breaker is tripped. The contacts are rated 4 A at 240 Vac. This switch is located in the breaker and is supplied with 19-20 inch long leads.

Transformer Selection—Space and drilling are provided in all disconnect switch and circuit breaker combination starters in NEMA 1, 4 & 4X stainless and polyester, 12 and 7 & 9 bolted enclosures for the field addition (or factory installation) of a Class 9070 control circuit transformer and Class 9999 Type SFR4 fuse holder. This kit can be either panel mounted or side mounted on the Type S starter. For standard control transformer selection in combination starters, see Table 16.106. Consult field office for transformer additions to NEMA 7 & 9 SPIN TOP™ enclosures. For secondary fuse holder order 9080PF1.

Fuse Block Mounting Brackets—The standard capacity transformer, Class 9070 Type T100, for the Size 0 and 1 starters mounts to the right of the magnetic starter.

Standards—Most combination starters and forms are UL Listed in file E152395, Category NKJH, and CSA File CR 584.

Discount

#### **Approximate Dimensions**

Table 16.107: NEMA 1 Enclosure—Figure 1

NEMA	Class	Time						Di	mension	s in Inch	ies 4								Top & Bottom		Sides	Wt.
Size	CidSS	Туре	Α	В	С	D	E	F	G	Н	1	J	K	L	M	N	0	Р	W	X	Υ	(lb)
0–1	8538	SBG SCG	9-1/2	22-1/2	8-11/32	6-3/8	20-1/2	14-21/32	1-13/16	1-11/16	3	2-5/16	1-1/16	3-1/4	2-3/16	1-1/4	7/8	_	1/2-3/4	1/2-3/4	1/2	38
<u>U</u> —1	8539	SBG SCG	9-1/2	22-1/2	9-27/32	6-3/8	20-1/2	14-21/32	1-13/16	1-11/16	3	2-5/16	1-1/16	3-1/4	2-3/16	1-1/4	7/8	_	1/2-3/4	1/2-3/4	1/2	38
2	8538 & 8539	SDG	10-1/2	26	9-19/32	7-3/8	24	16-29/32	2-1/8	2	4	2-5/16	1-1/16	3-1/4	2-3/16	1-1/4	7/8		1-1-1/4	1/2-3/4	1/2	54

Table 16.108: NEMA 1 Enclosure—Figure 2

NEMA	Class	Туре							Dimen	sions	in In	ches.▲							Top & E	ottom	Sides	Wt.
Size	Ciass	Туре	Α	В	С	D	Е	F	G	Н	I	J	K	L	M	N	0	Р	W	X	Υ	(lb)
3■	8538 & 8539	SEG	15-1/4	42	10-19/32	9-1/4	3	22-23/32	41	1/2	_	2-53/64	3-17/32	5	2-11/16	5-3/8	1-9/32	29/32	1–1-1/4 2–2-1/2	1/2-3/4	1/2	102
4	8538	SFG	16	52-1/2	10-17/32	10	3	23-21/32	51-1/2	1/2	_	2-53/64	3-17/32	5	2-11/16	5-3/8	1-9/32	29/32	2-1/2	1/2-3/4	1/2	163
4	8539	SFG	16	52-1/2	10-17/32	10	3	23-21/32	51-1/2	1/2	-	2-53/64	3-17/32	5	2-11/16	5-3/8	1-9/32	29/32	2-1/2	1/2-3/4	1/2	163
5	8538	SGG	20	78	15-1/2	12	4	29-13/32	77	1/2	ı	3-33/64	4-39/64	9-1/4	3-3/16	_	-	_	1/2–3/4 ♦	3	ı	450
	8539	SGG	20	66	13-23-62	12	4	29-13/32	65	1/2	-	3-33/64	4-39/64	5	3-3/16	_	_	_	1/2-3/4	3	1	420
6▼	8538 & 8539	SHG	36	90	21-1/32	_	_	41-3/8	_	_	_	_	_	5	_	_	_	_	_	_	_	

Table 16.109: NEMA 12/3R Enclosure—Figure 3

NEMA	Class	Time					Dimensions	in Inches *	r .				Wt.
Size	Class	Туре	Α	В	С	D	E	F	G	Н	I	J	(lb)
0–1	8538	SBA SCA	9-1/2	8-11/32	24	3-1/4	2-1/2	4-1/2	23-1/2	19/32	4-7/16	14-5/16	40
0-1	8539	SBA SCA	9-1/2	9-27/32	24	3-1/4	2-1/2	4-1/2	23-1/2	19/32	4-7/16	14-5/16	40
2	8538 & 8539	SDA	10-1/2	9-19/32	27-3/4	3-1/4	2-1/2	5-1/2	27	3/8	4-1/8	16-9/16	55
3■	8538 & 8539	SEA	15-1/4	10-19/32	42	5	3	9-1/4	41	1/2	5-1/16	22-5/16	111
4	8538	SFA	16	10-17/32	52-1/2	5	3	10	51-1/2	1/2	4-3/16	22-31/32	170
4	8539	SFA	16	10-17/32	52-1/2	5	3	10	51-1/2	1/2	5-3/16	22-31/32	170
5	8538	SGA	20	13-23/32	78	9-1/4	4	12	77	1/2	7-25/32	29-13/32	_
	8539	SGA	20	13-23/32	66	5	4	12	65	1/2	7-25/32	27-13/32	440
6▼	8538 & 8539	SHA	36	17	90	5	_	_	_	_	_	47-3/8	_

Table 16.110: NEMA 4 and 4X Stainless Steel Enclosures—Figure 4

NEMA	Class	Туре		Dimensions in Inches ▲  BCDFFFGHHILLK												Top & Bot.	Wt.
Size	Class	Туре	Α	В	С	D	E	F	G	Н		J	K	L	W	Х	(lb)
0–1	8538	SBW SCW	9-1/2	8-11/32	24-1/16	3-1/4	2-1/2	4-1/2	23-1/2	19/32	3-1/32	1-5/16	2-5/16	14-9/32	3/4 Hub	1 Hub	40
0-1	8539	SBW SCW	9-1/2	9-27/32	24-1/16	3-1/4	2-1/2	4-1/2	23-1/2	19/32	3-1/32	1-5/16	2-5/16	14-9/32	3/4 Hub	1 Hub	40
2	8538 & 8539	SDW	10-1/2	9-19/32	27-3/4	3-1/4	2-1/2	5-1/2	27	19/32	3	2	2-5/8	16-17/32	3/4 Hub	1-1/2 Hub	55
3■	8538 & 8539	SEW	15-1/4	10-19/32	42	5	3-3/16	10-1/4	40-1/2	19/32	3	2-9/16	3-3/16	223/16	3/4 Hub	2-1/2 Hub	111
4	8538	SFW	16	10-17/32	52-1/2	5	3-9/16	11	51	19/32	3	2-9/16	3-3/16	22-15/32	3/4 Hub	2-1/2 Hub	158
	8539	SFW	16	10-17/32	52-1/2	3-1/4	2-1/2	11	51	19/32	3	2-9/16	3-3/16	22-15/32	3/4 Hub	2-1/2 Hub	120
5	8538	SGW	20	13-23/32	78	9-1/4	4	12	77	9/16	4-1/2	3	3-1/2	29-13/32	3/4 Hub	3-1/2 Hub	
	8539	SGW	20	13-23/32	66	5	4	12	65	9/16	4-1/2	3	3-1/2	29-13/32	3/4 Hub	3-1/2 Hub	440
6▼	8538 & 8539	SHW	36	17	90	_	_	_	_	_	_	_	-	47-7/8	_	_	_

- ▲ Dimensions also for Form F4T (standard control transformer). Form F4T11 (100 VA extra capacity) and Form F4T12 (200 VA extra capacity) could require the use of an oversized enclosure. Refer to control transformer selection table on page 16-41.
- Class 8538 Size 3 devices with 200 A fuse clips use dimensions for Class 8538 Size 4.
- Left side only.
- ★ Dimensions include space for control circuit transformers.
- ▼ Size 6 enclosures are floor mounting.

Note: Illustrations may not represent the actual enclosure; they are intended for dimensional information only.

(4) .31 in (8 mm) dia. mtg. holes for sizes 0, 1, and 2, (4) .44 in (11 mm) dia. mtg. holes for sizes 3 and 4, (4) .56 in (14 mm) dia. mtg. holes located on external flanges for size 5.

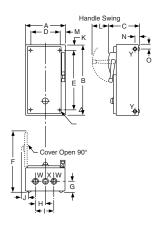
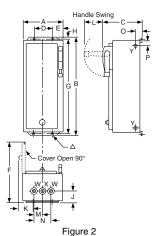


Figure 1 NEMA 1 Enclosure



NEMA 1 Enclosure

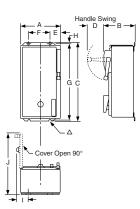


Figure 3 NEMA 12 Enclosure

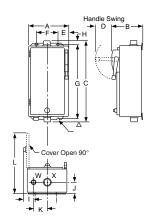


Figure 4 NEMAs 4 and 4X Stainless Steel Enclosure

www.schneider-electric.us

#### Table 16.111: NEMA 4X Polyester Enclosure—Figure 1

**NEMA Style** 

NEMA	Class			Dimensions	in Inches A				
Size	CidSS	Type	Α	В	С	E	F		
0, 1	8538	SBW							
0, 1	8539	SCW SDW	13.72	11.4	26.94	6.25	25.75		
0, 1, & 2	8738, 8739	SBW							
2	8538, 8539	SCW SDW	25.25	11.4	27.00	17.88	25.75		
3–4	8538, 8738 8539, 8739	SEW SFW ■	26.31	11.4	33.50	18.50	32.25		

Dimensions also for Form F4T (standard control transformer) and Form F4T10 (50 VA additional capacity). Other control transformers may require the use of oversized enclosures. Refer to the control transformer selection table on page 16-41.

8539 Size 4 only.

#### Table 16.112: NEMA 1, 4, 4X Stainless, 12/3R Oversize Enclosure—Figure 2

Combination Starters—

	NEMA			Dimension	s in Inches		
NEMA Size	Type Encl.	Wide	High B	Deep C	Handle	Mou	nting
	Encl.	Α	B	C.	L	D	E
	1	15	28-1/3	9-19/32	3-1/4	11-5/8	26-1/4
0–2	4	15	30-1/32	9-19/32	3-1/4	10	29-3/4
	12	15	31	10-31/32	3-1/4	9	30-1/4

#### Information on Hubs

Hubs are supplied with each NEMA Type 4X combination starter as shown in the table below.

Note that hubs are only installed in stainless steel enclosures; they are not installed in polyester enclosures.

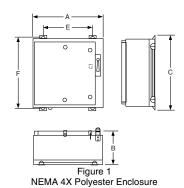
#### Table 16.113: Hub Sizes

NEMA Size	Quantity	Hub Size
0 & 1	1 2	0.75" 1.00"
2	1 2	0.75" 1.50"
3 & 4	1 2	0.75" 2.50"

Illustrations may not represent the actual enclosure; they are intended for dimensional information only

#### Table 16.114: Conduit Sizes LOC A, B, C and D

NEMA Size	Standard
0—1	1-1/4
2	1-1/2
3—4	2-1/2
5	4



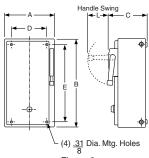


Figure 2 Class 8538 and 8539 in Oversize Enclosures -NEMA 1, 4 & 4X Stainless and 12

Class 8702 / Refer to Catalog 8502CT9701

by Schneider Electric www.schneider-electric.us



NEMA 00, 0, 1 **Reversing Contactor** 

Class 8702 Type S reversing magnetic contactors are used for starting, stopping, and reversing AC motors where overload protection is separately provided. Class 8702 reversing contactors consist of two Class 8502 contactors mechanically and electrically interlocked. Open type devices, Sizes 0–5, are available in either horizontal or vertical arrangements. Sizes 00, 6, and 7 are available as horizontal only. Enclosed devices, Size 00–7, use horizontally arranged components. Type S reversing contactors are designed for operation at 600 Vac, 50–60 Hz.

#### Table 16.115:

NEMA Size	Continuous Current Ratinus	Motor Voltage	Max. Hp		Open Type	÷	Genera	MA 1 I Purpose losure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure (Sizes 0-5) A		NEMA 7 & 9 ♦ Hazardous Locations, Div. 1 & 2 Class I, Groups C & D Class II, Groups E, F & G				NEMA 12/3R★ Dusttight & Driptight Industrial Use Enclosure	
_	0.5			Vertical Type	Horizontal Type	\$ Price	Туре	\$ Price	Туре	\$ Price	Bolted Type Aluminum	\$ Price	SPIN TOP <sup>™</sup> Type	\$ Price	Туре	\$ Price
00	9	200 230 460 575	1-1/2 1-1/2 2 2		SAO4■	855.00	SAG4■	917.00	Use	Size 0	Use S	ize 0	Use \$	Size 0	Use	Size 0
(	18	200 230 460 575	3 3 5 5	SBO12■	SBO4■	1026.00	SBG4■	1088.00	SBW14■	1742.00	SBT49■	3716.00	SBR9■	4649.00	SBA4■	1344.00
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO7■	SCO8■	1169.00	SCG8■	1259.00	SCW14■	2241.00	SCT49■	3900.00	SCR9■	4877.00	SCA4■	1515.00
2	2 45	200 230 460 575	10 15 25 25	SDO1■	SDO2■	2222.00	SDG2■	2456.00	SDW11∎	3936.00	SDT43■	6507.00	SDR3■	8139.00	SDA1■	2883.00
3	90	200 230 460 575	25 30 50 50	SEO1■	SEO2■	3689.00	SEG2■	4094.00	SEW11■	6287.00	ı	_	1		SEA1■	5034.00
4	135	200 230 460 575	40 50 100 100	SFO1■	SFO3■	9201.00	SFG3■	9945.00	SFW11■	13820.00	1111	_	1111		SFA1■	11399.00
5	270	200 230 460 575	75 100 200 200	SGO1■	SGO3■	16592.00	SGG3■	20885.00	SGW11∎	24017.00		_		_	SGA1■	24017.00
6	540	200 230 460 575	150 200 400 400		SHO1■	41489.00	SHG1■	48614.00	SHW1■	55736.00		_	1111		SHA1■	52461.00
7	810	200 230 460 575	300 600 600		SJO1■	59372.00	SJG1■	66816.00	SJW1■	73619.00		_			SJA1■	70343.00

- NEMA 4 and 4X stainless steel enclosures (sizes 0-5) have a brushed finish. Sizes 6 and 7 are painted sheet steel and are rated NEMA 4 only.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection table below. NEMA 7 and 9 bolted are not UL listed.
- NEMA 12 enclosure may be field modified for outdoor non-corrosive and non-service-entrance-rated application; see page 16-95 for more information.

#### Table 16.116: Coil Voltage Codes

	•		
Vol	tage	Code	\$ Price Adder
60 Hz	50 Hz	Code	\$11100 Addel
24▼△ 120△ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- $24\ V$  coils are not available on Sizes 4-7. On Sizes 00-3, where  $24\ V$  coils are available, Form S (separate control) must be specified (i.e., order as 8702SAO4V01S).
- These voltage codes must include **Form S** (supplied at no charge) (i.e., order as 8702SAO4V02S). For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

..... page 16-48 Factory Modifications (Forms) page 16-100
Separate Enclosures (Class 9991) page16-93 Replacement Parts (Class 9998).....page 16-105 Type S Accessories (Class 9999)



# Full Voltage Reversing Contactors—NEMA Style

#### Table 16.117: 600 Vac Maximum-50-60 Hz

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Type of Motor	C	pen Type		NEMA General Pu Enclosi	ırpose	NEMA 4 Watertight, I Brushed St Steel Encl	Ousttight ainless	Cla	ass I. Gro	7 & 9 ■ ations, Div. 1 oups C & D ups E, F & G		NEMA 12 Dusttig Dripti Industria Enclos	ght & ght al Use
					Vertical Type	Horizontal Type	\$ Price	Туре	\$ Price	Туре	\$ Price	Bolted Type	\$ Price	SPIN TOP <sup>™</sup> Type	\$ Price	Туре	\$ Price
2-Pole 9	Single Phase																
00	9	115 230	1/3 1	Single	<u> </u>	SAO1▲	827.	SAG1▲	887.	Use Siz	e 0	Use Siz	ze 0	Use Siz	ze 0	Use Si	ze 0
0	18	115 230	1 2	Phase 3-Wire	SBO9▲	SBO1▲	998.	SBG1▲	1061.	SBW11▲	1715.	SBT46▲	3686.	SBR6▲	4613.	SBA1▲	1314.
1	27	115 230	2		SCO1▲	SCO2▲	1139.	SCG2▲	1229.	SCW11▲	2142.	SCT46▲	3873.	SCR6▲	4841.	SCA1▲	1485.
3-Pole S	Single Phase																
00	9	115 230	1/3 1	4-Wire RepInd.	_	SAO2▲	855.	SAG2▲	917.	Use Siz	e 0	Use Siz	ze 0	Use Siz	ze 0	Use Si	ze 0
	9	115 230	1/3 1	4-Wire Split Ph.	_	SAO3▲	855.	SAG3▲	917.	Use Siz	e 0	Use Siz	ze 0	Use Siz	ze 0	Use Si	ze 0
0	18	115 230	1 2	4-Wire RepInd.	SBO10▲	SBO2▲	1026.	SBG2▲	1088.	SBW12▲	1742.	SBT47▲	3716.	SBR7▲	4649.	SBA2▲	1344.
	10	115 230	1 2	4-Wire Split Ph.	SBO11▲	SBO3▲	1026.	SBG3▲	1088.	SBW13▲	1742.	SBT48▲	3716.	SBR8▲	4649.	SBA3▲	1344.
1	27	115 230	2 3	4-Wire Rep.Ind.	SCO3▲	SCO4▲	1169.	SCG4▲	1259.	SCW12▲	2169.	SCT47▲	3900.	SCR7▲	3227.	SCA2▲	1515.
	21	115 230	2	4-Wire Split Ph.	SCO5▲	SCO6▲	1169.	SCG6▲	1259.	SCW13▲	2169.	SCT48▲	3900.	SCR8▲	3227.	SCA3▲	1515.
4-Pole F	Polyphase																
0	18	200 230 460 575	3 3 5 5		SBO13▲	SBO5▲	1310.	SBG5▲	1368.	SBW15▲	2028.			SBR10▲	5040.	SBA5▲	1629.
1	27	200 230 460 575	7-1/2 7-1/2 10 10		SCO9▲	SCO10▲	1497.	SCG10▲	1557.	SCW15▲	2469.	Cons Schneider CCC (1-888-778	Electric at	SCR10▲	5297.	SCA5▲	1814.
2	45	200 230 460 575	10 15 25 25	2 Phase 4-Wire	_ _ _ _	SDO4▲	2820.	SDG4▲	3054.	SDW12▲	4620.			SDR4▲	9071.	SDA2▲	3528.
3	90	200 230 460 575	25 30 50 50		1111	SEO4▲	4671.	SEG4▲	5103.	SEW12▲	7238.	1111		1111	_	SEA2▲	6017.
4	135	200 230 460 575	40 50 100 100		  	SFO4▲	11879.	SFG4▲	12653.	SFW12▲	16556.		_	  	_	SFA2▲	14129.

- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed in selection table on page 16-44.
- NEMA 7 and 9 bolted are not UL listed.
   NEMA 12 enclosure may be field modified for outdoor non-corrosive and non-service-entrance-rated application; see page 16-95 for more information.

#### Table 16.118: Auxiliary Units—Class 8702, 8736 and 8810

The table below shows the maximum number of auxiliary units (in addition to the holding circuit and interlocking contacts) that can be added to either the forward or reverse contactor or starter.

NEMA Size (Type)	No. of Poles of Basic Contactor	Maximum number of auxiliary units on each contactor, forward or reverse. (In addition to internal holding circuit and interlocking contacts.)
00 (SA)	2 or 3	2 single circuit auxiliary contacts (N.O. or N.C.)
0, 1 and 2	2 or 3	4 single circuit auxiliary contacts (N.O. or N.C.)★
(SB, SC and SD)	4	2 single circuit auxiliary contacts (N.O. or N.C.)
3, 4, 5, 6, and 7 (SE, SF, SG, SH, and SJ)	Any	2 single circuit auxiliary contacts (N.O. or N.C.)

★ When adding 4 external auxiliary contacts to one Size 0 or 1 contactor, remove one of the return springs.

www.schneider-electric.us



NEMA Sizes 00, 0, 1 Reversing Starter (Horizontal Type)

Class 8736 Type S reversing magnetic starters are used for full-voltage starting, stopping, and reversing AC squirrel cage motors. Class 8736 starters consist of one Class 8502 contactor and one Class 8536 starter mechanically and electrically interlocked. Open type devices, Sizes 0–5, are available in either horizontal or vertical arrangements. Sizes 00, 6, and 7 are available as horizontal only. Enclosed devices use horizontally arranged components. Type S starters are designed for operation at 600 Vac, 50-60 Hz.

#### Overload Relays

Class 8736 Type S Size 00-6 reversing starters are provided with melting alloy thermal overload relay as standard. Interchangeable thermal units are available in standard trip Sizes 00-6, as are bimetallic overload relays. Ambient compensated and non-compensated versions are supplied with manual or automatic reset, trip current adjustment, and an alarm contact on Sizes 0-2.

Quick trip is available on Sizes 00-4, and slow trip on Sizes 00-3.

Single phase starters use one thermal unit; three phase starters use three thermal units. See page 16-116 for selection

#### New! Adapted Bimetal (NEMA Sizes 00-1)

The Adapted Bimetal motor starter consists of a specially designed adapter that attaches with bus bars to the NEMA Type S contactor and holds the LRD or LR3D (IEC Style) bimetal overload relay. This starter configuration can be ordered by adding Form E (adapater only) to the standard catalog number. Once the FLA of the motor has been determined, the LRD or LR3D bimetal overload can be purchased separately and installed in the field at a later date. For more information see Table 16.269.

#### Solid State Overload Relay Protection (Motor Logic™)

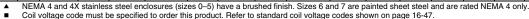
These ambient insensitive overload relays are available on three phase sizes 00 through 6 and standard on size 7. They provide phase loss, phase unbalance protection. To order, add Form **H30** (for selectable trip class 10 or 20 protection). For more information about Motor Logic overload relays, see pages 16-83 and 16-102.

#### New!) TeSys T Motor Management System (NEMA Sizes 1–6)

TeSys T is a flexible system that integrates seamlessly into your automation system through five major communication protocols. TeSys T can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. For additional information about TeSys T Motor Management System, see pages 16-84 to 16-88 and page 16-103.

#### Table 16.119:

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp		Open Type		NEM General I Enclo	Purpose	Watertight, Brusl Stainles: Enclos (Sizes (	Dusttight hed s Steel sure	CI	ass I, Gro	7 & 9 ♦ Location oups C & ups E, F	D	Dustt Drip Indust	12/3R★ ight & stight rial Use osure
	Sign			Vertical Type	Horizontal Type	\$ Price	Туре	\$ Price	Туре	\$ Price	Bolted Type	\$ Price	SPIN- TOP™ Type	\$ Price	Туре	\$ Price
00	9	200 230 460 575	1-1/2 1-1/2 2 2		SAO16■	926.	SAG16■	989.	Use Size 0		Use Size 0		Use Size 0		Use Size 0	
0	18	200 230 460 575	თ თ 5 5	SBO10■	SBO4■	1097.	SBG4■	1160.	SBW14■	1814.	SBT49■	3794.	SBR9■	4742.	SBA4■	1416.
1	27	200 230 460 575	7-1/2 7-1/2 10 10	SCO7■	SCO8■	1241.	SCG8■	1331.	SCW14■	2241.	SCT49■	3978.	SCR9■	4976.	SCA4■	1587.
2	45	200 230 460 575	10 15 25 25	SDO1■	SDO2■	2349.	SDG2■	2583.	SDW11■	4064.	SDT43■	6642.	SDR3■	8064.	SDA1■	3011.
3	90	200 230 460 575	25 30 50 50	SEO1■	SEO2■	3902.	SEG2■	4307.	SEW11■	6501.	I	_	_	_	SEA1■	5247.
4	135	200 230 460 575	40 50 100 100	SFO1■	SFO3■	9530.	SFG3■	10274.	SFW11■	14148.	1111			_	SFA1■	11727.
5	270	200 230 460 575	75 100 200 200	SGO1■	SGO3■	18309.	SGG3■	22602.	SGW11■	25734.	1111	_		_	SGA1■	25734.
6	540	200 230 460 575	150 200 400 400		SHO1■	43205.	SHG1■	50331.	SHW1■	57452.	1111	_		_	SHA1■	54176.
7	810	200 230 460 575	- 300 600 600	_ _ _ _	SJO1■	61250.	SJG1■	68736.	SJW1■	75497.		_	_ _ _	_	SJA1■	72221.



NEMA 7 and 9 bolted are not UL listed.



NEMA Sizes 00, 0, 1 Reversing Starter (Vertical Type)

NEMA 12 enclosure may be field modified for outdoor non-corrosive and non-service-entrance-rated application; see page 16-95 for more information.

#### **Full Voltage Reversing** Starters—NEMA Style

#### Table 16.120: 600 Vac Maximum-50-60 Hz

Note that prices shown do not include thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Type of Motor	(	Open Type		NEM/ General P Enclos	urpose	NEMA 4 Waterti Dustti Brushed S Steel End	ght, ght tainless	CI	azardou: ass I, Gr	7 & 9 ■ s Locations oups C & D oups E, F & G		NEMA 1 Dusttic Dripti Industri Enclos	ght & ight al Use
					Vertical Type	Horizontal Type	\$ Price	Туре	\$ Price	Туре	\$ Price	Bolted Type	\$ Price	SPIN TOP™ Type	\$ Price	Туре	\$ Price
2-Pole	Single Phase	—1 Therr	nal Unit Re	quired													
00	9	115 230	1/3 1	Cinala	_	SAO13▲	863.	SAG13▲	923.	Use Siz	ze 0	Use Siz	ze 0	Use Siz	e 0	Use Si	ize 0
0	18	115 230	1 2	Single Phase 3-Wire	SBO7▲	SBO1▲	1034.	SBG1▲	1094.	SBW11▲	1751.	SBT46▲	3722.	SBR6▲	4656.	SBA1▲	1350.
1	27	115 230	2	0 11110	SCO1▲	SCO2▲	1175.	SCG2▲	1265.	SCW11▲	2177.	SCT46▲	3909.	SCR6▲	4883.	SCA1▲	1521.
3-Pole	Single Phase	—1 Therr	nal Unit Re	quired													
00	9	115 230	1/3 1	4-Wire RepInd.	=	SAO14▲	891.	SAG14▲	953.	Use Si	ze 0	Use Siz	ze 0	Use Siz	e 0	Use Si	ize 0
	9	115 230	1/3 1	4-Wire Split Ph.		SAO15▲	594.	SAG15▲	635.	Use Siz	ze 0	Use Siz	ze 0	Use Siz	e 0	Use Si	ize 0
0	18	115 230	1 2	4-Wire RepInd.	SBO8▲	SBO2▲	1062.	SBG2▲	1124.	SBW12▲	1778.	SBT47▲	3752.	SBR7▲	4692.	SBA2▲	1380.
U	10	115 230	1 2	4-Wire Split Ph.	SBO9▲	SBO3▲	1062.	SBG3▲	1124.	SBW13▲	1778.	SBT48▲	3752.	SBR8▲	4692.	SBA3▲	1380.
1	27	115 230	2 3	4-Wire Rep.Ind.	SCO3▲	SCO4▲	1205.	SCG4▲	1295.	SCW12▲	2205.	SCT47▲	3942.	SCR7▲	4932.	SCA2▲	1551.
'	21	115 230	2 3	4-Wire Split Ph.	SCO5▲	SCO6▲	1205.	SCG6▲	1295.	SCW13▲	2205.	SCT48▲	3942.	SCR8▲	4932.	SCA3▲	1551.
4-Pole	Polyphase—	2 Therma	Units Requ	uired													
0	18	200 230 460 575	3355		SBO11▲	SBO5▲	1382.	SBG5▲	1443.	SBW15▲	2100.	Consi Schneider CCC (1-888-778	Electric at	SBR10▲	5133.	SBA5▲	1670.
1	27	200 230 460 575	7-1/2 7-1/2 10 10		SCO9▲	SCO10▲	1566.	SCG10▲	1629.	SCW15▲	2541.	Consi Schneider CCC (1-888-778	Electric at	SCR10▲	5396.	SCA5▲	1886.
2	45	200 230 460 575	10 15 25 25	2 Phase 4-Wire	ı	SDO4▲	2948.	SDG4▲	3182.	SDW12▲	4748.	Consi Schneider CCC (1-888-778	Electric at	SDR4▲	9248.	SDA2▲	3609.
3	90	200 230 460 575	25 30 50 50		İ	SEO4▲	4886.	SEG4▲	5318.	SEW12▲	7482.	_	_	_	_	SEA2▲	6228.
4	135	200 230 460 575	40 50 100 100		_	SFO4▲	12207.	SFG4▲	12981.	SFW12▲	16883.			_	_	SFA2▲	14462.

- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below. NEMA 7 and 9 bolted are not UL listed.
- NEMA 12 enclosure may be field modified for outdoor non-corrosive and non-service-entrance-rated application; see page 16-95 for more information.

#### Table 16.121: Coil Voltage Codes

Volt	age	Code	\$ Price Adder
60 Hz	50 Hz	Code	\$ Frice Adder
24▼★ 120▼ 208 240 277 480 600 Specify	110 220 440 550 Specify	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8736SCO1U01S).
- Note:

These voltage codes must include Form S (supplied at no charge) (i.e., order as 8736SBO7V02S). For voltage codes used with control transformers, see page 16-101. Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions . .....page 16-48 Factory Modifications (Forms) . . . . . . . . . . . . page 16-100 Replacement Parts (Class 9998) page 16-105 

#### **Approximate Dimensions**

Table 16.122: Open Type—2 or 3-Pole Only

Olean	NEMA	<b>T</b>	No. on the or	Figure						Dime	nsions—lı	nches						Weight
Class	Size	Туре	Mounting	Number	Α	В	С	D	E	F	G	Н	ı	J	K	L	M	(lb)
	00	SAO	Horizontal	1	7-1/8	5	5-5/16	1	1	3-13/32	15/32	4-11/32	3/16	5-1/2	29/32	ı	_	12
	0, 1	SBO, SCO	Horizontal Vertical	1 1▲	7-1/8 5-15/32	5 9-7/32	5-5/16 5-5/16	 5-1/2	 7/32	3-13/32	15/32 39/64	4-11/32 8	3/16 39/64	5-1/2 5-1/32	29/32 7/32		_	12 12
	2	SDO	Horizontal Vertical	1 1▲	9 6-3/4	6-7/8 11-3/8	6-1/32 6-1/32	<u> </u>	1/4	4-1/2 —	3/8 1/2	5-5/8 10-3/8	1/4 1/2	6 1/4	1-1/2 1/4	_	_	16 16
8702	3	SEO	Horizontal Vertical	1 1▲	12-23/32 7-13/64	7-31/32 19	7 7	11-3/4 6-1/4	31/64 31/64	_	31/64 1-1/64	7 17	31/64 63/64	11-3/4 6-1/4	31/64 31/64	_	_	35 35
6702	4	SFO	Horizontal Vertical	1 1▲	14-1/4 7-31/32	11-11/16 23-29/32	7 7	13-1/4 7	1/2 31/64	_	1/2 1-13/16	8 20-1/4	1-27/32 1-3/16	13-1/4 7	1/2 31/64	_	_	45 45
	5	SGO	Horizontal Vertical	1 1▲	19-5/16 10-3/4	16-3/16 34-13/32	9-3/8 9-3/8	18 9-1/2	21/32 5/8	_	1-1/32 1-1/4	14 32	1-5/32 1-5/32	18 9-1/2	21/32 5/8	_	_	98 98
	6	SHO	Horizontal	1	22-3/8	28-3/64	9-33/64	18	40/64	_	3-53/64	21-3/16	3-1/32	18	49/64	_	_	195
	7	SJO	Horizontal	1	24-1/4	37-1/4	13-13/16	19-3/4	1-33/64	_	_	30	_	-	-	-	_	310
	00	SAO	Horizontal	2	7-1/8	6-29/32	5-5/16	I	I	3-13/32	15/32	4-11/32	6-7/32	4-17/32	5-1/16	21/32	_	13
	0, 1	SBO, SCO	Horizontal Vertical	2 2▲	7-1/8 5-15/32	6-29/32 11-33/64	5-5/16 5-5/16	 5-1/32	 7/32	3-13/32	15/32 39/64	4-11/32 8	6-7/32 10-45/64	4-17/32 2-33/64	5-1/16 5-1/16	21/32 7/32	 5-1/32	13 13
	2	SDO	Horizontal Vertical	2 2▲	9 6-3/4	8-1/2 13-31/64	6-1/32 6-1/32	— 6-1/4	1/4	4-1/2 —	3/8 25/32	5-5/8 10-3/8	7-1/2 12-31/32	5 3-1/8	5-5/32 5-5/32	1-1/2 1/4	<u></u>	18 18
8736	3	SEO	Horizontal Vertical	2 2▲	12-23/32 7-5/16	11-23/32 22-1/4	7 7	11-3/4 6-1/4	31/64 31/64	_	31/64 1-1/64	10-3/4 20-3/4	10-3/4	11-3/4 6-1/4	6-1/4 6-1/4	31/64 31/64	11-3/4 6-1/4	38 38
0730	4	SFO	Horizontal Vertical	2 2▲	14-1/4 7-31/32	14-19/32 26-13/16	7 7	13-1/4 7	1/2 31/64	1 1	1-27/32 1-27/32	12-1/4 24-1/2	12-1/4	13-1/4 4-3/64	6-1/4 6-1/4	1/2 31/64	13-1/4 7	48 48
	5	SGO	Horizontal Vertical	2 2▲	19-5/16 10-3/4	20-29/32 39-5/32	9-3/8 9-3/8	18 9-1/2	21/32 21/32	1 1	1-9/32 1-9/32	19 371/4	19 37-1/4	18 9-1/2	6-5/8 6-5/8	5/8 5/8	18 9-1/2	115 115
	6	SHO	Horizontal	2	22-3/8	28-3/64	9-33/64	18	44/64	ı	3-53/64	21-3/16	3-1/32	18	49/64	I	_	200
	7	SJO	Horizontal	1	24-1/4	37-1/4	13-13/16	19-3/4	1-33/64	ı		30	_	-	_	_	_	315

Vertical type design differs from that shown on the corresponding NEMA size horizontal type figure, but dimensions listed apply to that figure.

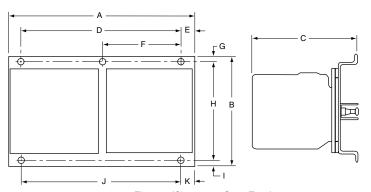


Figure 1 (Class 8702 Open Type)

В Ĥ RESET

Figure 2 (Class 8736 Open Type)

#### Table 16.123: NEMA 1 (Class 8702 and 8736)

NEMA				Dim	ensions	-Inches					Wei (II	
Size	А	В	8702	8736	D	Е	F	G	н	1	8702	8736
00, 0 <b>♦</b> 1 ■	11-7/8	11-7/8	7-13/32	7-17/32	9-3/4	1-1/16	1-1/16	9-3/4	1-1/16	5/16	16	17
2■	14-7/8	14-1/8	7-9/16	7-21/32	12-3/4	1-1/16	1-1/16	12	1-1/16	5/16	24	25
3 <b>♦</b> 4 <b>♦</b>	18-5/32	29-5/32	9-1/4	9-1/4	15-1/2	1-21/64	1-21/64	26-1/2	1-21/64	7/16	95	98
5	35-7/32	46-7/32	12-13/16	12-15/16	31	2-7/64	2-7/64	42	2-7/64	9/16	298	315
6	36-7/32	62-7/32	19-1	5/32			Floor Mou	ıntina			400	405
7	34-1/2	93	23-	1/2			i iooi iviou	ii iui iy.			_	_

Standard enclosure has space for a fused control transformer, Form F4T, on Sizes 0-2, except for Size 0 & 1 4-Pole devices.

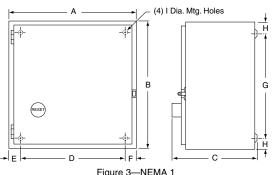


Figure 3—NEMA 1

16 NEMA/DEFINITE PURPOSE TYPE

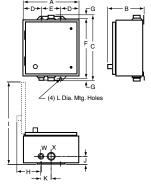
<sup>3-</sup>Pole only.

by Schneider Electric www.schneider-electric.us

#### **Approximate Dimensions**

#### Table 16.124: NEMA 4 & 4X—Stainless Steel ◆

						Dim	ensions	lnob						Hub	Dia.	We	ight
NEMA Size	Class Number					Dilli	ensions	—IIICI	es					w	X Top	(11	b)
3120	Number	A	В	С	D	E	F	G	н	100	J	K	L	Bot. Only	0	8702	8736
0▲ 1▲	8702 & 8736	12-5/8	7-13/16	14-11/16	2-9/16	7-1/2	13-1/2	19/32	3-7/8	18-13/32	1-21/32	2-5/16	5/16	3/4	1	25	26
2▲	8702 & 8736	14-7/8	8-1/4	15-3/4	2-9/16	9-3/4	15	3/8	3-7/8	20-7/8	1-23/32	2-5/8	5/16	3/4	1-1/2	33	35
3■	8702	18-5/32	8-3/4	32-7/32	3-5/64	12	30-1/2	7/8	3-11/16	26-23/32	2-9/16	3-3/16	7/16	3/4	2-1/2	96	
4■	8736	18-5/32	9-9/16	32-7/32	3-5/64	12	30-1/2	7/8	4-1/2	26-23/32	2-9/16	3-3/16	7/16	3/4	2-1/2	ı	99
5	8702	35-7/32	12-1/8	49-7/32	4-7/64	27	48	5/8	4-19/32	45-13/16	2-31/32	3-1/2	9/16	3/4	3-1/2	300	_
5	8736	35-7/32	12-15/16	49-7/32	4-7/64	27	48	5/8	5-13/32	45-13/16	2-31/32	3-1/2	9/16	3/4	3-1/2	_	317
6	8702 & 8736	36-7/32	19-15/32	70-1/8					El	or Mountir		·				500	505
7	8702 & 8736	34-1/2	23-1/2	101					FIC	JOI IVIOUTIUI	ıy					_	_



NEMA 4 & 4X Stainless Steel

- 3-Pole only.
- Size 6 & 7 are sheet steel enclosures and are rated NEMA 4 only.

#### Table 16.125: NEMA 7 and 9 Bolted Enclosure

See page 16-27 for drawing of enclosure.

NEMA	Time				Dime	nsions—	Inches★				Wt.
Size	Туре	G	Н	J	K	L	N	P	Q, R	S, T, U, V	(lb)
0–2	SBT SCT SDT	14-1/4	27-5/8	9-1/2	12-1/4	19-1/4	9-5/8	11-1/2	2-3/8	3-1/8	115
3–4	SET SFT	24-1/2	45-5/8	13-3/4	22-1/2	27-1/2	13-3/4	15-3/8	3-7/16	4	180

Dimensions shown for 2 or 3-Pole devices only.

#### Table 16.126: NEMA 7 & 9 SPIN TOP™ Enclosure

See page 16-26 for drawing of enclosure.

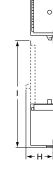
NEMA	Туре										Dimens	ions—Ir	ches										Wt.
Size	туре	Α	В▼	B△	C▼	C△	D	E▼	E△	F	G▼	G△	H▼	H△	J▼	J∆	K	L	M	N	Р	R	(lb)
0-1	SBR SCR	12	41-1/16	46-1/8	68-1/16	79-1/8	16-3/4	7-1/4	12-1/4	7-11/16	26-1/8	26-1/8	3	9	24	24	8-1/2	2-1/16	9-3/8	5-1/4	1-1/2	3/8	70
2	SDR	16-1/8	48-1/2	50-1/2	81-1/2	85	20-1/4	12-1/8	9-1/8	8-5/8	27-3/4	32-3/4	8	4-1/2	25	30	12	2-5/8	11	5-1/2	2-1/2	3/8	100
3	SER									Consult Sch	neider l	Electric (	CCC at (	1-888-77	78-2733	)							

Without control transformer.

#### Table 16.127: NEMA 12/3R

NEMA Size	Class Number				D	imensior	ns—Inche	s					ight b)
Size	Number	Α	В	С	D	E	F	G	Н	1	J	8702	8736
0□ 1□	8702 & 8736	11-7/8	7-3/4	13-3/4	2-9/16	6-3/4	12-3/4	1/2	3-21/32	18-1/8	5/16	23	24
20	8702 & 8736	14-7/8	7-7/8	16	2-9/16	9-3/4	15	1/2	3-21/32	21-1/4	5/16	31	32
3\$	8702	18-5/32	9-1/4	31-1/2	3-5/64	12	30-1/2	1/2	3-11/16	26-23/32	7/16	96	_
4◊	8736	18-5/32	9-9/16	31-1/2	3-5/64	12	30-1/2	1/2	4-1/2	26-23/32	7/16	_	99
5	8702	35-7/32	13-1/8	49	4-1/8	27	48	1/2	5-5/16	45-7/8	9/16	302	_
5	8736	35-7/32	13-15/16	49	4-1/8	27	48	1/2	6-1/8	45-7/8	9/16	_	319
6	8702 & 8736	36-7/32	19-15/32	62-7/32			-	a a u Marrosti				490	495
7	8702 & 8736	34-1/2	23-1/2	93			FIG	oor Mount	ing			_	_

Standard enclosure has space for a fused control transformer, Form F4T, on Sizes 0-2, except for Size 0 & 1 4-Pole devices.
3-Pole only.



•D**→**|**←**E**→**|**←**D**→** 

(4) J Dia. Mtg. Holes

NEMA 12

With control transformer (Form F4T).

#### BQUARE D

#### Class 8702 / Refer to Catalog 8502CT9701

by Schneider Electric www.schneider-electric.us



Class 8702 Type W Reversing Vacuum Contactors are used to switch capacitors, transformers and electric motors where overload protection is separately provided. Type W reversing vacuum contactors are designed for operation at 600 Volts, 50/60 Hz.

**Auxiliary Contacts**—An auxiliary contact block, Class 9999 Type WX11, with one normally open contact and one normally closed contact, is used with Size 4, 5 and 6 vacuum contactors. Additional auxiliary contact units may be added to the Size 4 and 5 reversing contactors in the field. A maximum of 2 units may be added to the Size 4; a maximum of 1 unit may be added to the Size 5.

**Termination Means**—The Size 4 reversing vacuum contactor is supplied with line and load side lugs. The Size 5 and 6 reversing vacuum contactors are supplied without line and load side lugs.

Table 16.128: Class 8702 Full Voltage Reversing Vacuum Contactors (Horizontal Only) 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

NEMA	Enclosed	Motor Maximum		Open Typ	oe e
Size	Ampere Rating	Voltage	Horsepower	Туре	\$ Price
4	135	200 230 380 460 575	40 50 75 100 100	WFO3 <b>▲</b>	10659.00
5	270	200 230 380 460 575	75 100 150 200 200	WGO3 <b>▲</b>	18678.00
6	540	200 230 380 460 575	150 200 300 400 400	WHO3V <b>▲</b>	45666.00

<sup>▲</sup> Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed on page 16-51. Replacement coils are listed on page 16-28.

Table 16.129: Class 9998—Replacement Coils for Class 8702 Reversing Contactors

Size	Type	Poles	Class and	(Complete Coil Nur	Suffix I mber Consists of Cla	Number ss and Type Followed	l by Suffix Number)	\$ Price
3126	Туре	rules	Type	120 Volts 110 Volts	240 Volts 220 Volts	480 Volts 440 Volts	600 Volts 550 Volts	\$ Frice
4 5 6	WF WG WH	All All All	9998WF 9998WG 9998WH	120 120 120	240 240 240	480 480 480	600 600 600	732.00 1724.00 1904.00

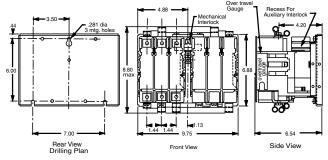
Table 16.130: Class 9999—Vacuum Starter Kits

For Use With		Kit Description	Class 9999	\$ Price
Туре	Size	Kit Description	Туре	\$ Price
WF-WG WH	4–5 6	Auxiliary Contacts, Non-Convertible 1 N.O. & 1 N.C. Isolated Contacts	WX11	122.00
WF WG-WH	4 5–6	Coil Circuit Auxiliary Contacts 1 N.O. & 1 N.C. Isolated Contacts, Delayed Break 1 N.C. Isolated Contact	WCX11 WLX01	114.00 503.00
WG	5	Lug Kits (6) lugs included	LUW5	275.00

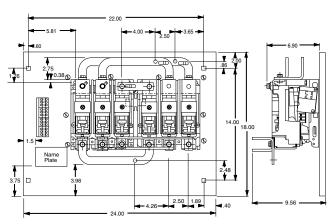
Table 16.131: Coil Voltage Codes

			-					
Volts	110	120	220	240	440	480	550	600
50 Hz	V02		V03		V06		V07	
60 Hz		V02		V03		V06		V07

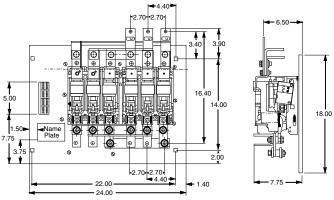
#### **Approximate Dimensions**



Size 4 Reversing Contactor Outline with Lugs Class 8702 WF



Size 5 Reversing Contactor Outline without Lugs Class 8702 WG



Size 6 Reversing Contactor Outline without Lugs Class 8702 WH



by Schneider Electric www.schneider-electric.us

Class 8738 and 8739 Type S reversing combination starters combine the requirements of motor overload and short circuit protection into one convenient package. Type S reversing combination starters are manufactured in accordance with NEMA standards, and are UL Listed (although some Form numbers may not be listed—contact your nearest Square D/Schneider Electric sales office for further information). Class 8738 and 8739 reversing combination starters are designed to operate at 600 Vac, 50–60 Hz—and are supplied with melting alloy overload relays as standard. For Class J fuses, use form Y1072 (No Charge).

#### Class 8738 Fusible Disconnect Switch Type

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.132: Class 8738 Full-Voltage Type, Fusible (With Class H Fuse Clips) Reversing with Melting Alloy Overload Relays—3-Pole Polyphase—600 Vac Maximum—50-60 Hz

	Rat	ings		NEMA General Pi	1 1	Watertight and	NEMA 4 & 4X Watertight and Dusttight		4X Dusttight	NEMA 12/3R▲ Dusttight and Driptight Industrial Use Enclosure			
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Fuse Clip Size	Enclosure		Enclosure Stainless Steel (304)		and Corrosion Resistant Polyester Enclosure		With External Reset	Without External Reset	\$ Price	
Voltage)	phase		(A)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре		
	3	0	30	SBG12■	2169.00	SBW12■	3909.00	SBW22■	4491.00	SBA22■	SBA12■	2654.00	
	5	1	30	SCG12■	2313.00	SCW12■	4050.00	SCW22■	4656.00	SCA22■	SCA12■	2798.00	
	7-1/2		60	SCG13■	2340.00	SCW13■	4077.00	SCW23■	4692.00	SCA23■	SCA13■	2825.00	
200 (208)	10	2	60	SDG12■	3851.00	SDW12■	6501.00	SDW22■	7149.00	SDA22■	SDA12■	4478.00	
( /	20	3	100	SEG15■	6357.00	SEW15■	11001.00		_	SEA25■	SEA15■	7182.00	
	40	4	200	SFG15■	13409.00	SFW15■	19277.00		_	SFA25■	SFA15■	15672.00	
	75	5	400	SGG15■	25605.00	SGW15■	40589.00	1	_	SGA25■	SGA15■	30990.00	
	3	0	30	SBG12■	2169.00	SBW12■	3909.00	SBW22■	4491.00	SBA22■	SBA12■	2654.00	
	5	1	30	SCG12■	2313.00	SCW12■	4050.00	SCW22■	4656.00	SCA22■	SCA12■	2798.00	
	7-1/2	'	60	SCG13■	2340.00	SCW13■	4077.00	SCW23■	4692.00	SCA23■	SCA13■	2825.00	
230 (240)	15	2	60	SDG12■	3851.00	SDW12■	6501.00	SDW22■	7149.00	SDA22■	SDA12■	4478.00	
( - /	25	3	100	SEG15■	6357.00	SEW15■	11001.00	_	_	SEA25■	SEA15■	7182.00	
	50	4	200	SFG15■	13409.00	SFW15■	19277.00	_	_	SFA25■	SFA15■	15672.00	
	100	5	400	SGG15■	25605.00	SGW15■	40589.00	_	_	SGA25■	SGA15■	30990.00	
	5	0	30	SBG13■	2199.00	SBW13■	3936.00	SBW23■	4527.00	SBA23■	SBA13■	2682.00	
	10	1	30	SCG14■	2340.00	SCW14■	4077.00	SCW24■	4692.00	SCA24■	SCA14■	2825.00	
	15	2	30	SDG16■	3873.00	SDW16■	6515.00	SDW26■	7163.00	SDA26■	SDA16■	4491.00	
460 (480)	25	_	60	SDG14■	3893.00	SDW14■	6543.00	SDW24■	7199.00	SDA24■	SDA14■	4521.00	
(100)	50	3	100	SEG13■	6443.00	SEW13■	11087.00	_	_	SEA23■	SEA13■	7268.00	
	100	4	200	SFG13■	13464.00	SFW13■	19332.00	_	_	SFA23■	SFA13■	15728.00	
	200	5	400	SGG13■	26204.00	SGW13■	41187.00	_	_	SGA23■	SGA13■	31589.00	
	5	0	30	SBG13■	2199.00	SBW13■	3936.00	SBW23■	4527.00	SBA23■	SBA13■	2682.00	
	10	1	30	SCG14■	2340.00	SCW14■	4077.00	SCW24■	4692.00	SCA24■	SCA14■	2825.00	
	15	2	30	SDG16■	3873.00	SDW16■	6515.00	SDW26■	7163.00	SDA26■	SDA16■	4491.00	
575 (600)	25		60	SDG14■	3893.00	SDW14■	6543.00	SDW24■	7199.00	SDA24■	SDA14■	4521.00	
(000)	50	3	100	SEG13■	6443.00	SEW13■	11087.00	_	_	SEA23■	SEA13■	7268.00	
	100	4	200	SFG13■	13464.00	SFW13■	19332.00	_	_	SFA23■	SFA13■	15728.00	
	200	5	400	SGG13■	26204.00	SGW13■	41187.00	_	_	SGA23■	SGA13■	31589.00	

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. For class J fuse clip, use Form Y1072 (no charge).

Discount

CP1

#### Table 16.133: Coil Voltage Codes

Volt	tage	Code	\$ Price Adder		
60 Hz	50 Hz	Code	\$ Price Adder		
24★◆ 120★ 208 240 277 480 600 Specify	110 220 440 550 Specify	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60		

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions
Factory Modifications (Forms) page 16-100
Replacement Parts (Class 9998) page 16-105
Type S Accessories (Class 9999) page 16-108

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

<sup>24</sup> V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8738SBG12V01S).

These voltage codes must include Form S (supplied at no charge) (i.e., order as 8738SC13V02S).

For voltage codes used with control transformers, see page 16-101

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.134: Non-Fusible Disconnect Switch Type—Full-Voltage Type Reversing with Melting Alloy Overload Relays

Ratings			NEMA 1 General Purpose		NEMA 4 & 4X Watertight and Dusttight		NEMA 4X Watertight, Dusttight and Corrosion Resistant		NEMA 12/3R▲ Dusttight and Driptight Industrial Use Enclosure			
Motor Voltage (Starter	Voltage Hp NEMA Clip (Starter Poly- Size Size		Size	Enclos	ure	Enclosure Stainless Steel (304)		Polyester Enclosure		With External Reset	Without External Reset	\$ Price
Voltage)	Phase		(A)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре	
	3	0	None	SBG11■	2127.00	SBW11■	3866.00	SBW21■	4442.00	SBA21■	SBA11■	2613.00
	7-1/2	1	None	SCG11■	2271.00	SCW11■	4008.00	SCW21■	4607.00	SCA21■	SCA11■	2754.00
200	10	2	None	SDG11■	3794.00	SDW11■	6443.00	SDW21■	7083.00	SDA21■	SDA11■	4419.00
(208)	25	3	None	SEG11■	6287.00	SEW11■	10929.00	_		SEA21■	SEA11■	7113.00
	40	4	None	SFG11■	13166.00	SFW11■	19034.00	_	_	SFA21■	SFA11■	15431.00
	75	5	None	SGG11■	25691.00	SGW11■	40674.00	_	_	SGA21■	SGA11■	31076.00
	3	0	None	SBG11■	2127.00	SBW11■	3866.00	SBW21■	4442.00	SBA21■	SBA11■	2613.00
	7-1/2	1	None	SCG11■	2271.00	SCW11■	4008.00	SCW21■	4607.00	SCA21■	SCA11■	2754.00
230	15	2	None	SDG11■	3794.00	SDW11■	6443.00	SDW21■	7083.00	SDA21■	SDA11■	4419.00
(240)	30	3	None	SEG11■	6287.00	SEW11■	10929.00	_	_	SEA21■	SEA11■	7113.00
	50	4	None	SFG11■	13166.00	SFW11■	19034.00	_	_	SFA21■	SFA11■	15431.00
	100	5	None	SGG11■	25691.00	SGW11■	40674.00	_	_	SGA21■	SGA11■	31076.00
	5	0	None	SBG11■	2127.00	SBW11■	3866.00	SBW21■	4442.00	SBA21■	SBA11■	2613.00
	10	1	None	SCG11■	2271.00	SCW11■	4008.00	SCW21■	4607.00	SCA21■	SCA11■	2754.00
460	25	2	None	SDG11■	3794.00	SDW11■	6443.00	SDW21■	7083.00	SDA21■	SDA11■	4419.00
(480)	50	3	None	SEG11■	6287.00	SEW11■	10929.00	_	_	SEA21■	SEA11■	7113.00
	100	4	None	SFG11■	13166.00	SFW11■	19034.00	_	_	SFA21■	SFA11■	15431.00
	200	5	None	SGG11■	25691.00	SGW11■	40674.00	_	_	SGA21■	SGA11■	31076.00
<u> </u>	5	0	None	SBG11■	2127.00	SBW11■	3866.00	SBW21■	4442.00	SBA21■	SBA11■	2613.00
	10	1	None	SCG11■	2271.00	SCW11■	4008.00	SCW21■	4607.00	SCA21■	SCA11■	2754.00
575	25	2	None	SDG11■	3794.00	SDW11■	6443.00	SDW21■	7083.00	SDA21■	SDA11■	4419.00
(600)	50	3	None	SEG11■	6287.00	SEW11■	10929.00	_	_	SEA21■	SEA11■	7113.00
	100	4	None	SFG11■	13166.00	SFW11■	19034.00	_	_	SFA21■	SFA11■	15431.00
	200	5	None	SGG11■	25691.00	SGW11■	40674.00	_	_	SGA21■	SGA11■	31076.00

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown on page 16-53.

Table 16.135: Fusible Disconnect Switch Type With Class R Fuse Clips—100,000 AIC Rating

	Rati	ngs			NEMA 1 General Purpose		NEMA 4 & 4X Watertight and Dusttight		NEMA 4X Watertight, Dusttight and Corrosion Resistant		NEMA 12/3R♦ Dusttight and Driptight Industrial Use Enclosure		
Motor Max. Voltage Hp (Starter Poly-		NEMA Size	Fuse Clip Size	Enclos		Ěnclos Stainless St		Polyes Enclosu	ter	With External Reset	Without External Reset	\$ Price	
Voltage)	Phase		(A)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	Туре		
	3	0	30	SBG32★	2192.00	SBW32★	3929.00	SBW42★	4521.00	SBA42★	SBA32★	2676.00	
	5		30	SCG32★	2334.00	SCW32★	4071.00	SCW42★	4685.00	SCA42★	SCA32★	2817.00	
	7-1/2	1	60	SCG33★	2363.00	SCW33★	4100.00	SCW43★	4706.00	SCA43★	SCA33★	2847.00	
200 (208)	10	2	60	SDG32★	3873.00	SDW32★	6521.00	SDW42★	7176.00	SDA42★	SDA32★	4499.00	
(200)	20	3	100	SEG35★	6399.00	SEW35★	11043.00	_	-	SEA45★	SEA35★	7226.00	
	40	4	200	SFG35★	13451.00	SFW35★	19319.00	_	-	SFA45★	SFA35★	15714.00	
	75	5	400	SGG35★	25707.00	SGW35★	40689.00	_	I —	SGA45★	SGA35★	31089.00	
	3	0	30	SBG32★	2192.00	SBW32★	3929.00	SBW42★	4521.00	SBA42★	SBA32★	2676.00	
	5		30	SCG32★	2334.00	SCW32★	4071.00	SCW42★	4685.00	SCA42★	SCA32★	2817.00	
	7-1/2	1	60	SCG33★	2363.00	SCW33★	4100.00	SCW43★	4706.00	SCA43★	SCA33★	2847.00	
230 (240)	15	2	60	SDG32★	3873.00	SDW32★	6521.00	SDW42★	7176.00	SDA42★	SDA32★	4499.00	
(2.0)	25	3	100	SEG35★	6399.00	SEW35★	11043.00	_	I —	SEA45★	SEA35★	7226.00	
	50	4	200	SFG35★	13451.00	SFW35★	19319.00	_	_	SFA45★	SFA35★	15714.00	
	100	5	400	SGG35★	25707.00	SGW35★	40689.00	_	I — I	SGA45★	SGA35★	31089.00	
	5	0	30	SBG33★	2219.00	SBW33★	3959.00	SBW43★	4548.00	SBA43★	SBA33★	2705.00	
	10	1	30	SCG34★	2363.00	SCW34★	4100.00	SCW44★	4712.00	SCA44★	SCA34★	2847.00	
400	15	2	30	SDG36★	3893.00	SDW36★	6534.00	SDW46★	7191.00	SDA46★	SDA36★	4514.00	
460 (480)	25	2	60	SDG34★	3915.00	SDW34★	6564.00	SDW44★	7433.00	SDA44★	SDA34★	4541.00	
(400)	50	3	100	SEG33★	6485.00	SEW33★	11129.00		_	SEA43★	SEA33★	7311.00	
	100	4	200	SFG33★	13508.00	SFW33★	19376.00	ı	_	SFA43★	SFA33★	15771.00	
	200	5	400	SGG33★	26303.00	SGW33★	41288.00	l	_	SGA43★	SGA33★	31688.00	
	5	0	30	SBG33★	2219.00	SBW33★	3959.00	SBW43★	4548.00	SBA43★	SBA33★	2705.00	
	10	1	30	SCG34★	2363.00	SCW34★	4100.00	SCW44★	4712.00	SCA44★	SCA34★	2847.00	
E7E	15	2	30	SDG36★	3893.00	SDW36★	6534.00	SDW46★	7191.00	SDA46★	SDA36★	4514.00	
575 (600)	25		60	SDG34★	3915.00	SDW34★	6564.00	SDW44★	7433.00	SDA44★	SDA34★	4541.00	
,000)	50	3	100	SEG33★	6485.00	SEW33★	11129.00	1	_	SEA43★	SEA33★	7311.00	
	100	4	200	SFG33★	13508.00	SFW33★	19376.00	1	_	SFA43★	SFA33★	15771.00	
	200	5	400	SGG33★	26303.00	SGW33★	41288.00			SGA43★	SGA33★	31688.00	

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information. Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown on page 16-53.

<sup>5.000</sup> AIC Rating

#### **Reversing Combination** Starters—NEMA Style

#### 3-Pole Polyphase—600 Vac Maximum—50-60 Hz

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Table 16.136: Full-Voltage Type, Reversing with Melting Alloy Overload Relays

Ratings			NEMA 1 General Purpose Enclosure		NEMA 4 & 4X Watertight and Dusttight Enclosure Stainless Steel (304) (Sizes 0-5)▲		NEMA 4X Watertight, Dusttight and Corrosion Resistant Polyester Enclosure		NEMA 12/3R■ Dusttight and Dripti Industrial Use Enclo		tight osure	
Motor Voltage (Starter Voltage)	Hp Range Poly- phase	NEMA Size	Circuit Breaker (See Page 7-32 for Breaker Adjustment Range)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset Type	Without External Reset Type	\$ Price
	1/4–3	0	HLL36030M71	SBG43♦	2555.	SBW43♦	4292.	SBW53♦	4932.	SBA53♦	SBA43♦	3038.
	1/4–5 7-1/2	1	HLL36030M71 HLL36050M72	SCG44♦ SCG45♦	2726.	SCW44♦ SCW45♦	4463.	SCW54♦ SCW55♦	5133.	SCA54♦ SCA55♦	SCA44♦ SCA45♦	3209.
	1-1/2–5 71/2–10	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	4350.	SDW42♦ SDW43♦	6998.	SDW52♦ SDW53♦	7695.	SDA52♦ SDA53♦	SDA42♦ SDA43♦	4976.
200 (208)	15–25	3	HLL36100M73	SEG42♦	6501.	SEW42♦	11142.	SEW52♦	12254.	SEA52♦	SEA42♦	7326.
(200)	30-40	4	JJL36250M75	SFG44♦	14718.	SFW44◆	20586.	SFW54♦	22644.	SFA54♦	SFA44♦	16982.
	50–60 75	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	29808.	SGW44♦ SGW45♦	44792.	_	_	SGA54 ♦ SGA55 ♦	SGA44♦ SGA45♦	35190.
	100 125–150	6	LJL36400M36 LJL36600M42	SHG43♦ SHG45♦	64274.	SHW43♦ SHW45♦	71396.	_	_	SHA53♦ SHA55♦	SHA43♦ SHA45♦	68120.
	1/4-3	0	HLL36030M71	SBG43♦	2555.	SBW43♦	4292.	SBW53♦	4932.	SBA53♦	SBA43♦	3038.
	1/4-7-1/2	1	HLL36030M71	SCG44♦	2726.	SCW44◆	4463.	SCW54♦	5133.	SCA54♦	SCA44◆	3209.
	1-1/2-7-1/2 10 15	2	HLL36030M71 HLL36050M72 HLL36100M73	SDG42♦ SDG43♦ SDG44♦	4350.	SDW42♦ SDW43♦ SDW44♦	6998.	SDW52♦ SDW53♦ SDW54♦	7695.	SDA52♦ SDA53♦ SDA54♦	SDA42♦ SDA43♦ SDA44♦	4976.
230 (240)	15–30	3	HLL36100M73	SEG42♦	6501.	SEW42♦	11142.	SEW52♦	12254.	SEA52♦	SEA42♦	7326.
(240)	40–50	4	JJL36250M75	SFG44♦	14718.	SFW44◆	20586.	SFW54♦	22644.	SFA54♦	SFA44♦	16982.
	60 75–100	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	29808.	SGW44♦ SGW45♦	44792.		_	SGA54 ♦ SGA55 ♦	SGA44♦ SGA45♦	35190.
. NEM	125–150 200	6	LJL36600M42 PLL34080M68	SHG45♦ SHG46♦	64274.	SHW45♦ SHW46♦	71396.		_	SHA55♦ SHA56♦	SHA45♦ SHA46♦	68120.

#### Table 16.137: Coil Voltage Codes

	•		
Vol	tage	Code	\$ Price Adder
60 Hz	50 Hz	Code	\$ Price Adder
24▼★ 120▼ 208 240 277 480 600 Specify		V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60

<sup>24</sup> V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8739SBG41V01S).

For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions	page 16-57
Factory Modifications (Forms)	page 16-100
Replacement Parts (Class 9998)	page 16-105
Type S Accessories (Class 9999)	nage 16-108

NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed below.

These voltage codes must include Form S (supplied at no charge) (i.e., order as 8739SCG41V02S).

Note:

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Table 16.138: Full-Voltage Type, Reversing with Melting Alloy Overload Relays

	Ra	atings		NEMA General Pr Enclos	urpose	NEMA 4 Waterti and Dus Enclos Stainless St (Sizes 0	ight ttight sure seel (304)	NEMA Waterti Dusttigh Corrosion R Polyester Er	ght, t and lesistant	NEMA 12/3R■ Dusttight and Driptight Industrial Use Enclosure			
Motor Voltage (Starter Voltage)	Hp Range Poly- phase	NEMA Size	Circuit Breaker (See Page 7-32 for Breaker Adjustment Range)	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset Type	Without External Reset Type	\$ Price	
	1/4–5	0	HLL36030M71	SBG43♦	2555.	SBW43♦	4292.	SBW53♦	4932.	SBA53♦	SBA43♦	3038.	
	1/4-10	1	HLL36030M71	SCG44♦	2726.	SCW44♦	4463.	SCW54♦	5133.	SCA54♦	SCA44♦	3209.	
	5–15 20–25	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	4350.	SDW42♦ SDW43♦	6998.	SDW52♦ SDW53♦	7695.	SDA52♦ SDA53♦	SDA42♦ SDA43♦	4976.	
460 (480)	20–25 30–50	3	HLL36050M72 HLL36100M73	SEG41♦ SEG42♦	6501.	SEW41♦ SEW42♦	11142.	SEW51♦ SEW52♦	12254.	SEA51♦ SEA52♦	SEA41 ♦ SEA42 ♦	7326.	
(400)	60-100	4	JLL36250M75	SFG44◆	14718.	SFW44♦	20586.	SFW54♦	22644.	SFA54♦	SFA44♦	16982.	
	125 150–200	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	29808.	SGW44♦ SGW45♦	44792.		_	SGA54 ♦ SGA55 ♦	SGA44♦ SGA45♦	35190.	
	250–350 400	6	LJL36600M42 PLL34080M68	SHG45♦ SHG46♦	64274.	SHW45♦ SHW46♦	71396.		_	SHA55♦ SHA56♦	SHA45♦ SHA46♦	68120.	
	1/4–5	0	HLL36030M71	SBG43♦	2555.	SBW43♦	4292.	SBW53♦	4932.	SBA53♦	SBA43♦	3038.	
	1/4-10	1	HLL36030M71	SCG44◆	2726.	SCW44◆	4463.	SCW54♦	5133.	SCA54♦	SCA44♦	3209.	
	5–20 25	2	HLL36030M71 HLL36050M72	SDG42♦ SDG43♦	4350.	SDW42♦ SDW43♦	6998.	SDW52♦ SDW53♦	7695.	SDA52♦ SDA53♦	SDA42♦ SDA43♦	4976.	
575 (600)	25–30 40–50	3	HLL36050M72 HLL36100M73	SEG41 ♦ SEG42 ♦	6501.	SEW41♦ SEW42♦	11142.	SEW51♦ SEW52♦	12254.	SEA51♦ SEA52♦	SEA41 ♦ SEA42 ♦	7326.	
(000)	60-100	4	JLL36250M75	SFG44♦	14718.	SFW44♦	20586.	SFW54♦	22644.	SFA54♦	SFA44♦	16982.	
	125–150 200	5	JLL36250M75 LJL36400M36	SGG44♦ SGG45♦	29808.	SGW44♦ SGW45♦	44792.		_	SGA54 ♦ SGA55 ♦	SGA44♦ SGA45♦	35190.	
	250 300–400	6	LJL36400M36 LJL36600M42	SHG43♦ SHG45♦	64274.	SHW43♦ SHW45♦	71396.		_	SHA53♦ SHA55♦	SHA43♦ SHA45♦	68120.	

Table 16.139: Coil Voltage Codes

	•					
Vol	tage	Code	\$ Price Adder			
60 Hz	50 Hz	Code	\$ Frice Adder			
24▼★ 120▼ 208 240 277 480 600 Specify	110 	V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60			

<sup>24</sup> V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8739SBG41V01S).

Note: For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions	page 16-57
Factory Modifications (Forms)	. page 16-100
Replacement Parts (Class 9998)	. page 16-105
Tyne S Accessories (Class 9999)	nage 16-108

NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.

NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

Coil voltage code must be specified to order this product. Refer to standard coil voltage codes listed below.

These voltage codes must include Form S (supplied at no charge) (i.e., order as 8739SCG41V02S).

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Table 16.140: Full-Voltage Type, Reversing with Melting Alloy Overload Relays

		Rating	gs		NEM. General F Enclos	urpose	NEMA 4 Watert and Dus Enclos Stainless S (Sizes (	ight sttight sure teel (304)	NEMA Waterti Dusttigh Corrosion F Polyester E	ight, it and Resistant	NEMA 12/3R■ Dusttight and Driptight Industrial Use Enclosure			
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Circuit Br	eaker	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset	Without External Reset	\$ Price	
Voltage)	phase	3126	Туре	Ampere Rating							Туре	Туре		
	2 3	0	HLL36015 HLL36020	15 20	SBG1 ♦ SBG3 ♦	2228.	SBW1 ♦ SBW3 ♦	3965.	SBW11♦ SBW13♦	4563.	SBA11♦ SBA13♦	SBA1 ♦ SBA3 ♦	2712.	
	5 7-1/2	1	HLL36035 HLL36050	35 50	SCG5♦ SCG2♦	2399.	SCW5♦ SCW2♦	4136.	SCW15♦ SCW12♦	4761.	SCA15♦ SCA12♦	SCA5♦ SCA2♦	2883.	
	10	2	HLL36060	60	SDG1♦	4022.	SDW1♦	6672.	SDW11♦	7340.	SDA11♦	SDA1♦	4649.	
200 (208)	15 20 25	3	HLL36100 HLL36125 HLL36150	100 125 150	SEG3♦ SEG1♦ SEG5♦	6501.	SEW3♦ SEW1♦ SEW5♦	11142.	SEW13♦ SEW11♦ SEW15♦	12254.	SEA13♦ SEA11♦ SEA15♦	SEA3♦ SEA1♦ SEA5♦	7326.	
	30 40	4	JLL36200 JLL36250	200 250	SFG3♦ SFG4♦	14718.	SFW3♦ SFW4♦	20586.	SFW13♦ SFW14♦	22644.	SFA13♦ SFA14♦	SFA3♦ SFA4♦	16982.	
	50 60–75	5	JLL36250 LLL36400E20	250 400	SGG6♦ SGG4♦	29808.	SGW6♦ SGW4♦	44792.			SGA16♦ SGA14♦	SGA6♦ SGA4♦	35190.	
	100–125 150	6	LLL36600E20 MJL36800	600 800	SHG4◆ SHG5◆	64274.	SHW4♦ SHW5♦	71396.		_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	68120.	
	2 3	0	HLL36015 HLL36020	15 20	SBG1 ♦ SBG3 ♦	2228.	SBW1 ♦ SBW3 ♦	3965.	SBW11♦ SBW13♦	4563.	SBA11♦ SBA13♦	SBA1 ♦ SBA3 ♦	2712.	
	5 7-1/2	1	HLL36035 HLL36045	35 45	SCG5♦ SCG6♦	2399.	SCW5♦ SCW6♦	4136.	SCW15♦ SCW16♦	4761.	SCA15♦ SCA16♦	SCA5♦ SCA6♦	2883.	
	10 15	2	HLL36060 HLL36090	60 90	SDG1♦ SDG7♦	4022.	SDW1♦ SDW7♦	6672.	SDW11♦ SDW17♦	7340.	SDA11♦ SDA17♦	SDA1 ♦ SDA7 ♦	4649.	
230 (240)	20 25–30	3	HLL36100 HLL36150	100 150	SEG3♦ SEG5♦	6501.	SEW3♦ SEW5♦	11142.	SEW13♦ SEW15♦	12254.	SEA13♦ SEA15♦	SEA3♦ SEA5♦	7326.	
	40 50	4	JLL36225 JLL36250	225 250	SFG1♦ SFG4♦	14718.	SFW1♦ SFW4♦	20586.	SFW11♦ SFW14♦	22644.	SFA11♦ SFA14♦	SFA1♦ SFA4♦	16982.	
	60 75 100	5	JLL36250 LLL36400E20 LLL36600E20	250 400 600	SGG6♦ SGG4♦ SGG2♦	29808.	SGW6♦ SGW4♦ SGW2♦	44792.		_	SGA16♦ SGA14♦ SGA12♦	SGA6♦ SGA4♦ SGA2♦	35190.	
	125 150–200	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	64274.	SHW4♦ SHW5♦	71396.	_	_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	68120.	

- NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

Table 16.141: Coil Voltage Codes

Volt	age	Code	\$ Price Adder					
60 Hz	50 Hz	Code	\$ Price Adder					
24▼★ 120▼ 208 240 277 480 600 Specify		V01 V02 V08 V03 V04 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60					

Note:

24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8739SBG1V01S).

These voltage codes must include Form S (supplied at no charge) (i.e., order as 8739SCG5V02S).

For voltage codes used with control transformers, see page 16-101.

Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

Dimensions	page 16-57
Factory Modifications (Forms)	page 16-100
Replacement Parts (Class 9998)	page 16-105
Tyne S Accessories (Class 9999)	nage 16-108

For How to Order Information, see page 16-13.

CP1

Note that the prices shown do not include thermal units. Devices require 3 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Table 16.142: Full-Voltage Type, Reversing with Melting Alloy Overload Relays

		Rating	gs .		NEM. General F Enclo	urpose	NEMA 4 Watertight an Enclos Stainless S (Sizes 0	d Dusttight sure iteel (304)	NEMA Watertig Dusttight Corrosion R Polyester Er	ght, t and esistant	NEMA 12/3R■ Dusttight and Driptight Industrial Use Enclosure			
Motor Voltage (Starter	Max. Hp Poly-	NEMA Size	Circuit B	reaker	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	With External Reset	Without External Reset	\$ Price	
Voltage)	phase	3126	Туре	Ampere Rating							Туре	Туре		
	5	0	HLL36015	15	SBG1♦	2555.	SBW1 ♦	4292.	SBW11♦	4932.	SBA11♦	SBA1 ♦	3038.	
	7-1/2 10	1	HLL36025 HLL36030	25 30	SCG3♦ SCG7♦	2726.	SCW3♦ SCW7♦	4463.	SCW13♦ SCW17♦	5133.	SCA13♦ SCA17♦	SCA3♦ SCA7♦	3209.	
	15 20 25	2	HLL36045 HLL36060 HLL36070	45 60 70	SDG3♦ SDG1♦ SDG5♦	4350.	SDW3 ♦ SDW1 ♦ SDW5 ♦	6998.	SDW13♦ SDW11♦ SDW15♦	7695.	SDA13♦ SDA11♦ SDA15♦	SDA3♦ SDA1♦ SDA5♦	4976.	
460 (480)	30 40 50	3	HLL36080 HLL36100 HLL36150	80 100 150	SEG6♦ SEG3♦ SEG5♦	6501.	SEW6♦ SEW3♦ SEW5♦	11142.	SEW16♦ SEW13♦ SEW15♦	12254.	SEA16♦ SEA13♦ SEA15♦	SEA6 ♦ SEA3 ♦ SEA5 ♦	7326.	
	60 75 100	4	JJL36105 JJL36200 JJL36250	150 200 250	SFG5♦ SFG3♦ SFG4♦	14718.	SFW5♦ SFW3♦ SFW4♦	20586.	SFW15♦ SFW13♦ SFW14♦	22644.	SFA15♦ SFA13♦ SFA14♦	SFA5♦ SFA3♦ SFA4♦	16982.	
	125–150 200	5	LLL36400E20 LLL36600E20	400 600	SGG4♦ SGG2♦	29808.	SGW4♦ SGW2♦	44792.	_	_	SGA14♦ SGA12♦	SGA4♦ SGA2♦	35190.	
	250 300–400	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦			71396.	_	_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	68120.	
	5	0	HLL36015	15	SBG1♦	2555.	SBW1◆	4292.	SBW11♦	4932.	SBA11♦	SBA1 ♦	3038.	
	7-1/2 10	1	HLL36020 HLL36025	20 25	SCG8♦ SCG3♦	2726.	SCW8♦ SCW3♦	4463.	SCW18♦ SCW13♦	5133.	SCA18♦ SCA13♦	SCA8♦ SCA3♦	3209.	
	15 20 25	2	HLL36035 HLL36045 HLL36060	35 45 60	SDG8♦ SDG3♦ SDG1♦	4350.	SDW8 ♦ SDW3 ♦ SDW1 ♦	6998.	SDW18♦ SDW13♦ SDW11♦	7695.	SDA18♦ SDA13♦ SDA12♦	SDA8 ♦ SDA3 ♦ SDA1 ♦	4976.	
575 (600)	30 40 50	3	HLL36070 HLL36090 HLL36100	70 90 100	SEG4♦ SEG6♦ SEG3♦	6501.	SEW4♦ SEW6♦ SEW3♦	11142.	SEW14♦ SEW16♦ SEW13♦	12254.	SEA14♦ SEA16♦ SEA13♦	SEA4♦ SEA6♦ SEA3♦	7326.	
	60–75 100	4	JLL36150 JLL36250	150 250	SFG5♦ SFG4♦	14718.	SFW5♦ SFW4♦	20586.	SFW15♦ SFW14♦	22644.	SFA15♦ SFA14♦	SFA5♦ SFA4♦	16982.	
	125–150 200	5	JLL36250 LLL36400E20	250 400	SGG6♦ SGG4♦	29808.	SGW6♦ SGW4♦	44792.	_	_	SGA16♦ SGA14♦	SGA6♦ SGA4♦	35190.	
	250–350 400	6	LLL36600E20 MJL36800	600 800	SHG4♦ SHG5♦	64274.	SHW4♦ SHW5♦	71396.		_	SHA14♦ SHA15♦	SHA4♦ SHA5♦	68120.	

- NEMA Size 6 starters are NEMA 4 painted sheet steel enclosures.
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.
- Coil voltage code must be specified to order this product. Refer to standard coil voltage codes shown below.

Table 16.143: Class 8738 UL Listed Short Circuit Ratings

NEMA Size	Fuse Clip Type	Enclosure	Ampere Interrupting Capability Rating (AIC)
0-3	Standard	Standard★	5,000
0-3	Class R	Standard★	100,000
4-5	Standard	Standard★	10,000
4-5	Class R	Standard★	100,000

Standard enclosure includes: NEMAs 1, 4 & 4X stainless, and 12/3R.

Table 16.144: Coil Voltage Codes

Volt	tage	Code	\$ Price Adder
60 Hz	50 Hz	Code	5 Filce Adder
24△▼ 120△ 208 240 480 600 Specify		V01 V02 V08 V03 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge 35.60

- 24 V coils are not available on Sizes 4–7. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified (i.e., order as 8739SBG2V01S).
- These voltage codes must include **Form S** (supplied at no charge) (i.e., order as 8739SDG3V02S).

For voltage codes used with control transformers, see page 16-101. Form S (separate control) is used when a separate source of power is available for the control (coil) voltage. Form S is supplied at no charge.

#### Table 16.145: Class 8739 UL Listed Short Circuit Ratings

	Moto	r Circuit Protector	Туре
NEMA Size	Voltage	Enclosure	Ampere Interrupting Capability Rating (AIC)
0, 1	480	Standard□	100,000
0, 1	481 – 600	Standard□	35,000
2, 3, 4, 5	480	Standard□	100,000
2, 3, 4, 5	481 – 600	Standard□	50,000
6	480	Standard□	65,000
6	600	Standard□	18,000
	Thermal M	lagnetic Circuit Bre	eaker Type
0, 1	480	Standard□	100,000
0, 1	481 – 600	Standard□	35,000
2, 3, 4, 5	480	Standard□	100,000
2, 3, 4, 5	481 – 600	Standard□	50,000
6	480	Standard□	65,000
6	600	Standard□	18,000

Standard enclosure includes: NEMAs 1, 4 & 4X stainless, and 12/3R.

www.schneider-electric.us

#### **Approximate Dimensions**

#### Table 16.146: NEMA 1 Enclosure (Size 0-2) Figure 1

NEMA	Class	Time		Dimensions (in inches) ♦—see Figure 1												Top &	Sides					
Size	Class	Туре	Α	В	С	D	E	F	G	Н	- 1	J	K	L	M	N	0	Р	W	X	Υ	(lb)
0–1	8738 & 8739	SBG SCG	13-3/4	23	8-11/32	10-5/8	21	18-29/32	1-7/8	1-7/8	3-3/4	2-5/16	1-1/16	3-1/4	2-3/16	1-1/4	7/8	ı	1/2-3/4-1	1/2-3/4-1	1/2	49
2	8738 & 8739	SDG	15	28-3/4	9-19/32	11-5/8	26-1/4	21-15/32	2-3/16	2	4	2-9/16	1-1/4	3-1/4	2-3/16	1-1/4	29/32	_	1-1-1/4	1–1-1/4	1/2	80

#### Table 16.147: NEMA 1 Enclosure (Size 3-6) Figure 2

NEMA	Class	Туре		Dimensions (in inches) ♦—see Figure 2													Top & Bottom		Sides	Wt.		
Size	Size Size			В	С	D	E	F	G	H	1	J	K	L	M	N	0	Р	W	X	Υ	(lb)
3	8738 & 8739	SEG	18-1/2	44	10-19/32	12-1/2	3	25-31/32	43-1/2	1/4	ı	2-13/16	3-1/2	5	2-11/16	5-3/8	1-7/32	29/32	1–1-1/4 2–2-1/4	1/2-3/4	1/2	245
	8738	SFG	21	51-1/2	10-17/32	15	3	30-23/32	51	1/4		2-13/16	3-1/2	5	2-11/16	5-3/8	1-7/32	29/32	2-1/2	1/2-3/4	1/2	
4	8739	SFG	18-1/2	44	10-19/32	12-1/2	3	25-31/32	43-1/2	1/4	ı	2-13/16	3-1/2	5	2-11/16	5-3/8	1-7/32	29/32	1–1-1/4 2–2-1/4	1/2-3/4	1/2	
5	8738	SGG	30	77	15-1/2	22	4	39-13/32	76	1/2	-	3-1/2	6-9/32	9-1/4	3-3/16	1	-	_	1/2-3/4	3	1	
5	8739	SGG	30	65	13-23/32	22	4	39-13/32	64	1/2	_	3-1/2	6-9/32	5	3-3/16	_	_	_	1/2-3/4	3	_	_
6	8738 & 8739	SHG	36	90	17-1/32	_	_		_	_	_	_	_	_	_	_	_	_	_	-	_	_

Table 16.148: NEMA 12/3R Enclosure Figure 3

NEMA	Class	Time				Dimens	ions (in incl	nes) •—see F	igure 3				Wt.
Size	Class	Туре	Α	В	С	D	Е	F	G	Н	I	J	(lb)
0–1	8738 & 8739	SBA SCA	13-3/4	10-3/32	24-3/4	3-1/4	2-1/2	8-3/4	24	3/8	3-3/4	20-5/16	52
2	8738 & 8739	SDA	15	10-31/32	31	3-1/4	3	9	30-1/4	3/8	3-3/4	23-7/16	95
3	8738 & 8739	SEA	18-1/2	10-19/32	45	5	3	12-1/2	44	1/2	3-3/4	25-19/32	255
4	8738	SFA	21	10-19/32	52-1/2	5	3	15	51-1/2	1/2	3-3/4	30-11/32	_
4	8739	SFA	18-1/2	10-19/32	45	3-1/4	3	12-1/2	44	1/2	3-3/4	25-19/32	_
5	8738	SGA	30	15-1/2	78	9-1/4	4	22	77	1/2	7-1/2	39-13/32	_
5	8739	SGA	30	15-1/2	66	_	4	22	65	1/2	7-1/2	37-7/8	_
6▲	8739	SHA	36	17-1/32	90	_	_	_	_	_	_	_	=

Size 6 enclosures are floor mounting.

#### Table 16.149: NEMA 4X Polyester Enclosure ■ Figure 4

NEMA	Class	Dimensions (in inches) ♦—see Figure 4										
Size	Class	Туре	Α	В	С	E	F					
0-2	8738 & 8739	SBW SCW SDW	25.25	11.4	27.00	17.88	25.75					
3-4	8739	SEW SFW	26.31	11.4	33.50	18.50	32.25					

- See page 16-58 for important information on hubs for NEMA 4X enclosures.
- The dimensions shown in all tables above are also for Form F4T (standard control transformer), Form F4T11 (100 VA extra-capacity), and Form F4T12 (200 VA extra-capacity).

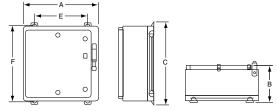
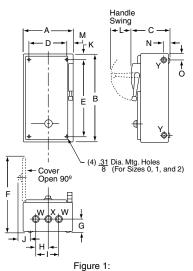


Figure 4: NEMA 4X Polyester Enclosure

NOTE: Illustrations may not represent the actual enclosure; they are intended for dimensional information only.



NEMA 1 Enclosure (Sizes 0-2)

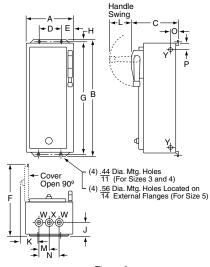
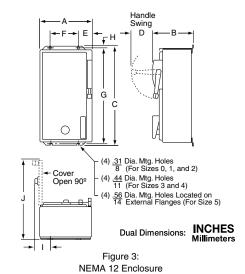


Figure 2: NEMA 1 Enclosure (Sizes 3-6)



ဖ

#### **Approximate Dimensions**

#### Table 16.150: NEMA 4 & 4X Stainless Enclosure Figure 1

NEMA Size	Class	Type				Dir	nensions	(in inches	s)▲—see	Figure <sup>-</sup>	ı				Bottom	Top & Bot.	Wt.
Size			Α	В	С	D	E	F	G	Н	I	J	K	L	W	Х	(lb)
0–1	8738 & 8739	SBW SCW	13-3/4	8-11/32	25-3/16	3-1/4	2-1/2	8-3/4	24	19/32	3	1-5/8	2-5/16	18-17/32	3/4 Hub	1 Hub	52
2	8738 & 8739	SDW	15	9-19/32	30-1/32	3-1/4	2-1/2	10	29-3/4	5/8	3	2	2-5/8	21-1/32	3/4 Hub	1-1/2 Hub	95
3	8738 & 8739	SEW	18-1/2	10-9/16	45-3/16	5	3	12-1/2	44	19/32	3-1/2	2-5/8	3-3/16	25-1/2	3/4 Hub	2-1/2 Hub	255
4	8738	SFW	21	10-17/32	52-11/16	5	3	15	51-1/2	19/32	3-1/2	2-5/8	3-3/16	30-1/4	3/4 Hub	2-1/2 Hub	
4	8739	SFW	18-1/2	10-9/16	45-3/16	5	3	12-1/2	44	19/32	3-1/2	2-5/8	3-3/16	25-1/2	3/4 Hub	2-1/2 Hub	
5	8738	SGW	30	15-1/2	78-3/32	9-1/4	4	22	77	9/16	6-3/32	3	3-1/2	39-13/32	3/4 Hub	3-1/2 Hub	_
	8739	SGW	30	13-57/64	66-3/32	5	4	22	65	9/16	6-3/32	3	3-1/2	37-7/8	3/4 Hub	3-1/2 Hub	
6	8739	SHW	36	17-1/32	98		_	_	_	_		_	_	_	_	_	

Above dimensions also for Form F4T (standard control transformer), Form F4T11 (100 VA extra capacity) and Form F4T12 (200 VA extra capacity).

NOTE: Illustrations may not represent the actual enclosure; they are intended for dimensional information only.

#### Information on Hubs

Hubs are supplied with each NEMA 4X combination starter as shown in the table below.

Note that hubs are only installed in stainless steel enclosures; they are supplied but not installed in polyester enclosures.

Table 16.151:

NEMA Size	Quantity	Hub Size
0 & 1	1 2	0.75" 1.00"
2	1 2	0.75" 1.50"
3 & 4	1 2	0.75" 2.50"

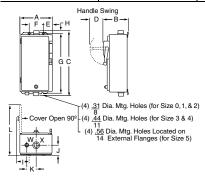


Figure 1: NEMA 4 & 4X Stainless Enclosure

16-58

#### Multipole Lighting Contactors, Type L & LX

#### **Features**

- 30 A fluorescent lighting rating, 20 A tungsten lighting rating
- Electrically and mechanically held
- 2 through 12-pole versions
- Field-convertible contacts with N.O. and N.C. indicators (8 N.C. contacts maximum★)
- Silver-Cadmium-Oxide double break contacts



E78427 NRNT File CCN



LR60905 Class 3211 07



Type L



Type LX

#### Table 16.152: Multipole Lighting Contactors (50-60 Hz)

Contact Ampere Ratings	No. of Poles	of Enclosure		NEMA 1 Flush Mounting General Purpose Enclosure with Plaster Adjustment		NEMA 3R Rainproof Enclosure ▼		NEMA 4 & 4X Watertight, Dusttight and Corrosion- Resistant Glass- Polyester Enclosure		NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure		NEMA 12/3R△ Dusttight and Driptight Industrial Use Enclosure		Open Type ■	
		Туре	\$ Price▲	Туре	\$ Price ▲	Туре	\$ Price ▲	Туре	\$ Price ▲	Туре	\$ Price ▲	Туре	\$ Price ▲	Туре	\$ Price ▲
Electrical	lly Held	k													
	2 3 4	LG20 ♦ LG30 ♦ LG40 ♦	446.00 489.00 617.00	LF20 ♦ LF30 ♦ LF40 ♦	689.00 732.00 860.00	LH20 ♦ LH30 ♦ LH40 ♦	860.00 903.00 1031.00	LWW20 ♦ LWW30 ♦ LWW40 ♦	1146.00 1197.00 1358.00	LW20 ♦ LW30 ♦ LW40 ♦	917.00 959.00 1088.00	LA20 ♦ LA30 ♦ LA40 ♦	860.00 903.00 1031.00	LO20 ♦ LO30 ♦ LO40 ♦	404.00 446.00 575.00
30♦	6 8 10	LG60 ♦ LG80 ♦ LG1000 ♦	890.00 1160.00 1331.00	LF60 ♦ LF80 ♦ LF1000 ♦	1031.00 1301.00 1472.00	LH60 ♦ LH80 ♦ LH1000 ♦	1202.00 1472.00 1643.00	LWW60 ♦ LWW80 ♦ LWW1000 ♦	1571.00 1908.00 2123.00	LW60 ♦ LW80 ♦ LW1000 ♦	1259.00 1529.00 1700.00	LA60 ♦ LA80 ♦ LA1000 ♦	1202.00 1472.00 1643.00	LO60 ♦ LO80 ♦ LO1000 ♦	746.00 1017.00 1188.00
	12	LG1200 ♦	1529.00	LF1200 ♦	1673.00	LH1200 ♦	1844.00	LWW1200 ♦	2372.00	LW1200 ♦	1899.00	LA1200♦	1844.00	LO1200 ♦	1386.00
Mechanic	ally Hel	d▼□													
	2 3 4	LXG20 ♦ LXG30 ♦ LXG40 ♦	702.00 738.00 761.00	LXF20 ♦ LXF30 ♦ LXF40 ♦	975.00 1008.00 1031.00	<u> </u>	_	LXWW20 ♦ LXWW30 ♦ LXWW40 ♦	1728.00 1764.00 1785.00	LXW20 ♦ LXW30 ♦ LXW40 ♦	1728.00 1764.00 1785.00	LXA20 ♦ LXA30 ♦ LXA40 ♦	1017.00 1052.00 1074.00	LXO20 ♦ LXO30 ♦ LXO40 ♦	590.00 624.00 647.00
30 ♦	6 8 10	LXG60 ♦ LXG80 ♦ LXG1000 ♦	1160.00 1287.00 1430.00	LXF60 ♦ LXF80 ♦ LXF1000 ♦	1430.00 1557.00 1700.00	_ _ _		LXWW60 ♦ LXWW80 ♦ LXWW1000 ♦	2186.00 2313.00 2456.00	LXW60 ♦ LXW80 ♦ LXW1000 ♦	2186.00 2313.00 2456.00	LXA60 ♦ LXA80 ♦ LXA1000 ♦	1472.00 1601.00 1742.00	LXO60 ♦ LXO80 ♦ LXO1000 ♦	1044.00 1173.00 1314.00
	12	LXG1200 ♦	1580.00	LXF1200 ♦	1850.00		_	LXWW1200 ♦	2604.00	LXW1200 ♦	2604.00	LXA1200◆	1893.00	LXO1200 ♦	1466.00

- Price does not include holding circuit contact.
- Separate enclosures are available for these devices. It may be possible to improve delivery by ordering an open type contactor and separate Class 9991 enclosure.
- Coil voltage code must be specified to order this product. Refer to standard voltage codes listed below. All lighting contactors are provided with separate control as standard. Factory conversion of N.O. contacts to N.C., order by catalog number and add \$42.80 to price (i.e. For 6 N.O. and 2 N.C. poles on an 8 pole contactor, order as 8903LG62V02). Versions are available from the factory with up to 12 N.C. poles electrically held or 2, 4, 6 and 12 N.C. poles mechanically held. For field conversion, there is a maximum of eight N.C. poles for Type L and a maximum of six N.C. poles for Type LX contactors.

NOTE: For contactors with more than 8 poles, the catalog number configuration will be the number of normally open contacts followed by a 0 and then the number of normally closed contacts (i.e. for 4 NO and 6 NC on a 10 pole contactor order 8903LG406V02).

- Cannot support control transformer forms
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 16-95 for more information. When ordering Form C, Form R6 must be included.

#### Table 16.153: Power Poles for Type L or LX -

The kits below are used to add 30 Ampere power poles to existing Type L contactors when additional circuits are required. Type L lighting contactors are supplied with mounting brackets, so that adder poles may be mounted from the front by a single captive screw. Adder poles are supplied standard with N.O. contacts which are convertible to N.C.

Power Pole Ad	der Kit∜	Can Only Be Added to Contactor Type☆		
Class 8903 Type	\$ Price	Can Only be Added to Contactor Types		
Single Pole		LO60		
L1L L1R	86.00 86.00	LXO60 LO80		
Double Pole		LXO80 LO1000		
L3L L3R	171.00 171.00	LXO1000		

- 8903LO (electrically held) devices can accommodate 10 or 12 N.C. contacts use only 120 V 60Hz coils.
- LO60 & LXO60—add 1-pole kits only, 1 on each side, for converting to 8-pole. To maintain proper operation, it cannot be converted to greater than 8-pole contactor. LO80 & LXO80—use single-pole kits, 1 on each side, for converting to 10-pole and use two-pole kits, 1 on each side, for converting to 12-pole. LO1000 & LXO1000—remove existing single pole kit and install two-pole kits, 1 on each side, for converting to 12-pole.

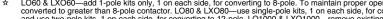


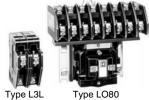
Table 16.154: Coil Voltage Codes

Voltage	e	Code	\$ Price
60 Hz	50 Hz	Code	Adder
24 120 208 240 277 480 Specify	110 	V01 V02 V08 V03 V04 V06 V99	No Charge No Charge No Charge No Charge No Charge No Charge 35.60

.page 16-63 Replacement Coils ......pages 16-105, 16-106 Replacement Contacts . . . . . page 16-107

#### Table 16.155: How to Order

	To Order Specify:	Catalog Number								
•	Class Number	Class	Type	Voltage Code	Form(s)					
:	Type Number Voltage Code Form(s)	8903	LXG60	VO4	CF4R6					





Type L3R



Type L1L Type LO60



Type L1R

#### **Features**

- Electrically and mechanically held
- 30-800 A lighting ratings
- 2- through 5-pole versions (5-poles through 200 A)
- UL Listed short-circuit rating up to 100,000 Amperes
- Factory wired controls and clearly marked termination points
- Quick ship on most items in 5-7 days

#### Table 16.156: Multipole Lighting Contactors—Type S (50-60 Hz)

O O NEMA 1 General Purpose Enclosure Enclosure		NEMA 1 Flush Mounting General Purpose Enclosure with Plaster Adjustment		NEMA Type 3R Rainproof Enclosure∆		NEMA 4 & 4X Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure		NEMA Type 4 & 4X ▲ Watertight and Dusttight Enclosure		NEMA Type 12 / 3R ◊ Dusttight and Driptight Industrial Use Enclosure		Open Type			
		Туре	\$ Price ■	Туре	\$ Price■	Туре	\$ Price ■	Туре	\$ Price■	Туре	\$ Price ■	Туре	\$ Price■	Туре	\$ Price■
lectri		•													
30	2 3 4 5	SMG1★ SMG2★ SMG3★ SMG4★	476. 518. 633. 831.	SMF1★ SMF2★ SMF3★ SMF4★	660. 689. 818. 1017.	SMH2★ SMH3★ SMH4★	647. 689. 804. 1002.	SMW21★ SMW22★ SMW23★ SMW24★	989. 1031. 1146. 1344.	SMW1★ SMW2★ SMW3★ SMW4★	989. 1031. 1146. 1344.	SMA1★ SMA2★ SMA3★ SMA4★	647. 810. 804. 1002.	SMO1★▼ SMO2★▼ SMO3★▼ SMO4★▼	446. 488. 603. 534.
60	2345	SPG1★ SPG2★ SPG3★ SPG4★	975. 1031. 1287. 1857.	SPF1★ SPF2★ SPF3★ SPF4★	1215. 1272. 1529. 2100.	SPH1★ SPH2★ SPH3★ SPH4★	1287. 1344. 1601. 2142.	SPW21★ SPW22★ SPW23★ SPW24★	1998. 2057. 2712. 3281.	SPW1★ SPW2★ SPW3★ SPW4★	1998. 2057. 2712. 3281.	SPA1★ SPA2★ SPA3★ SPA4★	1287. 1344. 1601. 2142.	SPO1★▼ SPO2★▼ SPO3★▼ SPO4★▼	831. 890. 1146. 1715.
100	2345	SQG1★ SQG2★ SQG3★ SQG4★	1601. 1715. 2114. 3024.	SQF1★ SQF2★ —	2015. 2127. —	SQH1★ SQH2★ SQH3★ SQH4★	1971. 2084. 2484. 3396.	SQW21★ SQW22★ —	3815. 3959. —	SQW1★ SQW2★ SQW3★ SQW4★	3054. 3167. 3965. 4877.	SQA1★ SQA2★ SQA3★ SQA4★	1971. 2084. 2484. 3396.	SQO1★▼ SQO2★▼ SQO3★▼ SQO4★▼	1314. 1430. 1827. 2739.
200	2345	SVG1★ SVG2★ SVG3★ SVG4★	3765. 4022. 5285. 7127.		1111	SVH1★ SVH2★ —	4991. 5247. —	1111	1111	SVW1★ SVW2★ SVW3★ SVW4★	6245. 6501. 8864. 10646.	SVA1★ SVA2★ SVA3★ SVA4★	4991. 5247. 7011. 8793.	SVO1★ SVO2★ SVO3★ SVO4★	3167. 3423. 4761. 6543.
300	2	SXG1★ SXG2★	7952. 8550.	_	_	_	_	_	_	SXW1★ SXW2★	11087. 11685.	SXA1★ SXA2★	11087. 11685.	SXO1★ SXO2★	6857. 7455.
00□	2	SYG1★ SYG2★	20813. 23534.	_	_	_	=	_	_	SYW1★ SYW2★	27935. 30654.	SYA1★ SYA2★	24659. 27378.	SYO1★ SYO2★	16299. 19020.
00□	2	SZG1★ SZG2★	25550. 28704.		=	_	=	_	_	SZW1★ SZW2★	32670. 35825.	SZA1★ SZA2★	29394. 32549.	SZO1★ SZO2★	20879. 24026.
00□	2	SJG1★ SJG2★	30285. 33875.	_	=	_	=	_	_	SJW1★ SJW2★	37535. 40995.	SJA1★ SJA2★	33845. 37719.	SJO1★ SJO2★	25457. 29033.
lecha						Į.	ļ.								
30	2 3 4 5	SMG10★ SMG11★ SMG12★ SMG13★	738. 782. 824. 1025.	SMF10★ SMF11★ SMF12★ SMF13★	923. 966. 1008. 1209.	_ _ _		SMW31★ SMW32★ SMW33★ SMW34★	1251. 1295. 1337. 1538.	SMW10★ SMW11★ SMW12★ SMW13★	1251. 1295. 1337. 1538.	SMA10★ SMA11★ SMA12★ SMA13★	912. 953. 995. 1196.	SMO10★▼ SMO11★▼ SMO12★▼ SMO13★▼	710. 752. 795. 995.
60	2345	SPG10★ SPG11★ SPG12★ SPG13★	1485. 1544. 1827. 2399.	SPF10★ SPF11★ SPF12★ SPF13★	1758. 1814. 2100. 2669.		1111	SPW31★ SPW32★ SPW33★ SPW34★	2511. 2570. 3252. 3824.	SPW10★ SPW11★ SPW12★ SPW13★	2511. 2570. 3252. 3824.	SPA10★ SPA11★ SPA12★ SPA13★	1800. 1857. 2142. 2712.	SPO10★▼ SPO11★▼ SPO12★▼ SPO13★▼	1373. 1430. 1715. 2285.
100	2345	SQG10★ SQG11★ SQG12★ SQG13★	2084. 2199. 2627. 3537.	SQF10★ SQF11★ —	2241. 2357. —			SQW31★ SQW32★ —	4419. 4563. —	SQW10★ SQW11★ SQW12★ SQW13★	3537. 3653. 4478. 5390.	SQA10★ SQA11★ SQA12★ SQA13★	2456. 2570. 2996. 3909.	SQO10★▼ SQO11★▼ SQO12★▼ SQO13★▼	1827. 1943. 2370. 3281.
200	2 3 4	SVG10★ SVG11★ SVG12★	5333. 6015. 7353.	111					111	SVW10★ SVW11★ SVW12★	7811. 8495. 10859.	SVA10★ SVA11★ SVA12★	6557. 7241. 9008.	SVO10★ SVO11★ SVO12★	4505. 4877. 6215.
300	2	SXG13★ SXG14★	9320. 10232.	_	_				_	SXW13★ SXW14★	12455. 13365.	SXA13★ SXA14★	12455. 13365.	SXO13★ SXO14★	7554. 7811.
400	2	SYG16★ SYG17★	22593. 25316.	1 1	=	_	=		=	SYW16★ SYW17★	29714. 32436.	SYA16★ SYA17★	26441. 29160.	SYO16★ SYO17★	18080. 20799.
600	2	SZG18★ SZG19★	27329. 30483.	_	_	_	=	_	_	SZW18★ SZW19★	34451. 37605.	SZA18★ SZA19★	31175. 34329.	SZO18★ SZO19★	22658. 25806.
	8 lectri 30 60 100 200 300 000 000 300 100 200 300 400 600	Color   Colo	Type	Type   S Price	Type   S Price   Type   S Price   Type	Type   SPrice   Type   SPric	Type	Type	Type	Type	Type	Type	Type	Type   SPrice   Type   Type	Type   SPrice   Type   SPric



File E78427 **CCN NRNT** 

Electrically Held

Mechanically Held



File LR60905 (Open Devices Only) Class 3231 01

- NEMA 4 & 4X enclosures are brush finished stainless steel for contactors sized 30 Å through 300 Å. Sizes 400–800 Å are painted sheet steel.
- Price does not include holding circuit contact.

  All lighting contactors are provided with separate control as standard, except electrically held 400, 600 and 800 A devices. Electrically held 400, 600 and 800 A devices are provided with common control.

  Voltage code must be specified to order this product. Refer to standard voltage codes above left.
- Separate enclosures are available for these devices. It may be possible to improve delivery by ordering an open type contactor and separate Class 9991 enclosure from pages 16-93 and 16-94.
- Cannot support control transformer forms
- Form F4T is provided as standard; include line voltage when ordering. Control voltage is 120–60.
  For 400, 600 and 800 ampere devices—must specify line voltage, not coil voltage.

  NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 16-95 for more information.

#### Poles for Type S Only

A single-pole or double-pole kit can be added to any 2- or 3-pole 30 or 60 A Type S lighting contactor to make a 4- or 5-pole device. Factory assembled 4- and 5-pole contactors utilize the basic 3-pole device with a single or double-pole kit installed. Only one power pole can be added per contactor. Sufficient room is provided in all enclosure styles for the addition of a power pole kit.

For How to Order Information, see page 16-13.

#### Table 16.158:

Ampere Rating	Description	Class 9999 Type	\$ Price
30	One N.O. One N.C. One N.O. and One N.C. Two N.O. Two N.C.	SB6 SB7 SB8 SB9 SB10	158.00 158.00 365.00 365.00 365.00
60	One N.O. One N.C. One N.O. and One N.C. Two N.O. Two N.C.	SB21∇ SB22∇ SB23∇ SB24∇ SB25∇	306.00 306.00 656.00 656.00 656.00

When power pole is added to 60 Ampere contactor, a 4-pole coil is also required. Order from Coil Table page 16-105. 60 A power poles are suitable for use with copper or aluminum wire.

Factory Modifications (Forms)	page 16-63
Replacement Coils	
Replacement Contacts	page 16-107

#### Table 16.157:

Coil Voltage Codes ♦								
Volt	age	Code	Price					
60 Hz	50 Hz	Code	Adder					
24☆	_	V01	N/C					
120	110	V02	N/C					
208	_	V08	N/C					
240	220	V03	N/C					
277	_	V04	N/C					
480	440	V06	N/C					
Specify	Specify	V99	35.60					

24 volt coils are not available for 200–800 A devices. Contact your nearest Square D/Schneider Electric sales office for additional information.

# 6 CONTACTORS AND START





### File E16151 CCN NRNT

#### **Features**

The features include: disconnect switch and circuit breaker versions; rugged flange-mounted handle; easy installation; occupation of less space; increased operator protection; room to spare for modifications; Class R fuse clips standard; electrically and mechanically held; 30-600 Amperes.

It is desirable to install the branch-circuit protective device and lighting contactor, combining switching and over-current protection, in one enclosure. Combination lighting contactors are well suited for industrial, highway and area lighting applications, or where a lighting circuit may have to be disconnected for periodic maintenance. They may also be used for resistance heating loads.

Table 16.159: Fusible or Non-Fusible Disconnect Switch (3-Pole, 50-60 Hz)

Contactor Ampere Rating	Fuse Clip Size (A)	Fuse Clip Spacing		IA 1 Purpose osure	Watertight a Encl	4 & 4X ■ and Dusttight osure ss Steel	NEMA 12/3R▼ Dusttight, Oiltight Driptight, Industrial Use Enclosure		
	(A)	(V)	Туре	\$ Price ▲	Туре	\$ Price▲	Туре	\$ Price ▲	
Electrically	Held♦								
30	None 30 30	600 250	SMG60★ SMG61★ SMG62★	1301.00 1373.00 1344.00	SMW60★ SMW61★ SMW62★	2669.00 2739.00 2712.00	SMA60★ SMA61★ SMA62★	1643.00 1715.00 1686.00	
60	None 60 60	600 250	SPG60★ SPG61★ SPG62★	2042.00 2142.00 2100.00	SPW60★ SPW61★ SPW62★	4149.00 4248.00 4206.00	SPA60★ SPA61★ SPA62★	2528.00 2627.00 2583.00	
100	None 100 100	600 250	SQG60★ SQG61★ SQG62★	3396.00 3609.00 3537.00	SQW60★ SQW61★ SQW62★	7070.00 7284.00 7212.00	SQA60★ SQA61★ SQA62★	4022.00 4235.00 4163.00	
200	None 200 200	600 250	SVG60★ SVG61★ SVG62★	6629.00 6926.00 6870.00	SVW60★ SVW61★ SVW62★	11327.00 11627.00 11570.00	SVA60★ SVA61★ SVA62★	8366.00 8585.00 8607.00	
300	None 400 400	600 250	SXG60★ SXG61★ SXG62★	13905.00 14418.00 14418.00	SXW60★ SXW61★ SXW62★	25898.00 26411.00 26411.00	SXA60★ SXA61★ SXA62★	18122.00 18635.00 18635.00	
Mechanical	lly Held♦								
30	None 30 30	600 250	SMG70★ SMG71★ SMG72★	1458.00 1529.00 1502.00	SMW70★ SMW71★ SMW72★	2825.00 2897.00 2867.00	SMA70★ SMA71★ SMA72★	1800.00 1871.00 1844.00	
60	None 60 60	600 250	SPG70★ SPG71★ SPG72★	2583.00 2682.00 2640.00	SPW70★ SPW71★ SPW72★	4692.00 4791.00 4748.00	SPA70★ SPA71★ SPA72★	3068.00 3167.00 3123.00	
100	None 100 100	600 250	SQG70★ SQG71★ SQG72★	3909.00 4121.00 4050.00	SQW70★ SQW71★ SQW72★	7583.00 7797.00 7725.00	SQA70★ SQA71★ SQA72★	4535.00 4748.00 4676.00	
200	None 200 200	600 250	SVG70★ SVG71★ SVG72★	8081.00 8379.00 8324.00	SVW70★ SVW71★ SVW72★	12780.00 13080.00 13023.00	SVA70★ SVA71★ SVA72★	9818.00 10116.00 10061.00	
300	None 400 400	600 250	SXG70★ SXG71★ SXG72★	14261.00 14774.00 14774.00	SXW70★ SXW71★ SXW72★	26253.00 26766.00 26766.00	SXA70★ SXA71★ SXA72★	18477.00 18990.00 18990.00	

Table 16.160: Circuit Breaker (3-Pole, 50-60 Hz)

Contactor Ampere Rating	Circuit	: Breaker	General	MA 1 Purpose osure	Watertight a Encl Stainle	4 & 4X■ and Dusttight osure ss Steel 800 A)	NEMA 12/3R▼ Dusttight, Oiltight, Driptight, Industrial Use Enclosure		
	Ampere Rating	Maximum Volts	Туре	\$ Price▲	Туре	\$ Price▲	Туре	\$ Price ▲	
Electrically H	leld♦							·	
30	30	600	SMG81★	1814.00	SMW81★	3182.00	SMA81★	2156.00	
60	60	600	SPG81★	2541.00	SPW81★	4649.00	SPA81★	3024.00	
100	100	600	SQG81★	3666.00	SQW81★	7340.00	SQA81★	4292.00	
200	200	600	SVG81★	8181.00	SVW81★	12879.00	SVA81★	9918.00	
300	300	600	SXG81★	18023.00	SXW81★	30014.00	SXA81★	21155.00	
400	400	600	SYG81★	40085.00	SYW81★	47205.00	SYA81★	43929.00	
600	600	600	SZG81★	45090.00	SZW81★	52212.00	SZA81★	48936.00	
Mechanically	/ Held♦								
30	30	600	SMG91★	1971.00	SMW91★	3338.00	SMA91★	2313.00	
60	60	600	SPG91★	3081.00	SPW91★	5189.00	SPA91★	3567.00	
100	100	600	SQG91★	4179.00	SQW91★	7853.00	SQA91★	4805.00	
200	200	600	SVG91★	9633.00	SVW91★	14333.00	SVA91★	11970.00	
300	300	600	SXG91★	18378.00	SXW91★	30371.00	SXA91★	21510.00	
400	400	600	SYG91★	41864.00	SYW91★	48986.00	SYA91★	45710.00	
600	600	600	SZG91★	46728.00	SZW91★	53991.00	SZA91★	50715.00	

- Price does not include holding circuit contact.
- For NEMA 4 & 4X Watertight, Dusttight and Corrosion-Resistant Glass-Polyester enclosure pricing, multiply stainless steel enclosed price by 1.25 and add Form G18 (limited to 100 A max.). 400 & 600 A enclosures are painted sheet steel (NEMA Type 4 & 4X).
- Control/coil voltage must be specified.
- Coil voltage codes must be specified to order this product. Refer to standard voltage codes shown on page 16-60.

  NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 16-95 for more information.

Table 16.161: Coil Voltage Codes ♦

Volt	age	Code	\$ Price
60 Hz	50 Hz	Code	Adder
24△	<del>_</del>	V01	N/C
120	110	V02	N/C
208	_	V08	N/C
240	220	V03	N/C
277	_	V04	N/C
480	440	V06	N/C
Specify	Specify	V99	35.60

<sup>24</sup> volt coils are not available for 200 A or larger devices. Contact Schneider Electric CCC for additional information.

www.schneider-electric.us

NIGHT-MASTER Outdoor Combination Lighting Contactors offer disconnecting means, overcurrent protection and a lighting contactor in one NEMA 3R Rainproof enclosure. These combination units satisfy requirements of the National Electrical Code and UL 508 for service entrance equipment.



Long Version

Short Version

UL Approved for Service Entrance

File E16151

CCN NRNT

#### Features:

- Solid neutral standard
- · Grounding lug standard
- Padlocking provisions
- Short and long versions available
- Electrically held Type S lighting contactor
- Eliminates the need for separate mounted safety switches
- Additional panel space eliminates the need for external mounting of time clocks

Table 16.162: Disconnect Switch Type ■ (3-Pole)

					Short \	/ersion		Long Version						
	Contactor Ampere Rating	Fuse Clip Size (A)	Fuse Clip Spacing (V)	Class 8903 Type 3R	\$ Price▲	Class 8903 Type 3R Stainless Steel	\$ Price▲	Class 8903 Type 3R	\$ Price▲	Class 8903 Type 3R Stainless Steel	\$ Price ▲			
	30	30 30	600 250	SMC61 ♦ SMC62 ♦	2015.00 1956.00	SMH61 ♦ SMH62 ♦	3263.00 3150.00	SMC63 ♦ SMC64 ♦	2199.00 2177.00	SMH63♦ SMH64♦	3600.00 3488.00			
Ì	60	60 60	600 250	SPC61 ♦ SPC62 ♦	2664.00 2505.00	SPH61 ♦ SPH62 ♦	4275.00 4050.00	SPC63♦ SPC64♦	2933.00 2825.00	SPH63♦ SPH64♦	4725.00 4500.00			
l	100	100 100	600 250	SQC61 ♦ SQC62 ♦	4571.00 4454.00	SQH61 ♦ SQH62 ♦	7425.00 7200.00	SQC63♦ SQC64♦	4797.00 4626.00	SQH63♦ SQH64♦	7875.00 7650.00			
	200	200 200	600 250	SVC61 ♦ SVC62 ♦	8171.00 7986.00	SVH61 ♦ SVH62 ♦	12525.00 12825.00	SVC63♦ SVC64♦	8949.00 8868.00	SVH63♦ SVH64♦	13725.00 13725.00			

Table 16.163: Circuit Breaker Type ■ (3-Pole)

	Circuit	Breaker		Short \	/ersion		Long Version						
Contactor Ampere Rating	Ampere Rating	Maximum Volts	Class 8903 Type 3R	\$ Price▲	Class 8903 Type 3R Stainless Steel	\$ Price▲	Class 8903 Type 3R	\$ Price▲	Class 8903 Type 3R Stainless Steel	\$ Price ▲			
30	30	600	SMC81 ♦	2475.00	SMH81 ♦	4050.00	SMC83◆	2807.00	SMH83♦	4500.00			
60	60	600	SPC81 ♦	3159.00	SPH81♦	5175.00	SPC83♦	3320.00	SPH83♦	5625.00			
100	100	600	SQC81♦	4544.00	SQH81 ♦	7425.00	SQC83♦	4841.00	SQH83♦	7875.00			
200	200	600	SVC81♦	8711.00	SVH81♦	14175.00	SVC83♦	9909.00	SVH83♦	14625.00			

- Price does not include holding circuit contact.
- All lighting contactors are provided with separate control as standard.
- Coil voltage codes must be specified to order this product. Refer to standard voltage codes listed below.

#### NIGHT-MASTER Combination Lighting Contactors

The Class 8903 NIGHT-MASTER Outdoor Combination Lighting Contactor is the only product on the market that is UL Listed for Service Entrance. This allows the contactor to be pole mounted when used to control lighting in remote locations such as parks, monuments, group sports facilities, and streets and highways.

Factory modifications such as photocells, time switches, key operated selector switches, and the combination of photocells and time switches (photocell on, time switch off) allow the NIGHT-MASTER to be located in applications where manual operation of lights is not practical.

NIGHT-MASTER comes in long and short versions in sizes 30 through 200 Amperes. Most common modifications can be provided from the factory, or added in the field to the pre-drilled and pre-tapped panels.

Table 16.164: Coil Voltage Codes

Volt	tage	Code	\$ Price
60 Hz	50 Hz	Code	Adder
24★ 120 208 240 277 480 Specify	110 	V01 V02 V08 V03 V04 V06 V99	No Charge No Charge No Charge No Charge No Charge No Charge 35.60

<sup>★ 24</sup> volt coils are not available for 200 A devices. Contact your nearest Schneider Electric sales office for additional information.



www.schneider-electric.us

Standard Equipment dimensions and enclosure construction may not apply when certain special features are added. Such cases should be referred to the factory with complete description when accurate dimensions are required.

NOTE: If UL label is required, consult Schneider Electric CCC at (1-888-778-2733). Some Forms are not UL Listed.

#### Table 16.165:

				NEMA			Used	On								400.
	Description		Form	Enclo-	S	itd.	Co	mbo	NIGHT-	Type L	30 A	60 A	100 A	200 A	300 A	600,
	Description		Letter	sure Type	Elec. Held	Mech. Held	Elec. Held	Mech. Held	MASTER •	30 A	50 A	00 A	100 A	200 A	000 A	800 A
"ON OFF" (moments	ary contact) push butt	ton	A3	1		Υ		Υ		336.	336.	336.	336.	336.	336.	336.
ON-OTT (ITIOITIETIE	ary cornact) pusir butt	IOII	A3	3R, 4, 12		Υ		Υ		336.	336.	336.	336.	336.	336.	336.
	on (with holding circu		A12	Any	Υ		Υ		Υ	336.	336.	336.	336.	336.	336.	336.
key operated selectors specify positions, leg This form must be used.	" selector switch. To sor switch, use Form Cogend marking, and keysed with another seled). Add \$266. (C33)	33 and y removal. ctor switch	С	1 3R, 4, 12	Y	Y▽	Y	Y▽	Y	336. 336.	336. 336.	336. 336.	336. 336.	336. 336.	336. 336.	336. 336.
	witch. To substitute a	key operated	C6	1	Υ	Y	Υ	Υ		336.	336.	336.	336.	336.	336.	336.
selector switch, use legend marking, and used with another se	Form C33 and specification of the second specification of	y positions, rm must be xample:	C6	3R, 4, 12	Y	Y	Y	Y	Υ	336.	336.	336.	336.	336.	336.	336.
Control circuit fuse (	1 fuse)		F	Any	Υ	Υ	Υ	Υ	Υ	314.	314.	314.	314.	314.	314.	314.
Control circuit fuses			F4	Any	Υ	Υ	Υ	Υ	Υ	314.	314.	314.	314.	314.	314.	314.
Control circuit transfe	ormer standard capac	city 50/60 Hz														
Fus	ses	Transformer														
Primary	Secondary	capacity														
2 ■	0	Std.	F4T	1, 4, 12	Υ	Υ	Υ	Υ	Υ	386.	386.	543.	797.	968.	1097. ☆	1097.
2	1	Std.	FF4T	1, 4, 12	Υ	Υ	Υ	Υ	Υ	698.	698.	855.	1112.	1283.	1412. <b>☆</b>	1412.
2	1	100 VA Add.	FF4T11	1, 4, 12	Υ	Υ	Υ	Υ	Υ	975.	975.	1197.	1425.	1566. ☆	1710. <b>☆</b>	
2	1	200 VA Add	FF4T12	1, 4, 12	Υ	Υ	Υ	Υ	Υ	1241.	1241.	1467.	1695. ☆	1839. ☆	1839. ☆	1839.
2	1	300 VA Add	FF4T13	1, 4, 12	Υ	Υ	Υ	Υ	Υ	1481. ☆	1481. ☆	1737. ☆	1967. ☆	2109. ☆	2109. 🕏	2109.
Noise reduced enclo	sure and shock mou	nted panel	G4	Any		Υ				1389.	1389.	1596.	1674.	2307.	2921.	3924.
Addition of photoeled	ctric receptacle		G10	1★, 3R, 12	Υ		Υ		Υ	185.	185.	185.	185.	185.	185.	185.
Addition of photoeled	ctric receptacle with p	hoto-cell	G101	1★, 3R, 12	Υ		Υ		Υ	399.	399.	399.	399.	399.	399.	399.
Addition of photoeled	ctric receptacle and re	elay (R6)▼	G10R6	1★, 12		Υ		Υ		549.	912.	912.	912.	1326.	1467.	1467.
With photo-cell ins	stalled ▼		G101R6	1★, 12		Υ		Υ		509.	750.	750.	750.	1026.	1121.	1121.
Addition of terminal I "xx" Represents the Available in multiples	blocks (other than sta number of terminals i s of 5 only.	ndard). needed.														
(PER TERMINAL	PRICE)	WIRED	G56xx	Any	Υ	Υ	Υ	Υ	Υ	116.	116.	116.	116.	116.	116.	116.
(PER TERMINAL	PRICE)	UNWIRED	G50xx	Any	Υ	Υ	Υ	Υ	Υ	57.	57.	57.	57.	57.	57.	57.
	ime clock (120-277 V	• • • • • • • • • • • • • • • • • • • •	K14	1, 4, 12	Υ	Υ	Υ	Υ		1197.	1197.	1197.	1197.	1197.	1197.	1197.
Addition of 24 hour to	ime clock w/day omis	sion (120-277 V)	K141	1, 4, 12	Υ	Υ	Υ	Υ		1197.	1197.	1197.	1197.	1197.	1197.	1197.
Addition of 7 day tim	e clock (120-277 V)		K142	1, 4, 12	Υ	Υ	Υ	Υ		1368.	1368.	1368.	1368.	1368.	1368.	1368.
Addition of 24 hour t	ime clock (120-277 V	only)	K14	3R					Υ	N/A	783.	783.	783.	783.	N/A	N/A
Addition of 24 hr time	e clock w/skip day (12	20-277 V)	K141	3R					Υ	N/A	783.	783.	783.	783.	N/A	N/A
Addition of 7 day tim			K142	3R					Υ	N/A	954.	954.	954.	954.	N/A	N/A
Addition of solid neu	tral terminal block		N	1, 4, 12	Υ	Υ	Υ	Υ	Std.	116.	116.	116.	171.	342.	714.	855.
Red Pilot Light			P1	Any	Υ	Υ	Υ	Υ	Υ	336.	336.	336.	336.	336.	336.	336.
Two or more lights 4			Р	Any	Υ	Υ	Υ	Υ	Υ	336.	336.	336.	336.	336.	336.	336.
Red Push-To-Test P	ilot Light		P21	Any	Υ	Υ	Υ	Υ	Υ	435.	435.	435.	435.	435.	435.	435.
	ich additional pilot ligh			Any	Υ	Y	Υ	Y	Υ	<b>*</b>	158.	158.	158.	158.	158.	158.
	or Mechanically Held	▼	R6 R46	Any Any	.,	Y	17	Y	.,	363.	728.	728.	728.	1139.	1283.	1283.
	ddition of under and overvoltage relay hree wire control for long distance applications▼				Υ	Y	Υ	Y	Υ	1463.	1463.	1463.	1463.	1463. 2280.	1463. 2564.	1463.
	. 3		R62	Any	Any Y Y Y 728. 1454. 1454. 2280. 2564. Any Y Y Y Y Y O 158. 158. 158. 158. 158.		2564.									
	pecify number of N.O		X		Y	Y	Y	Y	Y	040	158. N/A				158. N/A	158.
Addition of DC coil to Type L (7 poles max)  Auxiliary electrical interlock installed on disconnect swit			Y48	Any	Y		-	-		243.	N/A	N/A	N/A	N/A	N/A	N/A
or circuit breaker ope	erating mechanism	sconnect switch	Y74 Y145	Any Any	Y		Y	Υ	Y	N/A 158.	158. 158.	158. 158.	158. 158.	158. 158.	414. 158.	414. N/A
	essor (120 Vac Only)		Y145	Any	ı	Υ	ı		ı	314.	314.	314.	314.	314.	314.	314.
	. ,,		Y145 Y1532	,	Y	Y	Y	Y	Y		570.	570.	570.	570.	570.	570.
	Addition of lightning arrestor			Any Any	Y	Y	Y	Y	Y	570. N/A					5/0. N/C	
Substitute copper or	ubstitute copper only lugs for standard				Y	Y	Y	Y	Y	N/A	N/A	N/C	N/C	N/C	N/C	N/C

- NIGHT-MASTER maximum 200 A, minimum 30 A.
- Transformer Voltage Codes.
- Mechanically held only. Electrically held device has a control circuit requiring a 120 V secondary, therefore, a transformer is supplied. The transformer comes wired to L1 and L2 unless Form S is called for. It is supplied with two primary and one secondary fuse.

  Photocell mounted on a NEMA 1 enclosure is designed for indoor areas which rely on natural light. Addition of the photocell does not make the enclosure suitable for outdoor (NEMA Type 3R)
- Available for 24 V, 120 V, 240 V, 277 V and 480 V applications only.
- For electrically held enclosed devices, the first pilot is wired in parallel with the coil. Operating interlocks are required for all additional pilot lights. Mechanically held devices require operating interlocks for all pilot lights. Δ
- п DO NOT use Form X for any interlock which is wired in series with pilot light, but DO specify how pilot light and interlock are to be wired into the circuit.
- Electrically held 20 A multipole contactors cannot add interlocks. Additional poles can be used for the same function, however. Mechanically held (Type LX) provide one double throw auxiliary (or status) contact as standard.
- Single primary voltage must be specified using the codes shown below:
- Form R6 must be used with Form C on mechanically held devices

Voltage 60 Hz	Code
120–24	V89
208-120	V84
240–24	V82
240-120	V80
277-120	V85
480–24	V83
480-120	V81
480–240	V87
600–120	V86

#### **Order Example**

You have previously selected a Class 8903SMG2V02.

V02 means that you need a coil voltage of 120-60/110-50 wired for separate control. You would like to add form FF4T with the transformer voltages being 480 volt primary, 120 volt secondary.

The new and complete Class, Type, Voltage Code and Form number:

Class	Type	Voltage Code	Form⊖
8903	SMG2	V81	FF4T

Form numbers should always be shown in alphabetical order.

#### Table 16.166:

	Types L	& LX		Type S											
Description	30 A		30 A	L.	60 <i>F</i>	4	100 A	L.	200 A		300 A	L.	400, 600, 8	00 A	_
2000p	Kit	\$ Dries	Kit	\$	Kit	\$ Dries	Kit	\$ Price	Kit	\$ Price	Kit	\$ Price	Kit	\$	Form No.
Auxiliary Contacts	Kit	Price	KIT	Price	Kit	Price	KIT	Price	KIT	Price	KIT	Price	KIT	Price	
1 N.O. LH or RH Mounting		I _	9999SX6	86.00	9999SX6	86.00	9999SX6	86.00	9999SX6	86.00	9999SX6	86.00	9999SX6	86.00	
1 N.C. LH or RH Mounting	_	_	9999SX7	86.00	9999SX7	86.00	9999SX7	86.00	9999SX7	86.00	9999SX7	86.00	9999SX7	86.00	.,
1 N.C. & 1 N.O. Isolated LH or RH 1 N.O. Overlapping LH or RH	_	_	9999SX8 9999SX9	116.00 116.00	9999SX8 9999SX9	116.00 116.00	9999SX8 9999SX9	116.00 116.00	9999SX8 9999SX9	116.00 116.00	9999SX8 9999SX9	116.00 116.00	9999SX8 9999SX9	116.00 116.00	Х
1 N.C. Overlapping LH or RH		_	9999SX10	116.00	9999SX10	116.00	9999SX10	116.00	9999SX10	116.00	9999SX10	116.00	9999SX10	116.00	
Control Circuit Fuse Holder	0000LLV	00.70				l		ı						ı	1
Single Fuse Unit	9999LLX and	23.70	9999SFR3	64.00	9999SFR3	64.00	9999SFR3	64.00	9999SFR3	64.00	9999SFR3	64.00	9999SFR3	64.00	F
	9999SFR3	42.80 23.70													
Two Fuse Unit	9999LLX and		9999SFR4	86.00	9999SFR4	86.00	9999SFR4	86.00	9999SFR4	86.00	9999SFR4	86.00	9999SFR4	86.00	F4
Tues of a supraya (Few Duises	9999SFR4	57.00													<u> </u>
Transformers (For Prices See Class 9070 Section)	9070T50	_	9070T100	_	9070T100	_	9070T150	_	9070T300	_	9070T500	_	9070T750	_	Т
Oversized Enclosures (Non-Co															
NEMA 1 NEMA 4	9991SDG3 9991SDW3		9991SDG3 9991SDW3	339.00	9991SDG3 9991SDW3	339.00 1169.00	_	_	_	_	_	_	_	_	
NEMA 12	9991SDA3		9991SDA3	684.00		684.00	=	_		_	_		=	=	=
Standard Enclosures															
NEMA 1-Surface Mount NEMA 3R	9991LXG1		9991SCG7▲		9991SDG7▲	143.00	9991SFG8	599.00	9991SFG4	1259.00	9991SGG8	1241.00	_	_	_
NEMA 4-Standard	9991SDH1 9991SDW1	323.00 779.00	9991SCH2 9991SCW1	372.00 684.00	9991SDH1 9991SDW1	485.00 1169.00	9991SEH1	684.00	9991SFH1	1853.00	_		_		
NEMA 4–With 2 Cvr Mtd. Clsng Plts	9991SDW11	798.00	9991SCW11 9991SCW20	714.00	9991SDW11 9991SDW20	1197.00	9991SEW11	1767.00	_	_	_	_	_	-	_
NEMA 4X–Glass Polyester NEMA 12	9991SDW20 9991SDA11		9991SCW20			485.00	9991SEA11	684.00	_	_	_		_		=
NEMA 1-Flushmount-Complete	_		_		_	_	9991SEF11	882.00	_	_			_		
NEMA 1-Flush Mount Parts FLUSH PARTS						474 00	_	_	_	_	_	_	_	_	_
Standard-Elec. held -Mech. held	9991SDF13 9991SDF13		9991SCF11 9991SCF13	57.00 201.00	9991SDF11 9991SDF13	171.00 171.00	_	_		_	_		_	_	
Mounting Strap	9991SDF2 9991SDF1	66.00 77.00	9991SCF2 9991SCF1	71.00 86.00	9991SDF2 9991SDF1	99.00 116.00	_	_		_	_		_		_
Pull Box Internal Operator	00010011	77.00												1	
Mounting Bracket	3010215901	26.10	3010215901	39.20	3010215901	39.20	3010215901	39.20	3010215901	39.20	3010215901	39.20	3010215901	39.20	G53
Solid Neutral	9999SN1	89.00	9999SN1	134.00	9999SN1	134.00	9999SN1	134.00	9999SN2	392.00	9999SN2	392.00	9999SN3■	624.00	N
Combination Lighting Contact	or Disconne	ct Interl	ock Kit			1								1	
Breaker Type 1-Pole	_	_	9999R26	131.00	9999R26	131.00	9999R26	131.00	9999R26	131.00	9999R26	131.00	9999R26	131.00	
2-Pole	_	_	9999R27	243.00	9999R27	243.00	9999R27	243.00	9999R27	243.00	9999R27	243.00	9999R27	243.00	
Disconnect Type 1-Pole	_	_	9999TC11	120.00	9999TC10	116.00	9999TC10	120.00	9999R8	131.00	9999R35	435.00	9999R26	131.00	
2-Pole		_	9999TC21	239.00	9999TC20	221.00	9999TC20	239.00	9999R9	243.00	9999R36	521.00	9999R27	243.00	Y74
Lightning Arrestor														,	
175 Vac to Ground Max 2 or 3 wire Grounded	SDSA1175	92.00	SDSA1175	92.00	SDSA1175	92.00	SDSA1175	92.00	SDSA1175	92.00	SDSA1175	92.00	SDSA1175	92.00	Y1532
650 Vac to Ground Max 3 or 4 wire Grounded	SDSA3650	248.00	SDSA3650	248.00	SDSA3650	248.00	SDSA3650	248.00	SDSA3650	248.00	SDSA3650	248.00	SDSA3650	248.00	11532
2 2			ically hald on			1					1				

- For electrically held only. Limited to 400 and 600 A versions. 800 A is a factory modification only.

by Schneider Electric www.schneider-electric.us

#### Table 16.167: Mechanically Held

		TYPE L	_X						TYF	PES					
Description	Form No.	30 A		30 A		60 A		100 A		200 A		300 A		400, 600, 800 A	
		Kit	\$ Price												
PUSH BUTTON (ON-OFF) NEMA 1 Enclosure	A3	9999BLX 9999LXPB	35.60 116.00	•	_	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00
NEMA 3R, 4 or 12 Enclosure		9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00	9001KA2 9999SA3■	21.50 215.00
SELECTOR SWITCH (2 POSITION) NEMA 1 Enclosure	C6	9999BLX 9999LXS	35.60 116.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00
NEMA 3R, 4 or 12 Enclosure		9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00
SELECTOR SWITCH (3 POSITION) NEMA 1 Enclosure (MUST INCLUDE TWO WIRE CONTROL RELAY, Form R6	С	9999BLX 9999SC2	35.60 116.00	9001KN260 9001KS46BH2	4.40 138.00	9001KN260 9001KS46BH2	4.40 138.00		4.40 138.00	9001KN260 9001KS46BH2	4.40 138.00		4.40 138.00	9001KN260 9001KS46BH2	4.40 138.00
NEMA 3R, 4 or 12 Enclosure		9001KN260 9001KS46BH2	4.40 138.00												
TWO WIRE CONTROL RELAY (Form R6)△	R6	9999RLX CA2SK11□	35.60 95.00	8501XO11	201.00	8501XO11	201.00	8501XO11	201.00	8501XO11	201.00	8501XO11	201.00	8501XO11	201.00

#### Table 16.168: Electrically Held

10.010 1011001 2.10		•							T) (	DE 0					
Description	Form	TYPE 30 A		30 A		60 A		100 A		PE S 200 A		300 A		400, 600, 8	00 A
	No.	Kit	\$ Price	Kit	\$ Price		\$ Price		\$ Price		\$ Price		\$ Price		\$ Price
PILOT LIGHTS (RED and GREEN) NEMA 1 Enclosure NEMA 3R, 4 or 12 Enclosure	P1	9999SP28R	215.00		215.00 215.00	9999SP3R 9999SP28R	215.00 215.00	9999SP14R 9999SP28R	215.00 215.00	★ 9999SP28R 9999SP28R	215.00 215.00		215.00 215.00		215.00 215.00
PUSH BUTTONS▼ NEMA 1 Enclosure	A12	9999BLX 9999SA10	35.60 116.00	9999SA10	116.00	9999SA10	116.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00
NEMA 3R, 4 or 12 Enclosure	AIZ	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00	9999SA3	215.00
SELECTOR SWITCH (2 POSITION) NEMA 1 Enclosure	C6	9999BLX 9999SC22	35.60 116.00	9999SC22	116.00	9999SC22	116.00	9999SC22	116.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00
NEMA 3R, 4 or 12 Enclosure		9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BM1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00	9001KN244 9001KS11BH1	4.40 96.00
SELECTOR SWITCH (3 POSITION) NEMA 1 Enclosure	С	9999BLX 9999SC2	35.60 116.00	9999SC2	116.00	9999SC2	116.00	9999SC2	116.00	9999SC8	215.00	9999SC8	215.00	9999SC8	215.00
NEMA 3R, 4 or 12 Enclosure		9999SC8	215.00	9999SC8	215.00	9999SC8	215.00	9999SC8	215.00	9999SC8	215.00	9999SC8	215.00	9999SC8	215.00

- No field installed kit available.

  Mechanically held contactors need two distinct signals to operate. An N.O. contact block must be added to the Class 9999 Type SA3 push button kit.

  Selection for 2- or 3-Pole only; for 4- or 5-Pole use Class 9999SP15R \$215.

  The coil voltage must be the same as the pilot light rating. Kit contains one (1) Class 9001, Type KP1R6 120 V/60 Hz red pilot light control unit. For other voltages, refer to the Class 9001, Type KP Control Section.
- Requires holding circuit interlock for Type S or additional power pole on Type L devices. Form R6 available for 24 V, 120 V, 240 V and 277 V only. Insert CA2SK11() voltage code from page 23-21.

# 16 NEMA/DEFINITE PURPOSE TYPE

#### **Approximate Dimensions**

Table 16.169: Open Type

		Electri	cally He	ld					Mecha	anically H	leld		
Ampere	Туре	Number		Dime	nsions		Туре			Dimens	ions		
Rating	Туре	of Poles	Α	В	С	E	Туре	Α	В	С	D	E	F
		2–4	<b>2.88</b> 73	<b>5</b> 127	<b>4.62</b> 117	<b>3.12</b> 79		<b>2.88</b> 73	_	_	<b>8.81</b> 224	<b>3.25</b> 83	<b>7.70</b> 196
30	LO	6	<b>4.25</b> 108	<b>5</b> 127	<b>4.62</b> 117	<b>3.12</b> 79	LXO	<b>4.25</b> 108	_	1	<b>8.81</b> 224	<b>3.25</b> 83	<b>7.70</b> 196
		8–12	<b>5.63</b> 143	<b>5</b> 127	<b>4.62</b> 117	<b>3.12</b> 79		<b>5.63</b> 143	_	_	<b>8.81</b> 224	<b>3.25</b> 83	<b>7.70</b> 196
30	SMO	2–3	<b>4.34</b> 110	<b>3.22</b> 82	<b>4.22</b> 107	<b>3.50</b> 89	-	<b>7.15</b> 182	<b>3.79</b> 96	<b>4.68</b> 119	-	<b>6.04</b> 153	_
30	SIVIO	4–5	<b>4.34</b> 110	<b>4.25</b> 108	<b>4.22</b> 107	<b>3.50</b> 89	_	<b>7.15</b> 182	<b>4.54</b> 115	<b>4.68</b> 119	_	<b>6.04</b> 153	_
60	SPO	2–3	<b>5.33</b> 135	<b>4.31</b> 110	<b>4.94</b> 125	<b>5.50</b> 140	_	<b>8.25</b> 210	<b>4.61</b> 117	<b>5.23</b> 133	_	<b>7.81</b> 198	_
	5	4–5	<b>6.22</b> 158	<b>5.61</b> 142	<b>4.94</b> 125	<b>5.50</b> 140	1	<b>8.70</b> 221	<b>5.90</b> 150	<b>5.23</b> 133	-	<b>7.81</b> 198	_
100	SQO	2–3	<b>7.09</b> 180	<b>5.45</b> 138	<b>6.50</b> 165	<b>7.26</b> 184	_	<b>10.13</b> 257	<b>5.94</b> 151	<b>6.72</b> 171	_	<b>7.26</b> 184	_
100	30	4–5	<b>7.82</b> 199	<b>9.75</b> 248	<b>6.50</b> 165	<b>7.26</b> 184	_	<b>10.56</b> 268	<b>9.75</b> 248	<b>6.72</b> 171	_	<b>7.26</b> 184	_
200	SVO	2–3	<b>9.14</b> 232	<b>6.00</b> 152	<b>6.50</b> 165	<b>9.14</b> 232	SVO	<b>11.35</b> 288	<b>6.00</b> 152	<b>6.72</b> 171	_	<b>9.14</b> 232	_
200	300	4 & 5▲	<b>9.14</b> 232	<b>9.75</b> 248	<b>6.50</b> 165	<b>9.14</b> 232	300	<b>11.55</b> 293	<b>9.75</b> 248	<b>6.72</b> 171	_	<b>9.14</b> 232	_
300	SXO	2–3	<b>12.31</b> 313	<b>8.66</b> 220	<b>8.74</b> 222	<b>12.25</b> 311	SXO	<b>12.31</b> 313	<b>8.66</b> 220	<b>10.50</b> 267	_	<b>12.31</b> 313	_
400 600	SYO SZO	2–3		<b>12.33</b> 313	<b>9.00</b> 229	<b>27.78</b> 706	SYO SZO		<b>8.66</b> 220	<b>10.50</b> 267		<b>21.00</b> 533	
800	SJO	2–3	_	<b>12.33</b> 313	<b>11.94</b> 303	<b>42.70</b> 1085			_		_	_	

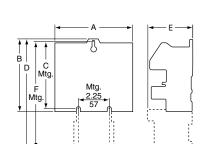
<sup>5-</sup>Pole, electrically held only.

Table 16.170: NEMA 1 Enclosure (Non-Combination) **Electrically and Mechanically Held** 

Ampere	Туре	Number	Fo	rm(s)	D	imensior	าร
Rating	туре	of Poles	FO	mi(s)	Width	Height	Depth
				3, A12, C, C6,	7.81	12.69	6.03
30	LG,			6, Y48	198 <b>11.88</b>	322 11.88	153 <b>7.44</b>
	LXG.	Any	I	P, T	302	302	189
30			K14, K	141, K142	<b>16.00</b> 406	<b>22.00</b> 559	<b>7.13</b> 181
			Electrically Held	Std., A12, C, C6, P, X	6.00	10.00	5.28
			Mechanically Held	Std., X	152	254	134
30	SMG	2–5	Electrically Held	Т	<b>6.34</b> 161	<b>15.88</b> 403	<b>5.19</b> 132
00	Oivia	2-3		N	14.88	14.12	7.56
				T, N, R6	378	359	192
			Mechanically Held	A3, C, C6, P	<b>8.12</b> 206	<b>14.12</b> 359	<b>9.73</b> 247
		2–5	Electrically Held	Std., A12, C, C6, P, X	<b>7.81</b> 198	<b>12.69</b> 322	<b>6.03</b> 153
60	SPG	2–5	Electrically Held & Mechanically Held	T, N, R6	<b>14.88</b> 378	<b>14.12</b> 359	<b>7.56</b> 192
		2–5	Mechanically Held	Std., A3, C, C6, P, X	<b>8.12</b> 206	<b>14.12</b> 359	<b>9.73</b> 247
			Electrically Held	Std., A12, C, C6, F, P, X, T	11.25	25.15	8.99
		2 & 3	Mechanically Held	Std., F, X, T	286	639	228
		200	Electrically Held	N, R6, T, T10-T13,■	18.15	29.15	9.24
			Mechanically Held	A3, C, C6, N, R6, T, T10-T13,■	461	740	235
100	SQG		Electrically Held	Std., A12, C, C6, F, P, X	11.25	25.15	8.99
			Mechanically Held	Std., F, X	286	639	228
		4 & 5	Electrically Held		18.15	29.15	9.24
			Mechanically Held	A3, C, C6, ■	461	740	235
			Electrically Held	N, R6, T, T10-T13	22.15	39.15	10.24
			Mechanically Held	N, R6, T, T10-T13	563	994	260
200	SVG	All	Electrically and Mechanically Held	Standard and All Forms	<b>22.15</b> 563	<b>39.15</b> 994	<b>10.24</b> 260
300	SXG	All	Electrically and Mechanically Held	Standard and All Forms	<b>17.21</b> 437	<b>44.21</b> 1123	<b>12.83</b> 326
400 and 600	SYG & SZG	All	Electrically and Mechanically Held	Standard and All Forms	<b>20.21</b> 513	<b>65.75</b> 1670	<b>13.10</b> 333
800	SJG	2–3	With or with	out any Forms	<b>34.50</b> 876	<b>93.00</b> 2362	<b>23.50</b> 597

All Type K Forms.

Dual Dimensions: INCHES Millimeters

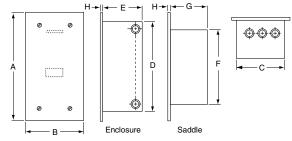


Open Type L & LX

Open Type S

Table 16.171: NEMA 1 Flush Mounted

Ampere	Туре	Forn	2/0)			Dim	ensions	;		
Rating	Type	FOIII	1(5)	Α	В	С	D	Е	F	G
30	LF	Standard, F	7, Y48, R6	<b>15.19</b> 386	<b>8.94</b> 227	<b>7.63</b> 194	<b>12.88</b> 327	<b>5.44</b> 138	<b>10.94</b> 278	<b>5.13</b> 130
	LXF	A3, A12, T,		<b>24.00</b> 610	<b>17.50</b> 445	<b>15.00</b> 381	<b>19.25</b> 489	<b>7.12</b> 181		
		Electrically Held	Std., A12, C, C6, P, X	13.44	7.19	5.88	11.13	4.75	9.19	4.50
30	SMF	Mechanically Held	Std., X	341	183	149	283	121	233	114
30	SIVIF	Electrically Held	T, N	24.00	17.50	15.00	19.25	5.75		-
		Mechanically Held	A3, C, C6, T, N, P, R6	610	445	381	489	146		
		Electrically Held	Std., A12, C, C6, P, X	15.19	8.94	7.63	12.88	5.44	10.94	5.13
60	SPF	Mechanically Held	Std., X	386	227	194	327	138	278	130
00	JF1	Electrically Held	T, N	24.00	17.50	15.00	19.25	5.75		
		Mechanically Held	A3, C, C6, T, N, P, R6	610	445	381	489	146		
100	SQF	With or withou	it any Forms	<b>31.00</b> 787	<b>16.75</b> 425	<b>14.25</b> 362	<b>26.25</b> 667	<b>8.00</b> 203	_	



NEMA 1 Flush Mounted

#### **Approximate Dimensions**

**Table 16.172: NEMA 3R** 

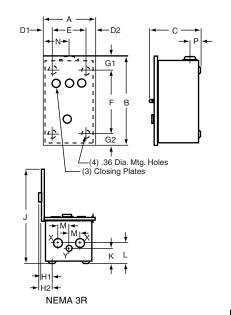
Ampere Rating	Туре	Number of Poles	А	В	С	D1	D2	E	F	G1	G2	H1	H2	J	К	L	M	N	Р	K.O. X	K.O. Y
30	SMH	All	8.83 224	12.30 312	7.12 181	1.39 35	1.44 37	6.00 152	7.50 191	2.64 67	2.16 55	2.08 53	2.62 66	14.28 363	1.37 35	1.37 35	1.88 48	4.38 111	1.83 46	1/2 3/4 1	1/2 3/4 1
30 60	LH SPH	All	9.83 250	16.30 414	8.62 219	1.39 35	1.44 37	7.00 178	11.50 292	2.64 67	2.16 55	2.08 53	2.62 66	16.78 426	1.31 33	1.75 44	2.13 54	4.88 124	1.83 46	1 1 1/4 1 1/2	1/2 3/4
100	SQH	All	12.83 326	25.30 643	8.62 219	1.39 35	1.44 37	10.00 254	20.50 521	2.64 67	2.16 55	2.08 53	2.62 66	19.78 502	1.31 33	1.94 49	2.44 62	6.38 162	1.83 46	1 1 1/4 2 2 1/2	1/2 3/4
200	SVH	All	12.83 326	40.30 1024	9.12 232	1.39 35	1.44 37	10.00 254	35.50 902	2.64 67	2.16 55	2.08 53	2.62 66	20.28 515	1.31 33	2.31 59	2.69 68	6.38 162	1.83 46	1 1 1/4 2 2 1/2	1/2 3/4

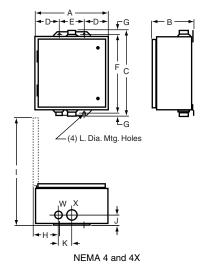
Table 16.173: NEMA 4 and 4X Stainless Steel Only ◆

Ampere Rating	Туре	Number of Poles	F	- Form(s)	For Gla	ıss Polye	Dir ester (thro			ainless Size 2				ons on	page 1	6-25.	Bottom Hub Only	Top & Bottom Hub
		Poles			Α	В	С	D	E	F	G	н	I	J	K	L	w	Х
30	LW	Any	Standa	rd, F, R6, Y48	8.13 206	7.88 200	16.19 411	1.56 40	5.00 127	15.00 381	.60 15	1.94 49	14.75 375	2.00 51	2.63 67	.31 8	3/4"	1 1/2"
30	LXW	Ally	A3, A1	2, C, C6, P, T	12.62 321	7.81 198	14.69 373	2.56 65	7.50 191	13.50 343	.63 16	3.38 86	18.44 468	1.69 43	2.31 59	.31 8	3/4"	1"
			Electrically Held Mechanically Held	Std., A12, C, C6, P, X Std., F, X	6.38 162	7.13 181	13.19 335	1.56 40	3.25 83	12.00 305	.63 16	1.19 30	11.81 300	1.63 41	2.31 59	.31 8	3/4"	1"
30	SMW	2–5	Electrically Held	T	12.63 321	7.11 181	14.69 373	2.56 65	7.50 191	13.50 343	.63 16	3.19 81	18.50 470	1.64 42	2.31 59	.31 8	3/4"	1"
			Electrically Held Mechanically Held	N, R6 A3, C, C6, T, N, P, R6	14.88 378	7.25 184	16.31 414	2.56 65	9.75 248	15.00 381	.63 16	3.19 81	20.88 530	2.06 52	2.63 67	.31 8	3/4"	1 1/2"
			Electrically Held Mechanically Held	Std., A12, C, C6, P, X Std., A3, C, C6, P, X	8.13 206	7.88 200	16.19 411	1.56 40	5.00 127	15.00 381	.60 15	1.94 49	14.75 375	2.00	2.63 67	.31	3/4"	1 1/2"
60	SPW	2–5	Electrically Held Mechanically Held	T, N, R6 A3, C, C6, T, N, P, R6	14.88 378	7.25 184	16.31 414	2.56	9.75 248	15.00 381	.63 16	3.88 98	20.88 530	2.06 52	2.63	.31	3/4"	1 1/2"
		2&3	Electrically Held	Std., A12, C, C6, F, N, R6, P, T, T10-13, X	18.15 461	8.77 223	32.21 818	3.08	12.00	30.50 775	.61 15	3.67	26.71 678	2.58	3.19	.44	3/4"	2 1/2"
100	sow		Mechanically Held	Std., A3, C, C6, F, N, P, R6, T, T10-13, X	401	223	010	76	303	775	15	93	676	00	01	11		
100	SQW	405	Electrically Held Mechanically Held	Std., A12, C, C6, F, P, ■ Std., A3, C, C6, P, ■	18.15 461	8.77 223	32.21 818	3.08 78	12.00 305	30.50 775	.61 15	3.67 93	26.71 678	2.58 66	3.19 81	.44 11	3/4"	2 1/2"
		4 & 5	Electrically Held Mechanically Held	N, R6, T, T10-13 N, R6, T, T10-13	22.15 563	9.77 248	42.21 1072	3.08 78	16.00 406	40.50 1029	.61 15	3.67 93	31.71 805	2.33 59	2.88 73	.44 11	3/4"	2 1/2"
200	SVW	All	Electrically and Mechanically Held	Standard and All Forms	22.15 563	9.77 248	42.21 1072	3.08 78	16.00 406	40.50 1029	.61 15	3.67 93	31.71 805	2.33 59	2.88 73	.44 11	3/4"	2 1/2"
300	sxw	All	Electrically and Mechanically Held	Standard and All Forms	17.21 437	12.63 321	47.21 1199	4.11 104	9.00 229	46.00 1168	.61 15	4.59 117	28.32 719	3.11 79	5.75 146	.56 14	3/4"	3 1/2"
400 & 600	SYW & SZW	All	Electrically and Mechanically Held	Standard and All Forms	20.21 513	12.13 308	65.21 1656	4.11 104	12.00 305	64.00 1626	.61 15	4.59 117	30.82 783	2.67 68	4.50 114	.56 14	3/4"	Two 3"▲
800	SJW	2–3	With or wi	thout any Forms	34.50 876	23.50 597	101.00 2565						Floor Mo	unting				

- X hub is 1/4" left of center. W hub shown is another X hub. K dimension is distance between two X hubs. Actual W hub is located 3-3/16" to the right of X hub shown. All "K" forms.

  For glass polyester (through 100A), see Size 2 NEMA 4/4X dimensions on page 16-25.





INCHES Millimeters **Dual Dimensions:** 

BQUARE D

#### **Approximate Dimensions**

#### Table 16.174: NEMA 12/3R

Ampere	Time	Number		Form(s)					Dimensi	ons▲				
Rating	Туре	of Poles		rom(s)	Α	В	С	D	E	F	G	Н	- 1	J
30	LA	Any	Star	ndard, F, R6, Y48	<b>8.13</b> 206	<b>8.50</b> 216	<b>15.75</b> 400	<b>1.56</b> 40	<b>5.00</b> 127	<b>15.00</b> 381	. <b>31</b> 8	<b>2.13</b> 54	<b>14.75</b> 375	. <b>31</b> 8
30	LXA	Arry	А3,	A12, C, C6, P, T	<b>11.88</b> 302	<b>7.75</b> 197	<b>13.50</b> 343	<b>3.81</b> 97	<b>4.25</b> 108	<b>12.75</b> 324	. <b>38</b> 10	<b>4.94</b> 125	<b>18.12</b> 460	. <b>31</b> 8
			Electrically Held	Std., A12, C, C6, P, X	6.38	8.53	12.75	1.56	3.25	12.00	.38	3.56	12.50	.31
			Mechanically Held	Std., F, P, X	162	217	324	40	83	305	10	90	318	8
30	SMA	2-5	Electrically Held	Т	<b>11.88</b> 302	<b>7.75</b> 197	<b>13.50</b> 343	<b>2.56</b> 65	<b>6.75</b> 171	<b>12.75</b> 324	<b>.38</b> 10	<b>3.66</b> 93	<b>18.12</b> 460	. <b>31</b> 8
			Electrically Held	N, R6	14.88	7.88	16.00	2.56	9.75	15.00	.50	3.66	21.25	.31
			Mechanically Held	A3, C, C6, T, N, P, R6	378	200	406	65	248	381	13	93	540	8
			Electrically Held	Std., A12, C, C6, P, X	8.13	9.28	16.00	1.56	5.00	15.00	.50	3.66	15.38	.31
60	SPA	2-5	Mechanically Held	Std., A3, C, C6, P, X	206	236	406	40	127	381	13	93	391	8
00	SIA	2-3	Electrically Held	T, N, R6	14.88	7.88	15.75	2.56	9.75	15.00	.38	3.66	21.25	.31
			Mechanically Held	A3, C, C6, T, N, P, R6	378	200	400	65	248	381	10	93	540	8
		2 & 3	Electrically Held	Std., A12, C, C6, F, N, R6, P, T, T10-13, X										
		2 & 3	Mechanically Held	Std., A3, C, C6, F, N, P, R6, T, T10-13, X	<b>18.15</b> 461	<b>9.24</b> 235	<b>31.50</b> 800	<b>3.08</b> 78	<b>12.00</b> 305	<b>30.50</b> 775	<b>.50</b> 13	<b>3.67</b> 93	<b>26.71</b> 678	<b>.44</b> 11
100	SQA		Electrically Held	Std., A12, C, C6, F, N, P, ■										ĺ
		4 & 5	Mechanically Held	Std., A3, C, C6, P, ■										<u> </u>
		403	Electrically Held	N, R6, T, T10-13, ■	22.15	10.24	41.50	3.08	16.00	40.50	.50	3.67	31.71	.44
			Mechanically Held	N, R6, T, T10-13, ■	563	260	1054	78	406	1029	13	93	805	11
200	SVA	All	Electrically and Mechanically Held	Standard and All Forms	<b>22.15</b> 563	<b>10.24</b> 260	<b>41.50</b> 1054	<b>3.08</b> 78	<b>16.00</b> 406	<b>40.50</b> 1029	<b>.50</b> 13	<b>3.67</b> 93	<b>31.71</b> 805	. <b>44</b> 11
300	SXA	All	Electrically and Mechanically Held	Standard and All Forms	<b>17.21</b> 437	<b>13.33</b> 339	<b>47.00</b> 1194	<b>4.11</b> 104	<b>9.00</b> 229	<b>46.00</b> 1168	<b>.50</b> 13	<b>4.59</b> 117	<b>28.32</b> 719	<b>.56</b> 14
400 & 600	SYA & SZA	All	Electrically and Mechanically Held	Standard and All Forms	<b>20.21</b> 513	<b>13.00</b> 330	<b>65.00</b> 1651	<b>4.11</b> 104	<b>12.00</b> 305	<b>64.00</b> 1626	<b>.50</b> 13	<b>5.31</b> 135	<b>30.87</b> 784	<b>.69</b> 18
800	SJA	2-3	With or	without any Forms	<b>93.00</b> 2362	<b>34.50</b> 876	<b>23.50</b> 597		•	Flo	or Mountii	ng		

See Figure 1 for all dimensions except 800 A; for 800 A dimensions, see Figure 2. All Type "K" Forms using Class 9001 Type K Control Units.

#### Table 16.175: NIGHT-MASTER® Outdoor Lighting Contactors (Short Version)—NEMA 3R

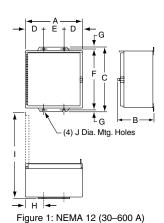
Ampere	Description	Type Number	^	В	_	D	_	_	G	н	14	V		М		Knockou	ts
Rating	Description	Type Number	A	ь	·	U	=	-	G	п	J+	Ν.		IVI	N	P	Q
30	Disconnect Switch & Circuit Breaker Types	SMC61, 62 & 81	23.50	15.00	8.42	10.50	19.00	22.38	7.00	2.18	1.50	2.13	2.13	2.13	.50-	1.–1.25	.50–
60	Disconnect Switch & Circuit Breaker Types	SPC61, 62 & 81	597	381	214	267	483	568	178	55	38	54	54	54	.75	1.50	.75
100	Disconnect Switch & Circuit Breaker Types	SQC61, 62 & 81	<b>34.53</b> 877	<b>20.00</b> 508	<b>8.42</b> 214	<b>10.50</b> 267	<b>30.04</b> 763	<b>33.41</b> 849	<b>7.00</b> 178	<b>2.18</b> 55	<b>2.0</b> 51	<b>2.68</b> 68	<b>2.68</b> 68	<b>3.44</b> 87	.50– .75	11.25 22.50	11.25 1.5-2.0
200	Disconnect Switch Type Circuit Breaker Type	SVC61 & 62 SVC81	<b>48.37</b> 1229	<b>19.00</b> 483	9.12 232	10.53 267	<b>44.00</b> 1118	<b>47.25</b> 1200	<b>7.00</b> 178	<b>2.18</b> 55	2.50 64	<b>2.68</b> 68	<b>2.68</b> 68	<b>3.44</b> 87	.50– .75	11.25 22.50	11.25 1.5-2.0

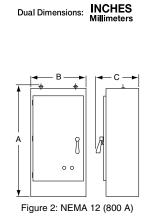
#### Table 16.176: NIGHT-MASTER® Outdoor Lighting Contactors (Long Version)—NEMA 3R

Ampere	Description	Type Number		ь	_		-	-	G	н	Jø	v		8.6		Knockou	ts
Rating	Description	Type Number	^	В	·		_		ď		J.	· K	_	IVI	N	P	Q
30	Disconnect Switch & Circuit Breaker Types	SMC63, 64 & 83	38.88	15.00	8.42	10.42	34.38	37.76	7.00	2.18	1.50	2.13	2.13	2.13	.50-	11.25	.50-
60	Disconnect Switch & Circuit Breaker Types	SPC63, 64 & 83	987	381	214	265	873	959	178	55	38	54	54	54	.75	1.50	.75
100	Disconnect Switch & Circuit Breaker Types	SQC63, 64 & 83	<b>42.53</b> 1080	<b>20.00</b> 508	<b>8.42</b> 214	<b>10.42</b> 265	<b>38.04</b> 966	<b>41.41</b> 1052	<b>7.00</b> 178	<b>2.18</b> 55	<b>2.0</b> 51	<b>2.68</b> 68	<b>2.68</b> 68	<b>3.44</b> 87	.50 <b>–</b> .75	1. <b>–</b> 1.25 2. <b>–</b> 2.50	11.25 1.5-2.0
200	Disconnect Switch Type Circuit Breaker Type	SVC63 & 64 SVC83	<b>56.37</b> 1432	<b>19.00</b> 483	<b>9.12</b> 232	<b>10.53</b> 267	<b>52.00</b> 1321	<b>55.25</b> 1403	<b>7.00</b> 178	<b>2.18</b> 55	2.50 64	<b>2.68</b> 68	<b>2.69</b> 68	<b>3.44</b> 87	.50 <b>–</b> .75	1. <b>–</b> 1.25 2. <b>–</b> 2.50	11.25 1.5-2.0

**Dual Dimensions:** 

Conduit size.





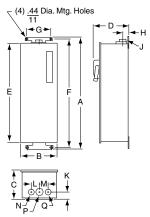


Figure 3: NIGHT-MASTER



#### **Approximate Dimensions**

Table 16.177: Combination Lighting Contactors—NEMA 1 Enclosure

Ampere	Toma						Dimen	sions	(see	Figure	1)						Top 8	Bot.	Sides
Rating	Туре	Α	В	С	D	Е	F	G	Н	- 1	J	K	L	M	N	0	W	Х	Υ
	SMG6- & 8-	<b>9.50</b> 241	<b>22.50</b> 572	<b>8.37</b> 213	<b>6.38</b> 162	<b>20.50</b> 521	<b>14.68</b> 373	<b>1.81</b> 46	<b>1.69</b> 43	<b>3.37</b> 86	<b>3.38</b> 86	<b>1.06</b> 27	<b>3.25</b> 83	<b>2.18</b> 55	<b>1.25</b> 32	<b>.87</b> 22	.50- .75	.50- .75	.50
30	SMG7- & 9-	<b>13.75</b> 349	<b>23.00</b> 584	<b>8.36</b> 212	<b>10.63</b> 270	<b>21.00</b> 533	<b>20.07</b> 510	<b>1.87</b> 47	<b>1.88</b> 48	<b>3.76</b> 96	<b>2.06</b> 52	<b>1.06</b> 27	<b>3.25</b> 83	<b>2.18</b> 55	<b>1.25</b> 32	<b>.87</b> 22	.50- .75- 1.0	.50- .75- 1.0	.50
60	SPG6- & 8-	<b>10.50</b> 267	<b>26.00</b> 660	<b>9.62</b> 244	<b>7.37</b> 187	<b>24.00</b> 610	<b>17.00</b> 432	<b>2.12</b> 54	<b>2.00</b> 51	<b>4.00</b> 102	<b>2.06</b> 52	<b>1.06</b> 27	<b>3.25</b> 83	<b>2.18</b> 55	<b>1.25</b> 32	<b>.87</b> 22	1.0- 1.25	.50- .75	.50
60	SPG7- & 9-	<b>15.00</b> 381	<b>28.75</b> 730	<b>9.62</b> 244	<b>11.62</b> 295	<b>26.25</b> 667	<b>21.50</b> 546	<b>2.18</b> 55	<b>2.00</b> 51	<b>4.00</b> 102	<b>2.56</b> 65	<b>1.31</b> 33	<b>3.25</b> 83	<b>2.18</b> 55	<b>1.25</b> 32	<b>.87</b> 22	1.0- 1.25	.50- .75	.50

# Table 16.178: NEMA 1 Enclosure

Ampere	Туре						Dimer	nsions#	(see	Figure	2)						Top &	Bot.	Sides
Rating	туре	Α	В	С	D	Е	F	G	Н	- 1	J	K	L	M	N	0	W	Х	Y
100	SQG6- & 7- SQG81 & 91	<b>15.25</b> 387	<b>39.50</b> 1003	<b>10.60</b> 269	<b>9.25</b> 235	<b>3.00</b> 76	<b>22.68</b> 576	<b>41.00</b> 1041	<b>2.69</b> 68	<b>5.38</b> 137	<b>2.83</b> 72	<b>3.74</b> 95	<b>5.00</b> 127	_	<b>1.21</b> 31	<b>.90</b> 23	11.25 22.50	.50- .75	.50
200	SVG6- & 7- SVG81 & 91	<b>16.00</b> 406	<b>50.00</b> 1270	<b>10.68</b> 271	10.00 254	<b>3.00</b> 76	<b>23.68</b> 601	<b>51.50</b> 1308	<b>2.69</b> 68	<b>5.38</b> 137	<b>2.83</b> 72	<b>3.74</b> 95	<b>5.00</b> 127	_	<b>1.21</b> 31	<b>.90</b> 23	2.50	.50- .75	.50
300	SXG6- & 7-	<b>20.00</b> 508	<b>75.00</b> 1905	<b>14.37</b> 365	<b>12.00</b> 305	<b>4.00</b> 102	<b>29.43</b> 748	<b>77.00</b> 1956	<b>3.19</b> 81	_	<b>3.52</b> 89	<b>7.00</b> 178	<b>9.25</b> 235	ı	_	_	.50- .75	3.00	_
300	SXG81 & 91	<b>20.00</b> 508	<b>63.00</b> 1600	<b>14.37</b> 365	<b>12.00</b> 305	<b>4.00</b> 102	<b>27.43</b> 697	<b>65.00</b> 1651	<b>3.19</b> 81	_	<b>3.52</b> 89	<b>7.00</b> 178	<b>5.00</b> 127	_	_	_	.50- .75	3.00	_
400	SYG81 & 91	36.00	90.00	17.00					Eloor M	lountin	a Enck	ocuro							
600	SZG81 & 91	914	2286																

Table 16.179: NEMA 4 & 4X Enclosure

Ampere	<b></b>						Din	nensions	▲ (see	Figure	3)				
Rating	Туре	Α	В	С	D	Ε	F	G	Н	I	J	K	L	W	Х
30	SMW6-& 8-	<b>9.50</b> 241	<b>8.36</b> 212	<b>24.76</b> 629	<b>3.25</b> 83	<b>2.50</b> 64	<b>4.50</b> 114	<b>23.50</b> 597	<b>.63</b> 16	<b>3.00</b> 76	<b>1.62</b> 41	<b>2.31</b> 59	<b>14.31</b> 363	.75 Hub	1.0 Hub
30	SMW7- & 9-	<b>13.75</b> 349	<b>8.36</b> 212	<b>25.26</b> 642	<b>3.25</b> 83	<b>4.75</b> 121	<b>4.25</b> 108	<b>24.00</b> 610	<b>.63</b> 16	<b>5.25</b> 133	<b>1.62</b> 41	<b>2.31</b> 59	<b>20.14</b> 512	.75 Hub	1.0 Hub
60	SPW6- & 8-	<b>10.50</b> 267	<b>9.61</b> 244	<b>28.26</b> 718	<b>3.25</b> 83	<b>2.50</b> 64	<b>5.50</b> 140	<b>27.00</b> 686	<b>.63</b> 16	<b>3.00</b> 76	<b>2.00</b> 51	<b>2.63</b> 67	<b>16.56</b> 421	.75 Hub	1.50 Hub
00	SPW7- & 9-	<b>15.00</b> 381	<b>9.61</b> 244	<b>31.01</b> 788	<b>3.25</b> 83	<b>5.38</b> 137	<b>4.25</b> 108	<b>29.75</b> 756	<b>.63</b> 16	<b>5.88</b> 149	<b>2.00</b> 51	<b>2.63</b> 67	<b>21.06</b> 535	.75 Hub	1.50 Hub
100	SQW6- & 7- SQW81 & 91	<b>15.25</b> 387	<b>10.60</b> 269	<b>41.76</b> 1061	<b>5.00</b> 127	<b>2.50</b> 64	<b>10.25</b> 260	<b>40.50</b> 1029	<b>.63</b> 16	<b>3.24</b> 82	<b>2.61</b> 66	<b>3.19</b> 81	<b>22.18</b> 563	.75 Hub	2.50 Hub
200	SVW6- & 7- SVW81 & 91	<b>16.00</b> 406	<b>10.56</b> 268	<b>52.26</b> 1327	<b>5.00</b> 127	<b>2.50</b> 64	<b>11.00</b> 279	<b>51.00</b> 1295	<b>.63</b> 16	<b>3.24</b> 82	<b>2.61</b> 66	<b>3.19</b> 81	<b>23.00</b> 584	.75 Hub	2.50 Hub
300	SXW6- & 7-	<b>20.00</b> 508	<b>14.21</b> 361	<b>78.12</b> 1984	<b>9.25</b> 235	<b>4.00</b> 102	<b>12.00</b> 305	<b>77.00</b> 1956	<b>.56</b> 14	<b>4.77</b> 121	<b>2.96</b> 75	<b>3.50</b> 89	<b>29.43</b> 748	.75 Hub	3.50 Hub
300	SXW81 & 91	<b>20.00</b> 508	<b>14.21</b> 361	<b>66.12</b> 1679	<b>5.00</b> 127	<b>4.00</b> 102	<b>12.00</b> 305	<b>65.00</b> 1651	<b>.56</b> 14	<b>4.77</b> 121	<b>2.96</b> 75	<b>3.50</b> 89	<b>27.43</b> 697	.75 Hub	3.50 Hub
400	SYW81 & 91	36.00	17.71	98.00				Floor Moi	ıntina F	nclosure	3				
600	SZW81 & 91	914	17.71   98.00   Floor Mounting Enclosure												

Table 16.180: NEMA 12/3R Enclosure

Ampere	Toma				Di	mensions▲	(see Figure	e 4)			
Rating	Туре	Α	В	С	D	E	F	G	Н	1	J
30	SMA6- & 8-	<b>9.50</b> 241	<b>8.36</b> 212	<b>24.26</b> 616	<b>3.25</b> 83	<b>2.50</b> 64	<b>4.50</b> 114	<b>23.50</b> 597	<b>.38</b> 10	<b>3.25</b> 83	<b>14.31</b> 363
30	SMA7- & 9-	<b>13.75</b> 349	<b>10.10</b> 257	<b>24.76</b> 629	<b>3.25</b> 83	<b>4.75</b> 121	<b>4.25</b> 108	<b>24.00</b> 610	<b>.38</b> 10	<b>5.50</b> 140	<b>22.00</b> 559
60	SPA6- & 8-	<b>10.50</b> 267	<b>9.61</b> 244	<b>27.76</b> 705	<b>3.25</b> 83	<b>2.50</b> 64	<b>5.50</b> 140	<b>27.00</b> 686	<b>.38</b> 10	<b>3.25</b> 83	<b>16.56</b> 421
60	SPA7- & 9-	<b>15.00</b> 381	<b>10.98</b> 279	<b>30.51</b> 775	<b>3.25</b> 83	<b>5.38</b> 137	<b>4.25</b> 108	<b>29.75</b> 756	<b>.38</b> 10	<b>6.13</b> 156	<b>23.43</b> 595
100	SQA6- & 7- SQA81 & 91	<b>15.25</b> 387	<b>10.59</b> 269	<b>42.00</b> 1067	<b>5.00</b> 127	<b>3.00</b> 76	<b>9.25</b> 235	<b>41.00</b> 1041	<b>.50</b> 13	<b>3.75</b> 95	<b>22.31</b> 567
200	SVA6- & 7- SVA81 & 91	<b>16.00</b> 406	<b>10.52</b> 267	<b>52.50</b> 1334	<b>5.00</b> 127	<b>3.00</b> 76	10.00 254	<b>51.50</b> 1308	<b>.50</b> 13	<b>3.75</b> 95	<b>23.00</b> 584
300	SXA6- & 7-	<b>20.00</b> 508	<b>14.21</b> 361	<b>78.00</b> 1981	<b>9.25</b> 235	<b>4.00</b> 102	<b>12.00</b> 305	<b>77.00</b> 1956	<b>.50</b> 13	<b>7.75</b> 197	<b>29.43</b> 748
300	SXA81 & 91	<b>20.00</b> 508	<b>14.21</b> 361	<b>66.00</b> 1676	<b>5.00</b> 127	<b>4.00</b> 102	<b>12.00</b> 305	<b>65.00</b> 1651	<b>.50</b> 13	<b>7.75</b> 197	<b>27.43</b> 697
400	SYA81 & 91	36.00	17.71	90.00			Floor N	Assessing Co.	alaarwa		
600	S7481 & 01	914	450	2286	1		Floor	Nounting En	ciosure		

<sup>▲</sup> Dimensions are the same for Form F4T (standard control transformer), Form F4T11 (100 VA extra capacity) and Form F4T12 (200 VA extra capacity).

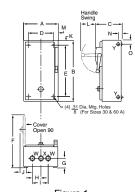


Figure 1 NEMA 1 Enclosure Combination Devices

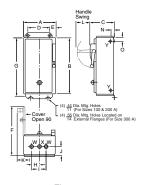


Figure 2 NEMA 1 Enclosure

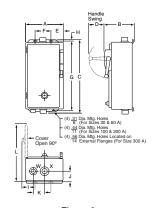


Figure 3 NEMA 4 & 4X Enclosure



Figure 4 NEMA 12/3R Enclosure

Dual Dimensions: INCHES Millimeters

- Industry Standard Mounting
- **Double Break Contacts**
- Low Coil VA
- Straight-Through Wiring
- Low Cost



8910DP22V09 Definite Purpose Contactor

Compact Design

Definite purpose contactors are ideal for heating, air conditioning, refrigeration, data processing, and food service equipment. New compact 1 and 2-Pole contactors are available along with standard size 2, 3, and 4-Pole devices.

They feature quick connect terminals and binder head screws for easy wiring. Box lugs are standard on 40 A contactors and larger. An exclusive DIN track mounting option may reduce installation costs. Coils can be changed on the Type DPA contactors (50 to 90 A) quickly without a tool. Auxiliary contact modules snap on either side of the Type DPA contactors.

Table 16.181: Compact 1-Pole Contactors—600 Vac Maximum

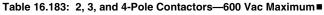
Full Load	Locked Rotor (A)			Resistive Load	N.O. Poles	Туре	\$ Price
(A)	277 V	460 V	575 V	(A)	Foles		
20	120	100	80	30	1	DP11♦	32.80
25	150	125	100	35	1	DP21♦	38.20
30	150	125	100	40	1	DP31♦	45.90
40	240	200	160	50▲	1	DP41♦	54.00



8910DP42V14 Definite Purpose Contactor

Table 16.182: Compact 2-Pole Contactors—600 Vac Maximum■

Full Load		Locked Rotor (A)		Resistive Load	N.O. Poles	Туре	\$ Price
(A)	277 V 460 V 575 V (A)	Poles					
20	120	100	80	30	2	DP12♦	38.20
25	150	125	100	35	2	DP22◆	50.00
30	150	125	100	40	2	DP32♦	55.00
40	240	200	160	50	2	DP42♦	65.00





8910DPA33V04 Definite Purpose Contactor

Full Load	1	Locked Rotor (A)		Resistive		Horsepower Ratings				Time	\$ Price
(A)	230 V	460 V	575 V	Load (A)	115 V 1Ø	230 V 1Ø	230 V 3Ø	460/575 V 3Ø	Poles	Туре	\$ Price
20	120	100	80	30	1.5	3	7-1/2	7-1/2	2 3 4	DPA12♦ DPA13♦ DPA14♦	53.00 61.00 76.00
25	150	125	100	35	2	5	10	15/20	2 3 4	DPA22 ♦ DPA23 ♦ DPA24 ♦	58.00 67.00 86.00
30	180	150	120	40	2	5	10	15/20	2 3 4	DPA32 ♦ DPA33 ♦ DPA34 ♦	71.00 75.00 99.00
40	240	200	160	50	3	7-1/2	10	20/25	2 3 4	DPA42♦ DPA43♦ DPA44♦	79.00 88.00 114.00
50	300	250	200	65	3	10	15	30	2	DPA52♦ DPA53♦	164.00 174.00
60	360	300	240	75	5	10	25	30	2	DPA62♦ DPA63♦	185.00 193.00
75	450	375	300	94	5	15	25	40	2	DPA72♦ DPA73♦	221.00 247.00
90	540	450	360	120	7-1/2	20	30	50	2	DPA92♦ DPA93♦	286.00 311.00

- 50 A Resistive, maximum 277 V. All others rated 40 A Resistive
- Above 240 V, all lines must be switched.
- Voltage code must be specified to order this product. Refer to standard voltage codes listed below.

Table 16.184: Coil Voltage Codes

Volt	Code		
60 Hz	50 Hz	Type DP, DPA	
24 24 120 208 208-240 230-240 277 480 600	24 ————————————————————————————————————	V14 V02 V09 V04 V06★ V07▼	

- Not available for Type DP11 through DP31 single-pole devices.
- Not available for Type DP one- and two-pole devices



#### by Schneider Electric www.schneider-electric.us

#### Types DP, DPA Application Data

#### Table 16.185: 2 Normally Open & 2 Normally Closed 4-Pole Contactors—600 Vac Maximum

Full					N.C.	Class	0 Dulas
Load (A)	Load (A)	Poles	Poles■	Туре	Form	\$ Price	
20	25	2	2	DPA14▲	Y392	148.00	
25	35	2	2	DPA24▲	Y392	159.00	
30	40	2	2	DPA34▲	Y392	171.00	

Voltage code must be specified to order this product. Refer to standard voltage codes below

Above 240 volts, all lines must be switched.

Note: N.C. poles on outside. N.C. poles open before N.O. poles close.

#### Table 16.186: Auxiliary Contacts, 5 A, 600 Vac Rated

For Use With	Contact	Class 99	4.5.	
Class 8910 Type	Arrangement	20–40 A	50–90 A	\$ Price
DPA	1 N.O. 1 N.C. 1 N.O. & 1 N.C. 2 N.O.	DD10 DD01 DD11 DD20	D10 D01 D11 D20	16.40 16.40 29.50 29.50

#### Table 16.187: NEMA 1 General Purpose Enclosures for Type DP, DPA Contactors

Class 8910 Type	Full Load (A)	Poles	Class 9991 Type	\$ Price ◆
DP	20-40	1 & 2	DPG1	78.00
DPA	20-40	2 & 3	DPG1	78.00
DPA	50 20–40	2 & 3 4	DPG2	99.00
DPA	60–75	2 & 3	DPG3	143.00
DPA	90	2 & 3	DPG4	287.00

CP1 discount schedule.

#### Table 16.188: Application Data

Mechanical Life: 500,000 operations Electrical Life: Type DP Type DPA 100,000 operations 200,000 operations

Duty Cycle: Continuous

Approvals: UL Component Recognized UL Listed (Form U1) CSA Certified File E3190, CCN NLDX2 File E3190, CCN NLDX File LR25490, Class 321104 DPA is CE marked Note: See page 16-107 for replacement contacts.

#### Coil Replacement



No tools required (DPA50-60A)

#### Table 16.189: Class 8910 Type DPA Replacement Coils

\$ Price△	ıperes▼	Volt-Am	Class 9998	Deles	Full Load
\$ Price△	Sealed	Inrush	Type	(A) Poles	
92.00	10	109	DA2★	2 & 3	50-60 A
114.00	19	214	DA3★	2 & 3	75–90 A
114.00	19	214	DA3×		75-90 A

Replace diamond with suffix from DPA Coil Table 16.193. Example: Coil for Class 8910 DPA53V02 120 V 60 Hz would be a Class 9998 Type DA2V02.

#### Table 16.190: Terminals

Full Load	Power Terminals			
(A)	Type of Lug	Wire Range□		
20–30 A 40 A 50–60 A 75–90 A	Binder Head Box Lug Box Lug Box Lug	#14–#8 #14–#6 #14–#2 #14–#I/O		

Solid or stranded copper wire only.

#### Table 16.191: Miscellaneous Parts

Description	Class 9999 Type	\$ Price
DIN mounting bracket attachment (Type DPA, 20 A to 60 A only)	DMB1	15.00
Type DP Series B Cover	DPC1	2.10

#### Table 16.192: Factory Modifications

Auxiliary contacts can be factory installed along with a DIN mounting bracket option. Special terminations are also available.

Modification	Туре	Form	\$ Price
Factory installed auxiliary contacts	_	<b>♦</b>	<b>♦</b>
Pressure wire connectors (20–30 A)	DPA	Y122	1.70 per pole
Box lugs (20-30 A)	DP DPA	Y124	3.30 per pole
DIN mounting bracket attached (35 mm style)☆	DP DPA	Y135	3.30 8.70
Contact cover for Type DP Series B	_	Y248	2.10
UL Listed label on device	DP	U1	No Charge
A Cantast valve magnest Cabasidas Flactric cale	tr		

- Contact your nearest Schneider Electric sales office
- Available for 20 through 60 A only.

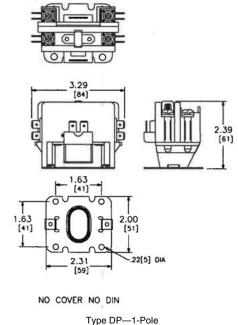
Table 16.193: Type DPA Coil Voltage Codes

Voltage, 60 Hz	Voltage, 50 Hz	Voltage Code
24	24	V14
120	110	V02
208-240	220	V09
277	—	V04
480	440	V06▽
600	550	V07▽

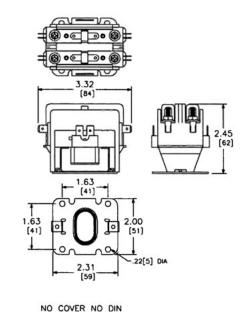
Available for Type DPA contactors only.

For Types DP11 through DP32: Inrush 30 VA; Sealed 5 VA.

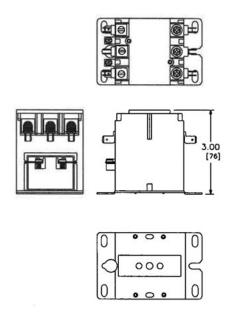
CP10 Discount Schedule, not CP1,



20 through 40 Full Load Amperes

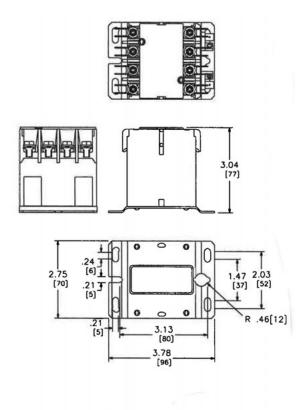


Type DP—2-Pole 20 through 40 Full Load Amperes



Type DPA—2 and 3-Pole 20 through 40 Full Load Amperes

WITH COVER NO DIN



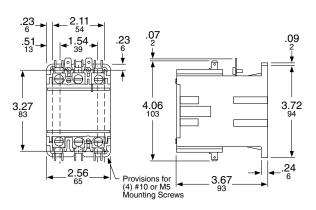
WITH COVER NO DIN

Type DPA—4-Pole
20 through 40 Full Load Amperes

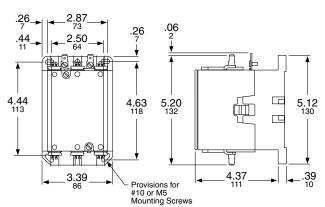
Dual Dimensions: INCHES



#### **Definite Purpose Contactors**



Type DPA-2 and 3-Pole 50 and 60 Full Load Amperes



Type DPA-2 and 3-Pole 75 and 90 Full Load Amperes

INCHES Millimeters Dual Dimensions:

Class 8911 / Refer to Catalog 8910CT9301

by Schneider Electric www.schneider-electric.us



8911DPSO33V09 Definite Purpose Starter

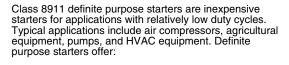
回

Type DPSG23V02

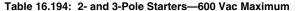
**Approximate** Dimensions

7.00

.60 41



- Low cost
- Small size
- Melting alloy overload block
- Trip-free reset mechanism
- Open type or enclosed
- 500,000 mechanical operations



No. of	Full Load	III Load Horsepower Ratings		Open Type		NEMA 1 Enclosed		No. of Thermal		
Poles	(A)	115 V 1Ø	230 V 1Ø	230 V 3Ø	460/575 V 3Ø	Type■	\$ Price ▲	Type■	\$ Price ▲	Units▲
2-Pole Single Phase	20 25 30 40 50	1 1/2 2 2 3 3	3 5 5 7 1/2 10	_ _ _ _	_ _ _ _	DPSO12♦ DPSO22♦ DPSO32♦ DPSO42♦ DPSO52♦	270.00 296.00 333.00 365.00 482.00	DPSG12◆ DPSG22◆ DPSG32◆ DPSG42◆ DPSG52◆	332.00 354.00 392.00 426.00 539.00	1
3-Pole Poly- Phase	20 25 30 40 50	1 1/2 2 2 3 3	3 5 5 7 1/2 10	7 1/2 10 10 10 10	7 1/2 15/20 15/20 20/25 30	DPSO13♦ DPSO23♦ DPSO33♦ DPSO43♦ DPSO53♦	297.00 320.00 363.00 399.00 638.00	DPSG13 ◆ DPSG23 ◆ DPSG33 ◆ DPSG43 ◆ DPSG53 ◆	356.00 381.00 423.00 459.00 696.00	3

- Holding circuit contacts are not provided as standard; refer to table below for kit.
- Voltage code must be specified to order this product. Refer to standard voltage codes listed below.

Table 16.195: Cross Reference Existing/Replacement Table 16.197: Class 8911 Type DPS **Class 8911** 

	Existing Device	Replacement Device
	HO33	DPSO13
	HG33	DPSG13
	JO33	DPSO23
	JG33	DPSG23
	KO33	DPSO33
	KG33	DPSG33
	KO43	*
	KG43	*
	LO33	DPSO43
	LG33	DPSG43
	MO33	DPSO53
	MG33	DPSG53
	MO43	*
	MG43	*
*	Type DPS 4-Pole starter not av	ailable. Suggest 3-Pole device with

auxiliary contact.

Table 16.196: Miscellaneous Parts and Kits

Description	Class & Type	\$ Price
Start-Stop push button kit▼△	8911DPB1	134.00
Hand-Off-Auto selector switch kit▼	8911DSS1	134.00
Standard N.C. overload relay contact	9998SO1	42.80
N.C. and N.O. isolated overload relay alarm contacts	9999SO4	116.00
Overload relay jumper strap	9998SO31	14.30

Use for 20 to 40 A starters. For 50 A starters, use the 9999BLX bracket. Does not include holding circuit interlock—order auxiliary contact

## Replacement Parts

Full Load	Poles	Class 9998	Vo	\$ Price□	
(A)	roles	Туре	Inrush	Sealed	\$ Price
50 A	2 & 3	DA2♦	109	10	92.00
Soo page 16-107 for replacement contacts for DPS devices					

CP10 Discount Schedule, not CP1

Replace with Voltage Code from the Coil Table shown below.

Table 16.198: Coil Voltage Codes

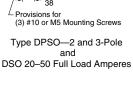
Voltage, 60 Hz	Voltage, 50 Hz	Voltage Code
24	24	V14
120	110	V02
208–240	220	V09
277	—	V04
480	440	V06
600	550	V07

Table 16.199: Auxiliary Contacts For Type DPS **Starters** 

Description	20–40 A	50 A	\$ Price ☆
Description	Class 9999 Type	Class 9999 Type	\$ FIICE A
1 N.O. 1 N.C. 1 N.O./1 N.C. 2 N.O.	DD10 DD01 DD11 DD20	D10 D01 D11 D20	16.40 16.40 29.50 29.50

CP1B discount schedule.

NOTE: Auxiliary contacts must be field installed.



Type DPSG-2 and 3-Pole 20-40 Full Load Amperes

3.00

.88 22

8.13 207

1.00

10.00 254

#### Table 16.200: Ratings—Overload Contacts and Auxiliary Contacts

	Device	Volts AC	Pilot Duty (35% Pow	Continuous Current Rating	
1 <u>6</u>		AC	Make	Carry and Break	Current Hading
	9998 SO1	120 or Less	30 A	3 A	5 A
	9999 SO4 9999 R20 & R21 9999 D10, D01, D11 & D20	120–600	3600 VA	360 VA	5 A

Table 16.201: How to Order

	To Order Specify:		Catalog	Number	
•	Class Number Type Number Voltage Code Form(s)	Class	Typse	Coil Voltage Code	Form(s)
:		8911	DPSG33	V02	

Type SSD4030

Type SSE4050

# WELL-GUARD Control<sup>™</sup> Pump Panels

NOTE: Motor Logic™SSOLR are designed to protect 50/60 hertz three-phase AC motors from overload and phase loss conditions. Open Delta systems or grounded B-phase systems are difficult to balance and could cause the Motor Logic SSOLR to trip. For applications of this nature, it is recommended that bi-metallic overload relays (Form B12) be used.

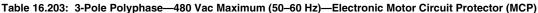
Class 8940 Type NS, SS, and XS panels in NEMA 3R enclosures are specifically designed for pumping applications. Extra space is provided for field installation of auxiliary equipment.

- Type S Contactor provided as standard
- Approved for submersible pump applications
- Motor Logic<sup>TM</sup> Class 10/20 (Selectable) SSOLR through 200 hp–480 V, 100 hp–240 V, Type SS only (Includes rubber boot.)
- All prices include a START push button and a HAND-OFF-AUTO selector switch
- Adjustable trip current
- Phase failure sensitive through 200 hp-480 V, 100 hp-240 V, Type SS only
- Ambient temperature compensated overload
- All devices are UL Listed, and marked "SUITABLE FOR USE AS SERVICE EQUIPMENT"

NOTE: Class 10 Motor Logic SSOLR does not protect for phase imbalance.



Volts	Maximum Hp Polyphase	Coil Voltage	Fuse Clip (A)♦	Туре	\$ Price
240	3, 5, 7-1/2 10, 15 20, 25, 30 40, 50 75 100 100 200 250, 300	240–60 220–50	30 60 100 200 LLL36400E20▼ 400 LLL36600E20▼ MJL36800▼ PLL34120▼	SSC2007★ SSD2015★ SSE2030★ SSF2050★ XSG2075■ SSG2100■ XSH2200■ XSH2200■	2003.00 2480.00 4194.00 7718.00 19890.00 16286.00 19890.00 43133.00 58145.00
480	3, 5, 7-1/2, 10 15, 20, 25 30 40, 50 60, 75, 100 150 200 200 300, 350, 400 500, 600	480–60 440–50	30 60 60 100 200 LLL36400E20▼ 400 LLL36600E20▼ MJL36800▼ PLL34120▼	SSC4010★ SSD4025★ SSD4030★ SSE4050★ SSF4100★ XSG4150■ SSG4200★ XSG4200■ XSH4400■ XSJ4600■	2003.00 2480.00 3338.00 4194.00 7718.00 19890.00 16286.00 19890.00 4313300 58145.00



Volts	Max. Hp Polyphase	Coil Voltage■	Circuit Breaker∆	Туре	\$ Price	
	30	240-60	HLL36100M73	XSE2030V03	4599.00	
240	40	220-50	JLL36250M75	XSE2040V03	7650.00	
	50		JLL36250M75	XSF2050V03	8258.00	
	40		HLL36100M73	XSE4040V06	4599.00	
480	50	480-60		XSE4050V06	4599.00	
460	75	440–50	JLL36250M75	XSE4075V06	7650.00	
	100		JLL36250M75	XSF4100V06	8258.00	
To substitute on IFO and blank annual and blank all line at all and a declaration for the Material and OOOL D. and a declaration and a declaration beautiful.						

- A To substitute an IEC ambient compensated bimetallic overload relay (up to size 5) for the Motor Logic SSOLR, request Form B12 and state motor hp (no charge). This applies to the above (SSx) devices only.
- See page 16-76 for coil voltage codes and pricing.
- Fuse clips are sized for use with dual-element time-delay fuses
- ★ Voltage code not required for 240 V or 480 V common control with 8940SS controllers.
- ▼ Circuit breaker disconnect supplied. (See page 7-32 for circuit breaker adjustment range.)
- △ See page 7-32 for circuit breaker adjustment range.

Table 16.204: Class 8940—UL Listed Short Circuit Ratings

		•				
Thermal Magnetic Circuit Breaker Type						
NEMA Size	Voltage	Enclosure	Available Amperes RMS Symmetrical			
0-5	0-480	Standard	100,000			
6, 7	0-480	Standard	65,000			

<sup>□</sup> Standard enclosure includes non-oversize NEMAs 1, 4 & 4X

Table 16.205: Class 10 Pump Panel Replacement Motor Logic SSOLR (with rubber boot)

Description	Catalog Number	\$ Price
Pump Panel SSOLR 27A Special	3116154764 (Size 1)	\$192.00
Pump Panel SSOLR 45A Special	3116154883 (Size 2)	270.00
Pump Panel SSOLR 90A Special	3116155158 (Size 3)	329.00
Pump Panel SSOLR 135A Special	3116155368 (Size 4)	477.00
Pump Panel SSOLR 270A Special	3116118474 (Size 5)	221.00
Pump Panel SSOLR 540A Special	3116118476 (Size 6)	221.00
Pump Panel SSOLR 810A Special	3116118477 (Size 7)	221.00
Replacement Boot Size 1 & 2	9999MRB12 (5 boots)	50.00
Replacement Boot Size 3 & 4	9999MRB34 (5 boots)	50.00

Table 16.206: Class 8940—UL Listed Short Circuit Ratings

NEMA Size	NEMA Fuse Class	Enclosure	Available Amperes RMS Symmetrical
0–3	Class H or K	Standard	5,000
0–3	Class R	Standard	100,000
0–2	Class H or K	Standard	5,000
0–2	Class R	Standard	100,000
4–5	Class H or K	Standard	10,000
4–5	Class R	Standard	100,000
6	Class H or K	Standard	18,000
6	Class R	Standard	100,000

For How to Order Information, see page 16-13.

CP1

Type WC3S2V06

Type XE3S2V02B12S

Class 8940 / Refer to Catalog 8940CT9701

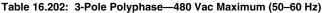
www.schneider-electric.us

Class 8940 "S2" Pumping Plant Panels in NEMA 3R enclosures are specifically designed for oil field applications. All panels are supplied with an Electonic Motor Circuit Protector (MCP) or a visible blade, fused, disconnect switch. This line of pumping plant panels features:

- Rugged spring latches for easy access without a tool
- Side mounted control units for convenient operation
- Door retainer available for windy areas
- Price includes Hand-Off-Auto selector switch
- UL Listed for use as service equipment for motors
- Extra panel space for additional electrical controls
- All devices are UL Listed, and marked "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT"

Thermal units must be ordered separately at \$21.50 each. See page 16-116 for selection information.

NOTE: Overload relays are ambient temperature compensated.



Volts	Max. Hp Polyphase Voltage	CoilA	NEMA Size	Fusible Disconnect Type		Circuit Breaker Type			
		Voltage		Fuse Clip (A)■	Туре	\$ Price	Frame Size	Туре	\$ Price
240	7-1/2	240–60 220–50	1	30	WC1S2V03	2109.00	HLL36030M71	XC1S2V03	2228.00
	10		2	60	WD1S2V03	2880.00	HLL36050M72	XD1S2V03	2997.00
	15						HLL36100M73	XD2S2V03	2997.00
	30		3	100	WE1S2V03	4649.00	HLL36100M73	XE1S2V03	4886.00
	50		4	200	WF1S2V03	8724.00	JLL36250M75	XF2S2V03	8963.00
480	10		1	30	WC3S2V06	2109.00	HLL36030M71	XC4S2V06	2262.00
	15		2	- 60	WD3S2V06	2919.00	HLL36030M71	XD3S2V06	3036.00
	25	480–60 440–50	2				HLL36050M72	XD4S2V06	3036.00
	50		3	100	WE3S2V06	4748.00	HLL36100M73	XE3S2V06	4986.00
	100		4	200	WF3S2V06	8801.00	JLL36250M75	XF4S2V06	9036.00
_	Coil voltage code must be supplied to order this product. See Coil Voltage Codes table to the left for codes.								

- Fuse clips are sized for use with dual-element time-delay fuses.

#### Table 16.203: Factory Modifications (Forms)

Table 10.2001 Factory meaning (Former		
Description	Form Letter	\$ Price
Substitute Class 10 IEC overload relay – state motor hp (NEMA Sizes 0–4 only)	B12	No Charge
Control transformer with fused primary:		
Types: NPD, NPE, NPF, SSC, WC, XC (50 VA)		386.00
NPG, SSD, XD, WD (100 VA)	F4T	539.00
NPJ, SSE, XE, WE (150 VA)		797.00
SSF, XF, WF (300 VA) SSG, NSG, XSG (50 VA and an interposing control relay)		968.00 1097.00
Factory installed door wind latch assembly in a standard 8940NPD, NPE, NPF, NPG, NPJ, SSC, SSD, SSE and SSF	G45	113.00
Elapsed time meter	G97	827.00
Substitute Class 10 Motor Logic™ SSOLR▼	H10	64.00
ON Delay Timer	K25	1197.00
OFF Delay Timer	K26	1197.00
Program timer with day omission feature	K141	1197.00
Backspin timer (time delay upon energization)	K15	1112.00
Start Pushbutton (S2 panels only)	A28	No Charge
"Slim" panel (Types WC, WD, WE, XC, XD, XE only)	L8	No Charge
"Short" panel (Types SSE, SSF, XE-S2 and XF-S2 only)	L9	No Charge
Pilot light (specify lens color). Does not include auxiliary contact.	P♦	336.00
Separate control	S	No Charge
Auxiliary contacts (specify N.O. or N.C.)	X★	158.00
Special UL panel label for modified UL Listed devices on non-standard panels, requires approval by manufacturing plant	Y1	267.00
Lightning arrestor	Y1532	570.00
Phase failure, phase reversal relay with time delay including under and over voltage protection	R44	1463.00
Substitute standard trip melting alloy overload relays	Y61	No Charge
Substitute quick-trip melting alloy overload relay (Sizes 1 and 2 only) – Not available on IEC style contactors	Y611	No Charge
Substitution of Class R rejection fuse clips for standard fuse clip. (8940 RD, RE, RF, RG, MD, ME, MF, MG, SSC, SSD, SSE, SSF, SSG, WC, WD, WE and WF)	Y1071	No Charge

- Indicate pilot light color as Form P1 (red) or Form P2 (green). See page 16-100, footnote △ for more selections.
- To determine the maximum number of auxiliary contacts which can be added to each Type S device and for the appropriate "X Form," refer to tables in the Class 8536 section.
- Motor Logic SSOLR are designed to protect 50/60 hertz three-phase AC motors from overload, phase unbalance and phase loss conditions. Open Delta systems or grounded B-phase systems are difficult to balance and could cause the Motor Logic SSOLR to trip. For applications of this nature, it is recommended that bi-metallic overload relays (Form B12) be used.

#### Table 16.204: Coil Voltage Codes

	•			
Volt	age	Code	S Price Adder	
60 Hz	50 Hz	Code	\$11100 Adder	
24△□ 120□ 208□ 240 — 480 600□	110□ 110□ 220 380 440 550□	V01 V02 V08 V03 V05 V06 V07	N/C N/C N/C N/C N/C N/C N/C	
Specify	Specify	V99	35.60	

- 24 V coils are not available on Size 4 starters. On Size 1-3, 24 V coils are available. Form S must be used.
  - Form S required for separate control.

www.schneider-electric.us

## Table 16.205: Replacement Overload Relay for Square D Class 8940 Pump Panel with IEC Style Bi-metallic Overload Relays Mounted on Current Transformers

	AMP Range	Number of Poles	Form	Series	Type≎	\$ Price
	40A-63A	3	B12	В	TJF40	428.00
•	63A-100A	3	B12	В	TJF63	428.00
	100A-160A	3	B12	В	TJF100	468.00
	160A-250A	3	B12	В	TJF160	468.00

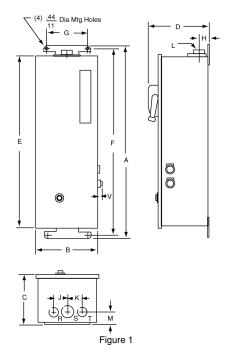
<sup>♦</sup> A retro-fit reset kit is required for pre-series B pump panels. See page 16-92 for selection.

## **Approximate Dimensions**

## Table 16.206:

Type	Eia	А	L.	В		C	;	D		E	Ē	F	=	G	i	ŀ	ł	J	J	ŀ	(	L	N	Λ	I	Knockout	s	\ \	V
Туре	Fig.	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	IN	mm	Conduit	IN	mm	R	S	Т	IN	mm
NPD/E/F SSC SSD	1	39.05	992	13.73	349	6.67	169	9.70	246	33.05	839	37.93	963	7.00	178	2.41	61	3.00	76	3.00	76	2-1/2	2.41	61	1/2-3/4	1-1/4— 1-1/2	1/2-3/4	1.41	36
NPG/J SSE/F XSE/F	1	49.00	1245	19.15	486	8.81	224	10.37	263	44.07	1119	47.88	1216	7.00	178	2.17	55	2.69	68	3.44	87	2-1/2	2.57	65	1/2-3/4	1–1-1/4 1–2-1/2	1–1-1/4 1-1/2–2		36
WC—S2 WD—S2 XC—S2 XD—S2	1	38.50	978	19.00	483	7.29	185	9.39	239	34.00	864	37.38	949	7.00	178	2.18	55	2.13	54	2.13	54	1-1/2	2.12	54	1/2-3/4	1–1-1/4 1-1/2	1/2-3/4	_	
WE—S2 WF—S2 XE—S2 XF—S2	1	56.50	1435	23.00	584	8.23	209	10.33	262	52.00	1321	55.38	1407	7.00	178	2.18	55	2.69	68	3.44	87	2	2.68	68	1/2-3/4	1–1-1/4 2–2-1/2	1–1-1/4 1-1/2–2	1.50	38
SSG XSG	1	75.50	1892	22.00	559	13.80	351	17.55	446	73.00	1854	74.50	13	14.00	356	N/A	N/A	.56	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.50	38
XSH	2	82.50	2096	36.00	914	20.00	508	23.25	591	80.00	2032	33.75	857	16.50	419	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
XSJ	2	92.50	2350	34.00	864	20.00	508	23.25	591	90.00	2286	31.75	806	16.50	419	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**NOTE:** Illustrations may not represent the actual enclosure; they are intended for dimensional information only.



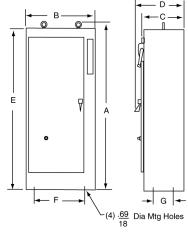


Figure 2

Dual Dimensions: INCHES Millimeters

by Schneider Electric www.schneider-electric.us



Duplex Motor Controllers are used to control two motors, and consist of two starters in a common enclosure. Two separate disconnect switches or circuit breakers with operators are included with all combination devices. Unless Form Y68 is specified, an alternation circuit (a Class 8501 Type XO40 relay) is included, which alternately operates first one motor and then the other on each successive closing of a pilot device. Both motors will be energized should a second pilot device close. All devices incorporate a terminal block to simplify wiring of pilot devices A and B. Typical applications include pump motors where a second pump is required for peak demand periods yet alternation is desirable to equalize pump wear.

## Table 16.207: 3-Pole Polyphase—600 Vac Maximum (50-60 Hz) Non-Combination Type—Without Disconnect—With Electric Alternation

Note that the prices shown do not include thermal units. Devices require 6 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

NEMA Size		ım Rating ı Motor	NEMA General Po Enclos	urpose	NEMA <sup>4</sup> Watertight and Enclos Stainless	Dusttight ure	NEMA (NEMA 3 a Dusttight and Industrial Use	nd 3R)▲ d Driptight	Open Type		
	Voltage	Hp Polyphase	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
0	200–230 460–575	3 5	NBG10■	2322.00	NBW10■	3105.00	NBA10■	2564.00	NBO10■	2138.00	
1	200–230 460–575	7-1/2 10	NCG20■	2478.00	NCW20■	3290.00	NCA20■	2721.00	NCO20■	2294.00	
2	200 230 460–575	10 15 25	NDG30■	3731.00	NDW30■	5427.00	NDA30■	4359.00	NDO30■	3290.00	
3	200 230 460–575	25 30 50	NEG40■	5112.00	NEW40■	8303.00	NEA40■	5925.00	NEO40■	4487.00	
4	200 230 460–575	40 50 100	NFG50■	10440.00	NFW50■	15881.00	NFA50■	13131.00	NFO50■	9116.00	

## Table 16.208: 3-Pole Polyphase—600 Vac Maximum (50–60 Hz) Combination Thermal Magnetic Circuit Breaker Type—With Electric Alternation

Note that the prices shown do not include thermal units. Devices require 6 thermal units. Standard trip thermal units are \$21.50 each. See page 16-116 for selection information.

Motor Starter Voltage	Max. Hp Poly-	Coil Voltage	NEMA Size	Circuit	Breaker	NEM/ General P Enclos	urpose	NEMA Watertight an Stainless Stee	d Dusttight	NEM. (NEMA 3 a Dusttight an Industrial Us	and 3R)▲ ad Driptight
voitage	phase			Frame Size	Ampere Rating	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
	2 3		0	HLL36015 HLL36020	15 20	CBG06■ CBG08■	3945.00	CBW06■ CBW08■	6951.00	CBA06■ CBA08■	4701.00
	5 7-1/2		1	HLL36035 HLL36050	35 50	CCG12■ CCG15■	4103.00	CCW12■ CCW15■	7109.00	CCA12■ CCA15■	4859.00
200	10	208–60	2	HLL36060	60	CDG22■	5826.00	CDW22■	10470.00	CDA22■	6894.00
(208)	15 20 25		3	HLL36100 HLL36125 HLL36150	100 125 150	CEG32■ CEG36■ CEG38■	9401.00	CEW32■ CEW36■ CEW38■	17490.00	CEA32■ CEA36■ CEA38■	10782.00
	30 40		4	JLL36200 JLL36250	200 250	CFG41■ CFG44■	19584.00	CFW41■ CFW44■	29924.00	CFA41■ CFA44■	23400.00
	2 3		0	HLL36015 HLL36020	15 20	CBG06■ CBG08■	3945.00	CBW06■ CBW08■	6951.00	CBA06■ CBA08■	4701.00
	5 7-1/2		1	HLL36035 HLL36045	35 45	CCG14■ CCG16■	4103.00	CCW14■ CCW16■	7109.00	CCA14■ CCA16■	4859.00
230 (240)	10 15	240–60 220–50	2	HLL36060 HLL36090	60 90	CDG22■ CDG24■	5826.00	CDW22■ CDW24■	10470.00	CDA22■ CDA24■	6894.00
	25 30		3	HLL36150	150	CEG38■	9401.00	CEW38■	17490.00	CEA38■	10782.00
	40 50		4	JLL36225 JLL36250	225 250	CFG43■ CFG44■	19584.00	CFW43■ CFW44■	29924.00	CFA43■ CFA44■	23400.00
	5		0	HLL36015	15	CBG10■	4859.00	CBW10■	7862.00	CBA10■	5612.00
	7-1/2 10		1	HLL36025 HLL36030	25 30	CCG18■ CCG20■	5013.00	CCW18■ CCW20■	8019.00	CCA18■ CCA20■	5769.00
460 (480)	15 20 25	480–60 440–50	2	HLL36045 HLL36060 HLL36070	45 60 70	CDG26■ CDG28■ CDG30■	6737.00	CDW26■ CDW28■ CDW30■	12881.00	CDA26■ CDA28■ CDA30■	7806.00
	30 50		3	HLL36080 HLL36150	80 150	CEG39■ CEG40■	9401.00	CEW39■ CEW40■	17490.00	CEA39■ CEA40■	10782.00
	75 100		4	JLL36200 JLL36250	200 250	CFG45■ CFG47■	19584.00	CFW45■ CFW47■	29924.00	CFA45■ CFA47■	23400.00

NEMA 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 16-95.

For How to Order Information, see page 16-13.

Coil voltage code must be specified to order this product. Refer to standard voltage codes listed on page 16-80. For voltage codes used with control transformers, see page 16-101.

## **AC Duplex Motor Controllers**

Table 16.209: 3-Pole Polyphase—600 Vac Maximum (50-60 Hz) Combination Disconnect Switch Type—With **Electric Alternation** 

Note that the prices shown do not include thermal units. Devices require 6 thermal units. Standard trip thermal units are **\$21.50** each. See page 16-116 for selection information.

Motor Voltage (Starter Voltage)	Max. Hp Poly- phase	Coil Voltage ◆	NEMA Size	Fuse Clip Size (A)■	NEN General Enclo	Purpose	Waterti	Énclosure	(NEMA 3 Dusttight a	IA 12 and 3R)▲ nd Driptight se Enclosure										
voitage)	pilase			(A)=	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price										
	3		0	None 30	UBG10 ♦ DBG08 ♦	3731.00 3816.00	UBW10♦ DBW08♦	6737.00 6822.00	UBA10♦ DBA08♦	4487.00 4572.00										
200	7-1/2	208-60	1	None 60	UCG20♦ DCG18♦	3888.00 3974.00	UCW20♦ DCW18♦	6894.00 6980.00	UCA20♦ DCA18♦	4644.00 4730.00										
(208)	10	206-00	2	None 60	UDG30♦ DDG28♦	5642.00 5754.00	UDW30♦ DDW28♦	10283.00 10398.00	UDA30 ♦ DDA28 ♦	6708.00 6822.00										
	25		3	None 200	UEG40♦ DEG38♦	8798.00 9072.00	UEW40♦ DEW38♦	16892.00 17163.00	UEA40♦ DEA38♦	10184.00 10454.00										
	3		0	None 30	UBG10♦ DBG08♦	3731.00 3816.00	UBW10♦ DBW08♦	6737.00 6822.00	UBA10♦ DBA08♦	4487.00 4572.00										
230	7-1/2	240-60	1	None 60	UCG20♦ DCG18♦	3888.00 3974.00	UCW20♦ DCW18♦	6894.00 6980.00	UCA20♦ DCA18♦	4644.00 4730.00										
(240)	15	220-50	2	None 60	UDG30♦ DDG28♦	5642.00 5754.00	UDW30♦ DDW28♦	10283.00 10398.00	UDA30 ♦ DDA28 ♦	6708.00 6822.00										
	30		3	None 200	UEG40♦ DEG38♦	8802.00 9072.00	UEW40♦ DEW38♦	16892.00 17163.00	UEA40♦ DEA38♦	10184.00 10454.00										
	5		0	None 30	UBG10♦ DBG10♦	3731.00 3833.00	UBW10♦ DBW10♦	6737.00 6836.00	UBA10♦ DBA10♦	4487.00 4586.00										
460	10	480-60 440-50 575 (600)	440-50 575	440-50 575	440-50 575	440-50 575	440-50 575	440-50 575	440-50 575	440-50 575	440-50 575		1	None 30	UCG20♦ DCG20♦	3888.00 3987.00	UCW20♦ DCW20♦	6894.00 6993.00	UCA20♦ DCA20♦	4644.00 4743.00
(480)	25											2	None 60	UDG30♦ DDG30♦	5642.00 5796.00	UDW30 ♦ DDW30 ♦	10283.00 10440.00	UDA30 ♦ DDA30 ♦	6708.00 6866.00	
	50		3	None 100	UEG40♦ DEG40♦	8802.00 9230.00	UEW40♦ DEW40♦	16892.00 17319.00	UEA40♦ DEA40♦	10184.00 10611.00										

- NEMA 12 enclosures may be field modified for outdoor applications. For details refer to Class 9991, page 16-95. Hp rating applies only when dual element time delay fuses are used.
- Coil voltage code must be specified to order this product. Refer to standard voltage codes listed on page 16-80.

For voltage codes used with control transformers, see page 16-101.

Table 16.210: Factory Modifications (Forms)

<b>Description</b> ♦	Enclosure	Form		Price/N	EMA Size	
Description√	Туре	Form	0–1	2	3	4
PILOT DEVICES IN COVER★ "START-STOP" push buttons—one supplied for each motor. (Form C or Form Y68 required.)	1, 4, 12	А	671.00	671.00	671.00	671.00
"HAND-OFF-AUTO" selector switch—one supplied for each motor.	1, 4,12	С	671.00	671.00	671.00	671.00
"NO. 1 LEAD—NO. 2 LEAD" selector switch for manual selection of lead pump. (Form Y68 required.) Red "ON" pilot light—one supplied for each motor.	Any 1, 4, 12	C13 P1	513.00 671.00	513.00 671.00	513.00 671.00	513.00 671.00
Push-to-test red "ON" pilot light—one supplied for each motor.  Non-standard markings for pilot devices.  "TEST" push button for each starter.	1, 4, 12 Any Any	P21 G12 Y29	869.00 28.70 671.00	869.00 28.70 671.00	869.00 28.70 671.00	869.00 28.70 671.00
CONTROL CIRCUIT MODIFICATIONS Fused control circuit without transformer One fuse Two fuses Fused control circuit transformer, two fuses in primary, with 600, 480, 240 or 208 V primary		F F4	627.00 627.00	627.00 627.00	627.00 627.00	627.00 627.00
and 120 V secondary -one supplied for each starter.	Any	F4T	770.00	1083.00	1596.00	1938.00
Fused control circuit transformer, two fuses in primary, one fuse in secondary— one supplied for each starter. 100 VA additional capacity 200 VA additional capacity	Any Any Any	FF4T FF4T11 FF4T12	1395.00 1994.00 2478.00	1710.00 2393.00 2934.00	2849.00	2564.00 3135.00 □ 3675.00 □
Extra capacity control circuit transformer—two fuses in primary—one supplied for each starter (See Table 16.211) 100 VA additional capacity 200 VA additional capacity Elapsed time meter for each starter	Any Any Any	F4T11 F4T12 G97	1446.00 1853.00 1652.00	1767.00 2303.00 1652.00	2763.00	
Pressure switch for each starter (Square D pressure switch 9012GAW25) Addition of 2 relays to modify controller for operation with single pole pilot devices. Addition of 3 relays to modify controller for operation with single pole mercury float switches.	Any Any Any	D R7 R8	755.00 1454.00 2178.00	755.00 1454.00 2178.00		755.00 1454.00 2178.00
Control circuit wired for separate 120 V source.	Any	S	No Charge	No Charge	No Charge	No Charge
Addition of 1 N.O. unwired interlock per starter for use by customer. (1 N.O. unwired interlock per starter is supplied as standard.) Addition of 1 N.C. unwired interlock per starter for customer use.	Any Any	X10 X01	315.00 315.00	315.00 315.00	315.00 315.00	315.00 315.00
Modified wiring for use with double pole mercury float switches.  Deduct for omission of electrical alternating circuit.  Additional Control circuit terminals—per wired terminal.  (5 point terminal block is standard)  Unwired	Any Any Any Any	Y24 Y68 G56▼ G50▼	314.00 869.00 116.00 57.00	314.00 869.00 116.00 57.00	314.00 869.00 116.00 57.00	314.00 869.00 116.00 57.00

- Not available on open style devices.
- Addition of terminal block 9080CA or 9080GR6 only. 5 point terminal block is provided as standard for custom connection. A wiring diagram must be supplied for factory wiring.

  Not available on this size. Use Form FF4T\_\_.

- Single primary voltage must be specified.

  These Forms are most commonly used. Other Forms may be available. Consult Schneider Electric CCC at (1-888-778-2733) for additional information.

## Table 16.211:

NEMA Size	Standard Capacity (Form F4T)	100 VA Additional Capacity (Form F4T11)	200 VA Additional Capacity (Form F4T12)
3126	Class 9070 Type	Class 9070 Type	Class 9070 Type
0 & 1	T100	T200	T300
2	T100	T200	T300
3	T150	T300	T500
4	T300	T500	T500

For How to Order Information, see page 16-13.

## **Approximate Dimensions**

## Table 16.212: NEMA 1 Enclosure—Non-Combination (Figure 1)

Starter Size	Α	В	С	D	Е	F	G	н
0, 1, or 2	20-1/2	24-1/8	8-11/16	17-7/8	21-1/2	1-5/16	1-5/16	5/16 Dia.
3 or 4	22-1/8	34	9-3/4	16	35-1/2	3-1/16	3/4	7/16 Dia.

## Table 16.213: NEMA 1 Enclosure—Combination (Figure 2)

Starter Size	Α	В	С	D	E	F	G	Н	J	K
0, 1, or 2 (For FAL Circuit Breaker and 30 A & 60 A Disconnect Switch)	20-3/8	35	9-5/8	17	32-1/2	3-5/16	1-1/4	1-1/4	1-1/4	7/16 Dia.
3 or 4 (For FAL & KAL Circuit Breaker and 100 A Disconnect Switch)	32	44	10-3/4	24	46	•	1	2-1/2	2-1/2	9/16 Dia.

For FAL & KAL Circuit Breaker. Dimension F=3-5/16. For 100 A Disconnect Switch Dimension F=4-7/8

## Table 16.214: NEMA 4 Enclosure—Non-Combination (Figure 3)

Starter Size	Α	В	С	D	E	F	G	Н	J
0, 1, or 2	20-1/2	24	8	25	15-3/8	26	2-9/16	1/2	5/16
3 or 4	22	34	9-1/8	35	17	36	2-1/2	1/2	9/16

## Table 16.215: NEMA 4 Enclosure—Combination (Figure 4)

Starter Size	Α	В	С	D	Е	F	G	Н	J	K
0, 1, or 2 (For FA Circuit Breaker and 30 A & 60 A Disconnect Switch)	20-1/2	35	9-9/16	36	15-3/8	37	2-9/16	1/2	5/16	3-5/16
3 or 4 (For FA and KA Circuit Breaker and 100 A Disconnect Switch)	32	44	10-11/16	46	26	47	3	1/2	9/16	•

For FA or KA Circuit Breaker K = 3-1/16. For 100 A Disconnect Switch K = 4-7/8

## Table 16.216: NEMA 12/3R Enclosure—Non-Combination (Figure 3)

Starter Size	Α	В	С	D	E	F	G	Н	J
0, 1, or 2	20-1/2	24-1/4	8	25-1/2	14-3/8	26-1/2	3-1/16	1/2	7/16
3 or 4	22	34	9-1/8	35-1/2	16	36-1/2	3	1/2	7/16

#### Table 16.217: NEMA 12/3R Enclosure—Combination (Figure 4)

					٠	•				
Starter Size	Α	В	С	D	E	F	G	Н	J	K
0, 1, or 2 (For FA Circuit Breaker and 30 A & 60 A Disconnect Switch)	20-1/2	35	9-9/16	36-1/2	14-3/8	37-1/2	3	1/2	7/16	3-5/16
3 or 4 (For FA and KA Circuit Breaker and 100 A Disconnect Switch)	32-1/4	44-1/4	10-11/16	46	24	47	4-1/8	1/2	9/16	•

♦ For FA or KA Circuit Breaker K = 3-5/16. For 100 A Disconnect Switch K = 4-7/8

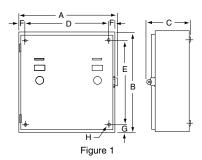
## Table 16.218: Coil Voltage Codes

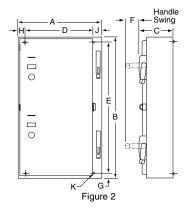
Voltage		Code	S Price Adder	
60 Hz	50 Hz	Code	3 File Adder	
24 ▼ ★ 120 ▼ 208 240 — 480 600 Specify	110 	V01 V02 V08 V03 V05 V06 V07 V99	No Charge No Charge No Charge No Charge No Charge No Charge No Charge 35.60	

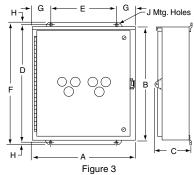
- 24 V coil is not available on Size 4. On Sizes 00–3, where 24 V coils are available, Form S (separate control) must be specified.

  These voltage codes must include Form S (No additional charge).

NOTE: Illustrations may not represent the actual enclosure; they are intended for dimensional information only. Dimensions are in inches.







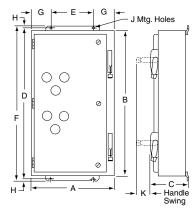


Figure 4





8965DPR33V02 Hoist Contactor 600 Vac, 25 A DPR, Angled

## **Definite Purpose Contactors**

Class 8965 Type DPR reversing/hoist contactors are designed for the control of motors in hoists, overhead doors, small elevators, commercial laundry equipment, and other related products which use reversing motors. They are rated to perform in the short periods of jogging experienced in hoist service.

The coils are designed to operate on line voltages of 85% to 110% of rated voltage, and are for applications at

## **Reversing Hoist, Type DPR**

Class 8965 / Refer to Catalog 8910CT9301

50 or 60 Hz only. Coils are easily replaced with external base removed.

Auxiliary contacts may be easily field-added to any Class 8965 reversing contactor. Type DPR contactors accept one auxiliary contact module with up to two isolated circuits per side (two modules per device). When auxiliary contacts are ordered separately, two modules are normally used for each device; one for forward, one for reverse.

Table 16.219: Reversing/Hoist Contactors—600 Vac Maximum

No. of		Horsepower Ratings.▲				Open Type		Replacement Coil	
Poles	115 V 1Ø	230 V 1Ø	230 V 3Ø	460/575 V 3Ø	Туре	\$ Price	Class 9998 Type	\$ Price■	
3- Pole Poly- Phase	1 2 2 3	2 3 5 7-1/2	5 7-1/2 10 15	7-1/2 10 15 20	DPR13♦ DPR23♦ DPR33♦ DPR43♦	998.00 1139.00 1283.00 1425.00	DA1 ♦ DA1 ♦ DA1 ♦ DA1 ♦	68.00 68.00 68.00 68.00	
4-Pole Poly- Phase	1 2 2 3	2 3 5 7-1/2	5 7-1/2 10 10	7-1/2 10 15 20	DPR14♦ DPR24♦ DPR34♦ DPR44♦	1070.00 1211.00 1353.00 1497.00	DA2♦ DA2♦ DA2♦ DA2♦	92.00 92.00 92.00 92.00	

- For rapid operation (jogging duty), use the next larger size contactor. CP10 Discount Schedule, not CP1.
- Voltage code must be specified to order this product. Refer to standard voltage codes listed below.

Table 16.220: Auxiliary Contacts Separate Module★

Description	Class 9999 Type	\$ Price
1 N.O.	DD10	35.60
1 N.C.	DD01	24.60
1 N.O1 N.C.	DD11	64.00
2 N.O.	DD20	44.30

Order two modules for Type DPR, one for each side.

Table 16.221: Factory Installed

Description	Form	\$ Price
1 N.O. Each Side	X1010	95.00
1 N.C. Each Side	X0101	95.00
1 N.O1 N.C. Each Side	X1111	153.00
2 N.O. Each Side	X2020	153.00

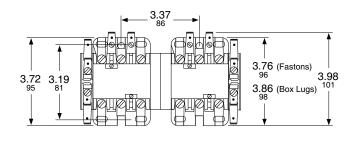
Table 16.222: Coil Voltage Codes

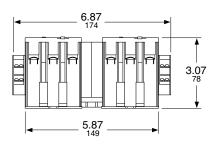
Volts,	Volts,	Voltage
60 Hz	50 Hz	Code
24	24	V14
120	110	V02
208–240	220	V09
277	—	V04
480	440	V06
600	550	V07

#### **Approvals**

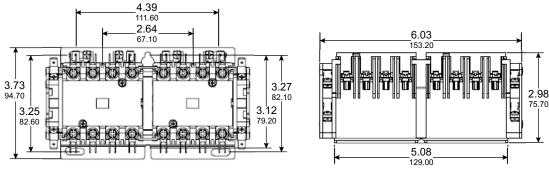
UL Component Recognized—File E42240, CCN NLDX CSA Certified—File LR25490, Class 3211 04

## **Approximate Dimensions**





Type DPR13 through DPR43



Type DPR14 through DPR44

www.schneider-electric.us



Type CO1R

NEMA-styled Thermal Overload Relays feature:

- Exclusive One-Piece Thermal Unit
- Inverse Time Delay Trip
- Trip Free Reset Mechanism on Types G & S
- Replaceable Contact Units on Types G & S

Note that the prices shown on this page do not include thermal units. Standard trip thermal units are \$21.50 each. Slow trip (Class 30) and quick trip (Class 10) melting alloy thermal units are available for all Size 1, 2, 5 and 6, and some Size 3 and 4 applications.

Table 16.223: For Separate Mounting—Melting Alloy—600 Volts Maximum, AC or DC▲

Maximum NEMA Size Full Load		Open Type for Separate Panel Mounting			For Terminal Block Channel Mounting Order Open Type Relay and Bracket Kit Below	
	Current (A)	Left Hand Type	Left Hand Type Right Hand Type		Туре	\$ Price
Single Pole Cor	Single Pole Construction (One N.C. Contact)—1 Thermal Unit Required					
1 2 3	25 45 86	CO1■ TO1■ UO1■	CO1R■ TO1■ UO1■	64.00 100.00 122.00		=
Three Pole Con	struction (One Comm	non N.C. Contact on T	ype S Only)—3 There	mal Units Required		'
1 2 3 4	25 45 86 133	SE SEC	SEO5 SEO8 SEO12 SEO15		SM2 SM2 —	35.60 35.60 —
5	266	Use 3 Ty	pe GO11R Relays Liste	ed Above	_	_

- Maximum power circuit rating for separate mounting overload relays, Types C, F, G, T and U, is 600 Vac or Vdc; Type S is 600 Vac only. Maximum control circuit contact rating for Types C, F, G, T, U and SDO18 is 600 Vac and 250 Vdc; the remaining Type S versions are 600 Vac only Not UL listed.
- Table 16.224: Replacement Melting Alloy Overload Relays for Square D Class 8536 Starters



Type SE05

L	ocate Class 8536 S	Starter in this Colun	nn	Order Class 9065 Overload Relay from this Column		
NEMA Size	Туре	Series	Number of Poles	Туре	\$ Price	Number of Thermal Units Required
00	SA	A & B	2 3	SDO4 SDO5	86.00 149.00	1 3
0	SB	А	2 3–5	SDO4 SDO5	86.00 149.00	1 3 <b>♦</b>
1	SC	Α	2 3–5	SDO4 SDO5	86.00 149.00	1 3 <b>♦</b>
1P	SC	Α	2	SDO10	116.00	1
2	SD	А	2 3–5	SDO7 SDO8	116.00 207.00	1 3 <b>♦</b>
3	SE	А	2 3 4 5	SDO11 SDO12 SDO13 SDO14	143.00 264.00 264.00 264.00	1 3 2 3
4	SF	А	3 4 5	SDO15 SDO16 SDO17	414.00 414.00 414.00	3 2 3
5	SG	Α	3	Form Y500 and Series B use SEO5	129.00	3
6	SH	A & B	3	SEO5	129.00	3

For 4-pole starters used on two phase systems order two thermal units plus one Class 9998 Type SO31 jumper strap kit for every two starters. Each kit includes two jumper straps.

#### Table 16.225: Special Features for Melting Alloy Types

	Form	\$ Price
Substitute 1-N.O. isolated alarm contact and 1-N.C. contact per relay. (Type S starters only)▼	Y342▼	179.00
Substitute 2-N.C. contacts for standard N.C. contact per relay. (Type S starters only)	Y344▼	179.00
Modify Type SDO12 relays to accept Type FB quick trip or SB slow trip thermal units, and Type F and Type SDO15 relays to accept Type FB quick trip thermal units. (Rejects Type CC standard trip units)	Y81 <b>★</b>	No Charge

- This form cannot be field modified.
- Field modification possible. Order 9999S04 (for Form Y342) or 9999S05 (for Form Y344).

## Solid State Overload Relay, Motor Logic™

Class 9065 / Refer to Catalog 9065CT9701

## **Motor Logic**

Solid State Overload relays feature: 3 to 1 adjustment for trip current; phase loss and unbalance protection; direct replacement for Type S melting alloy. They are ambient insensitive and self-powered. Switch selectable trip class; Class II ground fault detection; and direct replacement for Type S melting alloy. Electrical remote reset is also available.

NOTE: Motor Logic SSOLR are designed to protect 50/60 hertz three-phase AC motors from overload, phase unbalance and phase loss conditions. Open Delta systems or grounded B-phase systems are difficult to balance and could cause the Motor Logic SSOLR to trip. For applications of this nature, it is recommended that bi-metallic overload relays (Form B12) be used.

Table 16.226: Class 10/20 (Selectable): For Separate Mounting Solid State Overload Relay 600 Vac Maximum

NEMA Size□	Full Load	Open Type		
(3-Pole)	Current Range (A)	Trip Class 10/20	\$ Price	
00B 00C 0 1 2 3 4	1.5–4.5∆ 3-9∆ 6–18∆ 9-27∆ 15-45 30-90 45-135	SFB20 SFC20 SF020 SF120 SF220 SF320 SF420	221.00 221.00 221.00 221.00 309.00 378.00 545.00	

Δ Size 00B, 00C, 0, and 1 are supplied without lugs. Lower amperage loads can be protected by looping of power wires. Lugs are available. See page 16-111.

Table 16.227: Class 10/20 (Selectable): Replacement SSOLR for Retrofit of Square D Type S Starter Solid State Overload Relay 600 Vac Maximum

Locate 8536 Star	ter in this column	Order Class 9065 Overload Relay from this column	
	Full Load	Open Type	0 Pulsa
NEMA Size⊖	Current Range (A)	Trip Class 10/20	\$ Price
00B♦ 00C♦ 0♦ 1♦ 2 3 4 5★ 5∀	1.5-4.5 3-9 6-18 9-27 15-45 30-90 45-135 90-270 90-270 180-540 270-810	SFB20 SFC20 SF020 SF120 ST120 ST320 ST420 ST520 SF520 SF520 SF520 ST620 ST720	221.00 221.00 221.00 221.00 288.00 351.00 516.00 221.00 1074.00 221.00

NEMA Size 00B and 00C are not actual NEMA sizes. These designations are used to differentiate the lower FLA of these devices from the NEMA Size 00 Motor Logic Solid State Overload Relay.

Size 00B, 00C, 0, and 1 are supplied without lugs. Lower amperage loads can be protected by looping of power wires.

Size 5, 6 and 7 Replacement Overloads are only for existing NEMA S starters with Motor Logic overload relay. External CTs and additional components are not included.

Size 5 is a complete drop-in replacement for Square D NEMA S melting alloy, bimetallic, and Y500 overload relays only.

NEMA Size 00B and 00C are not actual NEMA sizes. These designations are used to differentiate the lower FLA of these devices from the NEMA Size 00 Motor Logic Solid State Overload Relay.

TeSys T is a motor management system that provides full motor monitoring, control, and protection when used with short circuit protection and a contactor. TeSys T manages most critical processes while reducing downtime and increasing productivity.

TeSys T is a flexible system that integrates seamlessly into your automation system through five major communication protocols. TeSys T predicts what will happen in the process, as it accurately monitors current, voltage, and power over a wide range.

TeSys T is a green motor management system with unique power monitoring capabilities for better energy management.

TeSys T carries all appropriate and necessary third party certifications.

To get detailed information about TeSys T, visit our website at www.schneider-electric.us.com.

#### TeSys T detailed functionalities and possible configuration:

#### Communication:

TeSys T is a flexible motor management system that supports five major communication protocols: Modbus, CANopen, DeviceNet, Profibus, and Ethernet Modbus TCP.

These communication protocols allow the TeSys T controller to integrate seamlessly into your automation

Ethernet Modbus TCP provides Faulty Device Replacement to reduce maintenance time to a minimum.

#### Protection functions:

- thermal overload
- phase imbalance and phase failure
- thermal motor protection via PTC probes
- phase reversal
- ground fault detection
- long starting times and motor stalling
- automatic load shedding and restarting
- load fluctuations (current, voltage, power)
- variations of Cos φ (power factor)

### Metering functions:

- Measurements (rms values):
  - current on the 3 phases
  - voltage on the 3 phases (shedding)
  - motor temperature
  - ground fault sensing
  - Values calculated:
    - average current
    - frequency
    - Power factor, power, power consumption

## Motor control functions:

A motor managed by a TeSys T controller can be controlled:

- locally, using the logic inputs present on the product, or via the human machine interface (HMI)
- remotely, via the network

#### Motor control modes:

10 predefined motor control modes are incorporated in the controller. Each listed mode is available as 2 or 3 wire control.

- overload mode: monitoring of motors whose control is not managed by the controller
- independent mode: starting of full voltage non-reversing motors
- reverser mode: starting of full voltage reversing motors
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor)
- 2-speed mode: 2-speed starting of motors (Dahlander,

A custom mode is available to allow the user to create a specific motor control mode that is not predefined in the controller.

Custom Logic has the basic functions of a small programmable logic controller (PLC). Programming can be done in Structured Text mode or in Block Diagrams through PowerSuite V2.6 software. To ensure consistency, the same software used to commission the TeSys T controller is used for Custom Logic programming.

#### Statistical and diagnostic functions:

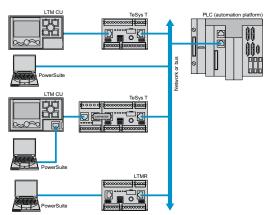
- history of the last five detected faults
- motor statistics
- controller operations
- warning of pending faults

#### Standards and Certifications

Product Type	LTMR Controllers	LTMEV40 Expansion Modules		
Conforming to standards	IEC/EN 60947-4-1, UL 508, UL E164353 NKCR, CSA 22-2 n°14, CSA LR43364 Class 3211 03, IACS E10			
Product certifications	UL, CSA, BV, LROS, DNV, GL, RINA, ABS, RMRos, NOM, CCC, C-TIC'K, ATEX, GOST, KERI			

## Possible Configurations:

TeSys T controller is a flexible motor management system using PowerSuite V2.6 commissioning tool. PowerSuite is the configuration software for the TeSys T controllers. See page 16-86 for details.





## LTMR Controller:

The controller is the central component in the motor management system. It manages the basic functions such as:

- measurement of 3-phase current via integral current transformers from 0.4 to 100 A (up to 1000 A by external current transformers)
- measurement of ground current internally or external ground sensors



LTMR27FBD

- measurement of motor temperature
- inputs and outputs for the various motor control modes, detected fault management, and other functions

#### Characteristics

As standard, the controller manages the following:

#### **Control Modes**

- overload mode
- independent mode
- reverser mode
- 2-speed mode 2-step mode

## Custom mode Inputs/Outputs

- 6 discrete logic inputs
- 3 relay logic outputs (1 N.O. contact each)
- 1 relay output for detected fault signalling (1 N.O. + 1 N.C.) overload relay

#### Measurements

- connection for a thermistor probe
- connections for a ground sensor

#### Table 16.228: Controllers

Setting Range (A)	Control Voltage (V)	Current Range (A)	Catalog Number	\$ Price
For Modbus®				
0	24 Vdc	0.4-8	LTMR08MBD	675.00
8	100-240 Vac	0.4-8	LTMR08MFM	675.00
27	24 Vdc	1.35-27	LTMR27MBD	675.00
21	100-240 Vac	1.35-27	LTMR27MFM	675.00
100	24 Vdc	5–100	LTMR100MBD	765.00
100	100-240 Vac	5–100	LTMR100MFM	765.00
For EtherNet Mo	odbus TCP			
	24 Vdc	0.4–8	LTMR08EBD	825.00
8	100-240 Vac	0.4–8	LTMR08EFM	825.00
07	24 Vdc	1.35-27	LTMR27EBD	825.00
27	100-240 Vac	1.35-27	LTMR27EFM	825.00
400	24 Vdc	5–100	LTMR100EBD	935.00
100	100-240 Vac	5–100	LTMR100EFM	935.00
For CANopen				
	24 Vdc	0.4-8	LTMR08CBD	750.00
8	100-240 Vac	0.4-8	LTMR08CFM	750.00
07	24 Vdc	1.35-27	LTMR27CBD	750.00
27	100-240 Vac	1.35-27	LTMR27CFM	750.00
100	24 Vdc	5–100	LTMR100CBD	850.00
100	100-240 Vac	5–100	LTMR100CFM	850.00
For DeviceNet				
	24 Vdc	0.4-8	LTMR08DBD	750.00
8	100-240 Vac	0.4–8	LTMR08DFM	750.00
27	24 Vdc	1.35-27	LTMR27DBD	750.00
21	100-240 Vac	1.35-27	LTMR27DFM	750.00
100	24 Vdc	5–100	LTMR100DBD	850.00
100	100-240 Vac	5–100	LTMR100DFM	850.00
For Probibus DF				
8	24 Vdc	0.4–8	LTMR08PBD	750.00
o	100-240 Vac	0.4–8	LTMR08PFM	750.00
27	24 Vdc	1.35–27	LTMR27PBD	750.00
21	100-240 Vac	1.35-27	LTMR27PFM	750.00
100	24 Vdc	5–100	LTMR100PBD	850.00
100	100-240 Vac	5-100	LTMR100PFM	850.00

#### LTME Expansion Module:

The expansion module adds the following functionalities to the TeSys T controller:

- voltage measurement between phases up to 690 V nominal
- 4 additional inputs

#### Inputs

4 discrete logic inputs (isolated)

- 2 types of power for the inputs: 24 Vdc and 100 to 240 Vac
  - A 24 Vdc LTMR controller can be assembled with a 240 Vac expansion module and vice versa

The LTMVE must be connected to the LTMR controller by a connecting cable.

#### Table 16.229: Expansion Module

Input Control Voltage	Number of Inputs	Supply to the Electronics	Catalog Number	\$ Price
24 Vdc	4	via the LTMR	LTMEV40BD	300.00
100-240 Vac	4	controller	LTMEV40FM	300.00

#### HMI — Human Machine Interface:

Depending on the application, two types of HMI can be used with the motor management system.

- The LTMCU operator control unit:
  - Control/monitoring of a 1 to 1 LTMR controller
- A Magelis XBTN410 terminal
  - Control/monitoring of 1 to 8 LTMR controllers

## LTMCU Compact Display:

- Configure the parameters
- Display information
- Monitor the alarms and detected faults
- Local control of the motor via the local control interface (keys can be customized) Three different languages can be loaded into the
- LTMCU controller at the same time: English, French, Spanish are the defaults. A language download utility (LangTool), together

with all the other languages, are available on the website www.schneider-electric.com.

This tool allows the languages present in the LTMCU control until to be adapted.

The LTMCU HMI control unit has an additional front panel RJ45 port, protected by a flexible cover.

### Magelis Display:



Two applications have been predefined for the TeSys T controller. Depending on the application loaded, the HMI terminal makes it possible to:

- Configure and monitor a motor starter (LTM\_1T1\_V1.dop)
- Monitor and modify certain parameters up to 8 motor starters (LTM\_1T8\_X\_V1.dop)

Vijeo Designer programming software is needed for loading applications into the XBT HMI terminal.

Table 16.230: HMI Modules and Software

Description	Supply Voltage	Catalog Number	\$ Price
Operator Control unit	via the LTMR controller	LTMCU	265.00
Holder for LTMCU (with magnetic back)		LTM9KCU	30.00
Magelis compact display	24 Vdc	XBTN410	300.00
Configuration software Windows 99, 2000, XP		VJD SND TMS V13M	161.00

New!)



LTM9KCU (Holder Only)

LTMEV40FM



LTMCU





LT6CT4001









#### Table 16.231: Current Transformers

Current Transformer Ratio ▲	Catalog Number	\$ Price
100:1	LT6CT1001	300.00
200:1	LT6CT2001	300.00
400:1	LT6CT4001	700.00
800:1	LT6CT8001	1000.00

For use with LTMR08. controllers. Three current transformers are required for 3-phase applications.

#### Table 16.232: Ground Fault Sensors

Rated Operational Current le (A)	Internal Toroid Ø (mm)	Catalog Number	\$ Price
Closed Toroids, Type A			
65 85 160 250 400 630	30 50 80 120 200 300	50437 50438 50439 50440 50441 50442	250.00 325.00 410.00 555.00 835.00 1530.00
Split Toroids, Type QA			
85 250	46 110	50485 50486	1145.00 2010.00

Note: Dimensional drawings are in catalog DIA1ED2061002EN-US.

#### Table 16.233: PTC Thermistor Probes ■

Description	Nominal Operating Temperature (NOT) °C	Color	Catalog Number ◆	\$ Price Each
Triple Probes	90 110 120 130 140 150 160 170	Green/green Brown/brown Grey/grey Blue/blue White/blue Black/black Blue/red White/green	DA1TT090 DA1TT110 DA1TT120 DA1TT130 DA1TT140 DA1TT150 DA1TT160 DA1TT170	3.30 3.30 3.30 3.30 3.30 3.30 3.30

- PTC: Positive Temperature Coefficient. Sold in lots of 10.

#### Configuration with PowerSuite

The TeSys T configurator is incorporated in the PowerSuite software application, versions 2.6 and higher.

PowerSuite software allows configuration, commissioning and maintenance of motor starters protected by a TeSys T controller.

A library containing predefined motor control mode functions is available in order to:

- avoid errors
- reduce motor starter setup times

By using logic functions, a custom mode makes it possible to:

- easily adapt these predefined motor control mode functions to the specific needs of your applications

The functions thus defined can be saved and used to build your function library for future applications.

To create special functions, a logic editor is incorporated in the configurator and allows a choice of 2 programming languages:

- function block
- structured text

## Table 16.234: Configuration Tools

Description	Composition	Catalog Number	\$ Price
Connection kit for PC serial port for Modbus® PLC multidrop connection	1 x 3 m length cable with two RJ45 connectors	VW3A8106	
	1 RS232/RS485 converter with one 9-pin female SUB-D connector and one RJ45 connector.		75.00
USB serial port adapter★ for connecting a TeSys T controller to your PC	1 USB / serial port adapter★	TSXCUSB485	250.00
USB serial port cable for connecting a TeSys T controller to your PC	1 USB / serial port cable	TCSMCNAM3M002P	52.00

Modbus (RS485) cable required, not included.

#### TeSys T and SMS PowerLogic:

TeSys T is integrated in PowerLogic SMS Version 4.0. and will address energy management needs by fully utilizing the TeSys T power/energy management features. For more information on PowerLogic products, see Power Monitor Control Section 4.



## Table 16.235: Connecting Cables

Description	Number and type of connectors	Length m (ft)	Catalog Number	\$ Price
	2 x RJ45	1 (3)	VW3A1104R10	35.00
LTMCU control unit		3 (10)	VW3A1104R30	35.00
		5 (16)	VW3A1104R50	35.00
XBTN410	SUB-D 25-pin female to RJ45	2.5 (8)	XBTZ938	30.00
	2 x RJ45	0.04 (0.13)	LTMCC004	125.00
LTME expansion module		0.3 (1)	LU9R03	20.00
		1 (3)	LU9R10	25.00
180 degree Ethernet external connector	1 x RJ45	=	LTM9CE180T	20.00

## **Table 16.236: Connection Accessories**

Descrip	otion	Length m (ft)	Catalog Number	\$ Price
For EtherNet (Modbus TCP)	connection			
Shielded twisted pair cables to	standard EIA/TIA568			
Cables fitted with 2 x BJ45	Straight	2 (7)	490NTW00002	48.60
connectors for connection to		5 (16)	490NTW00005	58.00
terminal equipment		12 (39)	490NTW00012	77.00
		40 (131)	490NTW00040	150.0
		80 (263)	490NTW00080	266.0
Shielded twisted pair cables, Ul	L and CA 22.1 approved	•		
Cables fitted with 2 x RJ45	Straight	2 (7)	490NTW00002U	48.0
connectors for connection to	5.1.5.ig. 1.1	5 (16)	490NTW00005U	57.0
terminal equipment		12 (39)	490NTW00012U	75.0
		40 (131)	490NTW00040U	159.0
		80 (263)	490NTW00080U	258.0
For Modbus <sup>®</sup> PLC connection	on			
Cables fitted with 2 x RJ45 con	nectors	0.3 (1)	VW3A8306R03	20.0
		1 (3)	VW3A8306R10	25.0
		3 (10)	VW3A8306R30	30.0
T-junctions		0.3 (1)	VW3A8306TF03	75.0
•		1 (3)	VW3A8306TF10	85.0
RS485 line terminator			VW3A8306R	N/
For CANopen connection				
Cables		50 (164)	TSXCANCA50	112.0
		100 (328)	TSXCANCA100	467.0
		300 (984)	TSXCANCA300	1323.0
IP20 connectors	Elbowed (90°)	_	TSXCANKCDF90T	52.0
SUB-D 9-pin female Line end adapter switch	Straight	_	TSXCANKCDF180T	52.0
Elife ond ddaptor switori	Elbowed (90°)	_	TSXCANKCDF90TP	
	SUB-D 9-pin connector for connection to PC or diagnostic tool		10,10,11,110,111	78.0
For DeviceNet connection				
Cables		50 (164)	TSXCANCA50	112.0
		100 (328)	TSXCANCA100	467.0
		300 (984)	TSXCANCA300	1323.0
For Profibus DP connection				
Cables		100 (328)	TSXPBSCA100	826.0
		400 (1313)	TSXPBSCA400	2990.0
Connectors	With line terminator	_	490NAD01103	73.0
	Without line terminator	_	490NAD01104	62.0
	With line terminator and		490NAD01105	

## Table 16.237: Marking Accessories

	Composition	lots of	Catalog Number	\$ Price Each
	ips of 10 identical mbers (0 to 9)	25	AB1R•▲	0.52
	ips of 10 identical pital letters (A to Z)	25	AB1G•▲	0.52
p-in markers nun aximum of 5 per unit) Stri	mbers (0 to 9) rips of 10 identical pital letters (A to Z)	25	AB1G•▲	

<sup>▲</sup> When ordering replace the • in the catalog number with the number or letter required.

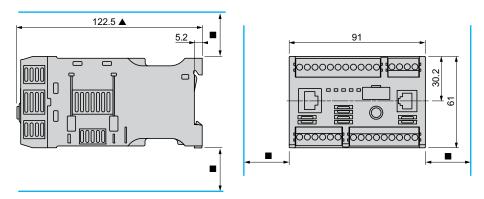




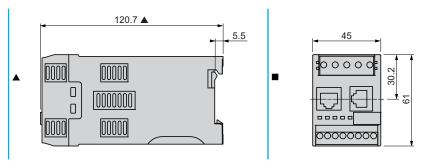
8536SCO3V02H626



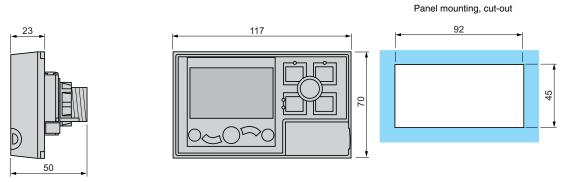
#### LTMR•• controllers



#### LTMEV40 • expansion modules

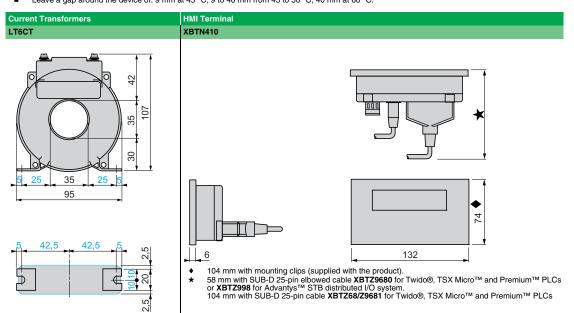


## LTMCU operator control unit



140 mm with RJ45 connector for connection to expansion module and to network, 166 mm with Profibus DP/CANopen connector.

Leave a gap around the device of: 9 mm at 45 °C, 9 to 40 mm from 45 to 50 °C, 40 mm at 60 °C.



Bimetallic thermal overload relays feature Class 20 protection with automatic reset or hand reset and a trip-free mechanism. There are ambient temperature-compensated versions. Note that thermal units are not included in the shown prices. Standard trip thermal units are \$21.50 each.



Class 9065 Type SEO6B2 Three Pole Construction Non-Compensated

### Table 16.238: For Separate Mounting—Bimetallic—600 V Maximum AC or DC▲

Description	Size	Maximum Full Load Current	Open Type	\$ Price		Terminal Block Mounting	Number of Thermal Units
		(A)			Туре	\$ Price	Required
Single Pole Construction (One N.C. Contact)							
Compensated	00, 0, 1 2 3 4	25 60 100 180	DA2 GA2 HA2 JA2	107.00 149.00 261.00 306.00	_ _ _	_ _ _	1
Three Pole Construction	n (One Comr	non SPDT Contact	on Type S)				
Non-Compensated	1 2	26 45	SEO6B2 SEO9B2	392.00 441.00	SM2 SM2	35.60 35.60	3
Ambient Temperature- Compensated	1 2	26 45	SEO6B SEO9B	441.00 441.00	SM2 SM2	35.60 35.60	3
Compensated			For additional se	elections see Internati	onal Control Product	ts.	

Maximum power contact rating for separate mounting overload relays. Maximum control circuit contact rating for Type S versions is 600 Vac only

### Table 16.239: Replacement Overload Relay for Square D Class 8536 Bimetallic Overload Relay on an Existing Starter

	Locate Clas	ss 8536 Starter in t	this Column	Order Class 906 from th	65 Overload Relay is Column		
NEMA Size	Туре	Series	Number of Poles	Form	Туре	\$ Price	Number of Thermal Units Required
0	SB	A & B	Any	B■ B1■ B2■	SDO6B SDO5B1 SDO6B2	441.00 392.00 392.00	3 2 3
1	sc	A & B	Any	B■ B1■ B2■	SDO6B SDO5B1 SDO6B2	441.00 392.00 392.00	3 2 3
2	SD	А	Any	B■ B1■ B2■	SDO9B SDO8B1 SDO9B2	512.00 464.00 464.00	3 2 3
		Α	3	Y59♦	26005-11000	243.00	1
3 ▼	SE	A B	3		SHA01Y59	1089.00	3
		Α	3	Y59◆	26005-11500	306.00	1
4 ▼	SF	Α	3		SJA01Y59	1431.00	3
	Ī	В	3		SUAUT 159	1431.00	3
5	SG	A & B	3	B2 <b>★</b>	SEO6B2	392.00	3
5	30	AAD	3	B★	SEO6B	441.00	3
6	SH	A & B	3	B B2	SEO6B SEO6B2	441.00 392.00	3 3

- B indicates ambient temperature-compensated bimetallic overload relay.
   B1 indicates single phase non-ambient temperature compensated bimetallic overload relay.
   B2 indicates polyphase non-ambient temperature compensated bimetallic overload relay.
- Y59 indicates single phase ambient temperature compensated bimetallic overload relay
- B2Y500 indicates bimetallic overload relay with current transformer sensing. BY500 indicates ambient temperature compensated bimetallic overload relay with current transformer sensing. This part number does not include the current transformer assembly.
- ▼ Non-compensated Size 3 & 4 OLRs are no longer available. Select an ambient compensated OLR from appropriate table above.

# New Adapted Bimetal Overload Relay Adapter (NEMA Sizes 00–1)

The adapted bimetallic Type S starter incorporates a mounting bracket for use with a self-contained adjustable bimetal overload relay. A separate mount version of the bracket is also available for use with contactors that do not offer the same terminal configuration as the Type S or for applications with height restraints that demand mounting mext to the contactor rather than directly below as is typical for most starter configurations.

The bimetallic thermal overload relays feature Class 10 or Class 20 protection with automatic and hand reset and a tripfree mechanism. These overloads are ambient temperature compensated and are available with or without phase imbalance protection. The component is available as a replacement on a starter or as a separately mounted overload relay adapter. The overload relay (LRD or LR3D) can be purchased separately and installed in the field at a later date. For more information see Table 16.269.

Table 16.240: Replacement

Description	Sizes	Maximum Full Load Current (A) of Overload Relay	Catalog Number	List \$ Price
Two Pole	00, 0, 1	27	SADR751	89.00
Three Pole	00, 0, 1	27	SADR75	89.00

Table 16.241: Stand Alone

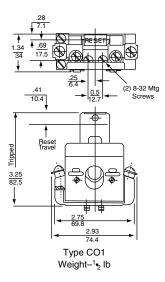
Description	Sizes	Maximum Full Load Current (A) of Overload Relay	Catalog Number	List \$ Price
Two Pole	00, 0, 1	27	SAD751	89.00
Three Pole	00, 0, 1	27	SAD75	89.00

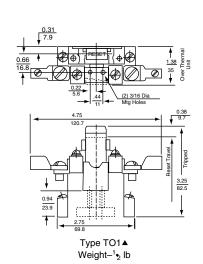
**NOTE:** The LRD or LR3D bimetal overload relay must be purchased separately.

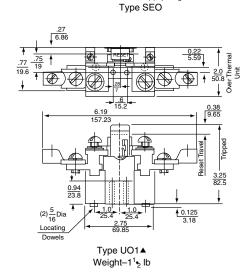
## **Approximate Dimensions**

Table 16.242: Melting Alloy Type NEMA Style

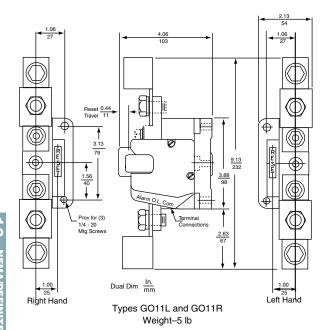
T		Dimensions (IN)													Shipping Weight			F		<b>←</b> G					
Туре	Α	В	С	D	E	F	G	Н	1	J	K	L	M	N	0	Р	(lb)					Ĥ	_	<b>[</b>	n Î
SEO5	3-5/16	_	15/32	3-31/32	3-17/32	2-13/16	7/32	11/16	2-5/16	1/2	1/2	1/2	27/32	1	1-3/8	#10	1		┧┟	Η,	Щ	<b> </b> 1		L	—¶
SEO8	3-5/16	_	15/32	3-31/32	3-1/2	2-13/16	3/16	11/16	2-5/16	1/2	1/2	1/8	27/32	1	1-3/8	#10	1-1/4	<u> </u>		出	ᅰ	J₊¦	_		
SEO12	_	5-19/32	9/16	5-3/4	5-5/16	4-3/4	9/32	1-7/16	3-9/16	3/4	9/16	7/8	1-1/2	1-3/4	2	#1/4	3	¥ Ue	周		ψĐ	<u> </u>		<u></u>	
SEO15	1	6-31/32	9/16	5-3/4	5-5/16	4-3/4	9/32	2-1/8	3-9/16	3/4	9/16	7/8	1-1/2	1-3/4	2	#1/4	4	162				+	<b>→</b> C <b>←</b>	<u> </u>	
																		₩M	- 1.	N <b>→</b>	\	- Prov	for (4) - p -	Mtg Screw	<b>-</b>

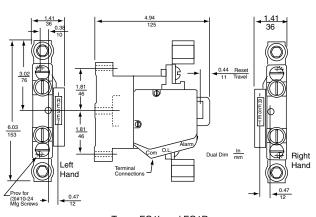






▲ Dimensions shown for Types TO1 and UO1 do not apply when Form Y342 or Y34 is supplied.



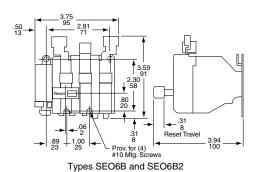


Types FO1L and FO1R Weight–2 lb

Dual Dimensions: INCHES Millimeters

## Approximate Dimensions

## **Bimetallic Overload Relays**



Weight—1lb

Dual Dimensions: INCHES Millimeters

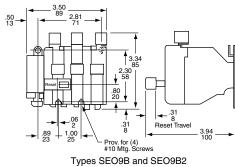
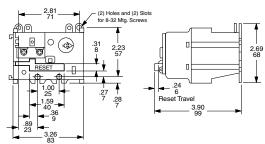


Table 16.243:

Class	Ampere	Outline Dimensions			Mou Dimer	nting isions		set isions	Mounting Screw	Maximum	Approximate Shipping	
9065	Rating	Α	В	С	D	E	K	L	G	Wire Size	Weight (lb)	
DA	25	3-1/2	7/8	3-3/16	3	1/2	3/8	1/8	10	8	2	
GA	60	4-7/8	7/8	3-3/16	3	1/2	3/8	1/8	10	1	2	
HA	100	4-7/8	1-1/4	3-3/16	3-1/2	1/16	1/2	1/8	10	00	3	
JA	180	5-15/16	1-1/4	3-3/16	3-1/2	1/2	3/16	1/8	10	250 MCM	4	

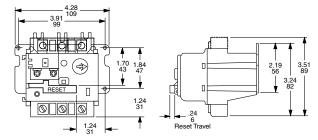
NOTE: Dimensions shown in inches.

## Motor Logic™ Solid State Overload Relay

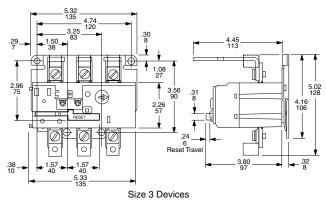


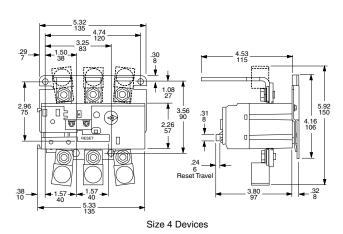
NEMA Size 00B, 00C, 0, and 1 Devices Note: NEMA Size 00B and 00C are not actual NEMA sizes. These

designations are used to differentiate the lower FLA of these devices from the NEMA size 00 Motor Logic Solid State Overload Relay.



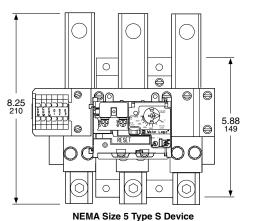
Size 2 Devices

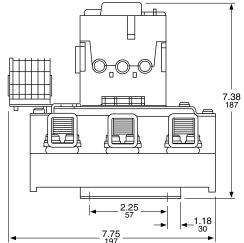




Types SEO9B and SEO9B2
Weight—1¹₂ lb

NEMA/DEFINITE PURPOSE TYPE
CONTACTORS AND STARTERS

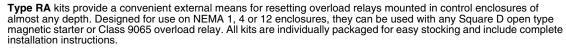


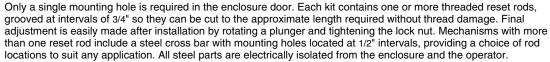


Note: The dimensions are for reference only

## **External Reset Mechanisms**

#### **Class 9066**





Type RB kits make it possible to field install external reset mechanisms to Type S combination starters in NEMA 12 enclosures. They may also be used to replace external reset mechanisms on Type S combination starters in NEMA 1, 4 and 12 enclosures.



Type W1

Type RB1

Type RA2 Series B



#### Table 16.244:

Where Used	Type of Enclosure	Reset Mechanism Kit							
Wilele Oseu	Type of Efficiosure	Description	Туре	\$ Price					
OEM Kit for commercial enclosures	NEMA 1, 12	With 1 Rod With 2 Rods With 3 Rods	RA1 RA2 RA3	57.00 71.00 86.00					
Replacement on 8538, 8539 starters	NEMA 1, 12	Size 0 and 1 Size 2	RB1 RB2	42.80 42.80					
On commercial enclosures or Type S combination starters	NEMA 4	W1 is a boot only and must be used with RA or RB Kit listed above	W1	28.70					
Replacement on Class 8536 Type S starters	NEMA 1 with slip-on covers	Size 00, 0 and 1 Size 2 Size 3	SC1 SD1 SE1	7.20 12.00 14.30					
Retro-fit kit Class 8940 Pump Panel	NEMA 3R	Reset for use with 9065TJF Series B OLR	RTJF	42.80					



Type SCW21 NEMA 4X Enclosure



Type SCA11 NEMA 12 Enclosure



Type SCW11 NEMA 4 Enclosure



Type SCH2 NEMA 3R Enclosure

## Separate Enclosures

Class 9991

Separate enclosures can be used with open style devices for field assembly of enclosed controls. These enclosures, plus the open style components, are equivalent to a factory-assembled device. Separate enclosures are to be used only with the equipment listed below:

- NEMA 4 and 12 Class 9991 separate enclosures for Type S devices are supplied as standard with closing plates. See selection chart below for specific number of closing plates on Various enclosures. For applications requiring enclosures without closing plates, contact your nearest Schneider Electric sales office.
- NEMA 3R enclosures for field assembly of equipment for outdoor applications are provided with three closing plates, a reset mechanism and predrilled panel as standard. For conduit connection to the top of these enclosures, select watertight hubs from listing on Digest page 3-10 in accordance with applicable code requirements. Square D's NEMA 12 enclosures can also be modified for outdoor use. For details, refer to NEMA 12 enclosure modification information on page 16-95. NOTE: Not for use in high-corrosive outdoor locations or sea coast environments.
- NEMA 4X enclosures for Type S devices, Sizes 0-2 and 30-60 Ampere, are provided as standard without closing plates. Cover mounted control units for NEMA 4X separate enclosures are available as a factory modification only.

When closing plates are removed from NEMAs 4, 12 & 3R enclosure covers, the openings can be used for easy installation of Class 9001 Type K or Type SK cover mounted control units. Convenient Class 9999 modification kits containing Class 9001 Type K control kits can be found on page 16-109.

#### Table 16.245:

		Enclosure Classification												
For	r Use With	NEMA Size or	NEMA 4X Watertight, Dusttight and Corrosion-Resistant Glass-Polyester			NEMA 4★ ight and Di tainless Ste	usttight		NEMA 12/3 ight and D	NEMA 3R Rainproof, Sleet Resistant, Outdoor Use				
Class	Types (All Pole Arrangements)	Ampere Rating	Туре	\$ Price	Туре	\$ Price	Number of Closing Plates	Туре	\$ Price	Number of Closing Plates	Туре	\$ Price		
Manual St	tarters													
2510	MBO, MCO	MO M1 M1P	MW1▼	485.00	MW11	485.00	_	MA1	129.00	_	_	_		
Magnetic	Contactors													
	SAO, SBO, SCO	00, 0, 1	SCW20	684.00	SCW11	714.00	2	SCA11△	372.00	3	SCH2	372.00		
8502▲	SDO	2	SDW20	1169.00	SDW11	1197.00	2	SDA11∆	485.00	3	SDH1	485.00		
8502	SEO	3	_	_	SEW11	1767.00	3	SEA11∆	684.00	3	SEH1	684.00		
	SFO	4	_	_	SFW11	3119.00	3	SFA11∆	1853.00	3	SFH1	1853.00		
Magnetic	Starters													
	SAO, SBO, SCO	00, 0, 1	SCW21	684.00	SCW11	714.00	2	SCA11△	372.00	3	SCH2	372.00		
8536	SDO	2	SDW21	1169.00	SDW11	1197.00	2	SDA11∆	485.00	3	SDH1	485.00		
8536	SEO	3	_	_	SEW11◆	1767.00	3	SEA11♦△	684.00	3	SEH1	684.00		
	SFO	4	_	_	SFW11◆	3119.00	3	SFA11♦△	1853.00	3	SFH1	1853.00		
Lighting (	Contactors, Non-	Combination	on, Electrical	ly and Med	hanically H	eld								
	LO, LXO	20 Amp	SDW20	1107.00	SDW11	1197.00	2	SDA11△	485.00	3	SDH1	485.00		
	SMO	30 Amp	SCW20■	684.00	SCW11	714.00	2	SCA11∆	372.00	3	SCH2	372.00		
8903▲	SPO	60 Amp	SCW20■	1169.00	SDW11	1197.00	2	SDA11∆	485.00	3	SDH1	485.00		
	SQO	100 Amp	_	_	SEW11◆	1767.00	3	SEA11♦△	684.00	3	SEH1	684.00		
	SVO	200 Amp	_	_	1	_	_	-	_	1	SFH1	1853.00		
Reversing	g and Two Speed	l Horizonta	lly Arranged	Contactor	s and Starte	rs								
8702▲ 8736	SBO, SCO SDO	0, 1 2	_		SCW12 SDW12	1182.00 1754.00	3	SCA12Δ SDA12Δ	527.00 728.00	3	=			
8810	SBO & SCO	0, 1		_	SCW13	1610.00	3	SCA13△	714.00	3		_		

- For contactors, replace reset assembly with proper closing plate; for NEMA 4 use Class 9001 Type K52, for NEMAs 3R and 12 use Class 9001 Type K51. Class 9991 Types SCW20 and SDW20 are designed for contactors only, reset closing plates not required. For electrically held devices only.
- Enclosure suitable for starter with melting alloy and solid state overload relays **only**.
- The standard cabinet has a brushed finish. Type MBO, Size MO only.
- NEMA 12 enclosures may be field modified for outdoor non-corrosive and non-service-entrance-rated applications; see page 16-95 for more information.

#### Table 16.246: How to Order

	To Order Specify:	Catalog Number					
•	Class Number	Class	Type				
•	Type Number	9991	SCW11				

## SQUARE D

#### Class 9991 by Schneider Electric www.schneider-electric.us

## **NEMA Type 1 and Flush Mounting**

## Flush Mounting Selection Table

**Flush Mounting General Purpose** separate enclosures for Type S Sizes 0–2, 30–60 ampere are provided with knock-outs in the cover for field assembly of one Class 9999 push button or selector switch kit and one Class 9999 pilot light kit. (Refer to Class 9999 for selection.) For Type S Size 3, 100 ampere, three closing plates are provided for installation of Class 9001 Type K oiltight control units. For enclosure dimensions, refer to page 16-96.

#### Table 16.247:

Table 16.247:											
			F	lush Mo	unting G	eneral P	urpose	(Compo	onents)	)	
For	Use With	NEMA Size		Flush	Plates		unting trap	Pull Box			
Class	Types (All Pole	or Ampere Rating	Stan	Standard		nless el■	Туре	\$ Price	Type	\$ Price	
	Arrange- ments)		Туре	\$ Price	Туре	\$ Price	· ·		-		
0540	MBO &	MO	MF1	215.00	(w	ith pullbo	x and p	laster ad	justmer	nt)	
2510	MCO	M1 M1P	MF2 129.00 (without pull				ox but	with mou	nting st	rap)	
Magne	tic Contacto	rs									
0500 •	SBO & SCO	0, 1	SCF11	57.00	SCF12	201.00	SCF2	71.00	SCF1	86.00	
8502▲	SDO	2	SDF11	171.00	SDF12	386.00	SDF2	99.00	SDF1	116.00	
	SEO	3	SEF11	882.00	(Enclosure Complete)						
Magne	tic Starters										
8536	SBO & SCO	0, 1	SCF11	57.00	SCF12	201.00	SCF2	71.00	SCF1	86.00	
	SDO	2	SDF11	171.00	SDF12	386.00	SDF2	99.00	SDF1	86.00	
Lightin	g Contactor	s Non-Co	mbinati	on Electi	rically a	nd Mech	anicall	y Held			
	LO, LXO	20 A	SDF13	171.00	_	_	SDF2	99.00	SDF1	86.00	
	SMO 1-4	30 A	SCF11	57.00	_	_	SCF2	71.00	SCF1	86.00	
8903▲	SMO 10-13	30 A	SCF13	201.00			SCF2	71.00	SCF1	86.00	
0300=	SPO 1-4	60 A	SDF11	171.00	_		SDF2	99.00	SDF1	86.00	
	SPO 10-13	60 A	SDF13	171.00	_	_	SDF2	99.00	SDF1	86.00	
	SQO 1-13	100 A	SEF11	882.00		(En	closure	Complete	e)		

- For contactors, replace reset assembly with proper closing plate. For Flush Mounting use Class 9999 Type SG2 except for Class 9991 Type SDF11 which requires a Class 9001 Type K51 or K11 closing plate. Class 9991 Types SE





Flush Mounting Starter With Pull Box and Mounting Strap Having Plaster Adjustment Feature



Type SCG8 NEMA 1 Enclosure

## **NEMA 1 Selection Table**

The NEMA 1 General Purpose separate enclosures listed below, when used with open style components, are equivalent to a standard factory assembled control device.

#### Table 16.248:

	For Use With		NEMA General Pu Enclosu Class 99	rpose ire
	_	No. of		1
Class	Туре	Poles	Туре	\$ Price
	F and K	All	EN1	29.30
2510	M-Sizes M0 and M1	All	MG1	57.00
	M-Size M1P	All	MG2	57.00
	CO	All	UE1 ♦	39.40
8501	ХО	2–12, 2–4 w/Attachments	UE7	99.00
-	XDO	2–8 w/o Attachments		
	SAO, SBO, SCO	2–4	SCG7	57.00
8502	SDO	2–4	SDG7	143.00
	SEO	2–4	SEG7	287.00
	SFO	2–4	SFG8	599.00
	SAO, SBO, SCO	2–4	SCG8	57.00
0500	SDO	2–4	SDG8	143.00
8536	SEO	2–4	SEG8★	287.00
	SFO	2–4	SFG8★	599.00
	SGO	3	SGG8★□	1241.00
8702,	SAO, SBO, SCO	All	SCG9▼	171.00
8736	SDO	All	SDG9▼	372.00
	LO, LXO	All	LXG1♦	143.00
	SMO	All	SCG7△	57.00
8903	SPO	All	SDG7△	143.00
	SQO	All	SFG8	599.00
	SVO	All	SFG4	1259.00
	DP	1–2	DPG1	78.00
	DPA12, 13, 22, 23, 32, 33, 42, 43	2–3	DPG1	78.00
8910	DPA14, 24, 34, 44, 52, 53	2–4	DPG2	99.00
	DPA62, 63	2–3	DPG3	143.00
	DPA72, 73, 92, 93, 122, 123	2–3	DPG4	287.00
	H, J, K, L & M	All	UE6	99.00
	DPSO13, 23, 33, 43	3	DPSG1	59.00
8911	DPSO53	3	DPSG2	102.00
	DPSO63, 73, 93	3	SEG8	287.00
9050	AO (Single Head)	All	UE6	99.00
	НО	All	UE6	99.00
	EO51, EO61, EO71, K750, K1000	_	SDG4	458.00
9070	EO2, EO3, EO4, EO15, EO16 EO18, EO19, T75, T100, T150, T200, T250, T300, T350, T500 EO1, EO17, T50	_	LG1 UE7	143.00
	EO1, EO17, 150		UE/	99.00

- CP2 Discount Schedule, not CP1.
- Enclosure suitable for starter with melting alloy or solid state overload relay only.
- For horizontally arranged Class 8702 contactors replace reset assembly with a Class 9001 Type K51 closing plate.

  For electrically held contactors only. See page 16-95 for mechanically held contactors.
- Series B starter enclosure.
- If cover mounted control units are required, select oversized enclosure listed on





Type SCW4 NEMA 4 Enclosure



Type SCG1 With Starter, Transformer and Fuse Block Installed



Type SCA11 NEMA 12 Enclosure

## NEMA 1, 4 and Oversized

Separate Enclosures

## For Addition of Control Circuit Transformer

The Class 9991 enclosures listed below accept an open type Class 8502 or 8536 Type S, NEMA Size 0, 1, 1P, or 2 contactor or starter along with a fused control circuit transformer (Form F4T) to allow field assembly of enclosed controllers. In the cover of the Class 9991 Type SCG1 enclosure, knock-outs are provided for field addition of Class 9999 cover-mounted control units. All other Class 8502 & 8536 enclosures include a panel with space and drilling for an open-type device and a fused control circuit transformer. In addition, three closing plates are included in each cover for several writer that the control of for easy installation of Class 9001 Type K or SK control units.

Oversized enclosures for open type Class 8903 Type L & LX, 20 A and Type S, 30 and 60 A electrically and mechanically held lighting contactors include a panel with space and drilling for an open-type contactor and fused control circuit transformer (Form F4T) and/or an auxiliary relay for use with single pole pilot devices (Form R6). When an auxiliary relay is required, use a Class 8501 Type XO11 relay. Three closing plates are provided as standard for easy installation of Class 9001 Type K or SK control units. **Note:** A Class 9991 Type SCG1 NEMA 1 separate enclosure can also be used for Class 8903 Type SMO, 30 A electrically held lighting contactor if Form F4T (control transformer), with or without cover control units is required.

#### Table 16.249:

For Use With				Class 9991 Enclosure							Recommended Class 9070 ♦ Transformer Selection					
Class	Туре	NEMA Size or Ampere	No. of	Gen Purp NEM	ose	Dust Stainle	ght and ttight ss Steel A 4▼	Drip Industi	ght and tight rial Use A 12■	Star	ndard	Extr	a Capacity	,	Fuse Block	
		Rating	Poles	Туре	\$ Price	Type	\$ Price	Туре	\$ Price	Туре	VA	100 VA	150 VA	300 VA		
				Туре	\$ FIICE	туре	FIICE	Туре	\$ FILE	Type	VA	Туре	Туре	Туре		
Magnetic Contactors and Starters																
*	SAO,		1–3							T50	50 VA	T100▲	T150▲			
8502 & 8536	SBO & SCO	00, 0 & 1	4–5	SCG1	270.00	SCW4	827.00	SCA4	485.00	T100▲	100 VA	_	T150▲	_		
6536	SDO	2	2–5	SDG4	458.00	SDW4	1488.00	SDA4	705.00	T100	100 VA	_	T150	T300	Class	
Lighting	g Contac	ctors, Non	-Combir	nation											9999	
	LO,	20 A	All							T50	50 VA	_	_	_	Type SFR4	
	LXO	20 A								T50	50 VA	T100▲	T150▲	_	01114	
8903	SMO△	30 A	1–3		399.00	SDW3	1169.00	SDA3	684.00	T100▲	100 VA		T150▲	_		
ļ			4–5							T100	100 VA	_	T150	T300		
	SPO△	60 A	2–5						l		1.00					

- For mounting in SCG1 enclosure, a Class 9991 Type S1 adapter bracket is also required \$44.00
- NEMA 12 modified for outdoor use (see below)
- For price list and complete description, see the Class 9070 section. Note: Class 9991 Type SCG1 enclosure is provided with a Class 9999 Type SF4 fuse block as standard.
- For contactors (Class 8502), a separate closing plate is provided with each enclosure to replace the reset mechanism with the exception of Class 9991 Type SCG1 which requires a separate reset closing plate.

  Class 9999 Type SG2 \$14.30
- The standard cabinet has a brushed finish.
- Mechanically held.

## **NEMA 12/3R Enclosures Modified for Outdoor Applications** (not to be used in salt air or corrosive environments)

Field Modifications for NEMA 3 dustlight, raintight and sleet resistant outdoor applications are as follows: Watertight conduit hubs or equivalent provision for watertight connection at the conduit entrance shall be used.

Field Modifications for NEMA 3R rainproof and sleet resistant outdoor applications are as follows:

- Watertight conduit hubs or equivalent provision for watertight connection at the conduit entrance, when the conduit enters at a level higher than the lowest live part, shall be used
- Drain holes of 1/8 inch diameter shall be added to the bottom of the enclosure.

Class 9001 Type K oiltight/watertight control units can be easily installed in NEMAs 4, 12, and oversized NEMA 1 separate enclosures provided with closing plates. When installing control units simply remove the closing plates and install the proper Class 9001 Type K components. Convenient control unit kits complete with assembled and pre-wired operators for quick installation are available as Class 9999 user modification kits. See Table 16.250 for contents of each control unit kit. Class 9001 Type SK NEMA 4X corrosion resistant control units may be used as an alternate.

Table 16.250: Control Unit Selection Table

	Class 9999	Control Function	Kit Contents	
	Type	Control Function	Class and Type	Description
•	SA3	Start-Stop Pushbutton	1-9001 KR1B 1-9001 KR1R 1-9001 KN201 1-9001 KN202 2-9001 KA1	Start Operator Stop Operator Start Legend Plate Stop Legend Plate Contact Block
	SC8 Hand-Off-Auto Selector Switch		1-9001 KS43B 1-9001 KN260 1-9001 KA1	Selector Operator Switch Hand-Off-Auto Legend Plate Contact Block
	SP28R	Pilot Light (120 V)	1-9001 KP1R31	Red Pilot Light

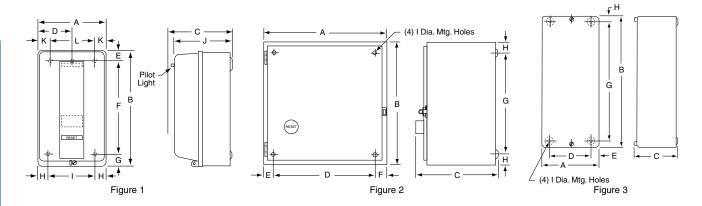
Approximate Dimensions	BQUARE D
Class <b>9991</b>	by Schneider Electric www.schneider-electric.us

Class   Type   Size   Poles   Fig.   Mounting   A   B   C   D   E   F   G   H   J   J   K   L   Weight   L   Class   Type   Size   Poles   Fig.   Fig.   Mounting   A   B   C   D   E   F   G   H   J   J   K   L   Weight   Class   Type   Ty	Class		For Use W	ith						T.	Dimensio	ns (inch	es/millin	eters)						Maria la la
DPG1   S910   DP	9991	Class	Туре	Size	No. of Poles	Fig. No.	Mounting Screws (in.)	A	В	С	D	E	F	G	Н	- 1	J	К	L	(lb)
DPG   S910   DPA   20-40 A   1-3   1   (4)#10   123   216   102   62   3   146   13   23   76   95     2	LXG1	8903	LO, LXO	20 A	2–12	1	_				1									8
SCG7 8502 SBO 0 1 All SCO 1 1 All SCO 2 All SCO 3 All SCO	DPG1	8910		20–40 A		1	(4)#10	4.85 123		4.03 102					.92 23			_	_	2
SCG    SSC		8903	SMO (E.H.)	30 A	All															
SCGB	SCG7		SAO	00	2–3															
SCG8 8536 SBO 0 All SCO 1 All DPSG 1 SPO 0 SCO 1 All DPSG 1 SPO 0 SCO 1 All DPSG 1 SPO 0 SCO 1 SCO 2 SCO 2 SCO 2 SCO 2 SCO 2 SCO 2 SCO 2 SCO 2 SCO 3 SCO 2 SCO 3 SCO 3 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 2 SCO 2 SCO 2 SCO 3 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 2 SCO 2 SCO 2 SCO 3 SCO 2 SCO 3 SCO 1 SCO 2 SCO 1 SCO 2 All 2 SCO 2 SCO 2 All 2 SCO 2 SCO 3 SCO 3 SCO 3 SCO 3 SCO 3 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 2 All 2 SCO 1 SCO 1 SCO 1 SCO 2 All 2 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 1 SCO 2 All 2 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 1 SCO 1 SCO 1 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 2 All 2 SCO 1 SCO 1 SCO 2 All 2 SCO 2 All 3 SCO 1 SCO 1 SCO 1 SCO 2 All 3 SCO 1 SCO 1 SCO 2 All 3 SCO 1 S		8502	SCO	0 1	All			0.00	10.00	134	0.00	00	0.10	1.00	04	4.10	F 00			
SCG8				00	2–3	1	(3)#10	152			76	.88		25	.94 24			_	_	4
DPG2	SCG8	8536	SBO SCO	0 1	All															
SDG7   8903   SPO (E.H.)   60 A   2-12   8502   SDO   2   All   1   (4)1/4   7.81   12.69   160   153					_					141										
SDG7   SDG7   SDG9   SDO   2   All	DPSG1			_																
SDG8   SSDC   SDO   2   All	SDG7																			
SDG8   8936   SDG   2								7.81	12 69	153		1 09	10.50	1 09	1 09	5.63	5.75	1 09	5.63	
DPSG						1	(4)1/4			6.31	_									8
SEG7         8502         SEO         3         All segment																				
SEG8         8536         SEO         3         All all brack and a second and all all all all all all all all all al																				
SEG8   8391   DPSG63 to 93     All	SEG7									8 00										
DPG   SPO   DPS   DPS   SPO	SEG8						(4)0/0	11.44	21.81	203		1.53	18.75	1.53	1.53	8.38	7.75	1.53	8.38	00
SFG8   SFO   SFO   4   All   2   (4)7/16   11.25   25.15   8.99   8.60   1.25   1.25   22.31   1.42   .44		8911	DPSG63 to 93		All	1	(4)3/8	291	554		_	39	476	39	39	213	197	39	213	23
SFG8 8536 SFO 4 AII 2 (4)7/16 11.25 25.15 8.99 8.60 1.25 12.5 1.25 32 32 567 36 11 — — 34  SCG9 8702 SCG	DPG4			_	_															
SFG8         SQO (E.H. & M.H.)         100 A         All         2         (4)//16         286         639         228         218         32         32         567         36         11         —         —         34           SCG9         8702 ▲         SBO, SCO         0 & 1         All         2         (4)5/16         11.88         7.41         9.75         1.06         1.06         9.75         1.06         .31         —				4																
SCG9   SCG	SFG8	8536		4	All	2	(4)7/16	11.25	25.15	8.99	8.60	1.25	1.25	22.31	1.42	.44	_	_	_	34
SCG9   SCG	0. 40	8903		100 A	All	_	(1)1710	286	639	228	218	32	32	567	36	11				0.
8922 E1BC236 — 302 302 166 246 27 27 246 27 6 E1BC236 SDG9 8702 SCO 2 All 2 (4)5/16 14.88 14.13 7.56 12.75 1.06 1.06 12.00 1.06 .31 _ 246	9000	8702▲	SBO, SCO	0 & 1	All	2	(A)E/16				9.75									16
S1)(59	3003	8922	ETBC36	_	All	۷	(4)5/10	302	302	188	248	27	27	248	27	8				10
8922   ETBC60   — 741   2   (4)5/10   378   359   192   324   27   27   305   27   8   —   —   24	SDG0	8702▲	SCO	2	ΔII	2	(4)5/16													2/
	3003	8922	ETBC60		ΛII		(4)3/10	378	359	192	324	27	27	305	27	8				44

Standard enclosure has space for a fused control transformer, Form F4T, on Sizes 0–2.

## Table 16.252: NEMA 1—General Purpose Enclosures (Oversize)

Class 9991 Type		For Use W	/ith													
	Class	Туре	Size	No. of Poles	Fig. No.	Mounting Screws (in.)	Α	В	С	D	E	F	G	Н	1	Weight (lb)
SDG3	8903	LO, LXO SMO (M.H.) SPO (Form F4T)	20 A 30 A 60 A	All					7.56 192							15
	8502	SDO (Form F4T)	2	All	2	(4)5/16	14.88 378	14.13 359		12.75 324	1.06 27	1.06 27	12.00 305	1.06 27	.31 8	
SDG4	8536	SDO (Form F4T)	2	All		, ,	3/8	359	7.66 194	324	21	21	305	21	0	21
	9070	EO51, EO61, EO71, T750, T1000	_	_					7.56 192							
	8502	SBO, SCO (Form F4T)	0, 1	All												
SCG1	8536	SBO, SCO (Form F4T)	0, 1	All	3	(4)9/32	6.34 161	15.88 403	5.19 132	4.66 118	.84 21	14.38 365	.75 19	.28 7	.35 9	8
	8903	SMO (E.H.) (Form F4T)	30 A	All												



Dual Dimensions: INCHES Millimeters

**Separate Enclosures** 

Class 9991

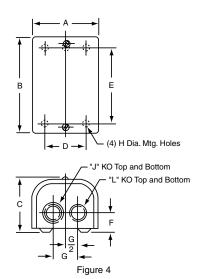
Table 16.253: NEMA 1—General Purpose Enclosures

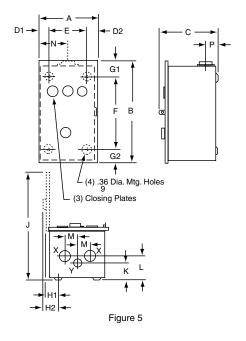
Class		For Use With						Dimens	ions (See I	Figure 4)				Weight
9991 Type	Class	Туре	No. of Poles	Α	В	С	D	Е	F	G	Н	J	L	(lb)
UE1	8501	со	All	3.63 92	5.28 134	3.31 84	1.88 48	3.63 92	1.06 27	1.50 38	1/4 in.▲	1/2–3	3/4 in.	2
	8910	H, J, K L & M	All	4.91	5.75	5.53	3.50	4.38	1.56	0.00		1/2–3/4 in.		
UE6	9050	AO (Single Head)	All	125	146	140	89	111	40	2.00 51	9/32 in.	1/2–3/4 in. 1–1-1/4 in.	1/2–3/4 in.	2
		НО	All											
	8501	хо	2–12, 2–4 w/Attachments	4.07	7.70	7.50	0.50	0.00	4.04	4.00				
UE7		XDO	2–8	4.87 124	7.79 198	7.53 191	3.50 89	6.38 162	1.31 33	1.88 48	#10	1/2-3	8/4 in.	4
	9070	EO1, EO17 T25, & T50	-	12-1	100	101	00	102	00	40				
LG1	9070	EO2, EO3, EO4, EO15, EO16, EO18, EO19 T75, T100, T150, T200, T250, T300, T350, & T500	_	7.53 191	9.78 248	5.91 150	6.13 156	8.38 213	1.31 33	1.88 48	9/32 in.	1/2–3/4	–1 in. ■	10

Class 9991 UE1 has only (3) -1 diameter mounting holes; 2 in the bottom as shown and 1 centered at the top. Class 9999 LG1 has three knockouts, top and bottom.

Table 16.254: NEMA 3R—Rainproof and Sleet-Resistant Enclosures

Class		For Us	se With									Dimensi	ons (se	e Figur	e 5)								
9991 Type	Class	Туре	Size	No. of Poles	A	В	С	D1	D2	E	F	G1	G2	H1	H2	J	К	L	M	N	Р	K.O. X	K.O. Y
SCH2	8502 8536	SBO, SCO	0, 1	All	8.83 224	12.30 312	7.12 181	1.39 35	1.44 37	6.00 152	7.50 191	2.61 66	2.19 56	2.08 53	2.62 66	14.28 363	1.37 35	1.37 35	1.88 48	4.38 111	1.83 46	1/2 3/4	1/2 3/4
	8903	SMO	30 A		224	312	181	35	3/	152	191	00	90	53	00	303	35	35	48		40	1	1
	8502 8536	SDO	2		0.00	40.00	0.00	4.00		7.00	44.50	0.04	0.40	0.00	0.00	40.70			0.40	4.00	4.00	1	4/0
SDH1	8903	LO	20 A	All	9.83 250	16.30 414	8.62 219	1.39 35	1.44 37	7.00 178	11.50 292	2.61 66	2.19 56	2.08 53	2.62 66	16.78 426	1.31 33	1.75 44	2.13 54	4.88 124	1.83 46	1-1/4 1-1/2	1/2 3/4
	8903	SPO	60 A																				İ
SEH1	8502 8536	SEO	3	All	12.63	25.30	8.62	1.39	1.44	10.00	20.60	2.61	2.19	2.08	2.62	19.78	1.31	2.31	2.69	6.38	1.83	1 1-1/4	
	8903	SQO	100 A	7 (11	321	643	219	35	37	254	523	66	56	53	66	502	33	59	68	162	46	2 2-1/2	3/4
SFH1	8502 8536	SFO	4	All	12.63	40.30	9.12	1.39	1.44	10.00	35.50	2.61	2.19	2.08	2.62	20.28	1.31	2.31	2.69	6.38	1.83	1 1-1/4	
	8903	SVO	200 A	2-3	321	1024	232	35	37	254	902	66	56	53	66	515	33	59	68	162	46	2 2-1/2	3/4





Dual Dimensions: INCHES Millimeters

Table 16.255: NEMA 4X—Watertight and Corrosion Resistant Enclosures

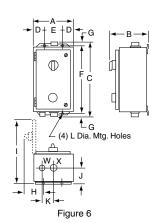
Class		For Us	e With						Dim	ensions (	see Figur	e 6)					Hub	Dia.	
9991 Type	Class	Туре	Size	No. of Poles	A	В	С	D	E	F	G	н	1	J	к	L	Bot. Only W	Top & Bot. X	Weight (lb)
SCW20	8903	SMO (E.H.)	30 A	All															
300020	8502	SBO, SCO	0, 1	All	6.50 165	6.44 164	12.13 308	.75 19	5.00 127	8.25 210	1.69 43	3.34 85	10.06 256	1.31 33	2.13 54	.31 8	3/4 in.	1 in.	7
SCW21	8536	SBO, SCO	0, 1	All															
	8903	LO, LXO	20 A	All															
SDW20	8903	SPO (E.H.)	60 A	All	8.50 216	7.06 179	13.88 352	.75 19	7.00 178	10.50 267	1.69 43	3.91 99	11.94 303	1.63 41	2.38 60	.31 8	3/4 in.	1-1/2 in.	13
	8502	SDO	2	All															
SDW21	8536	SDO	2	All															

## Table 16.256: NEMA 4—Watertight Enclosures (Standard)

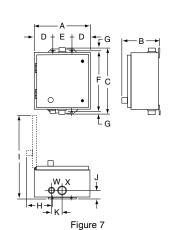
Class		For Use	With						Dimen	sions (se	Figure	6)					Hut	Dia.	
9991 Type	Class	Туре	Size	No. of Poles	А	В	С	D	E	F	G	н	1	J	K	L	Bot. Only W	Top & Bot. X	Weight (lb)
	8903	SMO	30 A	All	6.38	7.13	13.19	1.56	3.25	12.00	.59	1.88	11.78	1.63	2.31	.31			
SCW11	8502	SBO, SCO	0, 1	All	162	181	335	40	83	305	15	48	299	41	59	8	3/4 in.	1 in.	12
331111	8536	SBO, SCO	0, 1	All	6.38 162	7.81 198	13.19 335	1.56 40	3.25 83	12.00 305	.59 15	1.88 48	11.78 299	1.63 41	2.31 59	.31 8	G, 1		
	8903	LO, LXO	20 A	All	0.40	7.00	10.10	4.50		45.00	4.00			0.00	0.00				
	8903	SPO	60 A	All	8.13 206	7.88 200	16.19 411	1.56 40	5.00 127	15.00 381	1.09 28	1.94 49	14.75 375	2.00 51	2.63 67	.31 8			
SDW11	8502	SDO	2	All	200	200	711	70	127	301	20	73	0/3	31	0,		3/4 in.	1-1/2 in.	18
	8536	SDO	2	All	8.13 206	8.56 217	16.19 411	1.56 40	5.00 127	15.00 381	1.09 28	2.88 73	14.75 375	2.00 51	2.63 67	.31 8			
	8903	SQO	100 A	All	18.15	8.77	32.21	3.08	12.00	30.50	.86	3.67	26.71	2.58	3.19	.44			
SEW11	8502	SEO	3	All	461	223	818	78	305	775	22	93	678	66	81	11			
	8536	SEO	3	All	18.15	9.58	32.21	3.08	12.00	30.50	.86	4.48	26.71	2.58	3.19	.44	3// in	2-1/2 in.	51
	8536	SFO	4	All	461	243	818	78	305	775	22	114	678	66	81	11	0/ 111.	2 1/2 111.	01
SFW11	8502	SFO	4	All	18.15 461	8.77 223	32.21 818	3.08 78	12.00 305	30.50 775	.86 22	3.67 93	26.71 678	2.58 66	3.19 81	.44 11			

## Table 16.257: NEMA 4—Watertight Enclosures (Oversize)

Class		For Use	With						Dime	ensions (s	ee Figur	e 7)					Hub	Dia.	
9991 Type	Class	Туре	Size	No. of Poles	A	В	С	D	E	F	G	н	1	J	К	L	Bot. Only W	Top & Bot. X	Weight (lb)
SCW2	8702 8736	sco	1	All															23
SCW3	8810	SBO SCO	0 1	All	12.63 321	7.81 198	14.69 373	2.56 65	7.50 191	13.50 343	.59 15	3.88 98	18.41 468	1.66 42	2.31 59	.31 8	3/4 in.	1 in.	19
SCW4	8502 8536	SBO, SCO (Form F4T)	0, 1	All															24
SDW2	8702 8736	SDO	2	All															25
SDW3	8903	LO, LXO SMO, SPO (Form F4T)	20 A 30 A 60 A	All	14.88 378	7.25 184	16.19 411	2.56 65	9.75 248	15.00 381	.38 10	3.88 98	20.88 530	1.72 44	2.63 67	.31 8	3/4 in.	1-1/2 in.	29
SDW4	8502 8536	SDO (Form F4T)	2	All															28



Dual Dimensions: INCHES Millimeters



## **Approximate Dimensions**

## Table 16.258: NEMA 12/3R—Dusttight and Driptight Enclosures (Standard)

Class		For Use With					Dir	nensior	ıs (see	Figure 8	3)				Weight
9991 Type	Class	Туре	Size	No. of Poles	Α	В	С	D	Е	F	G	Н	1	J	(lb)
	8502	SBO, SCO	0, 1	All	0.00	0.50	40.75	4.50		40.00		0.50	40.50		
SCA11	8536	SBO, SCO	0, 1	All	6.38 162	8.53 217	12.75 324	1.56 40	3.25 83	12.00 305	.38 10	3.56 90	12.50 318	.31 8	10
	8903	SMO	30 A	All	102	217	024	40	00	505	10	30	010	0	
	8502	SDO	2	All											
SDA11	8536	SDO	2	All	8.13	9.28	16.00	1.56	5.00	15.00	.50	3.56	15.38	.31	15
SDATT	8903	LO, LXO	20 A	All	206	236	406	40	127	381	13	90	391	8	13
	8903	SPO	60 A	All											
	8903	SQO	100 A	All	18.15	9.24	31.50	3.08	12.0	30.50	.50	3.67	26.71	.44	
SEA11	8502	SEO	3	All	461	235	800	78	305	775	13	93	678	11	
	8536	SEO	3	All	18.15	9.58	31.50	3.08	12.0	30.50	.50	4.48	26.71	.44	51
	8536	SFO	4	All	461	243	800	78	305	775	13	114	678	11	01
SFA11	8502	SFO	4	All	18.15 461	9.24 235	31.50 800	3.08 78	12.0 305	30.50 775	.50 13	3.67 93	26.71 678	.44 11	

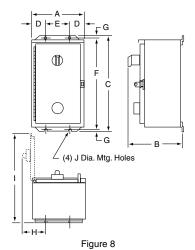


Table 16.259: NEMA 12/3R—Dusttight and Driptight Enclosures (Oversized)

Class		For Use With					Dii	mensio	ns (see	Figure 9	)				Weight
9991 Type	Class	Туре	Size	No. of Poles	A	В	С	D	E	F	G	н	1	J	(lb)
SCA2	8702 8736	SCO	1	All											17
SCA3	8810	SBO SCO	0 1	All	11.88 302	7.75 197	13.5 343	2.56 65	6.75 171	12.75 324	.38 10	3.66 93	18.13 460	.31 8	18
SCA4	8502 8536	SBO, SCO (Form F4T)	0, 1	All	002		0.0			02.	.0				19
SDA2	8702 8736	SDO	2	All											24
SDA3	8903	LO, LXO SMO, SPO (Form F4T)	20 A 30 A 60 A	All	14.88 378	7.88 200	16.00 406	2.56 65	9.75 248	15.00 381	.50 13	3.66 93	21.25 540	.31 8	27
SDA4	8502 8536	SDO (Form F4T)	2	All											27

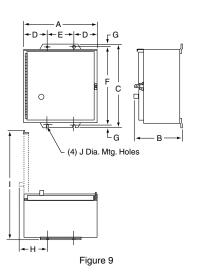
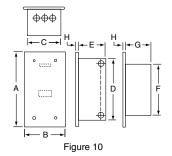


Table 16.260: Flush Mounting General Purpose Enclosures

Class		For Use Wit	h			Din	nensions	(see Figu	re 10)				Weight
9991 Type	Class	Туре	Size	No. of Poles	A	В	С	D	Е	F	G	н	(lb)
SDF13 (w/SDF1 & SDF2)	8903	LO, LXO	20 A	All	15.19 386	8.94 227	7.63 194	12.88 327	5.44 138	10.94 278	5.13 130	.38 10	17
00544	8502	SBO, SCO	0, 1	All									
SCF11 (w/SDF1	8536	SBO, SCO	0, 1	All	13.44	7.19	5.88	11.13	4.75	9.19	4.50	.38	10
& SDF2)	8903	SMO (E.H.)	30 A	All	341	183	149	283	121	233	114	10	10
00511	8502	SDO	2	All									
SDF11 (w/SDF1	8536	SDO	2	All	15.19	8.94	7.63	12.88	5.44	10.94	5.13	.38	17
& SDF2)	8903	SPO (E.H.)	60 A	All	386	227	194	327	138	278	130	10	.,
SEF11	8502	SEO	3	All	31.00	16.75	14.25	26.25	8.00			.18	48
JLFII	8903	SQO	100 A	All	787	425	362	667	203			5	40



by Schneider Electric www.schneider-electric.us

Factory installed modifications are available for the classes of control equipment listed in the respective tables. Prices shown are additions to standard equipment prices and are not to be used as separate selling prices. Kits are also available for many field modifications and normal parts replacement on most control items. Refer to Classes 9998 and 9999 for complete listings.

Standard equipment dimensions and enclosure construction may not apply when certain special features are added. Such cases should be referred to the factory with complete description when accurate dimensions are required.

NOTE: If UL label is required, consult Schneider Electric CCC at (1-888-778-2733). Some Forms are not UL Listed.

Table 16.261: Full Voltage Starters

	Factory Madifications	Englocure Ture	Form				ı	NEMA Size	е			
	Factory Modifications	Enclosure Type	Form	00	0	1	2	3	4	5	6	7
	Push Buttons ▲											
	Start-Stop	1□, 3R, 4, 4X, 12 7 & 9	A A	_	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
ОТ	Start-Stop (maintained contact)▼	1□, 3R, 4, 4X, 12	A16	_	378.00	378.00	378.00	378.00	378.00	378.00	378.00	378.0
CES V	Start-Stop push button and Hand-Off-Auto selector switch	1□, 3R, 4, 4X, 12	AC	_	671.00	671.00	671.00	671.00	671.00	671.00	671.00	671.0
/ER 』ll	On-Off	1□, 3R, 4, 4X, 12	A3	_	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
age n-	Single Oiltight Pushbutton (specify marking)	1, 3R, 4, 4X, 12	A11	_	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
sina	Selector Switches							'				
ollers nly ses	Hand-Off-Auto	1□, 3R, 4, 4X, 12 7 & 9	CC	=	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
)2 36	On-Off	1□, 3R, 4, 4X, 12 7 & 9	C6 C6	Ξ	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
38 39	NON-STANDARD markings for Pilot Devices	1, 3R, 4, 12	G12★	_	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.0
99	Addition of padlock attachment to Class 9001 operators	1, 3R, 4, 12	G122	_	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.0
	Pilot Lights (specify color/type) ■ See Table 16.262 below.											
	With Operating Interlock: Add price of each interlock per light	1, 3R, 4, 4X, 12	XΔ	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.0
	Push Buttons ▲											
	Forward-Reverse-Stop	1, 4, 4X, 12 7, 9	A1 A1	_	570.00 1017.00	570.00 1017.00	570.00 1017.00	570.00 1017.00	570.00 1017.00	570.00 1017.00	570.00 1017.00	570.0 1017.0
	High-Low-Stop	1, 4, 12	A2	_	570.00	570.00	570.00	570.00	570.00	570.00	570.00	570.0
T	Fast-Off-Slow	1, 4, 12	A9	_	570.00	570.00	570.00	570.00	570.00	570.00	570.00	570.0
CES	High-Low push button and Hand-Off-Auto selector	1, 4, 12	A10C	_	671.00	671.00	671.00	671.00	671.00	671.00	671.00	671.0
ER	Single Oiltight Pushbutton (specify marking)	1, 4, 4X, 12	A11	_	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
ll ige	Selector Switches			•								•
rsing d	Hand-Off-Auto	1□, 4, 4X, 12 7 & 9	CC	=	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
peed	On-Off	1□, 4, 4X 7 & 9	C6 C6	Ξ	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
ly ses	High-Off-Low	1, 4, 12	C7	224.00	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
02 36 38	Forward-Off-Reverse	1, 4, 4X, 12 7 & 9	C14	_	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.00 599.00	336.0 599.0
39	High-Low and Hand-Off-Auto	1, 4, 12	CC17	_	671.00	671.00	671.00	671.00	671.00	671.00	671.00	671.0
10 11	Slow-Fast	1, 4, 4X, 12	C19	_	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
12	Forward-Reverse	1, 4, 4X, 12	C20	_	336.00	336.00	336.00	336.00	336.00	336.00	336.00	336.0
	High-Low-Off-Auto	1, 4, 12	C25	_	671.00	671.00	671.00	671.00	671.00	671.00	671.00	671.0
	NON-STANDARD markings for Pilot Devices	Any	G12★	_	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.0
	Pilot Lights ■ With Operating Interlock: Add price of each interlock per light	1, 4, 4X, 12	XΔ	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00

- Indicate pilot light color as Form P1 (red) or Form P2 (green), etc. as shown in the table below. Unless otherwise requested, standard practice is to wire red pilot light to indicate device is energized. No additional auxiliary contact is required. Also, standard practice is to wire green pilot light to indicate device is de-energized. An additional normally closed auxiliary contact is supplied. A wiring diagram must be supplied for other pilot light colors and/or arrangements. Pilot lights available at 120 to 600 V only.
- Specify marking and/or Class 9001 Type KN or Type SKN legend plate required. Specify appropriate Class 9001 Type K or SK operator required.
- To determine the maximum number of auxiliary contacts which can be added to each Type S device and for the appropriate "X Form", refer to the tables in the Class 8536 section on page 16-15 (for non-reversing single-speed devices) or the Class 8736 section on page 16-52 (for reversing or two-speed devices). For Class 8600 Reduced Voltage controllers, consult Schneider Electric CCC at (1-888-778-2733).

  Various form combinations selected may force the use of a larger enclosure.

## Table 16.262: Pilot Light Forms

		Standard			Push-to-Test			LED		L	ED-Push-to-Te	st
	Form	Ty 1/4/12	Ty 7/9	Form	Ty 1/4/12	Ty 7/9	Form	Ty 1/4/12	Ty 7/9	Form	Ty 1/4/12	Ty 7/9
Red ON	P1	336.00	599.00	P21	435.00	599.00	P51	383.00	599.00	P42	482.00	599.00
Red OFF	P71	336.00	599.00	P81	435.00	599.00	P91	383.00	599.00	P43	482.00	599.00
Red Unwired	P38	336.00	599.00	P28	435.00	599.00	P58	383.00	599.00	P44	482.00	599.00
Green ON	P72	336.00	599.00	P82	435.00	599.00	P92	383.00	599.00	P45	482.00	599.00
Green OFF	P2	336.00	599.00	P22	435.00	599.00	P52	383.00	599.00	P46	482.00	599.00
Green Unwired	P39	336.00	599.00	P29	435.00	599.00	P59	383.00	599.00	P47	482.00	599.00
Amber	P3	336.00	599.00	P23	435.00	599.00	P53	383.00	599.00	P63	482.00	599.00
Clear	P4	336.00	599.00	P24	435.00	599.00	P54	383.00	599.00	P64	482.00	599.00
Yellow	P35	336.00	599.00	P25	435.00	599.00	P55	383.00	599.00	P48	482.00	599.00
Blue	P36	336.00	599.00	P26	435.00	599.00	P56	383.00	599.00	P66	482.00	599.00
White	P37	336.00	599.00	P27	435.00	599.00	P57	383.00	599.00	P67	482.00	599.00
Red LOW - Green HI	P73	672.00	1197.00	P83	870.00	1197.00	P93	765.00	1197.00	P77	963.00	1197.00
Green LOW - Red HI	P74	672.00	1197.00	P84	870.00	1197.00	P94	765.00	1197.00	P78	963.00	1197.00
Red OFF - Green FWD/REV	P75	1008.00	1796.00	P85	1305.00	1796.00	P95	1184.00	1796.00	P79	1445.00	1796.00
Green OFF - Red FWD/REV	P76	1008.00	1796.00	P86	1305.00	1796.00	P96	1184.00	1796.00	P80	1445.00	1796.00

## For Full Voltage Contactors and Starters

## Table 16.263: Full Voltage Controllers Only

	Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, 8810, 8811 and 8812												
Fo	ctory Modificat	one	Enclosure	Form					NEMA SIZE				
ra	ractory mounications		Туре	Form	00	0	1	2	3	4	5	6	7
	Separate Control (specify voltage	ol Circuit— and frequency)	Any	S▲		No Charge	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge	No Charge
	Fused Control ( without control												
	One	fuse	1, 3R, 4, 4X, 12	F	314.00	314.00	314.00	314.00	314.00	314.00	314.00	_	_
CONTROL	Two	fuses	1, 3R, 4, 4X, 7, 9, 12	F4	314.00	314.00	314.00	314.00	314.00	314.00	314.00	_	
CIRCUIT Full Voltage	Control Circuit Transformers ■—Standard capacity (50 or 60 Hz) Note: All orders requesting Form FT will be supplied as Form F4T.												
and Multi-Speed	FU	SES											
Controllers Only	Primary	Secondary											
Classes 8502	2	1	1, 4, 4X, 12	FF4T	698.00	698.00	698.00	855.00	1112.00	1283.00	1412.00	1412.00	1412.00
8536 8538	2	1	7 & 9	FF4T	755.00	755.00	755.00	1053.00	1353.00	1640.00	1839.00	1839.00	1839.00
8539 8702	2	2	1, 4, 4X, 12	F4F10T	698.00	698.00	698.00	855.00	1112.00	1283.00	1412.00	-	
8736 8738	Additional Ca	pacity (50 or 60	Hz)										
8739	Two fuses in pri	mary and one fus	se in secondary										
8810 8811	100 VA additi	onal capacity	1, 4, 4X, 12	FF4T11	998.00	998.00	998.00	1197.00	1425.00	1566.00 •	1710.00	1710.00	1710.00
8812	100 VA additi	onal capacity	7 & 9	FF4T11	1053.00	1053.00	1053.00	1395.00	1668.00	1925.00	2138.00	-	_
	200 VA additi	onal capacity	1, 4, 4X, 12	FF4T12	1241.00	1241.00	1241.00	1467.00	1695.00 ♦	1839.00 •	1839.00	1839.00	1839.00
	300 VA additi	onal capacity	1, 4, 4X, 12	FF4T13	1481.00	1481.00 ♦	1481.00 ♦	1737.00 ♦	1967.00 ♦	2109.00	2109.00	2109.00	2109.00
	400 VA additi	onal capacity	1, 4, 4X, 12	FF4T14	1967.00	1967.00 ♦	1967.00 ♦	2280.00 ♦	2507.00 ♦	2793.00 •	2793.00	2793.00	2793.00 ♦
	500 VA additi	onal capacity	1, 4, 4X, 12	FF4T15	2250.00	2250.00 ♦	2250.00 ♦	2564.00 ♦	2793.00 ♦	3077.00	3077.00	3077.00	3077.00 ♦

- All combination style devices such as 8538, 8539, 8738, 8739, that use Form \$ should also use Form \$74 (auxiliary contact installed on disconnect switch) per NEC Article 430-74.
- Table 16,266 at right.
- Single primary voltage must be specified.

### Table 16.264: Marine Control

Class	Factory Modification	Enclosure Type	Form	\$ Price
8502 8536 8538 8539 8702 8736 8738 8739 8810 8941	Modification of standard device for use as marine control per UL508	12/3R 4/4X (S.S. only)	M10	See Below

#### Table 16.265:

Form				NEMA	MA Size★					
FOIII	00▼	0▼	1	2	3	4	5	6		
M10	_	_	338.00	450.00	720.00	1260.00	3015.00	4725.00		

- Not available for NEMA Size 7.
- Cannot be used with Marine controls.

#### **■**Selection of Control Circuit Transformers

The standard primary/secondary voltages for control circuit transformers are indicated in the following table.

#### Table 16.266:

AC-OPERATED DEVICES With Control Transformers							
Voltage	Code						
60 Hz (Primary–Secondary)	Code						
120−12△ 120−24△	V88 V89						
208–120	V89 V84						
240–24△	V82						
240-120	V80						
277–120	V85						
480–24△	V83						
480–120	V81						
480–240	V87						
600–120	V86						
Specify	V99						
∧ 12 V coils are not available on Sizes 3–3	7						

<sup>24</sup> V coils are not available on Sizes 3–7.

To order, select the desired device with the appropriate transformer Form designation. Then convert the previously selected voltage code (V••) to reflect the desired primary/secondary voltage for the transformer. The secondary voltage should equal the previously selected coil voltage of the device.

#### Example:

Discount

You have previously selected a Class 8536SDG1V02S. V02S means that you need a coil voltage of 120-60/110-50 wired for separate control. You would like to add Form FF4T with the transformer voltages being 480 volt primary, 120 volt secondary with Solid State Overload Relay Protection Class 20 Trip Class (H20).

The new and complete class, type, voltage code and form number will be:

Class	Type	Voltage Code	Form 🗆
8536	SDG1	V81	FF4H20T

Form numbers should always be shown in alphabetical order. Each letter indicates the beginning of a new form and may be followed by one or more numbers.

Class 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, 8810, 8811 and 8812

#### Solid State Overload Relay Factory Modifications (Forms)

The solid state overload relay is available on NEMA Size 00-7. For Class 8536, 8538, 8539, 8736, 8738, 8739 and 8810 devices.

Form Description Type S Starter with MOTOR LOGIC™ Solid State Overload Relay 3—MOTOR LOGIC, Class 10/20 (Selectable) 0—No additional modifications 1—N.O. Auxiliary Contact (Field Convertible to N.C.)

Special Overload/Contactor Size Combinations (Base Unit & Feature Units): (Must Be Specified On Size 00 Starter Orders)
Blank -Overload Matched to Starter Size (i.e., Size 1 contactor & 9-27 A overload)

Blank - Overload Matched to Starter Size (i.e., Size 1 contactor & 9-27 A overload)

— A 6-18 A overload on a starter size as indicated by the Starter Catalog Number

1—A 9-27 A overload on a starter size as indicated by the Starter Catalog Number

2—A 15-45 A overload on a starter size as indicated by the Starter Catalog Number

3—A 30-90 A overload on a starter size as indicated by the Starter Catalog Number

4—A 45-135 A overload on a starter size as indicated by the Starter Catalog Number

8—A 1.5-4.5 A overload on a starter size as indicated by the Starter Catalog Number only offered on Feature Units)

-A 3-9 A overload on a starter size as indicated by the Starter Catalog Number

SPECIAL NOTE for Class 8810 devices:
You MUST SPECIFY TWO SEPARATE FORM NUMBERS TO GET MOTOR LOGIC OVERLOADS ON TWO SPEED STARTERS. The catalog number will be alphanumeric.
EXAMPLE: Open Style, Size 4 Two Speed Starter with MOTOR LOGIC Overload Relays Required.
Single Winding, 460 V, Constant or Variable Torque
High Speed FLA = 96 A
Low Speed FLA = 27 A (use Size 2 Overload)
Catalog Number to Order: 8810SF01V02H20H202S
Where: Form H20 is a Size 4 Contactor with a 45-135 A MOTOR LOGIC Overload Relay for the High Speed and form H202 is a 15-45 A MOTOR LOGIC Overload Relay on the low speed contactor.

#### Table 16.267: Classes 8536, 8538, 8539, 8736, 8738, 8739 and 8810

			NEMA Size (Overload Current Range)									
Factory Modifications		Form	00	0	1	2	3	4	5	6	7	
			3–9 A	6–18 A	9–27 A	15–45 A	30–90 A	45–135 A	90-270 A	180–540 A	270-810 A	
Motor Logic Solid State Overload Relay	Class 10/20 (Selectable)	H30	93.00	93.00	93.00	102.00	116.00	131.00	215.00	215.00	Std.	
Motor Logic Solid State Overload Relay with Auxiliary Contact	Class 10/20 (Selectable)	H31	149.00	149.00	149.00	161.00	171.00	188.00	270.00	270.00	56.00	

#### Table 16.268: Special Starter Combinations with Motor Logic Overload Relay Protection

NEMA		Solid State Overload Relay Size							
Contactor Size	00 <sub>B</sub>	00 <sub>C</sub>	0	1	2	3	4		
00	<b>♦</b>	Std							
0	<b>♦</b>	<b>♦</b>	Std						
1	<b>\Q</b>	<b>♦</b>	♦	Std					

NEMA			e Overload I	verload Relay Size				
Contactor Size	00 <sub>B</sub>	00 <sub>C</sub>	0	1	2	3	4	
2	<b>♦</b>	<b>♦</b>	<b>♦</b>	<b>♦</b>	Std			
3	n/a	n/a	n/a	n/a	n/a	Std		
4	n/a	n/a	n/a	n/a	n/a	<b>♦</b>	Std	

#### Table 16.269: New! Adapted Bimetal Overload Relay for NEMA Type S Starter

This bimetallic overload relay is available on NEMA Sizes 00, 0 & 1 for Class 8536, 8538, 8539, 8736, 8738 and 8739 devices. To order a astarter with the adapter ONLY add Form E to the catalog number (8536SBG2V02ES). When ordering with the adapter and bimetallic overload relay installed, please use the Q2C product configurator.

Form Description Bimetal Overload Relay		x 	YY 	z
1—Class 10 Balanced Loads 2—Class 20 Balanced Loads 3—Class 10 Unbalanced Loads (single phase) 4—Class 20 Unbalanced Loads (single phase)				
YY—Numbers (suffix from O/L table below———i.e. 4 to 6 FLA use suffix 10				
Z—0 for Screw Terminal and 6 for Ring Tongue	Terminals—			

Sample Catalog Number: 8536SCO3V02E2160S NEMA Size 1 Starter controlling a 7.5 hp motor (FA 11) Bimetal would be: LRD16L (9 to 13 FLA)

## Table 16.270: TeSys N Size 5-7, Non-Reversing and Reversing Starters

Current Settina	Class 20 with Single Phase			Class 20 without Single Phase	Adder CP1	Factory Installed	
Range Amperes	Sensitivity	Sensitivity	Sensitivity	Sensitivity	List	Catalog Number Suffix	
	W/O Lugs	W/O Lugs	With Lugs	With Lugs	\$ Price		
0.40 to 0.63 0.63 to 1 1 to 1.6 1.6 to 2.5 2.5 to 4 4 to 6	LRD04L LRD05L LRD06L LRD07L LRD08L LRD10L	LR3D04L LR3D05L LR3D06L LR3D07L LR3D08L LR3D10L	LRD04L6 LRD05L6 LRD06L6 LRD07L6 LRD08L6 LRD10L6	LR3D04L6 LR3D05L6 LR3D06L6 LR3D07L6 LR3D08L6 LR3D10L6	85.28 85.28 85.28 85.28 85.28 85.28	05 06 07 08	
5.5 to 8 7 to 10 9 to 13 12 to 18 17 to 24 23 to 32	LRD12L LRD14L LRD16L LRD21L LRD22L LRD32L	LR3D12L LR3D14L LR3D16L LR3D21L LR3D22L LR3D32L	LRD12L6 LRD14L6 LRD16L6 LRD21L6 LRD22L6 LRD32L6	LR3D12L6 LR3D14L6 LR3D16L6 LR3D21L6 LR3D22L6 LR3D32L6	87.46 87.46 87.46 87.46 87.46	14 16 21 22	

Possible factory starter combinations available

## **Factory Modifications** (Forms)

Table 16.271: TeSys T Motor Management System Modifications - H6xx or H7xx for use with Class 8536 and 8736 (Open Starters) NOTE: Product Configurator Must Be Used To Order TeSys T Open Starters.

Used on Size	Range	Control Voltage 100-240 Vac Form		Control Voltage 24 Vdc Form
00, 0, 1	0.4–8 A	H61X▲		H71X▲
0, 1	1.35–27 A	H62X▲		H72X▲
2, 3	5.0–100 A	H63X▲		H73X <b>▲</b>
4	8–160 (CT 300:5 3 turns)	H65X▲	or	H75X <b>▲</b>
5	24-480 A (CT 300:5 1 turn)	H66X▲		H76X▲
6	48-960 A (CT 600:5 1 turn)	H67X▲		H77X <b>▲</b>

Code	Communication Type	List Price Adder
2	Modbus	\$2,295.00
3	ProfiBus	\$2,550.00
4	CANopen	\$2,550.00
5	DeviceNet	\$2,550.00
6	Ethernet	\$2,805.00

NOTE: Auxiliary contact for control of starter coil has a maximum rating of 240V AC.

Table 16.272: Full Voltage Controllers Only

Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, 8810, 8811 and 8812														
	Factory Modifications	Enclosure	Form					NEMA Size	1					
	Factory Modifications	Туре	Form	00	0	1	2	3	4	5	6	7		
	Addition of one NEMA Size 1, 30 A single pole N.O. unit	Any	Y428	_	287.00	287.00	287.00 ■	287.00	287.00	287.00	287.00	287.00		
	Addition of one NEMA Size 1, 30 A single pole N.C. unit	Any	Y429	_	287.00	287.00	287.00 ■	287.00	287.00	287.00	287.00	287.00		
	Addition of one NEMA Size 1, 30 A double pole N.O./N.O. unit	Any	Y430	_	441.00	441.00	441.00	441.00	441.00	441.00	441.00	441.00		
	Addition of one NEMA Size 1, 30 A double pole N.C./N.C. unit	Any	Y434	_	441.00	441.00	441.00 ■	441.00	441.00	441.00	441.00	441.00		
Power	Addition of one NEMA Size 1, 30 A double pole N.O./N.C. unit	Any	Y435	_	441.00	441.00	441.00	441.00	441.00	441.00	441.00	441.00		
Poles	Addition of one NEMA Size 2 single pole N.O. unit	Any	Y436	_	_	_	414.00	414.00	414.00	414.00	414.00	414.00		
	Addition of one NEMA Size 2 single pole N.C. unit	Any	Y437	_	_	_	414.00	414.00	414.00	414.00	414.00	414.00		
	Addition of one NEMA Size 2 double pole N.O./N.O. unit	Any	Y438	_	_	-	698.00 ■	698.00	698.00	698.00	698.00	698.00		
	Addition of one NEMA Size 2 double pole N.C./N.C. unit	Any	Y439	_	_	-	698.00 ■	698.00	698.00	698.00	698.00	698.00		
	Addition of one NEMA Size 2 double pole N.O./N.C. unit	Any	Y440	_	_	-	698.00 ■	698.00	698.00	698.00	698.00	698.00		
	Coil transient suppressor (120 Volt only). Per Coil. Addition of terminal blocks (specify wired or unwired).	Any	Y145	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00		
Miscellaneous	Addition of terminal blocks (specify wired or unwired). Wired, per terminal. Each Unwired, per terminal. Each		G56▲ G50▲		116.00 57.00	57.00	116.00 57.00	116.00 57.00	116.00 57.00	116.00 57.00	116.00 57.00	116.00 57.00		

Addition of terminal block type 9080CA or 9080GR6 only. Number of circuits is same as ending of form number. (Ex.: G505 is 5 un-wired terminal block.) Available in groups of 5 only.

## Table 16.273: Reversing Full Voltage Starters Only ◆

		Clas	s 8810								
	Factory Modifications	Enclosure	Form				NEM	IA Size			
	Factory Modifications	Туре	Form	0	1	2	3	4	5	6	7
	Molded case circuit breaker	1 4, 7★, 9★ 12	Y791 Y791 Y791	2010.00 2862.00 2037.00	2010.00 2862.00 2037.00	2451.00 3533.00 2564.00	2664.00 4886.00 2862.00	4872.00 7092.00 5079.00	9471.00 11808.00 10839.00	13944.00 18216.00 14990.00	19328.00 23601.00 20397.00
	Non-fusible disconnect switch	1 4,9★ 12	Y792 Y792 Y792	1340.00 2172.00 1368.00	1340.00 2172.00 1368.00	1710.00 2646.00 1823.00	2165.00 4388.00 2366.00	2165.00 5327.00 4815.00	5355.00 7691.00 5925.00		
	Fusible switch with 30 A fuse clips	1 4 12	Y793 Y793 Y793	1566.00 2421.00 1596.00	1566.00 2421.00 1596.00	111	111	111	111		
	Fusible switch with 60 A fuse clips	1 4 12	Y794 Y794 Y794		1566.00 2421.00 1596.00	1823.00 2885.00 1938.00	111	111	111		
Circuit Breaker	Fusible switch with 100 A fuse clips	1 4 12	Y795 Y795 Y795	_	_		1336.00 4559.00 2537.00		111		
Disconnect Switch	Fusible switch with 200 A fuse clips	1 4 12	Y796 Y796 Y796	=	=		2885.00 5129.00 3105.00	3596.00 5840.00 5327.00		_	
	Fusible switch with 400 A fuse clips	1 4 12	Y797 Y797 Y797	=	=		=		5868.00 8204.00 6438.00	11039.00 15354.00 12861.00	
	Automatic molded case switch with 600 A fuse clips	1 4 12	Y798 Y798 Y798		=	=				13802.00 18075.00 14871.00	
	Automatic molded case switch with 1200 A or less fuse clips	1 4 12	Y799 Y799 Y799		_			_		15425.00 19697.00 17562.00	15425.00 19697.00 17562.00
	Automatic molded case switch	1 4 12	Y7910 Y7910 Y7910	_ _ _			_ _ _		_	12293.00 16565.00 13361.00	13004.00 17276.00 14072.00

For non-reversing 2-speed starters with disconnect switch or circuit breaker, see pages 16-60–16-64. NEMA 7 & 9 adders apply to 8810 non-reversing devices Sizes 0, 1 and 2 only.

Where X is the communication option per table (i.e.H612)

When adding a power pole to a Size 2 device, also specify Form Y118 and add \$140.00.

## BQUARE D

## For Full Voltage Contactors & Starters

#### Table 16.274: Full Voltage Controllers△

	Classes 8502, 853	6, 8538, 8539, 8702,	8736, 87	38, 8739, a	nd 8810						
							NEM	A Size			
	Factory Modifications	Enclosure Type	Form	0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD
	Control relay (4 & 8 poles)	1, 12 4, 4X■ 7, 9 1, 12 4, 4X■ 7, 9	R174 R174 R174 R178 R178	741.00 741.00 741.00 1112.00		\$ 485.00 741.00 741.00 741.00 1112.00	\$ 485.00 741.00 741.00 741.00 1112.00	\$ 485.00 741.00 741.00 741.00 1112.00	\$ 485.00 741.00 741.00 741.00 1112.00	\$ 485.00 741.00 — 741.00 1112.00	\$ 485.00 741.00  741.00 1112.00
	Pneumatic Timing Relay – specify Class 9050 Type A or B	7, 9	R178	1112.00	1112.00	1112.00	1112.00	1112.00	1112.00		
	0.1 seconds to 1.0 minute—On delay	1 3R, 4, 4X■, 12 7, 9	K25 K25 K25		1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00	1197.00 1566.00
	0.1 seconds to 1.0 minute—Off delay	1 3R, 4, 4X■, 12 7, 9	K26 K26 K26	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00 1566.00	1197.00 1566.00	1197.00 1566.00
	1.0 to 3.0 minute—On delay	1, 3R, 4, 12 4X■, 7, 9	K37 K37	1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00	1197.00
	1.0 to 3.0 minute—Off delay	1, 3R, 4, 12 4X■, 7, 9	K38 K38	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00 1197.00	1197.00	1197.00
A !!!	Solid State Timing Relay (specify timing range) and timer (120 V control required)	1, 4, 4X, 7, 9, 12	K1070	449.00	449.00	449.00	449.00	449.00	449.00	449.00	449.00
Auxiliary Relays	Motor driven timing relay▲◆	1, 4, 12	K5	2507.00	2507.00	2507.00	2507.00	2507.00	2507.00	2507.00	2507.00
	Phase failure and phase reversal relay with time delay option including under and over voltage protection. Addition of a protective relay with options of Phase Failure with Time Delay, Phase Reversal and Under/Over Voltage Protection. (RM3TR1). Both motor voltage and control voltage (V8• voltage code) must be specified with device even if Form S is specified. Form replaces Forms Y444, Y445, Y447, Y448 and Y449.	1, 3R, 4, 4X, 7/9, 12	R44	1463.00	1463.00	1463.00	1463.00	1463.00	1463.00	1463.00	1463.00
	For multispeed controllers: Compelling relay (requires motor to be started in low speed) Accelerating relay (provides timed acceleration to selected speed):	1, 4, 7, 9, 12	R1	941.00	941.00	941.00	941.00	941.00	941.00	941.00	941.00
	For Class 8810	1, 4, 7, 9, 12	R2	2195.00	2195.00	2195.00	2195.00	2195.00	2195.00	2195.00	2195.00
	For Class 8811	1, 4, 7, 9, 12	R2	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00
	For Class 8812 Decelerating relay (imposes a timing delay during transfer from a higher to a lower speed):	1, 4, 7, 9, 12	R2	6579.00	6579.00	6579.00	6579.00	6579.00	6579.00	6579.00	6579.00
	For Class 8810	1, 4, 7, 9, 12	R3	2195.00	2195.00	2195.00	2195.00	1	2195.00	2195.00	2195.00
	For Class 8811	1, 4, 7, 9, 12	R3	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00	4388.00
	For Class 8812	1, 4, 7, 9, 12 1, 4, 7, 9, 12	R3 R10	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00	6579.00 3846.00
	Antiplugging timers and relays  Ammeter in cover (includes current transformer if required)	1, 4, 7, 9, 12	G91	1994.00	1994.00	1994.00	1994.00	2820.00	2820.00	2820.00	2820.00
★ Meters and Metering	Ammeter and switch with two current transformers Ammeter and switch with three current transformers Voltmeter mounted Voltmeter and switch mounted Elapsed time meter	1, 12 1, 12 1, 12 1, 12 1, 12 1, 12	G92 G93 G94 G95 G97	827.00	4274.00 5270.00 2820.00 4274.00 827.00	4274.00 5270.00 2820.00 4274.00 827.00	4274.00 5270.00 2820.00 4274.00 827.00	4274.00 5270.00 2820.00 4274.00 827.00	4274.00 5270.00 2820.00 4274.00 827.00	4274.00 5270.00 2820.00	4274.00 5270.00 2820.00 4274.00 827.00
	Operation counter	1, 12	G99	1425.00	1425.00	1425.00	1425.00	1425.00	1425.00	1425.00	1425.00
	Additional starter (contactor) auxiliary contacts (Specify number of additional N.O. or N.C. contacts required per contactor.) Each will be X (2 digits) i.e. X01	Any	X▼	158.00	158.00	158.00	158.00	158.00	158.00	158.00	158.00
Auxiliary Contacts	Auxiliary contacts installed on disconnect switch or circuit breaker operating mechanism.  SPDT	1, 4, 4X, 12	Y74	192.00	192.00	192.00	221.00	221.00	413.00	413.00	413.00
	DPDT (Note: Above contacts do not switch with automatic tripping of circuit breaker. If such operation is required, consult your nearest Schneider Electric Sales Office.)	1, 4, 4X, 12	Y75	386.00	386.00	386.00	441.00	441.00	570.00	570.00	570.00
	Space heater with N.C. auxiliary contact	1, 4, 4X, 12	G51	386.00	386.00	684.00	1097.00	1767.00	2622.00	3987.00	3987.00
	Function identification plate, with marking as specified	Any	G11	42.80	42.80	42.80	42.80			42.80	42.80
	Drain and breather installed	7 & 9□	Y41	372.00	372.00	372.00	372.00	372.00	372.00	372.00	-
	Cover gaskets added to NEMA 1 enclosures: For Classes 8538 and 8539	1	Y47	143.00	143.00	Std.	Std.	Std.	Std.	_	_
Faele	For Classes 8738 and 8739	1	Y47	Std.	Std.	Std.	Std.	Std.	Std.	_	_
Enclosures	For other full voltage controllers	1	Y47	143.00	143.00	215.00	320.00	534.00	1070.00	1710.00	1710.00
	For reduced voltage controllers	1	Y47	143.00	143.00	215.00	320.00	534.00	1070.00	1710.00	1710.00
	Brushed stainless steel watertight device (add to catalog price of sheet steel watertight device):		V/50			4740.00	0400 07	0440.00	4770.00	0540.00	0540.00
	Class 8606 Classes 8630 and 8640	_	Y56 Y56	-	Std.	1710.00 Std.	2138.00 Std.	3419.00 Std.	4773.00 4773.00		8546.00 8546.00
	troller has a control transformer, price that transformer with additional				oiu.	olu.	oid.	Sid.	+113.00	00.00.00	0040.00

- If controller has a control transformer, price that transformer with additional capacity for the relay provided.

  This adder, used with a NEMA 4X enclosure, applies only to Classes 8538, 8539, 8738, 8739 and 8810 non-reversing. Specify control and line voltage.

- Motor hp and voltage required when placing order. Meters will be panel mounted in NEMA 12 enclosures.
- To determine the maximum number of auxiliary contacts which can be added to each Type S device and for the appropriate "X Form", refer to the tables in the Class 8536 section on page 16-15 (for non-reversing single-speed devices) or the Class 8736 section on page 16-45 (for reversing or two-speed devices). For Class 8600 Reduced Voltage controllers, consult Schneider Electric CCC at (1-888-778-2733).
- NEMA Type 7 & 9 enclosures not available with Class 8600 devices.

  Available only on SPIN TOP™ and cast aluminum NEMA 7/9 enclosures.

Class 9998

Table 16.275: Replacement AC Magnet Coils for Magnetic Contactors and Starters (Refer to Table 16.277 on page 16-106 for listing of mechanically held unlatch coils.)

E	quipment To Be	Serviced		Coil Prefix or Class	Hz		(C			Numb		isists c	of Prefi		ass			Co	oil VA	\$ Price
Device	Size	Туре	Poles	and Type		24 V	110-115 V	120 V	208 V	220 V	240 V	277 V	380 V	440 V	480 V	550 V	600 V	In- rush	Sealed	
			2–6	9998L	60 50	23 24	— 44	44 45	50 52	<b>▲</b> 53	53 54	55 —	— 60	— 62	62 63	— 65	65 66	150 140	30 30	85.00
Coils	30 A	_	8–12	9998LH	60 50	23 24	 44	44 45	50 —	<b>▲</b> 53	53 54	55 —	— 60	— 62	62 —	— 65	65 —	180 170	35 35	85.00
for Present Design	50 A	LX	2–4	9998L	60 50	23 24	 44	44 45	50 52	 53	53 54	55 —	— 60	— 62	62 63	— 65	65 66	150 140		85.00
Magnetic Contactors		(Latch)	6–12	9998LH	60 50	23 24	 44	44 45	50 —	 53	53 54	55 —	— 60	— 62	62 —	— 65	65 —	180 170		85.00
and Starters	00	SA■ (Series B)	All	9998SAC	60 50	23 —	<b>▲</b> 45	45 —	52 —	<b>▲</b> 54	54 —	55 —	59 —	<b>▲</b> 62	62 —	<b>▲</b> 65	65 —	165 —	33	85.00
Classes 8502, 8536,	00 0, 1, 1–P & 30 A	SA (Series A) SB, SC & SM	All	31041-400	60 50	20 22	<b>4</b> 2	42 43	48 —	<b>▲</b> 51	51 53	52 —	56 57	58 60	60 ▲	61 62	62 64	245 232	27 26	98.00
8538, 8539, 8606,	2 & 60 A	SD & SP	2 & 3	31063-409	60 50	16 17	<b>▲</b> 38	38 39	44 —	<b>▲</b> 47	47 48	49 —	53 54	<b>▲</b> 57	57 —	<b>▲</b> 60	60 61	311 296	37 36	128.00
8630, 8640,	2 & 00 A	3D & 3F	4 & 5	31063-400	60 50	16 17	<b>▲</b> 38	38 39	44 —	<b>▲</b> 47	47 48	49 —	53 54	<b>▲</b> 57	57 —	<b>▲</b> 60	60 61	438 429	38 37	128.00
8647, 8650,	3 & 100 A	DPA12_,	2 & 3	31074-400	60 50	16 17	<b>▲</b> 38	38 39	44 —	<b>▲</b> 47	47 48	49 —	53 54	<b>▲</b> 57	57 —	<b>▲</b> 60	60 61	700 678	46 47	254.00
8651, 8702, 8736,	3 Q 100 A	SE, SQ & SYD138	4 & 5	31091-400	60 50	_	<b>▲</b> 38	38 39	44 —	<b>▲</b> 47	47 48	49 —	53 54	<b>▲</b> 57	57 58	<b>▲</b> 60	60 61	1185 1260	85 89	254.00
8738, 8739,	4 & 200 A	SF, SV & SYD230	All	31091-400	60 50	_	<b>▲</b> 38	38 39	44 —	<b>▲</b> 47	47 48	49 —	53 54	<b>▲</b> 57	57 58	<b>▲</b> 60	60 61	1185 1260	85 89	254.00
8810, 8811, 8812.	5 & 300 A	SG, SX & SYD368 Series A	All	31096-400	60 50	_	09	09 10	15 —	<b>▲</b> 18	18 —	19 —	21 22	<b>▲</b> 24	24 —	<b>▲</b> 29	29 30	2970 2970	212 250	354.00
8903, 8910♦		SG, SX & SYD368 Series B	All	31096-320	60 50	_	50 50	50 50	51 —	52 52	52 52	53 —	54 54	55 55	55 55	_	_	1300 —	14 —	600.00
and	6 & 7	SH & SJ					0 11 0 11					,						1780	48	
8940 (except NP)	400, 600	SY, SZ, SJ (Elect. Held)	2–3			ı	Coil Part N				. ,		itages)					1960	59	860.00
	& 800 A	SY, SZ, SJ (Mech. Held)	2–3	31104-418	60 50	_	09	09 —	15 —	<b>▲</b> 18	18 —	19 —		<b>▲</b> 24	24 —	<b>▲</b> 29	29 —	1530 1250	_	860.00

- Use next higher voltage, 60 Hz coil.
  Use on Type S Series B devices only.
  For 8910DPA1x to DPA9x, see page 16-71.

## **NEMA S Size 5 E-Coil Modification Kit**

Classes 8502, 8536, 8538, 8539, 8606, 8630, 8640, 8647, 8650, 8651, 8702, 8736, 8738, 8739, 8810, 8811, 8812, 8910 and 8903

Consisting of:

- E-Coil
- Armature
- 15 A, 600 V Fuse and Holder (Class 9999SFR)
- **Bottom Magnet**
- Instruction Material

## Table 16.276:

Catalog Number	Description	\$ Price
9998SG120	Coil Modification Kit 120 V	1506.00
9998SG480	Coil Modification Kit 480 V	1506.00
9998SG277	Coil Modification Kit 277 V	1506.00
9998SG208	Coil Modification Kit 208 V	1506.00
9998SG240	Coil Modification Kit 240 V	1506.00
9998SG380	Coil Modification Kit 380 V	1506.00

Discount Schedule



Class 9998 / Refer to Catalog 9065CT9701 by Schneider Electric www.schneider-electric.us

## Table 16.277: Replacement AC Magnet Coils for Relays, Timers and Contactors

	Equipment Be Serviced		Coil Prefix	Hz	Suffix Number (Complete Coil Number Consists of Prefix or Class and Type Followed by Suffix Number)									er)	Co	oil VA	\$ Price		
Device	Туре	Poles	or Class and Type	п2	24 V	110–115 V	120 V	208 V	220 V	240 V	277 V	380 V	440 V	480 V	550 V	600 V	In- rush	Sealed	3 FIICE
Classes 850	1 and 9050																		
8501 (Relays)	Х	All	9998-X▲	60 50	23 24	— 44	44	51 52	52 53	53 —	55 —	_	<u> </u>	62 —	<u> </u>	65 —	148 143	23 25	69.00
9050	Α	All	2959-S49-	60 50	W25A W25B	W31B W32A	W32A W32B	W34A W34B	W34B W35A	W35A W35B	W35B W36A	_	W37B W38A	W38A W38B	W38B W39A	W39A W39B	74 68	17 17	132.00
(Timer)	В■	All	31017-400-	60 50	33 34	_	54 55	61 —	61 63	63 64	65 —	_	70 72	72 73	73 75	75 76	165 155	27 27	98.00
	y Held <i>Unlatch</i> th coil is also us					or selection o	of latch o	oils for n	nechanic	ally held	relays, r	efer to pa	age 16-1	05.					
	LX	All	9998LX	60 50	23 —	— 44	44 —	51 —	 53	53 —	55 —	_	— 62	62 —	— 65	65 —	25 —	_	118.00
8903 (Lighting	SM, SP	All	2959-S13	60 50	W23B W24B	♦ W30B	W30B W31B	W33A	<b>♦</b> W33B	W33B W34B	W34A	 W36A	<b>♦</b> W36B	W36B	<b>♦</b> W37B	W37B	80 —		202.00
Contactors)	SQ, SV, SX, SY, SZ	All	31096-416	60 50	03	<b>♦</b> 09	09 —	15 —	<b>♦</b> 18	18	20 —	_ 22	<b>♦</b> 24	24 —	<b>♦</b> 28	28 —	550 —		202.00
	SJ	All	31123-403	60 50	03	<b>♦</b> 09	09	15 —	<b>♦</b> 18	18 —	20	 22	<b>♦</b> 24	24 —	<b>♦</b> 28	28 —	2100 —		202.00

## Table 16.278: Replacement DC Magnet Coils for Magnetic Relays and Timers

Equipmer	TICHA						Suffix Number imber Consists of Prefix or Class and Type Followed by Suffix Number.)									Coil Burden	\$ Price	
Class	Туре	Poles	or Class and Type	6 V	12 V	18 V	24 V	32 V	48 V	64 V	72 V	90 V	110 V	115/ 125 V	220 V	230/ 250 V	Watts	\$ FIICE
0504	XD	All	9998 XD	19	28	34	37	40	46	49	52	55	_	58	_	67	18	168.00
8501 (Relays)	XDL	_	9998 XDL	19	28	34B	37B	40B	46B	49B	52B	55B	_	58B	_	67B	50	216.00
(Helays)	XUD	All	9998 XUD	19	28	_	37	_	46	_	_	_	_	58★	_	67★	16	168.00
9050	С		31018-400-	22	31	_	40	_	49	_	_	_	_	61	_	70	14	312.00
(Timers)	Н		4491S1	W21	W24	_	W27	_	W30	_	_	_	_	W34	_	W37	14	210.00

## Table 16.279: Replacement Coil for 8903 Panel Board Lighting Contactors

Class	Туре	Replacement Solenoid	Catalog Number	\$ Price ▼
		120 V	9998PBV02	428.00
8903	PB	208 V	9998PBV08	428.00
0903	FD	240/277 V	9998PBV39	428.00
		480 V	9998PBV28	428.00

- To order an unlatch coil add the letter "L" to the type number and the letter "B" to the suffix number. Example: For a 120 V 60 Hz unlatch coil order a Class 9998 Type XL44B. Price for the 9998 Type XL coil series is \$114.00. Series C (Double Pole) and Series E (Single Pole).

- Use next higher voltage, 60 Hz coil. Not dual rated. 125 Vdc or 250 Vdc only. CP1 discount schedule.

Class 9998 replacement parts kits are available for servicing Square D relays, contactors, and starters as well as pressure, vacuum, and float switches. Each kit contains the necessary movable and stationary contacts, contact springs (when required—NEMA Size 3 and above do not include contact springs, and springs are not available), and additional



hardware required to service the devices listed below. When servicing devices having more poles than contained in the corresponding kit, it may be necessary to order an additional kit.

Table 16.280: Magnetic Contactor and Starter Contact Kits for Present Designs

	Equipment To Be Serviced	d	No. of	Class 9998	
Class	Туре	NEMA Size or Ampere Rating	No. of Poles in Kit	Parts Kit Type No.	\$ Price
	SA-, (Series B)	00	3	SJ1	90.00
8502	SB-	0	3 4	SL2 SL12	130.00 176.00
8536 8538	SB-, SC-(Power Pole Adder)	0 & 1	1	SL22	63.00
8539 8547	SC-	1 & 1P 1	3 4	SL3 SL13	188.00 246.00
8549 8606	SD-	2	3 4	SL4 SL14	370.00 494.00
8630 8640	SD-(Power Pole Adder)	2	1	SL24	124.00
8647 8702	SE-	3	2	SL6 SL7	442.00 662.00
8736 8738	SF-	4	2 3	SL8 SL9	848.00 1270.00
8739 8810 8811	SG-	5	2	SL10 SL11	2104.00 3120.00
8812 8940	SH-	6	2	SL25 SL26	3762.00 5606.00
	SJ-	7	2	SL30 SL31	5454.00 8162.00
	L (Series C) & LX (Series B)	30 A	4	RA5B	174.00
	SM-	30 A	3 4	SL3 SL13	188.00 246.00
	SP-	60 A	3 4	SL4 SL14	370.00 494.00
	SQ-	100 A	2	SL6 SL7	442.00 662.00
	SV-	200 A	2	SL8 SL9	848.00 1270.00
	SX-	300 A	2	SL10 SL11	2104.00 3120.00
8903	SY-	400 A	2	SL25 SL26	3762.00 5606.00
	SZ-	600 A	2	SL32 SL33	3762.00 5606.00
	SJ-	800 A	2	SL30 SL31	5454.00 8162.00
	PBM, PBP PBN, PBQ	30, 60 A 75, 100 A	2	PB2	520.00
	PBM, PBP PBN, PBQ	30, 60 A 75, 100 A	3	PB3	780.00
	PBR, PBV, PBW	150, 200, 225 A	2	PB14	850.00
	PBR, PBV, PBW	150, 200, 225 A	3	PB15	1276.00

Table 16.281: Magnetic Contactor and Starter Contact Kits for Obsolete Designs

	Equipment To Be Serviced		No. of	Class 9998	
Class	Туре	NEMA Size	Poles in Kit	Parts Kit Type No.	\$ Price
8502 & 8536▲	SA-, (Series A)	00	3 4	SL2 SL12	130.00 176.00
8903	LL, L (Series A, B) & LX (Series A)	20 A	4	RA5	174.00

Includes reversing, two speed and similar devices. Select coil based on NEMA size of basic starter or contactor.

Table 16.282: Class 8965 Replacement Contact Kits

Device Type	Device Series	Class 9998 Kit Type	Device Series	Class 9998 Kit Type	\$ Price
DPR53 DPR63	A A	DRC5■ DRC6■	_	_	52.00 59.00
RO10	A&B	RA10	С	RA14	202.00
RO11	A&B	RA11	С	RA15	202.00
RO12	A&B	RA12	С	RA16	236.00
RO13	A&B	RA13	С	RA17	236.00

Single pole kits.

Table 16.283: Manual Starter Contact Kits

		Equipment To Be Serviced		No. of	Class 9998	
CI	ass	Туре	NEMA Size	Poles in Kit	Parts Kit Type No.	\$ Price
	510		M-0	3	ML1	90.00
	ınual ırters	M-, T-	M-1 & M-1P	3	ML2	106.00

Table 16.284: Replacement Control Transformers (150 VA) Class 8502, 8536 Type S Size 6

Volt	tage	Part Number	\$ Price		
60 Hz	50 Hz	Part Number	\$ FIICE		
240/480-120	220/440-110	3110451250			
208–120	_	3110451252			
277–120	_	3110451253			
_	380-110	3110451254	188.00		
600-120	550-110	3110451251			
120-120	110–110	3110451255			
240-120	220-110	3110451256			

Table 16.285: Replacement Control Transformers (200 VA) Class 8502, 8536 Type S Size 7

\$ Price	Part Number	age	Voltage 50 Hz	
\$ Price	Part Number	50 Hz		
	3112350150	220/440-110	240/480-120	
	3112350152	_	208-120	
	3112350153	_	277-120	
236.00	3112350154	380-110	_	
	3112350151	550-110	600-120	
	3112350155	110-110	120-120	
	3112350156	220-110	240-120	

Table 16.286: Class 8910, 8911 & 8965 Replacement Contact Kits

				-	
Devic	e To Be Service	i L	Class	9998	
Class 8910 Type	Class 8911 Type	Series	1-Pole Type	3-Pole Type	\$ Price
SYD138 SYD230 SYD368	_ _ _	_ _ _	_ _ _	SL27 SL28 SL29	662.00 1270.00 3120.00
DPA_50A DPA_60A DPA_75A DPA_90A	DPSO5_ — —	A, B A, B A A	DRC5 DRC6 DRC7 DRC9	_ _ _	52.00 59.00 100.00 132.00

## Table 16.287: How to Order

Discount

	To Order Specify:	Catalog Number				
•	Class Number	Class	Туре			
•	Гуре Number	9998	SL6			

SQUARE D



Class 9998 Type SO1

## Contact Units for Melting Alloy Type Overload Relays

One normally closed contact, Class 9998 Type SO1, is provided in each overload relay block on Type S starters Sizes 00-6. The Class 9998 Type SO1 contact unit listed below is provided as standard in each Class 9065 melting alloy overload relay. Contact modules can be easily replaced and are identified in the table below. Isolated overload relay alarm circuit contacts are available as an optional feature. A pilot light or alarm bell can be wired in series with this confact to indicate that the overload relay has tripped. For further information on isolated alarm contacts refer to Class 9999 Types SO4 and SO5 (page 16-113).

#### Table 16.288:

	Magnetic Starter			Parts Kit	
NEMA Size	Туре	Series	Description ▲	Number	\$ Price
00–4 & 6	SA-SF SH	A & B	Standard N.C. contact unit	Class 9998 Type SO1 ■	39.40
	SG	۸	Standard N.C. contact unit	3110251450	134.00
5	30	Α	N.C. and N.O. alarm (three point) contact unit	3110251451	196.00

- Refer to page 16-110 for contact ratings.
- The Type SO1 is also the replacement contact unit for Class 9065 Type M melting alloy overload relays.

## Class 9998 Type UB Universal Baseplate

A universal baseplate may be used to retrofit a Square D Type S NEMA starter into an application which is currently using a competitive NEMA starter. The universal baseplate is a metal plate which attaches to the panel in the location of the starter to be replaced. The Type S starter then mounts to the baseplate. It is available for NEMA Sizes 00 through 4, and mounting screws are provided with each plate.

The universal baseplate adapter allows the Type S starter to replace the following competitive starters:

#### Table 16.289:

Competitor Starter	NEMA Size	Baseplate	NEMA Size	Baseplate	NEMA Size	Baseplate	NEMA Size	Baseplate	\$ Price
Allen Bradley 509	0, 1		2		3		4		No charge
Allen Bradley 709	1		2		3		4	UB04	
Cutler Hammer Freedom Series	00, 0, 1	UB01	2	UB02	3	UB03	4		
Furnas ESP100	0, 1	OBOT	2	0602	3	UB03	4		
Furnas INNOVA	0, 1		2		3		4		
General Electric CR306	00, 0, 1		2		3		4		
Telemecanique "A" Line and Pre-type "S"	0, 1	UB11	2	UB12	3	UB13	4	UB14	

## Melting Alloy Overload Relay Jumper Strap Kits

Jumper strap kits are for use on three-phase manual or magnetic starters with melting alloy overload relays only, where a three-phase starter is used to control a single-phase motor. These kits will include two jumper straps, a wiring diagram showing how to wire a three-phase starter to control a single-phase motor, and single-phase (one thermal unit) selection tables.

Table 16.290: Melting Alloy Overload Relay Jumper Strap Kits

Class	F	Class 9998	\$ Price ◆			
Class	Size	Туре	SO31 SO32	3 File ▼		
	00, 0, 1, 2 and M0 & M1	SA, SB, SC, SD and M & T (Manual)	SO31	14.30		
ALL	3,4	SE, SF	SO32	50.00		
	5	None Available				

CP1 discount schedule.

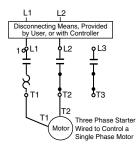
## **How to Order**

#### Table 16.291: How to Order

To Order Specify:	Catalog Number				
Class Number	Class	Type			
Type Number	9998	UB01			



Part No. 31102-514-50. Used on Size 5 Starter (8536SGO) with Melting Alloy Overload Relay.



Melting Alloy Overload Relay Jumper Strap Kits

## **Cover-Mounted Control Units**

Class 9999 push button, selector switch and pilot light cover-mounted control unit kits can be easily field installed in a NEMA 1, 3R, 4 or 12 Type S contactor or starter enclosure cover. Knockouts or removable closing plates are furnished with many enclosure covers for convenient field installation of control units. Kits are supplied with leads and clearly illustrated instructions. The Class 9999 cover mounted control unit kits are identical to the units which are factory installed.

#### Table 16.292:

	For Use With				NEMA 1 Kit 8538, 8539 and 8903 Pre-Series K Description						NEMAS 1, 3R & 12 Kit 8538, 8539 and 8903 Series K and Later Description★			Later	NEMA 4/4X Kit (Stainless) Description★									
		NEMA			Red or	Greer	n Pilot Lig	ht■		ush itton	Sele Swi			Red or Green Pilot Light	Push Button	Selector Switch		Red or Green Pilot Light	Push Button	Selector Switch				
Class	Type Size or Amp	Size or Ampere Rating	re Of	No. of H	of		Voltage	With Co Transfo (Form I	rmer	Stand	ard	Start- Stop	On- Off	Hand- Off- Auto	On- Off	\$ Price	120 V 60 Hz	Start-Stop or On-Off	Hand-Off- Auto	\$ Price	120 V 60 Hz	Start- Stop or On-Off	Hand- Off- Auto	\$ Price
					Туре	Price	Туре	Price	Туре	Туре	Туре	Туре		Туре	Туре	Туре		Туре	Туре	Туре				
	SA, SB & SC	00, 0, 1 & 1P	All		SP28R♦	215.	SP2R	215.			SA10 SC2 SC22													
0500	SD	2	All		SP28R♦	215.	SP3R	215.	SA2	SA10		SC2 SC2	SC2 SC2	SC2 SC2	SC2 SC22	SC2 SC22 116.	116.					1		
8502 &	SE	0	2–3		SP28R♦	215.	SP4R	215.	0,12	0,110	002	0022												
8536	SE	3	4–5		SP28R◆	215.	SP5R	215.						<u> </u>										
	SF	4	All		SP28R◆	215.	SP28R◆	215.	SA3		SA3	SC8		215.							ĺ			
	SG-SJ	5–7	All		SP28R◆	215.	SP28R◆	SP28R♦ 215.		0, 10	-													
	SB & SC	0 & 1	All		SP12R	215.	SP12R	215.			SA10 SC2	SC2 SC22 116.	SP28R◆■				SP29R ♦ ■ (incandescent)							
8538 8539	SD SE	3	All	6–600 Volts	SP13R SP14R	215. 215.	SP13R SP14R	215. 215.	SA2	SA10			C22 116.	(incandescent) SPL28R	1			SPL29R						
8702	SE	4	All	50-60	SP14R SP15R	215.	SP14R SP15R	215.						(LED-Red)	SA3▲	SC8	215.	(LED-Red) SPL29G	SA13	SC9	215.			
8736	SG-SJ	5–7	All	Hz	SP28R♦	215.	SP28R♦	215.	SA3	SA3	SC8		215.	`SPL28G ( (LED-Green)				(LED-Green)						
	L	20 A	All		SP28R♦	215.	_	_	_	SA10▼	_	SC22	116.	(LLD-Green)										
Δ	SM	30 A	All		SP28R♦	215.	SP2R	215.																
8903 (Elec-	SP	60 A	All		SP28R♦	215.	SP3R	215.	SA2▲	SA10▲	SC2	SC22	116.											
trically	SQ	100 A	All		SP28R◆	215.	SP28R◆	215.	SA3▲	SA3▲	SC8	_	215.											
Held)	SJ, SV, SX SY, SZ	200–800 A	All		SP28R◆		SP28R♦				SC8	_	215.											

- Also requires N.O. auxiliary contact for holding circuit contact when used on Class 8903 electrically held lighting contactors. Each pilot light kit contains 1 red and 1green lens cap.

- The coil voltage must be the same as the pilot light rating. Kit contains one Class 9001 Type KP1R31120V, 60 Hz red pilot light control unit. For other voltages, refer to Class 9001 Type KP. User made openings are required in order to field install these modification kits on standard 8502, 8536 Type S Sizes 0–2, and 8903 Sizes 30–60 A NEMAs 4 and 12 enclosures. To mount control unit in a NEMA 1 enclosure, a Class 9999 Type BLX bracket is also required, \$35.60.
- For Class 8903 (mechanically held contactor) control unit kits, refer to the Class 8903 section, page 16-65. There are no field modification kits available for the polyester enclosures. Note:

## Table 16.293: NEMA 1 Enclosure Closing Plates

	For Use W	ith				
Class	Туре	NEMA Size or Ampere Rating	Description	Туре	\$ Price	
8502, 8536.	SA-SE	00–3 or	For Pilot Light or Reset— Slip-on Cover NEMA 1 Enclosure	SG2	29.00	
8903	or SM–SP	30–60A	For Push Button or Selector Switch— Slip-on Cover NEMA 1 Enclosure	SG3	29.00	
8538 &	CD CE	0–4	For Push Button or Selector Switch— Hinged Cover NEMA 1 Enclosure	SG1	29.00	
8539 Pre-series "K"	SB-SF	0–4	For Pilot Light—Hinged Cover NEMA 1 Enclosure	SG2	14.30	
8538 & 8539 Series J and later	SB-SF	0–4	Pushbutton or Pilog Light NEMA Combination Starter	9001K51	14.30	
8903	SM-SV	30–400 A	Combination Lighting Contactor	9001K51	14.30	

## Table 16.294: How to Order

	To Order Specify:	Catalog Number				
•	Class Number	Class	Туре			
•	Type Number	9999	SP29R			



Class 9999 Type SP2R Pilot Light Kit



Class 9999 Type SA2 Push Button Kit



Class 9999 Type SC2 Selector Switch Kit



Class 9999 Type SA3 Push Button Kit

## **Auxiliary Contacts for Manual and Magnetic Contactors and Starters**

#### **Internal Contacts**



Internal Auxiliary Contact

Class 9999 Type SX11 internal contact kit is a replacement unit for the N.O. holding circuit contact supplied as standard on Type S Sizes 00–2 three phase starters and contactors. The Class 9999 Type SX12 is a replacement unit for the N.C. electrical contact which is furnished as standard on Type S, Sizes 00–2 mechanically interlocked devices (e.g., Class 8736 reversing

starters). Internal contacts are also used on Class 2510 Types M & T manual starters. The internal contacts can be used for other applications as long as the electrical rating is not exceeded. See table below for electrical ratings.

## **External Contacts**



External Single Circuit
Auxiliary Contact

Class 9999 Type SX6 external auxiliary contact is supplied as standard for the N.O. holding circuit contact on Type S Sizes 3–7 starters and contactors. Additional auxiliary contacts can be added to Type S contactors, starters and lighting contactors. These contacts mount on either side of the

basic contactor and are available with convertible or nonconvertible contacts. The contacts of the convertible version can be changed from N.O. to N.C. or vice versa in the field. The non-convertible version has fixed contacts, either N.O. or N.C.

To determine the number of auxiliary contacts which can be added to each Type S contactor or starter, refer to the Class 8536 or Class 8736 section.

See table below for electrical ratings.

Table 16.295: Maximum Ratings for Type S Auxiliary Contacts and Timers

Class		Contact	Ratings		Class		Contact	Ratings	
9999 Type	Volts AC			Continuous	9999 Type	Volts	AC ( (35% Pow	Continuous	
		Make	Break			AC	Make	Break	
SX11, SX12	120 or Less	30 A	3 A	3 A	SX6-SX10	120 or Less	60 A	6 A	10 A
3/11, 3/12	120-600	3600 VA	360 VA	3 A	SX13-SX17	120-600	7200 VA	720 VA	10 A

#### Table 16.296: Class 8502, 8536 and 8903 Type S

For Use With			Ordering Information	
Type	NEMA	Kit Description	Class 9	999
Туре	Size		Туре	\$ Price
External	—Field C	onvertible		
SA-SJ	00–7	1-N.O. Contact 1-N.C. Contact 1-N.O. and 1-N.C. Isolated Contacts 1-N.O. Overlapping Contact 1-N.C. Overlapping Contact	SX6 SX7 SX8 SX9▲ SX10▲	86.00 86.00 116.00 116.00 116.00
External	-Non-Co	onvertible		
SA-SJ	00–7	1-N.O. Contact 1-N.C. Contact 1-N.O. & 1 N.C. Isolated Contacts 1-N.O. Overlapping Contact 1-N.C. Overlapping Contact	SX13 SX14 SX15 SX16▲ SX17▲	99.00 99.00 134.00 134.00 134.00
Internal—Non-Convertible				
SA-SD	00–2	1-N.O. Contact 1-N.C. Contact	SX11■ SX12■	99.00 99.00

- Types SX9 and SX10 or Types SX16 and SX17 must be used together and mounted on the same side of the contactor. They are suitable for applications where it is necessary for a normally open contact to overlap a normally closed contact.
- Types SX11 and SX12 are not applicable for use on NEMA Sizes 3 or larger. Internal contacts can also be used on Class 2510 Types M and T manual starters.

Table 16.298: Class 8965 Reversing/Hoist Contactors
-Auxiliary Contacts

Device To Be Serviced	Auxiliary Contact Kit			
Class 8965 Type	Contact Arrangement	Type of Connector	Class 9999 Type	\$ Price Each
	1 N.O.		D10	35.60
DPR	1 N.C.	Screw/	D01	33.00
DFN	1 N.O./1 N.C.	Quick-Connect	D11	64.00
	2 N.O.		D20	04.00
RO2 & RG2 RO10 Form X1 RO11 Form X1	1 N.O. each side	Oliva and	R10	50.00
RO3 & RG3 RO10 Form X2 RO11 Form X2	1 N.C. each side	Slip-on	R11	75.00
RO5 & RG5 RO12 Form X1 RO13 Form X1	1 N.O. each side	Screw	R12	50.00
RO6 & RG6 RO12 Form X2 RO13 Form X2	1 N.C. each side	Sciew	R13	75.00

#### Table 16.297: Class 8910 and 8911 Definite Purpose Contactors and Starters – Auxiliary Contacts

Device To Be Serviced	Auxiliary Contact Kit			
Class 0010 av	Contact	Class 9999		\$ Price
Class 8910 or 8911 Type	Contact Arrangement	Series B (20-90 A)	Series C (20-40 A)	Each
	1 N.O.	D10	DD10	24.60
DPA	1 N.C.	D01	DD01	24.00
DPS	1 N.O./1 N.C.	D11	DD11	44.30
	2 N.O.	D20	DD20	44.30

Table 16.299: How to Order

To Order Specify:	Catalog	Number
Class Number	Class	Туре
<ul> <li>Type Number</li> </ul>	9999	SX6

Class 9999, 9065 / Refer to Catalog 9065CT9701



## **Accessories**

## Motor Logic—Class 9999

## **Isolated Auxiliary Contacts for Motor Logic Overload Relays**

Overload relay auxiliary contacts are available factory installed or in kit form for field installation on Motor Logic overload relays. These contacts may be used for isolated alarm contact applications.

#### Table 16.300:

For Use With		Parts Kit	Class 9999	¢ Brico	
Class & Type	NEMA Size♦	Description	Туре	5 FIICE	
8536 SA-SJ	00B through 7	N.O. or N.C.			
9065 SS, SR, SF, ST	00B through 7	Auxiliary Contact (Field Convertible)	AC04	57.00	

#### **DIN Adapter**

The DIN adapter provides a method to mount the Motor Logic overload relay to a 35 mm DIN rail.

#### Table 16.301:

For Use With		Parts Kit	Class 9999	\$ Price
Class & Type	NEMA Size♦	Description	Туре	\$ FIICE
9065 SS or SF	00B, 00C, 0, and 1	DIN Adapter	DA01	23.90

### Lug-Lug and Lug-Extender Kits

A Class 9999 LL0 Lug-Lug Kit can be field installed on separately mounted overload relays. The standard Size 00B, 00C, 0, and 1 Class 9065 Type SS and SF overload relays are supplied without lugs. A Class 9999 LB0 Lug-Extender Kit is designed for Size 00B, 00C, 0, and 1 Retrofit Starter Applications. This kit allows the lugs to be in the same location as the Class 9065 melting alloy overload relay, eliminating the need for additional wire length.

#### Table 16.302:

For Use With		Parts Kit	Class 9999	\$ Price
Class & Type	NEMA Size◆	Description	Туре	\$ Price
	00B, 00C, 0, and 1		LL0	42.80
9065 SS or SF	00B, 00C, 0, and 1	Lug-Extender Kit for retrofitting existing NEMA S starters	LB0	35.60

#### **Remote Reset Module**

The Remote Reset Module can be easily field installed on solid state overload relays. This module will allow the overload relay to be reset from a remote location.

#### Table 16.303:

For Use W	Parts Kit	Class 9999	\$ Price	
Class and Type	NEMA Size ♦	Description	Туре	\$ FIICE
536 SA-SJ	00B through 7	Remote Reset	RR04■	162.00
9065 SS, SR, SF, ST	00B through 7	Module	HH04	102.00
8536 SE-SF	3 and 4	Top Mounting Bracket	RB34▲■	100.00
9065 SS, SR, SF, ST	3 and 4	Bracket	ND04	100.00

- To be used to mount the remote reset module on the top of the overload relay.
- 120 Vac power required.
- NEMA Size 00B and 00C are not actual NEMA sizes. These designations are used to differentiate the lower FLA of these devices from the NEMA size 00 Motor Logic Solid State Overload Relay.

SQUARE D

Class 9999

by Schneider Electric www.schneider-electric.us

Class 9999 Type SB9 Double Power Pole Adder





Class 9999 Type SB9 Double Power Pole Adder



Class 9999 Type SB6 Single Power Pole Adder

### **Power Pole Adders**

One single or double circuit power pole kit may be field added to a basic 2 or 3-Pole Type S contactor or starter Sizes 0, 1 and 2, or 30–60 A lighting contactors. See table below for selection. The ratings for these power pole adders correspond to the NEMA contact ratings found on page 16-105. A two or three pole contactor or starter accepts only one single or double circuit unit. A power pole cannot be used on four or five pole devices or devices which are mechanically interlocked.

To add a power pole to a Size 0 and 1 device, remove return springs.

When adding a power pole to a Size 2 or 60 A device, a coil change is required. Select a 4- and 5-Pole coil from the coil selection table on page 16-105, or specify Form Y118 as noted in the footnote below.

When adding Sizes 0–2 power pole kits to a Size 3–7 or 100–800 A device, an adapter bracket (9999 SBT1) is required. The Class 9999 Types SB6 through SB15 power pole kits are suitable for copper wire only. Types SB21 through 25 are supplied with lugs suitable for copper and aluminum wire.

#### Table 16.304:

For Use With		Power Pole Adder Kit		
Туре	Size	Description	Class 9999 Type	\$ Price
SB, SC & SM	0, 1 & 30 A	O NO	SB6	158.00
SD	2	One N.O. power pole adder	SB11▲	287.00
SP	60 A	dadoi	SB21▲	207.00
SB, SC & SM	0, 1 & 30 A	0 N 0	SB7	158.00
SD	2	One N.C. power pole adder	SB12▲	287.00
SP	60 A	addei	SB22▲	267.00
SB, SC & SM	0, 1 & 30 A	One N.O. and one	SB8	365.00
SD	2	N.C.	SB13▲	656.00
SP	60 A	power pole adder	SB23▲	00.00
SB, SC & SM	0, 1 & 30 A	T 110	SB9	365.00
SD	2	Two N.O. power pole adders	SB14▲	656.00
SP	60 A	adders	SB24▲	00.00
SB, SC & SM	0, 1 & 30 A	T 110	SB10	365.00
SD	2	Two N.C. power pole adders	SB15▲	656.00
SP	60 A	udders	SB25▲	00.00
SE-SJ & SQ-SZ & SJ	3-7 & 100-800 A	Adapter Bracket	SBT1	100.00
. To suden	Cine 0 ex CO /	manuar mala liit aamanl	ata mith a na	

To order a Size 2 or 60 A power pole kit complete with a new starter coil, specify Form Y118, voltage and frequency and add \$140.00 to the price of the kit (e.g., Class 9999 Type SB11 Form Y118, 120 volts, 60 cycles. Priced at \$426.00).

#### **Control Circuit Fuse Holder**

The control circuit fuse holder is designed to be used on Type S contactors and starters, Sizes 00-7, when either one or two control circuit fuses, 600 V maximum, are required. The Type SF3 and SF4 fuse holders will accept standard 600 V Bussmann Type KTK or equivalent fuses (13/32" x 1-1/2"); 6 A maximum. The SFR3 and SFR4 will accept Class CC 600 V Bussmann Type KTK-R or equivalent fuses only.

Table 16.305:

Description =	Class	Class 9999		
Description <b>■</b>	Туре	\$ Price		
Single Fuse Unit	SF3	64.00		
Single Fuse Unit for Class CC Fuse	SFR3	64.00		
Two Fuse Unit	SF4	86.00		
Two Fuse Unit for Class CC Fuses	SFR4	86.00		

Fuses not included.



Class 9999 Type SF4 Fuse Kit

## **Transient Suppression Module**

The transient suppression module is designed to be used where the transient voltage, generated when opening the coil circuit, interferes with the proper operation of nearby integrated or solid state control circuits. The module consists of an RC circuit and is designed to suppress the coil voltage transients to approximately 200% of peak coil supply voltage. The module is wired across the coil for Type S, Sizes 00–5 and is designed for coil voltages of 120 volts only.

#### Table 16.306:

Description	Class 9999		
Description	Туре	\$ Price	
For Sizes 00-2	ST1	62.00	
For Sizes 3-5	ST2	62.00	



Class 9999 Type ST1 Transient Suppression Module

#### Table 16.307: How to Order

To Order Specify:	Catalog	Number			
Class Number	Class	Type			
<ul> <li>Type Number</li> </ul>	9999	SM1			







Type SO4

Tie Point Terminal Block

#### **Isolated Alarm Contacts For Melting Alloy Overload Relays**

Isolated overload relay alarm contacts are available factory installed or in kit form for field installation in Type S, NEMA Size 00–6▲ starters and Class 9065 Types M and S melting alloy overload relays. Type S, NEMA Size 7, utilizes a solid state overload relay which has isolated alarm contacts as a standard feature. The alarm contacts allow the starter to be used in applications which require isolated contacts, such as inputs to a computer.

Class 9999 Types SO4 and SO5 modules are interchangeable with the standard module (Class 9998 Type SO1) and may be installed on starters already in service. The case is made of clear plastic (polycarbonate) to allow for visual inspection of contacts.

Table 16.308: Contact Unit For Melting Alloy Overload Relays

	Magneti	c Starter		Class 9999	
	NEMA Size	Туре	Parts Kit Description	Type	\$ Price
	00.6	N.O. Isolated Alarm Contact Plus Standard N.C. Overload Contact N.C. Isolated Alarm Contact Plus Standard N.C. Overload Contact N.C. Isolated Alarm Contact Plus Standard N.C. Overload Contact		SO4	116.00
	00-0 <b>A</b>			SO5	110.00

Isolated alarm contacts **cannot** be added in the field to the Type S Size 5 starter. Current transformers and a Size 1 overload block must be used. For factory installation specify **Form Y342**.

#### Solid Neutral

**Accessories** 

The Class 9999 Type SN kit can be used on Class 8903 Type S lighting contactors and other controllers where field addition of a solid neutral is required. Each kit has lugs suitable for both copper and aluminum wire, and mounts with

Table 16.309:

Number of	Wire Capacity	Class 9999			
Lugs	Per Lug (Cu/Al)	Туре	\$ Price		
4	14–2/0	SN1	134.00		
3	(1) 4–600 MCM or (2) 1/0–250 MCM	SN2	392.00		
3 (Dual)	(2) 2-600 MCM	SN3	624.00		
2 (Dual)	(2) 6-350 MCM	SN4	392.00		

#### **Tie Point Terminal Block**



Table 16.310:

Mag Contactor	netic or Starter	Class 9999 Type	\$ Price	
NEMA Size	Туре	Туре		
00–4	SA-SF	T7	33.30	

Table 16.311: How to Order

To Order Specify:	Catalog Number			
Class Number	Class	Туре		
Type Number	9999	SO4		



Mechanical Interlock

General: Type S contactors or starters can be mechanically interlocked so that only one device is energized at a time. The mechanical interlock is an interference (non-jamming) type, locking at the beginning of the stroke of any starter or

Type S Sizes 00, 0, 1 and 2—The mechanical interlock is mounted on the underside of the reversing baseplate. Two pins extend from the mechanical interlock through openings in the baseplate and engage the contact carrier of each contactor. Two styles of mechanical interlock through openings in the baseplate and engage the contact carrier of each contactor. Two styles of mechanical interlocks are used: one version for three pole contactors, a different version for four or five pole contactors. When adding a power pole to the left-hand side of an existing Size 0, 1, or 2 three-pole reversing contactor, a new mechanical interlock must also be installed. When added to the right-hand side only, the power pole will not be mechanically interlocked with the left-hand contactor.

Type S Sizes 3 and 4—The mechanical interlock is separate from the mounting pan on Sizes 3 and 4. Cams on the mechanical interlocks are operated by the contact carrier of each contactor. The mechanical interlock is attached to the underside of the two contactor baseplates on Sizes 3 and 4.

#### Table 16.312: Mechanical Interlock for Two Contactors

The following mechanical interlock kits can be used to interlock 2-5 pole contactors. Mechanical interlocks for horizontal and vertical arrangement are listed in Various pole arrangements.

			Contactor NEMA Size	Class 9999 Type	\$ Price
2 POLE or 3 POLE  Horizontal Type SM1 for Size 00–1 Type SM12 for Size 2 Type SM12 for Sizes 3 & 4	4 POLE or 3 POLE  Horizontal  Type SM2 for Size 0 or 1 ▲ Type SM12 for Size 2 Type SM12 for Sizes 3 & 4	4 POLE or 5 POLE : 2 POLE or 3 POLE  Vertical  Type SM2 for Size 0 or 1 ▲ Type SM10 for Size 2 Type SM11 for Size 3 Type SM15 for Size 4	00, 0, 1 0, 1 0, 1 0, 1 0, 1	SM1 SM2 SM3 SM4 SM5	116.00 116.00 116.00 116.00 116.00
Horizontal Type SM8 for Size 2 Type SM12 for Sizes 3 & 4	2 POLE or 3 POLE 2 POLE or 3 POLE  Vertical  Type SM4 for Size 0 or 1 Type SM9 for Size 2 Type SM1 for Size 3 Type SM15 or Size 4	4 POLE or 5 POLE  4 POLE or 5 POLE  Vertical  Type SM15 for Size 0 or 1  Type SM11 for Size 3  Type SM13 for Size 4	2 2 2 2 2 2 3 3,4 4	SM6 SM7 SM8 SM9 SM10 SM11 SM12	257.00 257.00 257.00 257.00 257.00 257.00 257.00 257.00

The Type SM2 interlock is factory assembled for horizontal mounting, but can easily be converted to vertical mounting. Conversion instructions are

#### Table 16.313: Overload Relay Mounting Bracket

Mechanical interlock Types SM1 through SM10 for Sizes 00-2 devices use overload relay mounting brackets to support the overload relay portion of the starter.

Kit Description	Class 9999 Type	\$ Price
Bracket for one overload relay used with horizontal mechanical interlocks, Types SM1 through SM10	SO11	14.30
Bracket for two overload relays used with vertical mechanical interlocks, Types SM2, SM4, SM5, SM9 and SM10	SO12	42.80

#### Table 16.314: How to Order

	To Order Specify:	Catalog Number			
•	Class Number	Class	Туре		
•	Type Number	9999	SM1		

Overload Relay Mounting Bracket



Type SM12



Class 9422 TC33 Fuse Block

Class 9999 Type S2

Interchangeable Fuse Clips

## **Accessories**

Class 9422, 9999 / Refer to Catalog 9420CT9701

Class 8538 (Series D and newer), Class 8738 (Series E and newer), and Class 8903 (Series C and newer) Type S non-fusible combination starters and lighting contactors (sizes 0–2, 30 to 60 A) can be converted to the fusible type by installing a Class 9422 Fuse Clip Kit. Both fusible and non-fusible combination devices have the same size enclosure in NEMAs 1, 4, and 12 construction, which permits this conversion. The 9422 Fuse Clip Kits contain line and load fuse clips, load base, and fuse pullers.

Table 16.315: Class 9422 Replacement Fuse Clip Kits

Device		NE	MA Class H, K, J,	R Fuses				
Used on	Disconnect Ampere Rating		Fuse Clip Ratings (A)		\$ Price	Class R Fuse Clip Kits	\$ Price	
Size or Ampere Rating	naung	250 V Max.	600 V Max.	Class & Type				
0, 1 & 30 A	30	0–30	_	9422TC30▲	42.80	RFK03■	32.60	
0, 1 & 30 A	30	31–60	0–30	9422TC33▲	71.00	RFK06■	34.00	
2 & 60 A	60	31–60	0–30	9422TC33	71.00	RFK06■	36.50	
2 & 60 A	60	_	31–60	9422TD63	99.00	RFK06H■	34.00	

- When using with a 9422FTCN or FTCF disconnect switch in 8538 or 8738 combination starters, remove and discard metal base plate.
- No Class Number required Discount Schedule DE1.

#### Table 16.316: Class 9999 Replacement Fuse Clip Kits (8538 Pre-Series D, 8738 Pre-Series E)



- Fuse clips are not provided in the Type SR4 and SR5 kits. On new installations Class 9999 Type S fuse clips must also be purchased. Three non-removable pins are supplied and can be installed only in the latest production devices, which have a hole in the lower fuse clips.
- Cannot be used in Series B or newer 8538 devices.

#### Table 16.317: Class 9999 Auxiliary Contact Kits for Disconnect Switches and Circuit Breakers



Class	Type	SPDT		DPDT		Class	Tyree	SPDT		DPDT	
Class	Туре	Туре	\$ Price	Type	\$ Price	Class	Туре	Туре	\$ Price	Туре	\$ Price
8538, 8738	SB, SC (Series C)	R45	71.00	R46	207.00	Disconne	ect Switches				
8539, 8739	SB, SC, SD, SE, SF, SG	R26	131.00	R27	243.00	9422	BTCF, BTCN, BTDF, BTEF, BTEN	TC11	120.00	TC21	239.00
8538	SBA, SCA, SBG, SCG (Series K)	TC11	120.00	TC21	239.00	9422	TCF, TCN, TDF, TDN, TEF, TEN	TC10	120.00	TC11	239.00
8738	SBA, SCA, SBG, SCG (Series K)	TC10	120.00	TC20	239.00	9422	TF	R8	87.00	R9	243.00
8538	SB▼, SC▼, SD▼ (Series B)	R6	113.00	R7	221.00	Circuit Breaker Operating Mechanism		ıs			
8538	SBAS8, SCAS8, SBGS8, SCGS8, (Series K)	TC10	120.00	TC20	239.00	9421	LF, LK, LL, LM, LN, LP, LR, LT, LW	R47	131.00	R48	221.00
8538, 8738	SD (Series C)	R43	116.00	R44	221.00	9422	RM, RN, RP, RQ, RR, RT	R26	131.00	R27	243.00
8538	SDA, SDA▼, SDG, SDG▼ (Series K)	TC10	120.00	TC20	239.00	9422	CFA, CKA, CLA, CSF, CMP	R26	131.00	R27	243.00
8738	SDA, SDG (Series K)	TC10	120.00	TC20	239.00						
8538, 8738	SE (Series B & C)	R41	131.00	R42	243.00						
8538, 8738	SE, SF (Series A)	R8	131.00	R9	243.00						
8538, 8738	SF (Series B & C)	R39	135.00	R40	243.00						
8538, 8738	SG	R35	435.00	R36	521.00						

Class 8538 type numbers ending in suffix "S8".

#### Table 16.318: How to Order

	To Order Specify:	Catalog Number		
	Class Number	Class	Type	
	Type Number	9999	R6	



#### General

All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. Always be certain the correct thermal units are installed in the starter before operating the motor. Each thermal unit shall be installed such that its catalog number is visible. See page 16-120, Figure 1 for complete thermal unit installation instructions. On melting alloy thermal units the ratchet wheel must engage the pawl assembly.

#### **Selection Procedure**

#### 1. Determine motor data:

- a. Full load current rating
- b. Service factor

**NOTE:** If motor full load current (FLC) is not known, a tentative thermal unit selection could be made, based on horsepower and voltage. Refer to page 16-120.

#### Motor and controller in same ambient temperature:

- All starter classes, except Class 8198:
  - For 1.15 to 1.25 service factor motors use 100% of motor FLC for thermal unit selection.
  - For 1.0 service factor motors use 90% of motor FLC for thermal unit selection.
- b. Class 8198 only:
  - 1. For 1.0 service factor motors use 100% of motor FLC for thermal unit selection.
  - 2. For 1.15 to 1.25 service factor motors use 110% of motor FLC for thermal unit selection.

#### 3. Motor and controller in different ambient temperatures:

a. Multiply motor FLC by the multiplier in Table A. Use the resultant full load current for thermal unit selection.

#### 4. Locate proper selection table from index, pages 16-117 and 16-118.

a. The proper thermal unit number will be found adjacent, to the right of the range of full load currents in which the motor FLC or resultant full load current falls.

#### 5. See page 16-119 for calculation of trip current rating.

#### **Slow Trip Thermal Unit Selection**

To select Type SB slow trip thermal units, the selection table for a standard Type B thermal unit may be used with the following modifications: For continuous rated motors having service factors of 1.15 to 1.25, select thermal units from the standard Type B table using 93% (102% for Class 8198) of the full load current shown on the motor nameplate and then substitute an SB for the B in the thermal unit type number.

Example: A motor with a full load current of 12 A controlled by an 8536SCG3 would require B22 thermal units for standard trip applications and SB19.5 thermal units for slow trip applications. The SB is selected by multiplying 12 A times 93% for 11.16 A and using this value to select B19.5. Then add the S prefix to arrive at SB19.5.

For continuous rated motors having a service factor of 1.0, select thermal units in the same manner using 84% (93% for Class 8198) of full load current shown on the motor nameplate.

**NOTE:** SB thermal units are used on Size 0, 1, 2 and only some Size 3 applications. Check thermal unit tables for current ranges.

Table A: Selection of Thermal Units for Special Applications

			Melting Alloy and Non-Compensated Bimetallic Relays					
	Continuous		Ambient Tempe	erature of Motor				
Class of Controller	Duty Motor Service Factor	Same as Controller Ambient	Constant 10°C (18°F) Higher Than Controller Ambient	Constant 10° C (18°F) Lower Than Controller Ambient	Constant 40°C (104°F) or less, for Any Controller Ambient			
		Full Load Current Multiplier						
All Classes,	1.15 to 1.25	1.0	0.9	1.05	1.0			
Except 8198	1.0	0.9	0.8	.95	0.9			
Class 8198	1.15 to 1.25	1.1	1.0	1.15	1.1			
0198	1.0	1.0	0.9	1.05	1.0			

Table 16.382: Thermal Unit Prices

	Melting Alloy		Bimetallic			
Type of Trip	Thermal Unit Type \$ Price		Type of Trip	Thermal Unit Type	\$ Price	
	Α	21.50		AR	21.50	
	В	21.50	Standard	AF	21.50	
Standard	С	21.50		AU	21.50	
Claridard	CC	21.50		E	21.50	
	DD	21.50				
Quick	FB	35.60				
Slow	SB	57.00				

by Schneider Electric

www.schneider-electric.us

NOTE: For thermal unit selection tables for other devices including obsolete devices, consult Schneider Electric CCC at (1-888-778-2733).

Table 16.383: Thermal Unit Selection

		Controller			Thermal Unit Selection Table Number							
		Controller				Hand Reset Melting A	Moy	Bimeta	allic			
Starter Type	Class	Туре	Series▲	Size	Standard Trip (20)	Quick Trip (10)	Slow Trip (30)	Non-Compensated	Compensated			
Manual Starters FHP	2510 2512 8908	F	А	FHP	43◊	_	-	_	_			
Manual Starters (Small Enclosure)	2510	M, T	А	M-0 M-1 M-1P	1 1 1	72 72 72	∇ ∇ ∇	=	_ _ _			
Manual Starters (Large Enclosure)	2510 2511 2512 8925	M, T	А	M-0 M-1 M-1P	2 2 2	73 73 73	∇ ∇ ∇	=				
DC	7135	C, D	_	1, 2	65	_	▽	_	_			
iviagnetic 7126	E	_	3	9	_	_	_	_				
Starters EC & M Crane	7735	F	_	4	10	_	_	_	_			
Control Product	7736	G	_	5	12	_	_	_	_			
	8536 8904■	A (8536 only)	B, C	00	17♦	-	_	_	_			
	(Starter In Own	SA	A, B	00	13	_	▽	_	_			
	Enclosure)	SB	Α	0	13	74	$\nabla$	8				
	0000	SC	Α	1	13	74	▽	8				
	8933		Α	1P	41	ı	▽	_				
	8998	SD	Α	2	56	75	▽	62				
	8999 (Madel 2	SE	Α	3	18	76☆	134☆▽	63				
	(Model 3 Control Center)	91	В	3	_	1	_	142□	33 — 70 37□ — 29□ — 46			
	Control Center) I-LINE®	SF	Α	4	54	77☆	_	11				
	and QMB Motor		В	4		_		144□	37□ — 29□ — 46			
	Starter	SG	A	5	49			38				
	Centers		B*	5	59	83		23				
		SH	SH	SH	SH	A, B	6	21			39	47
		SC	Α	1 Fusible	66	74	_	64	33			
AC				1 Circuit Breaker	15	74						
Magnetic Starters		SD	Α	2 Fusible	67	75		57	70			
(Small	8998			2 Circuit Breaker	58△	75 76☆	104	F-1	07.0			
Ènclosure)	8999	SE	Α	3 Small Enclosure 3 Large Enclosure	16 68△	76× 76☆	134☆▽ 133☆▽	51	3/⊔			
	(Model 4	SE	В	3 Large Enclosure	- 684	76× —	133×V	141□				
	Control Center)		A	4	61			35				
		SF	В	4	— — — — — — — — — — — — — — — — — — —		<del>                                     </del>	143□				
		SG	A	5	24		_	52				
		SH	A	6	20			48				
				1	109	_		_				
		SC€	Α	1 COMPAC 6	104			_				
		SD⊕	Α	2	110	_	_	_	Compensated			
	8998	SE€	A	3	111	_	_	_				
	(Model 5 and Model 6 MCCs)	SF€	A	4	112	_	_	_				
	iviouel 6 ivious)		A	5	113	_	_	_				
		SG€	В	5 CT	103	_	_	_				
		SH€	A	6	114	_	_	_	102			
				20-30 A	135	_	_	_				
	8911	DPSG	С	40 A	145	_	_	_	_			
0911			Α	50 A	146		_	_				

NOTE: For thermal unit selection tables for other devices including obsolete devices, consult Schneider Electric CCC at (1-888-778-2733).

Thermal Unit Prices ......page 16-116.

Table 16.384: Thermal Unit Selection

		Controller			Thermal Unit Selection Table Number					
		Controller			Han	d Reset Melting	Alloy	Bimet	allic	
Starter Type	Class	Туре	Series▲	Size	Standard Trip (20)	Quick Trip (10)	Slow Trip (30)	Non-Compensated	Compensated	
	8198	G, S	_	_	5	_	▽	_	6	
	8536	A (8536 only)	B, C	00	14◊	_	_	_		
	(Starter Used in Multi-Motor Panel)	SA	A, B	00	53	_				
		SB, NB	Α	0	15	78				
	8538 8904 <b>▼</b> 8539 8906	SC, NC	Α	1	15	78				
	8606 8907	SD, ND	Α	2	58	79				
	8630♦ 8920	SE, NE	Α	3	16	80☆	133☆▽		37□	
	8640★ 8922 9089 8924	OL, IVL	В	3	_	_	_		_	
	8647 8925	SF, NF	Α	4	61	81☆	_		29□	
	8650 8930	0.,	В	4	_	_	_		_	
8736 8941 8738 8739	SG	Α	5	24	_					
		B <b>*</b>	5	59	83					
		SH	A, B	6	20	_				
AC Magnetic	CB, DB, SB, UB	Α	0	15	78					
	CC, DC, SC, UC	Α	1	15	78					
	CD, DD, SD, UD	Α	2	58	79					
Starters	0040	CE, DE, SE, UE	Α	3	16	80☆	133☆▽			
(Large 8810 Enclosure) 8811 8812	CF, DF, SF, UF	Α	4	61	81☆	_		29□		
	SE	В	3	_	_	_		_		
	SF	В	4	_	_					
	CG, DG, SG, UG	Α	5	24	_	_				
		B*	5	59	83	_				
		CH, DH, SH, UH	Α	6	20		·	48		
		WC, XC	Α	1	13	78	_	_		
		WD, XD, MD, RD,	Α	2	56	79	_	_		
	8940	WE, XE, ME, RE,	Α	3	18	80☆	_	_		
	WELL-GUARD™	PF, WF, XF, MF,	Α	4	54	81☆	_	_	29□	
	Control	XSG, NSG,	Α	5	_	_	_	_	46	
		MG,RG, VG♦	B*	5	_	_	_	_		
		XSH, VH	Α	6	_		_	_		
			С	20-30 A	136			_		
	8911	DPSO		40 A	147		_	_	_	
			Α	50 A	148	_	_	_		
		SC⊕	Α	1	127	_	_	_		
AC	8998	SD⊕	Α	2	128		_	_		
Magnetic	(Model 5 and	SE€	Α	3	129		_	_		
Part- Winding	Model 6 MCCs)	SF	Α	4	105			_		
vviriality	,	SG	Α	5	115		_	_		
			B <b>*</b>	5 CT	116	_	_	_		
		AF	В	4(133 A)	_		_		_	
		AG	Α	5(266 A)	_		_		_	
		AR	Α	1(25 A)	_		_		_	
		AT	Α	2(45 A)	_	_	_		_	
		AU	_	3(86 A)	_	_	_		_	
		DA2	Α	1(25 A)	_	_		_		
		GA2	Α	2(60 A)	_		_	_		
		HA2	Α	3(100 A)	_		_	_		
Separately Mounted		JA2	Α	4(180 A)	_		_	Slow Trip (30)		
Overload	9065	С	Α	1(25 A)	44	82		_	_	
Relays		F	В	4(133 A)	19	85☆	_	_	_	
		G	Α	5(266 A)	22					
		MEO	Α	(32 A)	86	_				
				1(26 A)	59	83				
		s	Α	2(45 A)	69	84	▽	27	71	
		3	^	3(86 A)	34	_				
				4(133 A)	28	_		_		
		Т	Α	2(45 A)	31	_	▽	_		
	I	U	_	3(86 A)	40	_	_	_	_	

- Series letters listed refer to the marking on the nameplate of the basic open type starter. When the starter is supplied in a controller containing other devices, the controller may have a different series letter marked on the enclosure nameplate.
- Small enclosure tables apply for Class 8904 non-combination and non-reversing starters. For combination and reversing Class 8904 starters refer to the large enclosure selections, index
- For Class 8630 starters divide the delta connected motor full load current by 1.73, and use this quotient to select thermal units.
- For Class 8640 and Class 8940 (MD, PD, ME, PE, MF, PF, MG and PG) starters use the full load current of each motor winding as a basis for thermal unit selection—normally one-half total motor current.
- Large enclosure tables apply for Class 8904 combination and reversing starters. For non-combination and non-reversing Class 8904 starters refer to small enclosure selections, page 16-117. Use for Autotransformer Starters (Fusible and Circuit Breaker).

  Order Type E thermal units by number from Schneider Electric, Furnas Electric Company, Batavia, Illinois or a Furnas distributor at \$13.50 each, subject to motor control discounts.
- Type A thermal units for full load currents lower than those listed in this table are available. For complete information, consult Schneider Electric CCC at (1-888-778-2733).
- Form Y81 must be specified to use quick trip (Class 10) or slow trip (Class 30) thermal units on Size 3 starters and quick trip (Class 10) thermal units on Size 4 starters. This device will accept Type SB slow trip (Class 30) thermal units. For selection, see page 16-116.
- Refers to type number of starter in MCC, not actual type number of MCC.
- Divide the motor FLC by 60 and use this quotient to select the appropriate thermal units.



#### Calculation of Trip Current Rating

**Trip Current Rating**—Trip current rating is a nominal value which approximates the minimum current to trip an overload relay in an ambient temperature, outside of the enclosure, of 40°C (104°F). In all selection tables except Class 8198, the trip current rating is 1.25 times the minimum full load current shown for the thermal unit selected. For Class 8198, the trip current rating is 1.15 times the minimum full load current. This applies to bimetallic overload relays with the trip adjustment set at 100 percent.

#### **Calculation Procedure**

- Use the selection table for the specific controller involved. 1.
- Find the minimum motor full load current listed for the thermal unit in question.
- Multiply that current by 1.25 (1.15 for Class 8198). The result is the trip current rating.

Example 1: Determine the thermal unit selection and trip current rating for thermal units in a Class 8536 Type SCG3 Size 1 magnetic starter used to control a three-phase, 1.15 service factor motor with a full load current of 17.0 Amperes, where the motor and controller are both located in a 40°C (104°F) ambient temperature.

- From Table 13 the proper selection is B32.
- 2. The minimum motor full load current is 16. 0 Amperes.
- 3. Trip current rating is 16.0 x 1.25= 20.0 Amperes.

Protection Level is the relationship between trip current rating and full load current. Protection level, in percent, is the trip current rating divided by the motor full load current times 100. In Example 1 the protection level for the B32 thermal unit is: 20.0/17.0 x 100=118%.

National Electrical Code, Section 430-32, allows a maximum protection level of 125% for the motor in the above example.

Minimum Trip Current (also called ultimate current) may vary from the trip current rating value, since ratings are established under standardized test conditions. Factors which influence variations include: the number of thermal units installed, enclosure size, proximity to heat producing devices, size of conductors installed, ambient (room) temperature, and others.

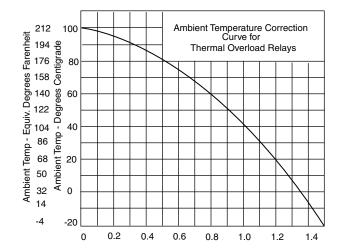
Except for ambient temperature-compensated overload relays, an ambient temperature higher than 40°C would lower the trip current, and a lower temperature would increase it. This variation is not a factor in selecting thermal units for the average application, since most motor ratings are based on an ambient temperature of 40°C, and motor capacity varies with temperature in about the same proportion as the change in trip current. Temperature-compensated relays maintain a nearly constant trip current over a wide range of ambient temperature, and are intended for use where the relay, because of its location, cannot sense changes in the motor ambient temperature.

#### Calculation of Trip Current For Ambient Temperatures Other Than 40°C

For a controller ambient temperature other than 40°C (104°F) trip current can be calculated by applying a correction factor from the curve in Figure 1. The approximate trip current for a particular ambient temperature is the product of (1) the multiplier M corresponding to the temperature and (2) the 40°C trip current rating.

NOTE: Ambient temperature is the temperature surrounding the starter enclosure. Normal temperature rise inside the enclosure has been taken into account in preparing the thermal unit selection tables.

Example 2: Determine the trip current for the motor and controller in Example 1, except the controller is in a 30°C (86°F) ambient temperature. From the curve in Figure 1 the multiplier M is 1.1 at 30°C. Approximate Trip Current is 16.0 x 1.25 x 1.1=22 Amperes





#### Approximate Thermal Unit Selection Based On Horsepower and Voltage

**General**—Thermal units selected using approximate full load currents from the table below will provide a trip current between 101% and 125% of full load current for many 4-pole, single speed, normal torque, 60 Hz motors. Since full load current rating of different makes and types of motors vary so widely, these selections may not be suitable.

Thermal units should be selected on the basis of motor nameplate full load current and service factor. Thermal unit sizes originally selected on an approximate basis should always be rechecked and corrected at the time of installation if required.

#### Instructions:

- 1. Locate motor horsepower and voltage.
- 2. Determine approximate full load current from the table below.
- 3. Use approximate full load current in place of actual nameplate full load current and follow instructions on page 16-116.

#### Only Use This Table When Motor Full Load Current Is Not Known

#### Table 16.385:

			Motor Full L	oad Current						
Motor Horsepower		Thr	ee Ø		Sing	gle Ø				
	200 V	230 V	460 V	575 V	115 V	230 V				
1/6	_	_	_	_	4.4	2.2				
1/4	_	_	_	_	5.8	2.9				
1/3	_	_	_	_	7.2	3.6				
1/2	2.5	2.2	1.1	0.9	9.8	4.9				
3/4	3.7	3.2	1.6	1.3	13.8	6.9				
1	4.8	4.2	2.1	1.7	16	8				
1-1/2	6.9	6.0	3.0	2.4	20	10				
2	7.8	6.8	3.4	2.7	24	12				
3	11.0	9.6	4.8	3.9	34	17				
5	17.5	15.2	7.6	6.1	56	28				
7-1/2	25.3	22	11	9	80	40				
10	32.2	28	14	11	_	50				
15	48.3	42	21	17	_	_				
20	62.1	54	27	22	_	_				
25	78.2	68	34	27	_	_				
30	92	80	40	32	_	_				
40	120	104	52	41	_	_				
50	150	130	65	52	_	_				
60	177	154	77	62	_	_				
75	221	192	96	77	_	_				
100	285	248	124	99	_	_				
125	359	312	156	125	_	_				
150	414	360	180	144	_	_				
200	552	480	240	192	_	_				

NOTE: These currents should not be used for selection of fuses, circuit breakers or wire sizes. See NEC tables 430-248 through 430-250. For motors rated 208-220 volts, use 230 V column. For motors rated 440 to 550 volts, use 460 and 575 V columns, respectively.

#### **Mounting Thermal Units**



Figure 1

Always be certain the correct thermal units are installed in the starter before operating the motor. Thermal units should always be mounted so that their type designation can be read from the front of the starter (see Figure 1). Melting alloy thermal units should be mounted so that the tooth of the pawl assembly can engage the teeth of the ratchet wheel when the reset button is pushed.

Mounting surfaces of starter and thermal units should be clean and care should be taken to insure that thermal unit mounting screws are fastened securely.

## Table 1

#### Table 2

	Ta
Thermal	

abl	_	2		

#### Table 4

Motor	FLC (A)	Thermal	Motor I	FLC (A)	Thermal Unit	Motor I	FLC (A)	Thermal	Motor	FLC (A)	Thermal
1 T.U.	3 T.U.	Unit Number	1 T.U.	3 T.U.	Number	1 T.U.	3 T.U.	Unit Number	1 T.U.	3 T.U.	Unit Number
0.33-0.36 0.37-0.40 0.41-0.45 0.46-0.52 0.53-0.59	0.29-0.32 0.33-0.36 0.37-0.39 0.40-0.47 0.48-0.56	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71	0.35-0.38 0.39-0.43 0.44-0.48 0.49-0.56 0.57-0.63	0.30-0.32 0.33-0.37 0.38-0.39 0.40-0.48 0.49-0.57	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71	0.29-0.31 0.32-0.36 0.37-0.39 0.40-0.47 0.48-0.56	0.28-0.29 0.30-0.33 0.34-0.36 0.37-0.44 0.45-0.52	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71	0.32-0.33 0.34-0.38 0.39-0.41 0.42-0.50 0.51-0.61	0.29-0.30 0.31-0.35 0.36-0.37 0.38-0.45 0.46-0.54	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71
0.60-0.66 0.67-0.73 0.74-0.81 0.82-0.91 0.92-1.02	0.57-0.63 0.64-0.69 0.70-0.77 0.78-0.86 0.87-0.96	B 0.81 B 0.92 B 1.03 B 1.16 B 1.30	0.64-0.71 0.72-0.78 0.79-0.88 0.89-0.99 1.00-1.15	0.58-0.64 0.65-0.70 0.71-0.78 0.79-0.87 0.88-0.98	B 0.81 B 0.92 B 1.03 B 1.16 B 1.30	0.57-0.63 0.64-0.69 0.70-0.77 0.78-0.86 0.87-0.97	0.53-0.59 0.60-0.64 0.65-0.71 0.72-0.80 0.81-0.90	B 0.81 B 0.92 B 1.03 B 1.16 B 1.30	0.62-0.68 0.69-0.74 0.75-0.83 0.84-0.93 0.94-1.05	0.55-0.61 0.62-0.66 0.67-0.74 0.75-0.83 0.84-0.93	B 0.81 B 0.92 B 1.03 B 1.16 B 1.30
1.03–1.14 1.15–1.29 1.20–1.42 1.43–1.64 1.65–1.80	0.97–1.11 1.12–1.23 1.24–1.37 1.38–1.55 1.56–1.75	B 1.45 B 1.67 B 1.88 B 2.10 B 2.40	1.16–1.23 1.24–1.43 1.44–1.51 1.52–1.75 1.76–1.93	0.99-1.13 1.14-1.25 1.26-1.40 1.41-1.58 1.59-1.79	B 1.45 B 1.67 B 1.88 B 2.10 B 2.40	0.98-1.12 1.13-1.24 1.25-1.39 1.40-1.57 1.58-1.78	0.91-1.03 1.04-1.14 1.15-1.27 1.28-1.44 1.45-1.63	B 1.45 B 1.67 B 1.88 B 2.10 B 2.40	1.06–1.21 1.22–1.34 1.35–1.50 1.51–1.70 1.71–1.93	0.94-1.07 1.08-1.19 1.20-1.33 1.34-1.51 1.52-1.70	B 1.45 B 1.67 B 1.88 B 2.10 B 2.40
1.81–2.10 2.11–2.30 2.31–2.61 2.62–2.99 3.00–3.37	1.76–1.92 1.93–2.16 2.17–2.50 2.51–2.81 2.82–3.16	B 2.65 B 3.00 B 3.30 B 3.70 B 4.15	1.94–2.25 2.26–2.47 2.48–2.81 2.82–3.20 3.21–3.63	1.80–1.91 1.92–2.20 2.21–2.55 2.56–2.87 2.88–3.24	B 2.65 B 3.00 B 3.30 B 3.70 B 4.15	1.79–1.96 1.97–2.20 2.21–2.41 2.42–2.75 2.76–3.25	1.64-1.79 1.80-2.01 2.02-2.19 2.20-2.52 2.53-2.95	B 2.65 B 3.00 B 3.30 B 3.70 B 4.15	1.94–2.12 2.13–2.38 2.39–2.61 2.62–2.99 3.00–3.53	1.71–1.87 1.88–2.10 2.11–2.29 2.30–2.63 2.64–3.09	B 2.65 B 3.00 B 3.30 B 3.70 B 4.15
3.38–3.94 3.95–4.24 4.25–4.54 4.55–5.29 5.30–5.73	3.17–3.40 3.41–3.76 3.77–4.00 4.01–4.68 4.69–5.18	B 4.85 B 5.50 B 6.25 B 6.90 B 7.70	3.64-4.19 4.20-4.53 4.54-4.89 4.90-5.68 5.69-6.27	3.25–3.48 3.49–3.85 3.86–4.10 4.11–4.79 4.80–5.31	B 4.85 B 5.50 B 6.25 B 6.90 B 7.70	3.26–3.50 3.51–3.87 3.88–4.13 4.14–4.69 4.70–5.20	2.96-3.17 3.18-3.50 3.51-3.73 3.74-4.22 4.23-4.68	B 4.85 B 5.50 B 6.25 B 6.90 B 7.70	3.54-3.80 3.81-4.21 4.22-4.49 4.50-5.10 5.11-5.66	3.10–3.32 3.33–3.67 3.68–3.91 3.92–4.43 4.44–4.91	B 4.85 B 5.50 B 6.25 B 6.90 B 7.70
5.74–6.35 6.36–7.08 7.09–7.83 7.84–8.47 8.48–9.83	5.19–5.51 5.52–6.19 6.20–7.12 7.13–8.15 8.16–8.60	B 8.20 B 9.10 B 10.2 B 11.5 B 12.8	6.28–6.85 6.86–7.73 7.74–8.50 8.51–9.29 9.30–10.4	5.32–5.65 5.66–6.35 6.36–7.31 7.32–8.34 8.35–8.84	B 8.20 B 9.10 B 10.2 B 11.5 B 12.8	5.21–5.53 5.54–6.23 6.24–7.18 7.19–8.20 8.21–8.98	4.69-4.98 4.99-5.59 5.60-6.43 6.44-7.41 7.42-8.02	B 8.20 B 9.10 B 10.2 B 11.5 B 12.8	5.67–6.03 6.04–6.79 6.80–7.84 7.85–8.96 8.97–9.82	4.92–5.23 5.24–5.88 5.89–6.77 6.78–7.90 7.91–8.44	B 8.20 B 9.10 B 10.2 B 11.5 B 12.8
9.84–10.5 10.6–11.4 11.5–12.8 12.9–13.9 14.0–16.1	8.61–9.21 9.22–10.1 10.2–11.2 11.3–12.0 —	B 14.0 B 15.5 B 17.5 B 19.5 B 22.0	10.5–11.3 11.4–12.3 12.4–13.9 14.0–15.0 15.1–18.0	8.85–9.47 9.48–10.4 10.5–11.5 11.6–12.0	B 14.0 B 15.5 B 17.5 B 19.5 B 22.0	8.99–9.63 9.64–10.6 10.7–11.8 11.9–12.7 12.8–14.3	8.03–8.59 8.60–9.52 9.53–10.5 10.6–11.2 11.3–12.0	B 14.0 B 15.5 B 17.5 B 19.5 B 22.0	9.83–10.4 10.5–11.6 11.7–12.9 13.0–13.9 14.0–15.7	8.45-9.05 9.06-9.99 10.0-11.0 11.1-11.9 12.0-12.0	B 14.0 B 15.5 B 17.5 B 19.5 B 22.0
	— lowing Selections ze M-1 & M-1P Or			owing Selections e M-1 & M-1P Only	_	14.4–16.1 16.2–18.0		B 25.0 B 28.0		— llowing Selections ze M-1 & M-1P Onl	B 25.0
16.2–17.6 17.7–20.6 20.7–23.1 23.2–26.0	11.3–12.1 12.2–13.6 13.7–15.3 15.4–17.3 17.4–19.1 19.2–21.7 21.8–24.2	B 19.5 B 22.0 B 25.0 B 28.0 B 32.0 B 36.0 B 40.0	15.1–17.4 17.5–19.2 19.3–22.0 22.1–24.6 24.7–26.0 —	11.6–12.4 12.5–14.0 14.1–15.8 15.9–17.8 17.9–19.7 19.8–22.4 22.5–25.1 25.1–26.0	B 19.5 B 22.0 B 25.0 B 28.0 B 32.0 B 36.0 B 40.0 B 45.0	for Size — — 16.2–18.3 18.4–20.2 20.3–23.0	owing Selections e M-1 & M-1P On 11.3–12.7 12.8–14.3 14.4–16.1 16.2–17.8 17.9–20.1	B 22.0 B 25.0 B 28.0 B 32.0 B 36.0	17.8–20.1 20.2–22.2 22.3–25.3 25.4–26.0	12.0–13.4 13.5–15.1 15.2–17.0 17.1–18.9 19.0–21.4 21.5–24.0 24.1–26.0	B 22.0 B 25.0 B 28.0 B 32.0 B 36.0 B 40.0 B 45.0
— Fol	24.3–26.0 lowing Selections	B 45.0		owing Selections Size M-1P Only.		23.1–26.0 — —	20.2–22.6 22.7–25.5 25.6–26.0	B 40.0 B 45.0 B 50.0	foi	llowing Selections Size M-1P Only.	
23.2–27.1 27.2–29.2 29.3–33.0	r Size M-1P Only  — — — — — —	B 36.0 B 40.0 B 45.0	24.7–29.1 29.2–31.7 31.8–36.0	<u>-</u> - -	B 36.0 B 40.0 B 45.0	for 25.9–29.0	owing Selections Size M-1P Only —	B 45.0 B 50.0	25.4–28.4 28.5–33.1 33.2–36.0	_ _ _	B 40.0 B 45.0 B 50.0
33.1–36.0	_	B 50.0				29.1–30.8 30.9–32.7 32.8–36.0		B 50.0 B 56.0 B 62.0			

#### Table 5

Table 5										
	Current Transformer Ratio								Thermal	
25/5	50/5	75/5	100/5	150/5	200/5	250/5	300/5	400/5	500/5	Unit Number
	Motor FLC									
10.6–11.7 11.8–13.2 13.3–14.8	21.1–23.6 23.7–26.5 26.6–29.6	31.7–35.4 35.5–39.8 39.9–44.5	42.3–47.2 47.3–53.1 53.2–59.4	63.4–70.9 71.0–79.7 79.8–89.1	84.5–94.6 94.7–105. 106.–118.	106.–117. 118.–132. 133.–148.	127.–141. 142.–159. 160.–177.	169.–188. 189.–212. 213.–237.	211.–236. 237.–265. 266.–296.	B 3.00 B 3.30 B 3.70
14.9–17.2 17.3–19.6 19.7–22.3	29.7–34.5 34.6–39.2 39.3–44.6	44.6–51.8 51.9–58.9 59.0–67.0	59.5–69.2 69.3–78.6 78.7–89.3	89.2–103. 104.–117. 118.–133.	119.–138. 139.–156. 157.–178.	149.–172. 173.–196. 197.–223.	178.–207. 208.–235. 236.–267.	238.–276. 277.–314. 315.–357.	297.–345. 346.–360. —	B 4.15 B 4.85 B 5.50

	Current Transformer Ratio								Thermal	
25/5	50/5	75/5	100/5	150/5	200/5	250/5	300/5	400/5	500/5	Unit Number
	Motor FLC									
10.6–11.9 12.0–13.4 13.5–15.0 15.1–16.6	21.2–23.9 24.0–26.9 27.0–30.0 30.1–33.4	31.8–35.9 36.0–40.3 40.4–45.1 45.2–50.1	42.4–47.9 48.0–53.8 53.9–60.1 60.2–66.9	63.6–72.0 72.1–80.8 80.9–90.2 90.3–99.9	84.8–96.0 96.1–107. 108.–119. 120.–133.	106.–119. 120.–134. 135.–150. 151.–166.	127.–143. 144.–161. 162.–180. 181.–200.	170.–191. 192.–215. 216.–240. 241.–267.	212.–239. 240.–269. 270.–300. 301.–334.	AR 3.62 AR 3.98 AR 4.37 AR 4.80
16.7–18.7 18.8–20.7 20.8–22.8	33.5–37.5 37.6–41.4 41.5–45.7	50.2–56.3 56.4–62.2 62.3–68.5	67.0–75.1 75.2–82.9 83.0–91.4	100112. 113124. 125136.	134.–149. 150.–165. 166.–182.	167.–187. 188.–207. 208.–228.	201.–225. 226.–248. 249.–274.	268.–300. 301.–331. 332.–365.	335.–360. — —	AR 5.3 AR 5.8 AR 6.4

į		
1		
)		
)		
)		
)		
2		
2		

Table 8			
	Motor FLC (A)	Thermal	
2.T.U.1Ø	2 T.U.2Ø	3 T.U.	Unit Number
0.37-0.39 0.40-0.42 0.43-0.46 0.47-0.50 0.51-0.59 0.60-0.65 0.66-0.71 0.72-0.78 0.79-0.86 0.87-0.94 0.95-1.04 1.05-1.14 1.15-1.25 1.26-1.42 1.43-1.62 1.63-1.75 1.76-1.91 1.92-2.07 2.08-2.25 2.26-2.47 2.48-2.73 2.74-2.99 3.00-3.31 3.32-3.71 3.72-4.15 4.16-4.65 4.66-5.11 5.12-5.68 5.69-6.24 6.25-7.15 7.16-7.84 7.85-8.56 8.57-9.40 9.41-10.2	0.37-0.39 0.40-0.42 0.43-0.46 0.47-0.50 0.51-0.54 0.55-0.59 0.60-0.65 0.66-0.71 0.72-0.78 0.79-0.86 0.87-0.94 0.95-1.04 1.05-1.14 1.15-1.25 1.26-1.42 1.43-1.62 1.43-1.62 1.63-1.75 1.76-1.91 1.92-2.07 2.08-2.25 2.26-2.47 2.48-2.73 2.74-2.99 3.00-3.31 3.72-4.15 4.16-4.65 4.66-5.11 5.12-5.68 5.69-6.24 6.25-7.15 7.16-7.84 7.85-8.56 8.57-9.40 9.41-10.2	0.30-0.31 0.32-0.34 0.35-0.37 0.38-0.41 0.42-0.45 0.46-0.49 0.50-0.54 0.55-0.56 0.57-0.62 0.63-0.68 0.69-0.75 0.76-0.82 0.83-0.91 0.92-1.00 1.01-1.18 1.19-1.30 1.31-1.41 1.42-1.53 1.54-1.69 1.70-1.79 1.80-2.02 2.03-2.19 2.20-2.43 2.44-2.81 2.82-3.12 3.13-3.47 3.48-3.89 3.90-4.30 4.70-5.19 5.20-5.93 5.94-6.45 6.46-7.08 7.09-7.71 7.72-8.39 8.40-8.64	AR .45 AR .49 AR .54 AR .59 AR .57 AR .78 AR .95 AR 1.05 AR 1.15 AR 1.26 AR 1.33 AR 1.68 AR 2.24 AR 2.24 AR 2.24 AR 2.71 AR 2.98 AR 3.62 AR 3.98 AR 4.80 AR 5.8 AR 7.7 AR 8.5 AR 7.7 AR 8.5 AR 10.2 AR 10.2 AR 11.2 AR 12.4
10.8–12.2 12.3–14.1 14.2–15.9 16.0–18.0	10.8–12.2 — — —	8.65–9.74 9.75–11.0 11.1–12.0	AR 13.6 AR 15.4 AR 17.6 AR 20.5
	Following Selection	s for Size 1 Only	
16.0–18.1 18.2–20.8 20.9–23.6 23.7–26.0	10.8–12.2 12.3–14.1 14.2–15.9 16.0–18.1 18.2–20.8 20.9–23.6 23.7–26.0	11.1-12.4 12.5-13.9 14.0-15.9 16.0-17.7 17.8-20.3 20.4-22.8	AR 13.6 AR 15.4 AR 17.6 AR 20.5 AR 23.0 AR 27.0 AR 30.0 AR 35.0
		22.9–26.0	AR 40.0

Motor FLC (A)	Thermal Unit Number
15.3–16.7	C 20.0
16.8–19.8	C 22.0
19.9–22.8	C 26.0
22.9–25.8	C 30.0
25.9–30.4	C 34.0
30.5–31.9	C 40.0
32.0–34.2	C 42.0
34.3–38.8	C 45.0
38.9–44.2	C 51.0
44.3–50.2	C 58.0
50.3–57.1	C 66.0
57.2–63.2	C 75.0
63.3–68.6	C 83.0
68.7–78.6	C 90.0
78.7–86.9	C 103.0
87.0–100.0	C 114.0

#### Table 10

Motor FLC (A)	Thermal Unit Number
43.6-47.3 47.4-51.3 51.4-54.6 54.7-59.7 59.8-65.1 65.2-70.1 70.2-75.1 75.2-82.2 82.3-89.2 89.3-96.5	CC 54.5 CC 59.4 CC 64.3 CC 68.5 CC 74.6 CC 87.7 CC 94.0 CC 103.0 CC 112.0
105.–113. 114.–123. 124.–132. 133.–150.	CC 132.0 CC 143.0 CC 156.0 CC 167.0

#### Table 11

Motor FLC (A)		Thermal Unit
2 T.U.	3 T.U.	Number
33.0–36.1 36.2–40.2 40.3–44.5 45.6–51.3 51.4–58.5 58.6–62.6 62.7–71.3 71.4–77.1 77.2–86.9	30.5–33.4 33.5–37.1 37.2–42.0 42.1–47.0 47.1–53.5 53.6–57.5 57.6–64.4 64.5–69.4 69.5–77.4	AU 44.0 AU 50.0 AU 56.0 AU 64.0 AU 72.0 AU 81.0 AU 88.0 AU 99.0 AU 110.0
87.0–93.3 93.4–102. 103.–107. 108.–112. 113.–121. 122.–123. 124.–133.	77.5–83.6 83.7–92.9 93.0–100. 101.–104. 105.–115. 116.–119. 120.–123. 124.–133.	AU 123.0 AU 135.0 AU 152.0 AU 169.0 AU 183.0 AU 198.0 AU 217.0 AU 235.0

Motor FLC (A)	Thermal Unit Number
92.–100.	DD 112.0
101.–109.	DD 121.0
110.–119.	DD 128.0
120.–131.	DD 140.0
132.–139.	DD 150.0
140.–156.	DD 160.0
157.–166.	DD 185.0
167.–180.	DD 213.0
181.–189.	DD 220.0
190.–209.	DD 230.0
210.–225.	DD 250.0
226.–238.	DD 265.0
239.–263.	DD 280.0
264.–300.	DD 300.0

www.schneider-electric.us

Table 13			
Motor FLC (A)		Thermal	
1.T.U.	2 T.U.	3 T.U.	Unit Number
0.29-0.31 0.32-0.34 0.35-0.38 0.39-0.45 0.46-0.54 0.55-0.61 0.62-0.66 0.67-0.73 0.74-0.81 0.82-0.94 0.95-1.05 1.06-1.22 1.23-1.34 1.35-1.51 1.52-1.71 1.72-1.93 1.94-2.14 2.15-2.40 2.41-2.72 2.73-3.15 3.16-3.55 3.56-4.00 4.01-4.40 4.41-4.88 4.89-5.19 5.20-5.73 5.74-6.39 6.40-7.13 7.14-7.90 7.91-8.55 8.56-9.53 9.54-10.6 10.7-11.8 11.9-13.2	0.29-0.31 0.32-0.34 0.35-0.38 0.39-0.45 0.46-0.54 0.55-0.61 0.62-0.66 0.67-0.73 0.74-0.81 0.82-0.94 0.95-1.05 1.06-1.22 1.23-1.34 1.35-1.51 1.72-1.93 1.94-2.14 2.41-2.72 2.73-3.15 3.16-3.55 3.56-4.00 4.01-4.40 4.41-4.88 4.89-5.19 5.20-5.73 5.74-6.39 6.40-7.13 7.14-7.90 7.91-8.55 8.56-9.53 9.54-10.6 10.7-11.8 11.9-12.0	0.28-0.30 0.31-0.34 0.35-0.37 0.38-0.44 0.45-0.53 0.54-0.59 0.60-0.64 0.65-0.72 0.73-0.80 0.81-0.90 0.91-1.03 1.04-1.14 1.15-1.27 1.28-1.43 1.44-1.62 1.63-1.77 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.97 1.78-1.98-2.32 1.79-3.98 1.79-3	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71 B 0.81 B 0.92 B 1.03 B 1.45 B 1.30 B 1.45 B 1.88 B 2.10 B 2.40 B 2.65 B 3.00 B 3.70 B 4.15 B 6.25 B 6.90 B 7.70 B 9.10 B 11.5 B 12.8 B 14.0 B 15.5 B 17.5 B 17.5
13.3-14.9	11.9–12.0 —	11.4–12.0	B 22.0
15.0–16.6 16.7–18.0	_	=	B 25.0 B 28.0
Fol	lowing Selection	s for Size 1 Only	
  16.7–18.9 19.0–21.2 21.3–23.0	11.9–13.2 13.3–14.9 15.0–16.6 16.7–18.9 19.0–21.2 21.3–23.0		B 19.5 B 22.0 B 25.0 B 28.0 B 32.0 B 36.0
23.1–25.5 25.6–26.0 —	23.1–25.5 25.6–26.0 —	19.8–21.9 22.0–24.4 24.5–26.0	B 40.0 B 45.0 B 50.0

Table 14

Motor FLC (A)			Thermal Unit
1.T.U.	2 T.U.	3 T.U.	Number
0.43-0.47 0.48-0.51 0.52-0.56 0.57-0.64 0.65-0.69 0.70-0.76 0.77-0.84 0.85-0.91 0.92-1.01 1.02-1.15	0.41–0.45 0.46–0.50 0.51–0.55 0.56–0.62 0.63–0.67 0.68–0.72 0.73–0.81 0.82–0.88 0.89–0.97 0.98–1.08	0.40-0.41 0.42-0.46 0.47-0.51 0.52-0.57 0.58-0.62 0.63-0.67 0.68-0.75 0.76-0.80 0.81-0.89 0.90-1.02	A .49 A .54 A .59 A .65 A .71 A .78 A .86 A .95 A 1.02 A 1.16 A 1.25
1.24–1.37	1.19–1.32	1.10–1.21	A 1.39
1.38–1.45	1.33–1.40	1.22–1.29	A 1.54
1.46–1.56	1.41–1.48	1.30–1.37	A 1.63
1.57–1.67	1.49–1.60	1.38–1.48	A 1.75
1.68–1.77	1.61–1.72	1.49–1.58	A 1.86
1.78–1.92	1.73–1.84	1.59–1.72	A 1.99
1.93–2.09	1.85–2.00	1.73–1.85	A 2.15
2.10–2.31	2.01–2.22	1.86–2.05	A 2.31
2.32–2.56	2.23–2.45	2.06–2.29	A 2.57
2.57-2.92	2.46–2.82	2.30–2.62	A 2.81
2.93-3.16	2.83–3.08	2.63–2.84	A 3.61
3.17-3.48	3.09–3.39	2.85–3.10	A 3.95
3.49-3.83	3.40–3.75	3.11–3.46	A 4.32
3.84-4.24	3.76–4.16	3.47–3.85	A 4.79
4.25–4.62	4.17–4.51	3.86–4.16	A 5.30
4.63–4.92	4.52–4.83	4.17–4.46	A 5.78
4.93–5.61	4.84–5.49	4.47–5.08	A 6.20
5.62–5.85	5.50–5.67	5.09–5.35	A 6.99
5.86–6.36	5.68–6.16	5.36–5.82	A 7.65
6.37–6.99 7.00–7.67 7.68–8.15 8.16–9.00	6.17–6.75 6.76–7.00 —	5.83–6.34 6.35–6.95 6.96–7.00	A 8.38 A 9.25 A 9.85 A 11.0

Table 15

	Motor FLC (A)		Thermal
1.T.U.	2 T.U.	3 T.U.	Unit Number
0.31-0.33 0.34-0.36 0.37-0.40 0.41-0.48 0.49-0.57 0.58-0.64 0.65-0.70 0.71-0.77 0.78-0.85 0.86-0.99 1.00-1.10 1.11-1.28 1.29-1.41 1.42-1.58 1.59-1.80 1.81-2.03 2.04-2.25 2.26-2.51 2.52-2.83 2.84-3.29 3.30-3.75 3.76-4.22 4.23-4.65 4.66-5.16 5.17-5.53 5.54-6.09 6.81-7.60	0.31-0.33 0.34-0.36 0.37-0.40 0.41-0.48 0.49-0.57 0.58-0.64 0.65-0.70 0.71-0.77 0.78-0.85 0.86-0.99 1.00-1.10 1.11-1.28 1.29-1.41 1.42-1.58 1.59-1.80 1.81-2.03 2.04-2.25 2.26-2.51 2.52-2.83 2.84-3.29 3.30-3.75 3.30-4.22 4.23-4.65 4.66-5.16 5.17-5.53 5.54-6.09 6.10-6.80 6.81-7.60 7.61-8.35 8.36-9.04 9.05-9.99 10.0-11.1 11.2-12.0	0.29-0.31 0.32-0.36 0.37-0.38 0.39-0.46 0.47-0.55 0.56-0.61 0.62-0.66 0.67-0.75 0.76-0.83 0.84-0.93 0.84-1.96 1.07-1.18 1.19-1.31 1.32-1.47 1.48-1.67 1.68-1.83 1.84-2.04 2.05-2.38 2.39-2.60 2.61-3.13 3.14-3.59 3.60-3.94 3.95-4.19 4.20-4.72 4.73-5.21 5.22-5.17 6.18-7.07 7.08-8.05 8.06-8.69 8.70-9.32 9.33-10.2 10.3-11.3 11.4-12.0	B 0.44 B 0.57 B 0.57 B 0.63 B 0.71 B 0.83 B 0.71 B 0.92 B 1.03 B 1.16 B 1.45 B 1.55 B
15.5–18.0 Follo	owing Selections	for Size 1 Only	B 25.0
	11.2–12.3 12.4–13.7 13.8–15.4 15.5–17.2 17.3–19.4 19.5–21.7 21.8–23.9 24.0–26.0		B 17.5 B 19.5 B 22.0 B 25.0 B 28.0 B 32.0 B 36.0 B 40.0 B 45.0

Table 16

Motor FLC (A)		Thermal	
1.T.U.	2 T.U.	3 T.U.	Unit Number
16.2–17.5	15.1–16.2	14.3–15.4	CC 20.9
17.6–18.8	16.3–17.3	15.5–16.4	CC 22.8
18.9–20.5	17.4–19.5	16.5–18.5	CC 24.6
20.6–22.2	19.6–20.7	18.6–19.6	CC 26.3
22.3–23.7	20.8–22.3	19.7–21.1	CC 28.8
23.8–25.4	22.4–24.0	21.2–22.7	CC 31.0
25.5–27.3	24.1–25.7	22.8–24.4	CC 33.3
27.4–29.3	25.8–27.5	24.5–26.1	CC 36.4
29.4–31.5	27.6–29.6	26.2–28.1	CC 39.6
31.6–33.9	29.7–31.7	28.2–30.0	CC 42.7
34.0–36.2	31.8–33.9	30.1–32.1	CC 46.6
36.3–39.3	34.0–36.6	32.2–34.7	CC 50.1
39.4–42.3	36.7–39.3	34.8–37.3	CC 54.5
42.4–45.3	39.4–42.3	37.4–40.1	CC 59.4
45.4–48.3	42.4–44.9	40.2–42.6	CC 64.3
48.4–52.0	45.0–48.3	42.7–45.8	CC 68.5
52.1–54.9	48.4–50.9	45.9–48.3	CC 74.6
55.0–59.7	51.0–55.5	48.4–52.6	CC 81.5
59.8–65.4	55.6–59.9	52.7–56.8	CC 87.7
65.5–69.6	60.0–64.2	56.9–60.9	CC 94.0
69.7–74.8 74.9–79.7 79.8–83.1 83.2–86.0	64.3–68.7 68.8–71.4 71.5–74.8 74.9–78.0 78.1–80.7	61.0–65.1 65.2–67.7 67.8–70.9 71.0–73.9 74.0–76.5	CC 103.0 CC 112.0 CC 121.0 CC 132.0 CC 143.0
	80.8–86.0	76.6–80.2	CC 156.0
	—	80.3–83.1	CC 167.0
	—	83.2–86.0	CC 180.0

Table 17

Motor FLC (A)		Thermal	
1.T.U.	2 T.U.	3 T.U.	Unit Number
0.42-0.46	0.39-0.43	0.38-0.40	A .49
0.47-0.50	0.44-0.47	0.41-0.44	A .54
0.51-0.55	0.48-0.52	0.45-0.49	A .59
0.56-0.62	0.53-0.58	0.50-0.55	A .65
0.63-0.67	0.59-0.64	0.56-0.60	A .71
0.68-0.73	0.65-0.68	0.61-0.65	A .78
0.74-0.81	0.69-0.77	0.66-0.72	A .86
0.82-0.89	0.78-0.84	0.73-0.79	A .95
0.90-0.98	0.85-0.93	0.80-0.88	A 1.02
0.99-1.12	0.94-1.05	0.89-0.98	A 1.16
1.13–1.20	1.06–1.13	0.99–1.07	A 1.25
1.21–1.34	1.14–1.25	1.08–1.17	A 1.39
1.35–1.41	1.26–1.33	1.18–1.25	A 1.54
1.42–1.51	1.34–1.42	1.26–1.33	A 1.63
1.52–1.62	1.43–1.52	1.34–1.44	A 1.75
1.63–1.73	1.53–1.63	1.45–1.53	A 1.86
1.74–1.86	1.64–1.75	1.54–1.65	A 1.99
1.87–2.02	1.76–1.90	1.66–1.79	A 2.15
2.03–2.25	1.91–2.13	1.80–1.99	A 2.31
2.26–2.46	2.14–2.33	2.00–2.18	A 2.57
2.47–2.77	2.34–2.73	2.19–2.45	A 2.81
2.78–2.99	2.74–2.86	2.46–2.65	A 3.61
3.00–3.26	2.87–3.14	2.66–2.90	A 3.95
3.27–3.59	3.15–3.47	2.91–3.19	A 4.32
3.60–3.99	3.48–3.83	3.20–3.56	A 4.79
4.00-4.42	3.84-4.16	3.57–3.83	A 5.30
4.43-4.61	4.17-4.43	3.84–4.08	A 5.78
4.62-5.23	4.44-5.00	4.09–4.64	A 6.20
5.24-5.39	5.01-5.16	4.65–5.00	A 6.99
5.40-5.88	5.17-5.56	5.01–5.36	A 7.65
5.89–6.56 6.57–7.18 7.19–7.80 7.81–9.00	5.57–6.22 6.23–6.89 6.90–7.00	5.37–5.87 5.88–6.43 6.44–6.79 6.80–7.00	A 8.38 A 9.25 A 9.85 A 11.0

Table 18

	Motor FLC (A)		Thermal Unit
1.T.U.	2 T.U.	3 T.U.	Number
15.5–16.4	14.4–15.3	13.6–14.5	CC 20.9
16.5–17.6	15.4–16.4	14.6–15.5	CC 22.8
17.7–19.1	16.5–18.4	15.6–17.4	CC 24.6
19.2–20.4	18.5–19.6	17.5–18.5	CC 26.3
20.5–22.1	19.7–21.0	18.6–19.9	CC 28.8
22.2–23.4	21.1–22.7	20.0–21.5	CC 31.0
23.5–25.6	22.8–24.2	21.6–22.9	CC 33.3
25.7–27.3	24.3–25.9	23.0–24.5	CC 36.4
27.4–29.4	26.0–27.8	24.6–26.3	CC 39.6
29.5–31.5	27.9–29.8	26.4–28.2	CC 42.7
31.6–33.7	29.9–31.7	28.3–30.0	CC 46.6
33.8–36.5	31.8–34.2	30.1–32.3	CC 50.1
36.6–39.1	34.3–36.9	32.4–34.9	CC 54.5
39.2–41.7	37.0–39.8	35.0–37.6	CC 59.4
41.8–44.8	39.9–42.3	37.7–40.0	CC 64.3
44.9–48.0	42.4–45.3	40.1–42.8	CC 68.5
48.1–50.7	45.4–47.9	42.9–45.3	CC 74.6
50.8–54.9	48.0–51.9	45.4–49.1	CC 81.5
55.0–59.9	52.0–56.5	49.2–53.4	CC 87.7
60.0–63.3	56.6–60.7	53.5–57.4	CC 94.0
63.4–67.2	60.8–64.8	57.5–61.3	CC 103.0
67.3–72.4	64.9–67.1	61.4–63.5	CC 112.0
72.5–74.9	67.2–70.1	63.6–66.3	CC 121.0
75.0–77.4	70.2–72.9	66.4–69.0	CC 132.0
77.5–80.7	73.0–74.9	69.1–70.9	CC 143.0
80.8–83.1 83.2–86.0 —	75.0–77.9 78.0–80.9 81.0–82.9 83.0–86.0	71.0–73.7 73.8–76.5 76.6–78.4 78.5–86.0	CC 156.0 CC 167.0 CC 180.0 CC 196.0

Motor FLC (A)	Thermal Unit Number
43.6-47.3	CC 54.5
47.4-51.3	CC 59.4
51.4-54.6	CC 64.3
54.7-59.7	CC 68.5
59.8-65.1	CC 74.6
65.2-70.1	CC 81.5
70.2-75.1	CC 87.7
75.2-82.2	CC 94.0
82.3-89.2	CC 103.0
89.3-96.5	CC 112.0
96.6–104.	CC 121.0
105.–113.	CC 132.0
114.–123.	CC 143.0
124.–133.	CC 156.0

#### Table 20

Motor FLC (A)	Thermal Unit Number
133.–148.	B 1.30
149.–174.	B 1.45
175.–195.	B 1.67
196.–219.	B 1.88
220.–239.	B 2.10
240.–271.	B 2.40
272.–308.	B 2.65
309.–348.	B 3.00
349.–397.	B 3.30
398.–429.	B 3.70
430.–495.	B 4.15
496.–520.	B 4.85

#### Table 21

Motor FLC (A)	Thermal Unit Load
128140.	B 1.30
141163.	B 1.45
164179.	B 1.67
180201.	B 1.88
202227.	B 2.10
228.–251.	B 2.40
252.–278.	B 2.65
279.–308.	B 3.00
309.–346.	B 3.30
347.–380.	B 3.70
381.–426.	B 4.15
427.–454.	B 4.85
455.–489.	B 5.50
490.–520.	B 6.25

#### Table 22

Motor FLC (A)	Thermal Unit Number
92.0–100.	DD 112.0
101.–109.	DD 121.0
110.–119.	DD 128.0
120.–131.	DD 140.0
132.–139.	DD 150.0
140.–156.	DD 160.0
157.–166.	DD 185.0
167.–180.	DD 213.0
181.–189.	DD 220.0
190.–209.	DD 230.0
210.–225.	DD 250.0
226.–238.	DD 265.0
239.–266.	DD 280.0

#### Table 23

1 41510 20			
Motor FLC (A	Thermal Unit		
Large Enclosure	Small Enclosure	Number	
0.31–0.32 0.33–0.36 0.37–0.39 0.40–0.43 0.44–0.43 0.44–0.47 0.48–0.52 0.53–0.58 0.59–0.60 0.61–0.62 0.63–0.69 0.70–0.76 0.77–0.84 0.85–0.93 1.24–1.35 1.36–1.47 1.48–1.61 1.62–1.76 1.77–1.93 1.94–2.12 2.13–2.35 2.36–2.61 2.62–2.79 2.80–3.14 3.15–3.48 3.49–3.89	0.29-0.30 0.31-0.33 0.34-0.37 0.38-0.41 0.42-0.45 0.46-0.50 0.51-0.55 0.56-0.57 0.58-0.60 0.61-0.66 0.67-0.73 0.74-0.81 0.82-0.90 0.91-0.99 1.00-1.18 1.19-1.30 1.31-1.42 1.43-1.49 1.50-1.69 1.70-1.85 1.86-2.03 2.04-2.25 2.26-2.50 2.51-2.68 2.69-3.01 3.02-3.35 3.36-3.74	AR. 45 AR. 49 AR. 54 AR. 59 AR. 65 AR. 71 AR. 78 AR. 86 AR. 95 AR 1.05 AR 1.15 AR 1.26 AR 1.39 AR 1.53 AR 1.85 AR 2.04 AR 2.24 AR 2.46 AR 2.71 AR 2.88 AR 3.28 AR 3.28 AR 3.89 AR 4.37 AR 4.80 AR 5.3	
3.90 – 4.30 4.31 – 4.73 4.74 – 5.20 5.21 – 5.95 5.96 – 6.49 6.50 – 7.08 7.09 – 7.77 7.78 – 8.48 8.49 – 9.15 9.16 – 10.3 10.4 – 11.9 12.0 – 13.4 13.5 – 15.4 15.5 – 17.5 17.6 – 19.8 19.9 – 22.5 22.6 – 26.0	3.75-4.14 4.15-4.57 4.58-5.03 5.04-5.76 5.77-6.29 6.30-6.87 6.88-7.54 7.55-8.25 8.26-8.60 8.61-9.63 9.64-11.1 11.2-12.5 12.6-14.3 14.4-16.1 16.2-18.2 18.3-20.6 20.7-23.4 23.5-26.0	AR 5.8 AR 6.4 AR 7.0 AR 7.7 AR 8.5 AR 9.3 AR 11.2 AR 11.2 AR 12.4 AR 15.4 AR 15.4 AR 20.5 AR 20.0 AR 30.0 AR 30.0 AR 40.0	

#### Table 24

Motor FLC (A)	Thermal Unit Number
88.2-95.1	DD 112.0
95.2-101.	DD 121.0
102111.	DD 128.0
112119.	DD 140.0
120131.	DD 150.0
132149.	DD 160.0
150170.	DD 185.0
171180.	DD 220.0
181197.	DD 240.0
198204.	DD 250.0
205.–213.	DD 265.0
214.–237.	DD 280.0
238.–243.	DD 300.0
244.–266.	DD 320.0

#### Table 25

Motor FLC (A)	Thermal Unit Number
0.28-0.30	AR .45
0.31-0.33	AR .49
0.34-0.36	AR .54
0.37-0.39	AR .59
0.40-0.42	AR .65
0.43-0.46	AR .71
0.47-0.50	AR .78
0.51-0.52	AR .86
0.53-0.56	AR .95
0.57-0.60	AR 1.05
0.61–0.66	AR 1.15
0.67–0.73	AR 1.26
0.74–0.81	AR 1.39
0.82–0.90	AR 1.53
0.91-1.05	AR 1.68
1.06-1.15	AR 1.85
1.16-1.25	AR 2.04
1.26-1.35	AR 2.24
1.36-1.47	AR 2.46
1.48-1.58	AR 2.71
1.59-1.74	AR 2.98
1.75-1.94	AR 3.28
1.95-2.20	AR 3.62
2.21-2.47	AR 3.98
2.48-2.76	AR 4.37
2.77-3.07	AR 4.80
3.08-3.45	AR 5.3
3.46-3.81	AR 5.8
3.82-4.20	AR 6.4
4.21–4.65	AR 7.0
4.66–5.29	AR 7.7
5.30–5.84	AR 8.5
5.85–6.27	AR 9.3
6.28–7.00	AR 10.2
Table 26	

#### Table 26

Size 7 Type J	Size 8 Type K	
Current Transformer Ratio		Thermal Unit
120/5	2000/5	Number
Motor FLC		
166187. 188211. 212232. 233267. 268301. 302336. 337383. 384425. 426466. 467522.	277312. 313352. 353388. 389445. 446503. 504561. 562640. 641708. 709777. 778870.	B 1.03 B 1.16 B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.40 B 2.65 B 3.00
523.–587. 588.–656. 657.–764.	871.–978. 979.–1093. 1094.–1215.	B 3.30 B 3.70 B 4.15

I able 21			
Motor FLC (A)		Thermal	
2 or	2 or 3 T.U.		
Large Enclosure	Small Enclosure	Number	
4.32–4.93 4.94–5.40 5.41–5.95 5.96–6.13 6.14–6.81	4.14–4.71 4.72–5.18 5.19–5.74 5.75–5.98 5.99–6.47	AR 8.5 AR 9.3 AR 10.2 AR 11.2 AR 12.4	
6.82–7.84 7.85–8.97 8.98–10.1 10.2–11.6 11.7–13.2	6.48-7.42 7.43-8.46 8.47-9.56 9.57-10.9 11.0-12.3	AR 13.6 AR 15.4 AR 17.6 AR 20.5 AR 23.0	
13.3–15.0 15.1–17.1 17.2–19.6 19.7–21.9 22.0–23.8	12.4-14.0 14.1-15.9 16.0-18.1 18.2-20.3 20.4-22.0	AR 27.0 AR 30.0 AR 35.0 AR 40.0 AR 44.0	
23.9–25.6 25.7–27.9 28.0–30.5 30.6–33.0 33.1–35.7	22.1–23.6 23.7–25.5 25.6–27.8 27.9–30.0 30.1–32.4	AR 47.0 AR 51.0 AR 55.0 AR 60.0 AR 66.0	
35.8–39.5 39.6–41.5 41.6–45.0	32.5–35.7 35.8–38.3 38.4–40.9 41.0–45.0	AR 72.0 AR 79.0 AR 86.0 AR 94.0	

#### Table 28

Motor FLC (A)		Thermal
2 or 3 T.U.		Unit
Large Enclosure	Small Enclosure	Number
45.3–48.2 48.3–52.4 52.5–56.4 56.5–61.2 61.3–66.1	40.3–42.8 42.9–46.2 46.3–49.8 49.9–54.9 55.0–57.9	CC 64.3 CC 68.5 CC 74.6 CC 81.5 CC 87.7
66.2–71.4 71.5–77.0 77.1–80.7 80.8–87.7 87.8–94.9	58.0–62.5 62.6–67.3 67.4–73.4 73.5–78.9 79.0–84.9	CC 94.0 CC 103.0 CC 112.0 CC 121.0 CC 132.0
95.0–102. 103.–110. 111.–117. 118.–133.	85.0–91.0 91.1–97.2 97.3–104. 105.–121. 122.–133.	CC 143.0 CC 156.0 CC 167.0 CC 180.0 CC 196.0

#### Table 29

Motor FLC (A)	Thermal Unit Number
50.0–55.9	E 88
56.0–60.9	E 89
61.0–65.9	E 91
66.0–69.9	E 92
70.0–75.9	E 93
76.0–81.9	E 94
82.0–86.9	E 96
87.0–92.9	E 97
93.0–97.9	E 98
98.0–107.9	E 99
108.0–113.9	E 101
114.0–125.9	E 102

#### Table 30

Motor FLC (A)		Thermal
Large	Small	Unit
Enclosure	Enclosure	Number
39.0–42.9	37.0–40.8	AU 44.0
43.0–48.0	40.9–45.6	AU 50.0
48.1–54.7	45.7–51.8	AU 56.0
54.8–62.2	51.9–58.8	AU 64.0
62.3–71.3	58.9–67.4	AU 72.0
71.4–76.0	67.5–70.4	AU 81.0
76.1–85.5	70.5–79.4	AU 88.0
85.6–92.4	79.5–86.3	AU 99.0
92.5–103.	86.4–96.7	AU 110.0
104.–111.	96.8–105.	AU 123.0
112.–123.	106.–117.	AU 135.0
124.–133.	118.–133.	AU 152.0

#### Table 31

Motor FLC (A)	Thermal Unit Number
0.31-0.35 0.36-0.39 0.40-0.44	B 0.44 B 0.51
0.45-0.50	B 0.57 B 0.63
0.51-0.61	B 0.71
0.62-0.68	B 0.81
0.69-0.73	B 0.92
0.74-0.82	B 1.03
0.83-0.92	B 1.16
0.93-1.03	B 1.30
1.04-1.19	B 1.45
1.20-1.34	B 1.67
1.35–1.50	B 1.88
1.51–1.74	B 2.10
1.75–1.97	B 2.40
1.98–2.14	B 2.65
2.15–2.47	B 3.00
2.48–2.91	B 3.30
2.92–3.31	B 3.70
3.32–3.75	B 4.15
3.76–4.05	B 4.85
4.06–4.94	B 6.25
4.95–5.52	B 6.90
5.53–6.11	B 7.70
6.12–6.52	B 8.20
6.53–7.31	B 9.10
7.32–8.43	B 10.2
8.44–9.83	B 11.5
9.84–10.7	B 12.8
10.8–11.6	B 14.0
11.7–12.9	B 15.5
13.0–14.3	B 17.5
14.4–15.7	B 19.5
15.8–17.8	B 22.0
17.9–20.3	B 25.0
20.4–23.3	B 28.0
23.4–26.6	B 32.0
26.7–30.3	B 36.0
30.4–35.3	B 40.0
35.4–41.5	B 45.0
41.6–45	B 50.0

#### Table 32

Motor FLC (A)	Thermal Unit Number
0.33-0.35 0.36-0.39 0.40-0.42 0.43-0.46 0.47-0.51 0.52-0.56 0.57-0.62 0.63-0.68 0.69-0.75 0.76-0.83 0.84-0.91 0.92-1.00 1.01-1.10 1.11-1.21 1.22-1.33 1.34-1.47 1.48-1.62 1.63-1.77 1.78-1.96 1.97-2.16 2.17-2.37 2.38-2.62 2.63-2.88 2.89-3.17 3.18-3.48 3.49-3.83 3.84-4.20 4.21-4.62 4.63-5.08 5.09-5.57 5.58-6.13 6.14-6.83 6.84-7.41 7.42-8.05 8.99-9.93 9.94-10.9 11.0-12.4 12.5-14.3 14.4-15.8	AR .45 AR .49 AR .59 AR .55 AR .71 AR .86 AR .95 AR 1.15 AR 1.26 AR 1.15 AR 1.26 AR 1.33 AR 1.33 AR 1.88 AR 2.24 AR 2.27 AR 2.24 AR 2.27 AR 3.98 AR 4.37 AR 4.80 AR 5.8 AR 7.0 AR 7.0 AR 7.0 AR 7.0 AR 7.0 AR 7.0 AR 1.24 AR 11.26 AR 11.26 AR 11.26 AR 12.05
15.9–17.9 18.0–20.0 20.1–22.4 22.5–25.0	AR 23.0 AR 27.0 AR 30.0 AR 35.0

#### Table 33

Motor FLC (A)	Thermal Unit Number	
0.28-0.30 0.31-0.33 0.34-0.36 0.37-0.39 0.40-0.42 0.43-0.46	AR .45 AR .49 AR .54 AR .59 AR .65	
0.47–0.50	AR .78	
0.51–0.52	AR .86	
0.53–0.56	AR .95	
0.57–0.60	AR 1.05	
0.61-0.66	AR 1.15	
0.67-0.73	AR 1.26	
0.74-0.81	AR 1.39	
0.82-0.90	AR 1.53	
0.91-1.05	AR 1.68	
1.06–1.15	AR 1.85	
1.16–1.25	AR 2.04	
1.26–1.35	AR 2.24	
1.36–1.47	AR 2.46	
1.48–1.58	AR 2.71	
1.59-1.74	AR 2.98	
1.75-1.94	AR 3.28	
1.95-2.20	AR 3.62	
2.21-2.47	AR 3.98	
2.48-2.76	AR 4.37	
2.77-3.07	AR 4.80	
3.08-3.45	AR 5.3	
3.46-3.81	AR 5.8	
3.82-4.20	AR 6.4	
4.21-4.65	AR 7.0	
4.66–5.29	AR 7.7	
5.30–5.84	AR 8.5	
5.85–6.27	AR 9.3	
6.28–6.97	AR 10.2	
6.98–7.59	AR 11.2	
7.60–7.89	AR 12.4	
7.90–8.95	AR 13.6	
8.96–10.3	AR 15.4	
10.4–11.7	AR 17.6	
11.8–12.0	AR 20.5	
Following Selections for Size 1 Only		
11 8_13 3	ΔR 20 5	

ioi size i Orliy		
11.8–13.3 13.4–15.2	AR 20.5 AR 23.0	
15.3–17.2	AR 27.0	
17.3-19.7	AR 30.0	
19.8–22.4	AR 35.0	
22.5-26.0	AR 40.0	

#### Table 34

Table 34		
Motor FLC (A)	Thermal Unit Number	
15.1–16.2	CC 20.9	
16.3–17.5	CC 22.8	
17.6–19.1	CC 24.6	
19.2–20.7	CC 26.3	
20.8–22.2	CC 28.8	
22.3–24.0	CC 31.0	
24.1–25.7	CC 33.3	
25.8–27.8	CC 36.4	
27.9–30.1	CC 39.6	
32.6–35.1	CC 46.6	
35.2–38.0	CC 50.1	
38.1–41.1	CC 54.5	
41.2–44.0	CC 59.4	
44.1–47.2	CC 64.3	
47.3–51.1	CC 68.5	
51.2–55.8	CC 74.6	
55.9–59.5	CC 81.5	
59.6–64.5	CC 87.7	
64.6–69.5	CC 94.0	
69.6–75.0	CC 103.0	
75.1–78.1	CC 112.0	
78.2–82.3	CC 121.0	
82.4–86.0	CC 132.0	

#### Table 35

Motor FLC (A)		Thermal
2 T.U.	3 T.U.	Unit Number
36.3–39.9 40.0–44.1 44.2–50.0 50.1–56.4 56.5–64.4	34.7–37.1 37.2–41.5 41.6–47.1 47.2–53.4 53.5–60.7	AU 44.0 AU 50.0 AU 56.0 AU 64.0 AU 72.0
64.5–68.4 68.5–77.7 77.8–84.2 84.3–94.8 94.9–101.	60.8–64.9 65.0–73.4 73.5–79.5 79.6–89.0 89.1–96.9	AU 81.0 AU 88.0 AU 99.0 AU 110.0 AU 123.0
102.–115. 116.–122. 123.–133.	97.0–108. 109.–115. 116.–120. 121.–133.	AU 135.0 AU 152.0 AU 169.0 AU 183.0

#### Table 36

Motor FLC (A)	Thermal Unit Number
90.6–97.4	AF 110.0
97.5–111.	AF 123.0
112.–129.	AF 135.0
130.–149.	AF 150.0
150.–163.	AF 159.0
164.–189.	AF 168.0
190.–213.	AF 188.0
214.–240.	AF 205.0
241.–266.	AF 220.0

Table 37		
Motor FLC (A)	Thermal Unit Number	
27.1-30.0	E 67	
30.1-33.2	E 69	
33.3-35.7	E 70	
35.8-39.4	E 71	
39.5-43.4	E 72	
43.5-46.9	E 73	
47.0-51.5	E 74	
51.6-57.0	E 76	
57.1-62.8	E 77	
62.9-69.1	E 78	
69.2–75.0	E 79	
75.1–83.3	E 80	

#### Table 38

Thermal
Motor FLC (A) Unit Number
85.0–95.9 AF 123.0 96.0–108. AF 135.0 109.–127. AF 150.0
128.–136. AF 159.0 137.–147. AF 168.0 148.–162. AF 188.0
163.–185. AF 205.0 186.–202. AF 220.0 203.–219. AF 240.0
220.–233. AF 260.0 234.–266. AF 308.0

#### Table 39

Motor FLC (A)	Thermal Unit Number
148173.	AR 1.68
174189.	AR 1.85
190205.	AR 2.04
206222.	AR 2.24
223243.	AR 2.46
244261.	AR 2.71
262289.	AR 2.98
290324.	AR 3.28
325367.	AR 3.62
368389.	AR 3.98
390.–404.	AR 4.37
405.–451.	AR 4.80
452.–495.	AR 5.3
496.–520.	AR 5.8

#### Table 40

Thermal Unit Number	
C 20.0 C 22.0 C 26.0 C 30.0 C 34.0	
C 40.0 C 42.0 C 45.0 C 51.0 C 58.0	
C 66.0 C 75.0 C 83.0 C 90.0 C 103.0	

#### Table 41

Motor FLC (A)	Thermal Unit Number
0.81-0.92 0.93-1.07 1.08-1.14 1.15-1.26 1.27-1.49 1.50-1.73 1.74-1.89 1.90-2.16 2.17-2.37 2.38-2.66 2.67-2.99 3.00-3.40 3.41-3.94 3.95-4.15 4.16-4.49 4.50-5.15 5.16-5.77 5.78-6.61 6.62-7.14 7.15-7.97 7.98-8.15 8.16-9.32 9.33-9.97 9.98-10.7 10.8-12.0	B 1.16 B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.40 B 2.65 B 3.00 B 3.70 B 4.15 B 4.85 B 5.50 B 6.25 B 6.90 B 7.70 B 8.20 B 11.5 B 11.5 B 14.0 B 15.5 B 11.5 B 14.0 B 15.5 B 17.5
12.1–13.9 14.0–15.7 15.8–18.4 18.5–21.6 21.7–24.0	B 19.5 B 22.0 B 25.0 B 28.0 B 32.0
24.1–24.0 24.1–28.6 28.7–30.7 30.8–33.5 33.6–36.0	B 36.0 B 40.0 B 45.0 B 50.0

Motor FLC (A)	Thermal Unit Number
0.28-0.30	AR .45
0.31-0.33	AR .49
0.34-0.36	AR .54
0.37-0.39	AR .59
0.40-0.42	AR .65
0.43-0.46	AR .71
0.47-0.50 0.51-0.52 0.53-0.56 0.57-0.60 0.61-0.66 0.67-0.73	AR .78 AR .86 AR .95 AR 1.05 AR 1.15
0.67-0.73	AR 1.26
0.74-0.81	AR 1.39
0.82-0.90	AR 1.53
0.91-1.05	AR 1.68
1.06-1.15	AR 1.85
1.16–1.25	AR 2.04
1.26–1.35	AR 2.24
1.36–1.47	AR 2.46
1.48–1.58	AR 2.71
1.59–1.74	AR 2.98
1.75–1.94	AR 3.28
1.95–2.20	AR 3.62
2.21–2.47	AR 3.98
2.48–2.76	AR 4.37
2.77-3.07	AR 4.80
3.08-3.45	AR 5.3
3.46-3.81	AR 5.8
3.82-4.20	AR 6.4
4.21-4.65	AR 7.0
4.66–5.29	AR 7.7
5.30–5.84	AR 8.5
5.85–6.27	AR 9.3
6.28–6.97	AR 10.2
6.98–7.59	AR 11.2
7.60–7.89	AR 12.4
7.90–8.95	AR 13.6
8.96–10.3	AR 15.4
10.4–11.7	AR 17.6
11.8–13.3	AR 20.5
13.4–15.2	AR 23.0
15.3–17.2	AR 27.0
17.3–19.7	AR 30.0
19.8–22.4	AR 35.0
22.5–26.0	AR 40.0

Table 43		
Thermal Unit Number		
Number  A. 49 A. 54 A. 59 A. 65 A. 71 A. 78 A. 86 A. 95 A. 1.02 A. 1.16 A. 1.25 A. 1.39 A. 1.54 A. 1.63 A. 1.75 A. 1.86 A. 1.99 A. 2.51 A. 2.31 A. 2.57 A. 2.81 A. 3.61 A. 3.95 A. 4.79 A. 5.30 A. 5.78 A. 6.20 A. 6.20 A. 6.99 A. 7.65 A. 8.38 A. 9.25 A. 9.85 A. 11.0 A. 11.9		
A 13.2 A 14.1 A 14.8 A 16.2 A 17.9		

Table 44		
Motor FLC (A)	Thermal Unit Number	
0.34-0.38	B 0.44	
0.39-0.43	B 0.51	
0.44-0.48	B 0.57	
0.49-0.53	B 0.65	
0.54-0.62	B 0.71	
0.63-0.69	B 0.81	
0.70-0.78	B 0.92	
0.79-0.88	B 1.03	
0.89-0.99	B 1.16	
1.00-1.10	B 1.30	
1.11-1.26	B 1.45	
1.27-1.43	B 1.67	
1.44-1.59	B 1.88	
1.60-1.81	B 2.10	
1.82-2.00	B 2.40	
2.01–2.28	B 2.65	
2.29–2.52	B 3.00	
2.53–2.87	B 3.30	
2.88–3.28	B 3.70	
3.29–3.75	B 4.15	
3.76–4.27	B 4.85	
4.28–4.77	B 5.50	
4.78–5.27	B 6.25	
5.28–5.91	B 6.90	
5.92–6.25	B 7.70	
6.26–6.83	B 8.20	
6.84–7.65	B 9.10	
7.66–8.55	B 10.2	
8.56–9.56	B 11.5	
9.57–10.3	B 12.8	
10.4–11.3	B 14.0	
11.4–12.4	B 15.5	
12.5–14.1	B 17.5	
14.2–15.7	B 19.5	
15.8–17.9	B 22.0	
18.0–20.1	B 25.0	
20.2–22.5	B 28.0	
22.6–25.0	B 32.0	

Table 45	5	
Size 7	Size 8	
Type J	Type K	
	Transformer latio	Thermal Unit Number
1200/5	2000/5	
Motor	FLC (A)	
No	n-Compensat	ed
136150. 151165. 166183. 184202. 203224. 225267. 268293. 294319. 320349. 350381. 382418. 419459. 460569. 510565. 566604. 605697. 698753.	227-251. 252-276. 277305. 306337. 338373. 374445. 440532. 533582. 533636. 637697. 698766. 767849. 850942. 9431007.	AR 1.05 AR 1.15 AR 1.26 AR 1.39 AR 1.53 AR 1.68 AR 2.04 AR 2.24 AR 2.46 AR 2.71 AR 2.98 AR 3.62 AR 3.62 AR 3.98 AR 4.80
Compensated		
161.–177. 178.–196. 197.–217. 218.–253. 254.–277.	268.–295. 296.–327. 328.–363. 364.–423. 424.–463.	AR 1.26 AR 1.39 AR 1.53 AR 1.68 AR 1.85

#### 739.-829. Table 46

420.–467. 468.–529. 530.–594. 595.–664. 665.–738.

254.–277. 278.–301. 302.–325. 326.–354. 355.–381. 382.–419.

ubic 40			
Motor FLC (A)	Thermal Unit Number		
105.–116.	AR 3.28		
117.–132.	AR 3.62		
133.–148.	AR 3.98		
149.–165.	AR 4.37		
166.–184.	AR 4.80		
185.–207.	AR 5.3		
208.–229.	AR 5.8		
230.–266.	AR 6.4		

424.–463. 464.–503. 504.–543. 544.–592. 592.–635. 636.–699.

700.–779. 780.–883. 884.–991. 992.–1107. 1108.–1231.

AR 2.04 AR 2.24 AR 2.46 AR 2.71 AR 2.98

AR 3.28 AR 3.62 AR 3.98 AR 4.37 AR 4.80

AR 5.3

#### Table 47

Motor FLC (A)	Thermal Unit Number
146.–169.	AR 1.68
170.–185.	AR 1.85
186.–201.	AR 2.04
202.–217.	AR 2.24
218.–236.	AR 2.46
237.–253.	AR 2.71
254.–279.	AR 2.98
280.–311.	AR 3.28
312.–353.	AR 3.62
354.–396.	AR 3.98
397.–442.	AR 4.37
443.–492.	AR 4.80
493.–520.	AR 5.3

## Table 48

Motor FLC (A)	Thermal Unit Number
158.–187.	AR 1.68
188.–206.	AR 1.85
207.–224.	AR 2.04
225.–244.	AR 2.24
245.–267.	AR 2.46
268.–289.	AR 2.71
290.–324.	AR 2.98
325.–361.	AR 3.28
362.–406.	AR 3.62
407.–445.	AR 3.98
446.–463.	AR 4.37
464.–520.	AR 4.80

#### Table 49

Motor FLC (A)	Thermal Unit Number
82.5-88.2 88.3-95.9 96.0-102. 103109. 110121. 122139. 140154. 155163. 164175. 176184. 185195. 196215. 216224. 225243. 244266.	DD 112.0 DD 121.0 DD 128.0 DD 128.0 DD 140.0 DD 150.0 DD 160.0 DD 185.0 DD 220.0 DD 240.0 DD 250.0 DD 265.0 DD 280.0 DD 300.0 DD 320.0 DD 320.0 DD 340.0 DD 340.0

#### Table 50

Motor FLC (A)	Thermal Unit Number
14.4–16.1	AU 20.0
16.2–18.6	AU 23.0
18.7–20.5	AU 26.0
20.6–23.4	AU 29.0
23.5–26.9	AU 33.0
27.0–28.3	AU 38.0
28.4–30.8	AU 40.0
30.9–35.0	AU 44.0
35.1–38.8	AU 50.0
38.9–44.3	AU 56.0
44.4–49.3	AU 64.0
49.4–55.5	AU 72.0
55.6–61.0	AU 81.0
61.1–68.6	AU 88.0
68.7–76.3	AU 99.0
76.4–86.0	AU 110.0

#### Table 51

Motor FLC (A)	Thermal Unit Number
15.7–17.7 17.8–19.9 20.0–22.7 22.8–25.7 25.8–29.1 29.2–30.8 30.9–34.3 34.4–38.3 38.4–42.3 42.4–47.5	AU 20.0 AU 23.0 AU 26.0 AU 29.0 AU 33.0 AU 40.0 AU 44.0 AU 56.0
47.6–53.0 53.1–60.5 60.6–64.9 65.0–71.5 71.6–77.3 77.4–86.0	AU 64.0 AU 72.0 AU 81.0 AU 88.0 AU 99.0 AU 110.0

## Table 52

Motor FLC (A)	Thermal Unit Number
92.0–103.	AF 123.0
104.–116.	AF 135.0
117.–139.	AF 150.0
140.–150.	AF 159.0
151.–167.	AF 168.0
168.–177.	AF 188.0
178.–205.	AF 205.0
206.–222.	AF 220.0
223.–232.	AF 240.0
233.–247.	AF 260.0
248.–266.	AF 308.0

#### Table 53

Motor FLC (A)		Thermal
1 T. U.	3 T. U.	Unit Number
0.31-0.33 0.34-0.36 0.37-0.40 0.41-0.48 0.49-0.57 0.58-0.64 0.65-0.70 0.71-0.77 0.78-0.85 0.86-0.99 1.00-1.10 1.11-1.28 1.29-1.41 1.42-1.58	0.29-0.31 0.32-0.36 0.37-0.38 0.39-0.46 0.47-0.55 0.56-0.61 0.62-0.66 0.67-0.75 0.76-0.83 0.84-0.93 0.94-1.06 1.07-1.18 1.19-1.31 1.32-1.47	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71 B 0.81 B 1.03 B 1.16 B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.40
1.81-2.03 2.04-2.25 2.26-2.51 2.52-2.83 2.84-3.29 3.30-3.75 3.76-4.22 4.23-4.65 4.66-5.16 5.17-5.53 5.54-6.09 6.10-6.80 6.81-7.60 7.61-8.35	1.68–1.83 1.84–2.04 2.05–2.38 2.39–2.60 2.61–3.13 3.14–3.59 3.60–3.94 4.20–4.72 4.73–5.21 5.22–5.51 5.52–6.17 6.18–7.00	B 2.65 B 3.00 B 3.30 B 3.70 B 4.15 B 4.85 B 5.25 B 6.90 B 7.70 B 8.20 B 9.10 B 10.2 B 11.5 B 12.8

#### Table 54

Motor FLC (A)		Thermal	
2 T. U.	3 T. U.	Unit Number	
43.6–45.5 45.6–49.6 49.7–53.1 53.2–57.6 57.7–62.4	41.1–43.5 43.6–46.8 46.9–50.0 50.1–54.9 55.0–57.5	CC 64.3 CC 68.5 CC 74.6 CC 81.5 CC 87.7	
62.5–67.5 67.6–71.1 71.2–75.9 76.0–81.9 82.0–84.6	57.6–61.8 61.9–66.2 66.3–72.4 72.5–78.1 78.2–80.7	CC 94.0 CC 103.0 CC 112.0 CC 121.0 CC 132.0	
84.7–90.7 90.8–98.4 98.5–105. 106.–117. 118.–123. 124.–133.	80.8–86.5 86.6–93.9 94.0–100. 101.–112. 113.–117. 118.–123.	CC 143.0 CC 156.0 CC 167.0 CC 180.0 CC 196.0 CC 208.0	
	124.–133.	CC 219.0	
Table FF			

#### Table 55

	Therma		
Motor F	Motor FLC (A)		
2 T. U.	3 T. U.	Unit Number	
0.38-0.40 0.41-0.43 0.44-0.48 0.49-0.52 0.57-0.61 0.62-0.67 0.68-0.73 0.74-0.81 0.82-0.89 0.90-1.07 1.08-1.17 1.18-1.31 1.32-1.49 1.50-1.69 1.70-1.83	0.31-0.33 0.34-0.36 0.37-0.39 0.40-0.43 0.44-0.47 0.48-0.51 0.52-0.56 0.57-0.58 0.59-0.64 0.65-0.70 0.71-0.77 0.78-0.85 0.86-0.94 0.95-1.03 1.04-1.22 1.23-1.34	AR .45 AR .49 AR .59 AR .65 AR .71 AR .78 AR 1.05 AR 1.15 AR 1.26 AR 1.83 AR 1.83 AR 1.84	
1.70-1.83 1.84-2.00 2.01-2.17 2.18-2.35 2.36-2.60 2.61-2.87 2.88-3.14 3.15-3.47 3.48-3.90	1.47–1.58 1.59–1.76 1.77–1.85 1.86–2.08 2.09–2.27 2.28–2.51 2.52–2.90 2.91–3.23	AR 2.04 AR 2.246 AR 2.71 AR 2.98 AR 3.28 AR 3.62 AR 3.98 AR 4.37	
3.91–4.36 4.37–4.88 4.89–5.37 5.38–5.97 5.98–6.55 6.56–7.50 7.51–8.23 8.24–9.00	3.24–3.58 3.59–4.02 4.03–4.43 4.44–4.86 4.87–5.37 5.38–6.12 6.13–6.65 6.66–7.00	AR 4.80 AR 5.3 AR 5.8 AR 6.4 AR 7.0 AR 7.7 AR 8.5 AR 9.3	

#### Table 56

Motor I	Motor FLC (A)	
1 or 2 T. U.	3 T. U.	Unit Number
3.29-3.74	3.18-3.40	B 4.85
3.75-4.23	3.41-3.76	B 5.50
4.24-4.68	3.77-4.00	B 6.25
4.69-5.22	4.01-4.57	B 6.90
5.23-5.67	4.58-5.03	B 7.70
5.68-6.13	5.04-5.32	B 8.20
6.14-6.91	5.33-5.97	B 9.10
6.92-7.70	5.98-6.88	B 10.2
7.71-8.56	6.89-7.82	B 11.5
8.57-9.39	7.83-8.47	B 12.8
9.40-10.4	8.48-9.15	B 14.0
10.5-11.6	9.16-10.1	B 15.5
11.7–12.9	10.2–11.2	B 17.5
13.0–14.6	11.3–12.0	B 19.5
14.7–16.5	12.1–13.6	B 22.0
16.6–18.5	13.7–15.2	B 25.0
18.6–21.0	15.3–17.1	B 28.0
21.1–23.6	17.2–19.0	B 32.0
23.7–26.3	19.1–21.5	B 36.0
26.4–29.3	21.6–24.1	B 40.0
29.4–35.1	24.2–27.0	B 45.0
35.2–36.1	27.1–28.7	B 50.0
36.2–39.1	28.8–30.4	B 56.0
39.2–41.5	30.5–32.2	B 62.0
41.6–45.0	32.3–35.4	B 70.0
	35.5–38.2 38.3–45.0	B 79.0 B 88.0

#### Table 57

Motor FLC (A))		Thermal Unit
2 T. U.	3 T. U.	Number
5.09-5.59 5.60-6.11 6.12-6.72 6.73-7.37 7.38-7.67 7.68-8.68 8.69-9.94 9.95-11.1 11.2-12.9 13.0-14.7	5.15–5.97 5.98–6.50 6.51–7.04 7.05–7.59 7.60–7.93 7.94–9.04 9.05–10.2 10.3–11.5 11.6–13.2 13.3–14.9	AR 8.5 AR 9.3 AR 10.2 AR 11.2 AR 12.4 AR 13.6 AR 17.6 AR 20.5 AR 23.0
14.8–16.9	15.0–16.9	AR 27.0
17.0–19.2	17.0–19.3	AR 30.0
19.3–21.9	19.4–21.7	AR 35.0
22.0–24.4	21.8–25.0	AR 40.0
24.5–26.3	25.1–27.0	AR 44.0
26.4–28.0	27.1–29.1	AR 47.0
28.1–30.3	29.2–30.8	AR 51.0
30.4–32.2	30.9–32.9	AR 55.0
32.3–34.4	33.0–35.0	AR 60.0
34.5–36.6	35.1–37.1	AR 66.0
36.7–39.5	37.2–39.1	AR 72.0
39.6–45.0	39.2–41.5	AR 79.0
—	41.6–45.0	AR 86.0

Motor FLC (A)		Thermal
1 or 2 T. U.	3 T. U.	Unit Number
3.37–3.82	3.28–3.51	B 4.85
3.83–4.33	3.52–3.89	B 5.50
4.34–4.79	3.90–4.14	B 6.25
4.80–5.33	4.15–4.73	B 6.90
5.34–5.79	4.74–5.22	B 7.70
5.80–6.27	5.23–5.53	B 8.20
6.28–7.03	5.54–6.21	B 9.10
7.04–7.88	6.22–7.17	B 10.2
7.89–8.73	7.18–8.19	B 11.5
8.74–9.55	8.20–8.90	B 12.8
9.56–10.6	8.91–9.57	B 14.0
10.7–11.8	9.58–10.6	B 15.5
11.9–13.1	10.7–11.8	B 17.5
13.2–14.9	11.9–12.7	B 19.5
15.0–16.9	12.8–14.4	B 22.0
17.0–18.8	14.5–16.1	B 25.0
18.9–21.5	16.2–18.2	B 28.0
21.6–24.1	18.3–20.2	B 32.0
24.2–26.8	20.3–22.8	B 36.0
26.9–29.9	22.9–25.6	B 40.0
30.0–35.5	25.7–28.8	B 45.0
35.6–36.5	28.9–30.6	B 50.0
36.6–39.6	30.7–32.4	B 56.0
39.7–41.5	32.5–34.6	B 62.0
41.6–45.0	34.7–38.6	B 70.0
	38.7–45.0	B 79.0



#### Table 59

Table 33			
Motor FLC (A)		Thermal Unit	
1 or 2 T. U.	3 T. U.	Number	
0.34-0.38 0.39-0.43 0.44-0.47 0.48-0.53 0.54-0.60 0.61-0.68 0.69-0.76 0.77-0.86 0.87-0.97 0.98-1.07 1.08-1.23 1.24-1.39 1.40-1.55 1.56-1.77 1.78-1.96	0.29-0.31 0.32-0.35 0.36-0.38 0.39-0.46 0.47-0.55 0.56-0.62 0.63-0.67 0.68-0.75 0.76-0.84 0.85-0.95 0.96-1.09 1.10-1.21 1.22-1.35 1.36-1.53 1.54-1.73 1.74-1.90	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71 B 0.81 B 0.92 B 1.03 B 1.16 B 1.30 B 1.45 B 1.67 B 1.88 B 2.40 B 2.65 B 2.65	
2.42–2.71 2.72–3.03 3.04–3.53 3.54–4.01	2.15–2.34 2.35–2.67 2.68–3.22 3.23–3.48	B 3.30 B 3.70 B 4.15 B 4.85	
4.02–4.56 4.57–5.03 5.04–5.59 5.60–5.95 5.96–6.58 6.59–7.31 7.32–8.15	3.49–3.87 3.88–4.14 4.15–4.73 4.74–5.28 5.29–5.64 5.65–6.39 6.40–7.43	B 5.50 B 6.25 B 6.90 B 7.70 B 8.20 B 9.10 B 10.2	
8.16–9.13 9.14–9.91	7.44–8.55 8.56–9.40	B 11.5 B 12.8	
9.92–10.7 10.8–12.1 12.2–13.5 13.6–15.1 15.2–17.0 17.1–18.9	9.41–10.0 10.1–11.2 11.3–12.5 12.6–13.5 13.6–15.4 15.5–17.5	B 14.0 B 15.5 B 17.5 B 19.5 B 22.0 B 25.0	
19.0–21.5 21.6–24.0 24.1–26.0	17.6–19.9 20.0–22.2 22.3–25.5 25.6–26.0	B 28.0 B 32.0 B 36.0 B 40.0	

#### Table 60

Motor FLC (A) Thermal Unit Number 6.84–7.49 7.50–8.05 8.06–9.10 9.11–9.99 AR 10.2 9.11–9.99 AR 12.4 11.2–12.7 AR 15.4 12.8–14.8 AR 17.6 14.9–16.6 AR 20.5 16.7–19.3 AR 23.0 19.4–21.4 AR 27.0 21.5–25.1 AR 30.0 25.2–28.3 AR 30.0 25.4–31.2 AR 40.0 31.3–33.3 AR 44.0 33.4–35.7 AR 47.0 35.8–38.5 AR 51.0 AR 65.0 AR 66.0		
7.50-8.05 AR 10.2 8.06-9.10 AR 11.2 9.11-9.99 AR 12.4 10.0-11.1 AR 13.6 11.2-12.7 AR 15.4 12.8-14.8 AR 17.6 14.9-16.6 AR 20.5 16.7-19.3 AR 23.0 19.4-21.4 AR 27.0 21.5-25.1 AR 30.0 25.2-28.3 AR 35.0 28.4-31.2 AR 40.0 31.3-33.3 AR 44.0 33.4-35.7 AR 47.0 35.8-38.5 AR 55.0 38.6-41.5 AR 55.0	Motor FLC (A)	Thermal Unit Number
12.8-14.8 AR 17.6 14.9-16.6 AR 20.5 16.7-19.3 AR 23.0 19.4-21.4 AR 27.0 21.5-25.1 AR 30.0 25.2-28.3 AR 35.0 28.4-31.2 AR 40.0 31.3-33.3 AR 44.0 33.4-35.7 AR 47.0 35.8-38.5 AR 55.0 38.6-41.5 AR 55.0	7.50–8.05 8.06–9.10 9.11–9.99	AR 10.2 AR 11.2 AR 12.4
25.2–28.3 AR 35.0 28.4–31.2 AR 40.0 31.3–33.3 AR 44.0 33.4–35.7 AR 47.0 35.8–38.5 AR 51.0 36.6–41.5 AR 55.0	12.8–14.8 14.9–16.6 16.7–19.3	AR 17.6 AR 20.5 AR 23.0
38.6–41.5 AR 55.0	25.2–28.3 28.4–31.2 31.3–33.3	AR 35.0 AR 40.0 AR 44.0
<u> </u>	38.6–41.5	AR 55.0

#### Table 61

Motor FLC (A)		Thermal Unit
2 T. U.	3 T. U.	Number
46.8–50.0 50.1–54.2 54.3–58.3 58.4–63.6 63.7–68.5	45.3–48.2 48.3–52.4 52.5–56.4 56.5–61.2 61.3–66.1	CC 64.3 CC 68.5 CC 74.6 CC 81.5 CC 87.7
68.6–74.0 74.1–79.8 79.9–83.0 83.1–88.9 89.0–95.6	66.2–71.4 71.5–77.0 77.1–79.0 79.1–84.7 84.8–91.1	CC 94.0 CC 103.0 CC 112.0 CC 121.0 CC 132.0
95.7–102. 103.–109. 110.–119. 120.–133.	91.2–98.1 98.2–104. 105.–113. 114.–123. 124.–133.	CC 143.0 CC 156.0 CC 167.0 CC 180.0 CC 196.0

#### Table 62

Motor FLC (A)		Thermal Unit
2 T. U.	3 T. U.	Number
4.83–5.33	4.90-5.68	AR 8.5
5.34–5.84	5.69-6.19	AR 9.3
5.85–6.43	6.20-6.71	AR 10.2
6.44–7.03	6.72-7.14	AR 11.2
7.04–7.30	7.15-7.49	AR 12.4
7.31–8.29	7.50-8.48	AR 15.4
8.30–9.49	8.49-9.66	AR 15.4
9.50–10.7	9.67-10.8	AR 20.5
10.8–12.3	10.9-12.4	AR 23.0
12.4–14.0	12.5-13.9	AR 27.0
16.1–18.4	15.8–18.1	AR 30.0
18.5–21.0	18.2–20.3	AR 35.0
21.1–23.0	20.4–23.0	AR 40.0
23.1–25.5	23.1–25.2	AR 44.0
25.6–26.7	25.3–26.6	AR 47.0
26.8–28.3	26.7–28.2	AR 51.0
28.4–30.3	28.3–30.2	AR 55.0
30.4–32.5	30.3–32.3	AR 60.0
32.6–34.5	32.4–34.3	AR 66.0
34.6–37.6	34.4–36.7	AR 72.0
37.7–39.7	36.8–39.3	AR 79.0
39.8–41.4	39.4–45.0	AR 86.0
41.5–45.0	—	AR 94.0

#### Table 63

Motor FLC (A)	Thermal Unit Numbe
1 or 2 T. U.	3 T. U.
15.1–17.0 17.1–19.1 19.2–21.8 21.9–24.5 24.6–27.9 28.0–29.5 29.6–32.9 33.0–36.6 36.7–40.3	AU 20.0 AU 23.0 AU 26.0 AU 29.0 AU 33.0 AU 38.0 AU 44.0 AU 50.0
40.4–45.1 45.2–50.4 50.5–57.3 57.4–62.4 62.5–68.3 68.4–73.9	AU 56.0 AU 64.0 AU 72.0 AU 81.0 AU 88.0 AU 99.0
74.0–80.6 80.7–86.0	AU 110.0 AU 123.0

#### Table 64

Motor FLC (A)			Thermal Unit
2 T. U.	2 T. U.	3 T. U.	Unit
1Ø	2Ø		No.
0.38-0.40	0.38-0.40	0.31-0.33	AR .45
0.41-0.43	0.41-0.43	0.34-0.36	AR .49
0.44-0.48	0.44-0.48	0.37-0.39	AR .54
0.49-0.52	0.49-0.52	0.40-0.43	AR .59
0.53-0.56	0.53-0.56	0.44-0.47	AR .65
0.57-0.61	0.57-0.61	0.48-0.51	AR .71
0.62-0.67	0.62-0.67	0.52-0.56	AR .78
0.68-0.73	0.68-0.73	0.57-0.58	AR .86
0.74-0.81	0.74-0.81	0.59-0.64	AR .95
0.82-0.89	0.82-0.89	0.65-0.70	AR 1.05
0.90-0.97	0.90-0.97	0.71–0.77	AR 1.15
0.98-1.07	0.98-1.07	0.78–0.85	AR 1.26
1.08-1.17	1.08-1.17	0.86–0.94	AR 1.39
1.18-1.31	1.18-1.31	0.95–1.03	AR 1.53
1.32-1.49	1.32-1.49	1.04–1.22	AR 1.68
1.50–1.69	1.50–1.69	1.23–1.34	AR 1.85
1.70–1.83	1.70–1.83	1.35–1.46	AR 2.04
1.84–2.00	1.84–2.00	1.47–1.58	AR 2.24
2.01–2.17	2.01–2.17	1.59–1.76	AR 2.46
2.18–2.35	2.18–2.35	1.77–1.85	AR 2.71
2.36–2.60	2.36–2.60	1.86–2.08	AR 2.98
2.61–2.87	2.61–2.87	2.09–2.27	AR 3.28
2.88–3.14	2.88–3.14	2.28–2.51	AR 3.62
3.15–3.47	3.15–3.47	2.52–2.90	AR 3.98
3.48–3.90	3.48–3.90	2.91–3.23	AR 4.37
3.91–4.36	3.91–4.36	3.24–3.58	AR 4.80
4.37–4.88	4.37–4.88	3.59–4.02	AR 5.3
4.89–5.37	4.89–5.37	4.03–4.43	AR 5.8
5.38–5.97	5.38–5.97	4.44–4.86	AR 6.4
5.98–6.55	5.98–6.55	4.87–5.37	AR 7.0
6.56-7.50	6.56–7.50	5.38–6.12	AR 7.7
7.51-8.23	7.51–8.23	6.13–6.65	AR 8.5
8.24-8.99	8.24–8.99	6.66–7.31	AR 9.3
9.00-9.86	9.00–9.86	7.32–7.96	AR 10.2
9.87-10.7	9.87–10.7	7.97–8.69	AR 11.2
10.8–11.2 11.3–12.8 12.9–14.8 14.9–16.7 16.8–18.0	10.8–11.2 11.3–12.0 — —	8.70–8.99 9.00–10.1 10.2–11.5 11.6–12.0	AR 12.4 AR 13.6 AR 15.4 AR 17.6 AR 20.5
Following Selections for Size 1 Only.  —   11.3–12.8   —   AR 13.6			
  16.8–19.0 19.1–22.0	12.9–14.8 14.9–16.7 16.8–19.0 19.1–22.0	11.6–13.0 13.1–14.6 14.7–16.5	AR 15.4 AR 17.6 AR 20.5 AR 23.0
22.1–24.9 25.0–26.0 —	22.1–24.9 25.0–26.0 —	16.6–18.5 18.6–21.0 21.1–23.6 23.7–26.0	AR 27.0 AR 30.0 AR 35.0 AR 40.0

#### Table 65

l able 65	
Motor FLC (A)	Thermal Unit Number
Motor FLC (A)  0.31-0.35  0.36-0.39  0.40-0.44  0.45-0.50  0.51-0.58  0.59-0.65  0.66-0.73  0.74-0.82  0.83-0.92  0.93-1.03  1.04-1.19  1.20-1.34  1.35-1.50  1.51-1.67  1.68-1.89  1.90-2.14  2.15-2.36  2.37-2.65  2.36-2.97  2.98-3.47  3.48-3.94  3.95-4.44  4.45-4.94  4.95-5.52  5.53-5.88  5.89-6.52  6.53-7.31  7.32-8.21  8.22-9.18  9.19-9.90  10.0-11.0  11.1-12.4	B 0.44 B 0.51 B 0.57 B 0.63 B 0.71 B 0.81 B 0.92 B 1.03 B 1.16 B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.40 B 2.40 B 2.55 B 6.90 B 3.70 B 4.15 B 4.85 B 5.50 B 6.25 B 6.90 B 7.70 B 8.20 B 9.10 B 10.2 B 11.5 B 12.8 B 14.0 B 15.5
12.5–13.9 14.0–15.7 15.8–17.8 17.9–20.0 20.1–22.9	B 17.5 B 19.5 B 22.0 B 25.0 B 28.0
23.0–25.0 Following	
for Size	•
23.0-25.7 25.8-28.6 28.7-32.2 32.3-35.8 35.9-40.1 40.2-44.4	B 32.0 B 36.0 B 40.0 B 45.0 B 50.0 B 56.0
44.5–50.0	B 62.0

#### Table 67

Table 07	
Motor FLC (A)	Thermal Unit Numbe
3.79-4.14	B 5.50
4.15-4.44	B 6.25
4.45-5.22	B 6.90
5.23-5.29	B 7.70
5.30-5.99	B 8.20
6.00-6.82	B 9.10
6.83-7.68	B 10.2
7.69-7.92	B 11.5
7.93-8.47	B 12.8
8.48-9.99	B 14.0
10.0–10.8	B 15.5
10.9–12.3	B 17.5
12.4–12.9	B 19.5
13.0–15.1	B 22.0
15.2–16.7	B 25.0
16.8–17.9	B 28.0
18.0–20.1	B 32.0
20.2–23.8	B 36.0
23.9–25.8	B 40.0
25.9–28.3	B 45.0
28.4–29.6	B 50.0
29.7–32.1	B 56.0
32.2–34.4	B 62.0
34.5–38.3	B 70.0
38.4–39.9	B 79.0
40.0–45.0	B 88.0

#### Table 70

able 10	
Motor FLC (A)	Thermal Unit Number
4.24–4.62	AR 8.5
4.63–5.05	AR 9.3
5.06–5.54	AR 10.2
5.55–6.13	AR 11.2
6.14–6.44	AR 12.4
6.45–7.48	AR 13.6
7.49–8.55	AR 15.4
8.56–9.74	AR 17.6
9.75–11.1	AR 20.5
11.2–12.7	AR 23.0
12.8–14.4	AR 27.0
14.5–16.4	AR 30.0
16.5–18.9	AR 35.0
19.0–21.6	AR 40.0
21.7–23.3	AR 44.0
23.4–24.9	AR 47.0
25.0–26.9	AR 51.0
27.0–29.1	AR 55.0
29.2–31.3	AR 60.0
31.4–33.5	AR 66.0
33.6–36.9	AR 72.0
37.0–39.1	AR 79.0
39.2–40.9	AR 86.0
41.0–45.0	AR 94.0

#### Table 71

T-1-1- 00	
Table 68	
Motor FLC (A)	Thermal Unit Number
14.9–16.1	CC 20.9
16.2–17.3	CC 22.8
17.4–19.5	CC 24.6
19.6–20.7	CC 26.3
20.8–22.4	CC 28.8
22.5–23.9	CC 31.0
24.0–25.8	CC 33.3
25.9–27.6	CC 36.4
27.7–29.7	CC 39.6
29.8–31.8	CC 42.7
31.9-34.2	CC 46.6
34.3-37.0	CC 50.1
37.1-39.6	CC 54.5
39.7-42.5	CC 59.4
42.6-45.0	CC 64.3
45.1–48.6	CC 68.5
48.7–51.2	CC 74.6
51.3–56.0	CC 81.5
56.1–60.1	CC 87.7
60.2–64.3	CC 94.0
64.4–68.9	CC 103.0
69.0–71.9	CC 112.0
72.0–75.4	CC 121.0
75.5–78.9	CC 132.0
79.0–82.1	CC 143.0
82.2–86.0	CC 156.0

#### 1 40.0

Motor FLC (A)	Thermal Unit Number
3.98–4.53	AR 8.5
4.54–5.03	AR 9.3
5.04–5.46	AR 10.2
5.47–6.01	AR 11.2
6.02–6.31	AR 12.4
6.32–7.19	AR 13.6
7.20–8.29	AR 15.4
8.30–9.49	AR 17.6
9.50–11.0	AR 20.5
11.1–12.6	AR 23.0
12.7–14.3	AR 27.0
14.4–16.5	AR 30.0
16.6–19.2	AR 35.0
19.3–21.9	AR 40.0
22.0–23.8	AR 44.0
23.9-25.5	AR 47.0
25.6-27.7	AR 51.0
27.8-30.1	AR 55.0
30.2-32.5	AR 60.0
32.6-34.8	AR 66.0
34.9–38.5	AR 72.0
38.6–41.5	AR 79.0
41.6–45.0	AR 86.0

#### Table 72

Motor	FLC (A)	Thermal Unit	Motor I	FLC (A)	Thermal Unit
1 T. U.	3 T. U.	Number	1 T. U.	3 T. U.	Number
2.38–2.62 2.63–2.94 2.95–3.31	2.38–2.62 2.63–2.94 2.95–3.31	FB 3.33 FB 3.71 FB 4.1	2.42-2.67 2.68-3.00 3.01-3.36	2.42-2.67 2.68-3.00 3.01-3.36	FB 3.33 FB 3.71 FB 4.1
3.32–3.43 3.44–3.81 3.82–4.32	3.32–3.43 3.44–3.81 3.82–4.32	FB 4.5 FB 4.75 FB 5.3	3.37-3.53 3.54-3.91 3.92-4.41	3.37–3.53 3.54–3.91 3.92–4.41	FB 4.5 FB 4.75 FB 5.3
4.33–4.75 4.76–5.38 5.39–5.75	4.33–4.75 4.76–5.38 5.39–5.75	FB 6.1 FB 6.75 FB 7.45	4.42–4.83 4.84–5.45 5.46–5.89	4.42–4.83 4.84–5.45 5.46–5.89	FB 6.1 FB 6.75 FB 7.45
5.76–5.97 5.98–6.30 6.31–6.55	5.76–5.97 5.98–6.30 6.31–6.55	FB 7.8 FB 8.21 FB 8.6	5.90–6.04 6.05–6.55 6.56–6.72	5.90–6.04 6.05–6.55 6.56–6.72	FB 7.8 FB 8.21 FB 8.6
6.56–6.89 6.90–7.14 7.15–7.36	6.56–6.89 6.90–7.14 7.15–7.36	FB 9.0 FB 9.5 FB 10.0	6.73–7.00 7.01–7.39 7.40–7.54	6.73–7.00 7.01–7.39 7.40–7.54	FB 9.0 FB 9.5 FB 10.0
7.37–8.30 8.31–8.59 8.60–9.01	7.37–8.30 8.31–8.59 8.60–9.01	FB 10.6 FB 11.2 FB 12.1	7.55–8.41 8.42–8.91 8.92–9.16	7.55–8.41 8.42–8.91 8.92–9.16	FB 10.6 FB 11.2 FB 12.1
9.02–9.68 9.69–9.99 10.0–10.9	9.02–9.68 9.69–9.99 10.0–10.9	FB 13.1 FB 13.9 FB 14.8	9.17–10.0 10.1–10.3 10.4–11.4	9.17–10.0 10.1–10.3 10.4–11.4	FB 13.1 FB 13.9 FB 14.8
11.0–11.3 11.4–12.4 12.5–12.9	11.0–11.3 11.4–12.0 —	FB 15.6 FB 16.4 FB 17.6	11.5–11.8 11.9–12.9 13.0–13.4	11.5–11.8 11.9–12.9 —	FB 15.6 FB 16.4 FB 17.6
13.0–14.0 14.1–14.5 14.6–15.7	_ _ _	FB 18.4 FB 19.4 FB 21.1	13.5–14.2 14.3–15.1 15.2–18.0	=	FB 18.4 FB 19.4 FB 21.1
15.8–16.6 16.7–18.0	_	FB 22.6 FB 23.6	Following Selec		-1 & M–1P Only.
	I tions for Size M-	-1 & M–1P Only.	_	11.5–11.8 11.9–12.9	FB 15.6 FB 16.4
_	11.4–12.4 12.5–12.9	FB 16.4 FB 17.6	_	13.0–13.4 13.5–14.2	FB 17.6 FB 18.4
_	13.0–14.0	FB 18.4		14.3-15.1	FB 19.4
_	14.1–14.5 14.6–15.7	FB 19.4 FB 21.1	15.2–17.1 17.2–18.0	15.2–17.1 17.2–18.0	FB 21.1 FB 22.6
 16.7–17.6	15.8–16.6 16.7–17.6	FB 22.6 FB 23.6	18.1–18.9 19.0–19.7	18.1–18.9 19.0–19.7	FB 23.6 FB 24.8
17.7–18.3	17.7–18.3	FB 24.8	19.8-20.9	19.8-20.9	FB 26.7
18.4–19.4 19.5–20.5	18.4–19.4 19.5–20.5	FB 26.7 FB 28.3	21.0–21.9 22.0–23.1	21.0–21.9 22.0–23.1	FB 28.3 FB 29.6
20.6-21.7	20.6-21.7	FB 29.6	23.2–24.3 24.4–25.5	23.2–24.3 24.4–25.5	FB 30.5 FB 32.6
21.8–22.8 22.9–24.3	21.8–22.8 22.9–24.3	FB 30.5 FB 32.5	25.6-26.0	25.6-26.0	FB 34.1
24.4–24.7 24.8–25.4	24.4–24.7 24.8–25.4	FB 34.1 FB 35.0		elections for Size	M–1P Only. FB 35.0
25.5-26.0	25.5-26.0	FB 36.6	26.1–26.8 26.9–27.3	_	FB 36.6
-	elections for Size		27.4–28.7 28.8–30.2	_	FB 38.3 FB 40.2
26.1–27.7 27.8–28.9 29.0–30.6	_ _ _	FB 38.3 FB 40.2 FB 42.0	30.3–31.9 32.0–36.0	_ _ _	FB 42.0 FB 44.0
30.7–32.5 32.6–36.0	=	FB 44.0 FB 46.0			

Motor FLC (A)		Thermal Unit
1 or 2 T. U.	3 T. U.	Number
3.46-3.90	3.38–3.65	B 4.85
3.91-4.44	3.66–4.07	B 5.50
4.45-4.91	4.08–4.36	B 6.25
4.92-5.51	4.37–5.19	B 6.90
5.52-5.84	5.20–5.59	B 7.70
5.85-6.54	5.60–5.98	B 8.20
6.55-7.33	5.99–6.78	B 9.10
7.34-8.31	6.79–7.91	B 10.2
8.32-9.22	7.92–9.12	B 11.5
9.23–10.0	9.13–10.0	B 12.8
10.1–11.2	10.1–10.7	B 14.0
11.3–12.5	10.8–12.0	B 15.5
12.6–14.2	12.1–13.5	B 17.5
14.3–16.1	13.6–14.6	B 19.5
16.2–18.4	14.7–16.7	B 22.0
18.5–20.5	16.8–18.9	B 25.0
20.6–23.2	19.0–21.6	B 28.0
23.3–26.6	21.7–24.1	B 32.0
26.7–29.6	24.2–27.6	B 36.0
29.7–33.5	27.7–31.2	B 40.0
33.6–37.2 37.3–41.5 41.6–45.0	31.3–35.5 35.6–37.8 37.9–41.5 41.6–45.0	B 45.0 B 50.0 B 56.0 B 62.0

#### Table 74

Table 74		
Motor FLC (A)		Thermal Unit
1 T. U.	3 T. U.	Number
2.23–2.47	2.23–2.47	FB 3.33
2.48–2.76	2.48–2.76	FB 3.71
2.77–3.04	2.77–3.04	FB 4.1
3.05–3.24	3.05–3.24	FB 4.5
3.25–3.61	3.25–3.61	FB 4.75
3.62–4.19	3.62–4.19	FB 5.3
4.20–4.62	4.20–4.62	FB 6.1
4.63–5.14	4.63–5.14	FB 6.75
5.15–5.39	5.15–5.39	FB 7.45
5.40-5.69	5.40–5.69	FB 7.8
5.70-5.99	5.70–5.99	FB 8.21
6.00-6.29	6.00–6.29	FB 8.6
6.30–6.64	6.30–6.64	FB 9.0
6.65–6.99	6.65–6.99	FB 9.5
7.00–7.39	7.00–7.39	FB 10.0
7.40–7.79	7.40–7.79	FB 10.6
7.80–7.94	7.80–7.94	FB 11.2
7.95–8.49	7.95–8.49	FB 12.1
8.50-8.99	8.50-8.99	FB 13.1
9.00-9.59	9.00-9.59	FB 13.9
9.60-10.1	9.60-10.1	FB 14.8
10.2–10.6	10.2-10.6	FB 15.6
10.7–11.3	10.7-11.3	FB 16.4
11.4–12.0	11.4-12.0	FB 17.6
12.0-12.6	_	FB 18.4
12.7-13.8	_	FB 19.4
13.9-14.7	_	FB 21.1
14.8–15.2 15.3–16.2 16.3–18.0		FB 22.6 FB 23.6 FB 24.8
Following	Selections for S	
 13.9–14.7	12.0-12.6 12.7-13.8 13.9-14.7	FB 18.4 FB 19.4 FB 21.1
14.8–15.2	14.8–15.2	FB 22.6
15.3–16.2	15.3–16.2	FB 23.6
16.3–17.4	16.3–17.4	FB 24.8
17.5–18.5	17.5–18.5	FB 26.7
18.6–19.6	18.6–19.6	FB 28.3
19.7–20.2	19.7–20.2	FB 29.6
20.3–21.5	20.3–21.5	FB 30.5
21.6–22.4	21.6–22.4	FB 32.6
22.5–23.2	22.5–23.2	FB 34.1
23.3–24.3	23.3–24.3	FB 35.0
24.4–25.4	24.4–25.4	FB 36.6
25.5–26.0	25.5–26.0	FB 38.3

Table 75	
Motor FLC (A)	Thermal Unit Number
3.22-3.57	FB 4.75
3.58-4.14	FB 5.3
4.15-4.56	FB 6.1
4.57–5.10	FB 6.75
5.11–5.39	FB 7.45
5.40–5.64	FB 7.8
5.65–5.96	FB 8.21
5.97–6.25	FB 8.6
6.26–6.58	FB 9.0
6.59–6.91	FB 9.5
6.92–7.41	FB 10.0
7.42–7.82	FB 10.6
7.83–8.32	FB 11.2
8.33–8.89	FB 12.1
8.90–9.47	FB 13.1
9.48–10.0	FB 13.9
10.1–10.5	FB 14.8
10.6–11.1	FB 15.6
11.2–12.0	FB 16.4
12.1–12.7	FB 17.6
12.8–13.5	FB 18.4
13.6–14.6	FB 19.4
14.7–15.7	FB 21.1
15.8–16.5	FB 22.6
16.6–17.4	FB 23.6
17.5–18.8	FB 24.8
18.9–20.1	FB 26.7
20.2–21.0	FB 28.3
21.1–21.6	FB 29.6
21.7–23.3	FB 30.5
23.4–24.3	FB 32.6
24.4–25.0	FB 34.1
25.1–26.3	FB 35.0
26.4–27.6	FB 36.6
27.7–29.1	FB 38.3
29.2–30.4	FB 40.2
30.5–32.0	FB 42.0
32.1–33.3	FB 44.0
33.4–35.2	FB 46.0
35.3–37.0	FB 48.0
37.1–38.5	FB 50.5
38.6–40.7	FB 52.5
40.8–45.0	FB 55.5

Table 76

Motor FLC (A)	Thermal Unit Number	Motor FLC (A)	Thermal Unit Number
19.9–20.8 20.9–22.2	FB 26.7 FB 28.3	3.31–3.67 3.68–4.23	FB 4.75 FB 5.3
22.3–23.8	FB 29.6	4.24-4.69	FB 6.1
23.9–25.4	FB 30.5	4.70-5.21	FB 6.75
25.5–27.2 27.3–29.2	FB 32.6 FB 34.1	5.22–5.49 5.50–5.74	FB 7.45 FB 7.8
29.3–31.9 32.0–33.8	FB 38.3 FB 40.2	5.75–6.07 6.08–6.35	FB 8.21 FB 8.6
32.0–33.8 33.9–36.1	FB 40.2 FB 42.0	6.36–6.71	FB 9.0
36.2–38.5 38.6–41.4	FB 44.0 FB 46.0	6.72–7.03 7.04–7.53	FB 9.5 FB 10.0
41.5–43.6	FB 48.0	7.54–7.91	FB 10.6
43.7–45.9 46.0–48.2	FB 50.5 FB 52.5	7.92–8.53 8.54–9.14	FB 11.2 FB 12.1
48.3–50.7	FB 55.5	9.15–9.71	FB 13.1
50.8–53.9 54.0–56.7	FB 58.0 FB 60.0	9.72–10.2 10.3–10.8	FB 13.9 FB 14.8
56.8–60.8	FB 63.5	10.9–11.5	FB 15.6
60.9–67.6	FB 69.0	11.6–12.3	FB 16.4
67.7–73.6 73.7–82.9	FB 77.0 FB 84.0	12.4–13.0 13.1–13.9	FB 17.6 FB 18.4
83.0-86.0	FB 92.0	14.0–15.1 15.2–16.1	FB 19.4 FB 21.1

#### Table 77

Thermal Unit Number
FB 50.5 FB 52.5 FB 55.5
FB 58.0 FB 60.0 FB 63.5
FB 69.0 FB 77.0 FB 84.0
FB 92.0 FB 105.0 FB 115.0

## Table 78

WOLDI FEC (A)		Thermal Unit
1 T. U.	2 T. U. or 3 T. U.	Number
2.26–2.51 2.52–2.82	2.26–2.51 2.52–2.82	FB 3.33 FB 3.71 FB 4.1
2.83–3.09 3.10–3.30	2.83-3.09 3.10-3.30	FB 4.1 FB 4.5
3.31–3.69 3.70–4.27	3.31–3.69 3.70–4.27	FB 4.75 FB 5.3
4.28-4.72 4.73-5.25	4.28–4.72 4.73–5.25	FB 6.1 FB 6.75
5.26-5.53	5.26-5.53	FB 7.45
5.54–5.81 5.82–6.14 6.15–6.44	5.54–5.81 5.82–6.14 6.15–6.44	FB 7.8 FB 8.21 FB 8.6
6.45–6.81 6.82–7.19	6.45–6.81 6.82–7.19	FB 9.0
7.20–7.19	7.20–7.19	FB 9.5 FB 10.0
7.60–7.99 8.00–8.17	7.60–7.99 8.00–8.17	FB 10.6 FB 11.2
8.18–8.74 8.75–9.31	8.18–8.74 8.75–9.31	FB 12.1 FB 13.1
9.32–9.94 9.95–10.5	9.32–9.94 9.95–10.5	FB 13.9 FB 14.8
10.6–11.1 11.2–11.9 12.0–12.4	10.6–11.1 11.2–12.0	FB 15.6 FB 16.4 FB 17.6
12.5–13.1 13.2–14.3	_	FB 18.4 FB 19.4
14.4-15.3	_	FB 21.1
15.4–15.9 16.0–18.0	_	FB 22.6 FB 23.6
Following	Selections for Si	
_	12.0–12.4 12.5–13.1 13.2–14.3	FB 17.6 FB 18.4 FB 19.4
14.4–15.3 15.4–15.9 16.0–16.9	14.4–15.3 15.4–15.9 16.0–16.9	FB 21.1 FB 22.6 FB 23.6
17.0-18.3	17.0-18.3	FB 24.8
18.4–19.5 19.6–20.5	18.4–19.5 19.6–20.5	FB 26.7 FB 28.3
20.6–21.1 21.2–22.6 22.7–23.7	20.6–21.1 21.2–22.6 22.7–23.7	FB 29.6 FB 30.5 FB 32.6
23.8–24.3 24.4–26.0	23.8–24.3 24.4–26.0	FB 35.0

#### Table 79

3.31-3.67 3.68-4.23	FB 4.75 FB 5.3
4.24–4.69	FB 6.1
4.70-5.21 5.22-5.49	FB 6.75 FB 7.45
5.50-5.74	FB 7.43
5.75–6.07 6.08–6.35	FB 8.21 FB 8.6
6.36–6.71	FB 9.0
6.72–7.03 7.04–7.53	FB 9.5 FB 10.0
7.54–7.53 7.54–7.91	FB 10.6
7.92–8.53 8.54–9.14	FB 11.2 FB 12.1
9.15–9.71	FB 13.1
9.72–10.2 10.3–10.8	FB 13.9 FB 14.8
10.9–11.5	FB 15.6
11.6–12.3 12.4–13.0	FB 16.4 FB 17.6
13.1-13.9	FB 18.4
14.0–15.1 15.2–16.1	FB 19.4 FB 21.1
16.2-16.9	FB 22.6
17.0–17.9 18.0–19.4	FB 23.6 FB 24.8
19.5–20.7	FB 26.7
20.8–21.7 21.8–22.3	FB 28.3 FB 29.6
22.4-23.9	FB 30.5
24.0–25.1 25.2–25.9	FB 32.6 FB 34.1
26.0–27.1	FB 35.0
27.2–28.6 28.7–30.1	FB 36.6 FB 38.3
30.2–31.7	FB 40.2
31.8–33.3 33.4–34.5	FB 42.0 FB 44.0
34.6–36.5	FB 46.0
36.6–38.5 38.6–39.9	FB 48.0 FB 50.5
40.0–45.0	FB 52.5

#### Table 80

Motor FLC (A)	Thermal Unit Numb
20.5–21.7	FB 26.7
21.8–23.1	FB 28.3
23.2–24.8	FB 29.6
24.9–26.5	FB 30.5
26.6–28.4	FB 32.6
28.5–30.4	FB 34.1
30.5–32.8	FB 38.3
32.9–34.9	FB 40.2
35.0–37.3	FB 42.0
37.4–39.8	FB 44.0
39.9–42.5	FB 46.0
42.6–45.8	FB 48.0
45.9–48.2	FB 50.5
48.3–50.6	FB 52.5
50.7–53.1	FB 55.5
53.2–56.5	FB 58.0
56.6–59.4	FB 60.0
59.5–63.4	FB 63.5
63.5–71.0	FB 69.0
71.1–78.8	FB 77.0
78.9–86.0	FB 84.0

#### Table 81

Motor FLC (A)	Thermal Unit Number
52.2-55.6	FB 50.5
55.7-58.8	FB 52.5
58.9-62.5	FB 55.5
62.6-66.0	FB 58.0
66.1-70.1	FB 60.0
70.2-78.6	FB 63.5
78.7–92.0	FB 69.0
92.1–102	FB 77.0
103–114	FB 84.0
115–123	FB 92.0
124–133	FB 105.0

I able oz	
Motor FLC (A)	Thermal Unit Numbe
2.36–2.63	FB 3.33
2.64–2.96	FB 3.71
2.97–3.23	FB 4.1
3.24-3.45	FB 4.5
3.46-3.86	FB 4.75
3.87-4.44	FB 5.3
4.45–4.95	FB 6.1
4.96–5.47	FB 6.75
5.48–5.75	FB 7.45
5.76–6.09	FB 7.8
6.10–6.42	FB 8.21
6.43–6.75	FB 8.6
6.76–7.16	FB 9.0
7.17–7.43	FB 9.5
7.44–7.99	FB 10.0
8.00-8.46	FB 10.6
8.47-9.19	FB 11.2
9.20-9.74	FB 12.1
9.75–10.3	FB 13.1
10.4–10.8	FB 13.9
10.9–11.6	FB 14.8
11.7–12.2	FB 15.6
12.3–13.1	FB 16.4
13.2–13.7	FB 17.6
13.8–14.3	FB 18.4
14.4–15.5	FB 19.4
15.6–16.7	FB 21.1
16.8–17.6	FB 22.6
17.7–18.6	FB 23.6
18.7–19.9	FB 24.8
20.0–21.1	FB 92.0
21.2–25.0	FB 105.0

Motor FLC (A) 2.30-2.60	Thermal Unit Number
2.30-2.60	
2.61 – 2.87 2.88 – 3.17 3.18 – 3.77 3.38 – 3.76 3.77 – 4.29 4.30 – 4.75 4.76 – 5.26 5.27 – 5.51 5.52 – 5.78 5.79 – 6.13 6.14 – 6.13 6.14 – 6.13 6.14 – 6.13 6.14 – 6.13 6.14 – 6.13 1.10 – 7.57 7.58 – 7.90 7.91 – 8.81 8.82 – 9.47 9.48 – 10.0 10.1 – 10.7 10.8 – 11.4 11.5 – 12.1 12.2 – 13.1 13.2 – 13.1 13.2 – 13.7 14.8 – 16.0 16.1 – 17.3 17.4 – 18.2 18.3 – 19.4 19.5 – 20.7 20.8 – 22.3	FB 3.33 FB 3.71 FB 4.1 FB 4.5 FB 4.75 FB 5.3 FB 6.1 FB 6.75 FB 7.45 FB 7.8 FB 8.6 FB 9.0 FB 9.5 FB 10.0 FB 10.6 FB 11.2 FB 12.1 FB 13.9 FB 14.8 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 17.6 FB 18.4 FB 19.4 FB 21.1 FB 22.6 FB 23.6 FB 24.8 FB 26.7
22.4–23.5 23.6–24.2	FB 28.3 FB 29.6
24.3–26.0	FB 30.5

Table 84		
Motor FLC (A)	Thermal Unit Number	
3.38–3.78	FB 4.75	
3.79–4.37	FB 5.3	
4.38–4.87	FB 6.1	
4.88–5.51	FB 6.75	
5.52–5.73	FB 7.45	
5.74–6.09	FB 7.8	
6.10–6.44	FB 8.21	
6.45–6.75	FB 8.6	
6.76–7.15	FB 9.0	
7.16–7.57	FB 9.5	
7.58–8.07	FB 10.0	
8.08–8.47	FB 10.6	
8.48–8.81	FB 11.2	
8.82-9.46	FB 12.1	
9.47-10.1	FB 13.1	
10.2-10.8	FB 13.9	
10.9–11.4	FB 14.8	
11.5–12.1	FB 15.6	
12.2–13.1	FB 16.4	
13.2–13.8	FB 17.6	
13.9–14.8	FB 18.4	
14.9–16.1	FB 19.4	
16.2–17.4	FB 21.1	
17.5–18.3	FB 22.6	
18.4–19.5	FB 23.6	
19.6–21.0	FB 24.8	
21.1–22.5	FB 26.7	
22.6–23.7	FB 28.3	
23.8–24.5	FB 29.6	
24.6–26.4	FB 30.5	
26.5–27.7	FB 32.6	
27.8–28.7	FB 34.1	
28.8–29.9	FB 35.0	
30.0–31.8	FB 36.6	
31.9–33.5	FB 38.3	
33.6–35.1	FB 40.2	
35.2–37.1	FB 42.0	
37.2–38.8	FB 44.0	
38.9–41.1	FB 46.0	
41.2–45.0	FB 48.0	

Motor FLC (A)	Thermal Unit Number
42.9–45.4	FB 44.0
42.9 <del>-4</del> 5.4 45.6-48.3	FB 44.0 FB 46.0
48.4–52.4	FB 48.0
52.5-55.9	FB 50.5
56.0–59.8	FB 52.5
59.9–63.8	FB 55.5
63.9–67.9 68.0–72.6	FB 58.0 FB 60.0
72.7–83.2	FB 63.5
83.3-94.7	FB 69.0
94.8-105	FB 77.0
106–116	FB 84.0
117–121	FB 92.0
122–133	FB 105.0

## Table 86

Table 86	
Motor FLC (A)	Thermal Unit Number
0.43-0.44	A .49
0.45-0.47	A .54
0.48-0.53	A .59
0.54-0.61	A .65
0.62-0.65	A .71
0.66-0.71	A .78
0.72-0.79	A .86
0.80-0.86	A .95
0.87-0.96	A 1.02
0.97-1.04	A 1.16
1.05-1.17	A 1.25
1.18-1.31	A 1.39
1.32–1.38	A 1.54
1.39–1.47	A 1.63
1.48–1.57	A 1.75
1.58–1.65	A 1.86
1.66–1.77	A 1.99
1.78–1.93	A 2.15
1.94–2.18	A 2.31
2.19–2.46	A 2.57
2.47–2.68	A 2.81
2.69–2.87	A 3.61
2.88–3.07	A 3.95
3.08–3.59	A 4.32
3.60–3.79	A 4.79
3.80–4.27	A 5.30
4.28–4.59	A 5.78
4.60-4.90	A 6.20
4.91-5.06	A 6.99
5.07-5.44	A 7.65
5.45-6.24	A 8.38
6.25-7.21	A 9.25
7.22-7.69	A 9.85
7.70-8.24	A 11.0
8.25-8.81	A 11.9
8.82-9.32	A 132
9.33–9.99	A 14.1
10.0–10.5	A 14.8
10.6–11.5	A 16.2
11.6–12.2	A 17.9
12.3–13.3	A 21.3
13.4–15.8	A 25.2
15.9–18.4	A 27.1
18.5–20.5	A 29.5
20.6–21.5	A 31.9
21.6–23.9	A 33.8
24.0–26.8	A 35.9
26.9–28.2	A 40.0
28.3–29.8	A 42.3
29.9–32.0	A 44.7
Table 87	

#### Table 87

Motor FLC (A)	Thermal Unit Number
0.40-0.41 0.42-0.45	A .49 A .54
0.46-0.51	A .59
0.52-0.58 0.59-0.63	A .65 A .71
0.64-0.68	A .78
0.69-0.76 0.77-0.83	A .86 A .95
0.84-0.93	A 1.02
0.94-1.01 1.02-1.14	A 1.16 A 1.25
1.15-1.28	A 1.39
1.29-1.34 1.35-1.44	A 1.54 A 1.63
1.45-1.55	A 1.75
1.56–1.61 1.62–1.71	A 1.86 A 1.99
1.72–1.85	A 2.15
1.86–2.04 2.05–2.38	A 2.31 A 2.57
2.39–2.60	A 2.81
2.61–2.77 2.78–2.98	A 3.61 A 3.95
2.99–3.40 3.41–3.64	A 4.32 A 4.79
3.65-4.08	A 5.30
4.09–4.38	A 5.78 A 6.20
4.39–4.68 4.69–4.79	A 6.99
4.80–5.11 5.12–5.84	A 7.65 A 8.38
5.85-6.70	A 9.25
6.71–7.18 7.19–7.70	A 9.85 A 11.0
7.71-8.14	A 11.9
8.15–8.56 8.57–9.15	A 13.2 A 14.1
9.16-9.80	A 14.8
9.81–10.6 10.7–11.0	A 16.2 A 17.9
	, , , , , , o

#### Table 88

Motor FLC (A)	Thermal Unit Num
0.39-0.40	A .49
0.41-0.44	A .54
0.45-0.49	A .59
0.50-0.57	A .65
0.58-0.61	A .71
0.62-0.66	A .78
0.67-0.73	A .86
0.74-0.80	A .95
0.81-0.90	A 1.02
0.91-0.97	A 1.16
0.98-1.09	A 1.25
1.10-1.23	A 1.39
1.24–1.57	A 1.86
1.58–1.66	A 1.99
1.67–1.79	A 2.15
1.80–1.99	A 2.31
2.00–2.31	A 2.57
2.32–2.50	A 2.81
2.51-2.66	A 3.61
2.67-2.85	A 3.95
2.86-3.26	A 4.32
3.27-3.49	A 4.79
3.50-3.92	A 5.30
3.93-4.20	A 5.78
4.21-4.49	A 6.20
4.50-4.64	A 6.99
4.65-4.94	A 7.65
4.95–5.62	A 8.38
5.63–6.39	A 9.25
6.40–6.82	A 9.85
6.83–7.27	A 11.0
7.28–7.71	A 11.9
7.72–8.13	A 13.2
8.14-8.64	A 14.1
8.65-9.15	A 14.8
9.16-9.97	A 16.2
9.98–11.0	A 17.9
T-1-1- 00	

#### Table 89

abic 05	
Motor FLC (A)	Thermal Unit Numbe
10.0–11.1	B 17.5
11.2–12.0	B 19.5
12.1–13.3	B 22.0
13.4–15.1	B 25.0
15.2–17.1	B 28.0
17.2–18.6	B 32.0
18.7–21.4	B 36.0
21.5–25.7	B 40.0
25.8–28.2	B 45.0
28.3–29.7	B 50.0
29.8–31.2	B 56.0
31.3–32.1	B 62.0
32.2–35.7	B 70.0
35.8–40.7	B 79.0
40.8–48.0	B 88.0
	•

i abie 90	
Motor FLC (A)	Thermal Unit Number
4.88–5.13	A 7.65
5.14–5.85	A 8.38
5.86–6.67	A 9.25
6.68–7.09	A 9.85
7.10–7.62	A 11.0
7.63–8.04	A 11.9
8.05-8.46	A 13.2
8.47-9.11	A 14.1
9.12-9.69	A 14.8
9.70–10.5	A 16.2
10.6–11.6	A 17.9
11.7–12.3	A 21.3
12.4–14.6	A 25.2
14.7–16.8	A 27.1
16.9–17.9	A 29.5
18.0–18.7	A 31.9
18.8–19.8	A 33.8
19.9–21.4	A 35.9
21.5–22.8	A 40.0
22.9–23.8	A 42.3
23.9–26.0	A 44.7

#### Table 91

Motor FLC (A)	Thermal Unit Number
4.80-5.07	A 7.65
5.08–5.73 5.74–6.48	A 8.38 A 9.25
6.49-6.90	A 9.85
6.91–7.25 7.26–7.81	A 11.0 A 11.9
7.82-8.29	A 13.2
8.30–8.81 8.82–9.40	A 14.1 A 14.8
9.41–10.0	A 16.2
10.1–11.1 11.2–11.7	A 17.9 A 21.3
11.8–13.7	A 25.2
13.8–16.0 16.1–16.9	A 27.1 A 29.5
17.0–17.7	A 31.9
17.8-18.7	A 33.8
18.8–20.2 20.3–21.4	A 35.9 A 40.0
21.5-22.5	A 42.3
22.6–23.8	A 44.7
23.9–26.0	A 48.0

#### Table 92

Motor FLC (A)	Thermal Unit Number
10.5–11.7	B 17.5
11.8–12.5	B 19.5
12.6–14.0	B 22.0
14.1–15.8	B 25.0
15.9–18.0	B 28.0
18.1–19.6	B 32.0
19.7–23.5	B 36.0
23.6–27.4	B 40.0
27.5–30.5	B 45.0
30.6–32.2	B 50.0
32.3–34.0	B 56.0
34.1–35.2	B 62.0
35.3–39.5	B 70.0
39.6–43.9	B 79.0
44.0–48.0	B 88.0

#### Table 93

Motor FLC (A)	Thermal Unit Number
23.8–25.2 25.3–26.8	CC 36.4 CC 39.6
26.9–28.4	CC 39.6 CC 42.7
28.5–30.3	CC 46.6
30.4–32.1 32.2–34.2	CC 50.1 CC 54.5
34.3–36.3	CC 59.4
36.4–40.2 40.3–43.1	CC 64.3 CC 68.5
43.2–45.9	CC 74.6
46.0–49.2 49.3–51.6	CC 81.5 CC 87.7
51.7-54.2	CC 94.0
54.3–55.7 55.8–60.3	CC 103.0 CC 112.0
60.4-63.5	CC 121.0
63.6–67.1 67.2–70.3	CC 132.0 CC 143.0
70.4–74.1	CC 156.0
74.2–78.3 78.4–83.3	CC 167.0 CC 180.0
83.4–86.0	CC 196.0

16-130

#### Table 94

Motor FLC (A)	Thermal Unit Number
25.8–27.5	CC 36.4
27.6–29.4	CC 39.6
29.5–31.4	CC 42.7
31.5–33.2	CC 46.6
33.3–36.2	CC 50.1
36.3–38.8	CC 54.5
38.9–41.6	CC 59.4
41.7–44.7	CC 64.3
44.8–47.9	CC 68.5
48.0-50.9	CC 74.6
51.0-54.4	CC 81.5
54.5-57.4	CC 87.7
57.5–60.6	CC 94.0
60.7–63.9	CC 103.0
64.0–68.4	CC 112.0
68.5–73.4	CC 121.0
73.5–78.7	CC 132.0
78.8–83.8	CC 143.0
83.9–86.0	CC 156.0

#### Table 95

Motor FLC (A)	Thermal Unit Number
42.5–44.7	CC 64.3
44.8–47.9	CC 68.5
48.0-51.2	CC 74.6
51.3–55.2	CC 81.5
55.3–59.4	CC 87.7
59.5–63.8	CC 94.0
63.9–68.8	CC 103.0
68.9–73.8 73.9–77.7	CC 103.0 CC 112.0 CC 121.0
77.8–82.5	CC 132.0
82.6–86.6	CC 143.0
86.7–91.9	CC 156.0
92.0–97.2	CC 167.0
97.3–104	CC 180.0
105–114	CC 196.0
115–123	CC 208.0
124–150	CC 219.0

#### Table 96

Motor FLC (A)	Thermal Unit Number
49.5–52.0	CC 64.3
52.1–54.8	CC 68.5
54.9–58.7	CC 74.6
58.8–63.3	CC 81.5
63.4–68.3	CC 87.7
68.4–73.6	CC 94.0
73.7–79.4	CC 103.0
79.5–85.5	CC 112.0
85.6–89.7	CC 121.0
89.8–94.8	CC 132.0
94.9–99.9	CC 143.0
100–105	CC 156.0
106–111	CC 167.0
112–126	CC 180.0
127–131	CC 196.0
132–141	CC 208.0
142–150	CC 219.0

#### Table 97

Motor FLC (A)	Thermal Unit Number
0.57-0.60 0.61-0.66	AR 1.05 AR 1.15
0.67-0.73	AR 1.26
0.74-0.81	AR 1.39
0.82-0.90 0.91-1.05	AR 1.53 AR 1.68
1.06–1.15 1.16–1.25	AR 1.85 AR 2.04
1.26–1.35	AR 2.24
1.36–1.47 1.48–1.58	AR 2.46 AR 2.71
1.59–1.74	AR 2.71 AR 2.98
1.75–1.94 1.95–2.20	AR 3.28 AR 3.62
2.21–2.47	AR 3.98
2.48–2.76	AR 4.37
2.77–3.07 3.08–3.45	AR 4.80 AR 5.3
3.46–3.81 3.82–4.20	AR 5.8 AR 6.4
4.21–4.65	AR 7.0
4.66–5.29 5.30–5.84	AR 7.7 AR 8.5
5.85–6.27	AR 9.3
6.28–6.97	AR 10.2
6.98–7.59 7.60–7.89	AR 11.2 AR 12.4
7.90–8.95 8.96–10.3	AR 13.6 AR 15.4
10.4–11.7	AR 15.4 AR 17.6
11.8–13.3 13.4–15.2	AR 20.5 AR 23.0
15.4–15.2 15.3–17.2	AR 23.0 AR 27.0
17.3–19.7 19.8–22.4	AR 30.0
19.8–22.4 22.5–26.0	AR 35.0 AR 40.0
le 98	

#### Table 9

Motor FLC (A)	Thermal Unit Number
4.24–4.62	AR 8.5
4.63–5.05	AR 9.3
5.06–5.54	AR 10.2
5.55–6.13	AR 11.2
6.14–6.44	AR 12.4
6.45–7.48	AR 13.6
7.49–8.55	AR 15.4
8.56–9.74	AR 17.6
9.75–11.1	AR 20.5
11.2–12.7	AR 23.0
12.8–14.4	AR 27.0
14.5–16.4	AR 30.0
16.5–18.9	AR 35.0
19.0–21.6	AR 40.0
21.7–23.3	AR 44.0
23.4–24.9	AR 47.0
25.0–26.9	AR 51.0
27.0–29.1	AR 55.0
29.2–31.3	AR 60.0
31.4–33.5	AR 66.0
33.6–36.9	AR 72.0
37.0–39.1	AR 79.0
39.2–40.9	AR 86.0
41.0–45.0	AR 94.0

#### Table 99

Motor FLC (A)	Thermal Unit Number
27.1–30.0	E 67
30.1–33.2	E 69
33.3–35.7	E 70
35.8–39.4	E 71
39.5–43.4	E 72
43.5–46.9	E 73
47.0–51.5	E 74
51.6–57.0	E 76
57.1–62.8	E 77
62.9–69.1	E 78
69.2–75.0	E 79
75.1–83.3	E 80

#### Table 100

Motor FLC (A)	Thermal Unit Number
50–55.9	E 88
56–60.9	E 89
91–65.9	E 91
66–69.9	E 92
70–75.9	E 93
76–81.9	E 94
82–86.9	E 96
87–92.9	E 97
93–97.9	E 98
98–107.9	E 99
108–113.9	E 101
114–125.9	E 102

#### Table 101

Motor FLC (A)	Thermal Unit Number
105–116	AR 3.28
117–132	AR 3.62
133–148	AR 3.98
149–165	AR 4.37
166–184	AR 4.80
185–207	AR 5.3
208–229	AR 5.8
230–266	AR 6.4

Table 102		
Motor FLC (A)	Thermal Unit Number	
146–169	AR 1.68	
170–185	AR 1.85	
186–201	AR 2.04	
202–217	AR 2.24	
218–236	AR 2.46	
237–253	AR 2.71	
254–279	AR 2.98	
280–311	AR 3.28	
312–353	AR 3.62	
354-396	AR 3.98	
397-442	AR 4.37	
443-492	AR 4.80	
493–520	AR 5.3	

Motor FLC (A)	Thermal Unit Number
40.8–45.5	B 1.03
45.6–49.9	B 1.16
51.0–57.5	B 1.30
57.6–65.9	B 1.45
66.0-73.1	B 1.67
73.2-81.5	B 1.88
81.6-92.3	B 2.10
92.4-104	B 2.40
105–114	B 2.65
115–128	B 3.00
129–140	B 3.30
141–160	B 3.70
161-193	B 4.15
194-209	B 4.85
210-232	B 5.50
233-248	B 6.25
249-266	B 6.90

Table 104			
Motor FLC	Thermal Unit	Max.	Fuse
(A)	Number	Ratin	ig (A)
0.65–0.73	B 1.03	1.	50
0.74–0.82	B 1.16		50
0.93–0.91	B 1.30		60
0.92-1.04	B 1.45		00
1.05-1.16	B 1.67		00
1.17-1.26	B 1.88		25
1.27–1.47	B 2.10	2.	00
1.48–1.65	B 2.40	3.	
1.66–1.89	B 2.65	3.	
1.90–2.17	B 3.00	4.	50
2.18–2.49	B 3.30	4.	
2.50–2.79	B 3.70	5.	
2.80-3.13	B 4.15	5.	
3.14-3.36	B 4.85	6.	
3.37-3.69	B 5.50	7.	
3.70–3.92	B 6.25	7.	00
3.93–4.42	B 6.90	8.	
4.43–4.99	B 7.70	9.	
5.00–5.27	B 8.20	12	0.0
5.28–5.84	B 9.10		2.0
5.85–6.61	B 10.2		2.0
6.62–7.42	B 11.5	15	5.0
7.43–8.02	B 12.8		5.0
8.03–8.53	B 14.0		5.0
8.54–9.34 9.35–10.1 10.2–10.8	B 15.5 17.5 B 17.5 17.5 B 19.5 20.0		7.5
10.9–12.0	B 22.0		5.0
12.1–13.0	B 25.0		5.0
13.1–15.5	B 28.0		0.0
		600 V Max.	250 V Max.
15.6–17.9	B 32.0	30	30
18.0–21.4	B 36.0	30	40
21.5–25.1	B 40.0	30	40
25.2–27.0	B 45.0	30	40

#### Table 105

Motor FLC (A)	Thermal Unit Number
105–112	CC 74.6
113–122	CC 81.5
123–131	CC 87.7
132–142	CC 94.0
143–153	CC 103.0
154–157	CC 112.0
158–169	CC 121.0
170–181	CC 132.0
182–195	CC 143.0
196–209	CC 156.0
210–227	CC 167.0
228–247	CC 180.0
248–266	CC 196.0

#### Table 109

Thermal Unit Number
B 0.81
B 0.92 B 1.03
B 1.16
B 1.30
B 1.45 B 1.67
B 1.88
B 2.10
B 2.40 B 2.65
B 2.05 B 3.00
B 3.30
B 3.70
B 4.15 B 4.85
B 5.50
B 6.25
B 6.90 B 7.70
B 8.20
B 9.10
B 10.2 B 11.5
B 12.8
B 14.0
B 15.5 B 17.5
B 19.5
B 22.0
B 25.0 B 28.0
B 32.0
B 36.0
B 40.0 B 45.0

Motor FLC (A)	Thermal Unit Number
3.94-4.45	B 6.90
4.46-4.97	B 7.70
4.98-5.28	B 8.20
5.29-5.97	B 9.10
5.98–6.89	B 10.2
6.90–7.92	B 11.5
7.93–8.71	B 12.8
8.72–9.27	B 14.0
9.28–10.2	B 15.5
10.3–11.4	B 17.5
11.5–12.3	B 19.5
12.4–13.9	B 22.0
14.0–15.8	B 25.0
15.9–17.9	B 28.0
18.0–19.9	B 32.0
20.0–22.8	B 36.0
22.9-25.4	B 40.0
25.5-28.9	B 45.0
29.0-30.8	B 50.0
30.9-32.5	B 56.0
32.6–34.9	B 62.0
35.0–39.7	B 70.0
39.8–44.7	B 79.0

www.schneider-electric.us

#### Table 111

Motor FLC (A)	Thermal Unit Number
14.0–14.9	CC 20.9
15.0–16.2	CC 22.8
16.3–17.2	CC 24.6
17.3–18.7	CC 26.3
18.8–20.2	CC 28.8
20.3–21.7	CC 31.0
21.8–23.3	CC 33.3
23.4–25.2	CC 36.4
25.3–27.1	CC 39.6
27.2–29.4	CC 42.7
29.5–31.6	CC 46.6
31.7–34.0	CC 50.1
34.1–36.8	CC 54.5
36.9–39.8	CC 59.4
39.9–42.3	CC 64.3
42.4–45.7	CC 68.5
45.8–49.2	CC 74.6
49.3–52.8	CC 81.5
52.9–56.8	CC 87.7
56.9–61.2	CC 94.0
61.3–66.1	CC 103.0
66.2–71.2	CC 112.0
71.3–76.7	CC 121.0
76.8–82.9	CC 132.0
83.0–90.0	CC 143.0

#### Table 112

Motor FLC (A)	Thermal Unit Number
44.0-46.8	CC 64.3
46.9-50.6	CC 68.5
50.7-54.5	CC 74.6
54.6-58.4	CC 81.5
58.5-62.9	CC 87.7
63.0-67.7	CC 94.0
67.8-72.9	CC 103.0
73.0-78.1	CC 112.0
78.2-83.9	CC 121.0
84.0-91.1	CC 132.0
91.2–97.5	CC 143.0
97.6–104	CC 156.0
105–113	CC 167.0
114–133	CC 180.0

#### Table 113

Motor FLC (A)	Thermal Unit Number
88.2–95.1	DD 112.0
95.2–101	DD 121.0
102–111	DD 128.0
112–119	DD 140.0
120–131	DD 150.0
132–149	DD 160.0
150–170	DD 185.0
171–180	DD 220.0
181–197	DD 240.0
198–204	DD 250.0
205–213	DD 265.0
214–237	DD 280.0
238–243	DD 300.0
244–266	DD 320.0

#### Table 114

Motor FLC (A)	Thermal Unit Number
133–148	B 1.30
149–174	B 1.45
175–195	B 1.67
196–219	B 1.88
220–239	B 2.10
240–271	B 2.40
272–308	B 2.65
309–348	B 3.00
349–397	B 3.30
398–429	B 3.70
430–495	B 4.15
496–520	B 4.85

#### Table 115

Motor FLC (A)	Thermal Unit Number
176–190	DD 112.0
191–203	DD 121.0
203–223	DD 128.0
224–239	DD 140.0
240–253	DD 150.0
254–299	DD 160.0
300–341	DD 185.0
342–361	DD 220.0
362–395	DD 240.0
396–409	DD 250.0
410–427	DD 265.0
428–475	DD 289.0
476–487	DD 300.0
488–532	DD 320.0

Motor FLC (A))	Thermal Unit Number
81.6–91.1	B 1.03
91.2–101	B 1.16
102–115	B 1.30
116–131	B 1.45
132–146	B 1.67
147–163	B 1.88
164–184	B 2.10
185–209	B 2.40
210–229	B 2.65
230–257	B 3.00
258–281	B 3.30
282–321	B 3.70
322–387	B 4.15
388–419	B 4.35
420–465	B 5.60
466–497	B 6.25
496–532	B 6.90

Motor FLC (A)	Thermal Unit Number
100–111.9	E 88
112–121.9	E 89
122–131.9	E 91
132–139.9	E 92
140–151.9	E 93
152–163.9	E 94
164–173.9	E 96
174–185.9	E 97
186–195.9	E 98
196–215.9	E 99
216–227.9	E 101
228–251.9	E 102

#### Table 118

Motor FLC (A)	Thermal Unit Number
210–233	AR 3.28
234–265	AR 3.62
266–297	AR 3.98
298–331	AR 4.37
332–369	AR 4.8
370–415	AR 5.3
416–459	AR 5.8
460–532	AR 6.4

#### Table 121

Table 121	
Motor FLC (A)	Thermal Unit Number
1.14–1.21	AR 1.05
1.22–1.33	AR 1.15
1.34–1.47	AR 1.26
1.48–1.63	AR 1.39
1.64–1.81	AR 1.53
1.82–2.11	AR 1.68
2.12–2.31	AR 1.85
2.32–2.51	AR 2.04
2.52–2.71	AR 2.24
2.72–2.95	AR 2.46
2.96–3.17	AR 2.71
3.18–3.49	AR 2.98
3.50-3.89	AR 3.28
3.90-4.41	AR 3.62
4.42-4.95	AR 3.98
4.96–5.53	AR 4.37
5.54–6.15	AR 4.80
6.16–6.91	AR 5.3
6.92–7.63	AR 5.8
7.64–8.41	AR 6.4
8.42–9.31	AR 7.0
9.32-10.59	AR 7.7
10.60-11.69	AR 8.5
11.70-12.55	AR 9.3
12.56–13.95	AR 10.2
13.96–15.19	AR 11.2
15.20–15.79	AR 12.4
15.80–17.91	AR 13.6
17.92–20.7	AR 15.4
20.8–23.5	AR 17.6
23.6–26.7	AR 20.5
26.8–30.5	AR 23.0
30.6–34.5	AR 27.0
34.6–39.5	AR 30.0
39.6–44.9	AR 35.0
45.0–52.0	AR 40.0

#### Table 122

Motor FLC (A)	Thermal Unit Number
8.48–9.25	AR 8.5
9.26–10.11	AR 9.3
10.12–11.09	AR 10.2
11.10–12.27	AR 11.2
12.28–12.89	AR 12.4
12.90–14.97	AR 13.6
14.98–17.11	AR 15.4
17.12–19.49	AR 17.6
19.50–22.3	AR 20.5
22.4–22.5	AR 23.0
22.6–28.9	AR 27.0
29.0–32.9	AR 30.0
33.0–37.9	AR 35.0
38.0–43.3	AR 40.0
43.4–46.7	AR 44.0
46.8–49.9	AR 47.0
50.0–53.9	AR 51.0
54.0–58.3	AR 55.0
58.4–62.7	AR 60.0
62.8–67.1	AR 66.0
67.2–73.8	AR 72.0
74.0–78.3	AR 79.0
78.4–81.9	AR 86.0
82.0–90.0	AR 94.0

#### Table 123

Motor FLC (A)	Thermal Unit Number
54.2–60.1	E 67
60.2–66.5	E 69
66.6–71.5	E 70
71.6–78.9	E 71
79.0–86.9	E 72
87.0–93.9	E 73
94.0–103.1	E 74
103.2–114.1	E 76
114.2–125.7	E 77
125.8–138.3	E 78
138.4–150.1	E 79
150.2–166.6	E 80

Motor FLC (A)	Thermal Unit Number
1.12–1.27	B 0.81
1.28–1.37	B 0.92
1.38–1.55	B 1.03
1.56–1.71	B 1.16
1.72–1.95	B 1.30
1.96–2.19	B 1.45
2.20–2.43	B 1.67
2.44–2.67	B 1.88
2.68–3.07	B 2.10
3.08–3.47	B 2.40
3.48–3.79	B 2.65
3.80–4.35	B 3.00
4.36–5.07	B 3.30
5.08–5.75	B 3.70
5.76–6.45	B 4.15
6.46–6.99	B 4.85
7.00–7.71	B 5.50
7.72–8.23	B 6.25
8.24–9.41	B 6.90
9.42–10.43	B 7.70
10.44–11.07	B 8.20
11.08–12.35	B 9.10
12.36–14.05	B 10.2
14.06-15.85	B 11.5
15.86–17.23	B 12.8
17.24–18.35	B 14.0
18.36–20.1	B 15.5
20.2–22.1	B 17.5
22.2–23.7	B 19.5
23.8–27.1	B 22.0
27.2–30.7	B 25.0
30.8–34.9	B 28.0
35.0–38.9	B 32.0
39.0-44.5	B 36.0
44.6–50.3	B 40.0
50.4–54.0	B 45.0

#### Table 128

Motor FLC (A)	Thermal Unit Number
7.88–8.91	B 6.90
8.92–9.95	B 7.70
9.96–10.57	B 8.20
10.58–11.95	B 9.10
11.96–13.79	B 10.2
13.80–15.85	B 11.5
15.86–17.43	B 12.8
17.44–18.55	B 14.0
18.56–20.5	B 15.5
20.6–22.9	B 17.5
23.0-24.7	B 19.5
24.8-27.9	B 22.0
28.0-31.7	B 25.0
31.8-35.9	B 28.0
36.0-39.9	B 32.0
40.0-45.7	B 36.0
45.8-50.9	B 40.0
51.0-61.7	B 45.0
61.8–65.1	B 50.0
65.2–69.9	B 56.0
70.0–79.5	B 62.0
79.6–89.4	B 70.0

#### Table 129

Motor FLC (A)	Thermal Unit Number	
28.0-29.9	CC 20.9	
30.0-32.5	CC 22.8	
32.6-34.5	CC 24.6	
34.6-37.5	CC 26.3	
37.6–40.5	CC 28.8	
40.6–43.5	CC 31.0	
43.6–46.7	CC 33.3	
46.8–50.5	CC 36.4	
50.6–54.3	CC 39.6	
54.4–58.9	CC 42.7	
59.0–63.3	CC 46.6	
63.4–68.1	CC 50.1	
68.2–73.7	CC 54.5	
73.8–79.7	CC 59.4	
79.8–84.7	CC 64.5	
84.8–91.5	CC 68.5	
91.6–98.5	CC 74.6	
98.6–105.7	CC 81.5	
105.8–113.7	CC 87.7	
113.8–122.5	CC 94.0	
122.6–132.3	CC 103.0	
132.4–142.5	CC 112.0	
142.6–153.5	CC 121.0	
153.6–165.9	CC 132.0	
166.0–180.0	CC 143.0	

Motor FLC (A)	Thermal Unit Number
4.60–5.23	B 6.90
5.24–5.86	B 7.70
5.87–6.25	B 8.20
6.26-7.09	B 9.10
7.10-8.25	B 10.2
8.26-9.49	B 11.5
9.50–10.3	B 12.8
10.4–11.2	B 14.0
11.3–12.5	B 15.5
12.6–13.8	B 17.5
13.9–15.0	B 19.5
15.1–16.9	B 22.0
17.0–19.1	B 25.0
19.2–22.0	B 28.0
22.1–24.4	B 32.0
24.5–28.0	B 36.0
28.1–31.8	B 40.0
31.9–36.0	B 45.0
36.1–38.5	B 50.0
38.6–41.2	B 56.0
41.3–44.4	B 62.0
44.5–50.3	B 70.0
50.4–56.9	B 79.0
57.0–59.0	B 88.0

Table 134

Table 104			
Motor FLC (A)	Thermal Unit Number		
4.30–4.98	B 6.90		
4.99–5.57	B 7.70		
5.58–5.94	B 8.20		
5.95–6.71	B 9.10		
6.72–7.79	B 10.2		
7.80–8.93	B 11.5		
8.94–9.77	B 12.8		
9.78–10.5	B 14.0		
10.6–11.7	B 15.5		
11.8–13.0	B 17.5		
13.1–14.0	B 19.5		
14.1–15.0	B 22.0		
15.1–17.2	B 25.0		
17.3–19.9	B 28.0		
20.0–22.3	B 32.0		
22.4–26.0	B 36.0		
26.1–29.8	B 40.0		
29.9–34.0	B 45.0		
34.1–36.7	B 50.0		
36.8–39.5	B 56.0		
39.6–42.1	B 62.0		
42.2–46.6	B 70.0		
46.7–51.5	B 79.0		
51.6–54.0	B 88.0		

Tubic 100				
Motor FLC (A)		Thermal Unit Number		
1 T. U.	3 T. U.	Thermal Onit Number		
0.77-0.88 0.89-1.02 1.03-1.19 1.20-1.37 1.38-1.62 1.63-1.90 1.91-2.12 2.13-2.46 2.47-2.83 2.84-3.19 3.20-3.61 3.62-3.89 3.90-4.32 4.33-4.57 4.58-5.19 5.20-5.79 5.80-6.16 6.17-6.94 6.95-7.99 7.80-8.99 9.00-9.98 9.99-10.6 10.7-11.6 11.7-13.1 13.2-14.2 14.3-15.4 15.5-17.6 17.7-20.0	0.85-0.95 0.96-1.09 1.10-1.21 1.22-1.35 1.36-1.56 1.57-1.76 1.77-1.94 1.95-2.27 2.23-2.57 2.58-2.87 2.88-3.21 3.22-3.50 3.51-3.79 3.80-4.04 4.05-4.53 4.54-5.03 5.04-5.36 5.37-5.97 5.98-6.89 6.90-7.79 7.80-8.53 8.54-9.09 9.10-9.99 10.0-10.9 11.0-11.7 11.8-13.4 13.5-15.4 15.5-17.9	B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.65 B 3.00 B 3.30 B 3.70 B 4.15 B 4.85 B 5.50 B 6.25 B 6.90 B 7.70 B 8.20 B 9.10 B 10.2 B 11.5 B 12.8 B 14.0 B 15.5 B 17.5 B 19.5 B		
	18.0–20.0	B 32.0		
For Type DPSG12 & DPSG13, 20 A Starter. Select Thermal Units from above.				
20.1–22.7 22.8–25.0 –	18.0–20.2 20.3–23.2 23.3–25.0	B 32.0 B 36.0 B 40.0		
For Type DPSG22 & DPSG23, 25 A Starter. Select any of the Thermal Units from above.				
22.8–26.1 26.2–29.6 29.7–30.0	23.3–25.8 25.9–28.6	B 36.0 B 40.0 B 45.0		
For Type DPSG32 & DPSG33, 30 A Starter. Select any of the Thermal Units from above.				

Table 136

Motor FLC (A)		The same of the St Normale and	
1 T. U.	3 T. U.	Thermal Unit Number	
0.98-1.09 1.10-1.24 1.25-1.41 1.42-1.59 1.60-1.81 1.82-2.04 2.05-2.19 2.20-2.52 2.53-2.90 2.91-3.29 3.30-3.69 3.70-3.99 4.00-4.42 4.43-4.69 4.70-5.37 5.38-5.94 5.95-6.34 6.35-7.05 7.06-8.14 8.15-9.39 9.40-10.3 10.4-11.1 11.2-12.2 12.3-13.5 13.6-14.7 14.8-16.1 16.2-18.3 18.4-20.0	0.88-0.98 0.99-1.13 1.14-1.26 1.27-1.38 1.39-1.62 1.63-1.82 1.83-2.04 2.05-2.36 2.37-2.72 2.73-3.07 3.08-3.44 3.45-3.69 3.70-4.11 4.12-4.34 4.35-4.89 4.90-5.44 5.45-5.80 5.81-6.47 6.48-7.45 7.46-8.49 8.50-9.29 9.30-9.99 10.0-10.8 10.9-12.1 12.2-13.1 13.2-14.6 14.7-16.4 16.5-18.9	B 1.30 B 1.45 B 1.67 B 1.88 B 2.10 B 2.40 B 2.65 B 3.00 B 3.30 B 3.70 B 4.15 B 4.85 B 5.50 B 6.25 B 6.90 B 7.70 B 8.20 B 9.10 B 10.2 B 11.5 B 12.8 B 14.0 B 15.5 B 19.5 B 19.5 B 19.5 B 19.5 B 19.5 B 22.0 B 25.0 B 25.0 B 28.0	
– For Typo	19.0–20.0 DPSO12 & DPSO13, 20 A	B 32.0	
Sele	ect Thermal Units from abo	ve.	
18.4–20.9 21.0–23.6 23.7–25.0 –	- 19.0–20.9 21.0–24.1 24.2–25.0	B 28.0 B 32.0 B 36.0 B 40.0	
For Type DPSO22 & DPSO23, 25 A Starter. Select any of the Thermal Units from above.			
23.7–27.2 27.3–30.0	- 24.2–27.2 27.3–30.0	B 36.0 B 40.0 B 45.0	
For Type Select an	DPSO32 & DPSO33, 30 A y of the Thermal Units from	N Starter. n above.	

Table 137

Motor FLC (A)	Thermal Unit Number	
50-55.9	E 88	
56-60.9	E 89	
61-65.9	E 91	
66-69.9	E 92	
70–75.9	E 93	
76–81.9	E 94	
82–86.9	E 96	
87–92.9	E 97	
93–97.9	E 98	
98–107	E 99	
108–113	E 101	
114–125	E 102	
126–138	E 103	
139–153	E 104	
154–163	E 106	
164–180	E 107	

Table 138

Motor FLC (A)	Thermal Unit Number
22.6–25.5	E 62
25.6–26.4	E 65
26.5–28.9	E 66
29.0–31.9	E 67
32.0–34.5	E 69
34.6–36.9	E 70
37.0–40.6	E 71
40.7–44.0	E 72
44.1–47.4	E 73
47.5–53.1	E 74
53.2–58.3	E 76
58.4–63.5	E 77
63.6–69.9	E 78
70.0–77.1	E 79
77.2–83.3	E 80
83.4–86.9	E 96
87.0–92.9	E 97
93.0–100	E 98

Table 139

Table 139		
Motor FLC (A)	Thermal Unit Number	
13.7–15.2	E 57	
15.3–16.8	E 59	
16.9–18.7	E 60	
18.8–20.0	E 61	
20.1–22.5	E 62	
22.6–23.3	E 65	
23.4–25.5	E 66	
25.6–27.9	E 67	
28.0–30.8	E 69	
30.9–33.2	E 70	
33.3–36.6	E 71	
36.7–38.9	E 72	
39.0-43.1	E 73	
43.2-47.4	E 74	
47.5-50.0	E 76	
50.1-55.2	E 77	
55.3-60.0	E 78	

#### Table 140

Table 140			
Motor FLC (A)	Thermal Unit Number		
0.34-0.36	E3		
0.37-0.40	E4		
0.41-0.43	E5		
0.44-0.47	E6		
0.48-0.51	E 7		
0.52-0.56	E 8		
0.57-0.62	E 9		
0.63-0.67	E 11		
0.68-0.73	E 12		
0.74-0.77	E 13		
0.78-0.84	E 14		
0.85-0.93	E 16		
0.94–1.00	E 17		
1.01–1.08	E 18		
1.09–1.15	E 19		
1.16–1.27	E 23		
1.28-1.45	E 24		
1.46-1.61	E 26		
1.62-1.81	E 27		
1.82-2.00	E 28		
2.01-2.12	E 29		
2.13-2.29	E 31		
2.30-2.43	E 32		
2.44-2.66	E 33		
2.67-2.98	E 34		
2.99-3.16	E 36		
3.17-3.39	E 37		
3.40-3.69	E 38		
3.70-4.00	E 39		
4.01-4.48	E 41		
4.49-5.00	E 42		
5.01-5.44	E 44		
5.45-5.99	E 46		
6.00-6.60	E 47		
6.61-6.96	E 48		
6.97-7.26	E 49		
7.27–7.99	E 50		
8.00–8.89	E 51		
8.90–9.74	E 52		
9.75–10.50	E 53		
10.6–11.5	E 54		
11.6–12.3	E 55		
12.4–13.4	E 56		
13.5–15.2	E 57		
15.3–17.2	E 60		
17.3–18.4	E 61		
18.5–20.6	E 62		
20.7–21.3	E 65		
21.4–23.4	E 66		
23.5–24.0	E 67		

#### Table 141

Motor FLC (A)	Thermal Unit Number	Max. Fuse Rating (A)	
12.2-14.4	E56	2	5
14.5-17.8	E57	3	0
17.9–18.8	E60	4	0
18.9–21.4	E61	4	0
21.5-23.0	E62	4	5
23.1-25.7	E65	5	0
25.8-28.0	E66	5	0
28.1-31.0	E67	6	0
31.1-32.7	E69	60	
32.8-35.5	E70	70	
35.6-38.2	E71	80	
38.3–43.3	E73	80	
43.4-46.9	E73A	90	
47.0–50.1	E74	100	
		600 V Max.	250 V Max.
50.2-54.0	E76	100	110
54.1-58.0	E77	100	110
58.1-60.0	E78	100	125
60.1-67.0	E79	100 125	
67.1-70.5	E80	100	125
70.6-75.9	E94	100 125	
76.0-82.0	E96	100	125
82.1-86.0	E97	100 125	

#### Table 142

Motor FLC (A)	Thermal Unit Number	Max. Ratin		
11.7–13.5	E56	2	5	
13.6–16.7	E57	3	0	
16.8–18.1	E60	3	5	
18.2–20.0	E61	4	0	
20.1-21.9	E62	4	0	
22.0–24.2	E65	4	5	
24.3–26.2	E66	5	0	
26.3–29.2	E67	50		
29.3–32.0	E69	60		
32.1–34.3	E70	70		
34.4–36.2	E71	70		
36.3–39.9	E73	80		
40.0–43.8	E73A	90		
43.9–46.2	E74	90		
46.3–50.0	E76	100		
		600 V Max.	250 V Max.	
50.1-53.9	E77	100	110	
54.0-56.0	E78	100	110	
56.1-61.0	E79	100 125		
61.1-65.9	E80	100 125		
66.0-72.0	E94	100 125		
72.1-75.9	E96	100	125	
76.0–79.9	E98	100	125	
80.0-86.0	E101	100	125	

Motor FLC (A)         Thermal Unit Number         Max. Fuse Rating (A)           18.9–20.0         E60         40           20.1–22.8         E61         45           22.9–24.7         E62         50           24.8–26.9         E65         50           27.0–29.2         E66         60           29.3–32.8         E67         60           32.9–34.9         E69         70           35.0–37.5         E70         70           37.6–39.6         E72         80           39.7–46.1         E73         80           46.2–49.9         E73A         100           50.0–56.3         E74         110           56.4–61.0         E76         125           61.1–64.0         E77         125           64.1–66.0         E78         125           66.1–72.4         E79         125           72.5–78.2         E80         150           78.3–83.9         E94         175	14.5.5							
20.1-22.8 E61 45 22.9-24.7 E62 50 24.8-26.9 E65 50 27.0-29.2 E66 60 29.3-32.8 E67 60 32.9-34.9 E69 70 35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 64.1-66.0 E77 125 64.1-66.0 E77 125 66.1-72.4 E79 125 72.5-78.2 E80 150								
22.9-24.7 E62 50 24.8-26.9 E65 50 27.0-29.2 E66 60 29.3-32.8 E67 60 32.9-34.9 E69 70 35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	18.9–20.0	E60	40					
24.8-26.9 E65 50 27.0-29.2 E66 60 29.3-32.8 E67 60 32.9-34.9 E69 70 35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	20.1-22.8	E61	45					
27.0-29.2 E66 60 29.3-32.8 E67 60 32.9-34.9 E69 70 35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	22.9-24.7	E62	50					
29.3-32.8     E67     60       32.9-34.9     E69     70       35.0-37.5     E70     70       37.6-39.6     E72     80       39.7-46.1     E73     80       46.2-49.9     E73A     100       50.0-56.3     E74     110       56.4-61.0     E76     125       61.1-64.0     E77     125       64.1-66.0     E78     125       66.1-72.4     E79     125       72.5-78.2     E80     150	24.8-26.9	E65	50					
32.9-34.9 E69 70 35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	27.0-29.2	E66	60					
35.0-37.5 E70 70 37.6-39.6 E72 80 39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	29.3–32.8	E67	60					
37.6–39.6 E72 80 39.7–46.1 E73 80 46.2–49.9 E73A 100 50.0–56.3 E74 110 56.4–61.0 E76 125 61.1–64.0 E77 125 64.1–66.0 E78 125 66.1–72.4 E79 125 72.5–78.2 E80 150	32.9-34.9	E69	70					
39.7-46.1 E73 80 46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	35.0-37.5	E70	70					
46.2-49.9 E73A 100 50.0-56.3 E74 110 56.4-61.0 E76 125 61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	37.6–39.6	E72	80					
50.0-56.3         E74         110           56.4-61.0         E76         125           61.1-64.0         E77         125           64.1-66.0         E78         125           66.1-72.4         E79         125           72.5-78.2         E80         150	39.7-46.1	E73	80					
56.4-61.0     E76     125       61.1-64.0     E77     125       64.1-66.0     E78     125       66.1-72.4     E79     125       72.5-78.2     E80     150	46.2-49.9	E73A	100					
61.1-64.0 E77 125 64.1-66.0 E78 125 66.1-72.4 E79 125 72.5-78.2 E80 150	50.0-56.3	E74	110					
64.1–66.0 E78 125 66.1–72.4 E79 125 72.5–78.2 E80 150	56.4-61.0	E76	125					
66.1–72.4 E79 125 72.5–78.2 E80 150	61.1–64.0	E77	125					
72.5–78.2 E80 150	64.1-66.0	E78	125					
	66.1-72.4	E79	125					
78.3–83.9 E94 175	72.5–78.2	E80	150					
	78.3–83.9	E94	175					
84.0–86.0 E96 175	84.0-86.0	E96	175					
86.1–92.8 E97 175	86.1-92.8	E97	175					
92.9–97.9 E98 200	92.9–97.9	E98	200					
98.0–105.0 E101 200	98.0-105.0	E101	200					
105.1–117.0 E102 200	105.1-117.0	E102	200					
117.1–133.0 E103 200	117.1–133.0	E103	200					

Table 144

TUDIC 177						
Motor FLC (A)	Thermal Unit Number	Max. Fuse Rating (A)				
18.2-19.1	E60	40				
19.2-22.1	E61	40				
22.2-23.1	E62	45				
23.2-25.7	E65	50				
25.8-27.7	E66	50				
27.8-31.3	E67	60				
31.4-33.3	E69	70				
33.4-35.9	E70	70				
36.0-38.4	E71	80				
38.5-44.2	E73	80				
44.3-46.8	E73A	90				
46.9-52.6	E74	100				
52.7-56.0	E76	110				
56.1-58.4	E77	125				
58.5-61.9	E78	125				
62.0-67.1	E79	125				
67.2-72.3	E80	150				
72.4–75.9	E94	150				
76.0–85.6	E96	150				
85.7-91.2	E98	175				
91.3–100.0	E101	200				
100.1-108.9	E102	200				
109.0-119.9	E103	200				
120.0-133.0	E104	200				

Table 145

Table 145							
Motor I	Thermal Unit						
1 T.U.	3 T.U.	Number					
16.1-18.1 18.2-20.5 20.6-23.5 23.6-27.2 27.3-30.8 30.9-35.0 35.1-37.2 37.3-40.0	14.5-16.4 16.5-18.9 19.0-21.3 21.4-23.3 23.4-27.9 28.0-31.4	B25.0 B28.0 B36.0 B36.0 B40.0 B45.0 B50.0 B56.0					

For Type DPSG42 & DPSG43, 40 A Starter. Select any of the Thermal Units from above.

Table 146

Motor F	Thermal Unit	
1 T.U.	3 T.U.	Number
3.90-4.22	3.60–3.89	B5.50
4.23-4.49	3.90–4.15	B6.25
4.50-5.14	4.16–4.76	B6.90
5.15-5.78	4.77–5.30	B7.70
5.79–6.23	5.31–5.70	B8.20
6.24–7.03	5.71–6.46	B9.10
7.04–8.23	6.47–7.65	B10.2
8.24–9.31	7.66–8.55	B11.5
9.32–10.1	8.56–9.36	B12.8
10.2–10.7	9.37–9.9	B14.0
10.8–11.9	10.0–10.9	B15.5
12.0–13.1	11.0–12.0	B17.5
13.2–13.9	12.1–12.8	B19.5
14.0–15.9	12.9–14.2	B22.0
16.0–18.0	14.3–16.0	B25.0
18.1–20.8	16.1–18.5	B28.0
20.9–23.1	18.6–21.2	B32.0
23.2–26.9	21.3–24.9	B36.0
27.0–31.4	25.0–28.0	B40.0
31.5–36.0	28.1–31.7	B45.0
36.1–38.8	31.8–34.6	B50.0
38.9–41.7	34.7–37.4	B56.0
41.8–46.3	37.5–40.0	B62.0
46.4–50.0	40.1–46.4	B70.0
	46.5–50.0 PSG52 & DPSG53, 5 of the Thermal Units f	

Table 147

Table 147							
Motor FLC (A) Thermal Unit							
1 T.U.	3 T.U.	Number					
1.04-1.14 1.15-1.29 1.30-1.43 1.44-1.56 1.57-1.79 1.80-2.03 2.04-2.26 2.27-2.51 2.52-3.03 3.04-3.31 3.32-3.73 3.74-4.07 4.08-4.49 4.50-4.76 4.77-5.44 5.45-6.04 6.05-6.46 6.47-7.24 7.25-8.64 8.65-9.59 9.60-10.5 10.6-11.3 11.4-12.6 12.7-13.9 14.0-14.9 15.0-16.5 16.6-18.9 19.0-22.2 22.3-24.6	0.93-1.04 1.05-1.18 1.19-1.33 1.34-1.43 1.44-1.67 1.68-1.88 1.89-2.09 2.10-2.41 2.42-2.79 2.80-3.15 3.16-3.54 3.55-3.75 3.76-4.22 4.23-4.46 4.47-5.09 5.10-5.61 5.62-5.99 6.00-6.70 6.71-8.19 8.20-8.79 8.80-9.66 9.67-10.2 10.3-11.4 11.5-12.6 12.7-13.5 13.6-15.1 15.2-17.2 17.3-19.9 20.0-22.5	B1.30 B1.45 B1.67 B1.88 B2.10 B2.40 B2.65 B3.00 B3.70 B4.15 B4.85 B5.50 B5.25 B6.90 B7.70 B8.20 B9.10 B10.20 B11.5 B12.8 B14.0 B15.5 B17.5 B19.5 B22.0 B25.0 B28.0 B32.0					
24.7–28.6 28.7–32.4 32.5–37.3	22.6–26.2 26.3–29.9	B36.0 B40.0 B45.0					
37.4–39.5 39.6–40.0		B50.0 B56.0					
For Type D Select any	PSO42 & DPSO43, 4 of the Thermal Units f	0 A Starter. rom above.					

Table 148

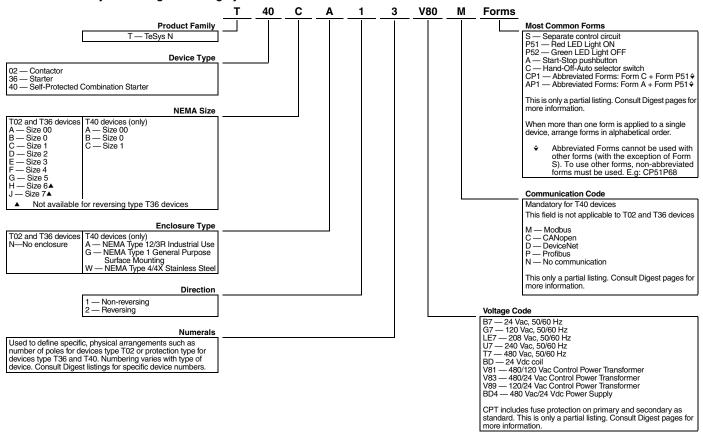
Motor F	Thermal				
1 T.U.	3 T.U.	Unit Number			
4.14–4.45	3.70-4.09	B5.50			
4.46–4.88	4.10-4.35	B6.25			
4.89–5.44	4.36-5.07	B6.90			
5.45–6.08	5.08-5.79	B7.70			
6.09–6.42	5.80-6.27	B8.20			
6.43–7.28	6.28-7.16	B9.10			
7.29–8.42	7.17-8.58	B10.2			
8.43–9.64	8.59-9.55	B11.5			
9.65–10.4	9.56-10.2	B12.8			
10.5–11.2	10.3-10.9	B14.0			
11.3–12.3	11.0-11.9	B15.5			
12.4–13.7	12.0-13.1	B17.5			
13.8–14.8	13.2-14.0	B19.5			
14.9–16.5	14.1-14.8	B22.0			
16.6–18.7	14.9-17.0	B25.0			
18.8–21.4	17.1–19.6	B28.0			
21.5–24.3	19.7–22.1	B32.0			
24.4–28.0	22.2–26.0	B36.0			
28.1–33.3	26.1–29.4	B40.0			
33.4–37.6	29.5–34.0	B45.0			
37.7–41.1	34.1–36.4	B50.0			
41.2–44.1	36.5–39.2	B56.0			
44.2–47.8	39.3–42.4	B62.0			
47.9–50.0	42.5–49.3	B70.0			
49.4–50.0 B79.0  For Type DPSO52 & DPSO53, 50 A Starter.  Select any of the Thermal Units from above.					

16 NEMA/DEFINITE PURPOSE TYPE CONTACTORS AND STARTERS

www.schneider-electric.us

#### Table 16.386: TeSys N Catalog Numbering System

**Catalog Number System** 









TeSys N non-reversing contactor, Size 1



TeSys N non-reversing contactor, Size 3

#### **TeSys N Contactors**

TeSys N contactors are used to switch heating loads, capacitors, transformers and electric motors where overload protection is provided separately. TeSys N contactors are available in NEMA Sizes 00 through 7. Target market segments include Hospitals, Retail, Food & Beverage, Marine, Oil & Gas and Mining, Metals & Minerals.

Table 16.387: TeSys N Non-Reversing Contactors, 3-Pole Polyphase, 600 Vac Max.

NEMA Size	Continuous Current	Motor Voltage	Max HP	Ор	en
NEWA SIZE	Rating (A)	Wolor Voltage	WIAX FIF	Catalog Number	\$ Price
00	9	200 230 460 575	1.5 1.5 2 2	T02AN13 <b>▲</b>	296.00
0	18	200 230 460 575	3 3 5 5	T02BN13▲	373.00
1	27	200 230 460 575	7.5 7.5 10 10	T02CN13▲	437.00
2	45	200 230 460 575	10 15 25 25	T02DN13▲	795.00
3	90	200 230 460 575	25 30 50 50	T02EN13▲■	1285.00
4	135	200 230 460 575	40 50 100 100	T02FN13▲■	3080.00
5	270	200 230 460 575	75 100 200 200	T02GN13▲■	6705.00
6	540	200 230 460 575	150 200 400 400	T02HN13▲■	18305.00
7	810	200 230 460 575	300 600 600	T02JN13▲■	26125.00

- Coil voltage code must be specified to order this product. Refer to voltage codes shown below. Lugs ordered separately. See Table 16.410 on page 16-146.

Table 16.388: TeSys N Non-Reversing Contactors, 3-Pole Single Phase, 600 Vac Max.

NEMA Size	Continuous Current	Motor Voltage	Max HP	Ор	en
NEWA SIZE	Rating (A)	Wolor Vollage	Wax FF	Catalog Number	\$ Price
00	9	115 230	1/3 1	T02AN13▲	296.00
0	18	115 230	1 2	T02BN13▲	373.00
1	27	115 230	2 3	T02CN13▲	437.00
2	45	115 230	3 7.5	T02DN13▲	795.00

Coil voltage code must be specified to order this product. Refer to voltage codes shown below.

#### Table 16.389: TeSys N Coil Voltage Codes

Voltage				Voltage 0	Code by N	EMA Size				\$ Price
Voltage	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 7	Adder
24 Vac	B7	B7	B7	B7	B6	B6		n/a		No Charge
24 Vdc	BD	BD	BD	BD	BD	BD		n/a		No Charge
120 Vac	G7	G7	G7	G7	G6	G6	G7	F7	F7	No Charge
208 Vac	LE7	LE7	LE7	LE7	L6	L6	L7	L7	L7	No Charge
240 Vac	U7	U7	U7	U7	U6	U6	U7	U7	U7	No Charge
480 Vac	T7	T7	T7	T7	Q5	Q5	S7	N7	N7	No Charge

Dimensions . . . . . . . . . . . . pages 16-147 to 16-151 TeSys N Accessories pages 16-144 to 16-146
Lugs page 16-146





TeSys N reversing contactor, Size 00



TeSys N reversing contactor, Size 4

#### **TeSys N Reversing Contactors**

TeSys N reversing contactors are used for starting, stopping and reversing AC motors where overload protection is provided separately. TeSys N reversing contactors are mechanically and electrically interlocked and are available in NEMA Sizes 00 through 7. Target market segments include Hospitals, Retail, Food & Beverage, Marine, Oil & Gas and Mining, Metals & Minerals.

Table 16.390: TeSys N Reversing Contactors, 3-Pole Polyphase, 600 Vac Max.

	NEMA Size	Continuous Current	Motor Voltage	Max HP	Op	en	
	NEMA SIZE	Rating (A)	wotor voitage	Wax nP	Catalog Number	\$ Price	
	00	9	200 230 460 575	1.5 1.5 2 2	T02AN23▲	770.00	
	0	18	200 230 460 575	3 3 5 5	T02BN23▲	923.00	
	1	27	200 230 460 575	7.5 7.5 10 10	T02CN23▲	1052.00	
	2	45	200 230 460 575	10 15 25 25	T02DN23▲	2000.00	
	3	90	200 230 460 575	25 30 50 50	T02EN23▲■	3320.00	
_	4	135	200 230 460 575	40 50 100 100	T02FN23▲■	8280.00	
_	5	270	200 230 460 575	75 100 200 200	T02GN23▲■	14935.00	
	6	540	200 230 460 575	150 200 400 400	T02HN23▲■	37340.00	
_	7	810	200 230 460 575	300 600 600	T02JN23▲■	53435.00	

Coil voltage code must be specified to order this product. Refer to voltage codes shown below.

Table 16.391: TeSys N Reversing Contactors, 3-Pole Single Phase, 600 Vac Max.

NIENA O'	Continuous	Madau Vallana	M 11D	Оре	en
NEMA Size	Current Rating (A)	Motor Voltage	Max HP	Catalog Number	\$ Price
00	9	115	1/3	T02AN23▲	770.00
	9	230	1	TUZANZ3	770.00
0	18	115	1	T02BN23▲	923.00
	10	230	2	102DIN23=	923.00
1	27	115	2	T02CN23▲	1052.00
	21	230	3	102CN23=	1032.00
2	45	115	3	T02DN23▲	2000.00
	40	230	7.5	I UZ DINZO 🛎	2000.00

<sup>▲</sup> Coil voltage code must be specified to order this product. Refer to voltage codes shown below.

#### Table 16.392: TeSys N Coil Voltage Codes

Voltage		Voltage Code by NEMA Size								\$ Price
	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 7	Adder
24 Vac	B7	B7	B7	B7	B6	B6	n/a			No Charge
24 Vdc	BD	BD	BD	BD	BD	BD	n/a			No Charge
120 Vac	G7	G7	G7	G7	G6	G6	G7	F7	F7	No Charge
208 Vac	LE7	LE7	LE7	LE7	L6	L6	L7	L7	L7	No Charge
240 Vac	U7	U7	U7	U7	U6	U6	U7	U7	U7	No Charge
480 Vac	T7	T7	T7	T7	Q5	Q5	S7	N7	N7	No Charge

Dimensions	pages 16-147 to 16-151
TeSys N Accessories	pages 16-144 to 16-146
Lugs	page 16-146

Lugs ordered separately. See Table 16.410 on page 16-146.

www.schneider-electric.us







TeSys N Size 1 Contactor + TeSys D Bimetal Overload Relay

## TeSys N Starters

TeSys N starters are used for full-voltage starting and stopping of AC squirrel cage motors. Starters are available in NEMA Sizes 00 through 7 and come standard with Motor Logic Class 10/20 selectable solid state overload relays. Starters with bimetal overload protection can be assembled from TeSys N contactors and TeSys D overload relays. For more information on TeSys D relays, see Table 16.395 below.

Table 16.393: TeSys N Non-Reversing Starters, 3-Pole Polyphase, 600 Vac Max.

NEMA Size	Continuous Current	Motor Voltage	Max HP	Op	en
NEWA Size	Rating (A)	wotor voitage	wax nP	Catalog Number	\$ Price
00	9	200 230 460 575	1.5 1.5 2 2	T36AN13 <b>▲</b>	431.00
0	18	200 230 460 575	3 3 5 5	T36BN13▲	520.00
1■	27	200 230 460 575	7.5 7.5 10 10	T36CN13▲	585.00
2	45	200 230 460 575	10 15 25 25	T36DN13▲	1005.00
3	90	200 230 460 575	25 30 50 50	T36EN13▲	1580.00
4	135	200 230 460 575	40 50 100 100	T36FN13▲	3490.00
5	270	200 230 460 575	75 100 200 200	T36GN13 <b>▲</b>	8430.00
6	540	200 230 460 575	150 200 400 400	T36HN13▲	19775.00
7	810	200 230 460 575	300 600 600	T36JN13 <b>▲</b>	28130.00

- ▲ Coil voltage code must be specified to order this product. Refer to voltage codes shown below.
- Special contactor/Motor Logic overload relay size combinations available: Add '0' to catalog number before coil voltage for Size 0 overload (6–18 A), '9' for Size 00C overload (3–9 A), and '8' for Size 00B overload (1.5–4.5 A). (i.e. T36CN130G7).

Table 16.394: TeSys N Coil Voltage Codes

Voltage		Voltage Code by NEMA Size								\$ Price
	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 7	Adder
24 Vac■	B7	B7	B7	B7	B6	B6	n/a			No Charge
24 Vdc▲	BD	BD	BD	BD	BD	BD	n/a			No Charge
120 Vac■	G7	G7	G7	G7	G6	G6	G7	F7	F7	No Charge
208 Vac	LE7	LE7	LE7	LE7	L6	L6	L7	L7	L7	No Charge
240 Vac	U7	U7	U7	U7	U6	U6	U7	U7	U7	No Charge
480 Vac	T7	T7	T7	T7	Q5	Q5	S7	N7	N7	No Charge

- ▲ 24 Vdc coil requires separate control, add Form S to catalog number (ie. T36AN13BDS).
- 24 and 120 Vac coils available with optional separate control, add Form S to catalog number (ie. T36AN13B7S).

#### Table 16.395: TeSys D Overload Relays—Ambient Compensated, Bimetallic, Direct Mounting

Current Setting Range (A)	For Direct Mounting to TeSys N contactors	Class 10 with Single-Phase Sensitivity	Class 10 without Single-Phase Sensitivity	Class 20 with Single-Phase Sensitivity	Class 20 without Single-Phase Sensitivity	\$ Price
0.10-0.16		LRD01	LR3D01	_	_	
0.16-0.25		LRD02	LR3D02	_	_	
0.25-0.40		LRD03	LR3D03	_	_	
0.40-0.63		LRD04	LR3D04	_	_	
0.63-1	Size 00-1	LRD05	LR3D05	_	_	60.00
1–1.6		LRD06	LR3D06	_	_	
1.6-2.5		LRD07	LR3D07	_	_	
2.5-4		LRD08	LR3D08	LRD1508	LR3D1508A1	
4–6		LRD10	LR3D10	LRD1510	LR3D1510A1	
5.5–8	Size 00–1	LRD12	LR3D12	LRD1512	LR3D1512A1	
7–10	Size 00-1	LRD14	LR3D14	LRD1514	LR3D1514A1	
9–13	Size 0–1	LRD16	LR3D16	LRD1516	LR3D1516A1	62.00
12-18	Size 0-1	LRD21	LR3D21	LRD1521	LR3D1521A1	02.00
16-24	Size 0–1	LRD22	LR3D22	_	_	
17–25	Size 0-1	_	_	LRD1522	LR3D1522A1	
23-32		LRD32	LR3D32	_	_	
23-28	Size 1	_	_	LRD1530	LR3D1530A1	73.00
25-32		_	_	LRD1532	LR3D1532A1	
9-13		LRD313	LR3D313	LRD313L	_	
12-18		LRD318	LR3D318	LRD318L	_	
16-25		LRD325	LR3D325	LRD325L	_	107.00
23-32	Size 2	LRD332	LR3D332	LRD332L	<u> </u>	107.00
30-40		LRD340	LR3D340	LRD340L	_	
37-50		LRD350	LR3D350	LRD350L	_	

 Dimensions
 pages 16-147 to 16-151

 TeSys N Accessories
 pages 16-144 to 16-146

## www.schneider-electric.us



TeSys N reversing starter, Size 00



TeSys N reversing starter, Size 4

#### **TeSys N Reversing Starters**

**Contactors and Starters** 

TeSys N reversing starters are used for full-voltage starting, stopping and reversing of AC squirrel cage motors. Reversing starters are mechanically and electrically interlocked and are available in NEMA Sizes 00 through 5. Starters come standard with Motor Logic Class 10/20 selectable solid state overload relays. Reversing starters with bimetal overload protection can be assembled from TeSys N reversing contactors and TeSys D overload relays. For more information on TeSys D relays, see Table 16.395 on page 16-142.

Table 16.396: TeSys N Reversing Starters, 3-Pole Polyphase, 600 Vac Max.

	NEMA Size	Continuous Current	Motor Voltage	Max HP	Open	
	NEWA SIZE	Rating (A)	wotor voltage	IVIAX NP	Catalog Number	\$ Price
	00	9	200 230 460 575	1.5 1.5 2 2	T36AN23 <b>▲</b>	1019.00
	0	18	200 230 460 575	3 3 5 5	T36BN23▲	1190.00
•	1■	27	200 230 460 575	7.5 7.5 10 10	T36CN23▲	1335.00
•	2	45	200 230 460 575	10 15 25 25	T36DN23▲	2450.00
•	3	90	200 230 460 575	25 30 50 50	T36EN23▲	4020.00
•	4	135	200 230 460 575	40 50 100 100	T36FN23▲	9660.00
•	5	270	200 230 460 575	75 100 200 200	T36GN23▲	18525.00

- Coil voltage code must be specified to order this product. Refer to voltage codes shown below.
- Special contactor/Motor Logic overload relay size combinations available: Add '0' to catalog number before coil voltage for Size 0 overload (6–18 A), '9' for Size 00C overload (3–9 A), and '8' for Size 00B overload (1.5–4.5 A). (i.e. T36CN230G7).

#### Table 16.397: TeSys N Coil Voltage Codes

Voltage			Voltage	Code by NE	MA Size			\$ Price	
voitage	Size 00	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	Adder	
24 Vac■	B7	B7	B7	B7	B6	B6	n/a	No Charge	
24 Vdc▲	BD	BD	BD	BD	BD	BD	n/a	No Charge	
120 Vac■	G7	G7	G7	G7	G6	G6	G7	No Charge	
208 Vac	LE7	LE7	LE7	LE7	L6	L6	L7	No Charge	
240 Vac	U7	U7	U7	U7	U6	U6	U7	No Charge	
480 Vac	T7	T7	T7	T7	Q5	Q5	S7	No Charge	

- 24 Vdc coil requires separate control, add Form S to catalog number (ie. T36AN23BDS).
- 24 and 120 Vac coils available with optional separate control, add Form S to catalog number (ie. T36AN13B7S).

E164862 CCN NLDX



LR43364 Class 3211 04





Front Mounted **Auxiliary Blocks** 

Table 16.398: Standard, Instantaneous Auxiliary Contact Blocks

Snap-On	Number of	Comp	osition	Catalog Number	\$ Price	
Mounting	Contacts	N.O.	N.C.	Catalog Number		
		2	2	LADN22 ▲	41.50	
		1	3	LADN13 ▲	41.50	
To front of	4	4	0	LADN40 ▲	41.50	
Size 00–2	4	4 0 4 LADNO4			41.50	
or		LADN31 ▲	41.50			
To right side of Size 3-7		2 ■	2 ■	LADC22 ▲■	41.50	
Size 3-7		1	1	LADN11 ▲	20.70	
	2 2 0 LADN		LADN20 ▲	20.70		
		0	2	LADN02▲	20.70	
To left side of	4	1	0	LADN10	13.10	
Size 3–7	'	0	1	LADN01	13.10	
To side of	2	1	1	LAD8N11 ◆	20.70	
Size 00–2	2	2	0	LAD8N20 ◆	20.70	

For spring terminal versions of these blocks, add a 3 to the end of the catalog number (for example, LADN223).

There is no charge for this modification. For slip-on versions, add 9 to the end of the catalog number (for example, LADN229).

#### Table 16.399: Instantaneous Blocks with Dust-Tight Auxiliary Contacts (IP54) NEMA 12

Snap-On Mounting	Standard	Contacts	Dust-Tigh	t Contacts	Catalog Number	\$ Price
	N.O.	N.C.	N.O.	N.C.	Catalog Number	\$ FIICE
To front of	_	_	2	_	LA1DX20	65.00
Size 00–2	2	_	2	_	LA1DZ40	82.00
To right side of Size 3–7	1	1	2	_	LA1DZ31	82.00
	_	_	2	_	LA1DY20★	77.00

<sup>★</sup> Device supplied with 4 ground terminal points.

#### Table 16.400: Pneumatic Time Delay Contact Blocks

Snap-On Mounting	Time Delay Contacts		Type	Range of	Catalog Number △	\$ Price	
Mounting	N.O.	N.C.		Time Delay	Number 4		
To front of	1			0.1 to 3 s▼	LADT0	131.00	
		4	On energization	0.1 to 30 s	LADT2	131.00	
Size 00–2	'	'	(on delay)	10 to 180 s	LADT4	131.00	
or				1 to 30 s□	LADS2	131.00	
To right side of Size 3–7				0.1 to 3 s▼	LADR0	131.00	
Size 5–7	1	1	On de-energization (off-delay)	0.1 to 30 s	LADR2	131.00	
			(OII-delay)	10 to 180 s	LADR4	131.00	

Scale range is expanded between 0.1 and 0.6 seconds on the dial for more accurate settings at the lower end of the range

Table 16.401: Mechanical Latch Blocks with Manual or Electrical Unlatch

Front snap-on mounting onto	Application	Catalog Number	\$ Price
Size 00-2	For silent operation and energy conservation	LAD6K10♦★	77.00

Does not include internal coil clearing contact.

#### Table 16.402: Coil Voltage Codes for LA6DK Mechanical Latch Blocks

	•					
Volts	24	120	208	240	480	
AC or DC∇	В	F	L	M	R	

DC available at 24 V only.

Including 1 N.O. + 1 N.C. make-before-break overlapping contacts.

1 block may be added to the left side of Size 00–1, AC coils only; only 1 block may be added to either side of the Size 2 contactor, AC coil only. Cannot be installed on Size 00–2 contactors with DC coils.

For spring terminal versions of these blocks, add a 3 to the end of the catalog number (for example, LADT23). There is no charge for this modification.

Switching time between the opening of the N.C. contact and the closing of the N.O. contact: 40 ms  $\pm$  15 ms .

Complete the catalog number by adding the coil voltage code (for example, LAD6K10F).

#### **Contactor Accessories**

# A A

LA4DA1U

#### **RC Coil Suppressor**

- Limitation of transient voltage to 300% of nominal voltage maximum.
- Oscillating frequency limited to 400 Hz maximum. Slight increase in drop-out time (1.2 to 2 times normal).

#### Table 16.403: Resistor/Capacitor Circuit (RC) for Reduction of Electrical Noise in AC Contactor Coils

Installed by	Mounting on	Operating Voltage 50/60 Hz	Catalog Number	\$ Price
		24 V	LAD4RCE	26.20
Snapping into the cavity on the right side without tools	Size 00-1	120 V	LAD4RCG	26.20
		120–240 V	LAD4RCE	26.20
		24 V	LAD4RC3E	26.20
Snap-on mounting, and connection without tools to the contactor coil terminals	Size 2	120 V	LAD4RC3G	26.20
Contactor con terminals		120-240 V	LAD4RC3U	26.20

#### **Varistor Coil Suppressor**

- Limitation of transient voltage value to 200% of nominal voltage maximum.
- Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times normal).

#### Table 16.404: Varistor (Peak Limiting) for Reduction of Electrical Noise in AC Contactor Coils

Installed by	Mounting on	Operating Voltage 50/60 Hz	Catalog Number	\$ Price
		24 V	LAD4VE	26.20
Snapping into the cavity on the right side without tools	Size 00-1	120 V	LAD4VG	26.20
		120-240 V	LAD4VU	26.20
		24 V	LAD4V3E	26.20
Snap-on mounting, and connection without tools to the contactor coil terminals	Size 2	120 V	LAD4V3G	26.20
contactor con terrinale		120-240 V	LAD4V3U	26.20

#### **Diode Coil Suppressor**

- No overvoltage or oscillating frequency.
- Polarized component. Increased drop-out time (6–10 times normal).

#### Table 16.405: Diode for Reduction of Electrical Noise in DC Contactor Coils

Installed on the upper part by	Mounting on	Operating Voltage, DC	Catalog Number	\$ Price
Snap-on mounting and connection w/o tools to the contactor coil terminals	Size 00-1	24 Vdc	LAD4DDL	26.20
Clip-on front mounting	Size 2	24 Vdc	LAD4D3U	26.20

#### **Bidirectional Diode Coil Suppressor**

- Protection provided by limiting the transient voltage to 2 Uc max.
- Maximum reduction of transient voltage peaks

#### Table 16.406: Bidirectional Peak Limiting Diode

Installed by	Mounting on	Operating Voltage 50/60 Hz and DC	Catalog Number	\$ Price
Snapping into the cavity on the right side of the contactor ♀	Size 00-1*	24 (AC only)	LAD4TB	26.20
0" ( ) "   1   "   1		24 V	LAD4T3B	26.20
Clip-on front mounting and connection without tools to the contactor coil terminals *	Size 2	120 V	LAD4T3G	26.20
to the contactor contentinals 4		208–240 V	LAD4T3U	26.20

- Installing the suppressor into the cavity makes the electrical connection. Overall width of the contactor remains the same.
- \* For Size 00–2 with DC coils, 3-pole contactors are fitted with built-in bidirectional diode suppression as standard.



LAD4T3B



LAD4BB••

Table 16.407: Cabling Accessories

Usage	Mounting on	Operating V	oltage 50/60 Hz	Catalog Number	\$ Price	
		Without coil suppression		LAD4BB	23.00	
For adapting existing wiring to a new product or for use with	Size 00-1, AC only	With coil	24 V	LAD4BBVE	23.00	
top-mounting accessory.	Size 00-1, AC Offig	suppres	suppression	120 V	LAD4BBVG	23.00
		(varistor)	ppression	23.00		
For adapting existing wiring to a new product or for use with top-mounting accessory	Size 2, AC only		_	LAD4BB3	26.20	

LA4DFB



The following accessories require use of cabling accessories (LAD4BB●●) for proper mounting. See page 16-145 for illustration.

#### Table 16.408: Electronic Serial Timer Modules

These solid state modules delay the energizing of the contactor coil, and feature built-in varistor surge suppression.

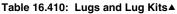
Туре	Operational Voltage 24–250 Vac	Time Delay	Catalog Number	\$ Price
		0.1–2 s	LA4DT0U	82.
On-delay	Size 00–2	1.5–30 s	LA4DT2U	82.
		25-500 s	LA4DT4U	82.

#### Table 16.409: Interface Modules ▲

These modules allow the contactor coils to be energized from low voltage and low current level signals. They come in mechanical relay and solid state versions. The relay plus manual operation versions include a lever for manually turning the contactor on and off. When a module receives a low level signal, it allows the separate-sourced control voltage to flow to the contactor coil. It saves space and wiring time compared to conventional interposing relays.

Interfere Time	Operational Voltage	Innut Valtage	Catalan Number	\$ Price
Interface Type	24–250 Vac	Input Voltage	Catalog Number	\$ Price
Relay	Size 00–2	24 Vdc	LA4DFB	55.
Relay Plus Manual Operation	Size 00-2	24 Vdc	LA4DLB	71.
Solid State	Size 00–2	24 Vdc	LA4DWB	71.

Adapter required, see Table 16.407 on page 16-145.



TeSys N	L	_ugs	Lucy Miles	Oakla sias AWO sassas
Contactor	Line Size	Load Side	- Lug Kits■	Cable size AWG range
Size 3	3 each DZ2FF1	3 each DZ2FF1	DZ2FF6	14 to 2/0
Size 4	3 each DZ2FG1	3 each DZ2FG1	DZ2FG6	6 to 3/0
Size 5	3 each DZ2FJ1	3 each DZ2FJ1	DZ2FJ6	4 to 500 MCM
Size 6	3 each DZ2FK1	3 each DZ2FK1	DZ2FK6	2 x 2 to 600 MCM
Size 7	1 each DZ2FL1 DZ2FL2 DZ2FL3	1 each DZ2FL1 DZ2FL2 DZ2FL3	DZ2FL6	3 x 2 to 600 MCM

Mounting hardware (screws, washers and nuts) are provided with the contactors, not the lugs. Starters Sizes 3-7 supplied with lugs. See Table 16.411

for pricing. Lug kits incude 6 lugs.

#### Table 16.411: Lug Pricing

\$ Price	Lug Catalog Number
6.50	DZ2FF1
11.00	DZ2FG1
11.00	DZ2FJ1
21.80	DZ2FK1
27.30	DZ2FL1
27.30	DZ2FL2
27 30	D72FI 3

ug Kit Catalog Number	\$ Price
DZ2FF6	39.30
DZ2FG6	65.00
DZ2FJ6	65.00
DZ2FK6	131.00
DZ2FL6	164.00



Table 16.412: TeSys N Contactors, Size 00-1, Non-Reversing▲

			Dimensions			
Dimensional Diagram	Dimension	Description	AC C	oil	DC	Coil
	b Without add-on accessories  With LAD4BB With LA4D*2 With LA4DF, DT With LA4DR, DW, DL  c Without cover or add-on blocks C1 With Cover, without add-on blocks C2 With LADN or LADC C2 With LADN T, R, S With LADT, R, S and sealing cover	In	mm	In	mm	
Minimum electrical clearance			3.35	85	3.35	85
- Inninian dicented dicardice		With LAD4BB	3.86	98	n/a	n/a
	h1	With LA4D•2	4.49	114	n/a	n/a
	DI	With LA4DF, DT	4.84	123	n/a	n/a
		With LA4DR, DW, DL	5.12	130	n/a	n/a
	_	Without cover or add-on blocks	3.54	90	3.90	99
	C	With cover, without add-on blocks	3.62	92	3.98	101
	c1	With LADN or LADC	4.84	123	5.20	132
39	c2	With LAD6K10	5.31	135	5.67	144
.       -   -   -   -   -   -   -   -		With LADT, R, S	5.63	143	5.98	152
c2 1.77 c3	c3	With LADT, R, S and sealing cover	5.79	147	6.14	156
▲ DIN rail and panel mountable.	•					

Table 16.413: TeSys N Contactors, Size 2, Non-Reversing▲

				Dimen	sions
Dia	nensional Diagram	Dimension	Description	AC or Do	C Coils
				ln	mm
_Minimum electrical clearance	00	а		2.17	55
			With LA4 DB3 or LAD 4BB3	5.35	136
		b1	With LA4 DF, DT	6.18	157
			With LA4 DM, DW, DL	6.54	166
		С	Without cover or add-on blocks	4.65	118
122	14.6	,	With cover, without add-on blocks	4.72	120
	<del>                                      </del>	c1	With LAD N or C (2 or 4 contacts)	5.91	150
		c2	With LAD 6K10 or LA6 DK	6.42	163
<del> </del>			With LAD T, R, S	6.73	171
0.47 c 12 c1 c2 c3	0.49 a 0.49 12.5 12.5 (LAD 8N) (LAD 8N)	сЗ	With LAD T, R, S and sealing cover	6.89	175

▲ DIN rail and panel mountable.

Table 16.414: TeSys N Contactors, Size 3-7, Non-Reversing

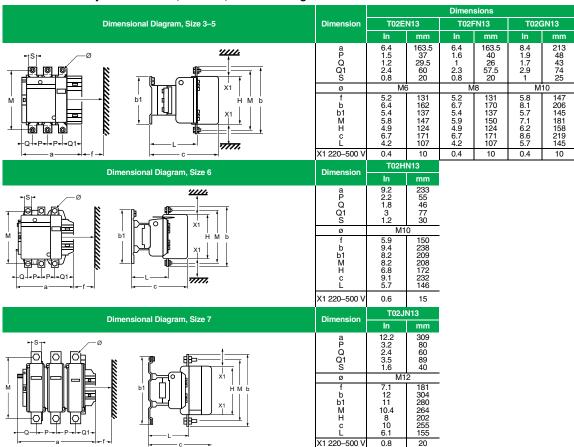




Table 16.415: TeSys N Size 00-1, Reversing Contactors▲

Dimensional Diagram		Dimension		Dimensions					
			Description	AC C	oil	DC Coil			
				ln	mm	ln	mm		
2xM4	а	Without side-mount accessories	3.54	90	3.54	90			
	000000	Ь	Contactor base	3.35	85	3.35	85		
	2	C	With cover, without add-on blocks	3.62	92	3.98	101		
		e1		0.35	9	0.35	9		
		e2		0.20	5	0.20	5		
	_ a →	G	Mounting holes	3.15	80	3.15	80		

DIN rail and panel mountable.

Table 16.416: TeSys N Size 2, Reversing Contactors▲

			Dimensions  AC and DC Coils			
Dimensi	onal Diagram	Description				
			ln	mm		
-		Width	4.69	119		
		Height	4.80	122		
		Depth with cover, without add-on blocks	4.72	120		
		Load side mounting hole width	2.52	64		
130		Line side mounting hole width	3.40	101.5		
120	119	Mounting hole height	5.04	128		

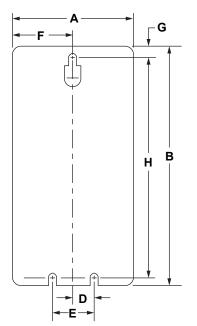
DIN rail and panel mountable.

Table 16.417: TeSys N Size 3-7, Reversing Contactors

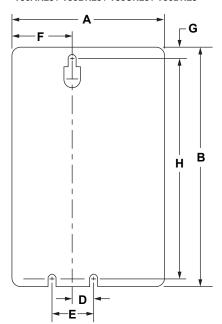
		Dimensions									
Dimensional Diagram	Dimension	T02EN23		T02FN23		T02GN23		T02HN23		T02JN23	
		In	mm	ln	mm	In	mm	In	mm	In	mm
D,   W L   R N	D	0.38	9, 7	0.38	9, 7	0.56	14, 2	0.56	14, 2	0.56	14, 2
	Н	7.96	202, 2	7.96	202, 2	15.27	387, 9	15.27	387, 9	22.25	565, 2
	L	11.75	298, 5	11.75	298, 5	18	457, 2	18	457, 2	30	762, 0
	М	7	177, 8	7	177, 8	14	355, 6	14	355, 6	19.75	501, 7
	N	0.49	12, 5	0.49	12, 5	0.62	15, 8	0.62	15, 8	1.25	31, 8
	R	0.49	12, 5	0.49	12, 5	0.62	15, 8	0.62	15, 8	0.69	17, 5
	W	12.71	322, 8	12.71	322, 8	19.27	489, 5	19.27	489, 5	31.38	797, 0
	Х	5.16	131, 0	5.16	131, 0	5.79	147, 0	5.91	150, 0	7.13	181, 0

# **Dimensions**

# Non-reversing T36AN13 / T36BN13 / T36CN13 / T36DN13



Reversing T36AN23 / T36BN23 / T36CN23 / T36DN23



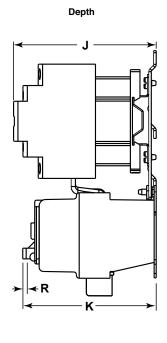


Table 16.418: TeSys N Size 00-2, Non-Reversing and Reversing Starters

				Non-Rev	ersing/							Reve	rsing			
Dimension	Size T36A			ze 0 BN13		ze 1 CN13		ze 2 DN13		e 00 AN23		ze 0 BN23		ze 1 CN23		ze 2 DN23
	ln	mm	ln	mm	In	mm	ln .	mm	ln .	mm	In	mm	ln	mm	ln .	mm
Α	3.19	81, 0	3.19	81, 0	3.19	81, 0	3.19	81, 0	43.9	111, 5	43.9	111, 5	43.9	111, 5	5.19	131, 8
В	6.64	168, 7	6.64	168, 7	6.64	168, 7	8.61	218, 7	6.64	168, 7	6.64	168, 7	6.64	168, 7	8.61	218, 7
D	0.5	12, 7	0.5	12, 7	0.5	12, 7	0.5	12, 7	0.5	12, 7	0.5	12, 7	0.5	12, 7	0.5	12, 7
E	1.0	25, 4	1.0	25, 4	1.0	25, 4	1.0	25, 4	1.0	25, 4	1.0	25, 4	1.0	25, 4	1.0	25, 4
F	1.59	40, 5	1.59	40, 5	1.59	40, 5	1.59	40, 5	1.59	40, 5	1.59	40, 5	1.59	40, 5	1.59	40, 5
G	0.20	5, 2	0.20	5, 2	0.20	5, 2	0.20	5, 2	0.20	5, 2	0.20	5, 2	0.20	5, 2	0.20	5, 2
Н	6.16	156, 5	6.16	156, 5	6.16	156, 5	8.22	208, 8	6.16	156, 5	6.16	156, 5	6.16	156, 5	8.22	208, 8
J (AC Coil)	4.17	105, 9	4.17	105, 9	4.17	105, 9	4.04	405.4	4.17	105, 9	4.17	105, 9	4.17	104, 9	4.04	405.4
J (DC Coil)	4.52	114, 9	4.52	114, 9	4.52	114, 9	4.94	125, 4	4.52	114, 9	4.52	114, 9	4.52	114, 9	4.94	125, 4
К	3.90	99, 0	3.90	99, 0	3.90	99, 0	3.90	99, 0	3.90	99, 0	3.90	99, 0	3.90	99, 0	3.90	99, 0
R▲	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1

Reset travel.



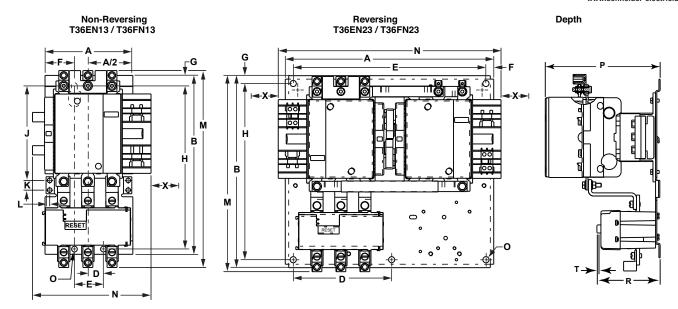


Table 16.419: TeSys N Size 3-4, Non-Reversing and Reversing Starters

		Non-Rev	ersing			Reve	rsing	
Dimension	Size T36El			te 4 FN13		te 3 EN23		te 4 FN23
	ln .	mm	ln	mm	ln	mm	In	mm
Α	5.31	134, 9	5.31	134, 9	12.71	322, 8	12.71	322, 8
В	10.82	274, 8	10.82	274, 8	11.71	297, 4	11.71	297, 4
D	0.88	22, 4	0.88	22, 4	6.0	152, 4	6.0	152, 4
E	1.75	44, 5	1.75	44, 5	11.75	298, 5	11.75	298, 5
F	1.78	45, 0	1.78	45, 0	0.48	12, 2	0.48	12, 2
G	0.32	8, 1	0.32	8, 1	0.48	12, 2	0.48	12, 2
Н	10.19	258, 8	10.19	258, 8	10.75	273, 1	10.75	273, 1
J	6.03	153, 2	6.03	153, 2	-		-	-
K	0.59	15, 0	0.59	15, 0	-	_	-	1
L	0.22	5, 6	0.22	5, 6	-	_	-	_
М	11.91	302, 4	11.91	302, 4	11.96	303, 8	11.96	303, 8
N	6.57	166, 8	6.57	166, 8	13.58	344, 9	13.58	344, 9
0	0.375	9, 5	0.375	9, 5	0.375	9, 5	0.375	9, 5
Р	6.96	176, 7	6.96	176, 7	7.18	182, 4	7.18	182, 4
R	3.8	97	3.8	97	3.8	97	3.8	97
T▲	0.24	6.1	0.24	6.1	0.24	6.1	0.24	6.1
X■	5.16	131, 0	5.16	131, 0	5.16	131, 0	5.16	131, 0

- ▲ Reset travel.
- Minimum distance for coil removal.



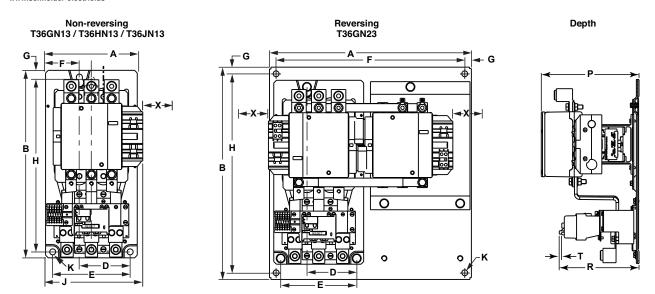


Table 16.420: TeSys N Size 5-7, Non-Reversing and Reversing Starters

			Non-Rev	ersing/			Reve	ersing
Dimension	Size T36G			e 6 HN13		e 7 JN13		e 5 GN23
	In	mm	In	mm	ln	mm	In	mm
Α	8.58	217, 9	8.58	217, 9	8.58	217, 9	19.3	489, 4
В	17.56	446, 0	19.75	501, 7	23.58	598, 9	20.3	514, 8
D	4.75	120, 7	4.75	120, 7	4.75	120, 7	4.75	120, 7
E	7.25	184, 2	7.25	184, 2	7.25	184, 2	7.25	184, 2
F	3.17	80, 4	3.17	80, 4	3.17	80, 4	18.0	457, 2
G	0.63	16, 0	0.63	16, 0	0.63	16, 0	0.63	16, 1
Н	16.37	415, 8	18.56	463, 6	22.38	565, 9	19.0	482, 6
J	9.91	251, 6	9.91	251, 6	9.91	251, 6	_	_
K	0.56	14, 2	0.56	14, 2	0.56	14, 2	0.56	14, 2
Р	9.32	236, 8	9.32	236, 8	9.32	236, 8	9.95	252, 7
R	7.38	187, 0	9.16	232, 7	8.07	205, 0	7.38	187, 0
T▲	0.24	6, 1	0.24	6, 1	0.24	6, 1	0.24	6, 1
X■	5.79	147 1	5.91	150, 1	7.13	181, 1	5.79	147, 1

Reset travel.

Minimum distance for coil removal.

# **Section 17**

# **Motor Control Centers**







Model 6 Unit



Model 6 Motor Control Center

#### **Model 6 Motor Control Centers**

Structure and Unit Features	17-2
Merchandised Units General Information	17-2
Combination Starters with Motor Circuit Protector Disconnects	17-3
Combination Starters with Fusible Switch Disconnects	17-4
Compac™ 6 Combination Starters	17-5
Branch Feeder Units	17-6

#### Overview

Designed and manufactured to tackle the toughest power and process control challenges, the Model 6 Motor Control Center features industry-finest innovations that provide unmatched performance, high reliability, and low maintenance. The Model 6 Motor Control Center has integrated industry-leading components into the smallest and most flexible footprint possible to meet your power, control, and automation needs. The Model 6 provides superior performance, as well as long, reliable operation with enhanced safety features.





Class 8998 / Refer to Catalog 8998CT9701

# MOTOR CONTROL CENTERS

Model 6 Motor Control Center



Model 6

#### Model 6 Structure Features

- Horizontal main bus uses captive splice bar assembly; allows splicing without removing units
- Horizontal bus is located at the top of the structure for easy installation, inspection and maintenance Available ampacity 600 A, 800 A, 1200 A, 2000 A, and 2500 A
- Sliding non-conductive bus barrier
- 300 A and 600 A vertical bus
- Vertical bus openings built on 3-inch centers
- Optional automatic vertical bus shutters are available
- Mounting channel includes leveling notches for ease of alignment
- Full depth vertical wireway available, either 4-inch or 9-inch width
- Vertical ground bus is standard

#### **Model 6 Unit Features**

- Cast metal handle, color coded for clear indication of disconnect position (including "Tripped")
- Twin-handle cam ("Butterfly") mechanism standard on all plug-on units (except Compac™ 6)
- Rugged unit construction features solid rear, side and hinged bottom plates
- Forward tilted pull-apart control terminal blocks standard with NEMA Type B or C wiring
- Starter units available with Class 8536 Type S NEMA or D-Line IEC
- Available overload relays on starter include: melting alloy, bimetallic, Motor Logic™, and TeSys T™
- Control station plate for pilot devices is mounted on front of unit (no cables across door hinge)
- Easily accessible control transformer
- Starter mounted on right-hand side of unit, adjacent to wireway, for ease of cable termination

#### Available units include:

- Automation equipment
- Altivar™ AC drives
- Altistart™ soft starts
- Surge Protection Device (SPD) units
- PowerLogic™ circuit monitor and power meter
- Compac 6 starters and branch
- Reduced voltage starters
- Distribution transformers and panelboards
- Empty mounting units
- Masterpact™ drawout main circuit breakers
- Master terminal compartments
- Automatic transfer switches
- Full voltage non-reversing
- Full voltage reversing
- Circuit breaker branch feeders
- Fusible switch branch feeders Full voltage 2-speed
- Programmable logic controllers
- Incoming devices
- Tie breakers

## Intelligent Motor Control Center—Model 6 iMCC

Streamline troubleshooting and maximize uptime by incorporating "intelligent" components and cabling solutions into your motor control center.

Access the information you need in real time—anywhere, anytime. Designed to work on open network protocols, the Square D™ brand Model 6 iMCC allows you to monitor AC drive parameters, view full voltage starter status, spot abnormal conditions immediately and quickly diagnose equipment failures from any networked computer.

Communication protocols available: CANopen, DeviceNet™, Ethernet, Modbus™, and PROFIBUS. Connect to your network control system and communicate with every unit in the iMCC regardless of your communication protocol. Monitor each motor and load so you can know what's going on at all times and take action before problems arise.

#### Merchandised Units (shipment in 3 days)

Model 6 Industrial Package units (white) are available for ordering by catalog number. A listing of types available by quick shipment may be found on the following pages. This limited offering includes popular combinations of types and options. Catalog numbers consist of class number (8998), disconnect and device types, horsepower or ampacity ratings and options (for example, 8998SBA001XFTMA). See table below. All units are UL Listed.

#### Combination Starters Catalog Numbering System

Units rated as follows:

- Model 6 Industrial Package, 480 V, 60 Hz, NEMA 12 enclosure
- Type 1B wiring, 100,000 AIR rating, 1 N.O./1 N.C. auxiliary interlock on each contactor

#### Table 17.1: Numbering System

First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth
8998	S	В	Α	005	A	FT	MA
Class	Туре	Disconnect	Device	Motor Hp	Pilot Device Function	Control Power	Overload Relay
8998	S- Standard Size H- High Density (Compac 6) A	B- Circuit Breaker (PowerPact™ MCP) F- Fusible (Class R except Compac 6 Class J)	A-FVNR C-FVR■	001=1 hp 002=2 hp 003=3 hp 005=5 hp 007=7.5 hp 010=10 hp 015=15 hp■ 025=25 hp■ 040=40 hp■ 050=50 hp■ 060=60 hp■ 075=75 hp■ 100=100 hp■	X=None A=Start-Stop PB, On/Off Lights ◆ C=HOA Sel.Switch, On/Off Lights ▲	FT- 480-120 V CPT★ FS- 120 V Fused Separate Ctl w/intlk	MA-Melting Alloy (Thermal Units not Included) SS-Motor Logic SSOL (Class 20 Base Unit)

- Not available with FVR
- Not available with Compac 6
- Includes forward, reverse and stop push-buttons; and forward and reverse pilot lights with FVR starters Includes extra 50 VA CPT on Sz 1 FVNR (T1)

For more information, contact your nearest Schneider Electric sales office.

Complete Model 6 Motor Control Centers are available from the factory.

# **Combination Starters with Motor Circuit Protector Disconnects**

Model 6 NEMA-rated FVNR combination starters use PowerPact™ Motor Circuit Protectors.

Ratings: 480 V, NEMA 12, Type 1B-D wiring, 100,000 AIR. Units include 1 N.O./1 N.C. auxiliary contacts. Units with pilot devices use 22 mm type. Units without pilot devices include a station plate with knockouts for five 22 mm devices.

Thermal units are not included with melting alloy overloads.

Table 17.2: FVNR Combination Starters with Motor Circuit Protector Disconnects

					Control Trans	former					Fused Separate	Control		
F	Ratings	5	No Pilot Dev	vices	Start-Stop Red On/Gree Lights		HOA Red On/Gree Lights	n Off	No Pilot Dev	rices	Start-Stop   Red On/Gree Lights	PB, n Off	HOA Red On/Gree Lights	n Off
NEMA Size	Max. Hp	Space (IN)	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
Full Vo	Itage N	Non-Rev	ersing (FVNR) St	arters Wi	th Motor Circuit P	rotector I	Disconnect and M	elting Alle	oy Overload Relay	,				
	1 2		SBA001XFTMA SBA002XFTMA		SBA001AFTMA SBA002AFTMA		SBA001CFTMA SBA002CFTMA		SBA001XFSMA SBA002XFSMA		SBA001AFSMA SBA002AFSMA		SBA001CFSMA SBA002CFSMA	
1	3	12	SBA003XFTMA SBA005XFTMA	2988.00	SBA003AFTMA SBA005AFTMA	3530.00	SBA003CFTMA SBA005CFTMA	3530.00	SBA003XFSMA SBA005XFSMA	2672.00	BA003AFSMA SBA005AFSMA	3214.00	SBA003CFSMA SBA005CFSMA	3214.00
	7.5 10		SBA007XFTMA SBA010XFTMA		SBA007AFTMA SBA010AFTMA		SBA007CFTMA SBA010CFTMA		SBA007XFSMA SBA010XFSMA		SBA007AFSMA SBA010AFSMA		SBA007CFSMA SBA010CFSMA	
2	15 25	12	SBA015XFTMA SBA025XFTMA	3322.00	SBA015AFTMA SBA025AFTMA	3864.00	SBA015CFTMA SBA025CFTMA	3864.00	SBA015XFSMA SBA025XFSMA	3006.00	SBA015AFSMA SBA025AFSMA	3548.00	SBA015CFSMA SBA025CFSMA	3548.00
3	40 50	18	SBA040XFTMA SBA050XFTMA	4798.00	SBA040AFTMA SBA050AFTMA	5340.00	SBA040CFTMA SBA050CFTMA	5340.00	SBA040XFSMA SBA050XFSMA	4362.00	SBA040AFSMA SBA050AFSMA	4904.00	SBA040CFSMA SBA050CFSMA	4904.00
4	60 75	21	SBA060XFTMA SBA075XFTMA	6644.00	SBA060AFTMA SBA075AFTMA	7186.00	SBA060CFTMA SBA075CFTMA	7186.00	SBA060XFSMA SBA075XFSMA	6086.00	SBA060AFSMA SBA075AFSMA	6628.00	SBA060CFSMA SBA075CFSMA	6628.00
	100		SBA100XFTMA		SBA100AFTMA		SBA100CFTMA		SBA100XFSMA		SBA100AFSMA		SBA100CFSMA	
Full Vo	Itage N	Non-Rev	• ,	arters Wi	,	rotector I		olid State	Overload Relay (I	Motor Log				
	1 2		SBA001XFTSS SBA002XFTSS		SBA001AFTSS SBA002AFTSS		SBA001CFTSS SBA002CFTSS		SBA001XFSSS SBA002XFSSS		SBA001AFSSS SBA002AFSSS		SBA001CFSSS SBA002CFSSS	
1	3 5	12	SBA003XFTSS SBA005XFTSS	3184.00	SBA003AFTSS SBA005AFTSS	3726.00	SBA003CFTSS SBA005CFTSS	3726.00	SBA003XFSSS SBA005XFSSS	2868.00	SBA003AFSSS SBA005AFSSS	3410.00	SBA003CFSSS SBA005CFSSS	3410.00
	7.5 10		SBA007XFTSS SBA010XFTSS		SBA007AFTSS SBA010AFTSS		SBA007CFTSS SBA010CFTSS		SBA007XFSSS SBA010XFSSS		SBA007AFSSS SBA010AFSSS		SBA007CFSSS SBA010CFSSS	
2	15 25	12	SBA015XFTSS SBA025XFTSS	3518.00	SBA015AFTSS SBA025AFTSS	4060.00	SBA015CFTSS SBA025CFTSS	4060.00	SBA015XFSSS SBA025XFSSS	3202.00	SBA015AFSSS SBA025AFSSS	3744.00	SBA015CFSSS SBA025CFSSS	3744.00
3	40 50	18	SBA040XFTSS SBA050XFTSS	5074.00	SBA040AFTSS SBA050AFTSS	5616.00	SBA040CFTSS SBA050CFTSS	5616.00	SBA040XFSSS SBA050XFSSS	4638.00	SBA040AFSSS SBA050AFSSS	5180.00	SBA040CFSSS SBA050CFSSS	5180.00
4	60 75	21	SBA060XFTSS SBA075XFTSS	6920.00	SBA060AFTSS SBA075AFTSS	7462.00	SBA060CFTSS SBA075CFTSS	7462.00	SBA060XFSSS SBA075XFSSS	6362.00	SBA060AFSSS SBA075AFSSS	6904.00	SBA060CFSSS SBA075CFSSS	6904.00
	100	۷1	SBA100XFTSS	0920.00	SBA100AFTSS	7402.00	SBA100CFTSS	7402.00	SBA100XFSSS	0302.00	SBA100AFSSS	0304.00	SBA100CFSSS	0904.00

Table 17.3: FVR Combination Starters with Motor Circuit Protector Disconnects

				Control Tra	ansformer			Fused Separa	ate Control	
	Ratings		No Pilot Devid	es	Forward-RevSto Forward/Reverse		No Pilot Devid	ces	Forward-RevSto Forward/Reverse	
NEMA Size	Max. Hp	Space (IN)	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
ull Volta	ge Rever	sing (FVR)	Starters With Motor Circ	uit Protector D	isconnect and Melting A	Alloy Overload	Relay			
	1	1	SBC001XFTMA		SBC001AFTMA		SBC001XFSMA		SBC001AFSMA	
	2		SBC002XFTMA		SBC002AFTMA		SBC002XFSMA	1	SBC002AFSMA	
	3	40	SBC003XFTMA		SBC003AFTMA		SBC003XFSMA		SBC003AFSMA	44-0
1	5	18	SBC005XFTMA	3884.00	SBC005AFTMA	4494.00	SBC005XFSMA	3568.00	SBC005AFSMA	4178
	7.5		SBC007XFTMA		SBC007AFTMA		SBC007XFSMA	1	SBC007AFSMA	
	10		SBC010XFTMA		SBC010AFTMA		SBC010XFSMA	1	SBC010AFSMA	
_	15	40	SBC015XFTMA	4=00.00	SBC015AFTMA	5050.00	SBC015XFSMA	4404.00	SBC015AFSMA	
2	25	18	SBC025XFTMA	4760.00	SBC025AFTMA	5370.00	SBC025XFSMA	4484.00	SBC025AFSMA	5054
3	40	27	SBC040XFTMA	6246.00	SBC040AFTMA	6856.00	SBC040XFSMA	5810.00	SBC040AFSMA	6420
3	50	21	SBC050XFTMA	0240.00	SBC050AFTMA	0030.00	SBC050XFSMA	3610.00	SBC050AFSMA	0420
	60		SBC060XFTMA		SBC060AFTMA		SBC060XFSMA		SBC060AFSMA	
4	75	33	SBC075XFTMA	9826.00	SBC075AFTMA	10436.00	SBC075XFSMA	9268.00	SBC075AFSMA	9878
	100		SBC100XFTMA		SBC100AFTMA		SBC100XFSMA	1	SBC100AFSMA	
ıll Volta	ge Rever	sing (FVR)	Starters With Motor Circ	uit Protector D	Disconnect and Solid Sta	te Overload Re	elay (Motor Logic)			
	1		SBC001XFTSS		SBC001AFTSS		SBC001XFSSS		SBC001AFSSS	
	2		SBC002XFTSS		SBC002AFTSS		SBC002XFSSS	1	SBC002AFSSS	
	3	18	SBC003XFTSS	4160.00	SBC003AFTSS	4690.00	SBC003XFSSS	3764.00	SBC003AFSSS	4374
1	5	16	SBC005XFTSS	4160.00	SBC005AFTSS	4690.00	SBC005XFSSS	3764.00	SBC005AFSSS	4374
	7.5		SBC007XFTSS		SBC007AFTSS		SBC007XFSSS	1	SBC007AFSSS	
	10		SBC010XFTSS		SBC010AFTSS		SBC010XFSSS	1	SBC010AFSSS	
2	15	18	SBC015XFTSS	5116.00	SBC015AFTSS	5566.00	SBC015XFSSS	4640.00	SBC015AFSSS	5250
2	25	16	SBC025XFTSS	5116.00	SBC025AFTSS	5500.00	SBC025XFSSS	4640.00	SBC025AFSSS	5250
3	40	27	SBC040XFTSS	6682.00	SBC040AFTSS	7132.00	SBC040XFSSS	6086.00	SBC040AFSSS	6696
3	50	21	SBC050XFTSS	0002.00	SBC050AFTSS	1132.00	SBC050XFSSS	00.00.00	SBC050AFSSS	0090
	60		SBC060XFTSS		SBC060AFTSS		SBC060XFSSS		SBC060AFSSS	
4	75	33	SBC075XFTSS	10102.00	SBC075AFTSS	10712.00	SBC075XFSSS	9544.00	SBC075AFSSS	10154
	100		SBC100XFTSS		SBC100AFTSS		SBC100XFSSS		SBC100AFSSS	

SQUARE D

#### **Combination Starters with Fusible Switch Disconnects**

Model 6 NEMA-rated FVNR combination starters listed below use fusible switches with Class R fuse clips (fuses not included).

Ratings: 480 V, NEMA 12, Type 1B-D wiring, 100,000 AIR. Units include 1 N.O./1 N.C. auxiliary contacts. Units with pilot devices use 22 mm type. Units without pilot devices include a station plate with knockouts for five 22 mm devices.

Thermal units are not included with melting alloy overloads.

**FVNR Combination Starters with Fusible Switch Disconnects** 

					Control Transf	ormer					Fused Separate	Control		
F	Ratings	;	No Pilot Dev	ices	Start-Stop I Red On/Gree Lights	PB, n Off	HOA Red On/Gree Lights	n Off	No Pilot Dev	ices	Start-Stop I Red On/Gree Lights	PB, n Off	HOA Red On/Gree Lights	n Off
NEMA Size	Max. Hp	Space (IN)	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
Full Vo	Itage N	Ion-Rev	ersing (FVNR) Sta	rters With	h Fusible Switch	Disconne	ct and Melting All	oy Overlo	ad Relay					
	1		SFA001XFTMA		SFA001AFTMA		SFA001CFTMA		SFA001XFSMA		SFA001AFSMA		SFA001CFSMA	
	2		SFA002XFTMA		SFA002AFTMA		SFA002CFTMA		SFA002XFSMA		SFA002AFSMA		SFA002CFSMA	
	3	40	SFA003XFTMA	0000 00	SFA003AFTMA	0070 00	SFA003CFTMA	0070 00	SFA003XFSMA	2014.00	SFA003AFSMA	0550.00	SFA003CFSMA	2556.00
1	5	12	SFA005XFTMA	2330.00	SFA005AFTMA	2872.00	SFA005CFTMA	2872.00	SFA005XFSMA	2014.00	SFA005AFSMA	2556.00	SFA005CFSMA	2556.00
	7.5		SFA007XFTMA		SFA007AFTMA		SFA007CFTMA		SFA007XFSMA		SFA007AFSMA		SFA007CFSMA	
	10		SFA010XFTMA		SFA010AFTMA		SFA010CFTMA		SFA010XFSMA		SFA010AFSMA		SFA010CFSMA	
2	15	12	SFA015XFTMA	2750.00	SFA015AFTMA	3292.00	SFA015CFTMA	3292.00	SFA015XFSMA	2434.00	SFA015AFSMA	2976.00	SFA015CFSMA	2976.00
	25	12	SFA025XFTMA	2750.00	SFA025AFTMA	3292.00	SFA025CFTMA	3292.00	SFA025XFSMA	2434.00	SFA025AFSMA	2970.00	SFA025CFSMA	2970.00
3	40	18	SFA040XFTMA	3960.00	SFA040AFTMA	4502.00	SFA040CFTMA	4502.00	SFA040XFSMA	3524.00	SFA040AFSMA	4066.00	SFA040CFSMA	4066.00
<u> </u>	50	10	SFA050XFTMA	3900.00	SFA050AFTMA	4502.00	SFA050CFTMA	4302.00	SFA050XFSMA	3524.00	SFA050AFSMA	4000.00	SFA050CFSMA	4000.00
	60		SFA060XFTMA		SFA060AFTMA		SFA060CFTMA		SFA060XFSMA		SFA060AFSMA		SFA060CFSMA	
4	75	30	SFA075XFTMA	6344.00	SFA075AFTMA	6886.00	SFA075CFTMA	6886.00	SFA075XFSMA	5786.00	SFA075AFSMA	6328.00	SFA075CFSMA	6328.00
	100		SFA100XFTMA		SFA100AFTMA		SFA100CFTMA		SFA100XFSMA		SFA100AFSMA		SFA100CFSMA	
Full Vo	Itage N	Ion-Rev	ersing (FVNR) Sta	rters With	n Fusible Switch	Disconne	ct and Solid State	Overload	Relay (Motor Log	gic™)				
	1		SFA001XFTSS		SFA001AFTSS		SFA001CFTSS		SFA001XFSSS		SFA001AFSSS		SFA001CFSSS	
	2		SFA002XFTSS		SFA002AFTSS		SFA002CFTSS		SFA002XFSSS		SFA002AFSSS		SFA002CFSSS	
	3	40	SFA003XFTSS		SFA003AFTSS		SFA003CFTSS		SFA003XFSSS		SFA003AFSSS	.==	SFA003CFSSS	
1	5	12	SFA005XFTSS	2526.00	SFA005AFTSS	3068.00	SFA005CFTSS	3068.00	SFA005XFSSS	2210.00	SFA005AFSSS	2752.00	SFA005CFSSS	2752.00
	7.5		SFA007XFTSS		SFA007AFTSS		SFA007CFTSS		SFA007XFSSS		SFA007AFSSS		SFA007CFSSS	
	10		SFA010XFTSS		SFA010AFTSS		SFA010CFTSS		SFA010XFSSS		SFA010AFSSS		SFA010CFSSS	
2	15	12	SFA015XFTSS	2946.00	SFA015AFTSS	3488.00	SFA015CFTSS	3488.00	SFA015XFSSS	0000 00	SFA015AFSSS	3172.00	SFA015CFSSS	3172.00
2	25	12	SFA025XFTSS	2946.00	SFA025AFTSS	3488.00	SFA025CFTSS	3488.00	SFA025XFSSS	2630.00	SFA025AFSSS	3172.00	SFA025CFSSS	3172.00
	40	18	SFA040XFTSS	4236.00	SFA040AFTSS	4778.00	SFA040CFTSS	4778.00	SFA040XFSSS	3800.00	SFA040AFSSS	4342.00	SFA040CFSSS	4342.00
3	50	18	SFA050XFTSS	4230.00	SFA050AFTSS	4778.00	SFA050CFTSS	4778.00	SFA050XFSSS	3000.00	SFA050AFSSS	4342.00	SFA050CFSSS	4342.00
	60		SFA060XFTSS		SFA060AFTSS		SFA060CFTSS		SFA060XFSSS		SFA060AFSSS		SFA060CFSSS	
4	75	30	SFA075XFTSS	6620.00	SFA075AFTSS	7162.00	SFA075CFTSS	7162.00	SFA075XFSSS	6062.00	SFA075AFSSS	6604.00	SFA075CFSSS	6604.00
	100		SFA100XFTSS		SFA100AFTSS		SFA100CFTSS		SFA100XFSSS		SFA100AFSSS		SFA100CFSSS	

Table 17.5: **FVR Combination Starters with Fusible Switch Disconnects** 

				Control Tr	ansformer			Fused Separa	te Control	
	Ratings		No Pilot Devic	es	Forward-RevSto Forward/Reverse	p PB, Lights	No Pilot Devi	ces	Forward-RevSto Forward/Reverse	p PB, Lights
NEMA Size	Max. Hp	Space (IN)	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
Full Voltag	ge Rever	sing (FVR)	Starters With Fusible Sw	itch Disconne	ect and Melting Alloy Ove	erload Relay				
	1		SFC001XFTMA		SFC001AFTMA		SFC001XFSMA		SFC001AFSMA	
	2		SFC002XFTMA		SFC002AFTMA		SFC002XFSMA		SFC002AFSMA	
	3	18	SFC003XFTMA	2000 00	SFC003AFTMA	2000.00	SFC003XFSMA	2000.00	SFC003AFSMA	0040.00
1	5	18	SFC005XFTMA	3322.00	SFC005AFTMA	3932.00	SFC005XFSMA	3006.00	SFC005AFSMA	3616.00
	7.5		SFC007XFTMA		SFC007AFTMA		SFC007XFSMA		SFC007AFSMA	
	10		SFC010XFTMA		SFC010AFTMA		SFC010XFSMA		SFC010AFSMA	
	15	18	SFC015XFTMA	4460.00	SFC015AFTMA	5070.00	SFC015XFSMA	4444.00	SFC015AFSMA	4754.04
2	25	18	SFC025XFTMA	4460.00	SFC025AFTMA	5070.00	SFC025XFSMA	4144.00	SFC025AFSMA	4754.00
3	40	27	SFC040XFTMA	6328.00	SFC040AFTMA	6938.00	SFC040XFSMA	5892.00	SFC040AFSMA	6502.00
3	50	21	SFC050XFTMA	6326.00	SFC050AFTMA	6936.00	SFC050XFSMA	5692.00	SFC050AFSMA	0502.00
	60		SFC060XFTMA		SFC060AFTMA		SFC060XFSMA		SFC060AFSMA	
4	75	39	SFC075XFTMA	10358.00	SFC075AFTMA	10968.00	SFC075XFSMA	9800.00	SFC075AFSMA	10410.00
	100		SFC100XFTMA		SFC100AFTMA		SFC100XFSMA		SFC100AFSMA	
Full Voltag	ge Rever	sing (FVR)	Starters with Fusible Sw	itch Disconne	ct and Solid State Overlo	oad Relay (Mot	or Logic)			
	1		SFC001XFTSS		SFC001AFTSS		SFC001XFSSS		SFC001AFSSS	
	2		SFC002XFTSS		SFC002AFTSS		SFC002XFSSS		SFC002AFSSS	
4	3	18	SFC003XFTSS	3518.00	SFC003AFTSS	4128.00	SFC003XFSSS	3202.00	SFC003AFSSS	3812.00
1	5	16	SFC005XFTSS	3516.00	SFC005AFTSS	4128.00	SFC005XFSSS	3202.00	SFC005AFSSS	3612.00
	7.5		SFC007XFTSS		SFC007AFTSS		SFC007XFSSS		SFC007AFSSS	
	10		SFC010XFTSS		SFC010AFTSS		SFC010XFSSS		SFC010AFSSS	
2	15	18	SFC015XFTSS	4656.00	SFC015AFTSS	5266.00	SFC015XFSSS	4340.00	SFC015AFSSS	4950.00
2	25	16	SFC025XFTSS	4656.00	SFC025AFTSS	5200.00	SFC025XFSSS	4340.00	SFC025AFSSS	4950.00
3	40	27	SFC040XFTSS	6604.00	SFC040AFTSS	7214.00	SFC040XFSSS	6168.00	SFC040AFSSS	6778.00
J	50	21	SFC050XFTSS	0004.00	SFC050AFTSS	7214.00	SFC050XFSSS	0100.00	SFC050AFSSS	0778.00
	60		SFC060XFTSS		SFC060AFTSS		SFC060XFSSS		SFC060AFSSS	
4	75	39	SFC075XFTSS	10634.00	SFC075AFTSS	11244.00	SFC075XFSSS	10076.00	SFC075AFSSS	10686.00
	100	l	SFC100XFTSS		SFC100AFTSS		SFC100XFSSS		SFC100AFSSS	

17-5

## Compac™ 6 Combination Starters with Motor Circuit Protector Disconnects

NEMA-rated Compac 6, half-height FVNR combination starters use GJ frame Mag-Gard™ Motor Circuit Protectors.

Ratings: 480 V, NEMA 12, Type 1B-D wiring, 100,000 AIR. Units include 1 N.O./1 N.C. auxiliary contacts. Units with pilot devices use 22 mm type. Units without pilot devices include a station plate with knockouts for four 22 mm devices. Thermal units are not included with melting alloy overloads.

Table 17.6: Compac 6 Combination Starters with Motor Circuit Protector Disconnects

					Control Transf	ormer					Fused Separate	Control		
1	Rating	s	No Pilot Dev	ices	Start-Stop F Red On/Gree Lights		HOA, Red On/Gree Lights	n Off	No Pilot Dev			PB, n Off	HOA, ff Red On/Green Off Lights	
NEMA Size	Max. Hp	Space (IN)	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
Full Vo	Itage I	Non-Rev	ersing (FVNR) Sta	arters Wit	h Motor Circuit Pı	otector D	Disconnect and Me	elting Allo	y Overload Relay					
1	1 2 3 5 7.5 10	6	HBA001XFTMA HBA002XFTMA HBA003XFTMA HBA005XFTMA HBA007XFTMA HBA010XFTMA	2860.00	HBA001AFTMA HBA002AFTMA HBA003AFTMA HBA005AFTMA HBA007AFTMA HBA010AFTMA	3402.00	HBA001CFTMA HBA002CFTMA HBA003CFTMA HBA005CFTMA HBA007CFTMA HBA010CFTMA	3402.00	HBA001XFSMA HBA002XFSMA HBA003XFSMA HBA005XFSMA HBA007XFSMA HBA010XFSMA	2544.00	HBA001AFSMA HBA002AFSMA HBA003AFSMA HBA005AFSMA HBA007AFSMA HBA010AFSMA	3086.00	HBA001CFSMA HBA002CFSMA HBA003CFSMA HBA005CFSMA HBA007CFSMA HBA010CFSMA	3086.00
Full Vo	Itage I	Non-Rev	ersing (FVNR) Sta	arters Wit	h Motor Circuit Pı	otector D	Disconnect and So	lid State	Overload Relay (M	Notor Log	jic™)			
1	1 2 3 5 7.5 10	6	HBA001XFTSS HBA002XFTSS HBA003XFTSS HBA005XFTSS HBA007XFTSS HBA010XFTSS	3056.00	HBA001AFTSS HBA002AFTSS HBA003AFTSS HBA005AFTSS HBA007AFTSS HBA010AFTSS	3598.00	HBA001CFTSS HBA002CFTSS HBA003CFTSS HBA005CFTSS HBA007CFTSS HBA010CFTSS	3598.00	HBA001XFSSS HBA002XFSSS HBA003XFSSS HBA005XFSSS HBA007XFSSS HBA010XFSSS	2740.00	HBA001AFSSS HBA002AFSSS HBA003AFSSS HBA005AFSSS HBA007AFSSS HBA010AFSSS	3282.00	HBA001CFSSS HBA002CFSSS HBA003CFSSS HBA005CFSSS HBA007CFSSS HBA010CFSSS	3282.00

#### **Compac 6 Combination Starters with Fusible Switch Disconnects**

NEMA-rated Compac 6, half-height FVNR combination starters listed below use fusible switches with Class J fuse clips (fuses not included). Ratings: 480 V, NEMA 12, Type 1B-D wiring, 100,000 AIR. Units include 1 N.O./1 N.C. auxiliary contacts.

Units with pilot devices use 22 mm type. Units without pilot devices include a station plate with knockouts for four 22 mm devices. Thermal units are not included with melting alloy overloads.

Table 17.7: Compac 6 Combination Starters with Fusible Switch Disconnects

					Control Transf	ormer					Fused Separate	Control		
ı	Rating	s	No Pilot Dev	ices	Start-Stop I Red On/Green O		HOA, Red On/Green O	ff Lights	No Pilot Dev	Pilot Devices Start-Stop Pi Red On/Green Off			HOA, Red On/Green O	ff Lights
NEMA Size	Max. Hp	Space (IN)	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price	Catalog No.	\$ Price
Full Vo	ltage N	Non-Rev	ersing (FVNR) Sta	rters with	n Fusible Switch [	Disconne	t and Melting Allo	y Overlo	ad Relay				•	
1	1 2 3 5 7.5 10	6	HFA001XFTMA HFA002XFTMA HFA003XFTMA HFA005XFTMA HFA007XFTMA HFA010XFTMA	2492.00	HFA001AFTMA HFA002AFTMA HFA003AFTMA HFA005AFTMA HFA007AFTMA HFA010AFTMA	3034.00	HFA001CFTMA HFA002CFTMA HFA003CFTMA HFA005CFTMA HFA007CFTMA HFA010CFTMA	3034.00	HFA001XFSMA HFA002XFSMA HFA003XFSMA HFA005XFSMA HFA007XFSMA HFA010XFSMA	2176.00	HFA001AFSMA HFA002AFSMA HFA003AFSMA HFA005AFSMA HFA007AFSMA HFA010AFSMA	2718.00	HFA001CFSMA HFA002CFSMA HFA003CFSMA HFA005CFSMA HFA007CFSMA HFA010CFSMA	2718.00
Full Vo	ltage N	Non-Rev	ersing (FVNR) Sta	rters Witl	h Fusible Switch I	Disconne	ct and Solid State	Overload	Relay (Motor Log	jic)				
1	1 2 3 5 7.5	6	HFA001XFTSS HFA002XFTSS HFA003XFTSS HFA005XFTSS HFA007XFTSS HFA010XFTSS	2688.00	HFA001AFTSS HFA002AFTSS HFA003AFTSS HFA005AFTSS HFA007AFTSS HFA010AFTSS	3230.00	HFA001CFTSS HFA002CFTSS HFA003CFTSS HFA005CFTSS HFA007CFTSS HFA010CFTSS	3230.00	HFA001XFSSS HFA002XFSSS HFA003XFSSS HFA005XFSSS HFA007XFSSS HFA010XFSSS	2372.00	HFA001AFSSS HFA002AFSSS HFA003AFSSS HFA005AFSSS HFA007AFSSS HFA010AFSSS	2914.00	HFA001CFSSS HFA002CFSSS HFA003CFSSS HFA005CFSSS HFA007CFSSS HFA010CFSSS	2914.00

**MOTOR CONTROL CENTERS** 

#### **Branch Feeder Units Catalog Numbering System**

Units rated as follows:

- 480 V, 60 Hz, NEMA Type 12 Enclosure, Industrial Package
- Short Circuit rating: 100,000 AIR

Table 17.8: Circuit Breaker Branch Feeder Units

First Position	Second Position	Third Position	Fourth Position	Fifth Position
8998	S	В	F	015
Class	Туре	Disconnect	Device	Feeder Amps
8998	S- Standard Size H- Compac™ 6	B- Breaker (Thermal-Mag)	F- Feeder	015 080 020 100 030 125 040 150 050 200 060 250 070
Amps	Breaker Frame	Space (IN)	Catalog No.	\$ Price
15 20 30 40 50	HL		HBF015 HBF020 HBF030 HBF040 HBF050 HBF060	2300.00
70		6	HBF070	
80 100			HBF080 HBF100	2650.00
125			HBF125	
150			HBF150	4850.00
200	JL		HBF200	4950.00
250	JL		HBF250	6400.00
15 20 30 40 50	HL	12	SBF015 SBF020 SBF030 SBF040 SBF050 SBF060	2200.00
70 80 100 125			SBF070 SBF080 SBF100 SBF125	2550.00 4370.00
150			SBF150	
200	JL	18	SBF200	4800.00
250			SBF250	5510.00

Table 17.9: Fusible Branch Feeder Units

·uk	10 17.0.				
	First Position	Second Position	Third Position	Fourth Position	Fifth Position
	8998	S	F	F	015
	Class	Туре	Disconnect	Device	Feeder Amps
	8998	S- Standard Size H- Compac 6	F- Fusible▲	F- Feeder	030 060 100 200 ■
	Amps	Fuse Clips	Space (IN)	Catalog No.	\$ Price
	30 60	Class J	6 (Compac 6)	HFF030 HFF060	1272.00
	100		(Oompac o)	HFF100	1746.00
	30 60	- Class R	12	SFF030 SFF060	1160.00
	100	Class R		SFF100	1592.00
	200	1	24	SFF200	1960.00

- Class R except Compac 6, fuses not included.
- Not available with Compac 6.

#### **Model 6 Blank Doors**

These doors may be used to cover an unused space in the MCC. A blank door will be required when placing a new unit in an existing space that is larger than the new unit.

Table 17.10: Model 6 Blank Doors

Catalog Number	Description	\$ Price
8998CP03	3 Inch High Blank Cover Plate	58.00
8998CP06	6 Inch High Blank Door	58.00
8998CP09	9 Inch High Blank Door	70.00
8998CP12	12 Inch High Blank Door	82.00
8998CP15	15 Inch High Blank Door	96.00
8998CP18	18 Inch High Blank Door	112.00
8998CP24	24 Inch High Blank Door	140.00

# Back to Product Index Section Listing

# Section 18

# **TeSys™ IEC Contactors and Starters**





TeSys D Contactors (p. 18-4)





TeSys F Contactors (p. 18-5)



GV7 Manual Motor Starters and Protectors (p. 18-35)







**GV3P** (p.18-33)

**LUB●2** (p. 18-28)

GV2P21 (p.18-33)

#### **Contactors**

TeSys D	18-4
TeSys D Reversing	18-6
TeSys F	18-
TeSys D and F Accessories	18-8
TeSys K	18-24
TeSys K Accessories	18-27

#### **Motor Starters and Protectors**

TeSys U	18-28
GV2, GV3, GV7 Manual Motor Protectors	18-33
Enclosed D-Line	18-21
GV Accessories	18-34
LS1D Fuse Block	18-36

#### **Overload Relays**

TeSys D	18-4
TeSys F	18-5
TeSys D and F Accessories	18-16
TeSys K	18-24
TeSys K Accessories	18-27
TeSys T Motor Management System	Section 16
Soft Start Module ATS01	18-32

#### **Replacement Parts**

TeSys D Coils	18-17
TeSys F Coils	18-20
TeSys F Contact Tips, etc.	18-13

#### **Wiring Systems**

GV-Line Bus Bars	18-37
TeSys D Quickfit	18-38
AK5	18-39

#### **Dimensions**

For more information on lighting, definite purpose (DP), and elevator ratings for TeSys D and TeSys F contactors, refer to catalog 8502CT9901.

For more information on machine safety applications using TeSys D and TeSys F contactors, refer to catalog MKTED208051EN-US.

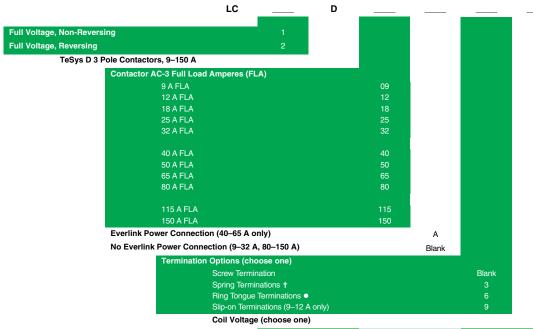
See our website, www.schneider-electric.us, for UL 508A short circuit ratings (SCCR).



Refer to Catalog 8502CT9901



Table 18.1: TeSys D Contactors—Interpretation of the Catalog Number



_	(Choose one)									
	AC Coils	(50/60 Hz)	DC Coils	(standard)	Iow consump for 9–38	Coils tion available 3 A only				
	12 V	J7	12 V	JD	5 V	AL				
	21 V	<b>Z</b> 7	21 V	ZD	12 V	JL				
	24 V	B7	24 V	BD	21 V	ZL				
	36 V	C7	36 V	CD	24 V	BL				
	42 V	D7	48 V	ED	48 V	EL				
	48 V	E7	60	ND	72 V	SL				
	60 V	EE7	72 V	SD	96 V	DL				
	100 V	K7	110 V	FD	110 V	FL				
	110 V	F7	125 V	GD	220 V	ML				
	115 V	FE7	220 V	MD	250 V	UL				
	120 V	G7	250 V	UD						
	127 V	FC7	440 V	RD						
	200 V	L7								
	208 V	LE7								
	220 V	M7								
	230 V	P7								
	240 V	U7								
	277 V	W7								
	380 V	Q7								
	400 V	V7								
	415 V	N7								
	440 V	R7								
	480 V	T7								
	500 V	S7								
	575 V	SC7								
	600 V	X7								
	660 V	Y5 (50 Hz only)								

- For spring terminal versions of LC1D09–LC1D65A, add **3** to the catalog number prior to adding the voltage code (for example, LC1D12G7 becomes LC1D123G7, and LC1D40AG7 becomes LC1D40A3G7. Note that 40–65 A spring terminals are only on the control terminations and not on power terminations). There is no charge for this modification.
- For ring tongue versions of LC1D09–LC1D65A and LC1DT20–LC1DT80A, add 6 to the catalog number prior to adding the voltage code (for example, LC1D09G7 becomes LC1D09G7, and LC1D50AG7 becomes LC1D50AG67). There is no charge for this modification.

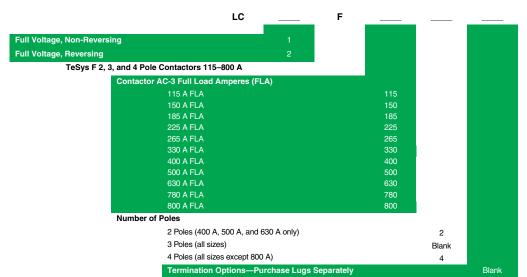
Note: Use this table only to interpret current catalog numbers. Some combinations are not available.



2, 3, and 4 Pole

**Contactors** 

Table 18.2: TeSys F Contactors—Interpretation of the Catalog Number



Coil Voltage (choose one, noting the contactor size it can be used on)

AC Coils		For use on:	AC Coils		For use on:
24 V (50 Hz)	B5	LC1F115-F225	230 V	P7	LC1F1700, F2100
24 V (60 Hz)	B6	LC1F115-F225	240 V (50 Hz)	U5	LC1F115-F225
24 V (40-400 Hz)	B7	LC1F225-F400	240 V (60 Hz)	U6	LC1F115-F225
42 V (50 Hz)	D5	LC1F115-F225	240 V (40-400 Hz)	U7	LC1F115-F780
48 V (50 Hz)	E5	LC1F115-F225	240 V	U7	LC1F1700, F2100
48 V (60 Hz)	E6	LC1F115-F225	277 V (50 Hz)	W5	LC1F115-F225
48 V (40-400 Hz)	E7	LC1F115-F630	277 V (40-400 Hz)	W7	LC1F115-F780
110 V (50 Hz)	F5	LC1F115-F225	277 V	W7	LC1F1700, F2100
110 V (60 Hz)	F6	LC1F115-F225	380 V (50 Hz)	Q5	LC1F115-F225
110 V	F7	LC1F1700, F2100	380 V (60 Hz)	Q6	LC1F115-F225
110 V (40-400 Hz)	F7	LC1F115-F780	380 V (40-400 Hz)	Q7	LC1F115-F780
115 V (50 Hz)	FE5	LC1F115-F225	380 V	Q7	LC1F1700, F2100
115 V (40-400 Hz)	FE7	LC1F115-F780	400 V (50 Hz)	V5	LC1F115-F225
120 V (60 Hz)	G6	LC1F115-F225	400 V (40-400 Hz)	V7	LC1F115-F800
120 V	G7	LC1F1700, F2100	400 V	V7	LC1F1700, F2100
120 V (40-400 Hz)	G7	LC1F115-F400	415 V (50 Hz)	N5	LC1F115-F225
120 V (40-400 Hz)	F7	LC1F500-F780	415 V (40-400 Hz)	N7	LC1F115-F780
127 V (60 Hz)	G6	LC1F115-F225	415 V	N7	LC1F1700, F2100
127 V (40-400 Hz)	G7	LC1F115-F780	440 V (50 Hz)	R5	LC1F115-F225
200/208 V (60 Hz)	L6	LC1F115-F225	440 V (40-400 Hz)	R7	LC1F115-F780
200/208 V (40-400 Hz)	L7	LC1F265-F780	440 V	R7	LC1F1700, F2100
208 V (40-400 Hz)	L7	LC1F115-F225	460/480 V (60 Hz)	Q6	LC1F115-F225
220 V (50 Hz)	M5	LC1F115-F225	480 V (40-400 Hz)	N7	LC1F780
220 V (60 Hz)	M6	LC1F115-F225	500 V (50 Hz)	S5	LC1F115-F225
220 V (40-400 Hz)	M7	LC1F115-F780	500 V (40-400 Hz)	S7	LC1F115-F780
220 V	M7	LC1F1700, F2100	500 V	S7	LC1F1700, F2100
230 V (50 Hz)	P5	LC1F115-F225	600 V (40-400 Hz)	X7	LC1F500-F630
230 V (40-400 Hz)	P7	LC1F115-F800	660 V (60 Hz)	Y6	LC1F115-F225

DC Coils		For use on:
24 V	BD	LC1F115-F400
48 V	ED	LC1F115-F630
110 V	FD	LC1F115-F780
110 V	FD	LC1F1700, F2100
110 V	FW	LC1F800
125 V	GD	LC1F115-F780
125 V	GD	LC1F1700, F2100
220 V	MD	LC1F265-F780
250 V	UD	LC1F1700, F2100
220/240 V	MW	LC1F800
250 V	UD	LC1F115-F780
380/400 V	QW	LC1F800
440 V	RD	LC1F1700, F2100
440 V	RD	LC1F115-F780

# **Overload Relays**



LC1D09



LC1D093



LC1D40A



LC1D115



LRD22



LRD3



E164862 CCN NLDX



LR43364 Class 3211 04

Table 18.3: TeSys D Contactors—3 or 4 Pole, Screw Terminal Connections

	Maximum Horsepower Ratings					Maximun Utiliz Categ	ation jories	No. of	Poles	Instant Auxi Con	liary	Catalog	\$ PI	rice	
Single	-Phase		Three-	Phase		Inductive						Number <b>A</b>			
115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp	AC3 (A)	AC1 (A)	N.O.	N.C.	N.O.	N.C.		AC Coils	DC Coils	
0.5	1	2	2	5	7.5	9		3	0			LC1D09 ◆★▼	94.00	119.00	
	_	_	_	_	_	_	20	4	U	1	1	LC1DT20 ♦	94.00	119.00	
	_	_	_	-	_	_		2	2			LC1D098 ◆	94.00	119.00	
1	2	3	3	7.5	10	12		3	0			LC1D12 ◆★▼	119.00	149.00	
	_	_	_	-	_	_	25	4	U	1	1	LC1DT25 ♦	119.00	149.00	
	_	_	_	-	_	_		2	2			LC1D128 ♦	119.00	149.00	
1	3	5	5	10	15	18		3	0			LC1D18 ◆★	136.00	160.00	
	_	_	_	_	_	_	32	4	U	0	1	1	LC1DT32 ♦	149.00	183.00
	_	_	_	-	_	_		2	2			LC1D188 ◆	149.00	183.00	
2	3	7.5	7.5	15	20	25		3	0			LC1D25 ◆★	151.00	181.00	
	_	_	_	-	_	_	40	4	1 0	1	1	LC1DT40 ♦	193.00	240.00	
_		_	_		_			2	2			LC1D258 ♦	193.00	240.00	
2	5	10	10	20	30	32	50	3	0	1	1	LC1D32 ◆★	172.00	213.00	
3	5	10	10	30	30	40	60	3	0	1	1	LC1D40A ♦	218.00	275.00	
_		_	_		_		00	4	0	0	0	LC1DT60A◆	296.00	353.00	
3	7.5	15	15	40	40	50		3	0	1	1	LC1D50A ♦	234.00	291.00	
5	10	20	20	40	50	65	80	3	0	'		LC1D65A ♦	322.00	379.00	
_		_	_		_			4	0	0	0	LC1DT80A◆	446.00	503.00	
7.5	15	25	30	60	60	80		3	0	1	1	LC1D80	363.00	420.00	
_		_	_		_		125	4	0	0	0	LC1D80004 ■	489.00	524.00	
_		_	_		_			2	2	U	U	LC1D80008 ■	489.00	524.00	
	_	30	40	75	100	115		3		1	1	LC1D115	479.00	479.00	
	_	40	50	100	125	150	200	3	0	_ '	1	LC1D150	696.00	696.00	
			_		<u> </u>			4		0	0	LC1D115004	630.00	630.00	

- Complete the catalog number by adding the coil voltage code from Table 18.11 on page 18-6 (for example, LC1D09G7).
- For DC version of these devices, replace the C with a P (for example, LC1D80004\*\* becomes LP1D80004\*\*). This applies only to 80 A, 4-pole devices.
- For DC version of these devices, replace the C with a P (for example, LC1D80004\*\* becomes LP1D80004\*\*). This applies only to 80 A, 4-pole devices For ring tongue versions of LC1D09\_LC1D65A and LC1DT20\_LC1DT80A, add 6 to the catalog number prior to adding the voltage code (for example, LC1D09G7 becomes LC1D09G7 and LC1D50AG7 becomes LC1D50AG7). There is no charge for this modification. For spring terminals versions of LC1D09\_LC1D65A, add 3 to the catalog number prior to adding the voltage code (for example, LC1D12G7 becomes LC1D123G7 and LC1D40AG7 becomes LC1D40A3G7. Note that 40–65 A spring terminals are only on the control terminations and not on power terminations). Ring tongue terminations have a 10% adder to list price. For slip-on connector versions of LC1D09 and LC1D12 only, add 9 to the catalog number prior to adding the voltage code (for example, LC1D09G7 becomes LC1D099G7). There is no charge for this modification.

Table 18.4: TeSys D Overload Relays—Ambient Compensated, Bimetallic, Direct Mounting

ut \$ Price	Class 20 without Single-Phase Sensitivity	Class 20 with Single-Phase Sensitivity	Class 10 without Single-Phase Sensitivity	Class 10 with Single-Phase Sensitivity	For Direct Mounting to LC1	Current Setting Range (A)
	_	_	LR3D01	LRD01		0.10-0.16
	_	_	LR3D02	LRD02		0.16-0.25
	_	_	LR3D03	LRD03		0.25-0.40
	LR3D04L	LRD04L	LR3D04	LRD04		0.40-0.63
60.00	LR3D05L	LRD05L	LR3D05	LRD05	D09-D32	0.63-1
	LR3D06L	LRD06L	LR3D06	LRD06		1-1.6
	LR3D07L	LRD07L	LR3D07	LRD07		1.6-2.5
	LRD08L	LRD08L	LR3D08	LRD08		2.5-4
	LRD10L	LRD10L	LR3D10	LRD10		4–6
	LR3D12L	LRD12L	LR3D12	LRD12	D09-D32	5.5-8
	LR3D14L	LRD14L	LR3D14	LRD14	D09-D32	7–10
62.00	LR3D21L	LRD16L	LR3D16	LRD16	D12-D32	9-13
	LR3D21L	LRD21L	LR3D21	LRD21	D18-D32	12-18
	LR3D22L	LRD22L	_	_	D25-D32	17–24
	LR3D32L	LRD32L	LR3D32	LRD32	D25-D32	23-32
73.00	_	_	LR3D35	LRD35	D32	30-38
		LRD313L	LR3D313	LRD313	D40A-D65A △	9-13
	_	LRD318L	LR3D318	LRD318	D40A-D65A △	12-18
	_	LRD325L	LR3D325	LRD325	D40A-D65A △	16-25
107.00	_	LRD332L	LR3D332	LRD332	D40A-D65A △	23-32
	_	LRD340L	LR3D340	LRD340	D40A-D65A △	30-40
	_	LRD350L	LR3D350	LRD350	D40A-D65A △	37-50
	_	LRD365L	LR3D365	LRD365	D40A-D65A △	48-65
	LR3D3522	LR2D3522	LR3D3322	LRD3322	D40-D80 □	17-25
	LR3D3553	LR2D3553	LR3D3353	LRD3353	D40-D80 □	23-32
107.00	LR3D3555	LR2D3555	LR3D3355	LRD3355	D40-D80 □	30-40
	LR3D3557	LR2D3557	LR3D3357	LRD3357	D50-D80 □	37-50
	LR3D3559	LR2D3559	LR3D3359	LRD3359	D50-D80 □	48-65
	LR3D3561	LR2D3561	LR3D3361	LRD3361	D65-D80	55–70
127.00	LR3D3563	LR2D3563	LR3D3363	LRD3363	D65-D80	63–80
	_	_	_	LRD3365	D80	80–104
	_	=	_	LRD4365	D115-D150	80–104
362.00	_	_	_	LRD4367	D115-D150	95–120
	_	_	_	LRD4369	D150	110–140

- Overload relays with Everlink termination—direct mount to D40A to D65A only.
- Direct mount to old D2 style D40 to D65 (no Everlink terminations) and to D80 only. NOTE: For Stand Alone Adapter order LAD7B205.

NOTE: To add ring tongue terminations, add '6' to end of part number. Only devices 0.4 A-32 A.

TeSys D contactor accessories . . . . . . . . . pages 18-8 to 18-11

TeSys D overload relay accessories page 18-16
TeSys D replacement coils page 18-19 

\$ Price



## **Contactors & Overload Relays**

TeSys D Overload Relays—Solid State Table 18.5:

Current Setting Range (A)	For Direct Mounting Beneath Contactor LC1	Class 10	Class 20	\$ Price
60–100	D115-D150	LR9D5367	LR9D5567	298.00
90–150	D115-D150	LR9D5369	LR9D5569	298.00

Table 18.6: TeSys F Contactors—2, 3, and 4 Pole Standard power ratings of 3-phase motors 50/60 Hz in category AC-3



LC1F115

LC1F1700, F2100

New!

HP	HP	HP	HP	Α	Α	. 0.00	with Screws	
30	40	75	100	115	200	3	LC1F115	479.00
30	40	/5	100	115	∠00	4	LC1F1154	630.00
40	50	100	125	150	250	3	LC1F150	696.00
40	50	100	125	150	250	4	LC1F1504	825.00
50	60	125	150	185	275	3	LC1F185	938.00
50	60	125	150	100	2/5	4	LC1F1854	1439.00
	Curr	ent Rated		225	315	3	LC1F225	1059.00
	Curr	eni naieu		225	315	4	LC1F2254	1935.00
60	75	150	175	265	350	3	LC1F265	1179.00
	75	150	175	205	330	4	LC1F2654	1646.00
75	100	200	250	330	400	3	LC1F330	1621.00
75	100	200	250	330	400	4	LC1F3304	1846.00
						2	LC1F4002	1521.00
100	125	250	300	400	500	3	LC1F400	1874.00
						4	LC1F4004	2133.00
						2	LC1F5002	4324.00
150	200	400	500	500	700	3	LC1F500	4970.00
						4	LC1F5004	5617.00
						2	LC1F6302	5917.00
250	300	600	800	630	1000	3	LC1F630	6474.00
						4	LC1F6304	7582.00
	Curr	ent Rated		780	1600	3	LC1F780	7788.00
	Curr	eni naieu		760	1600	4	LC1F7804	9940.00
	450	800	900	800	1000	3	LC1F800	6676.00
		Current Rated			1700	3	LC1F1700	10,000.00
		Current Rated			2100	3	LC1F2100	12,050.00
▲ Complete	the part number by a	adding the coil volta	ge code from Table 18.8	(for example	.LC1F115G7	). All contactors exc	cept F780 include 1 N.O.	coil interlock

Complete the part number by adding the coil voltage code from Table 18.8 (for example, LC1F115G7). All contactors except F780 include 1 N.O. coil interlock contact.

#### Table 18.7: TeSys F 3-Phase Overload Relays—Solid State, Separate Mounting •

Current Setting Range A	For Direct Mounting to Contactor LC1●●●	Class 10 Trip ♦ Catalog Number	Class 20 ♦ Catalog Number	\$ Price
30–50	F115-F185	LR9F5357	LR9F5557	298.00
48–80	F115-F185	LR9F5363	LR9F5563	298.00
60–100	F115-F185	LR9F5367	LR9F5567	298.00
90–150	F115-F185	LR9F5369	LR9F5569	298.00
132-220	F185 ★ -F265	LR9F5371	LR9F5571	298.00
200-330	F265-F500	LR9F7375■	LR9F7575■	333.00
300-500	F265-F500	LR9F7379■	LR9F7579■	737.00
380-630	F400-F630	LR9F7381 ■	LR9F7581 ■	905.00

- When mounting overload relays LR9F5•57–LR9F5•71 directly beneath the contactor, supporting the relays with a mounting plate is recommended. With overload relays LR9F7•75–LR9F7•81, use of a support mounting plate is mandatory. IEC standard 60947-4 specifies the following trip times when the overload relay senses 7.2 times the setting current: Class 10—between 4 and 10 seconds; Class 20—between 6 and 20 seconds.
- Interconnection kit LA7F407 is required to mount an LR9F•71 to an LC1F185.

#### Table 18.8: Coil Voltage Codes ◊

Contactor	Hz	24 V	48 V	110 V	120 V	208 V	220 V	240 V	440 V	480 V	500 V	600 V
					AC							
D09-D150	50/60	B7	E7	F7	G7	LE7	M7	U7	_	T7 ▼	_	X7 ▼△
LC1D80-LC1D150 only	60	B6	E6	F6	G6	L6	M6	U6	_	T6	_	X6 △
ECTD80-ECTD150 only	50	B5	E5	F5	_	_	M5 <b>▼</b>	U5	_	_	_	_
F115, F150, and F185	50	B5	E5	F5	_	_	M5	U5	_	_	_	_
1 115,1 150, and 1 165	60	B6	E6	F6	G6	L6	M6	U6	_	Q5	_	S7
F265, and F330	40-400	B7	E7	F7	G7	L7	M7	U7	_	S7☆	_	X7
F400— F780	40-400		E7	F7	G7	L7	M7	U7	_	N7	_	X7 🗆
F1700— F2100	40-400	_	_	F7	G7	_	M7	U7	R7	_	S7	_
Contactor	Hz	24 V	48 V	110 V	125 V	220 V	250 V	440 V				
			DC ▽									
D09-D32, DT20-D258 Low Consumption	_	BL	EL	FL	_	ML	UL	_				
D09-D150	_	BD	ED	FD	GD	MD	UD	RD				
F115-F330	_	BD	ED	FD	GD	MD	UD	RD				
F400-F780	_	_	ED	FD	GD	MD	UD	RD				
F1700— F2100	_	_	_	FD	GD	MD	UD	RD				

Not available for LC1D80.

Vac/Vdc

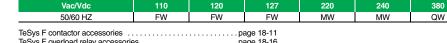
- Δ Not available for LC1D115 or LC1D150.
- Not available for LC1F780. The 600 V coils for LC1F400-LC1F630 do not include an auxiliary contact for holding circuits.
- For additional voltage codes refer to the IEC Contactor and Starter Catalog 8502CT9901.
- For use with F265-F330 only.
- DC coils 3-pole contactors are fitted with built-in surge suppression as standard.

112

110

#### Table 18.9: Coil Voltage Codes for AC and DC Voltages for F800 (includes built-in surge suppressor) 127

220



Discount Schedule

TeSys F overload relay accessories ..... . page 18-16 TeSys F replacement coils and parts ..... pages 18-13, 18-18, 18-20 . pages 18-42 to 18-49





E164862

LR43364

CCN NLDX

Class 3211 04

QW

Each 3-pole device is prewired with line and load side power wiring for reversing applications. Each 4-pole device is prewired with load side power wiring.



LC2D09

	Max	imum Hors	epower Rat	tings		Maximun	n Current	No. of N.O.		Auxiliary		Catalog \$ Pric	
Single	Phase		Three	Phase		Inductive	Resistive	Power		tacts ntactor)	Number	AC	DC
115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp	AC3 (A)	AC1 (A)	Poles	N.O.	N.C.	<b>A</b>	Control	Control
0.5	1	2	2	5	7.5	9	00	3	1	1	LC2D09♦	234.00	317.00
	_	_	_	_	_	_	20	4	1	1	LC2DT20	234.00	317.00
1	2	3	3	7.5	10	12	25	3	1	1	LC2D12♦	317.00	368.00
	_	-	_	_	1	-	23	4	1	1	LC2DT25	317.00	368.00
1	3	5	5	10	15	18	35	3	1	1	LC2D18♦	344.00	400.00
	_	-	_	_	-	_	32	4	1	1	LC2DT32	419.00	443.00
2	3	7.5	7.5	15	20	25	40	3	1	1	LC2D25♦	374.00	436.00
	_	_	_	_	_	_	40	4	1	1	LC2DT40	456.00	477.00
2	5	10	10	20	30	32	50	3	1	1	LC2D32◆	415.00	503.00
3	5	10	10	30	30	40	60	3	1	1	LC2D40A	565.00	650.00
3	7.5	15	15	40	40	50	70	3	1	1	LC2D50A	596.00	680.00
5	10	20	20	50	50	65	80	3	1	1	LC2D65A	778.00	857.00
7.5	15	30	30	60	60	80	125	3	1	1	*		_
	_	_	_	_	_	_	123	4	_	_	*		_
	_	30	40	75	100	115	200	3	1	1	LC2D115 ▼	1165.00	1165.00
	_	_	_	_	_	_	200	4	_	_	LC2D115004 ▼	1391.00	1391.00
	_	40	50	100	125	150	200	3	1	1	LC2D150▼	1598.00	1598.00

- Use voltage codes from Table 18.11 to complete the catalog number (for example, LC2D09G7).
  Includes mechanical interlock without electrical contacts. Installer to complete wiring for electronically interlocking contactor operating coils by using a N.C. auxiliary contact integrated in the contactor or optional LADN or LAD8N auxiliary contact block.

  For LC2D09–LC2D32, electrical interlock can be included by adding a V to the end of the catalog number (for example LC2D09B7V).
  List price adder \$5.00
- List price adder: \$5.00.
- For these items, order two non-reversing contactors and one mechanical interlock separately. See page 18-4 and 18-14 for selection. Includes mechanical interlock (LA9D11502) with prewired electrical contacts for interlocking contactor operating coils.

#### Table 18.11: Coil Voltage Codes ★

Contactor	Hz	24 V	48 V	110 V	120 V	125 V	208 V	220 V	240 V	250 V	440 V	480 V	600 V
						AC							
D09-D150	50/60	B7	E7	F7	G7	_	LE7	M7	U7	_	_	T7 △	X7 △
LC1D80-LC1D150	50	B5	E5	F5	_	-	-	M5 △	U5	_	-	-	_
LC1D60-LC1D150	60	B6	E6	F6	G6	_	L6	M6	U6	_	_	T6	X6 □△
F115, F150, F185	50 Hz	B5	E5	F5	_	_	_	M5	U5	_	_	_	_
F115, F150, F165	60 Hz	B6	E6	F6	G6	-	L6	M6	U6	_	-	Q5	SC
F265, F330	40–400 Hz	B7	E7	F7	G7	_	L7	M7	U7	_	_	S7 ▽	X7
F400-F780	40–400 Hz	_	E7	F7	F7	_	L7	M7	U7	_	_	N7	X7 ◊
						DC							
D09-D32, DT20-D258 Low Consumption	_	BL	EL	FL	_	_	_	ML	_	UL	_	-	_
D09-D150	_	BD	ED	FD	_	GD	_	MD	_	UD	RD	_	_
F115-F330	_	BD	ED	FD	_	GD	_	MD	_	UD	RD	_	_
F400-F780	_		ED	FD	_	GD	Ė	MD	_	UD	RD	_	

- Not available for LC1D80-LC1D150.
- Not available for LC1D115 or LC1D150. Not available for LC1F780. The 600 V coils for LC1F400–LC1F630 do not include an auxiliary contact for holding circuits.
- For additional voltage codes refer to the IEC Contactor and Starter catalog, 8502CT9901.
- For use with F265-F330 only.

#### Table 18.12: Coil Voltage Codes for AC and DC Coil Voltages for F800 (includes built-in surge suppressor)

Vac/Vdc	24	48	110	120	127	208	220	240	277	380	415	440	480	575	600	660
50/60 Hz	_	_	FW	FW	FW	_	MW	MW	_	QW	QW	QW	_	_	_	_

TeSys D contactor accessories . . . . . . . . . pages 18-8 to 18-11 TeSys D overload relay accessories page 18-16
TeSys D replacement coils pages 18-17 to 18-19 



E164862 CCN NLDX



LR43364 Class 3211 04











**Contactors** 

LC1F265

#### **How to Order:**

Components are available for customer assembly of TeSys F reversing contactors. For example, the following components must be ordered to build a reversing contactor, 75 hp @ 460 V, with a 120 V / 60 Hz coil:

Table 18.13: Example of Components

Description	Quantity	Catalog Number
Contactors	2	LC1F115G6
Lugs (page 18-12)	6	DZ2FF1
Auxiliary contacts	2	LADN11
Power connections	1	LA9FF976
Mechanical interlock	1	LA9FF970

Table 18.14: 3-Pole Contactors

Maxi	mum Hors	epower Ra	ntings	Maximun	n Current		Circuit	Catalog	
	Three	Phase		Inductive	Resistive	Contact Built Into Coil		Number▲	\$ Price
200 V hp	230 V hp	460 V hp	575 V hp	AC3 (A)	AC1 (A)	N.O.	N.C.		
30	40	75	100	115	200	1	0	LC1F115	479.00
40	50	100	125	150	250	1	0	LC1F150	696.00
50	60	125	150	185	275	1	0	LC1F185	938.00
60	75	150	200	265	350	1	0	LC1F265	1179.00
75	100	200	250	330	400	1	0	LC1F330	1621.00
100	125	250	300	400	500	1	0	LC1F400	1874.00
150	200	400	500	500	700	1	0	LC1F500	4970.00
250	300	600	800	630	1000	1	0	LC1F630	6872.00
	Currer	nt rated		780	1600	0	0	LC1F780	7788.00
	450	800	900	800	1000	0	0	LC1F800	6676.00

<sup>▲</sup> Use coil voltage codes from the Voltage Codes table on page 18-6 to complete the contactor catalog number.

Table 18.15: Auxiliary Contact (Electrical Interlocking)—2 must be purchased

For use with	Number of Contacts	Maximum Number of Blocks Per Contactor	Contact A	rrangement	Catalog Number	\$ Price
	4	4	1	_	LADN10	13.10
	'	'	_	1	LADN01	13.10
	2	2	1	1	LADN11	20.70
		2	2	-	LADN20	20.70
LC1F to be ordered			2	2	LADN22	41.50
separately			1	3	LADN13	41.50
	,	2	4	_	LADN40	41.50
	4	2	_	4	LADN04	41.50
			3	1	LADN31	41.50
			2	2 ■	LADC22	41.50

including 1 N.O. + 1 N.C. make-before-break

Table 18.16: Accessories—For the Assembly of 3-Pole Reversing Contactors (Horizontal Mounting)

With 2 Identical Contactors ◆	Set of Power Connections Catalog Number	\$ Price	Horizontal Mounting Mechanical Interlock Kit Catalog Number	\$ Price
LC1F115	LA9FF976	106.00	LA9FF970	53.00
LC1F150	LA9F15076	96.00	LA9FF970	53.00
LC1F185	LA9FG976	113.00	LA9FG970	53.00
LC1F265	LA9FH976	151.00	LA9FJ970	76.00
LC1F330	LA9FJ976	225.00	LA9FJ970	76.00
LC1F400	LA9FJ976	198.00	LA9FJ970	76.00
LC1F500	LA9FK976	306.00	LA9FJ970	76.00
LC1F630, F800	LA9FL976	568.00	LA9FL970	76.00

For two contactors of different size, refer to pages 18-15.

TeSys F contactor accessories page	18-11
TeSys F overload relay accessoriespage	18-16
TeSys F replacement coils and parts pages 18-13, 18-18,	18-20
Dimensions	18-42

Table 18.17: Definite Purpose Ratings, 3-Phase, Breaking All Lines (Hermetic Refrigeration Compressor)

Device	FLA		LRA	
Device	FLA	240V	480V	600V
LC1D09 (AC coil only)	9	54	45	36
LC1D12 (AC coil only)	12	72	60	48
LC1D18 (AC coil only)	18	108	90	72
LC1D25 (AC coil only)	25	150	125	100
LC1D32 (AC coil only)	32	192	160	128
LC1D40A	40	240	200	160
LC1D50A	50	300	250	200
LC1D65A	65	390	325	260
LC1D80	75	450	375	300
LC1D95	_	_	_	_
LC1D115	115	690	575	460
LC1D150	150	900	750	600



E164862 CCN NLDX



LR43364 Class 3211 04





Front Mounted **Auxiliary Blocks** 

Table 18.18: Standard, Instantaneous Auxiliary Contact Blocks

Snap-On	Number of	Comp	osition	Catalan Number A	\$ Price	
Mounting	Contacts	N.O.	N.C.	Catalog Number A	\$ FIICE	
		2	2	LADN22 ■	41.50	
		1	3	LADN13 ■	41.50	
To front of	4 ▲	4	0	LADN40 ■	41.50	
LC●DT20-D258 (4P),	4 🔺	0	4	LADN04 ■	41.50	
LC●D09–D150▲ or		3	1	LADN31 ■	41.50	
To right side of		2 ♦	2 ♦	LADC22 ■◆	41.50	
ĽC●F		1	1	LADN11 ■	20.70	
	2	2	0	LADN20 ■	20.70	
		0	2	LADN02■	20.70	
To front of LC●D80 and D115 or To left side of LC●F	1	1	0	LADN10 ★	13.10	
		0	1	LADN01 ★	13.10	
To side of LC●D09 to D150 only	2	1	1	LAD8N11 ▼	20.70	
(not for use on TeSys F)		2	0	LAD8N20 ▼	20.70	

- For low consumption coils (LC1D09-D32 only), only one front-mounted two-contact block allowed. No sidemounted contact blocks allowed.
- For spring terminal versions of these blocks, add a 3 to the end of the catalog number (for example, LADN223). There is no charge for this modification. For slip-on versions, add 9 to the end of the catalog number (for example,
- Including 1 N.O. + 1 N.C. make-before-break overlapping contacts.

  This block cannot be added to the LC1D 09–D32 contactors; a maximum of 2 blocks can be mounted on the LC1D40A–LC1/LP1D80 contactors only.
- 1 block may be added to the left side of LC1D09–D32, AC coils only; only 1 block may be added to either side of the LC1D40A–D80 contactors, AC coils only. Cannot be installed on TeSys D contactors with DC coils.

Table 18.19: Instantaneous Blocks with Dust-Tight Auxiliary Contacts (IP54) **NEMA 12** 

Snap-On	Standard Contacts		Dust-Tight Contacts		Catalog Number	\$ Price
Mounting	N.O.	N.C.	N.O.	N.C.	Catalog Number	\$ Price
To front of	_	_	2	_	LA1DX20	65.00
LP●D40-D80, LC●DT20-D258 (4P), LC●D09 to D80	2	_	2	_	LA1DZ40	82.00
or	1	1	2	_	LA1DZ31	82.00
To right side of LC●F	_	1	2	_	LA1DY20△	77.00

Device supplied with 4 ground terminal points.

#### Table 18.20: Pneumatic Time Delay Contact Blocks

Snap-On Mounting	Time Delay Contacts		tacts Type		Catalog Number ◊	\$ Price
Mounting	N.O.	N.C.		Time Delay	Number	
				0.1 to 3 s□	LADT0	131.00
To front of	1	1	Officiologization	0.1 to 30 s	LADT2	131.00
LP●D40-D80, LC●DT20-D258 (4P),				10 to 180 s	LADT4	131.00
LC●D09 to D150 "				1 to 30 s☆	LADS2	131.00
or <b>To right side of</b>				0.1 to 3 s□	LADR0	131.00
LC●F		1	On de-energization (off-delay)	0.1 to 30 s	LADR2	131.00
			(on delay)	10 to 180 s	LADR4	131.00

- Scale range is expanded between 0.1 and 0.6 seconds on the dial for more accurate settings at the lower end of
- ٥ For spring terminal versions of these blocks, add a 3 to the end of the catalog number (for example, LADT23). There
- Switching time between the opening of the N.C. contact and the closing of the N.O. contact: 40 ms  $\pm$  15 ms .

#### Table 18.21: Mechanical Latch Blocks with Manual or Electrical Unlatch (TeSys D only)

Front snap-on mounting onto	Application	Catalog Number <b>♀</b>	\$ Price
LC●D09 to D65A	For silent operation and energy conservation	LAD6K10∇⊕ <b>*</b>	77.00
LC1 D80 to D150 LP1 D80	For silent operation and energy conservation	LA6DK20∇ €	77.00

- Does not include internal coil clearing contact.
- Complete the catalog number by adding the coil voltage code (for example, LAD6K10F).
- Low consumption DC contactors (and relays) (code coil xL) are not compatible with the LAD6K10x mechanical latching blocks.

Table 18.22: Coil Voltage Codes for LA6DK Mechanical Latch Blocks

Volts	12	24	32/36	42/48	60/72	100	110/ 127	200/ 208	220/ 240	380/ 415	440/ 480	500/ 600
AC or DC	J	В	С	Е	EN	K	F	L	М	O	R	S





E164862 CCN NLDX



LR43364 Class 3211 04







LA4DA1U

#### **RC Coil Suppressor**

**Contactor Accessories** 

- Limitation of transient voltage to 300% of nominal voltage maximum.
- Oscillating frequency limited to 400 Hz maximum. Slight increase in drop-out time (1.2 to 2 times normal).



Installed by	Mounting on	Operating Voltage 50/60 Hz	Catalog Number	\$ Price
	1010001 101000 (00)	24–28 V	LAD4RCE	26.20
Snapping into the cavity on the right side without tools ♦	LC1D09 to LC1D32 (3P) LC•DT20 to DT40 (4P),	50-127 V	LAD4RCG	26.20
	200812010140(41),	110-240 V	LAD4RCU	26.20
		24-48 V	LAD4RC3E	26.20
Snap-on mounting, and connection without tools to the	LC1D40A to LC1D65A (3P), LC1DT60A to LC1DT80A (4P)	50-127 V	LAD4RC3G	26.20
contactor coil terminals		110-240 V	LAD4RC3U	26.20
	()	380-415 V	LAD4RC3N	26.20
		24–48 V	LA4DA2E	26.20
Screw connection to the contactor coil terminals		50-127 V	LA4DA2G	26.20
Sciew connection to the confactor conferminals	LC●D80 to D115 (4P)	110-240 V	LA4DA2U	26.20
		380-415 V	LA4DA2N	26.20

#### Varistor Coil Suppressor

- Limitation of transient voltage value to 200% of nominal voltage maximum.
- Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times normal).

#### Table 18.24: Varistor (Peak Limiting) for Reduction of Electrical Noise in AC Contactor Coils

Installed by	Mounting on	Operating Voltage 50/60 Hz	Catalog Number	\$ Price
		24–48 V	LAD4VE	26.20
Snapping into the cavity on the right side without tools ♦	LC●D09 to D32 TeSys D contactors	50-127 V	LAD4VG	26.20
	recys D contactors	110-250 V	LAD4VU	26.20
	LC1D40A to LC1D65A (3P).	24-48 V	LAD4V3E	26.20
Snap-on mounting, and connection without tools to the contactor coil terminals		50-127 V	LAD4V3G	26.20
Contactor con terrinical	(4P)	110-250 V	LAD4V3U	26.20
	LO-DOO +- D445 (OD 4D)	24-48 Vac	LA4DE2E	26.20
Screw connection to the contactor coil terminals	LCOD80 to D115 (3P or 4P) LCOD12, D25 (4P)	50-127 Vac	LA4DE2G	26.20
	200512, 525 (41)	110-250 Vac	LA4DE2U	26.20
		24-48 Vdc	LA4DE3E	26.20
Screw connection to the contactor coil terminals	LC●D80 (3P or 4P)	50-127 Vdc	LA4DE3G	26.20
		110–250 Vdc	LA4DE3U	26.20

#### **Diode Coil Suppressor**

- No overvoltage or oscillating frequency.
- Polarized component. Increased drop-out time (6-10 times normal).

#### Table 18.25: Diode for Reduction of Electrical Noise in DC Contactor Coils

Installed on the upper part by	Mounting on	Operating Voltage, DC	Catalog Number	\$ Price
Snap-on mounting and connection w/o tools to the contactor coil terminals	LC●D09-D32	24-250 Vdc	LAD4DDL	26.20
Clip-on front mounting	LC●D40A to D65, D65A to DT80A	24–250 Vdc	LAD4D3U	26.20
Screw connection of wire to the contactor coil terminals	D80 (3P) D80 (4P)	24–250 Vdc	LA4DC3U	26.20

#### **Bidirectional Diode Coil Suppressor**

- Protection provided by limiting the transient voltage to 2 Uc max.
- Maximum reduction of transient voltage peaks

#### Table 18.26: Bidirectional Peak Limiting Diode

Installed by	Mounting on	Operating Voltage 50/60 Hz and DC	Catalog Number	\$ Price
Snapping into the cavity on the right side of the contactor ❖	LC●D09 to LC●D32 (3P)	24 (AC only)	LAD4TB	26.20
Shapping into the cavity on the right side of the contactor •	DT20 to DT40 (4P)	72 (AC only)	LAD4TS	26.20
		12–24 V	LAD4T3B	26.20
	LC1D40A to LC1D65A (3P),	25–72 V	LAD4T3S	26.20
Clip-on front mounting and connection without tools to the contactor coil terminals ●	LC1DT60A to LC1DT80A	73–125 V	LAD4T3G	26.20
to the contactor contentinals		126–250 V	LAD4T3U	26.20
		251-440 V	LAD4T3R	26.20
		24 (AC only)	LA4DB2B	56.00
Corou mounting 5	LC●D80	72 (AC only)	LA4DB2S	26.20
Screw mounting •	LC#D80	24 (DC only)	LA4DB3B	56.00
		72 (DC only)	LA4DB3S	56.00

- Installing the suppressor into the cavity makes the electrical connection. Overall width of the contactor remains the same.
- For LC D09-LC D65A with DC or low consumption DC coils, 3-pole contactors are fitted with built-in bidirectional diode suppression as standard. Mounting at the top of the contactor on coil terminals A1 and A2

#### Table 18.27: Cabling Accessories

Usage	Mounting on	Operating Voltage 50/60 Hz		Catalog Number	\$ Price	
		Without coil sup	pression	LAD4BB	23.00	
For adapting existing wiring to a new product or for use with	AC only	With coil	24-48 V	LAD4BBVE	23.00	
top-mounting accessory.		AC only suppl	suppression	50-127 V	LAD4BBVG	23.00
		(varistor)	110-250 V	LAD4BBVU	23.00	
For adapting existing wiring to a new product or for use with top-mounting accessory	LC1D40A to LC1D65A (with no coil suppressor)		_	LAD4BB3	26.20	

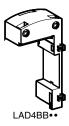




LA4DC3U



LAD4T3B



## TeSys™ D Electronic Timers and Interface Modules

Refer to Catalog 8502CT9901



The following accessories require use of cabling accessories (LAD4BB●●) for proper mounting. See page 18-9 for illustration.

#### Table 18.28: Electronic Serial Timer Modules

These solid state modules delay the energizing of the contactor coil, and feature built-in varistor surge suppression.

Туре		Operational Voltage ▲	Time Delem	Ontale w Name have	\$ Price
	24–250 Vac	100–250 Vac	Time Delay	Catalog Number	
	LC1D09-D65A	LC1D80-D150	0.1–2 s	LA4DT0U	82.
On-delay			1.5–30 s	LA4DT2U	82.
			25-500 s	LA4DT4U	82.

For 24 V operation, the contactor must be fitted with a 21 V coil: coil voltage code Z5 for 50 Hz; Z6 for 60 Hz; and ZD for DC.

#### Table 18.29: Interface Modules ■

These modules allow the contactor coils to be energized from low voltage and low current level signals. They come in mechanical relay and solid state versions. The relay plus manual operation versions include a lever for manually turning the contactor on and off. When a module receives a low level signal, it allows the separate-sourced control voltage to flow to the contactor coil. It saves space and wiring time compared to conventional interposing relays.

Interface Type	Operational Voltage		Input Voltage	Catalog Number	\$ Price
ппенасе туре	24–250 Vac	100-250 Vac	input voitage	Catalog Number	\$ FIICE
Relay	LC1D09-D150	ı	24 Vdc	LA4DFB	55.
nelay	LC1D09-D150	_	48 Vdc	LA4DFE	55.
Relay Plus	LC1D09-D150	ı	24 Vdc	LA4DLB	71.
Manual Operation	LC1D09-D150		48 Vdc	LA4DLE	71.
Solid State	LC1D09-D65	LC1D80-D115	24 Vdc	LA4DWB	71.

Adapter required for D09-D65A, see table 18.27.

#### Table 18.30: Automatic-Manual-Stop Control Modules

These modules allow for local and/or remote operation of the contactor coil. Each module includes a lever to switch from automatic to manual operation and a dial to turn the contactor on and off.

Operatio	nal Voltage	Catalog Number	\$ Price	
24-100 Vac	100-250 Vac	Catalog Number	\$ Frice	
LC1D09-D150	_	LA4DMK	35.	



LA4DFB

**18** 





Table 18.31: For Power Pole or Control Connection

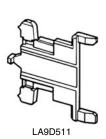












Description			For use with contactors LC1/LP1	Sold in lots of	Catalog Number	\$ Price each
Connectors for	4 poles	#8 AWG (10 mm <sup>2</sup> )	D09, D12	1	LAD92560	8.70
larger cable sizes	3 poles	#4 AWG (25 mm <sup>2</sup> )	D09-D32	1	LA9D3260	12.00
Everlink™ terminal block	3 poles		D40A-D65A	1	LAD96560	10.00
			D09-D32	10	LA9D2561	26.20
			D40A-D65A	1	LAD9P32	6.00
			D80	2	LA9D80961	6.50
	2 poles		F115	4	LA9FF602	55.00
	12 poies		F150, F185	4	LA9FG602	65.00
			F265, F330, F400	4	LA9FH602	169.00
			F500	4	LA9FK602	228.00
			F630, F800	4	LA9FL602	278.00
Links for the parallel	3 poles (wye-delta shorting strap)		D09-D32	10	LAD9P3	10.00
connection of:			D40A-D65A	1	LAD9P33	25.00
			D80	1	LA9D80962	6.50
			F115	1	LA9FF601	6.80
			F150, F185	1	LA9FG601	8.20
			F265, F330, F400	1	LA9FH601	12.00
			F500	1	LA9FK601	21.80
			F630, F800	1	LA9FL601	38.20
	4 malaa		DT20, DT25	2	LA9D1263	8.70
	4 poles		D80	2	LA9D80963	17.50
Second coil connection		LP1D40-D80	10	LA9D09966	2.20	
Control circuit take-off from main pole		D115, D150	10	LA9D11567	4.00	
		D80	10	LA9D8067	5.50	
Spreaders for increas	Spreaders for increasing pole pitch to 45 mm			3	GV7AC03	31.10
Replacement power	terminal block		D115, D150	1	LA9D115603	55.00

Table 18.32: For Marking

Description	For use with contactors LC1/LP1	Sold in lots of	Catalog Number	\$ Price each
Reference label holder snap-on 8 x 22 mm	4-pole contactors D80-D115	100	LA9D92	.06
Reference label holder snap-on 8 x 18 mm 3 poles	D09-D65A, DT20-DT80A, LADN, LADT, LADR	100	LAD90	.06
Sheet of 300 labels self adhesive 7 x 21 mm	For holder LA9D92	1	LA9D93	4.30

Table 18.33: For Mounting

Description	For use with contactors LC1/LP1	Sold in lots of	Catalog Number	\$ Price each
Set of shims for mounting LAD8N and LA8DN	D80	1	LA9D511	9.80
Retrofit plate for replacement of LC1D40-D65 with LC1D40A-D65A	D40A-D65A	1	LAD7X3	25.00
35 mm DIN Rail – 2 meters long	LC1D09 to D80	10	AM1DP200	5.20

Table 18.34: Replacement Contacts

	For use with contactors		Catalog Number	\$ Price
Three-pole	LC1D115	3 poles	LA5D1158031	239.00
Till ee-pole	LC1D150	3 poles	LA5D150803	239.00
Four-pole	LC1D115	4 poles	LA5D115804	318.00

Table 18.35: Arc Chambers

	For use with contactors		Catalog Number	\$ Price
Three-pole	LC1D115	3 poles	LA5D11550	90.00
Three-pole	LC1D150	3 poles	LA5D15050	90.00
Four-pole	LC1D115	4 poles	LA5D115450	119.00

TeSys D contactors	pages 18-4, 18-6
TeSys D overload relay accessories	page 18-16
TeSys D replacement coils	pages 18-18 to 18-19
Dimensions	pages 18-40 to 18-47
TeSys F contactors	pages 18-5, 18-7
TeSys F replacement coils and parts	pages 18-13, 18-18, 18-20

LA9D09981

Operating limit: up to 220 V, 50/60 Hz coils								
Description	For Use		Catalog Number	\$ Price				
Suppressor block	With coils	LX1FF, FG, FH, F115, F150, F185, F225, F265, F330	LA9F980	21.80				
(clip-on mounting to coil)	With coils	LX1FJ, FK, FL, FX, F400, F500, F630, F780, LX9FF, FG, FH, F115, F150, F185, F225, F265, F330	LA9D09980	20.70				
Mounting bracket (for 35 mm DIN rail or panel mounting) for suppressor block LA9D09981								
· · · · · · · · · · · · · · · · · · ·								

#### Table 18.37: Lugs and Lug Kits ▲

Contactor Type LC1	Lug Kit Catalog Number Contactor Only	Cable Size AWG range	Overload Relay	Directly mounted to contactor	Lugs Required		Cable size AWG range	
_	_	_	_	LC1•			Line side of contactor	Load side of overload
F115	DZ2FF6	14 to 2/0	LR9F5•57 to F5•69	F115	3 each DZ2FF1	3 each DZ2FG1	14 to 2/0	6 to 3/0
F150, F185	DZ2FG6	6 to 3/0	LR9F5•57 to F5•71	F150 to F185	1 each DZ2FG6		6 to 3/0	
_	_	_	LR9F5•71	F225, F265	1 each DZ2FH6		6 to 300 MCM	
F225, F265, F330	DZ2FH6	6 to 300 MCM	LR9F7•75 to F7•79	F265 or F330	3 each DZ2FH1	_	6 to 300 MCM	4 to 500 MCM
F400	DZ2FJ6	4 to 500 MCM	LR9F7•75 to F7•81	F400	3 each DZ2FJ1	_	4 to 500 MCM	4 to 500 MCM
F500	DZ2FK6	2 x 2 to 600 MCM	LR9F7•75 to F7•81	F500	3 each DZ2FK1	_	2x2 to 600 MCM	4 to 500 MCM
F630, F800	DZ2FL6	3 x 2 to 600 MCM	LR9F7•81		1 each DZ2FL1 DZ2FL2 DZ2FL3	1 each DZ2FR1	3x2 to 600 MCM	4 to 500 MCM
F780	DZ2FX6	4 x 1/0 to 750 MCM	_	_	_	_	_	_

Lug kits ending in the number 6 include 6 identical lugs. In some cases the LR9F overload relay mounted directly on the load side of an LC1F contactor will require a different size lug for your choice of contactor and overload. If the two sizes are different, order 3 of each size lug. Mounting hardware (screws, washers, and nuts) are provided with the contactors and overload relays, not with the lugs. See Table 18.39 for pricing.

#### Table 18.38: Lugs, 2- and 4-Pole ◆

Contactor Type LC1	Lug Kit	Qty. R	equired	AL/CU	
Contactor Type LC1	Catalog Number	2-Pole	4-Pole	Cable Size	
F115	DZ2FF1	4	8	14 to 2/0	
F150, F185	DZ2FG1	4	8	6 to 3/0	
F225, F265, F330	DZ2FH1	4	8	6 to 300 MCM	
F400	DZ2FJ1	4	8	4 to 500 MCM	
F500	DZ2FK1	4	8	2 X 2 to 600 MCM	
F630	DZ2FL■			3 X 2 to 600 MCM	
F780	DZ2FX1	4	8	4 X 1/0 to 750 MCM	

#### Table 18.39: Lugs Pricing

-	
Lug Catalog Number	\$ Price
DZ2FF6	39.30
DZ2FG6	65.00
DZ2FH6	65.00
DZ2FJ6	65.00
DZ2FK6	131.00
DZ2FL6	164.00
DZ2FX6	163.80
DZ2FF1	6.50
DZ2FG1	11.00

\$ Price	Lug Catalog Number
11.00	DZ2FH1
11.00	DZ2FJ1
21.80	DZ2FK1
27.30	DZ2FL1
55.00	DZ2FL2
27.30	DZ2FL3
173.30	DZ2FR1
27.30	DZ2FX1

These clear plastic protective shrouds are an effective means to meet international touch-safe requirements for power terminals. They are designed to be used with power cables that have been bolted to the terminal.

NOTE: The protection shrouds do not attach to contactors or overloads using DZ2F lug kits.

#### Table 18.40: Power Terminal Protection Shrouds

For Use With 2-, 3-, And 4-pole Contactors	Number of Shrouds Per Set	Catalog Number	\$ Price
LC1F115	6	LA9F701	42.40
LC1F150, F185	6	LA9F702	61.00
LC1F225, F265, F330, F400 and F4002, F500 and F5002	6	LA9F703	82.00
LC1F630, F6302 and F800	6	LA9F704	93.00
LC1F1154	8	LA9F706	58.00
LC1F1504 and F1854	8	LA9F707	80.00
LC1F2254, F2654, F3304, F4004, F5004	8	LA9F708	111.00
LC1F6304	8	LA9F709	120.00

For contactors LC1F115, LC1F150, and LC1F185, an available touch-safe terminal block may be used in place of lugs for power connections.

Table 18.41: Insulated Terminal Blocks

For contactor type LC1	For overload relay LR9	Maximum Cable Size	Catalog Number	\$ Price
F115, F150, F185	F5•57, F5•63, F5•67, F5•69	300 MCM	LA9F103	55.00

TeSys F contactors	.pages 18-5, 18-7
TeSys F overload relay accessories	page 18-16
TeSys F replacement coils and parts pages 1	
Dimensions	nes 18-40 to 18-47

LA9F70●

For 2-pole F630 contactors, order two DZ2FL1 (L1 and T2), and two DZ2FL3 (L2 and T1).
For 4-pole F6304, order two DZ2FL1 (L1 and T4), four DZ2FL2 (L2, T2, L3, T3) and two DZ2FL3 (L4 and T1).
Lugs for LC1F contactors and overload relays must be ordered separately. Each kit consists of one lug. Mounting hardware (screws, washers, nuts) are provided with the contactors, not the lugs. See Table 18.39 for pricing.



Table 18.42: Replacement Contact Sets A

**Replacement Parts** 



	For use on contactors	NUmber of Poles	Catalog Number	\$ Price
	LC1F4002	2 poles	LA5F400802	717.
Two-pole	LC1F5002	2 poles	LA5F500802	1111.
	LC1F6302	2 poles	LA5F630802	1651.
	LC1F115, F150	3 poles	LA5FF431	239.
	LC1F185	3 poles	LA5FG431	418.
	LC1F265	3 poles	LA5FH431	793.
Three note	LC1F330, F400	3 poles	LA5F400803	1076.
Three-pole	LC1F500	3 poles	LA5F500803	1589.
	LC1F630	3 poles	LA5F630803	2488.
	LC1F780	1 pole	LA5F780801★	1651.
	LC1F800	3 poles	LA5F800803	2488.
	LC1F1504, F1154	4 poles	LA5FF441	318.
	LC1F1854	4 poles	LA5FG441	549.
	LC1F2654	4 poles	LA5FH441	966.
Four-pole	LC1F3304, F400, F4004	4 poles	LA5F400804	1435.
	LC1F5004	4 poles	LA5F500804	2461.
	LC1F6304	4 poles	LA5F630804	3304.
	LC1F7804	1 pole	LA5F780801★	1651.

Table 18.43: Arc Chambers



	For use on contactors	Number of Poles	Catalog Number	\$ Price
	LC1F4002	2 poles	LA5F400250	280.
Two-pole	LC1F5002	2 poles	LA5F500250	305.
	LC1F6302	2 poles	LA5F630250	431.
	LC1F115	3 poles	LA5F11550	90.
	LC1F150	3 poles	LA5F15050	101.
	LC1F185	3 poles	LA5F18550	179.
	LC1F265	3 poles	LA5F26550	269.
Thuas male	LC1F330	3 poles	LA5F33050	287.
Three-pole	LC1F400	3 poles	LA5F40050	305.
	LC1F500	3 poles	LA5F50050	341.
	LC1F630	3 poles	LA5F63050	646.
	LC1F780	1 pole	LA5F780150★	431.
	LC1F800	3 poles	LA5F80050	750.
	LC1F1154	4 poles	LA5F115450	119.
	LC1F1504	4 poles	LA5F150450	131.
	LC1F1854	4 poles	LA5F185450	248.
	LC1F2654	4 poles	LA5F265450	299.
Four-pole	LC1F3304	4 poles	LA5F330450	414.
	LC1F4004	4 poles	LA5F400450 ♦	573.
	LC1F5004	4 poles	LA5F500450 ◆	610.
	LC1F6304	4 poles	LA5F630450■	861.
	LC1F7804	1 pole	LA5F780150★	431.

- Supplied per pole are: 2 fixed contacts, 1 moving contact, 2 deflectors, 1 backplate, mounting screws and washers.
- Comprises single-pole components.
- Comprises 2-pole components.
  2 identical components per pole are supplied.

TeSys F overload relay accessories ...page 18-16
TeSys F replacement coils and parts ...pages 18-13, 18-18, 18-20 Dimensions . . . . . pages 18-42 to 18-47

Table 18.44: AC and DC Coil Part Numbers for LC1F1700 and LC1F2100

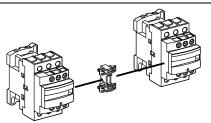
Control Circuit Voltage of the Contactor	Voltage Code	Spare Coil Part Number	Quantity
<u>'</u>	AC C	coils	
110 V	F7	LX1FK065	2
120 V	G7	LX1FK070	2
220 V	M7	LX1FK110	2
230 V	P7	LX1FK110	2
240 V	U7	LX1FK127	2
277 V	W7	LX1FK140	2
380 V	Q7	LX1FK200	2
400 V	V7	LX1FK200	2
415 V	N7	LX1FK220	2
440 V	R7	LX1FK220	2
500 V	S7	LX1FK240	2
	DC C	Coils	
110 V	FD	LX4FK055	2
125 V	GD	LX4FK065	2
220 V	MD	LX4FK110	2
250 V	UD	LX4FK125	2
440 V	RD	LX4FK220	2

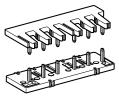
Note: These coills are standard parts included when a voltage code is added to the contactor part number LC1F1700 or LC1F2100.



Table 18.45: Contactors

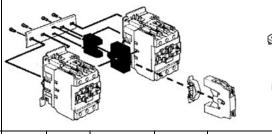
Reversing contactors comprising two identical,	Mechanical interlock				Set of power connections			
horizontally mounted contactors:	Without electrical interlock		With incorporated electrical interlock (2 N.C. contacts)		Reversing contactors for motor control		Four pole contactors	
			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
LC1D09, LC1D12, LC1D18, LC1D25, LC1D32	LAD9R1▲	32.10	LAD9R1V▲	45.50	Included	l with kit	_	-
LC1DT20, LC1DT25, LC1DT32, LC1DT40	LADT9R1▲	36.90	LADT9R1V▲	45.50	=	=	Included with kit	
	▲ Kit inc	▲ Kit including mechanical interlock and wiring.						





LC1D40, LC1D50, LC1D/LP1D65	LA9D50978	31.70	LA9D4002	45.90	LA9D6569	53.00	LA9D6570	63.00
LC1D40A, D50A, D65A	LAD4CM	45.00	_		LA9D65A69	75.00	-	
Newd	LAD9R3 ■	65.00	_		-	_	=	=

■ Kit combines both LAD4CM and LA9D65A69



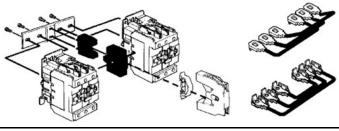


LC1D80 AC coil	LA9D50978	31.70	LA9D4002	45.90	LA9D8069	65.00	LA9D8070	79.00
LC1D80 DC coil	LA9D80978	31.70	LA9D8002	65.00	LA9D8069	65.00	LA9D8070	79.00





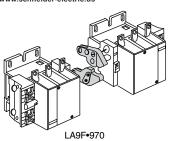
LC1D115 and LC1D150	Not Available	LA9D11502	78.00	LA9D11569	129.00	(3P)	53.00
			_			LA9D11570 (4P) (D115 only)	53.00

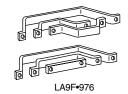


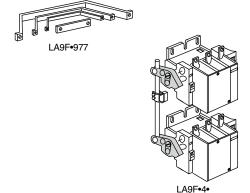


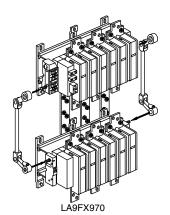
TeSys D contactors	pages 18-4, 18-6
TeSys D overload relay accessories	page 18-16
TeSys D replacement coils	pages 18-17 to 18-19
Dimensions	nages 18-40 to 18-46

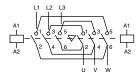




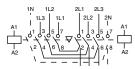








Reversing (motors) Application



Transfer/Changeover Applications

Table 18.46: Component Parts for the Assembly of F-Line 3-pole Reversing Contactors

With 2 Identical Contactors ▲	Set of Power Connections Catalog Number	\$ Price	Mechanical Interlock Kit Catalog Number	\$ Price
<b>Horizontal Mounting</b>				
LC1F115	LA9FF976	106.00	LA9FF970	53.00
LC1F150	LA9F15076	96.00	LA9FF970	53.00
LC1F185	LA9FG976	113.00	LA9FG970	53.00
LC1F265	LA9FH976	151.00	LA9FJ970	76.00
LC1F330	LA9FJ976	225.00	LA9FJ970	76.00
LC1F400	LA9FJ976	225.00	LA9FJ970	76.00
LC1F500	LA9FK976	306.00	LA9FJ970	76.00
LC1F630 or F800	LA9FL976	568.00	LA9FL970	76.00
<b>Vertical Mounting</b>				
LC1F115 or F150	*	_	LA9FF4F	97.00
LC1F185	*	_	LA9FG4G	113.00
LC1F265	*	_	LA9FH4H	126.00
LC1F330	*	_	LA9FJ4J	149.00
LC1F400	*	_	LA9FJ4J	149.00
LC1F500	*	_	LA9FK4K	149.00
LC1F630 or F800	*	_	LA9FL4L	149.00
LC1F780	•	_	LA9FX970 ■	508.00

Table 18.47: Component Parts for the Assembly of TeSys F 3-pole or 4-pole **Transfer Contactors** 

	Set of Power Connections		0.00	Mechanical	451
Horizontal Mounting	Three-Pole Four-Pole \$	\$ Price	Interlock Kit Catalog Number	\$ Price	
<b>Horizontal Mounting</b>					
LC1F115/4	LA9FF982	LA9FF977	53.00	LA9FF970	53.00
LC1F150/4	LA9F15082	LA9F15077	53.00	LA9FF970	53.00
LC1F185/4	LA9FG982	LA9FG977	53.00	LA9FG970	53.00
LC1F265/4	LA9FH982	LA9FH977	83.00	LA9FJ970	76.00
LC1F330/4	LA9FJ982	LA9FJ977	113.00	LA9FJ970	76.00
LC1F400/4	LA9FJ982	LA9FJ977	113.00	LA9FJ970	76.00
LC1F500/4	LA9FK982	LA9FK977	154.00	LA9FJ970	76.00
LC1F630/4	LA9FL982	LA9FL977	233.00	LA9FL970	76.00
<b>Vertical Mounting</b>					
LC1F115/4	*	*	_	LA9FF4F	97.00
LC1F185/4	*	*	_	LA9FG4G	113.00
LC1F265/4	*	*	_	LA9FH4H	149.00
LC1F330/4	*	*	_	LA9FJ4J	149.00
LC1F400/4	*	*	_	LA9FJ4J	149.00
LC1F500/4	*	*	_	LA9FK4K	149.00
LC1F630/4	*	*	_	LA9FL4L	149.00
LC1F780/4	-	•	_	LA9FX970 ◆	508.00

Table 18.48: Vertical Mounting of 2 Contactors of Different Ratings ▲

Upper Contactor	Lower Contactor ▼	Mechanical Interlock Kit Catalog Number	\$ Price
LC1F185 or 1854	LC1F115/150 or 1154/1504	LA9FG4F	113.00
LC1F265 or 2654	LC1F115/150 or 1154/1504	LA9FH4F	126.00
LC1F330 or 3304	LC1F185/1854 or 265/265A	LA9FH4G	126.00
	LC1F115/150 or 1154/1504	LA9FJ4F	126.00
LC1F400 or 4004	LC1F185 or 1854	LA9FJ4G	126.00
	LC1F265/2654 or 330/330A	LA9FJ4H	149.00
	LC1F115/150 or 1154/1504	LA9FK4F	149.00
LC1F500 or 5004	LC1F185 or 1854	LA9FK4G	126.00
LC1F300 0f 5004	LC1F265/2654 or 330/330A	LA9FK4H	149.00
	LC1F400 or 4004	LA9FK4J	149.00
	LC1F115/150 or 1154/1504	LA9FL4F	116.00
	LC1F185 or 1854	LA9FL4G	126.00
LC1F630, 6304 or LC1F800	LC1F265/2654 or 330/330A	LA9FL4H	149.00
2011 000	LC1F400 or 4004	LA9FL4J	149.00
	LC1F500 or 5004	LA9FL4K	149.00

- With identical or different numbers of poles.
- Double mechanical interlock with 2 mechanical links and 3 power connection bars.

  Double mechanical interlock with 2 mechanical links and 4 power connection bars.
- Power connection to be assembled by the customer, except for contactors LC1F780 and F7804.
- Lower contactor must have equal or lower current rating.

TeSys F contactors	pages 18-5, 18-
TeSys F overload relay accessories	page 18-1
TeSys F replacement coils and parts	pages 18-18 to 18-2
Dimoneione	pages 19-42 to 19-4

DX1AP26

LA7D902

12.00

16.40



LA7D901

## **TeSys D Overload Relay Accessories** Table 18.49: Mounting Kits and Plates▲

Description		For use with overload relays:	Catalog Number	\$ Price
		LRD01-35 and LR3D01-35	LAD7B10	8.70
Separate mounting kits for mounting to 35 mm DIN rail or for panel mounting with screws  New!	LRD01-35 and LRD01-35 for ring tongue terminals	LAD7B106	8.70	
	_	LRD15••	LAD7B105	10.40
	New!	LR2D15••, LR3D15	LA7D1064	8.70
		LR2D25••	LA7D2064	13.10
		LRD3•••, LR3D3•••, LR2D35••	LA7D3064	17.50
		LRD01-35, LR3D01-35, LR2D15 ••	DX1AP25	11.00

LR2D25••

LRD3•••, LR3D3••, LR2D35•• When using mounting plates, separate mounting kits are also required.

#### Table 18.50: Accessories

Mounting plates for screw mounting at 110 mm (4.3 in.) centers

Description	For use with	Standard Packaging	Catalog Number	\$ Price
Prewiring kit allows direct connection of the N.C. contact	LC1D09 through D18	10	LAD7C1	8.70
of relay LRD01-D32 or LR3D01-D32 to the contactor	LC1D25, D32	10	LAD7C2	8.70
Stop button locking device	All relays except LRD01-D32, LR3D01-D32 and LR9D	10	LA7D901	2.20
Remote stop/tripping or electrical reset ◆	LRD01-D32, LRD3, LR3D01-D32, LR3D3	1	LAD703■	43.70
Hernote stop/tripping or electrical reset▼	All relays except LRD01-D32, LR3D01-D31	1	LA7D03■	43.70
Reset by flexible cable 500 mm (19.6 in.)	LRD01-D32, LRD3, LR3D3	1	LAD7305	100.00
Part number to be completed by adding coil voltage code (for example LAD703F)				

#### Table 18.51: Control Circuit Voltages for LA7D03 and LAD703

Volts	12	24	48	110	220/230	380/400	415/440
AC 50/60 Hz	J★	В	E	F	М	Q	N
DC	J	В	E	F	М	1	_

The time that the LA7D03 can remain energized depends on its rest time; 1 s pulse with 9 s rest time; 5 s pulse with 30 s rest time; 10 s pulse with 90 s rest time; maximum pulse duration of 20 s with rest time of 300 s. Consumption on inrush and sealed: < 100 VA

#### **TeSys F Overload Relay Accessories**

#### Table 18.52: Mounting Plate for Overload Relay

For use with relays	Catalog Number	\$ Price
LR9F5•57, F5•63, F5•67, F5•69 and F5•71	LA7F901	27.30
LR9F7•75, F7•79 and F7•81	LA7F902	38.20

These clear plastic protective shrouds are an effective means to meet international finger-safe requirements for power terminals. They are designed to be used with power cables that have been bolted to the terminal.

NOTE: The protection shrouds do not attach to contactors or overloads utilizing DZ2F lug kits.

#### Table 18.53: Power Terminal Protection Shrouds, Single-Pole

For use with relays	Catalog Number	\$ Price
LR9F5•57	LA9F701	42.40
LR9F5•63, F5 <b>t</b> 67, F5•69	LA9F702	61.00
LR9F5•71	LA9F705	86.00
LR9F7•75, F7•79, F7•81	LA9F703	82.00
	*	

#### Table 18.54: Power Terminal Protection Shrouds, 3-Pole

For use with relays	Catalog Number	\$ Price
LR9F5•57, F5•63, F5•67, F5•69	LA7F701	27.30
LR9F5•71	LA7F702	38.20
LR9F7•75, F7•79, F7•81	LA7F703	49.20

#### Table 18.55: Connection Accessories (for Mounting Overload Relays Beneath Reversing Contactors) ▼

Application		Set of 3 Bars	\$ Price
For relays	For contactor	Catalog Number	\$ FIICE
LR9F5•57, F5•63, F5•67, F5•69	LC1F115	LA7F401	19.70
LR9F5•57, F5 <b>1</b> 63	LC1F150 and F185	LA7F402	21.80
LR9F5•71	LC1F265	LA7F403	27.30
LR9F7•75, F7••79	LC1F265F400	LA7F404	30.50
LR9F7•81	LC1F400	LA7F404	30.50
LR9F7•75, F7•79, F7•81	LC1F500	LA7F405	38.20
LR9F7•81	LC1F630	LA7F406	43.70

#### Mounting plate required. Table 18.56: Marking Accessories

	ibio roicor illiariting riccoccorioc			
De	escription	Sold in units of:	Catalog Number	\$ Price
Ma	arker holder, snan-in	100	LA7D903	0.03 each

Main overload selection	pages 18-2, 18-3
Dimensions	pages 18-45 to 18-47
ToCyo T	pages 16.01

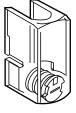


 $\overline{\alpha}$ 

LA7D03



LA7F90•



LA9F70•

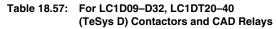


LA7F701

Not available for LRD01-D32, LR3D01-D32.

 $\infty$ 

LX1D2





Voltage for special coils fitted in contactors with serial timer modules, with 24 V supply.

Table 18.58: For LC1D09, D12, D18—For old D2 style contactors where the catalog number includes the auxiliary contact arrangement

	includes the	auxiliary corn	aot arrang	CITICITE	
Rated Nominal Voltage V	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price	
21 ■	LX1D2Z5	LX1D2Z6	LX1D2Z7		
24	LX1D2B5	LX1D2B6	LX1D2B7		
32	LX1D2C5	_	_	52.40	
42	LX1D2D5	_	LX1D2D7	9	
48	LX1D2E5	LX1D2E6	LX1D2E7		
110	LX1D2F5	LX1D2F6	LX1D2F7		
120	_	LX1D2G6	LX1D2G7		
127	LX1D2G5	"O O	( –	52.40	
208	_ (	LX1D2L6	_		
220	LX1D2M5	LX1D2M6	LX1D2M7		
230	LX1D2P5	57	LX1D2P7		
240	LX1D2U5	X1D2U6	LX1D2U7		
256	LX1D2W5	_	_	52.40	
277	11, -41	LX1D2W6	_		
380	LX1D2Q5	LX1D2Q6	LX1D2Q7		
400	LX1D2V5	_	LX1D2V7		
415	LX1D2N5	_	LX1D2N7		
440	LX1D2R5	LX1D2R6	LX1D2R7	52.40	
480		LX1D2T6	_		
500	LX1D2S5	_			
575	_	LX1D2S6	_		
600		LX1D2X6	_	52.40	
660	LX1D2Y5	_	_	]	
Specifications	50 Hz	60 Hz	50/60 I	Hz	
Average consumption Inrush (inductance .75)	60 VA	70 VA	70 VA at 50 o	or 60 Hz	
Sealed (inductance .3)	7 VA	7.5 VA	8 VA at 50 c		
Operating range at $\theta \le 55^{\circ}\text{C} / 131^{\circ}\text{F}$	80–110 % of nominal voltage	80–110% of nominal voltage	85-1109 nominal vo		

**Table 18.59:** For LC1D25, D32—For old D2 style contactors where the catalog number includes the auxiliary contact arrangement

Rated Nominal Voltage (V)	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price
21■	LX1D4Z5	LX1D4Z6	LX1D4Z7	
24	LX1D4B5	LX1D4B6	LX1D4B7	
32	LX1D4C5	_	_	72.00
42	LX1D4D5	- 46	LX1D4D7	
48	LX1D4E5	LX1D4E6	LX1D4E7	
110	LX1D4F5	LX1D4F6	LX1D4F7	
120	_	LX1D4G6	LX1D4G7	
127	LX1D4G5	00,040	_	72.00
208	- c	LX1D4L6	_	
220	LX1D4M5	LX1D4M6	LX1D4M7	
230	LX1D4P5	<u> </u>	LX1D4P7	
240	LX1D4U5	LX1D4U6	LX1D4U7	
256	LX1D4W5	_	_	72.00
277	17, WA	LX1D4W6	_	
380	LX1D4Q5	LX1D4Q6	LX1D4Q7	
400	LX1D4 <b>V</b> 5	_	LX1D4V7	
415	LX1D4N5	_	LX1D4N7	
440	QX1D4R5	LX1D4R6	LX1D4R7	72.00
480	- 6.6	LX1D4T6	_	
500	LX1D4S5	_	_	
575	_	LX1D4S6	_	
600	_	LX1D4X6	_	72.00
660	LX1D4Y5	_	_	
Specifications				
	50 Hz	60 Hz	50/60 Hz	
Average consumption				
- Inrush (inductance .75) - Sealed (inductance .3)	90 VA 7.5 VA	100 VA 8.5 VA	100 VA at 50 or 60 Hz 8.5 VA at 50 or 60 Hz	
	80–110% of	80–110% of	85–110% of	
Operating range at $\theta \le 55 ^{\circ}\text{C} / 131 ^{\circ}\text{F}$	nominal voltage	nominal voltage	nominal voltage	

<sup>■</sup> For use in 24 V applications involving serial timer modules refer to page 18-10.

TeSys D contactors	pages 18-4, 18-6
TeSys D overload relay accessories	page 18-16
TeSys D replacement coils	pages 18-17 to 18-19
Dimensions	nages 18-40 to 18-46

Table 18.60: For Old D2 Style LC1D40, D50, D65, D80

#### Table 18.61: For TeSys D LC1D40A, D50A, D65A, DT60A, DT80A



Rated Nominal Voltage V	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price	1
24	LX1D6B5	LX1D6B6	LX1D6B7	41.50	
32	LX1D6C5	_	_	41.50	
42	LX1D6D5	_	LX1D6D7	41.50	
48	LX1D6E5	LX1D6E6	LX1D6E7	41.50	
110	LX1D6F5	LX1D6F6	LX1D6F7	41.50	
120	_	LX1D6G6	LX1D6G7	41.50	
127	LX1D6G5	_	_	41.50	
208	_	LX1D6L6	LX1D6LE7	41.50	
220	LX1D6M5	LX1D6M6	LX1D6M7	41.50	
230	LX1D6P5	_	LX1D6P7	41.50	
240	LX1D6U5	LX1D6U6	LX1D6U7	41.50	
256	LX1D6W5	_	_	170.00	
277	_	LX1D6W6	_	41.50	
380	LX1D6Q5	LX1D6Q6	LX1D6Q7	41.50	
400	LX1D6V5	_	LX1D6V7	41.50	
415	LX1D6N5	_	LX1D6N7	41.50	
440	LX1D6R5	LX1D6R6	LX1D6R7	41.50	
480	_	LX1D6T6	_	41.50	
500	LX1D6S5	_	_	170.00	
575	_	LX1D6S6	_	41.50	
600	_	LX1D6X6	_	41.50	
660	LX1D6Y5	_	_	41.50	

Rated Nominal Voltage V	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price	Rated Nominal Voltage V	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price
24	LX1D6B5	LX1D6B6	LX1D6B7	41.50	12	LXD3J5	_	_	41.50
32	LX1D6C5	_	_	41.50	24	_	_	LXD3B7	41.50
42	LX1D6D5	_	LX1D6D7	41.50	32	_	_	LXD3C7	41.50
48	LX1D6E5	LX1D6E6	LX1D6E7	41.50	42	_	_	LXD3D7	41.50
110	LX1D6F5	LX1D6F6	LX1D6F7	41.50	48	_	_	LXD3E7	41.50
120	_	LX1D6G6	LX1D6G7	41.50	100	_	_	LXD3K7	41.50
127	LX1D6G5	_	_	41.50	110	_	_	LXD3F7	41.50
208	_	LX1D6L6	LX1D6LE7	41.50	115	_	_	LXD3FE7	41.50
220	LX1D6M5	LX1D6M6	LX1D6M7	41.50	120	_	_	LXD3G7	41.50
230	LX1D6P5	_	LX1D6P7	41.50	127	_	_	LXD3FC7	41.50
240	LX1D6U5	LX1D6U6	LX1D6U7	41.50	200	_	_	LXD3L7	41.50
256	LX1D6W5	_	_	170.00	208	_	_	LXD3LE7	41.50
277	_	LX1D6W6	_	41.50	220	_	_	LXD3M7	41.50
380	LX1D6Q5	LX1D6Q6	LX1D6Q7	41.50	230	_	_	LXD3P7	41.50
400	LX1D6V5	_	LX1D6V7	41.50	240	_	_	LXD3U7	41.50
415	LX1D6N5	_	LX1D6N7	41.50	277	_	_	LXD3W7	41.50
440	LX1D6R5	LX1D6R6	LX1D6R7	41.50	380	_	_	LXD3Q7	41.50
480		LX1D6T6		41.50	400	_	_	LXD3V7	41.50
500	LX1D6S5	_	_	170.00	415	_	_	LXD3N7	41.50
575	_	LX1D6S6		41.50	440	_	_	LXD3R7	41.50
600		LX1D6X6		41.50	480	_	_	LXD3T7	41.50
660	LX1D6Y5	_	_	41.50	500	_	_	LXD3S7	41.50
					575		_	LXD3SC7	41.50
	and new TeS y or may not i				600	_	_	LXD3X7	41.50
arrangemer		i iciuue li le al	Alliai y COI IIaC	ı	660	_	_	LXD3YC7	41.50
					690	_	_	LXD3Y7	41.50

Rated Nominal Voltage V	Catalog Number 50 Hz	Catalog Number 60 Hz	Catalog Number 50/60 Hz	\$ Price
24	LX1D8B5	LX1D8B6	LX1D8B7	78.00
32	LX1D8C5	_	LX1D8C7	78.00
42	LX1D8D5	_	LX1D8D7	78.00
48	LX1D8E5	LX1D8E6	LX1D8E7	78.00
110	LX1D8F5	LX1D8F6	LX1D8F7	78.00
115	LX1D8FE5	_	LX1D8FE7	78.00
120	_	LX1D8G6	LX1D8G7	78.00
127	LX1D8FC5	_	LX1D8FC7	78.00
208	_	LX1D8L6	LX1D8L7	78.00
220/230	LX1D8M5	LX1D8M6	LX1D8M7	78.00
230	LX1D8P5	_	LX1D8P7	78.00
240	LX1D8U5	LX1D8U6	LX1D8U7	78.00
277	_	LX1D8W6	LX1D8W7	78.00
380/400	LX1D8Q5	LX1D8Q6	LX1D8Q7	78.00
400	LX1D8V5	_	LX1D8V7	78.00
415	LX1D8N5	_	LX1D8N7	78.00
440	LX1D8R5	LX1D8R6	LX1D8R7	78.00
480	_	LX1D8T6	LX1D8T7	78.00
500	LX1D8S5	_	LX1D8S6	78.00

For old style and new TeSys style contactors where the catalog number may or may not include the auxiliary contact arrangement.

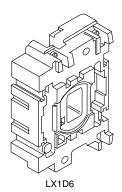
Specification	50 Hz	60 Hz	50/60 Hz
Average consumption: -inrush (inductance 0.75) -sealed (inductance 0.3)	200 VA 20 VA	220 VA 22 VA	245 VA 26 VA
	80-1109 nominal		85–110% of nominal voltage

Specification	50 Hz	60 Hz	50/60 Hz
Average consumption: -inrush (inductance 0.3) -sealed (inductance 0.3)	160 VA 7.0 VA	140 VA 7.5 VA	140 VA (Inductance: 0.9) 7.5 VA (Inductance: 0.9)
	85-1109 nominal		80-115% of nominal voltage

Specification	50 Hz	60 Hz	50/60 Hz
Average consumption: -inrush (inductance 0.8) -sealed (inductance 0.3)	300 VA 22 VA	300 VA 22 VA	350 VA (Inductance: 0.9) 18 VA (Inductance: 0.9)
	85–1109 nominal		80-115% of nominal voltage

#### Table 18.63: For LC1F115, F150, F185, F265, F330, F400, F500, F630, F780, F800

LX1 coils are the standard coils that are included when a voltage code is added to the contactor part number. The LX9 coils may be ordered separately for special applications. LX9 coils do not include a built-in normally open holding circuit contact; a separate auxiliary contact block with a N.O. contact should be added to the contactor. Both the LX1 and LX9 coils can be used on the previous F-line contactors.



Device Type																
	П2	Number	24 V	48 V	110 V	120 V	208 V	220 V	240 V	277 V	380 V	415 V	440 V	480 V	600 V	\$ Price
F115–F150	50	LX1FF•	024	048	110	127	200	220	240	264	380	415	415	500	600	78.00
	60	LX1FF•	020	040	092	095	162	184	187	220	316	340	360	380	475	78.00
	40-400	LX9FF•	_	048	110	127	200	220	220	260	380	415	415	500	_	78.00
F185 F225	50	LX1FG•	024	048	110	127	200	220	240	264	380	415	415	450	600	108.00
	60	LX1FG•	020	040	092	095	162	184	187	220	316	340	360	380	475	108.00
	40-400	LX9FG•	_	048	110	127	200	220	220	260	380	415	415	500	_	108.00
F265-F330	40-400	LX1FH•	0242	0482	1102	1272	2002	2202	2402	2772	3802	3802	4402	5002	6002	138.00
F205-F330	40-400	LX9FH•	_	0482	1102	1272	2002	2202	2402	2772	3802	3802		5002	_	138.00
F400★	40-400	LX1FJ•	_	048	110	110	200	220	240	280	380	415	415	415	600	287.00
1400	40-400	LX9FJ• △	910	917	925	925	930	931	932	932	936	936	937	937	_	287.00
F500 <b>★</b>	40-400	LX1FK•	_	048	110	110	200	220	240	280	380	415	415	415	600	360.00
1300	40-400	LX9FK• △	910	917	925	925	930	931	932	932	936	936	937	937	_	360.00
F630★	40-400	LX1FL•	_	048	110	110	200	220	240	260	380	415	415	415	600	398.00
F030×	40-400	LX9FL• △	910	917	924	925	930	930	931	932	935	936	936	937	_	483.00
F780, FX ♦	40-400	LX1FX•	_	_	110	110	200	220	220	280	380	415	415	415	_	795.00
F800	50/60	LX4F8• ▼	_	_	FW	FW	I	MW	MW	-	QW	QW	QW	-	_	725.00

- LC1F780 contactors operate on 2 coils as a set. The LX1FX part number includes both coils
- The 600 V coils for the F400, F500 and F630 do not include an auxiliary contact for holding circuits. If required, select appropriate contacts from page 18-8.
- Also requires rectifier DR5TE4U for 110–240 V coils, DR5TE4S for 380–440 V coils. See Table 18.64 for pricing. Coil circuit requires a separately mounted rectifier. Order from Table 18.64.
- Complete the catalog number by adding the suffix (for example, LX1FF024).

#### **Application Note on Contactor Drop-out Times:**

Contactors using LX1, FH, FJ, FK, FL, and FX coils have longer drop-out times. For critical applications such as emergency stop functions:

- Select a fast drop-out coil (LX9), or
- Use a maintained contact Stop button, or
- Use an interposing relay.

TeSys D contactors pages 18	-4, 18-6
TeSys F contactors pages 18	-5, 18-7
TeSys D overload relay accessories	e 18-16
TeSys D replacement coils pages 18-17 t	io 18-19
Dimensionspages 18-40 t	io 18-47

Table 18.64: Rectifier Table

Coil	Rectifier Catalog Number	\$ Price
LX9F•910	DR5TF4V	75.00
LX9F•917	DR5TF4V	75.00
LX9F•925	DR5TE4U	75.00
LX9F•926	DR5TE4U	75.00
LX9F•931	DR5TE4U	75.00
LX9F•936	DR5TE4S	75.00
LX9F•937	DR5TE4S	75.00
LX9F•938	DR5TE4S	75.00



Table 18.65: For Old D2 LP1D09, D12, D18 ▲ ◆

Rated Nominal Voltage V	Catalog Number	Catalog Number Wide Range	\$ Price
12	LX4D2JD	LX4D2JW	79.00
21■	LX4D2ZD		79.00
24	LX4D2BD	LX4D2BW	79.00
36	LX4D2CD	DX4D2CW	79.00
48	LX4D2ED	LX4D2EW S	79.00
60	LX4D2ND	-4170 e.	79.00
72	LX4D2SD	LX4D2SW	79.00
110	LX4D2FD	LX4D2FW	79.00
125	LX4D2GD	_	79.00
220	LX4D2MD	LX4D2MW	79.00
250	LX4D2UD	_	79.00
440	LX4D2RD	_	79.00
600	LX4D2XD	_	79.00

Specifications			
Average consumption 9 W 11 W			
Operating range at $\theta$ –55 °C / 131 °F	80–110% of nominal voltage	70–125% of nominal voltage	

Table 18.66: For Old D2 LP1D25, D32 ▲ +

Rated Nominal Voltage V	Catalog Number	Catalog Number Wide Range	\$ Price
12	LX4D4JD	LX4D4JW	110.00
21 ■	LX4D4ZD	-	110.00
24	LX4D4BD	LX4D4BW C	110.00
36	LX4D4CD	DX4D4CW	110.00
48	LX4D4ED	LX4D4EW C	110.00
60	LX4D4ND	41400	110.00
72	LX4D4SD	►X4D4SW	110.00
110 60	LX4D4FD	LX4D4FW	110.00
125	X4D4GD	_	110.00
220	LX4D4MD	LX4D4MW	110.00
250	LX4D4UD	_	110.00
440	LX4D4RD	_	110.00
600	LX4D4XD	_	110.00

Specifications			
Average consumption	11 W	13 W	
Operating range at $\theta \le 55 ^{\circ}\text{C} / 131 ^{\circ}\text{F}$	80–110% of nominal voltage	70–125% of nominal voltage	

- For old style contactors where the catalog number includes the auxiliary contact arrangement (for example, LP1D2510). The new style TeSys DC controlled contactors (for example, LC1D25BD) do not have replaceable coils.
- For use in 24 V applications with serial timer modules. Refer to page 18-10.

  No replacement DC coils for TeSys D contactors.

TeSys DC Coil Specifications			
	Average consumption	Operating range	
LC1D09-D32,	Inrush 5.4 W	70-125% @ 60°C	
LC1DT20-LC1DT40	Sealed 5.4 W	70-125% @ 60°C	
LCID••A	Inrush 19 W	75–125% @ 60°C	
LCID**A	Sealed 7.4 W	75-125% @ 60 C	
	Low consumption		
LC1D09-D32,	Inrush 2.4 W	70-125% @ 60°C	
LC1DT20-LC1DT40	Sealed 2.4 W	70-125% @ 60°C	

Discount Schedule

Note: DC coils for LC1D09-D32, LC1DT20-LC1DT40, and LCID••A contactors are not replaceable.

#### Table 18.67: For Old D2 LP1D40, D50, D65 ▲◆

Rated Nominal Voltage V	Catalog Number	Catalog Number Wide Range	\$ Price
12	LX4D6JD	LX4D6JW	4
24	LX4D6BD	LX4D6BW	<sup>7</sup> O <sub>1</sub>
36	LX4D6CD	LX4D6@WC	124.00
48	LX4D6ED	1X4D6EW	
60	LX4D6ND	i rets	
72	X4D6SD	LX4D6SW	
110	LX4D6FD	LX4D6FW	124.00
125	CLX4D6GD	_	124.00
220	LX4D6MD	LX4D6MW	
250	LX4D6UD	_	
440	LX4D6RD	_	124.00
600	LX4D6XD	_	
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	

Specifications			
Average consumption 22 W 23 W			
Operating range at $\theta \le 55 ^{\circ}\text{C} / 131 ^{\circ}\text{F}$	80-110% of nominal voltage	75–120% of nominal voltage	

Table 18.68: For Old D2 LP1D80 and LC1D80▲

Rated Nominal Voltage V	Catalog Number	Catalog Number Wide Range ★	\$ Price
12	LX4D7JD	LX4D7JW	
24	LX4D7BD	LX4D7BW	
36	LX4D7CD	LX4D7CW	134.00
48	LX4D7ED	LX4D7EW	
60	LX4D7ND		
72	LX4D7SD	LX4D7SW	
110	LX4D7FD	LX4D7FW	
125	LX4D7GD	_	134.00
220	LX4D7MD	LX4D7MW	
250	LX4D7UD		
440	LX4D7RD	_	134.00
600	LX4D7XD	_	134.00

Specifications			
Average consumption	22 W	23 W	
Operating range at $\theta \leq 55$ °C / 131 °F	80-110% nominal voltage	70-120% nominal voltage	

Wide range coils cannot be used with contactors using both front- and side-mounting auxiliaries.

#### Table 18.69: For TeSys D LC1D115, 150

Rated Nominal Voltage V	Catalog Number	\$ Price
24	LX4D8BD	
48	LX4D8ED	
60	LX4D8ND	78.00
72	LX4D8SD	
110	LX4D8FD	
125	LX4D8GD	
220	LX4D8MD	78.00
250	LX4D8UD	76.00
440	LX4D8RD	

Average Consumption	Inrush 365 W, Sealed 5 W
Operating range at $\theta \le 55$ °C / 131 °F	70%-120% of nominal voltage

TeSys D contactors	pages 18-4, 18-6
TeSys D overload relay accessories	page 18-16
TeSys D replacement coils	. pages 18-17 to 18-19
Dimensions	. pages 18-40 to 18-46

#### TeSys F DC Coils

LX4 coils are the standard coils when a voltage code is added to the part number. The LX9 coils may be ordered separately for special applications. LX9 coils do not include a built-in normally open holding circuit contact; a separate auxiliary contact block with a N.O. contact should be added to the contactor. Both the LX4 and LX9 coils can be used on previous F-line devices.

Table 18.70: LX4 Coils for LC1F115, F150, F185, F265, F400, F500, F630, F780, F800

Device	Catalog						<ul> <li>Catalog</li> </ul>	Number Su	ffix			
Туре	Number	24 V	36V	48 V	60 V	72 V	110 V	125 V	220 V	250 V	440 V	\$ Price
F115, F150	LX4FF●	024	035	048	060	070	110	125	220	250	440	78.00
F185, F225	LX4FG ●	024	035	048	060	070	110	125	220	250	440	108.00
F265, F330	LX4FH●	024	035	048	060	070	110	125	220	250	440	138.00
F400	LX4FJ●	_	_	048	060	070	110	125	220	250	440	287.00
F400	LX9FJ• ♦	_	_	918	_	_	926	927	932	_	938	287.00
F500	LX4FK●	_	_	048	060	070	110	125	220	250	440	360.00
1 300	LX9FK • ♦	_	_	918	_	_	926	927	932	_	938	360.00
F630	LX4FL●	_	_	048	060	070	110	125	220	250	440	398.00
1 030	LX9FK • ♦	_	_	918	_	_	926	927	932	_	938	398.00
F780	LX4FX●▲	_	_	_	_	_	110	125	220	250	440	795.00
F800	LX4F8●■		_		_		FW	FW	MW	_	QW	725.00

- LC1F780 contactors operate on 2 coils as a set. The LX4FX part number includes both coils.
- Also requires rectifier DR5TE4U, \$72.00 list price.

  Coil circuit requires a separately mounted resistor. Order from Table 18.71 below.

Table 18.71: LX9 Coils and Resistors

Coil	Resistor Catalog Number	Qty. Required	\$ Price	Coil	Resistor Catalog Number	Qty. Required	\$ Price	Coil	Resistor Catalog Number	Qty. Required	\$ Price
LX9FJ918	DR2SC0047	1	13.70	LX9FK918	DR2SC0039	1	13.70	LX9FL918	DR2SC0047	2	13.70
LX9FJ926	DR2SC0030	1	13.80	LX9FK926	DR2SC0220	1	13.70	LX9FL925	DR2SC0270	2	13.70
LX9FJ927	DR2SC0390	1	13.70	LX9FK927	DR2SC0330	1	13.70	LX9FL926	DR2SC0330	2	13.70
LX9FJ932	DR2SC1200	1	13.70	LX9FK932	DR2SC1000	1	13.70	LX9FL931	DR2SC1000	2	13.70
LX9FJ938	DR2SC4700	1	13.70	LX9FK938	DR2SC3300	1	13.70	LX9FL937	DR2SC3900	2	13.70

 
 TeSys F contactors
 pages 18-5, 18-7

 TeSys F overload relay accessories
 page 18-16

 TeSys F replacement coils and parts
 pages 18-18, 18-18, 18-20
 Dimensions . . . . . . . . . . . . . . . . . . pages 18-42 to 18-47



TeSys D enclosed full-voltage starters are available in Type 1 and Type 12/3R enclosures through 50 hp at 460 V. The enclosed D-line accepts standard D-Line accessories and all Insta-Kits™ control units and control power transformer\_ kits. Standard capacity control power transformers with built-in fuse block can be installed in the standard enclosure. For extra capacity, please refer to your local distributor or Schneider Electric sales office.

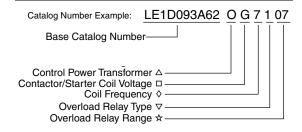
Table 18.72: Enclosed Full Voltage Non-Reversing Starters

	Max. Horsepower Ratings (AC3)						Contacte		Catalog Number		Catalog Number	
1 Ph	ase		3 Pł	nase		Auxiliary Contacts		Current Rating of Contactor	Catalog Hulliber	\$ Price	Catalog Nulliber	\$ Price
115	230	200 V	230 V	460 V	575V	N.O.	N.C.	0.00	Type 1		Type 12/3R	
0.333	1	2	2	5	7.5	1	1	9	LE1D093A62****	109.	LE1D093A72****	175.
0.5	2	3	3	7.5	10	1	1	12	LE1D123A62****	137.	LE1D123A72****	202.
1	3	5	5	10	15	1	1	18	LE1D183A62****	153.	LE1D183A72****	219.
2	3	5	7.5	15	20	1	1	25	LE1D253A62****	170.	LE1D253A72****	235.
2	5	7.5	10	20	25	1	1	32	LE1D323A62****	191.	LE1D323A72****	245.
3	5	10	10	30	30	1	1	40	LE1D403A62****	273.	LE1D403A72****	393.
3	7.5	12	15	40	40	1	1	50	LE1D503A62****	300.	LE1D503A72****	420.
5	10	20	20	40	50	1	1	65	LE1D653A62****	393.	LE1D653A72****	514.
7.5	15	30	30	60	60	1	1	80	LE1D803A62****	473.	LE1D803A72****	610.

Table 18.73: Enclosed Full Voltage Reversing Starters

Max. Horse	epower Ra	tings (AC	3) 3 Phase	Auxiliary On Each (		Current Rating of Contactor	Catalog Number	\$ Price	Catalog Number	\$ Price
200V	230 V	460 V	575 V	N.O.	N.C.	or Contactor	Type 1		Type 12/3R	
2	2	5	7.5	1	1	9	LE2D093A62****	305.	LE2D093A72****	382.
3	3	7.5	10	1	1	12	LE2D123A62****	355.	LE2D123A72****	453.
5	5	10	15	1	1	18	LE2D183A62****	385.	LE2D183A72****	483.
5	7.5	15	20	1	1	25	LE2D253A62****	415.	LE2D253A72****	513.
7.5	10	20	25	1	1	32	LE2D323A62****	464.	LE2D323A72****	573.
10	10	30	30	1	1	40	LE2D403A62****	655.	LE2D403A72****	819.
12	15	40	40	1	1	50	LE2D503A62****	710.	LE2D503A72****	874.
20	20	40	50	1	1	65	LE2D653A62****	900.	LE2D653A72****	1030.
30	30	60	60	1	1	80	LE2D803A62****	1248.	LE2D803A72****	1412.

Table 18.74: Catalog Number Nomenclature



# △Control Power Transformer

Add price from page 18-23. Select letter for primary voltage of CPT:

Voltage	No Transformer used	208	240	480	600
Code	0 🛦	L	М	Т	Х

Letter O. not zero.

If control transformer is used, the only options available are 24 or 120 V as the secondary of the transformer. Also, DC voltages are not available when control power transformer is used.

#### Contactor/Starter Coil Voltage Select coil voltage from table:

Voltage	24	120	208	240	480	600
AC	В	G	L	U	Т	Х
DC	В	-	_	_	-	_

#### ♦ Coil Frequency

Select: 7 = dual frequency coils (50/60 Hz.) 6 = 60 Hz. D=DC

Note: For 9 to 65 A contactors, only dual frequency coils are available; 80 A contactors, the 24–240 V coils are dual frequency only (50/60 Hz.). The 480-600 V coils are 60 Hz. only. See catalog 8502CT9901 for other restrictions.

#### ¬Overload relay type

Select: 0 = No overload relay 1 = Class 10 Trip 2 = Class 20 Trip

#### Table 18.75: **★Overload Relay Range**

(Select code from the table below)

	(		,
Code	Range	For use on Contactors	\$ Price Adder
01	0.1-0.16	D09–D32■	60.
02	0.16-0.25	D09-D32■	60.
03	0.25-0.40	D09–D32■	60.
04	0.40-0.63	D09-D32■	60.
05	0.63-1.0	D09-D32■	60.
06	1.0-1.6	D09–D32■	60.
07	1.6-2.5	D09-D32■	60.
08	2.5-4	D09-D32	60.
10	4–6	D09-D32	60.
12	5.5–8	D09-D32	60.
13	9–13	D40, D50, D65	107.
14	7–10	D09-D32	62.
16	9–13	D12-D32	62.
18	12–18	D40, D50, D65	107.
21	12-18	D18-D32	62.
	16–24	D25-D32■	62.
22	17–25	D25-D32◆	62.
	17–25	D80	107.
25	17–25	D40, D50, D65	107.
30	23-28	D25-D32♦	73.
32	23-32	D25-D32	73.
32	23-32	D40, D50, D65	107.
40	30-40	D40, D50, D65	107.
50	37–50	D40, D50, D65	107.
53	30–38	D80	107.
55	30-40	D80	107.
57	37–50	D80	107.
59	48-65	D80	107.
61	55-70	D65-D80	107.
63	63–80	D65-D80	107.
65	48-65	D40, D50, D65	107.
■ Available fo	or Class 10 only.		

Available for Class 20 only. If no overload relay is required, leave this portion of the catalog blank. Note: Add appropriate price adder to the base price of the starter.

**Enclosed Combination** 

**Starters** 

 $\overline{\alpha}$ 

## TeSys™ D Fusible Disconnect Switch or Circuit Breaker

Refer to Catalog 8502CT9901



IEC combination starters combine the requirements of motor overload and short circuit protection in one convenient compact package. All devices provide Type 2 Coordination through 30 hp at 460 V. Devices are available in Type 1 and Type 12/3R enclosures. The IEC combination starter line accepts standard TeSys D accessories and all Insta-Kits<sup>TM</sup> pilot devices and control power transformer kits. Standard capacity control power transformers with built-in fuse block can be installed in the standard enclosure. For extra capacity, please refer to your local distributor or nearest Square D/Schneider Electric sales office.

**NOTE:** Use tables and notes from page 18-21 to complete the catalog numbers.

Table 18.76: Enclosed Full Voltage Non-Reversing Fusible Combination Starters

Ma	Max. Horsepower Ratings (AC3)			Fuen Clin I	Auxiliary Curr		Current	Current Catalog Number		Catalog Number		
	3 Phase			Fuse Clip Rating		Contacts		Rating of	Catalog Nulliber	\$ Price	Catalog Number	\$ Price
200 V	230 V	460 V	575 V	Amperes	UL Class	N.O.	N.O. N.C. Contactor Type 1		Type 1		Type 12/3R	
2	2	5	7.5	30 A	CC	1	1	9	LE1D096B62****	426.	LE1D096B72****	551.
3	3	7.5	10	30 A	CC	1	1	12	LE1D126B62****	468.	LE1D126B72****	592.
5	5	10	15	30 A	J	1	1	18	LE1D186B62****	484.	LE1D186B72****	607.
5	7.5	15	20	30 A	J	1	1	25	LE1D256B62****	500.	LE1D256B72 •••••	623.
7.5	10	20	25	60 A	J	1	1	32	LE1D326C62****	653.	LE1D326C72****	829.
10	10	30	30	60 A	J	1	1	40	LE1D406C62****	708.	LE1D406C72****	877.

Table 18.77: Enclosed Full Voltage Reversing Fusible Combination Starters

Ma	Max. Horsepower Ratings (AC3)		Fues Clip Beting Aux. Conta					Current Catalog Number			Catalog Number	
	3 Phase			Fuse Clip i	Each Contactor		Rating of	Catalog Number	\$ Price	Catalog Number	\$ Price	
200 V	230 V	460 V	575 V	Amperes	UL Class	N.O.	N.C.	Contactor	Type 1		Type 12/3R	
2	2	5	7.5	30 A	CC	1	1	9	LE2D096B62•••••	712.	LE2D096B72 ·····	837.
3	3	7.5	10	30 A	CC	1	1	12	LE2D126B62****	778.	LE2D126B72****	915.
5	5	10	15	30 A	J	1	1	18	LE2D186B62****	808.	LE2D186B72 •••••	950.
5	7.5	15	20	30 A	J	1	1	25	LE2D256B62****	833.	LE2D256B72****	980.
7.5	10	20	25	60 A	J	1	1	32	LE2D326C62****	1089.	LE2D326C72****	1281.
10	10	30	30	60 A	J	1	1	40	LE2D406C62****	1179.	LE2D406C72 •••••	1371.

Table 18.78: Enclosed Full Voltage Non-Reversing Circuit Breaker Combination Starters

Ma	ax. Horsepow	er Ratings (A0	C3)	Au	xiliary	Circuit Breaker Current		Catalog Number		Catalog Number	
	3 Pł	nase		Contacts		Maximum	Rating of		\$ Price	Catalog Number	\$ Price
200 V	230 V	460 V	575 V	N.O.	N.C.	Current Rating	Contactor	Type 1		Type 12/3R	
2	2	5	7.5	1	1	15 A	9	LE1D097D62****	569.	LE1D097D72****	730.
3	3	7.5	10	1	1	15 A	12	LE1D127D62****	622.	LE1D127D72****	789.
5	5	10	15	1	1	30 A	18	LE1D187E62****	647.	LE1D187E72****	808.
5	7.5	15	20	1	1	30 A	25	LE1D257E62****	668.	LE1D257E72****	834.
7.5	10	20	25	1	1	50 A	32	LE1D327F62****	870.	LE1D327F72****	1088.
10	10	30	30	1	1	50 A	40	LE1D407F62****	944.	LE1D407F72****	1179.

Table 18.79: Enclosed Full Voltage Reversing Circuit Breaker Combination Starters

Ma	ax. Horsepow	er Ratings (A	C3)		y Contacts	Circuit Breaker	Current	Catalog Number		Catalog Number			
	3 P	hase		Each C	contactor	Maximum Rating o	Rating of		Rating of		\$ Price	Catalog Nulliber	\$ Price
200 V	230 V	460 V	575 V	N.O.	N.C.	Current Rating	Contactor	Type 1		Type 12/3R			
2	2	5	7.5	1	1	15 A	9	LE2D097D62****	836.	LE2D097D72****	972.		
3	3	7.5	10	1	1	15 A	12	LE2D127D62****	944.	LE2D127D72****	1096.		
5	5	10	15	1	1	30 A	18	LE2D187E62****	1010.	LE2D187E72****	1174.		
5	7.5	15	20	1	1	30 A	25	LE2D257E62****	1075.	LE2D257E72****	1251.		
7.5	10	20	25	1	1	50 A	32	LE2D327F62****	1403.	LE2D327F72****	1631.		
10	10	30	30	1	1	50 A	40	LE2D407F62****	1522.	LE2D407F72****	1770.		

Table 18.80: Enclosed Full Voltage Non-Reversing Non-Fused Combination Starters

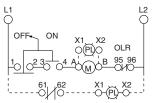
N	Max. Horsepo	wer Ratings (	AC3)		xiliary	Current	Catalog Number		Catalog Number	
	3	Phase		Co	ntacts	Rating of	Catalog Nullibel	\$ Price	Catalog Nulliber	\$ Price
200 V	230 V	460 V	575 V	N.O.	N.C.	Contactor	Type 1		Type 12/3R	
2	2	5	7.5	1	1	9	LE1D096A62****	416.	LE1D096A72 •••••	541.
3	3	7.5	10	1	1	12	LE1D126A62****	458.	LE1D126A72****	532.
5	5	10	15	1	1	18	LE1D186A62****	474.	LE1D186A72 •••••	597.
5	7.5	15	20	1	1	25	LE1D256A62****	490.	LE1D256A72****	613.
7.5	10	20	25	1	1	32	LE1D326A62****	643.	LE1D326A72****	819.
10	10	30	30	1	1	40	LE1D406A62****	698.	LE1D406A72****	867.

Table 18.81: Enclosed Full Voltage Reversing Non-Fused Combination Starters

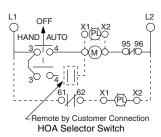
M	lax. Horsepo	wer Ratings	(AC3)		Contacts	Current	Catalog Number		Catalog Number	
	3	Phase		Each	Contactor	Rating of	Catalog Nulliber	\$ Price	Catalog Nullibel	\$ Price
200 V	230 V	460 V	575 V	N.O.	N.C.	Contactor	Type 1		Type 12/3R	
2	2	5	7.5	1	1	9	LE2D096A62****	702.	LE2D096A72 •••••	827.
3	3	7.5	10	1	1	12	LE2D126A62****	768.	LE2D126A72****	905.
5	5	10	15	1	1	18	LE2D186A62****	798.	LE2D186A72****	940.
5	7.5	15	20	1	1	25	LE2D256A62****	823.	LE2D256A72****	970.
7.5	10	20	25	1	1	32	LE2D326A62****	1079.	LE2D326A72****	1271.
10	10	30	30	1	1	40	LE2D406A62****	1169.	LE2D406A72****	1361.

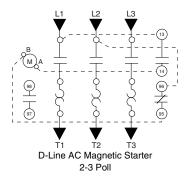
**Starters** 

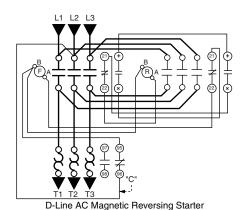
**Enclosed Combination** 



On-Off Selector Switch







3-Pole

#### Factory Modifications and Insta-Kits™ Selection

Add the factory modification code to the end of the catalog number created from page 18-21. With the use of Insta-Kits<sup>TM</sup>, only one operator scheme is allowed. Only the combinations of operators and pilot lights shown below can be ordered.

Pilot lights will be at the coil voltage indicated in the catalog number for the starter.

#### Table 18.82: Factory Modifications

Description	Factory Modification Code▲	\$ Price	Insta-Kits (for field installation)	\$ Price
Control Units Only				
For-Rev-Stop Push Button	A06L	131.	LA9CA06LT	71.00
Start/Stop Push Button	A06G	65.	LA9CA06GT	32.80
I/O (Start/Stop) Push Button	N/A	_	N/A	_
I/O Push Button (double touch)	A06I	83.	LA9CA06IO	41.50
Emergency Stop	N/A	_	N/A	_
Hand-Off-Auto Selector Switch	A06E	65.	LA9CA06ET	32.80
On/Off Selector Switch	A06D	65.	LA9CA06DT	41.50
Start/Mushroom Head Stop Push Button	A06X	65.	LA9CA06XT	63.00
Pilot Lights only				
LED Pilot light, 24, 120 or 240 V	A16S	134.	LA9CA16ST★	66.00
Green-Red Pilot Light, Direct Supply, 24 or 120 V ■	A06S	112.	LA9CA06ST★	62.00
Green-Red Transformer Pilot Light, 120, 208/240, 480 or 600 V ■	A06F	207.	LA9CA06FT★	113.00
Available Combination of Control Units and Pilot L	ights			
Hand-Off-Auto Selector Switch w/24, 120, or 240 V LED Pilot Light	A16U	213.	LA9CA16UT★	177.00
Start/Stop Push Button w/ 24, 120 or 240 V LED Pilot Light	A16V	213.	LA9CA16VT★	177.00
On/Off Selector w/ 24, 120 or 240 V LED Pilot Light	A16W	213.	LA9CA16WT★	177.00
Start/Stop Push Button w/ Green-Red Transformer Pilot Light	A06N	177.	LA9CA06NT★	95.00
Start/Stop Push Button w/Green-Red Pilot Light	A06V	177.	LA9CA06VT	95.00
Hand-Off-Auto Selector Switch w/Green-Red Pilot Light	A06U	273.	LA9CA06UT	97.00
Hand-Off-Auto Selector Switch w/Green-Red Transformer Pilot Light	A06J	273.	LA9CA06JT★	147.00
On/Off Selector w/Green-Red Pilot Light	A06W	177.	LA9CA06WT	95.00
On/Off Selector w/Green-Red Transformer Pilot Light	A06H	273.	LA9CA06HT★	147.00
Control Power Transformer				
Standard VA, 2 Fuses in Primary, 1 Fuse in Secondary	A206P	260.	•	_
50 VA extra, 2 Fuses in Primary, 1 Fuse in Secondary	A207P	456.	•	
100 VA extra, 2 Fuses in Primary, 1 Fuse in Secondary	A208P	634.	+	

- Add these forms to the catalog number selected on page 18-21. The numbers as shown are for use in NEMA 1 Enclosures. For uses in NEMA 12/3R change the 6 to a 7 (ex A06U becomes A07U). Price remains the same. The change DOES NOT apply to control power transformer forms.
- Pilot lights are wired such that the light is on when the contactor is energized. For non-LED type pilot lights, a green lens is installed on the unit when shipped. A red lens is included for use as applicable. Select Insta-Kits™ from table below.

#### Table 18.83: Insta-Kits™ Selection

Total VA	Insta-Kits™ Catalog Number	\$ Price
50	LA9TFD32★	140.00
100	LA9TFD80★	246.00
150	LA9TFD15★	343.00

Complete the part number for the Insta-Kits™ by selecting the voltage code from the appropriate tables below.

#### Table 18.84: Voltage Codes for Pilot Lights

	•	•			
Voltage (Vac)	24	120	208/240	480	600
Code	В	G	М	T	Х

#### Table 18.85: Voltage Codes for Control Power Transformers

Primary Voltage	120	208	240	480	600	208	240	480	600
Secondary Voltage			24				12	20	
Code	F	D	С	В	Δ		M	Т	Y

#### TeSys™ K 3-Pole Non-Reversing Contactors

Refer to Catalog 8502CT9901



#### 3-Pole Non-Reversing Mini-Contactors

#### Table 18.86: AC Operating Coils



LP4K09●

LR2K0316

F164862 CCN NLDX (screw terminals)

LR43364 Class 3211 04

E164862 CCN NLDX2 (slip-on &

solder-pin

terminals)

	Maxin	num Hors	epower Ra	atings		Maximun	n Current		Auxi			
1	Ø		3	Ø		Inductive	Resistive	Type of Connection	Cont	acts	Catalog Number	\$ Price
115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp	AC3 (A)	AC1 (A)		N.O.	N.C.		
0.5	1.5	1.5	1.5	3	3	6	15	Screw-clamp	1	_	LC1K0610 ▲ ■	57.
0.5	1.5	1.5	1.5	3	J	0	13	Screw-clamp		1	LC1K0601 ▲■	57.
0.5	1.5	2	3	5	5	9	20	Screw-clamp	1	_	LC1K0910 ▲■	75.
0.5	1.5		3	5	5	9	20	Screw-clamp	_	1	LC1K0901 ▲■	75.
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	1	_	LC1K1210 ▲■	86.
0.5	1.5	3	3	7.5	10	12	20	ociew-ciamp	_	1	LC1K1201 ▲■	86.

#### Table 18.87: Coil Voltage Codes for AC Contactors

Up to and including 240 V coil with integral suppression device available. Add 2 to the code required (for example, J72). Price adder \$10.00.

Vac 50/60 Hz	12	24	42	48	110	120	127	200/ 208	220/ 230	230	230/ 240	277	380/ 400	400/ 415	440	480	660/ 690
Code	J7	B7	D7	E7	F7	G7	FC7	L7	M7	P7	U7	UE7	Q7	N7	R7	T7	Y7

#### Table 18.88: DC Operating Coils

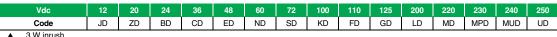
0.5	1.5	1.5	1.5	2	3	6	15	Screw-clamp	1	_	LP1K0610 ▲■	75.
0.5	1.5	1.5	1.5	3	3	U	15	ociew-ciamp	_	1	LP1K0601 ▲■	75.
0.5	1.5	0	9	_	_	0	20	Screw-clamp	1	_	LP1K0910 ▲■	92.
0.5	1.5	2	3	5	5	9	20	Screw-ciamp	_	1	LP1K0901 ▲■	92.
0.5	1.5	2	2	7.5	10	12	20	Screw-clamp	1	_	LP1K1210 ▲■	106.
0.5	1.5	3	3	7.5	10	12	20	Screw-ciamp	_	1	LP1K1201 ▲■	106.
. 0-	- T-1-1- 44	2 22										

See Table 18.89:
For TeSys K contactors with spring terminal clamps, add a 3 before the coil voltage code (for example, LC1K06103G7).
For TeSys K contactors with solder pin terminals, add a 5 before the coil voltage code (for example, LC1K09105B7).
For TeSys K contactors with slip-on terminals, add a 7 before the coil voltage code (for example, LC1K12107M7).

Complete the catalog number with the appropriate coil voltage code (for example, LC1K0610G7).



Coil with integral suppression device available. Add 3 to the code required (for example, JD3). Price adder \$10.00 ▲



## Table 18.90: DC-Low Consumption Operating Coils (devices have built-in transient suppression)

0.5	1.5	1.5	1.5	9	2	6	15	Screw-clamp	1	ı	LP4K0610 ▲■	92.
0.5	1.5	1.5	1.5	3	3	O	13	ociew-ciamp	_	1	LP4K0601 ▲■	92.
0.5	1.5	2	2	5	5	0	20	Screw-clamp	1	1	LP4K0910 ▲■	110.
0.5	1.5		3	5	5	9	20	Screw-ciamp	_	1	LP4K0901 ▲■	110.
0.5	1.5	2	2	7.5	10	12	20	Screw-clamp	1	_	LP4K1210 ▲■	126.
0.5	1.5	3	3	7.5	10	12	20	Screw-ciamp	_	1	LP4K1201 ▲■	126.

See Table 18.91:

For TeSys K contactors with spring terminal clamps, add a 3 before the coil voltage code (for example, LC1K06103G7). For TeSys K contactors with solder pin terminals, add a 5 before the coil voltage code (for example, LC1K09105B7). For TeSys K contactors with slip-on terminals, add a 7 before the coil voltage code (for example, LC1K12107M7).

Complete the catalog number with the appropriate coil voltage code (for example, LC1K0610G7)

#### Table 18.91: Coil Voltage Codes for DC Contactors—Low Consumption ▲

Vdc	12	24	48	72
Code	JW3	BW3	EW3	SW3

1.8 inrush sealed.

#### Table 18.92: Overload Relays for 3-Pole Contactors with Screw-Clamp Terminals

Class 10, Relay setting range-A	Catalog Number	\$ Price	
0.1 to 0.16	LR2K0301	59.	LR2K overload relays:
0.16 to 0.23	LR2K0302	59.	AC or DC protection
0.23 to 0.36	LR2K0303	59.	Ambient compensated bimetal
0.36 to 0.54	LR2K0304	59.	Class 10
0.54 to 0.8	LR2K0305	59.	Single phase sensitivity
0.8 to 1.2	LR2K0306	59.	Manual or auto reset
1.2 to 1.8	LR2K0307	59.	
1.8 to 2.6	LR2K0308	59.	<ul> <li>Full load current dial</li> </ul>
2.6 to 3.7	LR2K0310	59.	
3.8 to 5.5	LR2K0312	59.	
5.5 to 8	LR2K0314	59.	
8 to 11.5	LR2K0316	59.	
10 to 14	LR2K0321	59.	

Accessories . . . . . . page 18-27 Dimensions . . . . . . . . . . . . page 18-49







### 3-Pole Reversing Mini-Contactors

#### Table 18.93: AC Operating Coils

**Contactors** 





LP2K0910

	Maxii	mum Hors	epower Ra	atings		Maximur	n Current			liary		
1	Ø		3	Ø			Resistive	Type of	Con	tacts	Catalog Number	\$ Price
115V hp	230V hp	200V hp	230V hp	460V hp	575V hp	AC3 A	AC1 Connection		N.O.	N.C.	, i	
0.5	1.5	1.5	1.5	3	3	6	15	Screw-clamp	1 —	_ 1	LC2K0610 ▲ ■ LC2K0601 ▲ ■	130. 130.
0.5	1.5	2	3	5	5	9	20	Screw-clamp	1 —	_ 1	LC2K0910 ▲ ■ LC2K0901 ▲ ■	167. 167.
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	1 —	_ 1	LC2K1210 ▲ ■ LC2K1201 ▲ ■	191. 191.

#### Table 18.94: Coil Voltage Codes for AC Contactors

Up to and including 240 V coil with integral suppression device available. Add 2 to the code required. Example: J72. Price adder \$20.00.

Vac 50/60 Hz	12	24	42	48	110	120	127	200/ 208	220/ 230	230	230/ 240	277	380/ 400	400/ 415	440	480	660/ 690
Code	J7	B7	D7	E7	F7	G7	FC7	L7	M7	P7	U7	UE7	Q7	N7	R7	T7	Y7

#### Table 18.95: **DC Operating Coils**



0.5	1.5	1.5	1.5	2	2	6	15	Screw-clamp	1		LP2K0610 ▲■	167.
0.5	1.5	1.5	1.5	3	3	b	15	Screw-ciamp	_	1	LP2K0601 ▲■	167.
0.5	1.5	2	0	3 5 5 9 20 Screv		Screw-clamp	1		LP2K0910 ▲■	202.		
0.5	1.5	4	J	3	3	9	20	ociew-ciamp	_	1	LP2K0901 ▲■	202.
٥.	1.5	9	0	7.5	10	12	20	Screw-clamp	1		LP2K1210 ▲■	232.
0.5	1.5	3	3	7.5	10	12	20	Screw-ciamp	_	1	LP2K1201 ▲■	232.

#### Table 18.96: **Coil Voltage Codes for DC Contactors**

Coil with integral suppression device available. Add 3 to the code required. Example: JD3. Price adder \$20.00.

Vdc	12	20	24	36	48	60	72	100	110	125	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD

#### Table 18.97: DC-Low Consumption Operating Coils (devices have built-in transient suppression)

0.5	1.5	5 1.5 1.5 3 3 6 15 Screw-clamp		6	Corous alama	1	_	LP5K0610 ▲■	202.			
0.5	1.5	1.5	1.5	3	3	О	15	Screw-clamp	_	1	LP5K0601 ▲■	202.
0.5	1.5	2	2	5	5 9 2		20	Screw-clamp	1	_	LP5K0910 ▲■	238.
0.5	1.5		3	3	J	9	20	Sciew-ciamp	ı	1	LP5K0901 ▲■	238.
0.5	1.5	9	2	7.5	10	12	20	Screw-clamp	1	_	LP5K1210 ▲■	274.
0.5	1.5	3 3	3	7.5	10	12	20	Screw-clamp	_	1	LP5K1201 ▲■	274.

#### Table 18.98: Coil Voltage Codes for DC Contactors—Low Consumption

Vdc	12	24	48	72
Code	JW3	BW3	EW3	SW3

- For TeSys K contactors with spring terminal clamps, add a 3 before the coil voltage code (for example, LP2K09103BD). For TeSys K contactors with solder pin terminals, add a 5 before the coil voltage code (for example, LP5K09105BW3). For TeSys K contactors with slip-on terminals, add a 7 before the coil voltage code (for example, LC2K06107B7).
- Complete the catalog number with the appropriate coil voltage code (for example, LC1K0610G7).

Overload Relays	ae	18	-24
Accessoriespa			
Dimensions		40	40





LC2K090045

	Max	imum Hors	epower Ra	tings		Maximun	n Current		Po	wer		
1	Ø		3	Ø		Inductive	Resistive	Type of Connection	Po	les	Catalog	\$ Price
115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp	AC3 (A)	3 AC1 "		N.O.	N.C.	Number	<b>4</b>
4-Pole Mi	1-Pole Mini Contactor											
0.5	1.5	2	3	5	5	9	15	Screw-clamp	4	_	LC1K09004 ▲ ■	75.
0.5	1.5		3	3	3	9	13	Sciew-ciairip	2	2	LC1K09008 ▲ ■	81.
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	4	_	LC1K12004 ▲ ■	86.
4-Pole Me	echanically	Interlocke	ed Contact	ors								
0.5	1.5	2	3	5	5	9	20	Screw-clamp	4	_	LC2K09004 ▲ ■	167.
0.5	1.5	3	3	7.5	10	12	20			_	LC2K12004 ▲ ■	191.

#### Table 18.100: Coil Voltage Codes for AC Contactors

Up to and including 240 V coil with integral suppression device available. Add 2 to the code required. Example: J72. Price adder \$10.00 (\$20.00 for mechanically interlocked contactors)

	Vac 50/60 Hz	12	24	42	48	110	120	127	200/208	220/230	230	230/ 240	277	380/400	400/415	440	480	660/690
-	Code	J7	B7	D7	E7	F7	G7	FC7	L7	M7	P7	U7	UE7	Q7	N7	R7	T7	Y7

Table 18.101: DC Operating Coils

4-Pole Min	ni Contacto	or												
0.5	1.5	2	3	5	5	9	15	Screw-clamp	4 2	_	LP1K09004 ▲■ LP1K09008 ▲■	92. 98.		
0.5	1.5	3	3	7.5	10	12 20 Screw-clamp		Screw-clamp	4	_	LP1K12004 ▲■	106.		
4-Pole Me	4-Pole Mechanically Interlocked Contactors													
0.5	1.5	2	3	5	5	9	20	Screw-clamp	4	_	LP2K09004 ▲■	202.		
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	4	_	LP2K12004 ▲■	232.		

#### Table 18.102: Coil Voltage Codes for DC Contactors

Coil with integral suppression device available. Add 3 to the code required. Example: JD3. Price adder \$10.00 (\$20.00 for mechanically interlocked contactors)

Vdc	12	20	24	36	48	60	72	100	110	125	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD

Table 18.103: DC-Low Consumption Operating Coils (devices have built-in transient suppression)

4-Pole Mini Contactor												
0.5	1.5	0	3 5 5 9 15 Screw-clamp	Cavaur alaman	4	_	LP4K09004 ▲■	110.				
0.5	1.5	2		3	3	9	15	Screw-ciamp	2	2	LP4K09008 ▲■	116.
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	4	_	LP4K12004 ▲■	126.
4-Pole Mechanically Interlocked Contactors												
0.5	1.5	2	3	5	5	9	20	Screw-clamp	4	_	LP5K09004 ▲■	238.
0.5	1.5	3	3	7.5	10	12	20	Screw-clamp	4		LP5K12004 ▲■	274.

#### Table 18.104: Coil Voltages for DC Contactors—Low Consumption

Vdc	12	24	48	72	
Code	JW3	BW3	EW3	SW3	

For TeSys K contactors with spring terminal clamps, add a **3** before the coil voltage code (for example, LC1K09103L7). For TeSys K contactors with solder pin terminals, add a **5** before the coil voltage code (for example, LP4K06015JW3). For TeSys K contactors with slip-on terminals, add a **7** before the coil voltage code (for example, LP2K090047BD).

Complete the catalog number with the appropriate coil voltage code (for example, LC1K0610G7).

Overload Relays	page	18-24
Accessories	page	18-27
Dimensions		10 10

18-27



#### **Contactors and Accessories**

#### Table 18.105: Instantaneous Auxiliary Contact Blocks



LA1KN22

LA2KT2U

P	Auxiliar	y Contacts	Catalog	0.0
Type of connection	N.O.	N.C.	Number	\$ Pri
	2	_	LA1KN20	14.
	_	2	LA1KN02	14.
	1	1	LA1KN11	14.
Screw clamp	4	_	LA1KN40 ▲	27.
screw clamp	3	1	LA1KN31 ▲	27.
	2	2	LA1KN22 ▲	27.
	1	3	LA1KN13 ▲	27.
		4	LA1KN04 ▲	27.
	2	_	LA1KN207	14.
	_	2	LA1KN027	14.
	1	1	LA1KN117	14.
Slip-on 1 x 0.250 in. or 2 x 0.110 in.	4	_	LA1KN407 ▲	27.
σηρ-οτι τ x 0.200 πι. οτ 2 x 0.110 πι.	3	1	LA1KN317 ▲	27.
	2	2	LA1KN227 ▲	27.
	1	3	LA1KN137▲	27.
	-	4	LA1KN047 ▲	27.

Block of 4 contacts cannot be used with LP4K or LP5K contactors.

#### Table 18.106: Electronic Time Delay Auxiliary Contact Blocks

Clip-on front mounting, 1 block per c	ontactor and 2 blocks pe	er pair of mechanically i	nterlocked contactor	'S.	
Voltage (V)	Туре	Timing Range (S)	Contacts	Catalog Number	\$ Price
24-48 Vac or Vdc	On-delay	1–30	SPDT	LA2KT2E	32.80
110-240 Vac	On-delay	1–30	SPDT	LA2KT2U	32.80
Makes Delay a deside with already waters	I I - I + I 0 40 \ / 0 / - I -	0.4			

Relay outputs, with single pole double throw, 240 Vac/Vdc, 2 A max. Maximum switching capacity 250 VA / 150 W
Operating temperature: -10 to + 60°C (14 to 140°F)
Reset time: 1.5 s during time delay, 0.5 after time delay

#### Table 18.107: Suppressor Module with Incorporated LED Indicator

Voltage range	Туре	Sold in lots of	Catalog Number	\$ Price each
12-24 Vac/Vdc	Varistor	5	LA4KE1B ■	9.80
32-48 Vac/Vdc	Varistor	5	LA4KE1E ■	9.80
50-129 Vac/Vdc	Varistor	5	LA4KE1FC ■	9.80
130-250 Vac/Vdc	Varistor	5	LA4KE1UG ■	9.80
12-24 Vdc	Diode + Zener	5	LA4KC1B ◆	9.80
32-48 Vdc	Diode + Zener	5	LA4KC1E ◆	9.80
220-250 Vac	RC	5	LA4KA1U ★	9.80

- (1.1–1.5 times normal).
- No overvoltage or oscillation frequency. Polarized component. Slight time delay on drop-out (1.1–1.5 times normal).
- Protection by limitation of the transient voltage to 3 Uc maximum and limitation of the oscillation frequency. Slight time delay on drop-out (1.2 times normal).

#### Table 18.108: Paralleling Links

Description	Sold in lots of	Catalog Number	\$ Price each
For 2 poles with screw-clamp terminals	4	LA9E01	2.20
For 4 poles with screw-clamp terminals	2	LA9E02	3.50

#### Table 18.109: Power Connectors

Description	Sold in lots of	Catalog Number	\$ Price each
Set of 6 power connections for reversing contactors with screw-clamp terminals	100	LA9K0969	6.20
Set of 4 power connections for changeover contactors with screw-clamp terminals	100	LA9K0970	6.20

#### Table 18.110: Marking Strips

Description	Sold in lots of	Catalog Number	\$ Price each
Clips onto front of the contactor	100	LA9D90	.06

#### Table 18.111: Accessories for Overload Relays

Description	Type of Connection	Catalog Number	\$ Price
Terminal block for separate clip-on mounting of the overload relay onto 35 mm omega rail (AM1DP200)	Screw-clamp	LA7K0064	11.90



E164862 CCN NLDX

LR43364 Class 3211 04

The TeSys U motor starter is integrated, making it simple to choose and install. It consists of a control unit snapped in a power base. TeSys U can be configured to fit specific applications as well. Optional accessories include a reverser, a current limiter, predictive maintenance options, and communication options.

For detailed information about TeSys U, visit our website.

1 Power Base



**Control Unit** 



TeSys U Motor Starter

#### Selecting TeSys U Motor Starters in Three Steps

Table 18.112: Step 1. Select Power Base (Only two different bases up to 32 A)

Control	Max. Current		Three Phase (H		(HP max.)		se (HP max.)	Self-Protected Power Base	
Connection	(A)	200/208 V	220/240 V	460 V	575/600 V	120 V	240 V	Catalog Number	\$ Price
With screw terminations	12	3	3	7.5	10	1.5	2	LUB12	246.00
with screw terminations	32	10	10	20	25	2	5	LUB32	345.00
Without screw terminations	12	3	3	7.5	10	1.5	2	LUB120●	276.00
williout screw terminations	32	10	10	20	25	2	5	LUB320●	375.00
<ul> <li>For use with reversing mo</li> </ul>	dules or commu	nication modu	les with prewire	ed connec	tor				

#### Table 18.113: Step 2. Select Control Unit

Setting Range (A)	Standard 3-phase Class 10 trip ▼	\$ Price	Advanced 3-phase Class 10 trip ▼	\$ Price	Advanced single-phase Class 10 trip ▼	\$ Price	Advanced 3-phase Class 20 trip ▼	\$ Price
0.15-0.6	LUCAX6●●	120.00	LUCBX6●●	150.00	LUCCX6●●	150.00	LUCDX6●●	150.00
0.3-1.4	LUCA1X••	120.00	LUCB1X●●	150.00	LUCC1X**	150.00	LUCD1X**	150.00
1.25-5.0	LUCA05●●	120.00	LUCB05●●	150.00	LUCC05●●	150.00	LUCD05●●	150.00
3–12	LUCA12 ••	120.00	LUCB12●●	150.00	LUCC1200	150.00	LUCD12●●	150.00
4.5-18	LUCA18●●	120.00	LUCB18●●	150.00	LUCC18 ••	150.00	LUCD18●●	150.00
8–32	LUCA32●●	120.00	LUCB32●●	150.00	LUCC32●●	150.00	LUCD32●●	150.00
• • • • • • • • • • • • • • • • • • • •		1.10				LLICANOCIN		

Complete the catalog number by adding appropriate code from voltage code table below (for example, LUCAX6FU).

#### Table 18.114: Voltage Codes

Volts	24	48–72	110–240
DC	BL□	_	_
AC	В	_	
DC or AC	_	ES♦	FU

DC voltage with range of 0.90 to 1.10 of nominal.

48-72 Vdc: 48 Vac

#### Table 18.115: Step 3. Select Auxiliary Contacts (optional)

					Contact S	State for Each	Mode▲			
Terminals	Contact Indicates	Contact Normal Status	Off	Ready	Run	Short Circuit Trip	Overload Trip (Manual Reset)	Overload Trip (Remote/ Auto Reset)■	Catalog Number	\$ Price
<b>Auxiliary Conta</b>	act Blocks					•				
Screw	Ready condition	N.O.	0	_	- 1	0	0	1	LUA1C11	
Screw	Fault condition	N.C.	ı		- 1	0	0	1		34.5
Screw	Ready condition	N.O.	0			0	0		LUA1C20	34.3
Sciew	Fault condition	N.O.	0	0	0	I		0		
<b>Auxiliary Conta</b>	act Function Modul	es								
Screw	Pole state	2 N.O.	0	0	- 1	0	0		LUFN20	
Screw	Pole state	1 N.O. and 1 N.C.	0 I	0 I	1 0	0 I	0 1		LUFN11	34.5
Screw	Pole state	2 N.C.	1	I	0	I	1		LUFN02	

I indicates closed contact; O indicates open contact

#### Table 18.116: Accessories

Accessory	Quick Description	For details & selection, see:
Accessory	Quick Description	For details & selection, see.
Current limiter	Increases the breaking capacity to 130kA @ 460 V	Table 18.123
Reverser	Stacked or side mounted (LU6MB0 only)	Table 18.119
Line phase barrier	Required for use as a self-protected combination starter (UL508E)	Table 18.118
Multifunction control unit	Has functions for monitoring and predictive maintenance	Table 18.124
Function modules	Fault differentiation, thermal overload, motor load indication	Table 18.125
Communication modules	Integrates into existing networks, major portocols are available	Table 18.126
Soft starter + Tesys U	Use Altistart U01soft starter with TeSys U	Table 18.132
Powerbus	Use TeSys U with a prewired system	Table 18.128
Configuration and connection accessories	PowerSuite software, busbar, external handle	Table 18.129



E164862 CCN NLDX

Power Base

Control Unit

**Auxiliary Contact** 



LR43364 Class 3211 08



The control unit contains solid-state overload relay and control power source for TeSys U. For more details on the different control units, their functions, and placement on the power base, see 18-29

Requires multifunction or advanced control unit plus fault differentiation module LUFDA10.

■ Line Phase Barrier



#### **Table 18.117: Control Units and Functions**

**Control Units** 

	Standard		Multifunction		
Reference	LUCA	LUCB	Advanced LUCC	LUCD	LUCM
	LUCA	LUCB	LUCC	LUCD	EUCIN
Protection type Class 10					
Class 10					
Class 5–30			<u> </u>		
Single Phase: LUCC Class 10 only					
Protection functions					
Short circuit					
Over current					
Thermal overload					
Phase loss					
Phase imbalance					
Ground fault					
Underload, long start, jam					
Control functions					
Manual reset					1
Automatic or local/remote reset					
Fault differentiation					
Thermal alarm					
Motor load display					
Fault history					
Alarm threshold adjustment					
Tripping test					

#### **Power Base and Plug-in Accessories**

See below where to install accessories on the power base. Only one accessory can be installed in each location.

Reverser Unit mounts under power base
Current Limiter attaches above power base
Multifunction Control Unit

Auxiliary
Function or Communication Module
Auxiliary Contact Block

Power Base (Front View)

Side View

Line Phase Barrier



Reverser Unit Assembled under the Power Base

œ

#### Table 18.118: Line Phase Barrier (optional) ▲

Description	Catalog Number	\$ Price
Incoming line phase barrier to allow the TeSys U to be used as a self protected combination starter according to UL508E	LU9SP0	15.00
▲ See page 18-29 for placement on the power base.		

#### Table 18.119: Reverser

Control Connection	Max. Current	Three Phase (HP max.)				Self-Protected Starter Base	
Control Connection	(A)	200/208 V	220/240 V	460 V	575 V	Catalog Number	\$ Price
With screw terminations	12	3	3	7.5	10	LU2B12■	488.00
	32	10	10	20	25	LU2B32■	720.00

Voltage code required.

#### Table 18.120: Select Control Unit Options★▼

Setting Range (A)	Standard 3-phase Class 10 trip ◆	\$ Price	Advanced 3-phase Class 10 trip ♦	\$ Price	Advanced single-phase Class 10 trip ♦	\$ Price	Advanced 3-phase Class 20 trip ♦	\$ Price
0.15-0.6	LUCAX6●●	120.00	LUCBX6●●	150.00	LUCCX6••	150.00	LUCDX6●●	150.00
0.3-1.4	LUCA1X●●	120.00	LUCB1X●●	150.00	LUCC1X**	150.00	LUCD1X**	150.00
1.25-5.0	LUCA05	120.00	LUCB05●●	150.00	LUCC05●●	150.00	LUCD05	150.00
3–12	LUCA12 ••	120.00	LUCB12●●	150.00	LUCC12®®	150.00	LUCD1200	150.00
4.5–18 ♦	LUCA18 ••	120.00	LUCB18●●	150.00	LUCC18●●	150.00	LUCD18 ••	150.00
8–32 ♦	LUCA32●●	120.00	LUCB32●●	150.00	LUCC32	150.00	LUCD32●●	150.00
	•	•						

- Complete the catalog number by adding the appropriate code from Table 18.121 (for example, LUCAX6FU). Control units for 4.5–18 and 8–32 can be used **only** with 32 A rated power bases (LUB32/LU2B32). The control unit contains solid-state overload relay and control power source for TeSys U. For more details on the different control units, their functions, and placement on the power base see page 18-29.

#### Table 18.121: Voltage Codes

Volts	24	48–72	110–240
DC	BL△□	_	_
AC	В	1	_
DC or AC		ES♦	FU

- Voltage code to use for a power base with a communication module. DC voltage with range of 0.90 to 1.10 of nominal.

#### Table 18.122: Reversing Modules for Field Addition

Mounting	Catalog No.	\$ Price	Wiring Adapter	\$ Price
Beneath	LU2MB0	192.00	LU9MR1C	31.50
Beside	LU6MB0	222.00	LU9MR1	15.00

Note: For LU2MB0 and LU6MB0, voltage code required; must match control unit.

Table 18.123: Current Limiter ☆▽

Accessory	Application	Technical Data	Mounting	Catalog Number	\$ Price
Current limiter/isolator	Additional current limiting aspects for the starter	130 kA at 460 V 60 kA at 575 V	Direct mounting to LUB● and LU2B●	LUALB1	171.00
Limiter cartridge	Replacement cartridge for LUALB1	130 kA at 460 V 65 kA at 575 V	_	LUALF1	78.00

Increases the breaking capacity of the motor starter.

#### See page 18-29 for placement on the power base.

#### Table 18.124: Control Unit Multifunction ∘\*

Setting Range (A)	Multifunction programmable	\$ Price
0.15–0.6	LUCMX6BL	
0.3–1.4	LUCM1XBL	
1.25–5.0	LUCM05BL	615.00
3–12	LUCM12BL	615.00
4.5–18	LUCM18BL	
8–32	LUCM32BL	

- Offers motor management system capabilities. For more details see the LUCM on page 18-31.
- See page 18-29 for placement on the power base

#### Table 18.125: Function Modules ♦ o

Module	Description	For use with:	Operation Requirements	Catalog Number	\$ Price
Fault differentiation with manual reset (thermal overload)	Provides indication between an overload trip and a short circuit trip.	Advanced control units only	24–250 Vac or Vdc (power from control unit)	LUFDH11	156.00
Fault differentiation with auto reset	anu a short dilcuit trip.	(p	(power from control drift)	LUFDA10	156.00
Thermal overload pre-alarm	Signals when the motor current reaches 1.05 of the full load setting on the control unit.	Advanced control units only	24–250 Vac or Vdc (power from control unit)	LUFW10	156.00
Motor load indication	Provides a signal proportional to the average currents in the three phases divided by the full load current setting of the control unit. The output corresponds to a load status of 0–2 times the full load setting of the control unit.	Advanced or multi-function control units	4–20 mA (requires separate 24 Vdc power supply)	LUFV2	188.00
Parallel wiring	Provides a convenient way to reduce control wiring and allow for connecting starters to a communications network by providing 24 Vdc for the starters.	Advanced or multi-function control units(24 Vdc only) and LU9BN11C or LU9MRC prewired connector	LU9G02 splitter box and PLC network	LUFC00	57.00

- Offers customization for specific application requirements.
- See page 18-29 for placement on the power base.



Control Unit Multifunction

Alarm Differentiation





Motor Load Indicator





#### Table 18.126: Communication Modules ♥ □



Modbus

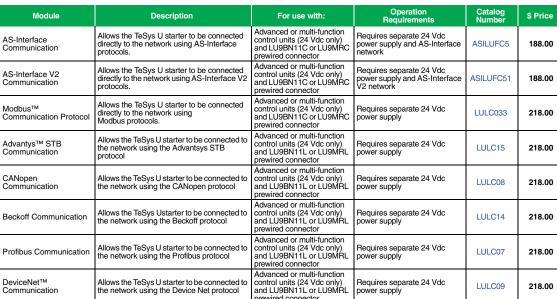




**Profibus** 



CANopen



Communication capabilities can be integrated into existing automation architecture via a variety of protocols.

#### **Configuration and Connection Accessories**

Table 18.127: Control Circuit Accessories ♦

Accessory	Application	Technical Data	Mounting		Catalog Number	\$ Price
Control circuit contact block	Switches control circuit power via LUB• handle (NEC430-74 compliance)	5 A at 600 Vac 5 A at 250 Vdc	Side mounting to LUB• and LU2B• only			71.00
Through-the-door operating mechanism		NEMA 1, 12 Black w/ trip indication	Kit	Kit		140.00
	Use to enclose TeSys LUB● only.	NEMA 1, 12 Red/Yellow w/ trip indication	Kit	Kit		140.00
		NEMA 3R, 4, 4X Red/Yellow without trip indication	Kit		LU9APN24	161.00
Control sine vit filters	Use with electronic or triac output	Up to 150 Vac max.	Diversity to earl townsingle	Non-reversing	LUA4F11	39.30
Control circuit filters	controllers	υριο του vac max.	Directly to coil terminals	Reversing	LUA4F12	39.30
Angle bracket	Support shaft, for use with LUB®	_	_		GVAPK12	19.00

See page 29 for placement on the power base.

#### Table 18.128: PowerSuite Configuration Software and Accessories

ltem ▲	Catalog Number	\$ Price ■
PowerSuite software	VW3A8104	225.00
PC connection kit	VW3A8106	113.00
Pocket PC connection kit	VW3A8111	143.00

For complete details on all components included with each item, refer to catalog **8502CT0201**. Items under discount schedule CP4C.

#### **Powerbus**

Table 18.129: GV2 Cabling Accessories—Bus Bars

Description	Application	Pitch	Standard Pack	Catalog Number	\$ Price Each
	E ( ! 0.0)(0	45	1	GV2G245	23.30
	For feeding 2 GV2 starters or TeSys U controllers	54	1	GV2G254	23.30
	ledys o controllers	72	1	GV2G272	23.30
	For feeding 3 GV2 starters or	45	1	GV2G345	28.70
3-Pole, 63 A Bus Bar	TeSys U controllers	54	1	GV2G354	28.70
0 1 010, 00 71 Dao Dai	F ( " + 0)(0 + +	45	1	GV2G445	34.20
	For feeding 4 GV2 starters or TeSys U controllers	54	1	GV2G454	34.20
	ledys o controllers	72	1	GV2G472	34.20
	For feeding 5 GV2 starters or TeSys U controllers	54	1	GV2G554	34.20

Additional accessories and components are available, including:

- Mounting accessories
- Gateways
- Cabling accessories
- Magelis™ remote display unit

For the complete line of TeSys U-Line motor starter accessories and all technical details (specifications, wiring diagrams, etc.) pertaining to the product line, refer to Catalog 8502CT0201.

See 18-29 for placement on the power base

Refer to Catalog 8502CT9901



#### **Altistart Drive and TeSys U Motor Starter**

Table 18.130: Soft Start / Soft Stop Unit for 0.75 to 15 kW Motors (can be combined with the TeSys U starter)

Mo	tor		Starter					
Motor F	Power▲	Nominal Current						
230 V	460 V	Nominal Current	Catalog Number	\$ Price				
HP	HP	Α						
3-phase supply voltage: 200	480 V 50/60 Hz	<u>'</u>	·					
1	2	2	ATOLIOANIOOGI T	400.00				
1.5	3	6	ATSU01N206LT	133.00				
2	5	9	ATSU01N209LT	152.00				
3	7.5	12	ATSU01N212LT	175.00				
5	10	00	ATSU01N222LT	219.00				
7.5	15	22	AISUUINZZZLI	219.00				
10	20	32	ATSU01N232LT	300.00				

Standard motor power ratings, HP power ratings indicated according to standard UL 508.

#### Table 18.131: Accessories

Description	Used for Starter	Catalog Number	\$ Price
Power connector between ATSU 01N2 of LT and TeSys U	ATSU01N2••T	VW3G4104	10.00

#### Table 18.132: TeSys U Starter and Soft Start Unit Combinations

Motor	Power		TeSys U			
Volt	Voltage					
200 V	460 V	Soft Starter	Power Base	Control Unit ■		
HP	HP					
1	2	ATSU01N206LT		LUC•05BL		
1.5	3	ATSU01N206LT		LUC•12BL		
2	5	ATSU01N209LT	LUB 12	LUC•12BL		
3	_	ATSU01N212LT	LUB 12	LUC•12BL		
_	7.5	ATSU01N212LT	1	LUC •18BL		
5	10	ATSU01N222LT	1	LUC•18BL		
7.5	15	ATSU01N222LT	LUB 32	LUC•32BL		
10	20	ATSU01N232LT	1 LOB 32	LUC•32BL		

Depending on the configuration of the chosen TeSys U starter, replace the • with A for standard, B for advanced, and M for multifunction. See page 18-28 for a complete list of available control units. Control voltage must be 24 Vdc.



ATSU01 \*\*











**GV2ME** 

The GV family of products are 3-pole, horsepower rated, UL 508 listed manual starters. They include a manual disconnect, class 10 ambient-compensated thermal overload relay, and instantaneous, magnetic trip mechanism in one compact unit.

Any GV manual starter can be used alone for local manual control of a motor with individual full-load currents up to 220 A. The GV products may also be used in group motor installations in accordance with National Electric Code article 430-53. Group motor installations give you greater panel density for smaller size and require fewer parts and less wiring for installation when compared to conventional panel designs.

The GV2P and GV3P products also have an additional UL 508 type E rating as a stand-alone, self-protected manual combination starter. The UL 508 type E rating requires the addition of line side insulating barrier GV2GH7 for the GV2P, or GV3G66 for the GV3P. The GV2P and GV3P self-protected manual combination starters may also be combined with specific size contactors from the LC1D product family for a UL 508 Type F combination starter construction. These products have a UL-listed short circuit current rating from 10-100 kA depending on application size and voltage. See the Schneider Electric website for more information.

**Starters** 

To order a basic motor starter, select the model number (GV2ME••, GV2P••, or GV3P••) with the appropriate thermal setting from the table below. The thermal trip range and setting should be determined from the motor nameplate full-load current.

Table 18.133: GV2, GV3



GV2P21 with GV2GH7 installed



GV3P



GV7RE20

Theward			Maxim	num Hors	epower R	atings			Group Motor	GV2/3M pus	sh button	GV2/3P rotary handle	
Thermal Setting	10			3 Ø			Applications	G / Z o iii pu	ar buttori	G12701 10tal	y manaic		
(A)	120 V hp	208 V hp	240 V hp	120 V hp	208 V hp	240 V hp	480 V hp	600 V hp	Max. Fuse or Circuit Breaker	Catalog Number	\$ Price	Catalog Number	\$ Price
0.11-0.16	_	_	_	_	_	_	_	_	450 A	GV2ME01▲	159.	GV2P01	212.
0.16-0.25	_	_	_	_	_	_	_	_	450 A	GV2ME02▲	159.	GV2P02	212.
0.25-0.40	_	_	_	_	_	_	_	_	450 A	GV2ME03▲	159.	GV2P03	212.
0.40-0.63	_	_	_	_	_	_	_	_	450 A	GV2ME04▲	180.	GV2P04	233.
0.63-1	_	_	_	_	_	_	_	0.5	450 A	GV2ME05▲	180.	GV2P05	233.
1–1.6	_	_	1/10	_	_	_	0.75	0.75	450 A	GV2ME06▲	180.	GV2P06	233.
1.6-2.5	_	1/6	1/6	_	0.5	0.5	1	1.5	450 A	GV2ME07▲	180.	GV2P07	233.
2.5–4	1/8	0.25	1/3	_	0.75	0.75	2	3	450 A	GV2ME08▲	180.	GV2P08	233.
4-6.3	0.25	0.5	0.5	0.75	1	1.5	3	5	450 A	GV2ME10▲	180.	GV2P10	233.
6–10	0.5	1	1.5	1	2	3	5	7.5	450 A	GV2ME14▲	180.	GV2P14	233.
9–14	0.75	2	2	2	3	3	10	10	450 A	GV2ME16▲	224.	GV2P16	278.
13–18	1	2	3	2	5	5	10	15	450 A	GV2ME20▲	224.	GV2P20	278.
17–23	1.5	3	3	3	5	7.5	15	20	450 A	GV2ME21▲	224.	GV2P21	278.
20–25	2	_	_	_	7.5	7.5	15	20	450 A	GV2ME22▲	224.	GV2P22	278.
24–32	2	5	5	5	7.5	10	20	25	450 A	GV2ME32	224.	GV2P32	278.
9–13	0.5	_	1.5	_	3	3	7.5	10	_	_	_	GV3P13	404.
12–18	0.75	_	2	_	5	5	10	15	_	_	_	GV3P18	404.
17–25	1.5	_	3	_	5	7.5	15	20	_	_	_	GV3P25	404.
23–32	2	_	5	_	7.5	10	20	25	_	_	_	GV3P32	404.
30–40	3	_	_	_	10	_	25	30	_	_	_	GV3P40	504.
37–50	_	_	7.5	_	10	15	30	40	_	_	_	GV3P50	504.
48–65	5	_	10	_	15	20	40	50	_	_	_	GV3P65	504.
▲ For s	spring ter	minals ad	d 3 to the	catalog n	umber (fo	r example	GV2MF	013) GV	2ME32 is not avail	able with sprin	a terminals	For ring termin	als add 6

#### Table 18.134: GV7

		Maxi	mum Hors	epower Ra	itings		Toggle Operator			
Thermal Setting	1	Ø	3 Ø				Standard In	nterrupt	High Interrupt	
(A)	115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp	Catalog Number	\$ Price	Catalog Number	\$ Price
12–20	_	_	_	5	10	15	GV7RE20	417.	GV7RS20	813.
15–25	_	_	_	7.5	15	20	GV7RE25	417.	GV7RS25	813.
25-40	_	_	_	10	30	30	GV7RE40	417.	GV7RS40	813.
30-50	_	_	_	15	30	40	GV7RE50	417.	GV7RS50	813.
48-80	_	_	_	30	60	75	GV7RE80	417.	GV7RS80	813.
60-100	_	_		30	75	100	GV7RE100	456.	GV7RS100	891.
90-150	_	_	_	50	100	150	GV7RE150	502.	GV7RS150	978.
132–220	_	_	_	75	150	200	GV7RE220	502.	GV7RS220	978.

Specifications: page 18-36 Accessories: pages 18-34 to 18-35 Dimensions: pages 18-52 to 18-55

#### **Motor Protector Circuit Breakers**

Motor protector circuit breakers provide built-in thermal and magnetic protection. They are used in two-device motor feeder solutions to provide protection against short circuits, overloads, and phase imbalance.

Table 18.135: Two-Device Solutions—Electronic Motor Protector Circuit Breakers with UL Ratings: H-Frame (150A), J-Frame (250 A), and L-Frame (600 A) ■ (refer to discount schedule DE2)

Electronic	<b>-</b>	Sensor	Trip	Full Load	Isd	G Interrupti	ng	J Interrupti	ng	L Interrupti	ng
Trip Unit Type	Frame	Rating	Unit	Ampere Rating (FLA)	(x FLA)	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
	H-Frame	30	2.2 M	14-25	5-13 x FLA	HGL36030M38X	1608.	HJL36030M38X	1658.	HLL36030M38X	1812.
		50		14-42	5-13 x FLA	HGL36050M38X	1938.	HJL36050M38X	1998.	HLL36050M38X	2191.
		100		30-80	5-13 x FLA	HGL36100M38X	2229.	HJL36100M38X	2298.	HLL36100M38X	2506.
Standard ♦		150		58-130	5-13 x FLA	HGL36150M38X	2701.	HJL36150M38X	2785.	HLL36150M38X	3057.
	J-Frame	250		114-217	5-13 x FLA	JGL36250M38X	3105.	JJL36250M38X	3201.	JLL36250M38X	3253.
	L-Frame	400	2.3 M	190-348	5-13 x FLA	LGL36400M38X	6041.	LJL36400M38X	6160.	LLL36400M38X	6468.
		600	2.5 101	312-520	5-13 x FLA	LGL36600M38X	8429.	LJL36600M38X	8604.	LLL36600M38X	9156.

Two-device solutions (these electronic motor protector circuit breakers include short circuit and overload protection):

E164864 CCN NLRV





Contactor, plus
 electronic motor circuit protector with a Micrologic 2.2 M

The standard trip unit offers Class 5, 10, and 20 and phase unbalance or phase loss protection.

#### Table 18.136: Voltage Trips



GVAU116

	Only one trip or fa	ault signaling contact c	an be installed per GV2/GV	/3 device.	
Description	Characteristics	Voltage	Frequency	Catalog Number▲	\$ Price
		24 V	50 Hz	GVA•025	
		24 V	60 Hz	GVA•026	
		48 V	50 Hz	GVA®055	
		46 V	60 Hz	GVA•056	
		100-110 V	50/60 Hz	GVA•107	
		110 115 \/	50 Hz	GVA•115	
		110–115 V	60 Hz	GVA•116	
		120-127 V	50 Hz	GVA•125	81.00
		127 V	60 Hz	GVA•115	
	Undervoltage or	200 V	50 Hz	GVA•207	
Voltage trips GV2 & GV3P	Shunt trip (external mounting,	200-220 V	60 Hz	GVA•207	
avz a avoi	1 block right side only)	000 04014	50 Hz	GVA•225	
	3,	220–240 V	60 Hz	GVA•226	
		380–400 V	50 Hz	GVA•385	
		380-400 V	60 Hz	GVA•386	
		415-440 V	50 Hz	GVA•415	
		415 V	60 Hz	GVA•416	
		440 V	60 Hz	GVA•385	
		480 V	60 Hz	GVA•415	
		500 V	50 Hz	GVA•505	
		600 V	60 Hz	GVA*505	

To order an undervoltage trip: replace the bullet (\*) with a **U** (for example, GVAU025). To order a shunt trip: replace the bullet (\*) with an **S** (for example, **GVAS025**).

#### Table 18.137: Auxiliary Contact Blocks



Description	Mounting Location	Max. No. of Blocks Contact Type		Sold in lots of	Catalog Number	\$ Price
		1	N.O. or N.C.♦	1	GVAE1	21.80
Instantaneous auxiliary contacts GV2 + GV3P	Front■□		N.O. + N.C.	10	GVAE11▼	35.70
			N.O. + N.O.	1	GVAE20▼	35.70
	Left Hand Side	2	N.O. + N.C.	1	GVAN11▼	35.70
			N.O. + N.O.	1	GVAN20▼	35.70
			N.O. (fault) + N.O.	1	GVAD1010	54.00
Fault signaling contact + instantaneous auxiliary contact			N.O. (fault) + N.C.	1	GVAD1001	54.00
GV2 + GV3P	Left Hand Side★	'	N.C. (fault) + N.O.	1	GVAD0110	54.00
472 1 4761			N.C. (fault) + N.C.	1	GVAD0101	54.00
Short circuit signaling contact GV2 + GV3P	Left Hand Side	1	SPDT	1	GVAM11	35.70

- Mounting of a GVAE contact block or a GV2AK00 visible isolation block on GV2P.
  Choice of N.C. or N.O. contact operation, depending on which way the reversible block is mounted.
- The GVAD is always mounted next to the starter.
- For spring terminals, add 3 to the catalog number (for example, **GVAE113**). One trip or one fault signaling can be fitted per GV3. Cannot be used with **GV2GH7** insulator.

#### Table 18.138: Voltage Trips-Technical Data (GV2AU, GV2AS)

Rated Voltage—660 Vac										
Model	Inrush	Sealed	Pick-Up Voltage	Drop-Out Voltage	Operating Time ◊					
GVAU	12 VA / 8 W	3.5 VA / 1.1 W	0.8—1.1	0.35—0.7	10—15 ms					
GVAS	14 VA / 10.5 W	5 VA / 1.6 W	0.7—1.1	0.2-0.75	10—15 ms					
♦ From the loss of vo	♦ From the loss of voltage at the trip terminals to the opening of the starter contacts.									

#### Table 18.139: GV3P Accessories



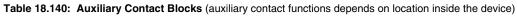
GVAD0101

Accessory	Application / Use With	Catalog Number	\$ Price
	NEMA 1, 12, Black with trip indication, for use with GV3P	GV3APN01	136.00
Through-the-door operating mechanism (Qty: 1)	NEMA 1, 12, Red/Yellow, with trip indication, for use with GV3P	GV3APN02	136.00
	NEMA 3R, 4, 4X Red/Yellow without trip indication, for use with GV3P	GV3APN04	149.00
Angle bracket (Qty: 1)	Support shaft, for use with GV2P and GV3P	GVAPK12	19.00
Hard bracket (Qty: 1)	_	GVAPH03	30.00
Set of 3-pole 115 A busbars (tap-offs: 2, pitch: 64 mm)	GV3P••	GV3G264	25.00
Set of 3-pole 115 A busbars (tap-offs: 3, pitch: 64 mm)	GV3P••	GV3G364	45.00
Cover "Larger Spacing" UL 508 type E (Only one cover required on supply side)	GV3P**	GV3G66	18.00
IP 20 cover (Two covers required per starter)	GV3P••	LAD96570	12.00
Padlocking device For use with up to 4 padlocks (not supplied) Ø 6 mm shank maximum	GV3P** GV3P***	GV2V03	15.00



#### **Starter Accessories**

Refer to Catalog 2520CT0001





GV7AC01

Description	Mounting Location	Max. No. of Blocks	Contact Type	Catalog Number	\$ Price
Standard					
Instantaneous	Inside Device	2 per device	N.O. + N.C.		
Trip Indication		1 per device	N.O. + N.C.	GV7AE11	35.70
Fault Indication		1 per device	N.O. + N.C.	1	
Low Level					
Instantaneous		2 per device	N.O. + N.C.		
Trip Indication	Inside Device	1 per device	N.O. + N.C.	GV7AB11	35.70
Fault Indication		1 per device	N.O. + N.C.		

Table 18.141: Voltage Trips



GV7RE20

Description	Mounting Location	Max. No. of Blocks	Voltage	e	Catalog Number	\$ Price	
			48 Vac	50 Hz	GV7AU055		
	Inside Device		110-130 Vac	50/60 Hz	GV7AU107		
Undervoltage Trip		1 per device	200-240 Vac	50/60 Hz	GV7AU207	64.00	
			380-440/480 Vac	50/60 Hz	GV7AU387		
			525 Vac	50 Hz	GV7AU525		
			48 Vac	50 Hz	GV7AS055		
			110-130 Vac	50/60 Hz	GV7AS107		
Shunt Trip	Inside Device	1 per device	200-240 Vac	50/60 Hz	GV7AS207	64.00	
			380-440/480 Vac	50/60 Hz	GV7AS387	i	
			525 Vac	50 Hz	GV7AS525		
Coult Indication	Incide Device	1 man davisa	24–130		GV7AD111		
Fault Indication	Inside Device	1 per device	110-415		GV7AD112	72.00	

Table 18.142: Wiring Accessories



Description	Application	Catalog Number	\$ Price
David von	Sold in lots of 3 for GV7R●20–150☆	GV7AC021	19.70 each
Box Lugs	Sold in lots of 3 for GV7R●220☆	GV7AC022	24.90 each
Phase Barriers, Bus Bars & Shrouds			
Terminal Extension Kit	Increases center distance between phases to 45 mm	GV7AC03	46.70
Terminal Shroud Kit	Covers terminal connections for touch safe protection	GV7AC01	41.90
Phase Barriers	Provides maximum phase separation at connection points	GV7AC04	31.10
Insulating Barriers	Provides insulation between connectors and backplate	GV7AC05	24.90
Busbars and Covers	Connect to LC1F115–185 contactor	GV7AC06	46.70
Busbars and Covers	Connect to LC1F225–265 contactor	GV7AC07	46.70
Operating Handles and Accessorie	s		
Black rotary operating handle with black	c legend plate (mounts directly on device)	GV7AP03	86.00
Red rotary operating handle with yellow	legend plate (mounts directly on device)	GV7AP04	86.00
Conversion accessory to mount the dev	rice directly on panel door	GV7AP05	14.00
Black rotary operating handle with black	k legend plate and extension kit (185–600 mm)	GV7AP01	102.00
Red rotary operating handle with yellow	legend plate and extension kit (185–600 mm)	GV7AP02	102.00
Padlocking device for toggle handle (ma	ax. 38 mm padlocks)	GV7V01	14.00





GV7AS055

GV7AP03

#### Table 18.143: Operating Handles

For use with GV2, GV3, and TeSys U through-the-door operating mechanisms

Accessory	Description	Catalog Number	\$ Price
	NEMA 1, 12, Black with trip indication	GVAPB54	31.00
Operating Handle (Qty: 1)	NEMA 1, 12, Red/Yellow, with trip indication	GVAPR54	31.00
	NEMA 3R, 4, 4X Red/Yellow without trip indication	GVAPR65	37.00

Dimensions . . . . . . pages 18-52 to 18-55





**GVAPR54** 



GV7AC021



GV7V01



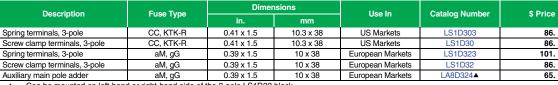
GV7AE11



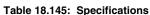
LS1D30

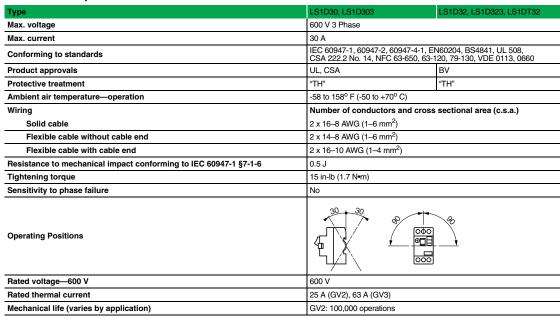
- 45 mm wide (same dimensions as GV2ME)
- Available with screw clamp and spring type terminals
- Mounts directly to LC1D09-D32 contactors (with use of GV2AF3 or GV2AF4)
- Meets application needs for fusible starter
- Uses GV2AE instantaneous contact blocks to open control circuits
- DIN rail mounted

#### Table 18.144: LS1 Fuseholders



Can be mounted on left-hand or right-hand side of the 3-pole LS1D32 block.





#### Table 18.146: Environmental Specifications and Approvals

rabio for for Environmental operationations	and Approvaio
Shock resistance	30 g (conforming to IEC 600 68-2-27)
Vibration resistance	5 g (5 to 150 Hz) (IEC 600 68-2-26)
Ambient temperature	-40 to 176 °F (-40 to +80 °C) for storage -4 to 140 °F (-20 to +60 °C) open operation -4 to 104 °F (-20 to +40 °C) enclosed operation
Maximum operating rate	25 operations per hour
Operating current of magnetic trip	Approximately 13 times the maximum thermal trip (non-adjustable setting)



File E164864 CNN NLRV



File LR81630 Class 3211 05



 $\overline{\alpha}$ 







GV2GH7



**Starter Accessories** 

Description	Application	Standard Pack ■	Catalog Number	\$ Price
Common mounting plate	For GV2 plus any 3-pole LC1D09 thru LC1D25 contactor. (supplied with GV1G02 connector)	1	GK2AF01	21.60
Adapter plate	For screw mounting of GV2M	10	GV2AF02	7.10
	Interconnect for GV2 plus any 3-pole LC1K or LP1K contactor	10	GV2AF01	14.00
Combination block	Interconnect GV2 and LC1D09 thru D32	10	GV2AF3	3.20
	Interconnect GV2 and LC1D09 thru D32 mounted on LAD31	10	GV2AF4	3.20
7.5 mm compensation plate	To allow mounting of GV2M and GV2P on a common bus bar	10	GV1F03	5.40
Mounting plate	For mounting GV2ME or GV2P and contactor LC1D09 thru D32	10	LAD31	6.20
wourting plate	For mounting GV2IVIE of GV2F and contactor LC 1009 thru D32	10	LAD311	12.30

#### Table 18.148: GV2 Cabling Accessories—Bus Bars

Description	Application	Pitch	Standard Pack ■	Catalog Number	\$ Price
		45	1	GV2G245	23.30
	For feeding 2 GV2 starters	54	1	GV2G254	23.30
		72	1	GV2G272	23.30
	For feeding 3 GV2 starters	45	1	GV2G345	28.70
3-Pole, 63 A Bus Bar	Tor leeding 5 GV2 starters	54	1	GV2G354	28.70
		45	1	GV2G445	34.20
	For feeding 4 GV2 starters	54	1	GV2G454	34.20
		72	1	GV2G472	34.20
	For feeding 5 GV2 starters	54	1	GV2G554	34.20

#### Table 18.149: GV2 Other Cabling Accessories

Description	Application	Standard Pack ■	Catalog Number	\$ Price
	Top feed for use with bus bars	1	GV1G09	34.20
Terminal blocks	Bottom feed, to be used with bus bars; can be fitted with GV1L3 current limiter	1	GV2G05	34.20
Protective end cover	To cover unused bus bar outlets	5	GV1G10	3.60
3-pole flexible connector	For connecting a GV2 to an LC1D09 thru D25 contactor	10	GV1G02	14.30
Conduit adapter (1/2" NPT)	_	1	GV2AK1	16.20
Incoming line insulator	For GV2P when used in UL 508 Type E applications▲	10	GV2GH7	15.00

<sup>▲</sup> Cannot be used with front-mounted auxiliary contact block.

#### Table 18.150: GV2 Other Accessories

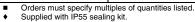
Description	Application	Standard Pack ■	Catalog Number	\$ Price
Visible isolation block—GV2P	Front mounting, 3-pole visible isolation on incoming side of GV2P	1	GV2AK00	71.40
Current limiter—GV2M	Increases interrupt capacity when attached to GV2M	1	GV1L3	117.00
	NEMA 1, 12, Black with trip indication, for use with GV2P	1	GV2APN01	131.00
Through-the-door operating	NEMA 1, 12, Red/Yellow with trip indication, for use with GV2P	1	GV2APN02	131.00
mechanism	NEMA 3R, 4, 4X, Red/Yellow without trip indication, for use with GV2P	1	GV2APN04	144.00
Angle bracket	Support shaft, for use with GV2P	1	GVAPK11	19.00
Hard bracket	_	1	GVAPH02	30.00

#### Table 18.151: GV2 Enclosures

Description	Mounting	Rating	Catalog Number	\$ Price
Enclosures for GV2M with or without accessories	Surface mounting	NEMA 1, IP41 IP55	GV2MC01 GV2MC02	54.00 78.00
(maximum of 1 accessory on right and left)	Flush mounting	NEMA 1, IP41 IP55	GV2MP01 GV2MP02	31.10 54.00
Enclosures are not UL or CSA listed.	Flush mounting reduced width (max. of 1 accessory on right)	NEMA 1, IP41 IP55	GV2MP03 GV2MP04	27.90 49.70

#### Table 18.152: GV2 Enclosures Accessories

Description		Туре	Standard Pack■	Catalog Number	\$ Price
Padlocking device for GV2M (when padlocked, starter is automatically in Off position)		_	1	GV2V01	26.90
	Spring return		1	GV2K011	35.90
Mushroom head stop push button	Latching	Key release (Ronis key no. 455)	1	GV2K021	104.00
(40 mm, red) ♦	Laterling	Turn to Release	1	GV2K031	52.00
(12 1111, 122)	Latching / Padlockable Turn to	o Release	1	GV2K04	117.00
Sealing kit	For enclosures G'	For enclosures GV2MC01 and GV2MP01		GV2E01	18.00
	110 V	Green	10	GV2SN13	
	110 V	Red	10	GV2SN14	
	110 V	Orange	10	GV2SN15	
	110 V	White	10	GV2SN17	
	220/240 V	Green	10	GV2SN23	
Dilat Light (near)	220/240 V	Red	10	GV2SN24	26.90
Pilot Light (neon)	220/240 V	Orange	10	GV2SN25	26.90
	220/240 V	White	10	GV2SN27	
	380/440 V	Green	10	GV2SN33	
	380/440 V	Red	10	GV2SN34	
	380/440 V	Orange	10	GV2SN35	
	380/440 V	White	10	GV2SN37	





LAD31

LAD311

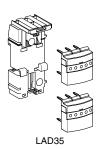


GV2AF3 / GV2AF4





APP2R4H1





**1**8



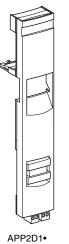


Table 18.153: Splitter Boxes

A total of up to eight starters is permissible after extensions. Use multiple quantities of the same catalog number to create the desired line-up.

Description	Type of Control-Command Connection on Control System Side	No. of I/O per Starter	No. of Starters per Unit	Catalog Number	\$ Price
50 A power splitter box			2	LAD322	52.00
50 A power spiller box	_	_	4	LAD324	93.00
	1 x HE10 8I/8O	11/10	4	APP2R4H1	124.00
	1 x HE10 16l and 1 x HE10 8O	21/10	4	APP2R4H2	124.00
FO A narray and control onlitter have	via module APP1C●●● ▲		2	APP2R2E	124.00
50 A power and control splitter box	via module APP IC	_	4	APP2R4E	124.00
	AS-Interface	21/10	2	APP2R2AS	124.00
	A3-interface	11/10	4	APP2R4AS	124.00

Connection to an APP1C module via APP2CX adapter (LAD35).

#### Table 18.154: Power Connection Components for One Starter

Description	Kit Consists Of:	Catalog Number	\$ Price
Assembly and power connection kit	One LAD31 plate for GV2ME and two LAD34 power connection modules	LAD351	21.00
Reversing kit ■	One set of bus bars and one mechanical interlock	LAD32	20.70

To create a TeSys D reverser, use two LC1D contactors, one assembly and power connection kit, and one reversing kit.

#### Table 18.155: Power Connection Accessories for One Starter

Description	Max. Connection Cross-Section	Use	Catalog Number	\$ Price
Upstream terminal block (50 A max)	16 mm <sup>2</sup> (6 AWG)	Power supply for one or two power splitter boxes	LAD3B	83.00
Downstream terminal block (50 A max)	6 mm <sup>2</sup> (10 AWG)	Connection of motor cables	LAD331	5.00

#### Table 18.156: Control Connection Module for One Starter

Description	D-Line Coil Voltage	Type of Coil Control Relay	Type of Starter	Catalog Number	\$ Price
	12-240 Vac or	Electromechanical ◆	Non-reversing	APP2D1	41.40
Control connection module	24-125 Vdc	Electroniechanicai ▼	Reversing	72.00	
(integrating contact block GVAE20)	04 40 1/-1- 14/54-	Mithout rolov +	Non-reversing	APP2D1D	31.10
	24–48 Vdc Without relay ★		Reversing	APP2D2D	31.10

- Relay supplied mounted on the front panel of the control connection.
- The use of TeSys D low consumption contactors is recommended.

#### Table 18.157: Spare or Replacement Parts

Description	Type of Control-Command Connection on Control System Side	No. of I/O per Starter	No. of Starters	Sold in Lots of	Catalog Number	\$ Price
Plate for mounting a GV2ME manual starter			1	10	LAD31	6.20
Flate for mounting a GVZIVIE manual starter	_	_	1	10	LAD311	12.30
Power connection module	_	_	1	10	LAD341	7.50
	1 x HE10 8I/8O	11/10	4	1	APP2R4H3	11.30
	1 x HE10 16l and 1 x HE10 8O	21/10	4	1	APP2R4H4	11.30
Control-command splitter box (single, for	Per module APP1C●●● ▼		2	1	APP2R2C	11.30
mounting on a power splitter box)	Per module APP IC	_	4 1 APP2R4C		APP2R4C	11.30
	AC Interfere	21/10	2	1	APP2R2A	11.30
	AS-Interface	11/10	4	1	APP2R4A	11.30
Replacement electromechanical relay (for co	ontrol connection module)	_	1	10	APP2ER	7.50

Connection to an APP1C ••• module via APP2CX adapter (LAD35).



#### **Busbar Accessories**

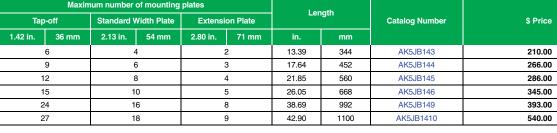
Refer to Catalog 8502CT0101

The AK5 pre-fabricated bus bar system provides a quick and easy method of mounting control devices. All components are finger safe, UL Listed, CSA approved and CE marked. Although the AK5 system can be screw mounted onto any type of support, it **must be mounted** on the AM1DL201 DIN rail when component mounting plates incorporating a tap-off are used. When using tap-offs, the nominal operating current of the bus bar (160 A @ 35°) must not be exceeded.

Table 18.158: 160 A, 3-Phase Busbar System



AK5JB143





AK5PA231

Table 18.159: Mounting Plate Tap-off (plugs into busbar mounted on AM1DL201 DIN rail)

Wi	dth	Thermal	Appli	cation	Catalog Number	\$ Price
in. mm		Current Amperes	Appli	CallOff	Catalog Number	\$ 1 Hoc
2.13	54	25 A		LUS or LUB 12 and 32	AK5PA231	98.00
2.13	54	25 A	GV2 with	contactor	AK5PA232	120.00
4.25	108	25 A		reversing contactor	AK5PA232S	206.00



AK5PA232S

Table 18.160: Bus Tap-off (plugs into busbar for wiring to a separately mounted device)

Wi	dth	Thermal	Length	of Leads	Catalog Number	\$ Price	
in.	mm	Current Amperes	mperes in. mm		Catalog Number	3 File	
1.42	36	32 A	9.84	250	AK5 PC33	23.00	
1.42	36	32 A	39.37	1000	AK5 PC33L	37.80	



AK5PC33

Table 18.161: Extension Plates

Used to mount wider components. Bolt to standard mounting plates (after DIN rails are removed).

	Wi	dth	Application	Catalog Number	\$ Price
	in.	mm	дрисации	Catalog Number	\$ Flice
Ī	2.80	71	GV & Reversing contactor	AK5PE27	26.30

•

AM1DL201

Table 18.162: Mounting Rail (must be used for mounting plates with tap-offs)

Description	Depth	Length	Catalog	S Price
Description	mm	mm	Number	ŞFIICE
75 mm Omega Rail	15	2000	AM1DL201	41.10

Table 18.163: Approvals: IEC 439, UL, CSA, DNV, LROS

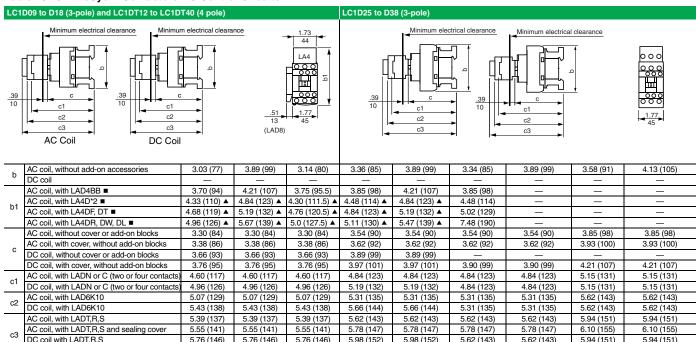


File E161251 CCN NMTR



File LR 89150 Class 6228-01

Table 18.164: TeSys D Contactors AC Control Circuits



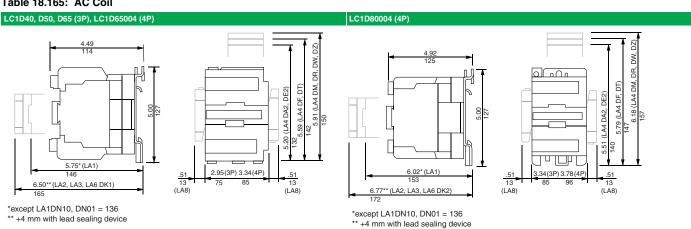
Including LAD4BB

5.90 (150)

5.76 (146)

5.76 (146)

#### Table 18.165: AC Coil



6.14 (156)

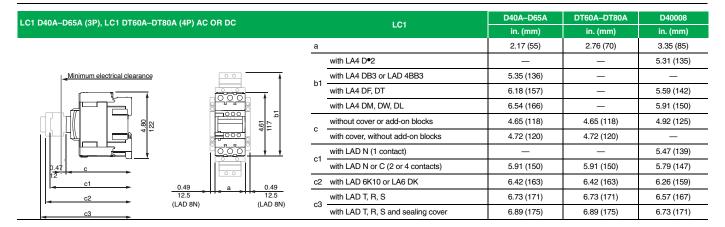
6.14 (156)

5.78 (147)

5.78 (147)

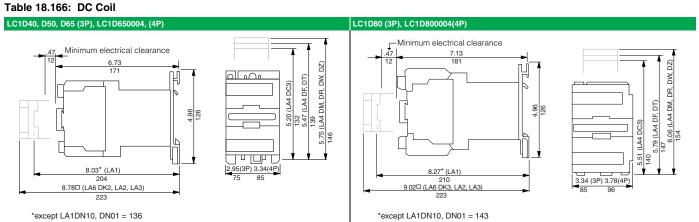
6.10 (155)

6.10 (155)

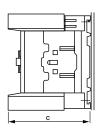


DC coil with LADT,R,S and sealing cover Not applicable to devices with DC coils

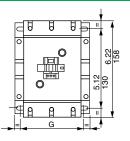








 $\hfill\Box$  + 4 mm with lead sealing device

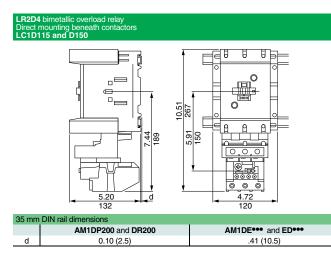


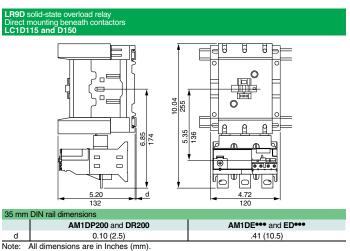
	LC1	D115	D1156	D150	D1506
	С	5.12 (132)	4.53 (115)	5.12 (132)	4.53 (115)
•	G (3-poles)	3.78/4.33 (96/110)	3.78/4.33 (96/110)	3.78/4.33 (96/110)	3.78/4.33 (96/110)
	G (4-poles)	5.12/5.67 (130/144)	5.12/5.67 (130/144)	_	_

□ + 4 mm with lead sealing device

### LC1D115, D150 6.61■ (LA2, LA3) 168 LA4 7.40 (DM, DR, DW, DL) 188 .28 (DF, DT) 6.22 With 2 or 4 contacts. 150 6.10 (LA6-DK20) 155 + 4 mm with sealing cover.

LC1	С	A
D115, D150	5.12 (132)	4.72 (120)
D115004	5.12 (132)	6.10 (155)
D1156, D1506	4.53 (115)	4.72 (120)
D1150046	4.53 (115)	6.10 (155)





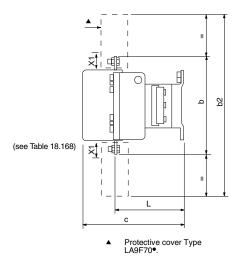
#### **TeSys™ F Contactors**

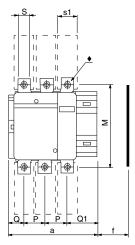
Refer to Catalog 8502CT9901



All dimensions shown in mm. To convert to inches, divide by 25.4.

#### LC1F115 to F330





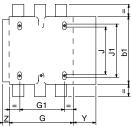


Table 18.167: LC1F115-F330 Dimensions

	F1	15	F1	50	F1	85	F2	65	F3	30
LC1	3- Pole	4- Pole	3- Pole	4- Pole	3- Pole	4- Pole	3- Pole	4- Pole	3- Pole	4- Pole
а	163.5	200.5	163.5	200.5	168.5	208.5	201.5	243.5	213	261
q	162	162	170	170	174	174	203	203	206	206
b1	137	137	137	137	137	137	145	145	145	145
b2	265	265	301	301	305	305	370	370	375	375
O	165 ■	165■	165■	165 ■	176	176	207	207	219	219
f	131	131	131	131	130	130	147	147	147	147
G	106	143	106	143	111	151	142	190	154.5	202.5
G1	80	80	80	80	80	80	96	96	96	96
J	106	106	106	106	106	106	106	106	106	106
J1	120	120	120	120	120	120	120	120	120	120
Г	107	107	107	107	113.5	113.5	141	141	145	145
М	147	147	150	150	154	154	178	178	181	181
Р	37	37	40	40	40	40	48	48	48	48
Ø	29.5	29.5	26.5	26	29	29	39	34	43	43
Q1	60	60	57.5	55.5	59.5	59.5	66.5	66.5	74	74
S	15	15	20	20	20	20	25	25	25	25
S1	27	27	34	34	34	34	38	38	44.5	44.5
Υ	44	44	44	44	44	44	38	38	38	38
Z	13.5	13.5	13.5	13.5	13.5	13.5	21.5	21.5	20.5	20.5
	_									

+6 mm with time delay block (for F115 and F150).
Optimal terminal shroud

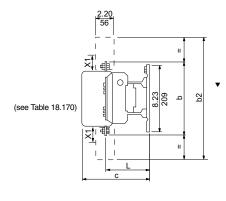
f = minimum distance required for coil removal.

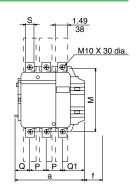
#### Table 18.168: LC1F115-F330 Voltage

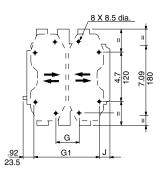
	220/380 V	415/440 V	500 V	660 V	1000 V
LC1F115, F150	20	25	30	40	20
LC1F185	20	25	30	40	30
LC1F265	20	25	40	50	40
LC1F330	25	35	40	50	50

X1: Minimum clearance according to the operational voltage and the breaking capacity.

#### LC1F400 to F500







Dual Dimensions: INCHES Millimeters

Table 18.169: LC1F400-F500 Dimensions

LC1		F400			F500	
LUI	2-Pole	3-Pole	4-Pole	2-Pole	3-Pole	4-Pole
а	213	213	261	233	233	288
b	206	206	206	238	238	238
b2	375	375	375	400	400	400
С	213	213	213	226	226	226
f	119	119	119	141	141	141
G★	80	80	80	80	80	140
G min.	66	66	66	66	66	66
G max.	102	102	150	120	120	175
G1★	170	170	170	170	170	230
G1 min.	156	156	156	156	156	156
G1 max.	192	192	240	210	210	265
J	19.5	19.5	67.5	39.5	39.5	34.5
L	145	145	145	146	146	146
М	181	181	181	208	208	208
Р	48	48	48	55	55	55
Q	69	43	43	76	46	46
Q1	96	74	74	102	77	77
S	25	25	25	30	30	30

★ Supplied

▼ Protective cover

f = Minimum distance required for coil removal.

#### Table 18.170: LC1F400-F500 Voltage

	220/230 V	415/440 V	500 V	660 V	1000 V
LC1F400	30	40	40	50	60
LC1F500	40	45	50	60	60

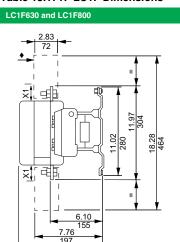
X1: Minimum clearance according to the operational voltage and the breaking capacity.

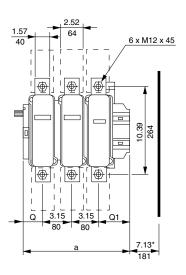


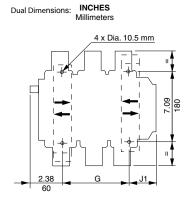
www.schneider-electric.us

Table 18.171: LC1F Dimensions

**Dimensions** 





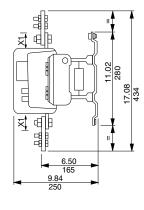


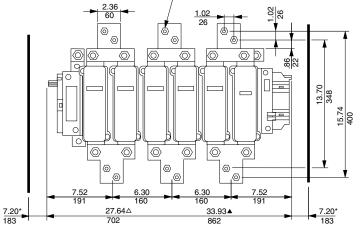
	LC1F630	á	ì	G sup	plied	G n	nin.	Gn	nax.	J	1	C	1	Q	11
	LC IF 030	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
* = minimum distance	2 P	12.17	309	7.09	180	3.94	100	7.68	195	2.70	68.5	4.02	102	5.00	127
required for coil removal.  • Protective terminal cover.	3 P	12.17	309	7.09	180	3.94	100	7.68	195	2.70	68.5	2.36	60	3.50	89
	4 P	15.31	389	9.45	240	5.91	150	10.83	275	2.70	68.5	2.36	60	3.50	89

X1:Minimum clearance according to the operational voltage and the breaking capacity.

Voltage (V)	380	415/440	500	660	1000
X1 in mm	60	60	60	70	80

#### LC1F780, F7804





12 x M14 x 45

X1: Minimum clearance according to the operational voltage and the breaking capacity.

Voltage (V)	380	415/440	660	1000
X1 in mm	90	100	120	120

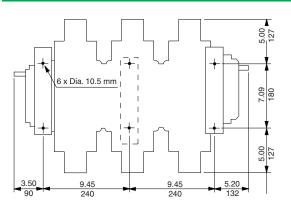
△ Overall length (3 poles)

▲ Overall length (4 poles)

\*minimum distance required for coil removal.

#### LC1F780 mounting

#### LC1F7804 mounting



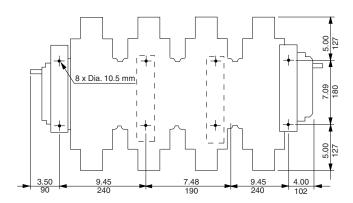
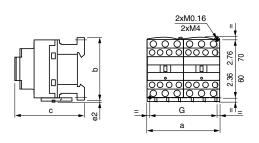


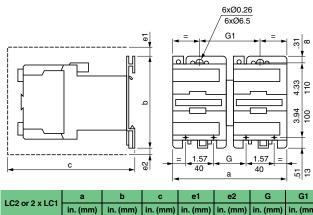
Table 18.172: Reversing Contactor Dimensions





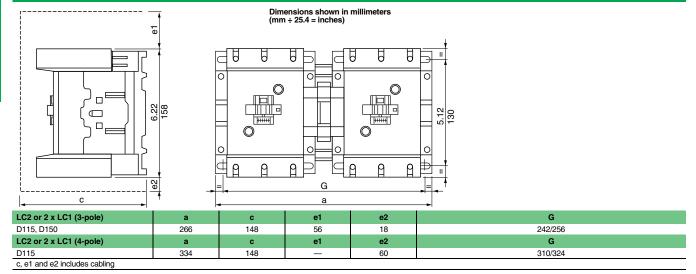
LC2 or 2 x LC1	а	b	С	G					
in. (mm) in. (mm) in. (mm) in. (mm)									
DT20 and DT25 3.54 (90) 3.34 (85) 3.54 (90) 3.14 (80)									
DT32 to DT60 3.54 (90) 3.58 (91) 3.85 (98) 3.14 (80)									
c. e2: includes cabling.									

#### 2 x LP1D40, D65, D80, D95



	LC2 or 2 x LC1	u	2	•	٠.	01	,	٥.
	LC2 OI 2 X LC1	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
D40 to D65 7.16 (182) 5.0 (127) 7.4 (190) 1.19 (5) 0.43 (11) 2.2 (57)								3.8 (97)
D80 and D95 8.14 (207) 5.0 (127) 8.4 (215) 0.51 (13) 0.78 (20) 3.7 (96)								4.3 (111)
c, e1 and e2: includes cabling.								





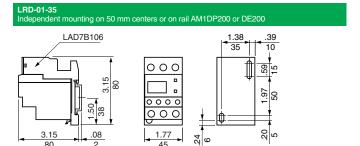
NOTE: For dimensions of TeSys F reversing contactors, please refer to catalog 8502CT9901.

**1**8

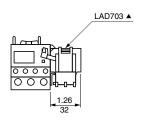


## **Dimensions**

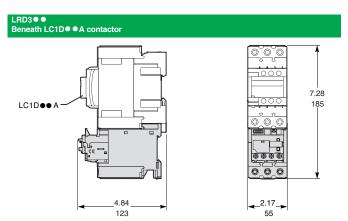
#### Table 18.173: TeSys D Overload Relay Dimensions



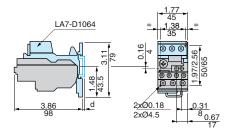
80



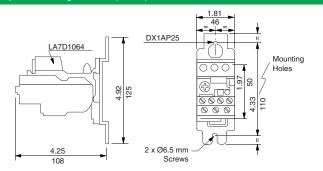
Can only be mounted on RH side of relay LRD-01 to 35



Separate mounting at 50 mm (1.97 in.) centers or on AM1DP200 or DE200 rail



#### parate mounting at 110 mm (4.33 in.) centers



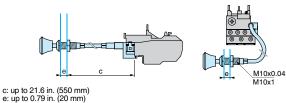
## 1.81 LAD7B106 110 .92 0000 000

DX1AP25

Independent mounting on 110 mm centers

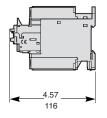
2xØ6.5 90 LRD, LR2D and LR9D Reset by flexible cable LA7D305 and LAD7305 Mounting with cable straight

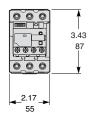
Mounting with cable bent



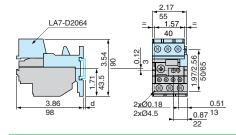
2xØ0.26

#### Separate mounting

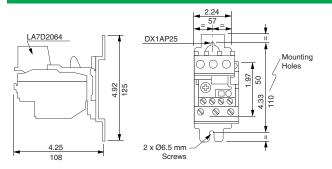




#### LR2D2, LR3D2 Separate mounting at 50 mm (1.97 in.) centers or on AM1DP200 or DE200 rail



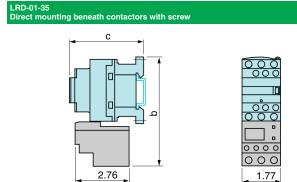
#### Separate mounting at 110 mm (4.33 in.) centers



Refer to Catalog 8502CT9901

ద

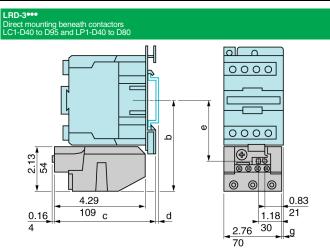
Table 18.174: TeSys D Thermal Overload Relay Dimensions, in. (mm)



70

LC1•	D09-D18	D25-D38				
b	4.84 (123)	5.39 (137)				
С	See Catalog 8502CT9901 pages 122, 123.					

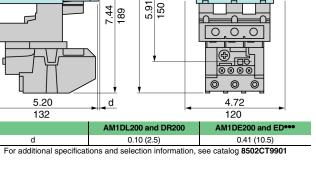
45

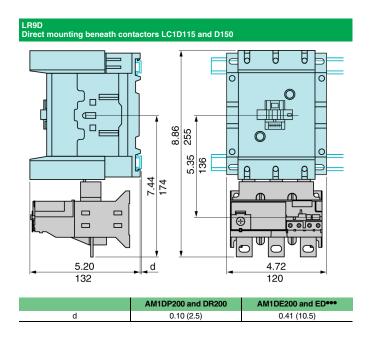


## LRD-013-353 Direct mounting beneath contactors with spring terminal connections C 2.60 66 45 LC1 D093-383 4.84 (123) See Catalog 8502CT9901 pages 122, 123. С

AC Control Circuit           LC1D80         4.55 (115.5)         4.88 (124)         3.03 (76.9)         0.37 (9.5)         0.87 (2           LC1D95         4.55 (115.5)         4.88 (124)         3.03 (76.9)         0.37 (9.5)         —           DC Control Circuit           LC1D40, LP1D40         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         0.51(1)           LC1D50         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         —	AM1●	DL201			DL200		
AC Control Circuit         AC Scottor Circuit         AC Control Circuit         AC Cont	d	0.20 (7)					
LC1D80         4.55 (115.5)         4.88 (124)         3.03 (76.9)         0.37 (9.5)         0.87 (2           LC1D95         4.55 (115.5)         4.88 (124)         3.03 (76.9)         0.37 (9.5)         —           DC Control Circuit           LC1D40, LP1D40         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         0.51(1)           LC1D50         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         —	u	0.26 (1)	b	С	е	g(3P)	g(4P)
LC1D95     4.55 (115.5)     4.88 (124)     3.03 (76.9)     0.37 (9.5)     —       DC Control Circuit       LC1D40, LP1D40     4.37 (111)     6.93 (176)     2.85 (72.4)     0.18 (4.5)     0.51(1)       LC1D50     4.37 (111)     6.93 (176)     2.85 (72.4)     0.18 (4.5)     —			AC	Control Circ	uit		
DC Control Circuit           LC1D40, LP1D40         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         0.51(1)           LC1D50         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         —	LC1	D80	4.55 (115.5)	4.88 (124)	3.03 (76.9)	0.37 (9.5)	0.87 (22)
LC1D40, LP1D40         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         0.51(1)           LC1D50         4.37 (111)         6.93 (176)         2.85 (72.4)         0.18 (4.5)         —	LC1	D95	4.55 (115.5)	4.88 (124)	3.03 (76.9)	0.37 (9.5)	_
LC1D50 4.37 (111) 6.93 (176) 2.85 (72.4) 0.18 (4.5) —			DC	Control Circ	uit		
- ( ) ( ) ( - )	LC1D40,	LP1D40	4.37 (111)	6.93 (176)	2.85 (72.4)	0.18 (4.5)	0.51(13)
LC1D65, LP1D65 4.37 (111) 6.93 (176) 2.85 (72.4) 0.18 (4.5) 0.51(1	LC1	D50	4.37 (111)	6.93 (176)	2.85 (72.4)	0.18 (4.5)	_
	LC1D65,	LP1D65	4.37 (111)	6.93 (176)	2.85 (72.4)	0.18 (4.5)	0.51(13)
LC1D80, D95, LP1D80   4.55 (115.5)   7.06 (179.4)   3.03 (76.9)   0.37 (9.5)   0.87(2	LC1D80, D9	95, LP1D80	4.55 (115.5)	7.06 (179.4)	3.03 (76.9)	0.37 (9.5)	0.87(22)

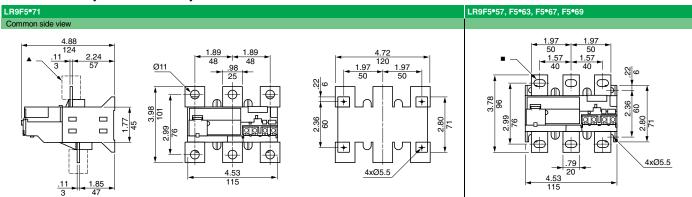
#### LRD4\*\*\* Direct mounting beneath contactors LC1D115 and D150 9 8 \_E 10.51 267 5.91 7.44 0 0 0 5.20 d 4.72 132 120



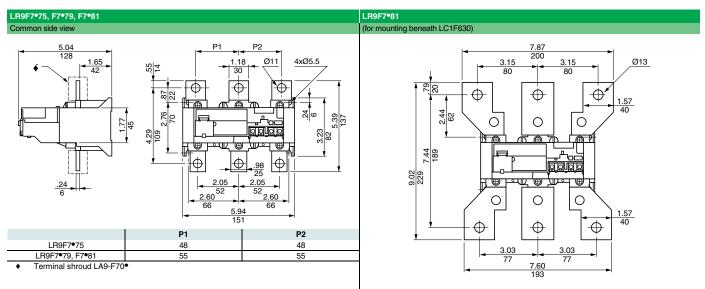


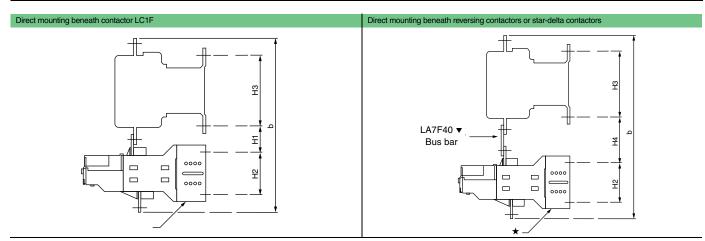
# **Dimensions**

#### Table 18.175: TeSys F Overload Relay Dimensions



- Terminal shroud LA9F70• 6.5 x 13.5 for LR9F5•57 and 8.5 x 13.5 for LR9F5•63, F5•67, F5•69





LC1 contactors	With LR9 relays	b	H1	H2	Н3	LC1 contactors	With LR9 relays	b	H4	H2	НЗ
F115	F5•57, F5•63, F5•67, F5•69	240	30	76	120	F115	F5•57, F5•63, F5•67, F5•69	279	60	76	120
F150	F5•57, F5•63, F5•67, F5•69	246	30	76	120	F150	F5•57, F5•63, F5•67, F5•69	283	60	76	120
F185	F5•57, F5•63, F5•67, F5•69	250	30	76	120	F185	F5•57, F5•63, F5•67, F5•69	285	60	76	120
F225	F5•71	273	40	76	120	F225	F5•71	319	80	76	120
	F7•75, F7•79	308	50	108.8	120		F7•75, F7•79	360	100	108.8	120
F265	F5•71	279	40	76	120	F265	F5•71	332	90	76	120
	F7•75, F7•79	314	60	108.8	120		F7•75, F7•79	363	100	108.8	120
F330	F7•75, F7•79	317	60	108.8	120	F330	F7•75, F7•79	364	100	108.8	120
F400	F7•75, F7•79, F7•81	317	60	108.8	180	F400	F7•75, F7•79, F7•81	364	100	108.8	180
F500	F7•75, F7•79, F7•81	346	70	108.8	180	F500	F7•75, F7•79, F7•81	390	110	108.8	180
F630	F7•81	510	110	108.8	180	F630	F7•81	509	120	108.8	180

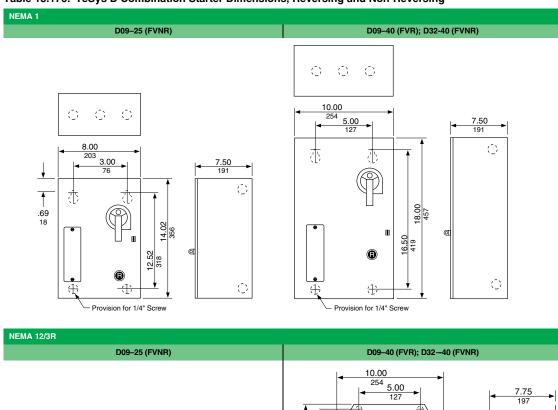
- Relay mounting plate, see page 18-16. Connection accessories, see page 18-16.

**18** 

Refer to Catalog 8502CT9901



Table 18.176: TeSys D Combination Starter Dimensions, Reversing and Non-Reversing



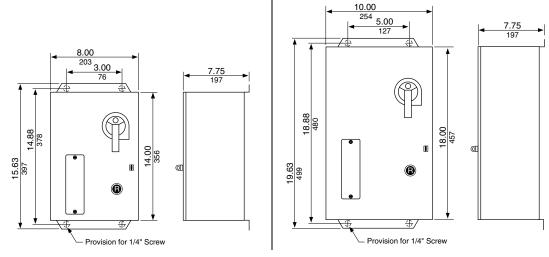


Table 18.177: Non-Combination Starter Dimensions

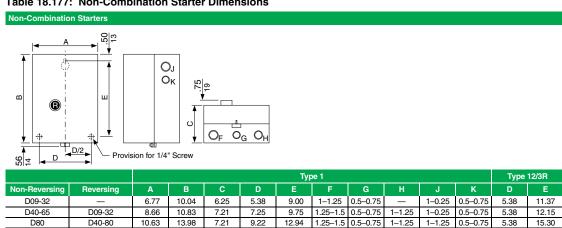




Table 18.178: TeSys K Contactor Dimensions

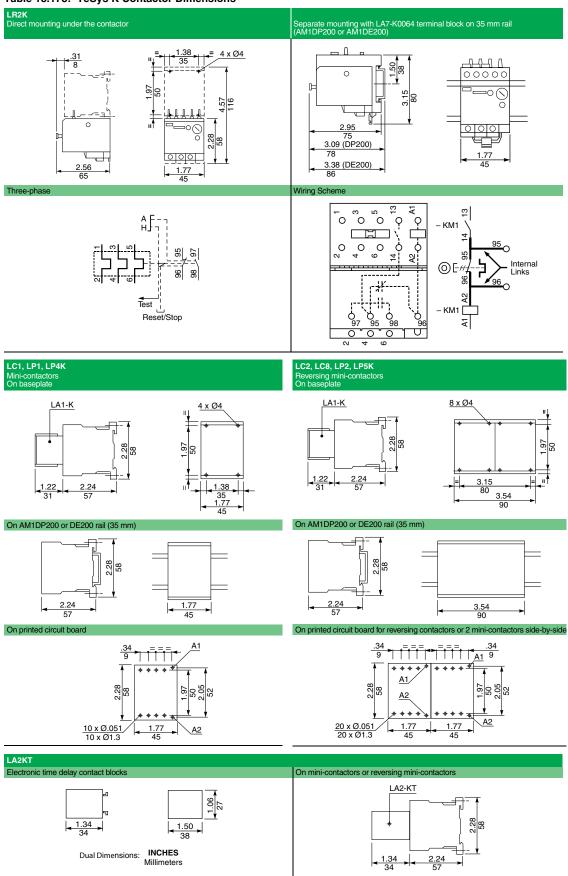
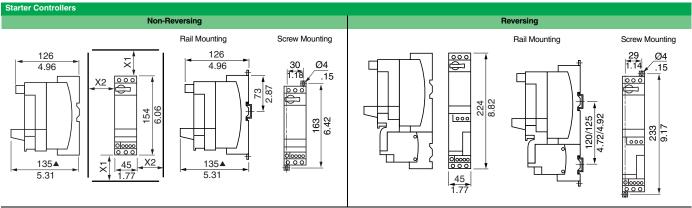


Table 18.179: TeSys U Starter Dimensions

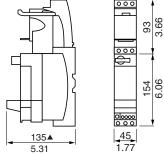


Note: Minimum electrical clearance: X1: 35 mm for Ue = 440 V; and 70 mm for Ue = 500 and 690 V X2: 0

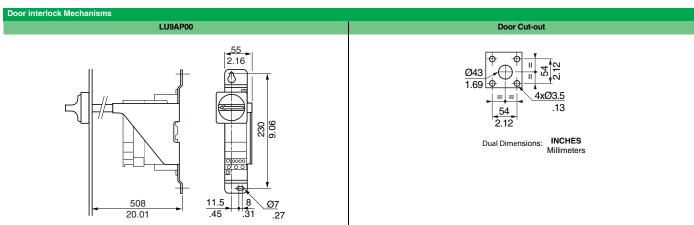
Maximum depth (with Modbus $^{\text{TM}}$  communication module)

Reversing Block for Mounting Separately from Power Base							
	Rail Mounting	Screw Mounting					
113 4.45 1.77	113 4.45	04 .15 000 000 000 000 000 000 000 000 000 0					

#### Limiter Disconnector LUALB1



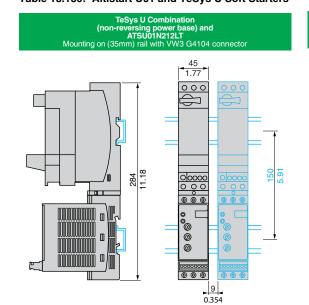
Maximum depth (with Modbus communication module)

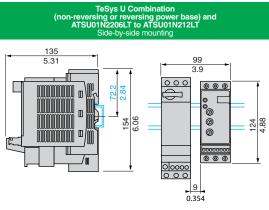




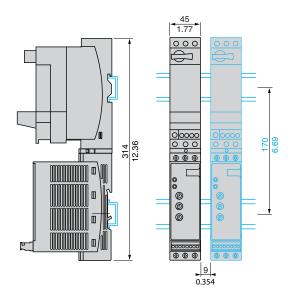
#### Table 18.180: Altistart U01 and TeSys U Soft Starters

**Dimensions** 

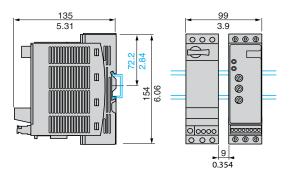




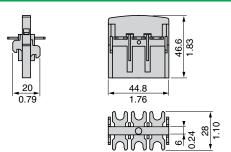
TeSys U Combination
(non-reversing power base) and
ATSU01N222LT to ATSU01N232LT
Mounting on (35mm) rail with VW3G4104 connecto



TeSys U Combination (non-reversing or reversing power base) and ATSU01N22LT to ATSU01N232LT Side-by-side mounting



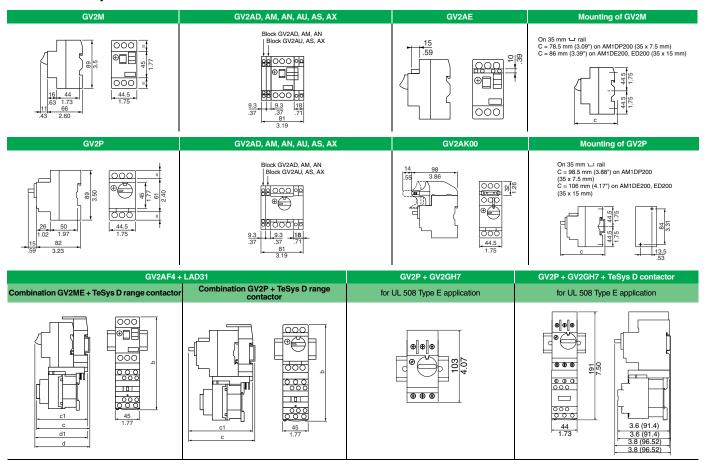
#### VW3G4104 Power Connector



Refer to Catalog 2520CT0001

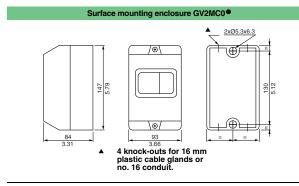


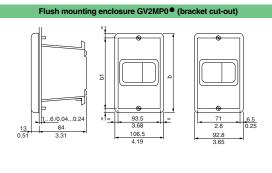
Table 18.181: TeSys GV2 and GV3 Manual Starter and Protector Dimensions



GV2ME +	LC2D09 to D18	LC2D25 and D32
b	7.4 (188.6)	7.8 (199)
c1	3.6 (92.7)	3.9 (99)
С	3.9 (98.2)	4.11 (104.5)
d1	3.9 (98.3)	3.9 (98.3)
d	4 1 (103 8)	1 4 (103 8)

GV2P +	LC2D09 to D18	LC2D25 and D32
b	6.61 (168.1)	7.9 (199.5)
c1	4.6 (116.8)	4.6 (116.8)
С	4.8 (122.3)	4.8 (122.3)
_	_	_
	_	

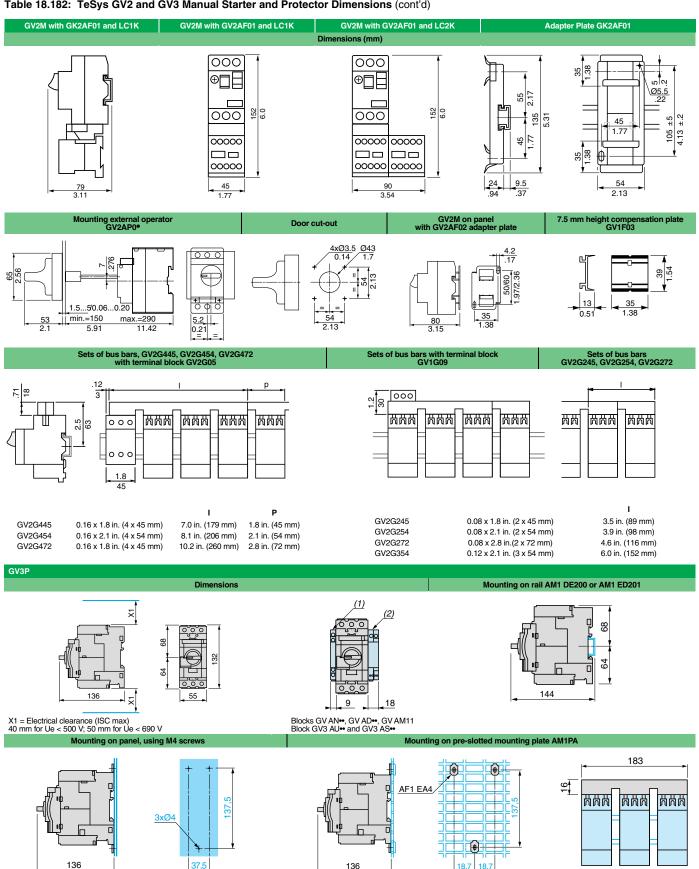




GV2	1	b	b1			
GVZ	in.	mm	in.	mm		
MP01, MP02	5.51	140	5.00	127		
MP03, MP04	5.24	133	4.61	117		



Table 18.182: TeSys GV2 and GV3 Manual Starter and Protector Dimensions (cont'd)



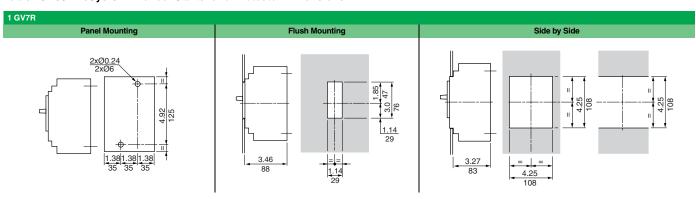
Note: Leave a space of 9 mm between 2 manual motor protectors: either an empty space or side-mounting add-on contact blocks. Horizontal mounting is possible: please consult your regional sales office.

**18** 

Refer to Catalog 2520CT0001

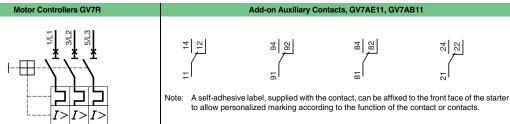


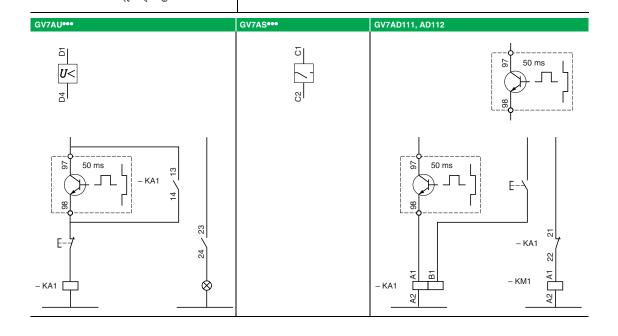
Table 18.183: TeSys GV7 Manual Starter and Protector Dimensions



Minimum Clearance		x1	x2		
		in. (mm)	in. (mm)		
Painted or insulated metal plate, insulation or insulated bar		0 (0)	1.18 (30)		
	U <u>&lt;</u> 440 V	0.20 (5)	1.38 (35)	<u>x1</u>     <u>x1</u>	
	440 V < U < 600 V	0.39 (10)	1.38 (35)	<b>                                     </b>	
Bare metal plate	U ≥ 600 V	0.79 (20)	1.38 (35)		

Note: Minimum distance between 2 units mounted side by side = 0.



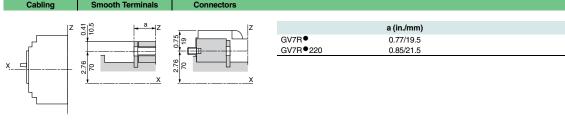


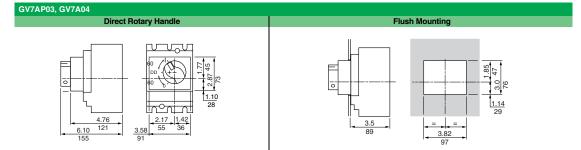


#### **Dimensions**

Table 18.184: TeSys GV7 Manual Starter and Protector Dimensions (cont'd)







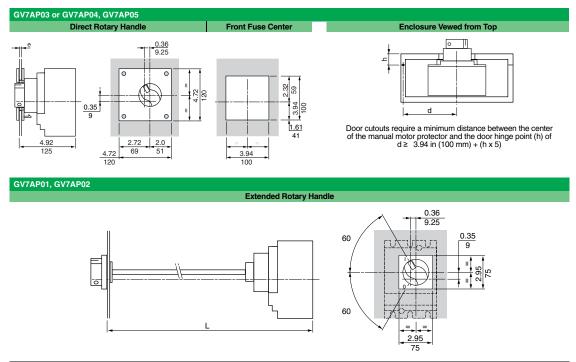
**18** 

#### **TeSys™ GV7 Manual Starters and Protectors**

Refer to Catalog 2520CT0001



Table 18.185: TeSys GV7 Manual Starter and Protector Dimensions (cont'd)



L: 7.28 in. (185 mm) minimum, 23.62 in. (600 mm) maximum. The shaft of the extended rotary handle GV7AP01 or GV7AP02 must be cut to length: L-4.96 in. (126 mm)

19-8

19-94

19-105

# Back to Product Index Section Listing

## Section 19

## **Push Buttons and Operator Interface**



Type O Compact Light (p. 19-11)



XVL Compact Light (p. 19-11)



Type J Compact Light (p. 19-10)



**16 mm XB6** (p. 19-12)



**22 mm XB4** (p. 19-23)



**22 mm XB5** (p. 19-42)



XB5R Wireless, Batteryless Push Button (p. 19-63)



XB5S Biometric Switch (p. 19-65)



**30 mm Type K** (p. 19-67)



**30 mm Type SK** (p. 19-77)



**30 mm Type KX** (p. 19-94)



Type KY Enclosure (p. 19-105)



Type B Wall Station



Pendant Stations (p. 19-117)



**Tower Lights** (p. 19-107)



Type A Foot Switch (p. 19-124)



Rotary Cam Switch (p. 19-126)

#### **Product Panorama**

Push Buttons	19-2
Control Stations	19-4
Pendant Stations	19-5
Tower Lights	19-6

#### 22 and 30 mm Most Common Complete Operators

XB4, XB5 (22 mm) and Class 9001 Type K, SK (30 mm) most common complete operators assembled with contact blocks and and light modules. Start-Stop, Hand-Off-Auto, and other configurations are offered in this simplified quick selector.

#### **Compact Pilot Lights**

The Compact Pilot Light ranges include the **XVL** miniature LED type; the **Type O** lowcost incandescent; and the **Type J** incandescent, push-to-test types.

#### 16 mm Push Buttons

XB6 16 mm Push Buttons, selector switches, and pilot lights with a plastic bezel are intended for high density panels such as laboratory and test fixtures.

#### 22 mm Push Buttons

<b>XB4 22 mm Push Buttons</b> , selector switches, and pilot lights with a metal bezel are designed for industrial applications, and combine ease of installation and robustness.	19-23
<b>XB5 22 mm Push Buttons</b> , the plastic version of the XB4 unit, is particularly suited to applications requiring a resistance to chemical agents and/or double electrical insulation.	19-42
XB5R Plastic and XB4R Metal Wireless, Batteryless Push Buttons	19-63
XB5S Biometric Switches	19-65
30 mm Push Buttons	

## Class 9001 Type K Chrome-Plated Oiltight/Watertight Push Buttons are intended primarily for machine tool and heavy-duty industrial applications.

Class 9001 Type SK Non-Metallic Watertight operators are designed for use in highly corrosive areas.

**Class 9001 Type KX** operators are Square-Shaped Multifunction Control Units that mount in a Type K mounting hole. This highly versatile line saves space by combining push buttons and pilot lights into one common operator.

#### **Control Stations and Enclosures**

XAL control stations are available pre-assembled or custom assembled. These control stations use push buttons and pilot lights from the XB5 22 mm range. XAP enclosures are available in glass reinforced polyester, die cast metal and flush mount.

**Type B** Standard Duty Control Stations in 1, 2, and 3 button configurations are available as predetermined complete stations.

Class 9001 Type KY/SKY Heavy Duty Control Stations are ideally suited for commercial and industrial applications. Available in die cast metal, stainless steel, painted sheet steel, and reinforced polyester.

#### **Tower Lights**

**Tower Lights and Beacons.** XVB, XVC, XVE, and XVP tower lights and beacons provide long distance indication of the operation status or sequences of a machine with with lights or buzzers.

#### **Pendant Stations**

Our full line of pendant stations for most crane and hoist applications range from the light to medium duty **BW** and **XAC** pendants to the heavy duty **SKYP** pendants.

#### **Foot Switches**

The **Type A** foot switch is a heavy duty industrial foot switch which can be used in a variety of industrial applications.

#### **Rotary Cam Switches**

K2 and K30–K150 Rotary Cam Switches. Miniature, Custom, and Power Switching
Cam Switches provide an inexpensive and versatile means of switching from 10 A
logic control through 150 A power switching.



XB6



Type O



Type J







#### XVLA3••

Type of Product	Mini Pilot Light	Compact Pilot Light	Compact Pilot Light	16 mm Push Button (plastic)
Mounting Hole Diameter	8 mm / 12 mm	17.5 mm (0.68 in)	17.5 mm (0.68 in)	16.2 mm
	UL Recognized File E164353, CCN NKCR	UL Recognized File E179183, CCN NKCR	UL File E78403, CCN NKCR	UL File E164353, CCN NKCR
Approvals	CSA File LR44078, Class 3211-03	CSA File LR25490, Class 3211-03	CSA File LR25490, Class 3211-03	CSA File LR44087 Class 3211-03
Conforming to Standards	CE Marked RoHS Compliant IEC337-2 NF C 63-140 VDE 0660-200	CE Marked RoHS Compliant	CE Marked RoHS Compliant	CE Marked RoHS Compliant EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-5 EN/IEC 60204-1 and EN/ISO 13850: 2006 (trigger action and mechanical latching Emergency Stop push buttons) JIS C 4520 and 853 UL 508 and CSA C22-2 no. 14 Gost CCC
Degree of Protection	IP40 (IP65 with seal)	NEMA 13	NEMA 4, 13	IP65 NEMA 1, 4, 4X, 12
Electric Shock Protection				
Electrical Consumption				
LED	25 mA			6-30 Vac/Vdc: 15 mA 48–120 Vac: 20 mA
Rated Operational Characteristics				AC-15; B300 Ue = 240 Vac and le = 1.5A Ue = 120 Vac and le = 3 A Continuous 5 A DC-13; R300 Ue = 250 Vdc and le = 0.1 A
				Ue = 125 Vdc and le = 0.22 A
Connection Type	XVLA1** and XVLA2** = 2.8mm x 0.5mm Faston	Faston	Screw Terminal	Quick Connect/ Solder Tabs 0.11 x 0.02 in. (2.8 x 0.5 mm)
	XVLA3** = Screw Terminals			, , , , , , ,
Cable Size	1 x 1.5 mm <sup>2</sup> max.		2 x 14 AWG (copper only)	
Digest Page	19-10	19-10	19-11	19-13

9001KX

XB4 Family

XB5

**Push Buttons and Pilot** 

Lights

9001K





9001SK



Type of Product         22 mm Push Butlon [lastict] collastict         23 mm Push Butlon [lastict] collastict         30 mm Push Butlon [lastict] collastict         31 mm [lastict] collastict         11 mm [lastict] collastict         11 mm [lastict] collastict         12 mm [lastict] collastict         12 mm [lastict] collastict         13 mm [lastict] collastict         13 mm [lastict] collastict         13 mm [lastict] collastict         14 mm [lastict]						
Lice   Lice	Type of Product					
CCN NCCR   U. Fice propried File E14933   U. File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File propried File E14933   U. File E14933   U. File propried File E14933   U. File E14933   U	Mounting Hole Diameter	22.5 mm	22.5 mm	31 mm (1.22 in)	31 mm (1.22 in)	
U.R. Paccopyrisod File E144933   Ch. NacCorp.   CSA File LP26490.   CSA File LP265490.   CS		UL Listed File E164353, CCN NKCR		LIL Eilo E79400 CON NIVOD	LIL Eilo E79400 CONLNIZOD	LIL EILO EZRACO CONTAINOS
Class 3211-03   Class 3211-0	Approvals	UL Recognized File E164353. CCN NKCR2	UL Recognized File E164353., CCN NKCR2	OL FIIE E78403. CON INCH	OL FIIE E/8403. CCN NACH	OLT HE E76403. CONTINON
RoHS Compliant   RoHS		CSA File LR44087. Class 3211-03	CSA File LR44087. Class 3211-03	CSA File LR25490. Class 3211-03	CSA File LR25490. Class 3211-03	CSA File LR25490. Class 3211-03
ENNEC 60947-5-1, ENNE		CE Marked RoHS Compliant	CE Marked RoHS Compliant			
ENISO 13850: 2006 (trigger class of more contained latching emergency (stop push buttons)		EN/IEC 60947-5-1, EN/IEC 60947-5-4,	EN/IEC 60947-5-1, EN/IEC 60947-5-4,	EN/IEC 60947-1	EN/IEC 60947-1	
Conforming to Standards		EN/ISO 13850: 2006 (trigger action and mechanical latching	EN/ISO 13850: 2006 (trigger action and mechanical latching	EN/IEC60947-5-1	EN/IEC60947-5-1	
Light   Ligh	Conforming to Standards	(emergency switching of mechanical latching push	(emergency switching of mechanical latching push	EN/IEC60947-5-4	EN/IEC60947-5-4	
UL 508		_	trigger action and mechanical latching push buttons with			
CSA C22.2 No.14   GOST   GOS		JIS C 4520	JIS C 4520	JIS C 4520 and 852	JIS C 4520 and 852	
GOST   GOST   CCC   CC		UL 508	UL 508	UL 508	UL 508	
CCC   CCC   P65   P65   P65   P66		CSA C22.2 No.14	CSA C222 No.14	CSA C22.2 No.14	CSA C22.2 No.14	
Pegree of Protection		GOST	GOST			
Pegree of Protection   IP66 for booted   IP66 for booted   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 4X, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 4X, 12, 13   NEMA 1, 2, 3, 3R, 4, 4X, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 12, 13   NEMA 1, 2, 14		CCC	CCC			
NEMA 1, 2, 3, 4, 12, 13   NEMA 1, 2, 3, 3R, 4, 4X, 12, 13   Class II   Clas		IP65	IP65	IP66	IP66	IP66
Class   Clas	Degree of Protection	IP66 for booted	IP66 for booted	NEMA 1, 2, 3, 3R, 4, 12, 13	NEMA 1, 2, 3, 3R, 4, 4X, 12, 13	NEMA 1, 2, 3, 3R, 4, 12, 13
LED		NEMA 1, 2, 3, 4, 12, 13	NEMA 1, 2, 3, 3R, 4, 4X, 12, 13			
24 Vac/Vdc: 18 mA   24 Vac/Vdc: 18 mA   120 Vac: 14 mA   120 Vac: 16 A   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 mA   120 Vac: 14 MA   120 Vac: 14 MAWG (1.5 mm²) max. 120 Vac: 14 mA   1	Electric Shock Protection	Class I	Class I	Class II	Class II	Class II
120 Vac: 14 mA   240 Vac: 140 Vac: 14 mA   240 Vac: 140	Electrical Consumption					
AC-15; B600	· · · · · · · · · · · · · · · · · · ·	24 Vac/Vdc: 18 mA	24 Vac/Vdc: 18 mA			
AC-15; B600   Ue = 600 Vac and le = 1.2 A   Ue = 240 Vac and le = 1.2 A   Ue = 240 Vac and le = 3 A   Ue = 240 Vac and le = 3 A   Ue = 120 Vac and le = 6 A   Continuous 10 A	LED	120 Vac: 14 mA	120 Vac: 14 mA	Incandescent and LED bulbs	Incandescent and LED bulbs	
De - 600 Vac and le = 1.2 A   Ue = 240 Vac and le = 1.2 A   Ue = 240 Vac and le = 3 A   Ue = 120 Vac and le = 6 A   Continuous 10 A		240 Vac: 14 mA	240 Vac: 14 mA	see raurigs on page 19-66	see railings on page 19-66	
DC-13; Q600		Ue = 600 Vac and le = 1.2 A Ue = 240 Vac and le = 3A Ue = 120 Vac and le = 6A	Ue = 600 Vac and le = 1.2 A Ue = 240 Vac and le = 3 A Ue = 120 Vac and le = 6 A			
Cable Size   Screw Terminal:   Spring Terminal:   Spring Terminal:   1 x 24 AWG (0.22 mm²) min. 2 x 14 AWG (0.22 mm²) min. 2 x 14 AWG (2.5 mm²) max. 2 x 16 AWG (1.5 mm²) ma		Ue = 600 Vdc and le = 0.1 A Ue = 250 Vdc and le = 0.27 A	Ue = 600 Vdc and le = 0.1 A Ue = 250Vdc and le = 0.27 A	Ue = 600 Vdc and le = 0.1 A Ue = 250 Vdc and le = 0.27 A	Ue = 600 Vdc and le = 0.1 A Ue = 250 Vdc and le = 0.27 A	Ue = 600 Vdc and le = 0.1 A Ue = 250 Vdc and le = 0.27 A
Screw Terminal:   Spring Terminal:	Connection Type	IP20 Fingersafe Screw or Spring Terminal			ID20 Eingereefe Serow Terminal	
Cable Size  2 x 14 AWG (2.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max. 2 x 16 AWG (1.5 mm²) max.	ооннеской туре	Screw Terminal:	Spring Terminal:		IP20 Fingersate Screw Terminal	
Digest Page 19-23 19-42 19-67 19-77 19-94	Cable Size	2 x 14 AWG (2.5 mm²) max.	2 x 14 AWG (2.5 mm²) max.	1 x 24 AWG (0.22 mm²) min. 2 x 16 AWG (1.5 mm²) max	1 x 24 AWG (0.22 mm²) min. 2 x 16 AWG (1.5 mm²) max	1 x 24 AWG (0.2 2mm²) min. 2 x 16 AWG (1.5 mm²) max
	Digest Page	19-23	19-42	19-67	19-77	19-94



9001B 9001KY/SKY Family



XAPA1100



NEMA 1 Surface Mounting 9001BG**●●** 



NEMA 1 Flush Mounting 9001BF●●



9001KYSS3 9001KY3















XALD02

9001BW●●

9001BR••

9001KYAF3

9001SKY2

Type of Product/Material	XALD—Polycarbonate XALK—Polycarbonate	XAPA—glass filled polyester XAPG—die cast zinc XAPE—anodized aluminum	9001BG—plastic cover 9001BF—stainless steel 9001BW—die cast zinc 9001BR—cast aluminum	9001KYAF—sheet steel 9001KYSS—stainless steel 9001KY—die cast zinc 9001KZ—die cast zinc 9001SKY—Polyester
Number of holes	1 to 3	0 to 16	1 to 3	1 to 6
Type of Operators	XB5 (22mm)	XB5 (22mm)	Built in	9001K/SK (30mm)
Available without Operators	Yes	Yes	No	Yes
Available with Operators	Yes	No	Yes	Yes
A	UL File E164353 CCN NKCR	UL File E164353 CCN NKCR	UL File E78403 CCN NKCR	UL File E78403 CCN NKCR
Approvals	CSA File LR 44087 Class 3211-03	CSA File LR 44087 Class 3211-03	CSA File LR 25490 Class 3211-03	CSA File LR 25490 Class 3211-03
	CE Marked	CE Marked	CE Marked	CE Marked
Conforming to Chandenda	EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-4,	EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-4,	EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-4,	EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC 60947-5-4,
Conforming to Standards	JIS C 4520	JIS C 4520	JIS C 4520	JIS C 4520
	UL 508	UL 508	UL 508	UL 508
	CSA C22.2 No.14	CSA C22.2 No.14	CSA C22.2 No.14	CSA C22.2 No.14
Cable Entry	No. 13 knock out	XAPA—undrilled XAPG—Tapped 3/4NPT XAPE—flush mount (n/a)	9001BG—1/2 &3/4 knockout 9001BF—N/A 9001BW—1/2-14NPT 9001BR—1/2-14NPT	9001KYAF—customer provided 9001KYSS—G conduit hub 9001KY—customer provided 9001KZ—1/2 & 3/4 knockout 9001SKY—G conduit hub
Digest Page	19-100	19-100	19-103	19-105



Family 9001BW XACA2 XACA0 9001SKYP









Type of Product	2-Button Pendant	2-Button Pistol Grip Pendant	General Purpose Pendant	Heavy Duty Pendant
Number of operators	2	2	2, 3, 4, 6, 8, 12	2, 4, 6, 8, 10
Approvals	UL File E78403 CNN NKCR CSA File LR25490 Class 3211-03	UL File E164353 CNN NKCR CSA File LR 44087 Class 3211-03	UL File E164353 CNN NKCR CSA File LR 44087 Class 3211-03	UL File E78403 CNN NKCR CSA File LR25490 Class 3211-03
Conforming to Standards	CE Marked	EN/IEC 60947-5-1, EN/IEC 60204-32, EN/IEC 60204-35-5, and EN/ISO 13850 (for versions with trigger action emergency stop) UL 508 CSA C22-2 No. 14 RoHS compliant	EN/IEC 60947-5-1, EN/IEC 60204-32, EN/IEC 60204-75-5, and EN/ISC 013850 (for versions with trigger action emergency stop) UL 508 CSA C22-2 No. 14 RoHS compliant	CE Marked
Degree of Protection	NEMA 1, 3, 3R, 4, 4X	NEMA 1, 4, 4X, 5 IP65 IK08	NEMA 1, 4, 4X, 5 IP65 IK08	NEMA 1,2, 3, 4, 4X, 12, 13
Housing Material	Polycarbonate / PET Polyester Blend	Yellow Polypropylene	Yellow Polypropylene	Yellow Polycarbonate
Rated Operational Characteristics ▲	AC - B600	AC-15: A600 or Ue = 600V, le = 1.2A or Ue = 240V, le = 3A	AC-15: A600 or Ue = 600V, le = 1.2A or Ue = 240V, le = 3A	SKRU2-SKRU5 AC - B300 DC - P600
	DC - P600	DC-13: Q600 or Ue = 600V. le = 0.1A or Ue = 250V, le = 0.27A	DC-13: Q600 or Ue = 600V. le = 0.1A or Ue = 250V, le = 0.27A	SKRU1, 10, 11 AC - A600 DC - P600
Thermal Current	Continuous 5A	Continuous 10A	Continuous 10A	_
Connection Type	1/2 in. NPT screw clamp terminals	8–26 mm cable entry screw clamp terminals	8–26 mm cable entry screw clamp terminals	NPT threaded conduit entry screw clamp terminals
Cable Size	_	1 x 0.5 mm² (20AWG) min. 2 x 1.5 mm² (16AWG) max. 1 x 2.5 mm² (14AWG) max.	1 x 14 AWG (copper only)	_
Digest Page	19-117	19-118	19-118	19-121

▲ OSHA Section 1910.179, Overhead and Gantry Cranes, limits voltage at pendant push buttons to 150 Vac or 300 Vdc max.

Family XVP XVB L XVB C









Type of Product	Beacon	Tower Light	Tower Light	Tower Light and Beacon
Diameter	70mm	70 mm	50 mm	70 mm
Features	Product for Customer Configuration			
Approvals	UL File E164353 CCN NKCR CSA File LR 44087 Class 3211 03	UL File E164353 CCN NKCR CSA File LR 44087 Class 3211 03	UL File E164353 CCN NKCR CSA File LR 44087 Class 3211 03	UL File E164353 CCN NKCR CSA File LR 44087 Class 3211 03
	CE Marked	CE Marked	CE Marked	CE Marked
0	IEC/EN 60947-5-1	IEC/EN 60947-5-1	IEC/EN 60947-5-1	IEC/EN 60947-5-1
Conforming to Standards	UL 508	UL 508	UL 508	UL 508
	CSA 22.2 No 14			
Degree of Protection	IP65	IP65	IP65	IP42
Light Source	LED / Incandescent	LED / Incandescent	LED / Incandescent	LED / Incandescent
Electrical Consumption				
	24 Vac/dc: < 30 mA		24 Vac/dc: < 80 mA	24V ac/dc: < 25mA
LED Steady	120-230 Vac: < 30 mA		120-230 Vac: < 30mA	120-230 Vac: I< 25 mA
	24 Vac/dc: < 40 mA		24 V ac/dc: < 40mA	24 V ac/dc: < 30mA
LED Flashing with Buzzer	120-230 Vac: < 15mA		120-230 Vac: < 15 mA	120-230Vac: < 25 mA
	1 Hz (1 flash per second)		1 Hz (1 flash per second)	1 Hz (1 flash per second)
	24 Vdc: 5 Joules unit < 430 mA; 10 J unit: < 850 mA		24 Vdc: ≤40mA	24 Vdc: ⊴85 mA
Strobe (Energized)	120 Vac: 5 Joules unit: < 130 mA; 10 J unit: < 260 mA		120 Vac: ≤20mA	120 Vac: ≤35 mA
, -,	230 Vac: 5 Joules unit: < 105 mA; 10 J unit: < 210 mA		230 Vac: ⊴11mA	230 Vac: ⊴25 mA
	1 Hz (1 flash per second)		1 Hz (1 flash per second)	1 Hz (1 flash per second)
Audible Sounders	12–48 Vac/dc: < 20 mA		24 Vdc: ≤15 mA	85 decibels at 1 meter
	120-230 Vac: < 50 mA		120 Vac: ≤15 mA	_
	90 decibels at 1 meter		230 Vac: ≤12mA	_
	_		55 to 85 decibels at 1 meter	_
Connection Type	Screw Clamp	Screw Clamp	Screw Clamp	Screw Clamp
Cable Size	1 x 16 AWG (1.5 mm²) With Cable End	1 x 16 AWG (1.5 mm²) With Cable End	2 x 16 AWG (1.5 mm²) With Cable End	2 x 16 AWG (1.5 mm²) With Cable End
Digest Page	19-110	19-111	19-114	19-113



# **Tower Lights and** Beacons



Type of Product	Tower Light	Tower Light	Tower Light	Siren and Electronic Alarm	Rotating Mirror Beacon
Diameter	40 mm	60 mm	100 mm	_	84/106/120/130 mm
Features	All devices are pre-assemb	led and pre-wired		Adjustable Tones XVS14BMW, 0 to 105 decibels, 43 tones XVS72BM••, 0 to 90 decibels, 16 tones	All devices are pre-assembled and pre-wired. XVR12●●●S includes buzzer: 70 to 90 decibels
A	UL Recognized E164353 CNN NKCR	UL Recognized E164353 CNN NKCR	UL Recognized E164353 CNN NKCR	UL Recognized E164353 CNN UCST	UL Recognized E164353 CNN NKCR
Approvals	CSA LR44087 Class 3211-03	CSA LR44087 Class 3211-03	CSA LR44087 Class 3211-03	CSA LR44087 Class 3211-03	CSA LR44087 Class 3211-03
	CE Marked	CE Marked	CE Marked	CE Marked	CE Marked
	EN61000-6-2	EN61000-6-2	EN61000-6-2	_	EN61000-6-2
Conforming to Standards	EN61000-6-3	EN61000-6-3	EN61000-6-3	_	EN61000-6-4
	_	EN61000-6-4	EN61000-6-4	_	_
	UL 508	UL 508	UL 508	UL 508	UL 508
	CSA 22.2 No. 14	CSA 22.2 No. 14	CSA 22.2 No. 14	CSA 22.2 No. 14	CSA 22.2 No. 14
Degree of Protection	IP54	IP54	IP54	IP53 / IP54	IP23 / IP65 / IP66
Light Source	LED	LED	LED	_	LED
Electrical Consumption					
LED Steady	1 unit = 40mA; 2 unit = 80mA; 3 unit = 120mA 4 unit = 160mA;		24 V: 1 unit = 100mA; 2 unit = 200mA; 3 unit = 300mA 4 unit = 400mA; 5 unit = 500mA	_	XVR08, XVR10, XVR12, and XVR13 (without buzzer) 12 Vac/dc: 360mA 24 Vac/dc: 180mA
LED Flashing ** with Buzzer	**24 V: 1 unit = 90 mA; 2 unit = 130 mA; 3 unit = 170 mA 4 unit = 210 mA; 5 unit = 250 mA 0.7 to 3 Hz (1 flash per 0.7	5 unit = 200mA  **24 V: 1 unit = 90 mA; 2 unit = 130 mA; 3 unit = 170 mA 4 unit = 210 mA;		_	XVR12 with buzzer: 12 Vac/dc: 400 mA 24 Vac/dc: 230 mA 3 Hz (1 flash per 3 seconds)
Strobe (Energized)	_	_	_	_	_
Audible Sounders	70 to 85 decibels at 1 meter	70 to 85 decibels at 1 meter	60 to 85 decibels at 1 meter	XVS14BMW 12 Vdc: 350mA 24 Vdc: 400 mA 105 decibels at 1 meter	_
Audible Sounders		_	_	XVS72BM 12 Vdc: 280 mA 24 Vdc: 190 mA 90 decibels at 1 meter	_
Connection Type	Pre-Wired, Color-Coded Wires cable length: 600mm XVC4++ 900mm XVC4++ 5	Pre-Wired, Color-Coded Wires cable length: 600mm XVC6•• 850mm XVC6••S50mm XVC6••SS 850mm XVC6••SS	Pre-Wired, Color-Coded Wires cable length: 500mm XVC1••K 500mm XVC1••SK 550mm XVC6••SS 850mm XVC6••SSK	XVS14BMW Pre-Wired, Color-Coded Wires cable length: 500mm XVS14  XVS72BM•• Not Pre-Wired	Pre-Wired cable length: 500mm XVR08••• 400mm XVR10••• 400mm XVR12••• 400mm XVR13•••
Cable Size	22 AWG (0.33 mm²)	22 AWG (0.33 mm²)	22 AWG (0.33 mm²)	_	18 AWG (0.75 mm²)
Digest Page	19-111	19-109	19-109	19-116	19-107
					<u> </u>

For Tower Lights catalog numbers:

O first dot denotes voltage selection

second dot denotes color selection

#### XB4-XB5 Common Operators, Complete with Contact Blocks

Refer to Catalog DIA4ED2060507BEN-US



**BLACK—Start Push Buttons Table 19.1:** (flush head)

Operato Style Legend Plate \$ Price Туре XB4 Die Cast Chrome XB4BA21 ZBY2303 3.40 1 N.O. XB5 Double Insulated XB5AA21 38.50 ZBY2303 3.40 1 N.O.

**RED—Stop Push Buttons** Table 19.5: (extended head)

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
XB4 Die Cast Chrome		1 N.C.	XB4BL42	38.50	ZBY2304	3.40
XB5 Double Insulated		1 N.C.	XB5AL42	38.50	ZBY2304	3.40

**BLACK—Off-On Selector Switch** Table 19.2:

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
XB4 Die Cast Chrome		1 N.O.	XB4BD21	51.00	ZBY2367	3.40
XB5 Double Insulated		1 N.O.	XB5AD21	51.00	ZBY2367	3.40

Table 19.6: **Hand-Off-Auto Selector Switch** 

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
XB4 Die Cast Chrome		2 N.O.	XB4BD33	68.00	ZBY2387	3.40
XB5 Double Insulated		2 N.O.	XB5AD33	68.00	ZBY2387	3.40

**Table 19.3:** RED-120 Vac LED-On Pilot Light

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
XB4 Die Cast Chrome		120 Vac Red LED	XB4BVG4	72.00	ZBY2311	3.40
XB5 Double Insulated	64 Al	120 Vac Red LED	XB5AVG4	72.00	ZBY2311	3.40

GREEN-120 Vac LED-Off Pilot Light Table 19.7:

							-
	Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
_	XB4 Die Cast Chrome		120 Vac Green LED	XB4BVG3	72.00	ZBY2312	3.40
_	XB5 Double Insulated	See 200 Bares	120 Vac Green LED	XB5AVG3	72.00	ZBY2312	3.40

Table 19.4: RED-40 mm Mushroom Stop (Push-Pull)

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
XB4 Die Cast Chrome		1 N.C.	XB4BT42	68.00	ZBY9330	3.40
XB5 Double Insulated		1 N.C.	XB5AT42	68.00	ZBY9330	3.40

Table 19.8: RED-40 mm Mushroom Emergency Stop (Trigger Action, Turn-to-Release)

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate 60 mm Round	\$ Price
XB4 Die Cast Chrome		1 N.O. / 1 N.C.	XB4BS8445	165.00	ZBY9330	3.40
XB5 Double Insulated		1 N.O./ 1 N.C.	XB5AS8445	165.00	ZBY9330	3.40

#### When ordering, please specify:

- Quantity
- Type or Catalog Number

#### **BLACK—Start Push Buttons Table 19.9:**

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		0 0	KR1BH13	89.00	KN201	4.40
30 mm Corrosion Resistant (Non- Metallic)	0	<u>0 ■ 0</u> 0 0	SKR1BH13	89.00	KN101SP	4.40

#### Table 19.13: RED—Stop Push Buttons

Operator Style	Description	Contact Block	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		0 0	KR1RH13	89.00	KN202	4.40
30 mm Corrosion Resistant (Non- Metallic)		0 0	SKR1RH13	89.00	KN102RP	4.40

#### Table 19.10: BLACK-Off-On Selector Switch

Operator Style	Description	Contact Sequence (Contact Block Included)	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		1 0	KS11BH13	106.00	KN244	2.90
30 mm Corrosion Resistant (Non- Metallic)		0 1	SKS11BH13	106.00	KN144SP	2.90

Table 19.14: BLACK—Hand-Off-Auto Selector Switch

Operator Style	Description	Contact Sequence (Contact Block Included)	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)	3	* * * 1 0 0 0 0 1	KS43BH13	106.00	KN260	4.40
30 mm Corrosion Resistant (Non- Metallic)		0 0 1	SKS43BH13	106.00	KN160SP	4.40

# Table 19.11: RED—120 Vac—On Pilot Light

Operator Style	Description	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		KP1R31	153.00	KN203	4.40
30 mm Corrosion Resistant (Non- Metallic)		SKP1R31	153.00	KN103SP	4.40

Table 19.15: GREEN—120 Vac—Off Pilot Light

				-	
Operator Style	Description	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		KP1G31	153.00	KN204	4.40
30 mm Corrosion Resistant (Non- Metallic)		SKP1G31	153.00	KN104SP	4.40

#### Table 19.12: RED—120 Vac—On Push-To-Test **Pilot Light**

Operator Style	Description	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)		KT1R31	197.00	KN203	4.40
30 mm Corrosion Resistant (Non- Metallic)		SKT1R31	197.00	KN103SP	4.40

Table 19.16: GREEN—120 Vac—Off Push-To-Test **Pilot Light** 

Operator Style	Description	Туре	\$ Price	Legend Plate	\$ Price
30 mm Industrial (Metal)	M	KT1G31	197.00	KN204	4.40
30 mm Corrosion Resistant (Non- Metallic)		SKT1G31	197.00	KN104RP	4.40

#### When ordering, please specify:

- Quantity
- Class Number (if appropriate)
  Type or Catalog Number

32.80

52.00





#### **XVL Miniature LED**

# Table 19.17: Specifications

Conforming to standards	IEC 337-2, NF C 63-140, VDE 0660-200
Degree of protection	IP40 (IP65 with seal) conforming to IEC 529 and NF C 20-010
Current consumption	25 mA
Cabling	XVLA1••, XVLA2••: tags for 2.8 x 0.5 mm Faston connectors, also for soldered connections. XVLA3••: threaded connectors, clamping, capacity: min. 1 x 0.2 mm², max. 1 x 1.5 mm²



Table 19.18: With Black Bezel, Raised LED

Description	Supply Voltage DC	Color	Catalog Number	\$ Price Each
Ø 8 mm ▲ with integral ballast resistor and reverse polarity protection diode	12 V	Green Red Amber	XVLA123 XVLA124 XVLA125	32.80
Degree of protection IP40 LED pilot lights Ø 8 mm, with black bezel, visible LED XVLA1••	24 V	Green Red Amber	XVLA133 XVLA134 XVLA135	32.00

Table 19.19: With Integral Lens Cap, Covered LED

	Description	ouppry voltage bo	00101	Outding Humber	<b>411100</b>
			Green	XVLA223	
	Ø 8 mm▲ with integral ballast resistor and reverse polarity protection diode	12 V	Red	XVLA224	
			Amber	XVLA225	
XVLA3••	Degree of protection IP40		Green	XVLA233	,
	Ø 8 mm, with lens incorporated, LED XVLA2	24 V	Red	XVLA234	
			Amber	XVLA235	
	Ø 12 mm ■ with integral ballast resistor		Green	XVLA323	
		12 V	Red	XVLA324	
	and reverse polarity protection diode		Amber	XVLA325	
	Degree of protection IP40		Green	XVLA333	;
	Ø 12 mm, with lens incorporated, LED XVLA3	24 V	Red	XVLA334	
/ >	LLD XVLAS		Ambor	V//I A225	

Quick connects (2.8 x 0.5 mm).

Screw termination.

#### Table 19.20: Accessories

Des	Description					
Tightening tools	For Ø 8 mm pilot lights	XVLX08	18.60			
(Sold singly)	For Ø 12 mm pilot lights	XVLX12	24.00			
Seals (IP65)	For Ø 8 mm pilot lights	XVLZ911	0.65			
(Sold in lots of 10)	For Ø 12 mm pilot lights	XVLZ912	0.65			



# Class 9001 Type O, NEMA 13 Pilot Lights

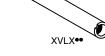
#### Table 19.21: Instrument Type Incandescent Pilot Lights—Type O NEMA 13

Voltage Vac/Vdc	Avg. Current (A)	Red Lens Type <b>♦</b>	Green Lens Type ♦	Amber Lens Type ♦	Clear Lens Type <b>♦</b>	Yellow Lens Type♦	White Lens Type♦	Fluted Blue Lens Type ♦	\$ Price
12	.170	OR12	OG12	OA12	OC12	OY12	OW12	_	
24	.073	OR24	OG24	OA24	OC24	OY24	OW24	FB24	28.70
120	.025	OR120	OG120	OA120	OC120	OY120	OW120	FB120	

To order, add prefix 9001 to the beginning of the catalog number.

#### Table 19.22: Replacement Lamps—Class 9001, Type O

Voltage	Sylvania Lamp Number	Square D Part Number	\$ Price
12 V	12PSB	2550105003	
24 V	24PSB	2550105004	16.50
120 V	120PSB	2550105005	





Type O





Type JP1R29

#### Standard, Push-To-Test, and Remote Test Pilot Lights

Class 9001 Type J compact pilot lights are designed to be mounted in a 0.69 in. (1146 in. or 17.5 mm) diameter mounting hole. Each terminal accepts up to two 14 AWG wires (CU only). Type J compact pilot lights meet NEMA 4 (watertight) and NEMA 13 (oiltight). Type JT push-to-test pilot lights have contacts built into the encapsulated body. Type JTR remote test pilot lights have dual inputs for one push remote testing—all you need is a push button with a current rating equal to or greater than the total lamp draw. Type JTR remote test pilot lights can also be energized from two separate input signals of the same voltage and polarity. This is done by wiring the Test terminal to the second input

Table 19.23: Standard Pilot Light ▲

Style/Voltag	_		Color Cap■					Lamp	Replacement	\$ Price
Style/ Voltage		None	\$ Price	Red	Green	Yellow	\$ Price	Lamp	Lamp	\$ FIICE
Transformer 110–120 V, 50–6		JP1	143.00	JP1R29	JP1G29	JP1Y29	153.00	6.3 V, 0.15 A	2550101020	12.50
Incandescent, 120	Vac/Vdc	JP38	116.00	JP38R29	JP38G29	JP38Y29	126.00	120 V, 0.015 A	2550101040	12.50
Incandescent, 24-28	Vac/Vdc	JP35	116.00	JP35R29	JP35G29	JP35Y29	126.00	28 V, 0.040 A	2550101024	12.50
LED, 24-28 V	ac	-	_	JP35LRR29	JP35LGG29	JP35LYY29	153.00	28 V, 0.03 A	_	I
LED, 24-28 V	dc	-	_	JP35DRR29	JP35DGG29	JP35DYY29	153.00	28 V, 0.03 A	_	I
LED, 120 Va	С	_	_	JP38LRR29	JP38LGG29	JP38LYY29	153.00	28 V, 0.03 A		
- · · · · · · · · · · · · · · · · · · ·	Red	_	_	_	_	_	_	_	6508805207	43.00
Replacement LED, 120 Vac	Yellow	_	_	_	_	_	_	_	6508805208	43.00
120 140	Green	_	_	_	_	_	-	_	6508805209	43.00

#### Table 19.24: Push-To-Test Pilot Light ▲

Style/Voltac				Col	or Cap■			Lamp	Replacement	\$ Price
Style/voltag	je	None	\$ Price	Red	Green	Yellow	\$ Price	Lamp	Lamp	3 Price
Transformer, 110–120 V, 50–60 H	z	JT1	185.00	JT1R29	JT1G29	JT1Y29	195.00	6.3 V, 0.15 A	2550101020	12.50
Incandescent, 120 V	ac/Vdc	JT38	158.00	JT38R29	JT38G29	JT38Y29	168.00	120 V, 0.015 A	2550101040	12.50
Incandescent, 24-28	Vac/Vdc	JT35	158.00	JT35R29	JT35G29	JT35Y29	168.00	28 V, 0.040 A	2550101024	12.50
LED, 24-28 Vac		_	_	JT35LRR29	JT35LGG29	JT35LYY29	195.00	28 V, 0.03 A	_	_
LED, 24-28 Vdc		_	_	JT35DRR29	JT35DGG29	JT35DYY29	195.00	28 V, 0.03 A		
LED, 120 Vac		_	_	JT38LRR29	JT38LGG29	JT38LYY29	195.00	28 V, 0.03 A		
	Red	_	_	_	_	_	_	_	6508805207	43.00
Replacement LED, 120 Vac	Yellow	_	_	_	_	_	_	_	6508805208	43.00
	Green	_	_	_	_	_	_	_	6508805209	43.00

#### Table 19.25: Color Caps, Class 9001 Type J

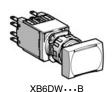
Color	Replacement Color Caps				
Color	Plastic■	\$ Price			
Red Green Amber Blue White Yellow	R29 G29 A29 L29 W29 Y29	9.90			

#### Table 19.26: Legend Plates

Description		Maximum Number of Lines	Maximum Number of Characters	Catalog Number■	\$ Price
Blank	Black Field Red Field			JN100 JN100R	4.40
Special Marking (Specify Marking)	Black Field Red Field	2	8	JN199 JN199R	18.50
Blank	Aluminum Field			JN700	4.40
Special Marking (Specify Marking)	Aluminum Field	2	16	JN799	18.50

- Other voltages are available. Refer to Catalog 9001CT0001. To order, add prefix 9001 to the beginning of the catalog number.

Table 19.27: Illuminated Push Buttons (12-24 Vac/Vdc LED included) Complete Units with Quick Connectors/Solder Tabs





XB6CE...B



Type of Contact Type of Operator Color \$ Price Rectangula N.O. N.C Catalog Numbe White XB6DW1B1B XB6CW1B1B XB6AW1B1B XB6DW3B1B XB6AW3B1B Green XB6CW3B1B 1 44.40 Yellow XB6DW5B1B XB6CW5B1B XB6AW5B1B Blue XB6DW6B1B XB6CW6B1B XB6AW6B1B Flush, spring return Red XB6DW4B2B XB6CW4B2B XB6AW4B2B 44.40 White XB6DW1B5B XB6CW1B5B XB6AW1B5B Green XB6DW3B5B XB6CW3B5B XB6AW3B5B 1 1 Red XB6DW4B5B XB6CW4B5B XB6AW4B5B 52.00 Yellow XB6DW5B5B XB6CW5B5B XB6AW5B5B Blue XB6DW6B5B XB6CW6B5B XB6AW6B5B White XB6DF1B1B XB6CF1B1B XB6AF1B1B Green XB6DF3B1B XB6CF3B1B XB6AF3B1B 1 44.40 Yellow XB6DF5B1B XB6CF5B1B XB6AF5B1B XB6DF6B1B XB6AF6B1B Blue XB6CF6B1B Red XB6DF4B2B XB6CF4B2B XB6AF4B2B 44.40 Flush, maintained White XB6DF1B5B XB6CF1B5B XB6AF1B5B Green XB6DF3B5B XB6CF3B5B XB6AF3B5B XB6DF4B5B 1 1 Red XB6CF4B5B XB6AF4B5B 52.00 Yellow XB6DF5B5B XB6CF5B5B XB6AF5B5B Blue XB6DF6B5B XB6CF6B5B XB6AF6B5B White XB6DE1B1B XB6CE1B1B XB6AE1B1B Green XB6DF3B1B XB6CF3B1B XB6AF3B1B 44.40 Yellow XB6DE5B1B XB6CE5B1B XB6AE5B1B Blue XB6DE6B1B XB6CE6B1B XB6AE6B1B 1 Red XB6DE4B2B XB6CE4B2B XB6AE4B2B 44.40 Extended, spring return White XB6DE1B5B XB6CE1B5B XB6AE1B5B Green XB6DE3B5B XB6CE3B5B XB6AE3B5B 1 1 Red XB6DE4B5B XB6CE4B5B XB6AE4B5B 52.00 Yellow XB6CE5B5B XB6AE5B5B XB6DE5B5B Blue XB6CE6B5B XB6AE6B5B

Table 19.28: Illuminated Push Buttons (120 Vac LED included) Complete Units with Quick Connectors/Solder Tabs

Type of Operator	Type of	Contact	Color	Rectangular	Square	Round	\$ Price	
	N.O.	N.C.			Catalog Number			
			White	XB6DW1G1B	XB6CW1G1B	XB6AW1G1B		
	1		Green	XB6DW3G1B	XB6CW3G1B	XB6AW3G1B	44.40	
	ļ		Yellow	XB6DW5G1B	XB6CW5G1B	XB6AW5G1B	44.40	
			Blue	XB6DW6G1B	XB6CW6G1B	XB6AW6G1B		
Flush,	_	1	Red	XB6DW4G2B	XB6CW4G2B	XB6AW4G2B	44.40	
spring return			White	XB6DW1G5B	XB6CW1G5B	XB6AW1G5B		
			Green	XB6DW3G5B	XB6CW3G5B	XB6AW3G5B		
	1	1	Red	XB6DW4G5B	XB6CW4G5B	XB6AW4G5B	52.00	
			Yellow	XB6DW5G5B	XB6CW5G5B	XB6AW5G5B		
			Blue	XB6DW6G5B	XB6CW6G5B	XB6AW6G5B		
		_	White	XB6DF1G1B	XB6CF1G1B	XB6AF1G1B		
			Green	XB6DF3G1B	XB6CF3G1B	XB6AF3G1B		
	1		_	Yellow	XB6DF5G1B	XB6CF5G1B	XB6AF5G1B	44.40
			Blue	XB6DF6G1B	XB6CF6G1B	XB6AF6G1B		
Elizabe an alternation and	_	1	Red	XB6DF4G2B	XB6CF4G2B	XB6AF4G2B	44.40	
Flush, maintained				White	XB6DF1G5B	XB6CF1G5B	XB6AF1G5B	
			Green	XB6DF3G5B	XB6CF3G5B	XB6AF3G5B		
	1	1	Red	XB6DF4G5B	XB6CF4G5B	XB6AF4G5B	52.00	
			Yellow	XB6DF5G5B	XB6CF5G5B	XB6AF5G5B		
			Blue	XB6DF6G5B	XB6CF6G5B	XB6AF6G5B		
			White	XB6DE1G1B	XB6CE1G1B	XB6AE1G1B		
	1		Green	XB6DE3G1B	XB6CE3G1B	XB6AE3G1B	44.40	
	'	_	Yellow	XB6DE5G1B	XB6CE5G1B	XB6AE5G1B	44.40	
			Blue	XB6DE6G1B	XB6CE6G1B	XB6AE6G1B		
Extended,	_	1	Red	XB6DE4G2B	XB6CE4G2B	XB6AE4G2B	44.40	
spring return			White	XB6DE1G5B	XB6CE1G5B	XB6AE1G5B		
			Green	XB6DE3G5B	XB6CE3G5B	XB6AE3G5B		
	1	1	Red	XB6DE4G5B	XB6CE4G5B	XB6AE4G5B	52.00	
			Yellow	XB6DE5G5B	XB6CE5G5B	XB6AE5G5B		
			Blue	XB6DE6G5B	XB6CE6G5B	XB6AE6G5B		

Legends . . . . . pages 19-20 and 19-22

Table 19.29:

Flush, spring return

Shape of Head

Ronis 200 key

\$ Price

26.20

26.20

34.10

\$ Price

65.00

73.00

78.00

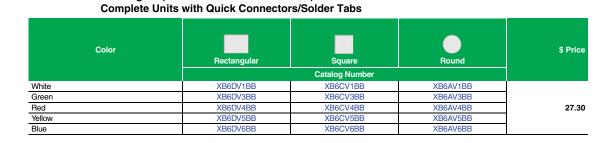




XB6DV..B



XB6CV..B



XB6AV..B

Table 19.30: Pilot Lights (120 Vac LED) Complete Units with Quick Connectors/Solder Tabs

Table 19.31: Push Buttons (Non-Illuminated)

1

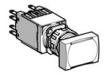
Type of Push

Turn-to-release

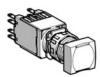
Key release

Pilot Lights (12-24 Vac/Vdc LED included)

Color	Rectangular	Square Catalog Number	Round	\$ Price
White	XB6DV1GB	XB6CV1GB	XB6AV1GB	
Green	XB6DV3GB	XB6CV3GB	XB6AV3GB	
Red	XB6DV4GB	XB6CV4GB	XB6AV4GB	27.30
Yellow	XB6DV5GB	XB6CV5GB	XB6AV5GB	
Blue	XB6DV6GB	XB6CV6GB	XB6AV6GB	



XB6DA..B



XB6CA..B



XB6AA..B

Type of Push	Type of	f Contact	Color	Rectangular	Square	Round
	N.O.	N.C.			Catalog Number	
			White	XB6DA11B	XB6CA11B	XB6AA11B
			Black	XB6DA21B	XB6CA21B	XB6AA21B
	1	_	Green	XB6DA31B	XB6CA31B	XB6AA31B
			Yellow	XB6DA51B	XB6CA51B	XB6AA51B
			Blue	XB6DA61B	XB6CA61B	XB6AA61B
		4	Black	XB6DA22B	XB6CA22B	XB6AA22B

XB6DA42B

XB6DA15B

XB6DA25B

XB6DA35B

XB6DA45B

XB6DA55B

XB6DA65B

N.C

1

XB6CA42B XB6CA15B

XB6CA25B

XB6CA35B

XB6CA45B

XB6CA55B

XB6CA65B

Diameter of Head (mm)

30

30

30

30

XB6AA42B

XB6AA15B

XB6AA25B

XB6AA35B

XB6AA45B

XB6AA55B

XB6AA65B

Catalog Number

XB6AS8342B

XB6AS8345B

XB6AS9342B■

XB6AS9345B■

Complete Units with Quick Connectors/Solder Tabs

Red

White

Black

Green

Red

Yellow

Blue

N.O.





XB6AS9345B

(B6AS9345B

Table 19.33:	Circular Legends, 45 mm

Description	Color	Text	Catalog Number	\$ Price
Circular legends, 45 mm	Yellow	Blank	ZB6Y7001	3.40
Circular legerius, 45 mm	fellow	Emergency stop	ZB6Y7330	3.40

Complies with EN418/ISO13850 standards for Emergency Stop push buttons when used with circular Legend Plate ZB6Y7330 (see page 19-22)





ZB6Y7330



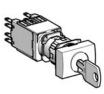
XB6DD•••B



XB6CD•••B



XB6AD•••B



XB6DG••B



XB6DGH3B

XB6CGH3B

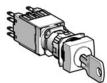
XB6AGH3B

68.00

Note: 

\( \) Indicates key withdrawal position.

2



XB6CG••B



XB6AG••B

#### Table 19.35: Selector Switch Sequence

3-maintained

2 i osition delector dwitch						
•	•	Contact block guide ▲				
0	Х	1 N.O. (left or right)				
X	0	1 N.C. (left or right)				
0	Х	1 N.O. and				
X	0	1 N.C.				

3 Position Selector Switch						
•	•	•	Contact block guide ▲			
0	0	Х	1 N.O. (left)			
X	0	X	2 N.O. wired in <b>parallel</b> (side by side)			
X	0	0	1 N.O. (right)			
0	X	X	1 N.C. (right)			
X	X	0	1 N.C. (left)			
0	X	0	2 N.C. wired in <b>series</b> (side by side)			

As viewed from the front of the panel.

Legends . . . . . pages 19-20 and 19-22

Description

Quick connectors/solder tabs

Contact blocks with mounting base

Catalog Number

ZB6Z1B

ZB6Z2B

ZB6Z3B

ZB6Z4B

ZB6Z5B

N.C.

2

\$ Price

9.40

9.40

16.60

16.60

16.60





ZB6ZB••B



Table 19.36: Contact Blocks and Light Modules for Illuminated Push Buttons▲

Description	Supply Voltage	Type of	Contact	Color of Light	Catalog Number	\$ Price
Description	Supply voltage	N.O.	N.C.	Source		
Quick connectors/solder tabs						
		1	_	White Green Yellow Blue	ZB6ZB11B ZB6ZB31B ZB6ZB51B ZB6ZB61B	28.00
	12–24 Vac/Vdc	_	1	Red Yellow	ZB6ZB42B ZB6ZB52B	28.00
Integral LED ■		1	1	White Green Red Yellow Blue	ZB6ZB15B ZB6ZB35B ZB6ZB45B ZB6ZB55B ZB6ZB65B	35.20
		1	_	White Green Yellow Blue	ZB6ZG11B ZB6ZG31B ZB6ZG51B ZB6ZG61B	28.00
	120 Vac	_	1	Red Yellow	ZB6ZG42B ZB6ZG52B	28.00
		1	1	White Green Red Yellow Blue	ZB6ZG15B ZB6ZG35B ZB6ZG45B ZB6ZG55B ZB6ZG65B	35.20
Direct for incandescent bulb		1	_	_	ZB6ZH01B	23.80
(not included)★	≤24 Vac/Vdc	_	1	_	ZB6ZH02B	23.80
(not morados) A		1	1	_	ZB6ZH05B	31.00

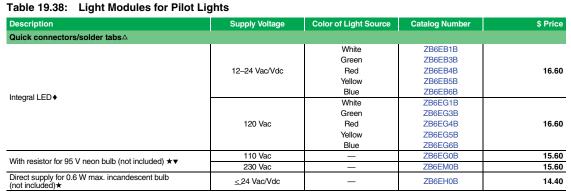
N.O.

2

Table 19.37: Contact Blocks for Push Buttons and Selector Switches

7B67•B

ZB6Z•B

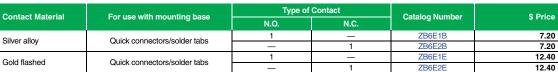


ZB6E••B

ZB6F•0B

ZB6E•B

Table 19.39: Separate Contact Blocks (Maximum of 3 contacts per mounting base.)



- Illuminated selector switches can be assembled by using a contact block/light module assembly in conjunction with a selector switch head, supplied without handle, and a transparent handle. See page 19-16.
- The LED must be the same color as the push button cap.
- The LED must be the same color as the lens.
- Order bulbs separately. See page 19-22.
- Neon bulb can only be used with a red, yellow, or white cap.
- Electrical components with connection by printed circuit board pins are available. See page 19-22.





Table 19.40: Accessories for Printed Circuit Board Installations

Description	for use with	Catalog Number
Plug-in Socket Adapter	contact blocks and light modules	ZB6Y010
Body Bracket	plug-in socket adapter	ZB6Y011

Table 19.41: Heads for Illuminated Push Buttons (To combine with complete bodies and contact blocks, see page 19-15)



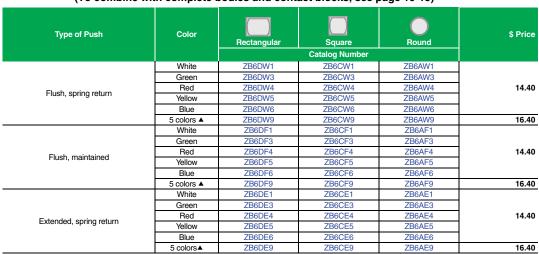
ZB6DW•



ZB6CE•



ZB6AF•



Five different color caps included with head (white, green, red, yellow, and blue).



ZB6DV•



ZB6CV•



ZB6AV•

Table 19.42: Heads for Pilot Lights (To combine with light modules, see page 19-15.)

Color	Rectangular	Square Catalog Number	Round	\$ Price
White	ZB6DV1	ZB6CV1	ZB6AV1	
Green	ZB6DV3	ZB6CV3	ZB6AV3	
Red	ZB6DV4	ZB6CV4	ZB6AV4	8.20
Yellow	ZB6DV5	ZB6CV5	ZB6AV5	
Blue	ZB6DV6	ZB6CV6	ZB6AV6	
5 colors ■	ZB6DV9	ZB6CV9	ZB6AV9	10.20

Five different color caps included with head (white, green, red, yellow, and blue).

Legends . . . . . pages 19-20 and 19-22

19-17



#### **Non-Illuminated Operators**

16 mm Push Buttons

Table 19.43: Heads for Push Buttons

(To combine with complete bodies and contact blocks, see page 19-15.)







ZB6AA•



Five different color caps included with head (white, green, red, yellow, and blue).





ZB6AS934

ZB6Y7330

Table 19.44: Mushroom Heads for Trigger Action Push Buttons (30 mm)■

Shape of Head	Type of Push	Cap Color	Catalog Number	\$ Price
	Turn-to-release	Red	ZB6AS834	49.60
	Key release	Red	ZB6AS934◆	62.60

Table 19.45: Circular Legends, 45 mm

Description	Color	Text	Catalog Number	\$ Price	
Circular largenda 45 mas	Valleur	Blank	ZB6Y7001	3.40	
Circular legends, 45 mm	Yellow	Emergency stop	ZB6Y7330		

Complies with EN418/ISO13850 standards for Emergency Stop push buttons when used with circular Legend Plate ZB6Y7330 (see page 19-22) Ronis 200 key

#### **Non-Illuminated Selector Switches**

Table 19.46: Heads for Non-Illuminated Selector Switches ▲ ♦ (To combine with complete bodies and contact blocks, see page 19-15.)

Number and Type of Positions		Color of Handle	Rectangular	Square Catalog Number	Round	\$ Price	
Switching angle: maintained positions 60°, spring return positions 45°							
2-maintained	$\vee$	Black	ZB6DD22	ZB6CD22	ZB6AD22		
2-maintained	<b>\</b>	Black	ZB6DD28■	ZB6CD28■	ZB6AD28■		
3-maintained	$\downarrow$	Black	ZB6DD23	ZB6CD23	ZB6AD23		
2-spring return to center	$\triangleright$	Black	ZB6DD24	ZB6CD24	ZB6AD24	17.60	
3-spring return to center	$\heartsuit$	Black	ZB6DD25	ZB6CD25	ZB6AD25		
3-spring return from right to center	$\downarrow \downarrow$	Black	ZB6DD26	ZB6CD26	ZB6AD26		
3-spring return from left to center	<b>\( \lambda \)</b>	Black	ZB6DD27	ZB6CD27	ZB6AD27		



ZB6AD•

- For bodies with 2 contact blocks, maximum. Switching angle: maintained positions 90°
- See selector switch sequence charts on page 19-19.



Table 19.47: Heads for Non-Illuminated Selector Switches▲◆ (To combine with complete bodies and contact blocks, see page 19-15.)







ZB6AD••

Number and Type of Positions		Color of Handle	Rectangular	Square	Round	\$ Price
Switching angle: maintained pos	itions 60°, spi	rina return na	sitions 45°	Catalog Number		
2-maintained		Black	ZB6DD22	ZB6CD22	ZB6AD22	
2-maintained	<b>\</b>	Black	ZB6DD28■	ZB6CD28■	ZB6AD28■	
3-maintained	$\downarrow$	Black	ZB6DD23	ZB6CD23	ZB6AD23	
2-spring return to center	$\triangleright$	Black	ZB6DD24	ZB6CD24	ZB6AD24	17.60
3-spring return to center	$\heartsuit$	Black	ZB6DD25	ZB6CD25	ZB6AD25	
3-spring return from right to center	$\downarrow$	Black	ZB6DD26	ZB6CD26	ZB6AD26	
3-spring return from left to center	$\downarrow$	Black	ZB6DD27	ZB6CD27	ZB6AD27	

- For bodies with 2 contact blocks, maximum. Switching angle: maintained positions 90°.
- See selector switch sequence charts on page 19-14.

Legends . . . . . pages 19-20 and 19-22



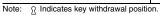
ZB6DG•

ZB6CG•

ZB6AG•

Table 19.48: Heads for Ronis Key Operated Selector Switches ▲ (To combine with complete bodies and contact blocks, see page 19-15.)

Number and Type of Positions		Key Withdrawal	Rectangular	Square	Round	\$ Price
Switching angle: maintained positions 70°, spri		ng return positions 45°		Catalog Numbe	r	
,	P	Right-hand position	ZB6DGA	ZB6CGA	ZB6AGA	
2-maintained	8	Center position	ZB6DGB	ZB6CGB	ZB6AGB	
	B	Both positions	ZB6DGC	ZB6CGC	ZB6AGC	
2-spring return from right to center	8>	Center position	ZB6DGL	ZB6CGL	ZB6AGL	
	<b>₩</b>	Left-hand position	ZB6DGD	ZB6CGD	ZB6AGD	
	₹.	Center position	ZB6DGE	ZB6CGE	ZB6AGE	
	Ø\$	Left-hand and center positions	ZB6DGF	ZB6CGF	ZB6AGF	
3-maintained	VP	Right-hand position	ZB6DGG	ZB6CGG	ZB6AGG	45.60
	N. S. S. S. S. S. S. S. S. S. S. S. S. S.	All 3 positions	ZB6DGH	ZB6CGH	ZB6AGH	
	<b>₩</b>	Left-hand and right-hand positions	ZB6DGJ	ZB6CGJ	ZB6AGJ	
	₹ P	Right-hand and center positions	ZB6DGK	ZB6CGK	ZB6AGK	
	$\bigvee$	Left-hand position	ZB6DGQ	ZB6CGQ	ZB6AGQ	
3-spring return from right to center	3	Center position	ZB6DGR	ZB6CGR	ZB6AGR	
	Ø <sub>8</sub> .	Left-hand and center positions	ZB6DGS	ZB6CGS	ZB6AGS	
3-spring return to center	₹	Center position	ZB6DGT	ZB6CGT	ZB6AGT	



<sup>▲</sup> Ronis 200 key standard.

Table 19.49: Selector Switch Sequence (using contact block assemblies, page 19-15)

	2 Position Se	lector Switch
•	•	Contact block guide ■
0	X	1 N.O. (left or right)
Х	0	1 N.C. (left or right)
0	Х	1 N.O.
		and
X	0	1 N.C.

	3 Position Selector Switch						
•	1	•	Contact block guide ■				
0	0	Х	1 N.O. (left)				
Х	0	X	2 N.O. wired in parallel (side by side)				
X	0	0	1 N.O. (right)				
0	X	X	1 N.C. (right)				
Х	X	0	1 N.C. (left)				
0	Х	0	2 N.C. wired in series (side by side)				
<ul> <li>As viewe</li> </ul>	ed from the front	of the panel.					

Legends...... pages 19-20 and 19-22











Table 19.50: Standard Legend Plate (24 X 28 mm) for 8 X 21 mm Legend ▲

Description	Background Color of Legend	Catalog Number	\$ Price
Without legend insert	<u> </u>	ZB6YD20	2.00
With blank lagand insort	White or yellow	ZB6YD21	3.40
With blank legend insert	Black or red	ZB6YD22	3.40

Table 19.51: 8 x 21 mm Marked Legends (for 24 x 28 mm legend holder ZB6YD20) ▲

Color	Ma	rking	Catalog Number	\$ Price
		O-I	ZB6Y2178	
	International	I-II	ZB6Y2179	
	International	I-O-II	ZB6Y2186	
		<b>←</b> 0 →	ZB6Y2190	
		HAND-O-AUTO	ZB6Y2387	
		CLOSE	ZB6Y2314	
		DOWN	ZB6Y2308	1.60
		FORWARD	ZB6Y2305	
White Text		FAULT	ZB6Y2334	
Red Background (Stop and Fault)		LEFT	ZB6Y2310	
Black Background (all others)		OFF	ZB6Y2312	
	English	ON	ZB6Y2303	
		OPEN	ZB6Y2313	
		RESET	ZB6Y2323	
		REVERSE	ZB6Y2306	
		RIGHT	ZB6Y2309	
		RUN	ZB6Y2311	
		STOP	ZB6Y2304	
		UP	ZB6Y2307	

<sup>▲</sup> Additional legend plate sizes and markings are available in Catalog 9001CT1102.



Table 19.52: Push Button Caps—Marked



ZB6YD•10



ZB6YC•10



ZB6YA•10



ZB6YD•17



ZB6YD•19

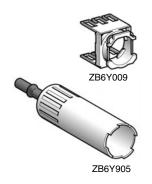


ZB6YC•19



ZB6YA•19

Ink Marking Color: White on colored cap Black on white cap	Color	Rectangular	Square	Round	\$ Pric
		ricotangulai	Catalog Number	Hound	
on illuminated puch buttons			Catalog Number		
on-illuminated push buttons	White	ZB6YD100	ZB6YC100	ZB6YA100	
0	Black	ZB6YD200	ZB6YC200	ZB6YA200	
	White	ZB6YD101	ZB6YC101	ZB6YA101	
1	Black	ZB6YD201	ZB6YC201	ZB6YA201	
_	White	ZB6YD102	ZB6YC102	ZB6YA102	
2	Black	ZB6YD202	ZB6YC202	ZB6YA202	
3	White	ZB6YD103	ZB6YC103	ZB6YA103	
3	Black	ZB6YD203	ZB6YC203	ZB6YA203	
4	White	ZB6YD104	ZB6YC104	ZB6YA104	
•	Black	ZB6YD204	ZB6YC204	ZB6YA204	
5	White	ZB6YD105	ZB6YC105	ZB6YA105	
	Black White	ZB6YD205	ZB6YC205 ZB6YC106	ZB6YA205 ZB6YA106	
6	Black	ZB6YD106 ZB6YD206	ZB6YC206	ZB6YA206	
	White	ZB6YD107	ZB6YC107	ZB6YA107	
7	Black	ZB6YD207	ZB6YC207	ZB6YA207	
	White	ZB6YD108	ZB6YC108	ZB6YA108	
8	Black	ZB6YD208	ZB6YC208	ZB6YA208	
9	White	ZB6YD109	ZB6YC109	ZB6YA109	
3	Black	ZB6YD209	ZB6YC209	ZB6YA209	
ON	White	ZB6YD117	ZB6YC117	ZB6YA117	
	Green	ZB6YD317	ZB6YC317	ZB6YA317	
OFF	Black Red	ZB6YD224 ZB6YD424	ZB6YC224 ZB6YC424	ZB6YA224 ZB6YA424	
	White	ZB6YD111	ZB6YC111	ZB6YA111	
·	Green	ZB6YD311	ZB6YC311	ZB6YA311	
_	Black	ZB6YD210	ZB6YC210	ZB6YA210	
0	Red	ZB6YD410	ZB6YC410	ZB6YA410	4.6
R	Black	ZB6YD226	ZB6YC226	ZB6YA226	4.2
п	Blue	ZB6YD626	ZB6YC626	ZB6YA626	
START	White	ZB6YD140	ZB6YC140	ZB6YA140	
	Green	ZB6YD340	ZB6YC340	ZB6YA340	
STOP	Black	ZB6YD241	ZB6YC241	ZB6YA241	
	Red White	ZB6YD441 ZB6YD112	ZB6YC441 ZB6YC112	ZB6YA441 ZB6YA112	
<b>"</b>	Black	ZB6YD212	ZB6YC212	ZB6YA212	
	White	ZB6YD113	ZB6YC113	ZB6YA113	
	Black	ZB6YD213	ZB6YC213	ZB6YA213	
	White	ZB6YD114	ZB6YC114	ZB6YA114	
+	Black	ZB6YD214	ZB6YC214	ZB6YA214	
	White	ZB6YD115	ZB6YC115	ZB6YA115	
=	Black	ZB6YD215	ZB6YC215	ZB6YA215	
UP	White	ZB6YD127	ZB6YC127	ZB6YA127	
-	Black	ZB6YD227	ZB6YC227	ZB6YA227	
DOWN	White	ZB6YD128	ZB6YC128	ZB6YA128	
	Black White	ZB6YD228 ZB6YD132	ZB6YC228 ZB6YC132	ZB6YA228 ZB6YA132	
CLOSE	Black	ZB6YD232	ZB6YC232	ZB6YA232	
	White	ZB6YD119	ZB6YC119	ZB6YA119	
<b>↑</b>	Black	ZB6YD219	ZB6YC219	ZB6YA219	
_	White	ZB6YD120	ZB6YC120	ZB6YA120	
<b>↓</b>	Black	ZB6YD220	ZB6YC220	ZB6YA220	
	White	ZB6YD121	ZB6YC121	ZB6YA121	
7	Black	ZB6YD221	ZB6YC221	ZB6YA221	
_	White	ZB6YD122	ZB6YC122	ZB6YA122	
_	Black	ZB6YD222	ZB6YC222	ZB6YA222	













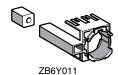
ZB6YD001











Description	Application	Catalog Number	\$ Price
Body	Fitting contact blocks	ZB6Y009	2.00
Bezel tightening tool + bulb extractor	Fixing the switch and changing bulbs	ZB6Y905	4.20
Three piece tool kit	_	ZB6Y019	12.40
Nut	Fixing head to panel	ZB6Y002	2.00
Adaptor	Flush mounting a circular head push button or pilot light in $\emptyset$ 22 mm cut-out	ZB6YA002	6.20
Shroud	Protecting contacts against touching	ZB6Y001	3.40
D	Circular and square head push buttons and switches	ZB6YA001	16.60
Protective cover	Rectangular head push buttons and switches	ZB6YD001	16.60
Female Quick connector/Solder tab	Sold in lots of 100 pieces	ZB6Y004	0.42
Blanking plug	Plugging an unused knockout	ZB6Y005	4.20
Ronis key, 2 pieces	Key operated selector switches and emergency stop mushroom	ZB6Y007	6.20
	6 V	ZB6YA006	2.00
Incandescent bulbs, bayonet T1 1/4	12 V	ZB6YJ012	2.00
	28 V▲	ZB6YB028	2.00
Neon bulbs	110/230 V ■	ZB6YG095	4.20

- 28 V bulb supplied, for use on 24 V. 95 V bulb supplied, for use on 110/230 V.

#### Table 19.54: Standard Legend Plate (24 X 28 mm) for 8 X 21 mm Legend ▲

Description	Background Color of Legend	Catalog Number	\$ Price
Without legend insert	<u> </u>	ZB6YD20	2.00
With blank legend insert	White or yellow	ZB6YD21	3.40
with blank legend insert	Black or red	ZB6YD22	3.40

#### Table 19.55: 8 x 21 mm Marked Legends (for 24 x 28 mm legend holder ZB6YD20) ▲

Color	Ma	rking	Catalog Number	\$ Price
		O-I	ZB6Y2178	
	International	I-II	ZB6Y2179	
	International	I-O-II	ZB6Y2186	
		<b>←</b> 0→	ZB6Y2190	
		HAND-O-AUTO	ZB6Y2387	
		CLOSE	ZB6Y2314	
		DOWN	ZB6Y2308	
		FORWARD	ZB6Y2305	1.60
White Text		FAULT	ZB6Y2334	
Red Background (Stop and Fault)		LEFT	ZB6Y2310	
Black Background (all others)		OFF	ZB6Y2312	
	English	ON	ZB6Y2303	
		OPEN	ZB6Y2313	
		RESET	ZB6Y2323	
		REVERSE	ZB6Y2306	
		RIGHT	ZB6Y2309	
		RUN	ZB6Y2311	
		STOP	ZB6Y2304	
		UP	ZB6Y2307	

Additional legend plate sizes and markings are available in Catalog 9001CT0001.

Table 19.56: Circular Legends, 45 mm

Description	Color	Text	Catalog Number	\$ Price
Circular largenda 45 mm	Velleur	Blank	ZB6Y7001	2.40
Circular legends, 45 mm	Yellow	Emergency stop	ZB6Y7330	3.40

Table 19.57: Accessories for Printed Circuit Board Installations

Description	for use with	Catalog Number
Plug-in Socket Adapter	contact blocks and light modules	ZB6Y010
Body Bracket	plug-in socket adapter	ZB6Y011





XB4BA31



XB4BA4322



XB4BP51



XB4BL42



XB4BC21



XB4BL73415



XB4BL73731p5



XB4BA731327

#### Table 19.58: Non-Illuminated Push Buttons, Momentary (screw clamp terminal connections)

Shape of	Type of Push	Type of	Contact	Marking	Cap Color	Catalog Number	Components	\$ Price			
Head	Type of Push	N.O.	N.C.	warking	Cap Color	Catalog Number	Components	\$ Price			
					Black	XB4BA21	(ZB4BZ101 + ZB4BA2)				
					Green	XB4BA31	(ZB4BZ101 + ZB4BA3)	38.50			
		1	_	_	Yellow	XB4BA51	(ZB4BZ101 + ZB4BA5)	38.50			
					Blue	XB4BA61	(ZB4BZ101 + ZB4BA6)				
	Flush	_	1	_	Red	XB4BA42	(ZB4BZ102 + ZB4BA4)	38.50			
	Flush				Black	XB4BA25	(ZB4BZ105 + ZB4BA2)				
					Green	XB4BA35	(ZB4BZ105 + ZB4BA3)				
		1	1	_	Red	XB4BA45	(ZB4BZ105 + ZB4BA4)	56.00			
					Yellow	XB4BA55	(ZB4BZ105 + ZB4BA5)				
					Blue	XB4BA65	(ZB4BZ105 + ZB4BA6)				
	Flush	1	_	"l" (white)	Green	XB4BA3311	(ZB4BZ101 + ZB4BA331)	44.70			
	Flush	-	1	"O" (white)	Red	XB4BA4322	(ZB4BZ102 + ZB4BA432)	44.70			
					Black	XB4BP21	(ZB4BZ101 + ZB4BP2)				
	Flush with clear							Green	XB4BP31	(ZB4BZ101 + ZB4BP3)	53.00
((	silicone boot (color of pusher	'	_	_	Yellow	XB4BP51	(ZB4BZ101 + ZB4BP5)	55.00			
	unobscured)				Blue	XB4BP61	(ZB4BZ101 + ZB4BP6)				
	, ,	_	1	_	Red	XB4BP42	(ZB4BZ102 + ZB4BP4)	53.00			
201047041707		_	1	_	Red	XB4BL42	(ZB4BZ102 + ZB4BL4)	38.50			
	Extended	1	1	_	Red	XB4BL45	(ZB4BZ105 + ZB4BL4)	56.00			
	Mushroom head Ø 40 mm	1	_	_	Black	XB4BC21	(ZB4BZ101 + ZB4BC2)	56.00			

Table 19.59: Two Button Push Buttons, Momentary (screw clamp terminal connections)

Shape of	Type of Buch	Type of Contact		Marking	Degree of Protection	Catalog Number	Componento	\$ Price
Head			N.O. N.C.		Degree of Protection	Catalog Number	Components	3 Frice
	One flush green push* One extended red push**	1	1	*"I" (white) **"O" (white)	IP66 IP69K	XB4BL73415	(ZB4BZ105 + ZB4BL7341)	69.00

Table 19.60: Two Button Push Buttons, Momentary + one white central pilot light (screw clamp terminal connections)

Shape of	Type of Push	Type of	Contact	Marking	Degree of Protection	Pilot Light Voltage	Catalog Number	\$ Price
Head	Type of Fusit	N.O.	N.C.	Marking	Degree of Frotection	not Light voltage	Odtalog Hulliber	\$111CC
Protected. LED	One flush green push* One extended red push** One white central pilot light block	1	1	*"[" (white) **"O" (white)	IP66 IP69K	24 120 240	XB4BW73731B5 XB4BW73731G5 XB4BW73731M5	130.00

Table 19.61: Three Button Push Buttons, Momentary (screw clamp terminal connections)

Type of Duch		Type of	Type of Contact Degree		Marking and Cap Color Catalog Number		\$ Price
Head	Type of Pusit	N.O.	N.C.	Protection	Marking and Cap Color Catalog Number		\$ FIICE
	Two flush pushes + one central	2	1	IP66	White "I" on green background White "II" on green background *White "Stop" on red background	XB4BA731327	120.00
	projecting red push*			IP69K	Black "→" on white background White "⇔" on black background *White "Stop" on red background	XB4BA711237	120.00

#### Table 19.62: Non-Illuminated Emergency Stop and Emergency Off Mushroom Head Push Buttons, Ø 40 mm, Red (screw clamp terminal connections)



XB4BT845



XB4BS9445



XB4BS542

XB4BD33

XB4BJ33

XB4BG33

	1100 (001011)		Contact	,			
Shape of Head	Type of Push	N.O.	N.C.		Catalog Number	Components	\$ Price
0	Trigger action push-pull ▲	1	1		XB4BT845	(ZB4BZ105 + ZB4BT84)	101.00
	Trigger action	1	1		XB4BS8445	(ZB4BZ105 + ZB4BS844)	165.00
	turn-to-release▲	1	2		XB4BS84441	(ZB4BZ141 + ZB4BS844)	165.00
	Trigger action Key release ▲ (No. 455)	1	1		XB4BS9445	(ZB4BZ105 + ZB4BS944)	165.00
0	Push-pull	_	1		XB4BT42	(ZB4BZ102 + ZB4BT4)	68.00
	Turn-to-release	_	1		XB4BS542	(ZB4BZ102 + ZB4BS54)	110.00
	Key release (No. 455)	_	1		XB4BS142	(ZB4BZ102 + ZB4BS14)	147.00

Trigger action mushroom heads are tamper proof in that a change of contact state is not possible by teasing or floating the operator. For emergency stop applications, always use a trigger action push button (per EN/IEC 13850).

#### Table 19.63: Non-Illuminated Selector Switches and Key Switches (screw clamp terminal connections)

Shape of	Type of Operator	Type of	Contact	Number and Type of		Catalog Number	Components	\$ Price	
Head	Type of Operator	N.O.	N.C.	Position	is	Catalog Number	Components	\$ FIICE	
		1	_	2-maintained	$\vee$	XB4BD21	(ZB4BZ101 + ZB4BD2)	51.00	
		1	1	2-maintained	$\vee$	XB4BD25	(ZB4BZ105 + ZB4BD2)	68.00	
	Standard lever, black	2		3-maintained	$\downarrow$	XB4BD33	(ZB4BZ103 + ZB4BD3)	68.00	
		2	_	3-momentary to center	$\heartsuit$	XB4BD53	(ZB4BZ103 + ZB4BD5)	75.00	
		1	_	2-maintained	$\vee$	XB4BJ21	(ZB4BZ101 + ZB4BJ2)	51.00	
	Extended lever, black	2		3-maintained	$\downarrow$	XB4BJ33	(ZB4BZ103 + ZB4BJ3)	68.00	
T		2		3-momentary to center	$\heartsuit$	XB4BJ53	(ZB4BZ103 + ZB4BJ5)	75.00	
					<b>&gt;</b>	XB4BG21	(ZB4BZ101 + ZB4BG2)	123.00	
			1 -	_	2-maintained	\$	XB4BG41	(ZB4BZ101 + ZB4BG4)	123.00
	Key (No. 455)			2-momentary to left	<b>♥</b>	XB4BG61	(ZB4BZ101 + ZB4BG6)	123.00	
		2		3-maintained	ØÎ.	XB4BG03	(ZB4BZ103 + ZB4BG0)	141.00	
Note: The s		2	_	3-maintained	\$	XB4BG33	(ZB4BZ103 + ZB4BG3)	141.00	

Note: The symbol  $\Omega$  indicates key withdrawal position(s).

See page 19-29 for contact configurations.

Legends . . . . . pages 19-37 to 19-39



#### Table 19.64: Pilot Lights with Protected LED™ (screw clamp terminal connections) ▲







XB4BV64



XB4BV33



XB4BW33B5



XB4BW3465



XB4BW3545

Shape of Head	Supply Voltage	Color	Catalog Number	Components	\$ Price
Direct supply, for BA9s (incand	escent, LED, neon) $V \le 250 V, 2$	.4 W bulb (bulb not	included)		
		White	XB4BV61	(ZB4BV6 + ZB4BV01)	51.00
	< 250 Vac/Vdc	Green	XB4BV63	(ZB4BV6 + ZB4BV03)	
	< 250 vac/vdc	Red	XB4BV64	(ZB4BV6 + ZB4BV04)	51.00
		Yellow	XB4BV65	(ZB4BV6 + ZB4BV05)	
Transformer type with 1.2 VA, 6	V secondary. BA9s incandesce	ent bulb included			
		White	XB4BV31	(ZB4BV3 + ZB4BV01)	117.00
	110-120 Vac	Green	XB4BV33	(ZB4BV3 + ZB4BV03)	
	50/60 Hz	Red	XB4BV34	(ZB4BV3 + ZB4BV04)	
		Yellow	XB4BV35	(ZB4BV3 + ZB4BV05)	1

Table 19.66: Illuminated Push Buttons, Momentary (screw clamp terminal connections) A

Shape of Head	Description	Type of	Contact	Supply Voltage	Color of Push	Catalog Number	Components	\$ Pric										
snape or nead	Description	N.O.	N.C.	Supply voltage	Color of Push	Catalog Number	Components	\$ Pric										
lush																		
					White	XB4BW31B5	(ZB4BW0B15 + ZB4BW313)											
					Green	XB4BW33B5	(ZB4BW0B35 + ZB4BW333)											
	hote			24 Vac/Vdc	Red	XB4BW34B5	(ZB4BW0B45 + ZB4BW343)	119.0										
					Yellow	XB4BW35B5	(ZB4BW0B55 + ZB4BW353)											
	Protected		4		Blue	XB4BW36B5	(ZB4BW0B65 + ZB4BW363)											
	1 <b> </b>	1	1		White	XB4BW31G5	(ZB4BW0G15 + ZB4BW313)											
					Green	XB4BW33G5	(ZB4BW0G35 + ZB4BW333)											
				110-120 Vac	Red	XB4BW34G5	(ZB4BW0G45 + ZB4BW343)	119.0										
					Yellow	XB4BW35G5	(ZB4BW0G55 + ZB4BW353)											
					Blue	XB4BW36G5	(ZB4BW0G65 + ZB4BW363)											
	Direct supply				White	XB4BW3165	(ZB4BW065 + ZB4BW31)											
	for BA9s 2.4 W max. bulb not	1	1	< 250 Vac/Vdc	Green	XB4BW3365	(ZB4BW065 + ZB4BW33)	99.0										
				'	'	'	≤ 250 vac/vuc	Red	XB4BW3465	(ZB4BW065 + ZB4BW34)	99.0							
	included				Yellow	XB4BW3565	(ZB4BW065 + ZB4BW35)											
								White	XB4BW3135	(ZB4BW035 + ZB4BW31)	<u> </u>							
	T								110-120 Vac	Green	XB4BW3335	(ZB4BW035 + ZB4BW33)	163.00					
	Transformer type					50/60 Hz	Red	XB4BW3435	(ZB4BW035 + ZB4BW34)	103.0								
	1.2 VA, 6 V secondary.	1	1		Yellow	XB4BW3535	(ZB4BW035 + ZB4BW35)											
	BA9s incandescent	'   '	'   '	'   '	'	'	'	'	' '	'	'	1	'   '		White	XB4BW3145	(ZB4BW045 + ZB4BW31)	
	bulb included										230-240 Vac	Green	XB4BW3345	(ZB4BW045 + ZB4BW33)	163.00			
	Inoladed			50/60 Hz	Red	XB4BW3445	(ZB4BW045 + ZB4BW34)	163.00										
					Yellow	XB4BW3545	(ZB4BW045 + ZB4BW35)											
xtended																		
					White	XB4BW11B5	(ZB4BW0B15 + ZB4BW113)											
					Green	XB4BW13B5	(ZB4BW0B35 + ZB4BW133)											
				24 Vac/Vdc	Red	XB4BW14B5	(ZB4BW0B45 + ZB4BW143)	113.0										
					Yellow	XB4BW15B5	(ZB4BW0B55 + ZB4BW153)											
Protected	_			Blue	XB4BW16B5	(ZB4BW0B65 + ZB4BW163)												
	C LED	1	1		White	XB4BW11G5	(ZB4BW0G15 + ZB4BW113)											
					Green	XB4BW13G5	(ZB4BW0G35 + ZB4BW133)	113.00										
				110-120 Vac	Red	XB4BW14G5	(ZB4BW0G45 + ZB4BW143)											
					Yellow	XB4BW15G5	(ZB4BW0G55 + ZB4BW153)											
					Blue	XB4BW16G5	(ZB4BW0G65 + ZB4BW163)											

<sup>▲</sup> For 240 V LED, replace the last "B" or "G" in the catalog number with an "M". For example, XB4BVB1 (24 V) becomes XB4BVM1 (240 V—AC only









ZB4BP18



ZB4BL1



ZB4BA36

ZB4BA331

ZB4BA334

ZB4BL432

Shape of Head	Type of Push	Cap Color	Catalog Number	\$ Price
	Flush, without color cap ▲	_	ZB4BA0	11.00
	Flush, with set of 6 color caps	White Black Green Red Yellow Blue	ZB4BA9	13.00
	Flush	White Black Green Red Yellow Blue Gray	ZB4BA1 ZB4BA2 ZB4BA3 ZB4BA4 ZB4BA5 ZB4BA6 ZB4BA6 ZB4BA8	13.00
	Flush with transparent cap, for insertion of legend ■	White Green Red Yellow Blue	ZB4BA18 ZB4BA38 ZB4BA48 ZB4BA58 ZB4BA68	16.00
	Booted Flush (clear silicone) Cap color unobscured	White Black Green Red Yellow Blue	ZB4BPA1 ZB4BPA2 ZB4BPA3 ZB4BPA4 ZB4BPA5 ZB4BPA6	25.80
	Booted Extended (clear silicone) Cap color unobscured	White Black Green Red Yellow Blue	ZB4BP1 ZB4BP2 ZB4BP3 ZB4BP4 ZB4BP5 ZB4BP5	25.80
	Booted (colored silicone) Cap color unobscured	White Black Green Red Yellow Blue	ZB4BP1S ZB4BP2S ZB4BP3S ZB4BP4S ZB4BP5S ZB4BP6S ZB4BP6S	25.80
	Booted (clear silicone) for insertion of legend ■ Cap color unobscured	White Green Red Yellow Blue	ZB4BP18 ZB4BP38 ZB4BP48 ZB4BP58 ZB4BP68	29.00
	Extended	White Black Green Red Yellow Blue	ZB4BL1 ZB4BL2 ZB4BL3 ZB4BL4 ZB4BL5 ZB4BL5	13.00
0	Guarded Head -	White Black Green Red Yellow Blue	ZB4BA16 ZB4BA26 ZB4BA36 ZB4BA46 ZB4BA56 ZB4BA66	35.00

Color cap to be ordered separately, see page 19-39. For legend ordering information, see page 19-39.

#### Table 19.68: Non-Illuminated Operators, Momentary—Premarked

Shape of Head	Type of Push	Marking Text	Marking Color	Cap Color	Catalog Number	\$ Price
			White	Green	ZB4BA331	
		'	Black	White	ZB4BA131	
		START	White	Green	ZB4BA333	
		SIANI	Black	White	ZB4BA133	
		ON	White	Green	ZB4BA341	
		ON	Black	White	ZB4BA141	
		RESET	White	Black	ZB4BA222	
	Flush	JOG	White	Black	ZB4BA245	18.60
( )		0	White	Red	ZB4BA432	10.00
		O	VVIIILE	Black	ZB4BA232	
		STOP	White	Red	ZB4BA434	
		3101	VVIIILE	Black	ZB4BA234	
		OFF	White	Red	ZB4BA435	
		OH	VVIIILE	Black	ZB4BA235	
		<b>↑ •</b>	Black	White	ZB4BA334	
		'	White	Black	ZB4BA335	
		0	White	Red	ZB4BL432	
	Extended	O	VVIIILE	Black	ZB4BL232	
		STOP	White	Red	ZB4BL434	18.60
	LAGRIGEG	010	VVIIILE	Black	ZB4BL234	10.00
		OFF	White	Red	ZB4BL435	
	1					

Cap supplied not clipped-in, allowing orientation of arrow in any one of 4 directions:  $\uparrow$ ,  $\downarrow$ ,  $\leftarrow$  or  $\rightarrow$ 

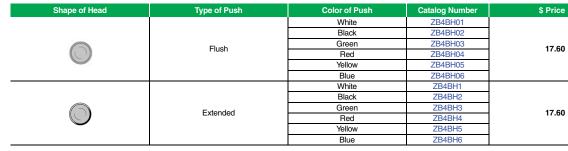
Legends . . . . . pages 19-37 to 19-39



#### Table 19.69: Non-Illuminated Push-on/Push-off Operators



ZB4BH02



# Table 19.70: Three Head Operators, Momentary



ZB4BA73133



ZB4BA71124

Shape of Head	Description	Marking	Cap Color	Degree of Protection	Catalog Number	\$ Price
Premarked	·	•				
		" " " ]"	Green Green		ZB4BA73132	
		" <del>~</del> "	Green Green		ZB4BA73133	
	Two flush	" <b>†</b> "	Green Green		ZB4BA73134	60.00
		" <del>+</del> "	Green Green	IP66 IP69K	ZB4BA73135	
Two flush + one central projecting red push		" <del>+</del> "	White White		ZB4BA71115	
marked "Stop"		"←" " <del>→</del> "	White Black		ZB4BA71123	
		" <del>†</del> "	White Black	]	ZB4BA71124	
		" <b>†</b> "	Black Black		ZB4BA72124	
Without caps	,		,		,	
	Two flush without caps	_	_	IP66 IP69K	ZB4BA791	51.00

Table 19.71: Two Head Operators, Momentary





Table 19.71. Two nead Operators, womentary								
Shape of Head	Description	Marking	Cap Color	Degree of Protection	Catalog Number	\$ Price		
No Marking								
		_	Green Red		ZB4BA7340			
	Two flush	_	White Black	IP66	ZB4BA7120	37.20		
	One flush One extended	-	Green Red	IP69K	ZB4BL7340	31.20		
Premarked								
	Two flush	"I" "O"	Green Red	IP66 IP69K	ZB4BA7341			
		"l" "O"	White Black		ZB4BA7121	41.40		
	One flush One extended	"Į" "O"	Green Red		ZB4BL7341	41.40		
Without caps								
	Two flush without caps	_	_	IP66 IP69K	ZB4BA79	35.00		

 Legends
 pages 19-37 to 19-39

 Caps
 page 19-39









ZB4BC2



ZB4BR2



ZB4BS834



ZB4BT4



ZB4BS64



ZB4BS74

Table 19.72: Mushroom Heads, Momentary

Shape of Head	Diameter of Head	Color of Head	Catalog Number	\$ Price
		Black	ZB4BC24	
		Green	ZB4BC34	
	30 mm	Red	ZB4BC44	29.40
		Yellow	ZB4BC54	
		Blue	ZB4BC64	
		Black	ZB4BC2	
		Green	ZB4BC3	
	40 mm	Red	ZB4BC4	29.40
		Yellow	ZB4BC5	
		Blue	ZB4BC6	
		Black	ZB4BR2	
		Green	ZB4BR3	
	60 mm	Red	ZB4BR4	35.00
		Yellow	ZB4BR5	
		Blue	ZB4BR6	

Table 19.73: Mushroom Heads for Maintained Push Buttons

Shape of Head	Type of Push	Diameter of Head	Color	Catalog Number	\$ Price	
0	Trigger action Push-pull ▲	40 mm	Red	ZB4BT84	54.00	
	Trigger action	30 mm	Red	ZB4BS834	112.00	
	Turn-to-release ▲		Red	ZB4BS844	112.00	
		40 mm	Red marked "EMO"	ZB4BS84430	118.00	
		60 mm	Red	ZB4BS864	112.00	
	Trigger action	30 mm	Red	ZB4BS934	112.00	
	Key release (No. 455) ▲	40 mm	Red	ZB4BS944 ■	112.00	
0	(140. 455) =	60 mm	Red	ZB4BS964	112.00	
	Push-pull			Black	ZB4BT2	
		40 mm	Red	ZB4BT4	40.4	
( O )			Black	ZB4BX2		
		60 mm	Red	ZB4BX4	46.0	
			Black	ZB4BS42	78.00	
		30 mm	Red	ZB4BS44		
			Black	ZB4BS52	70.00	
			Red	ZB4BS54	78.00	
	Turn-to-release	40 mm	Red marked "EMO"	ZB4BS5430	85.00	
	Turrito-release	40 11111	Yellow	ZB4BS55	78.00	
			Yellow marked "Robot Stop"	ZB4BS5550	85.00	
			Black	ZB4BS62		
		60 mm	Red	ZB4BS64	90.00	
		30 mm	Black	ZB4BS72	112.00	
		30 mm	Red	ZB4BS74	112.00	
	Key release	40 mm	Black	ZB4BS12	110.00	
	(Ńo. 455)	40 mm	Red	ZB4BS14 ■	112.00	
0 3		60 mm	Black	ZB4BS22	112.00	
		60 111111	Red	ZB4BS24	112.00	

#### Table 19.74: Circular Legends for Emergency Stop Mushroom Heads (yellow background)



ZBY9330

Diameter	Text	Catalog Number	\$ Price	
60 mm	Blank	ZBY9101		
60 11111	EMERGENCY STOP	ZBY9330	3.40	
90 mm	Blank	ZBY8101	3.40	
90 111111	EMERGENCY STOP	ZBY8330		

Legends . . . . . pages 19-37 to 19-39



#### Table 19.75: Non-Illuminated Selector Switches ■



ZB4BD4 Standard Lever



ZB4BJ3 Extended Lever

ZB4BG8

	iaiiiiiatoa coloctor c				
Color	Number and Ty	pe of Positions		Ф	\$ Price
			Standard Lever ▲	Extended Lever	
			Catalog	Number	
Black	2-maintained		ZB4BD2	ZB4BJ2	24.00
Black	2-momentary from right to left	$\Diamond$	ZB4BD4	ZB4BJ4	29.40
Black	3-maintained	$\vee$	ZB4BD3	ZB4BJ3	24.00
Black	3-momentary to center	$\bigcirc$	ZB4BD5	ZB4BJ5	29.40
Black	3-momentary from left to center	$\lor$	ZB4BD7	ZB4BJ7	29.40
Black	3-momentary from right to center	$\lor$	ZB4BD8	ZB4BJ8	29.40

For colored lever, add the following code to the end of part number: 01-white, 03-green, 04-red, 05-yellow, 06-blue (Example: ZB4BD204).

#### Table 19.76: Non-Illuminated Key Switches ■

Type of Operator	Number and Type	of Positions	Catalog Number	\$ Price
		<b>%</b> /	ZB4BG2	
	2-maintained	V2	ZB4BG02	
		N. P	ZB4BG4	
Key (No. 455) ♦ Note:	2-momentary from right to left	\$	ZB4BG6	
Youe: The symbol  indicates the key withdrawal position(s).		N R	ZB4BG0	
		\$	ZB4BG3	90.0
		Ø\$	ZB4BG03	
	3-maintained	N. C. C. C. C. C. C. C. C. C. C. C. C. C.	ZB4BG04	
		<b>₹</b>	ZB4BG5	
		<b>₹</b>	ZB4BG9	
		VP	ZB4BG09	
<ul><li>See Table 19.77 for contact configurations.</li><li>Other key numbers:</li></ul>	3-momentary from	\$ P	ZB4BG1	
<ul> <li>key no. 421E: add the suffix 12 to the catalog number.</li> <li>key no. 458A: add the suffix 10 to the catalog</li> </ul>	left to center	<u> </u>	ZB4BG01	
number. key no. 520E: add the suffix 14 to the catalog number. key no. 3131A: add the suffix 20 to the catalog number.	3-momentary to center		ZB4BG7	
			ZB4BG8	116.0
	3-momentary from right to center	<u> </u>	ZB4BG05	
<b>Example:</b> For a head with key no. 421E for a 2 position maintained, lockable selector switch, with key withdrawal from the left-hand position, order ZB4BG212.		<b>N</b>	ZB4BG08	

# Table 19.77: Sequence of Contacts on Selector Switch Bodies

Unit Type					Selector Switches											
Unit Type		2-position 3-position														
Note: L=Left, C=Center, R: O=Open, X=Clos	=Right, sed		15°	)			.5°	31	5°							
0	Up															
Operator Plunger Position	Down															
Contact Block Location		L	С	R	L	С	R	L	С	R	L	С	R	L	С	R
Contacts N/O N/C		0	0	0	Х	Х	Х	Χ	Х	0	0	0	0	0	Х	Х
		Х	Х	Х	0	0	0	0	0	Х	Х	Х	Х	Х	0	0

 Legends
 pages 19-37 to 19-39

 Selector Switch Sequence (Table 19.91)
 page 19-33



ZB4BD922

XD4PA12

ZB4BD28

XB4BA8•1

# Table 19.78: Potentiometer Operator (with Mounting Collar)

Shape of Head	Description	Application	Catalog Number	\$ Price
	For potentiometer with shaft length 1.73 to 1.97 in.	For shaft Ø 1/4 in. (6.35 mm)	ZB4BD922	142.00
	(45 to 50 mm) (potentiometer not included)	For shaft Ø 0.24 in. (6 mm)	ZB4BD912	142.00

# Table 19.79: Joysticks (54 mm, Extended Operating Shaft) ▲

Description	Contact Operation	Action	Catalog Number	\$ Price
<u>↑</u>	1 stop 1 N O contact per direction	Maintained	XD4PA12	250.00
<b>↓</b>	1 step 1 N.O. contact per direction	Momentary	XD4PA22	250.00
<u></u>		Maintained	XD4PA14	316.00
4 direction	, ,	Momentary	XD4PA24	316.00
	<b>↑ ↓ ← ↓</b>	1 step 1 N.O. contact per direction  1 step 1 N.O. contact per direction	1 step 1 N.O. contact per direction  Maintained  Momentary  Maintained  1 step 1 N.O. contact per direction	1 step 1 N.O. contact per direction  Maintained XD4PA12  Momentary XD4PA22  Maintained XD4PA14  1 step 1 N.O. contact per direction  Momentary XD4PA24

#### Table 19.80: Legends for Joysticks

Description	For use with	Color	Catalog Number	\$ Price
Legends 30 x 48 mm for customer engraving	2 direction	Black one side Red reverse	ZBG2201	
	2 dil ection	White one side Yellow reverse	ZBG2401	3.40
Legends	4 direction	Black one side Red reverse	ZBG4201	3.40
48 x 48 mm for customer engraving	4 un ection	White one side Yellow reverse	ZBG4401	

#### Table 19.81: Two Position Toggle Switch

	Shape of Head	Color	Type of Positions	Catalog Number	\$ Price
		Black	Maintained	ZB4BD28	46.60
_		Black	Momentary	ZB4BD48	46.60

# Table 19.82: Reset Operators, Flush, Adjustable Shaft

Shape of Head	Travel		Actuation	Distance	Color	Catalog Number	\$ Price							
Зпаре от пеац	in.	mm	in.	mm	Color	Catalog Nulliber	a Frice							
					Black	XB4BA821								
			0.24-0.63	6–16	Red	XB4BA841	30.10							
	0.39	10			Blue	XB4BA861								
	0.39	10			Black	XB4BA822								
_			0.63-1.02	16–26	Red	XB4BA842	30.10							
														Blue
				8-5.12 30-130	Black	XB4BA921								
			1.18-5.12		Red	XB4BA941	36.10							
	0.55	1.4			Blue	XB4BA961								
	0.55	0.55 14 5.12–10.		5.12–10.12 130–257	Black	XB4BA922								
			5.12-10.12		12 130-257	Red	XB4BA942	45.10						
					Blue	XB4BA962								

Legends . . . . pages 19-37 to 19-39



Discount Schedule



Table 19.83: Pilot Light Heads



ZB4BV063



ZB4BV04



ZB4BV043S



ZB4BV6

Shape of Head	For Use with Body Comprising Light Module Type	Color of Lens	Catalog Number	\$ Price
	Protected LED™ only	White Green Red Yellow Blue	ZB4BV013 ZB4BV033 ZB4BV043 ZB4BV053 ZB4BV063	7.60
	Protected LED only Fresnel (jeweled) lens ▲	White Green Red Amber Blue	ZB4BV013S ZB4BV033S ZB4BV043S ZB4BV053S ZB4BV063S	7.60
	For BA9s incandescent bulb, neon or LED only ■	White Green Red Yellow Blue Clear	ZB4BV01 ZB4BV03 ZB4BV04 ZB4BV05 ZB4BV06 ZB4BV07	7.60
	For BA9s incandescent bulb, neon or LED Fresnel (jeweled) lens ■	White Green Red Amber Blue Clear	ZB4BV01S ZB4BV03S ZB4BV04S ZB4BV05S ZB4BV06S ZB4BV07S	7.60

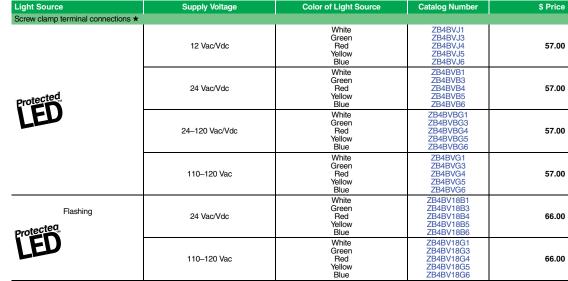
<sup>▲</sup> For use in bright ambient conditions, for example, in sunlight.

#### Table 19.84: Complete Bodies (Mounting Collar + Light Module for BA9s Incandescent Bulb, Neon or LED)

Description	Light Source	Supply Voltage (V)	Catalog Number	\$ Price	
Screw clamp terminal connection	s				
Direct supply	BA9s bulb 2.4 W max. Not included ■	≤250	ZB4BV6	38.60	
Direct supply	BA9s incandescent bulb included	24 v 2 Watt	ZB4BV624	49.20	
Direct supply	BA9s incandescent bulb included	120 v 2.4 Watt	ZB4BV6120	49.20	
		110-120 Vac 50/60 Hz	ZB4BV3		
	Dia :	230–240 Vac 50/60 Hz	ZB4BV4		
Transformer type 1.2 VA, 6 V secondary	BA9s incandescent bulb included	400–50 Hz	ZB4BV5	98.00	
1.2 VA, 0 V Secondary	baib included	440–480 Vac 60 Hz	ZB4BV8		
		550–600 Vac 60 Hz	ZB4BV9		

Order bulb separately; see page 19-40. For BA9 LED, see page 19-120.

#### Table 19.85: Complete Bodies (Mounting Collar + Light Module with Protected LED™) ◆



For 240 V LED, replace the last "B" or "G" in the catalog number with an "M". For example, ZB4BVB1 (24 V) becomes ZB4BVM1 (240 V).
 ★ For Quick-Connect version, add "3" to the end of the catalog number Example: ZB4BVJ13 (Quick-Connect size 1 x 1/40" or 2 x 0.110").

Discount Schedule

Legends...... pages 19-37 to 19-39



ZB4BV•

# **XB4 Illuminated Operators**





Table 19.86: Heads for Momentary Illuminated Push Buttons





ZB4BW563



ZB4BW113



ZB4BW33



ZB4BW14



ZB4BW643



ZB4BH033



ZB4BH63

Shape of Head	Type of Push	Color	Catalog Number	\$ Price	
Only use with Protected LED	O™ light modules				
		White	ZB4BW313		
		Green	ZB4BW333		
	Flush	Red	ZB4BW343	18.60	
		Yellow	ZB4BW353		
		Blue	ZB4BW363		
		White	ZB4BW513		
		Green	ZB4BW533		
	Flush with clear silicone boot	Red	ZB4BW543	31.00	
		Yellow	ZB4BW553		
		Blue	ZB4BW563		
		White	ZB4BA18		
		Green	ZB4BA38		
	Flush for insertion of legend	Red	ZB4BA48	16.00	
		Yellow	ZB4BA58		
		Blue	ZB4BA68		
		White	ZB4BW113	13.00	
		Green	ZB4BW133		
	Extended	Red	ZB4BW143		
		Yellow	ZB4BW153		
		Blue	ZB4BW163		
		Clear	ZB4BW413		
		Green	ZB4BW433		
( 0 )	Mushroom (40 mm)	Red	ZB4BW443	29.40	
		Yellow	ZB4BW453		
		Blue	ZB4BW463		
nly use with light modules	for a BA9s incandescent bulb, neon or LED				
		White	ZB4BW31		
		Green	ZB4BW33		
	Flush	Red	ZB4BW34	18.60	
	Flush	Yellow	ZB4BW35	10.00	
		Blue	ZB4BW36		
		Clear	ZB4BW37		
		White	ZB4BW11		
		Green	ZB4BW13		
	Estandad	Red	ZB4BW14	13.00	
	Extended	Yellow	ZB4BW15		
		Blue	ZB4BW16		
		Clear	ZB4BW17		

#### Table 19.87: Heads for Maintained Illuminated Push Buttons

Shape of Head	Type of Push	Color of Lens	Catalog Number	\$ Price
Only use with Protected LED ligh	nt modules			
		Clear	ZB4BW613	
	Push/Pull Mushroom (40 mm)	Green	ZB4BW633	
		Red	ZB4BW643	46.00
		Yellow	ZB4BW653	
		Blue	7B4BW663	

# Table 19.88: Illuminated Push-On/Push-Off Operators

Shape of Head	Type of Push	Color of Lens	Catalog Number	\$ Price
Only use with Protected LED lig	ht modules			
		White	ZB4BH013	
		Green	ZB4BH033	
	Flush	Red	ZB4BH043	24.80
		Yellow	ZB4BH053	
		Blue	ZB4BH063	
		White	ZB4BH13	
		Green	ZB4BH33	
	Extended	Red	ZB4BH43	19.60
		Yellow	ZB4BH53	
		Blue	ZB4BH63	

# Schneider Electric www.schneider-electric.us

#### Table 19.89: Two Button with Clear Pilot Light, Momentary



6	
6	O
1	CHIHIH)
U	0
ZB4	BW7A1721

ZB4BK1343

Shape of Head	Description Marking Cap Color Degree of Protection		Degree of Protection	Catalog Number	\$ Price		
No Marking							
Protected.		_	Green Red		ZB4BW7A3740		
LED 5	Two flush	_	White Black	IP66	ZB4BW7A1720	48.00	
Protected.	One flush One extended	_	Green Red	IP69K	ZB4BW7L3740	46.00	
Premarked		1		,			
Protected		"l" "O"	Green Red		ZB4BW7A3741		
	Two flush	"Į" "O"	White Black		ZB4BW7A1721	52.00	
Protected. O	One flush One extended	"[" "O"	Green Red	IP66	ZB4BW7l3741		
Protected D	Two flush	ա <b>գ</b> ո ա <b>դ</b> ո	White Black	IP69K	ZB4BW7A1724	52.00	
Protected D	Two flush	"+" "-"	White Black		ZB4BW7A1715		
Without caps							
	Two flush without caps	_	_	IP66 IP69K	ZB4BW7A9	35.00	



Shape of Head	Number and Type of Position	Catalog Number ▼	\$ Price	
Only use with Protected L	ED light modules			
	2-maintained	$\checkmark$	ZB4BK12•3	35.00
	2-momentary from right to left	$\Diamond$	ZB4BK14•3	51.00
	3-maintained	$\vee$	ZB4BK13•3	35.00
	3-momentary to center	$\Diamond$	ZB4BK15•3	51.00
	3-momentary from right to center	$\downarrow$	ZB4BK18•3	51.00
	3-momentary from left to center		ZB4BK17•3	51.00

<sup>▼</sup> Designate color as follows: 1—white, 3—green, 4—red, 5—yellow, 6—blue.

Table 19.91: Sequence of Contacts on Illuminated Selector Switch Bodies

Heit Tone	Selector Switches										
Unit Type		2-position						3-po:	sition		
		315°			45°	315°					45°
	Up										
Operator Plunger Position	Down										
Contact Block Location		L	R	L	R	L	R	L	R	L	R
Contacts	N/O	0	0	Х	Х	Х	0	0	0	0	Х
	N/C	Х	Х	0	0	0	Х	Х	Х	Х	0

Note: L=Left, R=Right, O=Open, X=Closed

	2 Position Selector Switch			3 Position Selector Switch					
•	•	Contact block guide	•	•	•	Contact block guide			
0	Х	1 N.O. (left or right)	0	0	Х	1 N.O. (left)			
X	0	1 N.C. (left or right)	X	0	Х	2 N.O. wired in parallel (side by side)			
0	Х	1 N.O.	X	0	0	1 N.O. (right)			
		and	0	X	Х	1 N.C. (right)			
X	0	1 N.C.	X	X	0	1 N.C. (left)			
		_	0	X	0	2 N.C. wired in <b>series</b> (side by side)			

 Legends
 pages 19-37 to 19-39

 Caps
 page 19-39







ZB4BZ101

#### Table 19.92: Contact Blocks (Mounting Collar with Contact Blocks)

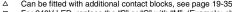
Description	Type of	Catalog Number	\$ Price	
Description	N.O.	N.C.	Catalog Number	\$ FIICE
	1	_	ZB4BZ101	22.00
	ı	1	ZB4BZ102	22.00
Screw clamp terminal connections	2	_	ZB4BZ103	38.20
Screw clamp terminal connections	ı	2	ZB4BZ104	38.20
	1	1	ZB4BZ105	38.20
	1	2	ZB4BZ141	55.00

For Quick-Connect version add "3" to the end of the catalog number Example: ZB4BZ1013 (Quick-Connect size 1 x 0.250" or 2 x 0.110"). For Ring Tongue compatible blocks add "9" to the end of the catalog number (Example: ZB4BZ1029). Electrical components with connection by printed circuit board pins are available. Refor to Catalog 9001CT0001. Electrical components with connection by plug-in connector are available. Refor to Catalog 9001CT0001.

Table 19.93: Complete Bodies

(Mounting Collar + Single Contact Block + Light Module with Protected LED™)

	Type of	Contact △		Supply '	Voltage □	
Light Source			Color	24 Vac/Vdc	110-120 Vac	\$ Price
	N.O.	N.C.		Catalog	Number	
Screw clamp termin	nal connecti	ons				
			White	ZB4BW0B11	ZB4BW0G11	
			Green	ZB4BW0B31	ZB4BW0G31	
	1	_	Red	ZB4BW0B41	ZB4BW0G41	73.00
			Yellow	ZB4BW0B51	ZB4BW0G51	
			Blue	ZB4BW0B61	ZB4BW0G61	
			White	ZB4BW0B12	ZB4BW0G12	
	_		Green	ZB4BW0B32	ZB4BW0G32	73.00
		1	Red	ZB4BW0B42	ZB4BW0G42	
			Yellow	ZB4BW0B52	ZB4BW0G52	
Protected			Blue	ZB4BW0B62	ZB4BW0G62	1
Protection			White	ZB4BW0B13	ZB4BW0G13	
1 ピレ			Green	ZB4BW0B33	ZB4BW0G33	
	2	_	Red	ZB4BW0B43	ZB4BW0G43	90.00
			Yellow	ZB4BW0B53	ZB4BW0G53	
			Blue	ZB4BW0B63	ZB4BW0G63	
			White	ZB4BW0B15	ZB4BW0G15	
			Green	ZB4BW0B35	ZB4BW0G35	
	1	1	Red	ZB4BW0B45	ZB4BW0G45	90.00
			Yellow	ZB4BW0B55	ZB4BW0G55	1
			Blue	ZB4BW0B65	ZB4BW0G65	



Can be fitted with additional contact blocks, see page 19-35.
For 240V LED, replace the "B" or "G" with "M". (Example: change "ZB4BW0B11 (24V) to ZB4BW0M11 (24VV))

#### Table 19.94: Mounting Collar, Contact Block and Light Module (with screw clamp terminal connections) ◊

Commba	Links Course	Cumply Vallage	Type of Contact ◊		Color of Light	Catalog Number	\$ Price
Supply	Light Source	Supply Voltage	N.O.	N.C.	Source	Catalog Number	\$ Price
Screw clamp termin	nal connections						
			1	_	_	ZB4BW061	55.00
Discot or soul	BA9s 2.4 W max. bulb	< 250 Vac/Vdc	_	1	_	ZB4BW062	55.00
	Not included ◊	<_250 vac/vuc	2	_	_	ZB4BW063	71.00
	Trot moladou T		1	1	_	ZB4BW065	71.00
		110-120 Vac	1	_	_	ZB4BW031	114.00
		50/60 Hz	1	1	_	ZB4BW035	130.00
Transformer type	BA9s	230-240 Vac	1	_	_	ZB4BW041	114.00
	incandescent bulb included	50/60 Hz	1	1	_	ZB4BW045	130.00
	2012 11.0.0000	440-480 Vac	1	_	_	ZB4BW081	114.00
		60 Hz	1	1	_	ZB4BW085	130.00



ZB4BW06•



ZB4BW0•5

Can be fitted with additional contact blocks, see page 19-35.





ZB4BZ009



ZBE101



ZBE203



ZBVB•

Table 19.95: Body/Mounting Collar

For use with	Catalog Number	\$ Price
Electrical block (contact or light module)	ZB4BZ009	5.40

Table 19.96: Add-On Contact Block (with screw clamp terminal connections) ★▼

Description		Туре о	f Contact	Catalan Number	\$ Price
Description	Description		N.C.	Catalog Number	\$ Price
Standard single contact bloc	No A	1		ZBE101	16.40
Standard Single Contact bloc	KS =	_	1	ZBE102	16.40
•		2	_	ZBE203	33.20
Standard double contact blo	cks▲■	_	2	ZBE204	33.20
		1	1	ZBE205	33.20
Special contact blocks for low	u novina avvitalnina A	1	_	ZBE1016	32.80
Special contact blocks for low	v power switching ▼	_	1	ZBE1026	32.80
I am a am a markatata a	Dusty environment ♦	1	_	ZBE1016P	32.80
Low-power switching	(IP5X, 50 µm dust)	_	1	ZBE1026P	32.80
	Early make N/O	1	-	ZBE201	16.40
Ote	Late break N/C	_	1	ZBE202	16.40
Staggered contacts	Overlapping N/O+N/C	1	1	ZB4BZ106	32.80
	Staggered N/O+N/O	_	2	ZB4BZ107	32.80

- For Quick-Connect version add "3" to the end of the catalog number Example: ZBE1013 (Quick-Connect size 1 x 0.250" or 2 x 0.110").
- For Ring Tongue compatible blocks add "9" to the end of the catalog number (Example: ZBE1029). Cannot stack additional contact blocks onto these blocks.

Table 19.97: Light Modules (with screw clamp terminal connections) ★▼

Description	Supply voltage	Color of Light Source	Catalog Nulliber	\$ FIICE
		White	ZBVJ1	
		Green	ZBVJ3	
	12 Vac/Vdc	Red	ZBVJ4	52.00
		Yellow	ZBVJ5	
		Blue	ZBVJ6	
		White	ZBVB1	
		Green	ZBVB3	
	24 Vac/Vdc	Red	ZBVB4	52.00
		Yellow	ZBVB5	
		Blue	ZBVB6	
		White	ZBVG1	
		Green	ZBVG3	
protected.	110–120 Vac	Red	ZBVG4	52.00
		Yellow	ZBVG5	
		Blue	ZBVG6	
		White	ZBVBG1	
	24-120 Vac/Vdc	Green	ZBVBG3	
		Red	ZBVBG4	52.00
		Yellow	ZBVBG5	
		Blue	ZBVBG6	
		White	ZBVM1	
		Green	ZBVM3	
	230-240 Vac	Red	ZBVM4	52.00
		Yellow	ZBVM5	
		Blue	ZBVM6	
Direct supply for BA9s 2.4 W max. bulb Not included △	≤ 250 Vac/Vdc	_	ZBV6	33.20

- Electrical components with connection by philed circuit board pins are available. Refer to Catalog **9001CT0001** for more details. See page 19-40 for bulb information.

19-35



ZB4BZ009



ZBE1015



ZB4BZ1015

#### Table 19.98: Spring Terminal Products for XB4 22 mm Push Buttons

#### **Body/Mounting Collar**

For use with	Catalog Number	\$ Price
Contact block or light module	ZB4BZ009	5.40

#### Contact Blocks A

Spring Terminal Connections, Contacts for Standard Applications					
Description	Type of contact	\	•	Catalog Number	\$ Price
		N/O	N/C		
	Single	1	-	ZBE1015	18.00
		-	1	ZBE1025	18.00
		1	-	ZB4BZ1015	24.00
Contact blocks		-	1	ZB4BZ1025	24.00
	Single with body/mounting collar	2	=	ZB4BZ1035	42.00
	body/mounting oblide	-	2	ZB4BZ1045	42.00
		1	1	ZB4BZ1055	42.00

#### Light Modules A

Spring Terminal Connections				
Description	Supply voltage	Color of light source	Catalog Number	\$ Price
		White	ZBVJ15	57.00
		Green	ZBVJ35	57.00
	12 Vac/Vdc	Red	ZBVJ45	57.00
		Orange	ZBVJ55	57.00
		Blue	ZBVJ65	57.00
		White	ZBVB15	57.00
Integral LED		Green	ZBVB35	57.00
(to combine with	24 Vac/Vdc	Red	ZBVB45	57.00
heads for integral LED)		Orange	ZBVB55	57.00
Protected		Blue	ZBVB65	57.00
i En		White	ZBVG15	57.00
		Green	ZBVG35	57.00
	110-120 Vac	Red	ZBVG45	57.00
		Orange	ZBVG55	57.00
		Blue	ZBVG65	57.00
		White	ZBVM15	57.00
		Green	ZBVM35	57.00
	230-240 Vac	Red	ZBVM45	57.00
		Orange	ZBVM55	57.00
		Blue	ZBVM65	57.00

Additional blocks cannot be attached to the back of these contact blocks or light modules. However, spring terminal contact blocks can be mounted behind screw terminal contact blocks.





#### Table 19.99: Standard (30 x 40 mm) Legend Holders for 8 x 27 mm Legends



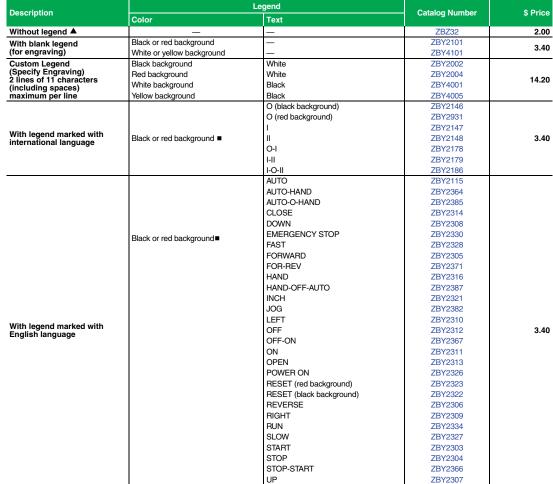
ZBZ32



ZBY•101



ZBY2303







ZBY610• ZBZ33

- For marked legends, see page 19-38.
- Start functions: white letters on black background. Stop functions: white letters on red background (unless otherwise specified above).





#### Table 19.100: Large (30 x 50 mm) Legend Holders for 18 x 27 mm Legends

	Description ◆	Color	Catalog Number	\$ Price	
ı	Without legend insert	_	ZBZ33	2.00	
N	With blank larged incort	Black or red background	ZBY6101	3.40	
J	With blank legend insert	White or yellow background	ZBY6102	3.40	

**B 3** 4

**B** Y•H101



**B Z** 5 ☑ Y6H10・

Table 19.101: 30 x 40 mm legend holder (flush mounting with bezel) for 8 x 27 mm legends

Description ♦	Color	Catalog Number	\$ Price
Without legend	_	ZBZ34	2.00
With blank legend	Black or red background	ZBY2H101	3.40
	White or vollow background	7PV/IH101	2.40

#### Table 19.102: 30 x 50 mm legend holder (flush mounting with bezel) for 18 x 27 mm legends

Description ◆	Color	Catalog Number	\$ Price
Without legend	_	ZBZ35	4.20
With blank legend	Black or red background	ZBY6H101	5.40
	White or yellow background	ZBY6H102	5.40

For custom Legends, see page 19-38.

Color	Marking	Text	Catalog Number	\$ Price
		O (black background)	ZBY02146	
		O (red background)	ZBY02931	
		ı	ZBY02147	
	International	II	ZBY02148	1.70
		O-I	ZBY02178	
		I-II	ZBY02179	
		I-O-II	ZBY02186	
		AUTO	ZBY02115	
		AUTO-HAND	ZBY02364	
		AUTO-O-HAND	ZBY02385	
		CLOSE	ZBY02314	
		DOWN	ZBY02308	
	English	EMERGENCY STOP	ZBY02330	
	Liigiisii	FAST	ZBY02328	
		FORWARD	ZBY02305	
		FOR-REV	ZBY02371	
		HAND	ZBY02316	
Black or red background ▲		HAND-OFF-AUTO	ZBY02387	
black or red background A		INCH	ZBY02321	
		JOG	ZBY02382	
		LEFT	ZBY02310	
		OFF	ZBY02312	1.70
		OFF-ON	ZBY02367	
		ON	ZBY02311	
		OPEN	ZBY02313	
		POWER ON	ZBY02326	
		RESET (red background)	ZBY02323	
		RESET (black background)	ZBY02322	
		REVERSE	ZBY02306	
		RIGHT	ZBY02309	
		RUN	ZBY02334	
		SLOW	ZBY02327	
		START	ZBY02303	
		STOP	ZBY02304	
		STOP-START	ZBY02366	
		UP	ZBY02307	

A Start functions: white letters on black background. Stop functions: white letters on red background (unless otherwise specified above).

#### Table 19.104: Legends for Customer Engraving (inserts only)

Description	For use with	Color	Text Color	Catalog Number	\$ Price
8 x 27 mm	20 v 40 mans lawared baldons	Black or red background	White	ZBY0101	
	30 x 40 mm legend holders	White or yellow background	Black	ZBY0102	1.70
18 x 27 mm	30 x 50 mm legend holders	Black or red background	White	ZBY5101	1.70
	30 x 30 min legend holders	White or yellow background	Black	ZBY5102	

#### Table 19.105: Legends for Factory Engraving (inserts only)

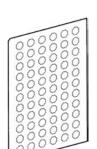
Description	For use with	Color	Text Color	Catalog Number	\$ Price
8 x 27 mm Custom Legend/Insert Only (Specify Engraving) 2 lines of 11 characters (including spaces) maximum per line (Example: ZBY01002 marked "Robot")		Black background	White	ZBY01002	
	30 x 40 mm	Red background	White	ZBY01004	12.20
	legend holders	White background	Black	ZBY01001	12.20
		Yellow background	Black	ZBY01005	
18 x 27 mm Custom Legend/Insert Only (Specify Engraving) 3 lines of 11 characters (including spaces) maximum per line (Example: ZBY05002 marked "Robot")	30 x 50 mm legend holders	Black background	White	ZBY05002	
		Red background	White	ZBY05004	12.20
		White background	Black	ZBY05001	12.20
		Yellow background	Black	ZBY05005	

SiS Label Software

104.00

XBY2U



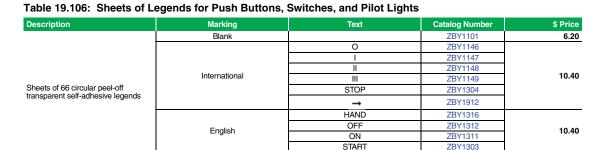


ZBY1101









Legend Design Software: English, French, German, Spanish, Italian

Table 19.107: Push Button Caps—Unmarked

For use with	Type of Push	Color	Catalog Number	\$ Price
		White	ZBA1	
		Black	ZBA2	
		Green	ZBA3	2.00
	Flush	Red	ZBA4	2.00
		Yellow	ZBA5	
		Blue	ZBA6	
ZB4BA0		6 colors ▲	ZBA9	4.20
push button heads		White	ZBL1	2.00
		Black	ZBL2	
		Green	ZBL3	
	Extended	Red	ZBL4	
		Yellow	ZBL5	
		Blue	ZBL6	
		6 colors ▲	ZBL9	4.20

<sup>▲</sup> Set of 6 different colored caps: white, black, green, red, yellow, blue.

#### Table 19.108: Push Button Caps-Marked

English with	Torre of Breek	Mar	king	0-11 0-1-11		\$ Price
For use with	Type of Push	Text ■	Color	Cap Color	Catalog Number	
			White	Green	ZBA331	
			Black	White	ZBA131	
			White	Green	ZBA333	
			Black	White	ZBA133	
			White	Green	ZBA341	
			Black	White	ZBA141	
			Black	White	ZBA343	
			White	Black	ZBA344	
	-	•	White	Green	ZBA345	
	_		The write	G.55.1		
ZB4BA0 push button heads	Flush	•	White	Black	ZBA245	4.20
		$\Diamond$	White	Green	ZBA346	
			Black	White	ZBA334 ★	
		1	White	Black	ZBA335 ★	
			140 %	Red	ZBA432	
		White	Black	ZBA232		
		\A/leike	Red	ZBA434		
		White	Black	ZBA234		
			White	Red	ZBA435	
			vvriite	Black	ZBA235	
		•	White	Blue	ZBA639	

- Start functions: white letters on black background. Stop functions: white letters on red background (unless otherwise specified).
- Double injection molded marking. Cap supplied not clipped-in, allowing orientation of arrow in any one of 4 directions:  $\uparrow$ ,  $\downarrow$ ,  $\leftarrow$  or  $\rightarrow$



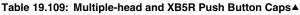






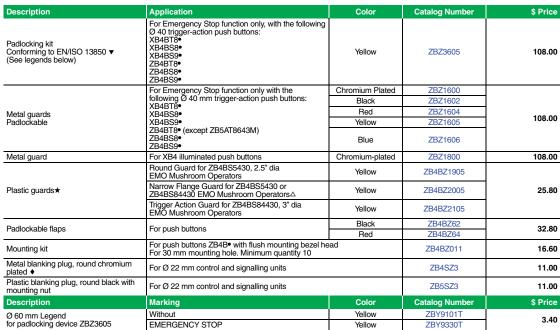


ZBA79



For use with	Type of Push	Marking	Cap Color	Catalog Number	\$ Price
		Unmarked		ZBA71	4.00
		"I" black	White	ZBA7131	5.30
		"→" black	vvriite	ZBA7134	5.30
		"+" black		ZBA7138	5.30
		Unmarked		ZBA72	4.00
		"O" white		ZBA7232	5.30
		"+" white	Black	ZBA7233	5.30
	Flush	"→" white		ZBA7235	5.30
Double push button heads		"I" white		ZBA7237	5.30
Tripe push button heads ZB4RZA0		Unmarked	Green	ZBA73	4.00
ZB5RZA0		"I" white		ZBA7331	5.30
		"+" white		ZBA7333	5.30
		"t" white		ZBA7335	5.30
		"II" white		ZBA7336	5.30
		Unmarked	Red	ZBA74	4.00
		"O" white	neu	ZBA7432	5.30
		Unmarked	Yellow	ZBA75	4.00
		Unmarked	Blue	ZBA76	4.00
		Assorted	10 colors■	ZBA79	3.00

#### Table 19.110: Accessories



- Requires a ZB4BZ009 body/mounting collar for mounting, see page 19-35.
- For additional information, refer to publication 9001DB0601R6/06.
- Standard circular legends are not compatible with this product. Use special legends ZBY• •T listed above.
- Maximum panel thickness is 2.5 mm.

# Table 19.111: BA9s Bulbs and Associated Accessories

Description	Characteristics	Catalog Number	\$ Price
	6 V, 1.2 W	DL1CB006	
Replacement bulbs (Type BA9s) Incandescent	12 V, 2 W	DL1CE012	11.00
	24 V, 2 W	DL1CE024	11.00
	120-130 V, 2.4 W	DL1CE130	
	120-130 V, 1.8 mA	DL1CF110	15.20
Neon bulbs	230-240 V, 1,8 mA	DL1CF220	15.20
Bulb extractor	_	XBFX13	11.00
Lens cap tightening tool	Illuminated push buttons with flush push	ZBZ8	6.20
Power driver bits for mounting and wiring (package of 5)	Cross headed screw (POZIDRIV type 1)	ZB4BZ905	52.00
Mounting Adapter	For mounting 22 mm push button in 30 mm KO	ZBZ41	10.40





ZBZ160•





ZB4BZ6•



ZB4BZ011





ZBZ8

DL1CF\*\*

XBFX13

Set of 10 different caps: white, black, green, red, yellow, blue, white "I" on green background, black "I" on white background, white "O" on red background, white "O" on black background.



# www.schneider-electric.us

#### Table 19.112: Bellows Seals for Harsh Environments (IP 69K) ▲









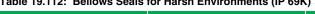












0	Description	For use with	Color & Material	Sold in Lots of	Catalog Number	\$ Price
		A I I a man a man VD 4 a man tal	Red Silicone	2	ZBZ48	
		Any Harmony XB4 metal, mushroom head push button ★, Ø 40 mm or Ø 60 mm (except ZB4BR•16)	Black EPDM	2	ZBZ28	12.40
			Yellow EPDM	2	ZBZ58	

▲ Only when mounted on control stations. Use special legends ZBY• •T.

#### Table 19.113: Boot for Standard Selector Switch Handle

Description	For use with	Catalog Number	\$ Price
Boot for standard handle	ZB4BD••	ZBD D2	12.40

Table 19.114: Replacement Keys

Description	Key Number	Catalog Number	\$ Price
	455	ZBG455	
	421E	ZBG421E	
Set of 2 keys	458A	ZBG458A	11.00
	520E	ZBG520E	
	3131A	ZBG3131A	
	455	ZBG455P	
0 + (0)	421E	ZBG421EP	
Set of 2 keys, One of which is supplied booted (rubber boot)	458A	ZBG458AP	23.40
Che of Which is supplied scoted (russer soot)	520E	ZBG520EP	
	3131A	ZBG3131AP	

#### Table 19.115: Clear Boots

ZBP0





ZBA709

Description	For use with	Material	Catalog Number	\$ Price
Cinale beets	Booted push buttons with circular head		ZBP0	12.40
Single boots	Booted push buttons with circular head used in food industry applications		ZBP0A	12.40
Double boots	Double-headed push buttons, two flush	Silicone	ZBA708	10.80
Double boots	Double-headed push buttons, one flush + one projecting		ZBA709	10.80
Triple boot	Triple-headed push buttons, two flush + one projecting		ZBA710	10.80
Iripie boot	Triple-neaded push buttons, two tlush + one projecting		ZBA/10	10.

#### Table 19.116: Colored boots

Description	Color	Catalog Number	\$ Price
	Black	ZB2 BP012	13.00
	Green	ZB2 BP013	
Single boot (can be replaced without dismantling the head)	Red	ZB2 BP014	
(carrie replaced without dismartaing the nead)	Yellow	ZB2 BP015	
	Blue	ZB2 BP016	

#### Table 19.117: Lens Caps

For use with	Color	Catalog Number	\$ Price
Lens caps for Protected LED™ light modules			
	White	ZBV0113	
	Green	ZBV0133	
Pilot lights	Red	ZBV0143	5.40
	Yellow	ZBV0153	
	Blue	ZBV0163	
	White	ZBW9113	
	Green	ZBW9133	
Illuminated push buttons with flush push	Red	ZBW9143	5.40
	Yellow	ZBW9153	
	Blue	ZBW9163	
	White	ZBW9313	
	Green	ZBW9333	
Illuminated push buttons with extended push	Red	ZBW9343	5.40
	Yellow	ZBW9353	
	Blue	ZBW9363	
Lens caps for BA9 light modules			
	White	ZBV011	
	Green	ZBV013	5.40
Dilat liebta	Red	ZBV014	
Pilot lights	Yellow	ZBV015	5.40
	Blue	ZBV016	
	Clear	ZBV017	
	White	ZBW911	
	Green	ZBW913	
Illuminated push buttons with flush push	Red	ZBW914	5.40
munimated push buttons with husin push	Yellow	ZBW915	3.40
	Blue	ZBW916	
	Clear	ZBW917	
	White	ZBW931	
	Green	ZBW933	5.40
Illuminated push buttons with extended push	Red	ZBW934	
munimated push buttons with extended push	Yellow	ZBW935	
	Blue	ZBW936	
	Clear	ZBW937	



ZBV01•3





# **XB5** Complete Devices Refer to Catalog **DIA4ED2060507BEN-US**





XB5AA4322





XB5AL42



XB5AC21



XB5AL73415





Table 19.118: Non-Illuminated Push Buttons, Momentary (screw clamp terminal connections)

Chana of Llass	d Type of Push	Type of	Contact	Marking	Cap Color	Catalog Number	Components	\$ Price
Sпаре от <b>п</b> еас	Type of Push	N.O.	N.C.	iviarking	Cap Color	Catalog Number	Components	\$ Price
					Black	XB5AA21	(ZB5AZ101 + ZB5AA2)	
					Green	XB5AA31	(ZB5AZ101 + ZB5AA3)	00.50
		1	_	_	Yellow	XB5AA51	(ZB5AZ101 + ZB5AA5)	38.50
					Blue	XB5AA61	(ZB5AZ101 + ZB5AA6)	
	Elizab	_	1	_	Red	XB5AA42	(ZB5AZ102 + ZB5AA4)	38.50
	Flush				Black	XB5AA25	(ZB5AZ105 + ZB5AA2)	
					Green	XB5AA35	(ZB5AZ105 + ZB5AA3)	
		1	1	_	Red	XB5AA45	(ZB5AZ105 + ZB5AA4)	56.00
					Yellow	XB5AA55	(ZB5AZ105 + ZB5AA5)	
					Blue	XB5AA65	(ZB5AZ105 + ZB5AA6)	
	Flush	1	_	"I" (white)	Green	XB5AA3311	(ZB5AZ101 + ZB5AA331)	44.70
	Flush	_	1	"O" (white)	Red	XB5AA4322	(ZB5AZ102 + ZB5AA432)	44.70
			1 —	_	Black	XB5AP21	(ZB5AZ101 + ZB5AP2)	53.00
	Flush with clear	4			Green	XB5AP31	(ZB5AZ101 + ZB5AP3)	
(( ))	silicone boot (color of pusher	'			Yellow	XB5AP51	(ZB5AZ101 + ZB5AP5)	
	unobscured)				Blue	XB5AP61	(ZB5AZ101 + ZB5AP6)	
	,	_	1	_	Red	XB5AP42	(ZB5AZ102 + ZB5AP4)	53.00
5/35/47/34/55 *			1	_	Red	XB5AL42	(ZB5AZ102 + ZB5AL4)	38.50
	Extended	1	1	_	Red	XB5AL45	(ZB5AZ105 + ZB5AL4)	38.50
	Mushroom head Ø 40 mm	1	_	_	Black	XB5AC21	(ZB5AZ101 + ZB5AC2)	56.00

Table 19.119: Two Button Push Buttons, Momentary (screw clamp terminal connections)

Shape of Head	Type of Push	Type of Contact		Marking	Degree of Protection	Cotolog Number	Components	\$ Price
Shape of Head	Type of Fusit	N.O.	N.C.	iviarking	Degree of Protection	Catalog Number	Components	\$ Price
	One flush green push* One extended red push**	1	1	*"]" (white) **"O" (white)	IP66 IP69K	XB5AL73415	(ZB5AZ105 + ZB5AL7341)	80.75

Table 19.120: Two Button Push Buttons, Momentary + one white central pilot light (screw clamp terminal connections)

	`	•		,				
Shape of Head	Type of Push	Type of	Contact	Marking	Degree of Protection	Dilet Light Veltage	Catalog Number	\$ Price
Shape of Head	Type of Fusit	N.O.	N.C.	iviarking	Degree of Protection	Filot Light voltage	Catalog Number	ą FIICe
protected.	One flush green push* One extended red push*** One white central pilot light block	1	1	*"[" (white) **"O" (white)	IP66 IP69K	24 120 240	XB5AW73731B5 XB5AW73731G5 XB5AW73731M5	123.50

Table 19.121: Three Button Push Buttons, Momentary (screw clamp terminal connections)

Shape of Head	Type of Push	Type of	Contact	Degree of	Marking and Cap Color Catalog Number	Catalag Number	\$ Price
Shape of Head	Type of Fusit	N.O.	N.C.	Protection	Marking and Cap Color	Catalog Number	\$ FIICE
	Two flush pushes + one central	pushes		IP66	White "I" on green background White "II" on green background "White "Stop" on red background	XB5AA731327	114.00
	projecting red push*	-	·	IP69K	Black "→" on white background White "⇔" on black background *White "Stop" on red background	XB5AA711237	114.00

Legends	 pages 19-58 to	19-60
Caps	 page	19-39

Discount Schedule

(screw clamp terminal connections)

\$ Price

51.00





XB5AS9445



XB5AT42



XB5AS542

Chang of Hood	Time of Duch	Type of	Contact	Catalan Number	0	\$ Price
Shape of Head	Type of Push	N.O.	N.C.	Catalog Number	Components	\$ Price
0	Trigger action push-pull▲	1	1	XB5AT845	(ZB5AZ105 + ZB5AT84)	101.00
	Trigger action turn-to-release▲	1	1	XB5AS8445	(ZB5AZ105 + ZB5AS844)	165.00
	mgger action turn-to-release =	_	2	XB5AS8444	(ZB5AZ104 + ZB5AS844)	103.00
	Trigger action Key release (No. 455)▲	1	1	XB5AS9445	(ZB5AZ105+ ZB5AS944)	165.00
0	Push-pull	_	1	XB5AT42	(ZB5AZ102 + ZB5AT4)	68.00
	Turn-to-release	_	1	XB5AS542	(ZB5AZ102 + ZB5AS54)	110.00
	Key release (No. 455)	_	1	XB5AS142	(ZB5AZ102 + ZB5AS14)	147.00

Table 19.122: Non-Illuminated Emergency Stop and Emergency Off Mushroom Head Push Buttons, Ø 40 mm (Red)

Catalog Number

XB5AD21

XB5AG33

(ZB5AZ101 + ZB5AD2)

(ZB5AZ103 + ZB5AG3)

Number and Type of Positions

Table 19.123: Non-Illuminated Selector Switches and Key Switches (screw clamp terminal connections) ■

2-maintained

N.C.



XB5AD33



XB5AJ33

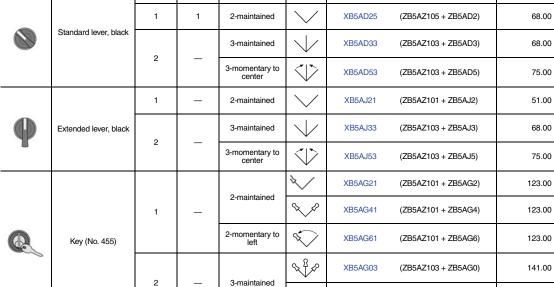


See 19-49 for contact configurations.

The symbol  $\Omega$  indicates key withdrawal position(s)

Type of Operator

Legends...... pages 19-58 to 19-60



141.00

Trigger action mushroom heads are tamper proof in that a change of contact state is not possible by teasing or floating the operator. For emergency stop applications, always use a trigger action push button (per EN/IEC 13850).



XB5AVB1

XB5AV63

XB5AV34

XB5AW31B5

XB5AW3465

XB5AW3335



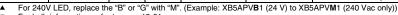
### Table 19.125: Pilot Lights for BA9s Bulb (screw clamp terminal connections)

Table 19.124: Pilot Lights with Protected LED™ (screw clamp terminal connections) ▲

Shape of Head	Supply Voltage	Color	Catalog Number	Components	\$ Price
Direct supply, for BA9s (inc	candescent, LED, neon) V <	250 V, 2.4 W bulb (bulb	not included) ■		
		White	XB5AV61	(ZB5AV6 + ZB5AV01)	
	< 250 Vac/Vdc	Green	XB5AV63	(ZB5AV6 + ZB5AV03)	51.00
	≤ 250 vac/ vdc	Red	XB5AV64	(ZB5AV6 + ZB5AV04)	
		Yellow	XB5AV65	(ZB5AV6 + ZB5AV05)	
Transformer type with 1.2 \	/A, 6 V secondary. BA9s in	candescent bulb include	ed		
		White	XB5AV31	(ZB5AV3 + ZB5AV01)	
	110-120 Vac	Green	XB5AV33	(ZB5AV3 + ZB5AV03)	117.00
	50/60 Hz	Red	XB5AV34	(ZB5AV3 + ZB5AV04)	117.00
		Yellow	XB5AV35	(ZB5AV3 + ZB5AV05)	

Table 19.126: Illuminated Push Buttons, Momentary (screw clamp terminal connections) ▲

Chang of Head	Description	Type of	Contact	Owner Walterna	Colon of Buch	Catalan Number	Components	C Dule						
Shape of Head	Description	N.O.	N.C.	Supply Voltage	Color of Push	Catalog Number	Components	\$ Price						
Flush						i de la companya de la companya de la companya de la companya de la companya de la companya de la companya de								
					White	XB5AW31B5	(ZB5AW0B15 + ZB5AW313)							
				Green	XB5AW33B5	(ZB5AW0B35 + ZB5AW333)								
				24 Vac/Vdc	Red	XB5AW34B5	(ZB5AW0B45 + ZB5AW343)	119.0						
					Yellow	XB5AW35B5	(ZB5AW0B55 + ZB5AW353)							
	Protected	1	1		Blue	XB5AW36B5	(ZB5AW0B65 + ZB5AW363)							
	i EN	'	'		White	XB5AW31G5	(ZB5AW0G15 + ZB5AW313)							
					Green	XB5AW33G5	(ZB5AW0G35 + ZB5AW333)							
				110-120 Vac	Red	XB5AW34G5	(ZB5AW0G45 + ZB5AW343)	119.0						
					Yellow	XB5AW35G5	(ZB5AW0G55 + ZB5AW353)							
					Blue	XB5AW36G5	(ZB5AW0G65 + ZB5AW363)							
	Direct supply for				White	XB5AW3165	(ZB5AW065 + ZB5AW31)							
	BA9s		1 1		1 050 \/a = \/d=	Green	XB5AW3365	(ZB5AW065 + ZB5AW33)	99.00					
	2.4 W max. bulb	!		≤ 250 Vac/Vdc	Red	XB5AW3465	(ZB5AW065 + ZB5AW34)	99.00						
	not included				Yellow	XB5AW3565	(ZB5AW065 + ZB5AW35)							
					White	XB5AW3135	(ZB5AW035 + ZB5AW31)							
				110-120 Vac	Green	XB5AW3335	(ZB5AW035 + ZB5AW33)	160.0						
	Transformer type 1.2 VA, 6 V			50/60 Hz	Red	XB5AW3435	(ZB5AW035 + ZB5AW34)	163.00						
	secondary.	4		4	1	1	1	1				Yellow	XB5AW3535	(ZB5AW035 + ZB5AW35)
	BA9s	1	'		White	XB5AW3145	(ZB5AW045 + ZB5AW31)							
_	incandescent bulb included			230-240 Vac	Green	XB5AW3345	(ZB5AW045 + ZB5AW33)	163.0						
	buib iriciaaea			50/60 Hz	Red	XB5AW3445	(ZB5AW045 + ZB5AW34)							
					Yellow	XB5AW3545	(ZB5AW045 + ZB5AW35)							
Extended														
					White	XB5AW11B5	(ZB5AW0B15 + ZB5AW113)							
					Green	XB5AW13B5	(ZB5AW0B35 + ZB5AW133)							
				24 Vac/Vdc	Red	XB5AW14B5	(ZB5AW0B45 + ZB5AW143)	113.0						
					Yellow	XB5AW15B5	(ZB5AW0B55 + ZB5AW153)							
	protected	4			Blue	XB5AW16B5	(ZB5AW0B65 + ZB5AW163)							
	I I ZN	1	1		White	XB5AW11G5	(ZB5AW0G15 + ZB5AW113)							
					Green	XB5AW13G5	(ZB5AW0G35 + ZB5AW133)							
				110-120 Vac	Red	XB5AW14G5	(ZB5AW0G45 + ZB5AW143)	113.0						
	ĺ				Yellow	XB5AW15G5	(ZB5AW0G55 + ZB5AW153)							
		l	I		Rlue	XR5AW16G5	(ZB5AW0G65 + ZB5AW163)							



Discount Schedule

For bulb information, refer to page 19-61

Legends . . . . . pages 19-58 to 19-60

# www.schneider-electric.us

### Table 19.127: Non-Illuminated Operators, Momentary—Unmarked



ZB5AA0



ZB5AA5





ZB5AP1



Shape of Nead   Type of Plash   Cap Color   Catalog Number   S Price		area operatore, memeritar,	,			
Flush, with set of 6 color cape   Colors   ZISSAA9   13.00	Shape of Head	Type of Push	Cap Color	Catalog Number	\$ Price	
Flush, with set of 6 color cape   Colors   ZISSAA9   13.00		Eluch without color con A		7DE A A O	11.00	
White   238.A41     Black   278.A42     Green   278.A43     Flush   Flush   Flush   Flush   Flush     Flush with transportent cap.		Flush, without color cap	_	ZBOAAU	11.00	
White   238.A41     Black   278.A42     Green   278.A43     Flush   Flush   Flush   Flush   Flush     Flush with transportent cap.						
Black   238AA2   Groon   236AA3   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278A		Flush, with set of 6 color caps	6 colors ■	ZB5AA9	13.00	
Black   238AA2   Groon   236AA3   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278AA44   Fad   278A			White	ZB5AA1		
Flush						
Validow   238AA5   Blue   238AA6   Gray   238AA6   Gray   238AA8   White   238AA8   Whit						
Blue   285A/6   Gray   285A/8   White   285A/18   Gray   285A/8   White   285A/18   Gray   285A/8   Gray   Gray   285A/8   Gray   Gra		Flush	Red	ZB5AA4	13.00	
Gray   ZBSAA8   White   ZBSAA18   Telephone   Telep			Yellow	ZB5AA5		
White   ZBSAA18			Blue			
Flush with transparent cap. bit reservor of legand ◆   Red   285AA48    16.00			•	<u> </u>		
Flush with bransparent caps.   Field						
Section   Sec		Flush with transparent can				
Blue   285AA68   White   285AL1   Black   285AL1   Black   285AL1   Black   285AL2   Caren   285AL3   Black   285AL4   Standard					16.00	
White   Z85AL1   Black   Z85AL1   Black   Z85AL1   Z85AL2   Green   Z85AL3   T3.00		-				
Black   ZBSAL2   Green   ZBSAL3   13.00						
Extended   Green   Z98AL3   13.00						
Extended   Red   ZBSAL4   13.0U						
Neitow   ZESALS     Bible   ZESALS     Bible   ZESALS     Bible   ZESALPA     Black   ZESAPA     Cap color unobscured   Green   ZESAPA     Red   ZESAPA     R		Extended			13.00	
Blue   ZBSAIE	•					
White						
Black   ZESAPN2   Green   ZESAPN3   25.80						
Booted Flush (clear)   Green   ZBSAPA4   25.80	_					
Red   ZBSAPA4   ZBSAPA5     Willow   ZBSAPA5     Blue   ZBSAPA6     White   ZBSAP6     White   ZBSAP6     Cap color unobscured   Black   ZBSAP6     Cap color unobscured   Red   ZBSAP6     Cap color unobscured   Red   ZBSAP6     Blue   ZBSAP6     Cap color unobscured   Red   ZBSAP6     Blue   ZBSAP6     Blue   ZBSAP6     Blue   ZBSAP6     Blue   ZBSAP6     Cap color unobscured   Red   ZBSAP6     Cap co		Bootod Flush (cloar)				
Net		Cap color unobscured			25.80	
Blue   ZBSAPAB		·				
White						
Booled Extended (scient)	-		White			
Red   ZBSAP4   ZBSAP5			Black	ZB5AP2		
Red   ZBSAP4   Yellow   ZBSAP5   SBue   ZBSAP6   SBue   ZBSAP6   SBue   ZBSAP6   SBue   ZBSAP6   SBue   ZBSAP6   SBue   ZBSAP15   SBuck   ZBSAP15   SBuck   ZBSAP25   SBuck   ZBSAP25   ZBSAP25   SBuck   ZBSAP25   Z		Booted Extended (clear)	Green	ZB5AP3	25.80	
Blue   ZBSAP6   White   ZBSAP1S		Cap color unobscured	Red	ZB5AP4		
## White			Yellow	ZB5AP5		
Black						
Booted (colored)   Cap color unobscured   Red   ZBSAPS    ZBSAPAS    Red   ZBSAPAS    ZBSAPAS    ZBSAPAS    SBlue   ZBSAPS    ZBSAPAS    ZBS					25.80	
Cap color unobscured   Red   ZB5AP4S   Yellow   ZB5AP5S   Blue   ZB5AP6S   Blue   ZB5AP6S   Blue   ZB5AP6S   White   ZB5AP18   ZB5AP38   Green   ZB5AP38						
Hed		Booted (colored) Cap color unobscured				
Blue						
Booted (clear) for insertion of legend ◆ Cap color unobscured   Red						
Booted (clear)   Green						
Ped   ZBSAP48   29,00						
Cap color unobscured   Yellow   ZBSAP58     Blue		Booted (clear)			20.00	
Blue					29.00	
White						
Black   ZB5AA24   Green   ZB5AA34						
Flush Plunger (with high guard)   Red						
(with high guard)         Red         ZB5AA44         32.20           Yellow         ZB5AA54         2BSAA54         32.20           Blue         ZB5CA1         2BSCA1         2BSCA1         2BSCA2         2FSCA2         2FSCA2         2FSCA2         2FSCA2         2FSCA2         2FSCA2         2FSCA2         2FSCA3         > <td>Flush Plunger</td> <td></td> <td></td>		Flush Plunger				
Blue				ZB5AA44	32.20	
Flush Flush			Yellow	ZB5AA54		
Black			Blue	ZB5AA64		
Flush   Green   ZB5CA3   27.00			White	ZB5CA1		
Flush			Black	ZB5CA2		
Hed   ZBSCA4   Yellow   ZBSCA5		Flush			27 00	
Blue   ZB5CA6   White   ZB5CL1		i idoli			27.00	
Extended						
Black   ZB5CL2     Green   ZB5CL3     Red   ZB5CL4     Yellow   ZB5CL5     Blue   ZB5CL6     White   ZB5 AA16     Black   ZB5 AA26     CFeen   ZB5 AA36     Black   ZB5 AA26     Green   ZB5 AA36     Red   ZB5 AA46     Yellow   ZB5 AA56     Blue   ZB5 AA66     White   ZB5 AA66     Green   ZB5 AA66     White   ZB5 AA66     White   ZB5 AA66     Green   ZB5 AA66     White   ZB5 CA16     Black   ZB5 CA16     Black   ZB5 CA26     Green   ZB5 CA36						
Extended						
Red   ZB5CL4   27.00						
Yellow   ZB5CL5     Blue   ZB5CL6     White   ZB5 AA16     Black   ZB5 AA26     Black   ZB5 AA26     Creen   ZB5 AA36     Red   ZB5 AA46     Yellow   ZB5 AA56     Blue   ZB5 AA66     Blue   ZB5 AA66     White   ZB5 AA66     Blue   ZB5 AA66     Black   ZB5 CA16     Black   ZB5 CA26     Creen   ZB5 CA36     Red   ZB5 CA26     Red   ZB5 CA46     Yellow   ZB5 CA56     Blue   ZB5 CA56     Blue   ZB5 CA56     Blue   ZB5 CA56     Creen   ZB5 CA56		Extended			27.00	
Blue						
White						
Black						
Heads only Recessed (high guard)   Green						
Recessed (high guard)   Red   ZB5 AA46     Yellow   ZB5 AA56     Blue   ZB5 AA66     White   ZB5 CA16     Black   ZB5 CA26     Green   ZB5 CA36     Recessed (high guard)   Red   ZB5 CA46     Yellow   ZB5 CA56     Blue   ZB5 CA56     Blue   ZB5 CA66     Can be a considered as a consid		Heads only				
Yellow   ZB5 AA56     Blue   ZB5 AA66     White   ZB5 CA16     Black   ZB5 CA26     Green   ZB5 CA36     Recessed (high guard)   Red   ZB5 CA46     Yellow   ZB5 CA56     Blue   ZB5 CA66		Recessed (high guard)				
Blue						
White						
Black   ZB5 CA26     Heads only   Green   ZB5 CA36     Recessed (high guard)   Red   ZB5 CA46     Yellow   ZB5 CA56     Blue   ZB5 CA66					32.20	
Recessed (high guard)         Red         ZB5 CA46           Yellow         ZB5 CA56           Blue         ZB5 CA66			Black	ZB5 CA26		
Recessed (high guard)         Red         ZB5 CA46           Yellow         ZB5 CA56           Blue         ZB5 CA66		_ Heads only				
Blue ZB5 CA66		Recessed (high guard)				
▲ Order color cap separately, see page 19-60.		1	Blue	ZB5 CA66		

- Order color cap separately, see page 19-60.
  Six colored caps included with head (white, black, green, red, yellow, blue).
  For legend ordering information see page 19-60.

Legends...... pages 19-58 to 19-60





ZB5AA331



ZB5AA432



ZB5AL232



ZB5AC24



ZB5AC2



ZB5AR4

Chana of Head	Time of Duch	Mai	rking	Con Color	Catalan Number	\$ Price
Shape of Head	Type of Push	Text	Color	Cap Color	Catalog Number	\$ Price
			White	Green	ZB5AA331	
			Black	White	ZB5AA131	
			White	Green	ZB5AA333	
			Black	White	ZB5AA133	
			White	Green	ZB5AA341	
			Black	White	ZB5AA141	
			White	Green	ZB5AA345	
			\A#-:+-	Red	ZB5AA432	
	Flush		White	Black	ZB5AA232	18.60
			White	Red	ZB5AA434	
( )				Black	ZB5AA234	
			White	Red	ZB5AA435	
			vvriite	Black	ZB5AA235	
			Black	White	ZB5AA343	
			White	Black	ZB5AA344	
			<b>†</b> •	Black	White	ZB5AA334
		1 -	White	Black	ZB5AA335	
			White	Red	ZB5AL432	
			vvriite	Black	ZB5AL232	
Extended	Estanded		White	Red	ZB5AL434	10.66
	Exterided		vvriite	Black	ZB5AL234	18.60
			White	Red	ZB5AL435	
			vviille	Black	ZB5AL235	
			White	Green	ZB5CA331	32.00
Flush	Flush		White	Red	ZB5CA432	32.00

lacktriangle Cap supplied not clipped-in, allowing orientation of arrow in any one of 4 directions:  $\uparrow$ ,  $\downarrow$ ,  $\leftarrow$  or  $\rightarrow$ 

### Table 19.129: Mushroom Heads, Momentary

Shape of Head	Diameter of Head	Color of Head	Catalog Number	\$ Price
		Black	ZB5AC24	
		Green	ZB5AC34	
	30 mm	Red	ZB5AC44	29.40
		Yellow	ZB5AC54	
		Blue	ZB5AC64	
		Black	ZB5AC2	
		Green	ZB5AC3	1
	40 mm	Red	ZB5AC4	29.40
		Yellow	ZB5AC5	
(		Blue	ZB5AC6	
		Black	ZB5AR2	
		Green	ZB5AR3	
	60 mm	Red	ZB5AR4	35.00
		Yellow	ZB5AR5	
		Blue	ZB5AR6	

Legends . . . . . pages 19-58 to 19-60

Shape of Head No Marking

Without caps

Catalog Number

ZB5AA7340

ZB5AA7120

ZB5AL7340

ZB5AA7341

ZB5AA7121

ZB5AL7341

ZB5AA79

\$ Price

35.50

39.50

33.25

Degree of Protection

IP66 IP69K

IP66 IP69K

IP66 IP69K

### www.schneider-electric.us



ZB5AH04

### Table 19.130: Non-Illuminated Push-on/Push-off Operators

Shape of Head	Type of Push	Color of Push	Catalog Number	\$ Price
		White	ZB5AH01	
		Black	ZB5AH02	
	Flush	Green	ZB5AH03	17.60
	Flusii	Red	ZB5AH04	17.00
		Yellow	ZB5AH05	
		Blue	ZB5AH06	
		White	ZB5AH1	
	Extended	Black	ZB5AH2	
		Green	ZB5AH3	17.60
		Red	ZB5AH4	17.00
		Yellow	ZB5AH5	
		Blue	ZB5AH6	
		White	ZB5CH01	
		Black	ZB5CH02	
	Flush	Green	ZB5CH03	35.20
	riusn	Red	ZB5CH04	35.20
		Yellow	ZB5CH05	
		Blue	ZB5CH06	

Cap Color Green Red

White Black

Green Red

White Black

Green Red

### Table 19.131: Two Head Operators, Momentary

Two flush

One flush One extended

Two flush

One flush One extended

Two flush without caps

Description

Marking

"I" "O"

"I" "O"

"I" "O"





	0
	0
ZΒ	5AA7121





70-		404
ZB5	AA71	124

Shape of Head	Description	Marking	Cap Color	Degree of Protection	Catalog Number	\$ Price
Premarked						
		" " " I"	Green Green		ZB5AA73132	
		"←" "→"	Green Green		ZB5AA73133	
		" <b>†</b> "	Green Green	IP66 IP69K	ZB5AA73134	57.00
	Two flush	" <del>+</del> " " <u>-</u> "	Green Green		ZB5AA73135	
Two flush + one central projecting red push		" <del>+</del> " "-"	White White		ZB5AA71115	
projecting red push marked "Stop"		" <del>_</del> "	White Black		ZB5AA71123	
		"†" "↓"	White Black		ZB5AA71124	
		"†" "↓"	Black Black		ZB5AA72124	
Without caps						
	Two flush without caps	_	_	IP66 IP69K	ZB5AA791	48.50



ZB5AS844



ZB5AS934



ZB5AT4



ZB5AS54



ZB5AS64



ZBY9330

### Table 19.133: Mushroom Heads for Maintained Push Buttons

Shape of Head	Type of Push	Diameter of Head	Color	Catalog Number	\$ Price
0	Trigger action Push-pull ■	40 mm	Red	ZB5AT84	54.00
	Trigger action	30 mm	Red	ZB5AS834	112.00
	Turn-to-release ■	40 mm	Red	ZB5AS844	112.00
F-20 1		30 mm	Red	ZB5AS934	112.00
	Trigger action Key release (No. 455) ■	40 mm	Red	ZB5AS944 ▲	112.00
Carl Contract	(NO. 455) ■	60 mm	Red	ZB5AS964	112.00
	Push-pull	30 mm	Black	ZB5AT24	40.40
			Red	ZB5AT44	40.40
		40 mm	Black	ZB5AT2	
			Red	ZB5AT4	40.40
		60 mm	Black	ZB5AX2	40.00
			Red	ZB5AX4	46.00
		30 mm	Black	ZB5AS42	78.00
		30 mm	Red	ZB5AS44	78.00
			Black	ZB5AS52	
	Turn-to-release	40 mm	Red	ZB5AS54	78.00
			Yellow	ZB5AS55	
		60 mm	Black	ZB5AS62	90.00
		00 11111	Red	ZB5AS64	30.00
		30 mm	Black	ZB5AS72	112.00
		00 11111	Red	ZB5AS74	112.00
( 00)	Key release	40 mm	Black	ZB5AS12	112.00
0	(Ńo. 455)	70 111111	Red	ZB5AS14 ▲	1.2.00
		60 mm	Black	ZB5AS22	112.00
A Other Iron pumbaro			Red	ZB5AS24	

- Other key numbers:

  —key no. 421E: add the suffix 12 to the catalog number.

  —key no. 428A: add the suffix 10 to the catalog number.

  —key no. 520E: add the suffix 14 to the catalog number.

  —key no. 3131A: add the suffix 20 to the catalog number.

  —key no. 3131A: add the suffix 20 to the catalog number.

  Example: The catalog number for a Ø 40 mm red mushroom head for a trigger action, maintained push button, with release by key no. 421E becomes: ZBSAS94412.
- Trigger action mushroom heads are tamper proof in that a change of contact state is not possible by teasing or floating the operator. For emergency stop applications, always use a trigger action push button (per EN/IEC 13850).

### Table 19.134: Circular Legends for Emergency Stop Mushroom Heads (yellow background)

Diameter	Text	Catalog Number	\$ Price
CO	Blank	ZBY9101	0.40
60 mm	EMERGENCY STOP	ZBY9330	
90 mm	Blank	ZBY8101	3.40
90 11111	EMERGENCY STOP	ZBY8330	

Legends . . . . . pages 19-58 to 19-60



### Table 19.135: Non-Illuminated Selector Switches



ZB5AD• Standard Lever



ZB5AJX• Extended Lever

Color	Number and Ty	Number and Type of Positions		Extended Lever Number	\$ Price
Black	2-maintained	$\vee$	ZB5AD2	ZB5AJ2	24.00
Black	2-momentary from right to left	$\Diamond$	ZB5AD4	ZB5AJ4	29.40
Black	3-maintained	$\vee$	ZB5AD3	ZB5AJ3	24.00
Black	3-momentary to center	$\Diamond$	ZB5AD5	ZB5AJ5	29.40
Black	3-momentary from left to center	<b>\(\frac{1}{2}\)</b>	ZB5AD7	ZB5AJ7	29.40
Black	3-momentary from right to center	$\downarrow \downarrow$	ZB5AD8	ZB5AJ8	29.40

For colored lever, add the following code to the end of catalog number: 01—white, 03—green, 04—red, 05—yellow, 06—blue (Example: ZB5AD204).

### Table 19.136: Non-Illuminated Key Switches



ZB5AG•

	Type of Operator	Number and Type	of Positions	Catalog Number ■	\$ Price
			<b>\</b>	ZB5AG2	
	Key (No. 455)	2-maintained		ZB5AG4	
			VP.	ZB5AG02	
		2-momentary from right to left	<b>\( </b>	ZB5AG6	
				ZB5AG0	90.00
			\$	ZB5AG3	
		3-maintained	<b>N</b>	ZB5AG5	
Note:	The symbol $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$		<b>V</b>	ZB5AG9	
•	Other key numbers: —key no. 421E: add the suffix 12 to the catalog number.		$\bigvee$	ZB5AG09	
	<ul><li>—key no. 458A: add the suffix 10 to the catalog number.</li><li>—key no. 520E: add the suffix 14 to the catalog</li></ul>	3-momentary from left to center	<b>\</b> \$	ZB5AG1	
	number.  —key no. 3131A: add the suffix 20 to the catalog number.  —key no. 8D1: add the suffix D to the catalog number.  Example: The catalog number for a head with key no. 421E for a 2 position maintained, lockable selector switch, with key withdrawal from the left-hand position, becomes:  ZB5AG212	3-momentary to center		ZB5AG7	
			\$	ZB5AG8	116.00
		3-momentary from right to center	<b>V</b>	ZB5AG08	
			<b>₹</b> }	ZB5AG05	

### Table 19.137: Sequence of Contacts on Selector Switch Bodies

Unit Type			Selector Switches													
		2-position				3-position										
		3:	15°	)			.5°	3	15°			0.				·5°
Operator Plunger Position	Up															
Operator Fluriger Fosition	Down															
Contact Block Location		L	С	R	L	С	R	L	С	R	L	С	R	L	С	R
O-mto-sto	N/O	0	0	0	Х	Х	Х	Х	Х	0	0	0	0	0	Χ	Х
Contacts	N/C	Х	Х	Х	0	0	0	0	0	Χ	Х	Χ	Х	Х	0	0

Discount Schedule

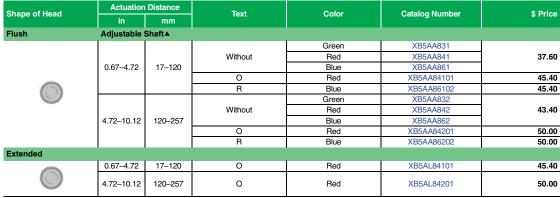
CS2

Note: L=Left, C=Center, R=Right, O=Open, X=Closed

Selector Switch Sequence (Table 19.91) . . . . . . . . . . . . page 19-33







Shaft only (short) is W40437632 (Price = \$20.00)

### Table 19.139: Potentiometer Operator (with Mounting Collar)

Shape of Head	Description	Application	Catalog Number	\$ Price
	For potentiometer with shaft length 1.73 to 1.97 in.	For shaft Ø 0.25 in. (6.35 mm)	ZB5AD922	142.00
	(44 to 50 mm) (potentiometer not included)	For shaft Ø 0.24 in. (6 mm)	ZB5AD912	142.00



XD5PA12

### Table 19.140: Joystick (54 mm, Extended Operating Shaft) ■

Description	Contact Operation	Action	Catalog Number	\$ Price
2 direction	1 step 1 N.O. contact	Maintained	XD5PA12	250.00
	per direction	Momentary	XD5PA22	230.00
4 direction $\longleftrightarrow$	1 step 1 N.O. contact per direction	Maintained	XD5PA14	316.00
		Momentary	XD5PA24	316.00

■ Do not use standard contact blocks ZBE10• (single) or ZBE20• (double)

### Table 19.141: Legends for Joystick

Description	For use with		Catalog Number	\$ Price
Legends 30 x 48 mm for engraving	O divention	Black one side Red reverse	ZBG2201	
	2 direction	White one side Yellow reverse	ZBG2401	3.40
Legends 48 x 48 mm for engraving	aving 4 direction	Black one side Red reverse	ZBG4201	3.40
		White one side Yellow reverse	ZBG4401	



XB5DS•

### Table 19.142: Hour Counters ◆

Table 19.143: Buzzer ♦

Cha	aracteristics	Supply Voltage	Catalog Number	\$ Price
		12-24 Vdc or Vac, 50/60 Hz	XB5DSB	
Indication 0–9999.9 (IP40 NEMA 1)		120 Vac, 60 Hz	XB5DSG	383.00
(		230-240 Vac. 50 Hz	XB5DSM	



XB5KS.

ZB5AD28

Table 1011 101 Edition V								
Characteristics	Supply Voltage	Catalog Number	\$ Price					
05	24 Vdc or Vac, 50/60 Hz	XB5KSB						
85 db buzzer:4kHz, continuous or intermittent (IP40 NEMA 1)	120 Vac, 60 Hz	XB5KSG	183.00					
(IF40 NEWA I)	230-240 Vac, 50 Hz	XB5KSM						

UR E191025, XHNR2 and XHNR8

### Table 19.144: Two Position Toggle Switch

Shape of Head	Color	Type of Positions	Catalog Number	\$ Price
	Black	Maintained	ZB5AD28	46.60
	Black	Momentary	ZB5AD48	40.00

Discount Schedule

Legends . . . . . pages 19-58 to 19-60

19-51

## www.schneider-electric.us



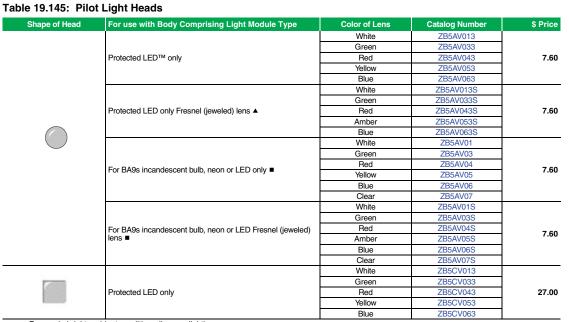
ZB5AV053



ZB5AV01



ZB5CV063



- For use in bright ambient conditions (i.e., sunlight).
  Order bulb separately; see page 19-40. For BA9 LED, see page 19-120.

Legends...... pages 19-58 to 19-60

Discount Schedule



ZB5AV6



ZB5AV3

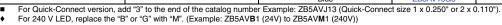
Table 19.146: Complete Bodies (Mounting Collar + Light Module for BA9s Incandescent Bulb, Neon or LED)

Description	Light Source	Supply Voltage (V)	Catalog Number	\$ Price
Screw clamp terminal co	nnections	<u> </u>		
Direct supply	BA9s bulb 2.4 W max. Not included ▲	<u>&lt;</u> 250	ZB5AV6	38.60
Direct supply	BA9s incandescent bulb included	24 V 2 W	ZB5AV624	49.20
Direct supply	BA9s incandescent bulb included	120 V 2.4 W	ZB5AV6120	49.20
		110–120 Vac 50/60 Hz	ZB5AV3	
		230–240 Vac 50/60 Hz	ZB5AV4	
Transformer type 1.2 VA, 6 V secondary	BA9s incandescent bulb included	400–50 Hz	ZB5AV5	98.00
1.2 VA, 0 V Secondary	Suis induded	440–480 Vac 60 Hz	ZB5AV8	
		550–600 Vac 60 Hz	ZB5AV9	

Order bulb separately, see page 19-61.

### Table 19.147: Complete Bodies (Mounting Collar + Light Module with Protected LED™) ■ ◆

•		•		
Light Source	Supply Voltage	Color of Light Source	Catalog Number	\$ Price
Screw clamp terminal connection	is			
		White	ZB5AVJ1	
		Green	ZB5AVJ3	
	12 Vac/Vdc	Red	ZB5AVJ4	57.00
		Yellow	ZB5AVJ5	
		Blue	ZB5AVJ6	
		White	ZB5AVB1	
		Green	ZB5AVB3	
	24 Vac/Vdc	Red	ZB5AVB4	57.00
		Yellow	ZB5AVB5	
hote		Blue	ZB5AVB6	
Protected		White	ZB5AVBG1	
1 1-17		Green	ZB5AVBG3	
	24-120 Vac/Vdc	Red	ZB5AVBG4	57.00
		Yellow	ZB5AVBG5	
		Blue	ZB5AVBG6	
		White ZB5AV0	ZB5AVG1	
		Green	ZB5AVG3	
	110-120 Vac	Red	ZB5AVG4	57.00
		Yellow	ZB5AVG5	
		Blue	ZB5AVG6	
		White	ZB5AV18B1	
Flashing		Green	ZB5AV18B3	
riasillig	24 Vac/Vdc	Red	ZB5AV18B4	66.00
		Yellow	ZB5AV18B5	
Protected		Blue	ZB5AV18B6	
izn		White	ZB5AV18G1	
		Green	ZB5AV18G3	66.00
	110-120 Vac	Red	ZB5AV18G4	
		Yellow	ZB5AV18G5	
		Blue	ZB5AV18G6	



ZB5AV••

# Schneider Electric www.schneider-electric.us

### Table 19.148: Heads for Momentary Illuminated Push Buttons



ZB5AW313



ZB5AW363



ZB5AW143



ZB5CW313



ZB5AW33

Shape of Head	Type of Push	Color	Catalog Number	\$ Price
Only use with Protected LED	™ light modules			
-		White	ZB5AW313	
9-2-3		Green	ZB5AW333	
	Flush	Red	ZB5AW343	18.60
		Yellow	ZB5AW353	
		Blue	ZB5AW363	
		White	ZB5AW513	
		Green	ZB5AW533	
	Flush with clear boot	Red	ZB5AW543	31.00
		Yellow	ZB5AW553	
		Blue	ZB5AW563	
		White	ZB5AA18	
		Green	ZB5AA38	
	Flush for insertion of legend	Red	ZB5AA48	16.00
		Yellow	ZB5AA58	
		Blue	ZB5AA68	
		White	ZB5AW113	
		Green	ZB5AW133	
	Extended	Red	ZB5AW143	13.00
		Yellow	ZB5AW153	
		Blue	ZB5AW163	
		White	ZB5CW313	
		Green	ZB5CW333	27.00
	Flush for insertion of legend	Red	ZB5CW343	
		Yellow	ZB5CW353	
		Blue	ZB5CW363	
	<u> </u>	White	ZB5CW113	
		Green	ZB5CW133	
	Extended	Red	ZB5CW143	27.00
		Yellow	ZB5CW153	
		Blue	ZB5CW163	
Only use with light modules f	or a BA9s incandescent bulb, neon or LED			
		White	ZB5AW31	
		Green	ZB5AW33	
	Floris	Red	ZB5AW34	40.00
	Flush	Yellow	ZB5AW35	18.60
		Blue	ZB5AW36	
		Clear	ZB5AW37	
		White	ZB5AW11	
		Green	ZB5AW13	13.00
	Estanded	Red	ZB5AW14	
	Extended	Yellow	ZB5AW15	
		Blue	ZB5AW16	
		Clear	ZB5AW17	

### Table 19.149: Illuminated Push-on/Push-off Operators

Shape of Head	Type of Push	Color of Lens	Catalog Number	\$ Price
Only use with Protected LED lig	ht modules		<u> </u>	
		White	ZB5AH013	
		Green	ZB5AH033	
((())	Flush	Red	ZB5AH043	24.80
		Yellow	ZB5AH053	
		Blue	ZB5AH063	
		White	ZB5AH13	
		Green	ZB5AH33	
	Extended	Red	ZB5AH43	19.60
		Yellow	ZB5AH53	
		Blue	ZB5AH63	

Legends...... pages 19-58 to 19-60





ZB5AW7A1721





ZB5AW7•



**B** 5AT8643M



ZB5AK1213



ZB5AK1463

Shape of Head	Description	Marking	Cap Color	Degree of Protection	Catalog Number	\$ Price
No Marking						
Protected.		_	Green Red		ZB5AW7A3740	
	Two flush	_	White Black	IP66	ZB5AW7A1720	45.60
Protected.	One flush One extended	_	Green Red	IP69K	ZB5AW7L3740	10.00
Premarked						
Protected.		"l" "O"	Green Red		ZB5AW7A3741	
LED 0	Two flush	"[" "O"	White Black		ZB5AW7A1721	
Protected.	One flush One extended	"I" "O"	Green Red	IP66	ZB5AW7l3741	49.50
Protected D	Two flush	"*" "*"	White Black	IP69K	ZB5AW7A1724	10.00
protected.	Two flush	" 1" " 2"	White Black		ZB5AW7A1715	
Without caps						
	Two flush without caps	_	_	IP66 IP69K	ZB5AW7A9	42.75

Table 19.151: Heads for Maintained Illuminated Push Buttons

Shape of Head	Type of Push	Color	Catalog Number	\$ Price
Only use with Protected	LED light modules			
		White	ZB5AW713	
		Green	ZB5AW733	
	Turn-to-Release Mushroom (40 mm)	Red	ZB5AW743	63.00
		Yellow	ZB5AW753	
		Blue	ZB5AW763	

Table 19.152: Emergency Stop, Trigger Action and Mechanical Latching Push Button with Mechanical State Indicator for Elevator Inspection Box Applications—Heads Only

Shape of Head	Type of Reset	Color	Catalog Number	\$ Price
QQQ	Push-pull (40 mm)	Red	ZB5AT8643M	124.00

NOTE: ZB5AT8643M not to be used with ZBZ16\* guard.

### Table 19.153: Illuminated Selector Switches, Standard Lever

Shape of Head	Number and Type of Positio	Number and Type of Positions			
Only use with Protecte	ed LED light modules				
	2-maintained	<u></u>	ZB5AK12★3	35.00	
	2-momentary from right to left	$\Diamond$	ZB5AK14★3	51.00	
	3-maintained	$\vee$	ZB5AK13★3	35.00	
	3-momentary to center	$\Diamond$	ZB5AK15★3	51.00	
	3-momentary from right to center	$\checkmark$	ZB5AK18★3	51.00	
	3-momentary from left to center	</td <td>ZB5AK17★3</td> <td>51.00</td>	ZB5AK17★3	51.00	

<sup>★</sup> Designate color as follows: 1—white, 3—green, 4—red, 5—yellow, 6—blue

### Table 19.154: Sequence of Contacts on Selector Switch Bodies

Unit Type			Selector Switches													
Onit Type				2-po:	sition			3-position								
		:	315°	)			15 )	:	315°						Ø <sup>45</sup>	•
	Up															
Operator Plunger Position	Down															
Contact Block Location		L	С	R	L	С	R	L	С	R	L	С	R	L	С	R
Contacts	N/O	0	0	0	X	X	X	X	Χ	0	0	0	0	0	X	X
	N/C	ΙX	ΙX	I X	10	. 0	. 0	10	0	ΙX	I X	ΙX	ΙX	ΙX	. 0	0

Note: L=Left, C=Center, R=Right, O=Open, X=Closed

Legends . . . . . pages 19-58 to 19-60 Caps . . . . . . . . . . . . page 19-60

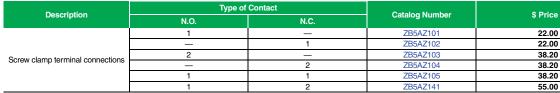


### www.schneider-electric.us

NOTE: For the Quick-Connect version, add the numeral 3 to the end of the catalog number. Example: ZB5AZ1013 (Quick-Connect size 1 x 0.250" or 2 x 0.110").

### Table 19.155: Contact Blocks (Mounting Collar with Contact Blocks) ▲ ■ ◆

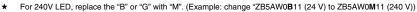




- For Ring Tongue compatible blocks add "9" to the end of the catalog number (Example: ZB5AZ1029).
- Electrical components with connection by printed circuit board pins are available. Refer to Catalog 9001CT0001 for more information. Electrical components with connection by plug-in connector are available. Refer to Catalog 9001CT0001 for more information.

### Table 19.156: Complete Bodies (Mounting Collar + Single Contact Block + Light Module with Protected LED™)







ZB5AW0••1

ZB5AW065



ZB5AW035

### Table 19.157: Mounting Collar, Contact Block and Light Module (with screw clamp terminal connections) ▼

	•			•	•	•	•		
Cumphy	Light Source	Comple Vallage	Type of 0	Contact ▼	Color of Light	Catalan Number	\$ Price		
Supply	Supply Light Source	Supply Voltage	N.O.	N.C.	Source	Catalog Number	\$ Price		
Screw clamp term	inal connections								
			1	-	_	ZB5AW061	55.00		
Directormely	BA9s	. OEO \/aa/\/da	_	1	_	ZB5AW062	55.00		
Direct supply	2.4 W max. bulb Not included △	<_250 Vac/Vdc	<_250 Vac/Vuc	<_250 vac/vuc	2	_	_	ZB5AW063	71.00
			1	1	_	ZB5AW065	71.00		
		110-120 Vac	1	_	_	ZB5AW031	114.00		
		50/60 Hz	1	1	_	ZB5AW035	130.00		
Transformer type 1.2 VA. 6 V	BA9s incandescent	230-240 Vac	1	_	_	ZB5AW041	114.00		
secondary	bulb included	50/60 Hz	1	1	_	ZB5AW045	130.00		
		440–480 Vac	1	_	_	ZB5AW081	114.00		
		60 Hz	1	1	_	ZB5AW085	130.00		

- Can be fitted with additional contact blocks, see page 19-56.
- Order bulb separately, see page 19-61.





ZB5AZ009



ZBE101



ZBE203



ZBVB•

### Table 19.158: Body/Mounting Collar

For use with	Catalog Number	\$ Price
Electrical block (contact or light module)	ZB5AZ009	5.40

Table 19.159: Add-On Contact Block (with screw clamp terminal connections) ★▼

Description		Туре о	f Contact	Outstan Name	0 Pulsa
Description		N.O.	N.C.	Catalog Number	\$ Price
Standard single contact blo	a also A =	1	_	ZBE101	16.40
Standard single contact bit	OCRS -	_	1	ZBE102	16.40
		2	_	ZBE203	33.20
Standard double contact b	locks▲■	_	2	ZBE204	33.20
		1	1	ZBE205	33.20
O		1	_	ZBE1016	32.80
Special contact blocks for lo	ow-power switching ◆	=	1	ZBE1026	32.80
Low-power switching	Dusty environment ◆	1	_	ZBE1016P	32.80
Low-power switching	(IP5X, 50 μm dust)	_	1	ZBE1026P	32.80
	Early make N/O	1	-	ZBE201	16.40
Staggered contacts  N/C  Overlapt N/O+N/C  Staggere	Late break N/C	_	1	ZBE202	16.40
	Overlapping N/O+N/C	1	1	ZB4BZ106	32.80
	Staggered N/O+N/O	_	2	ZB4BZ107	32.80

- For Quick-Connect version add "3" to the end of the catalog number (Example: ZBE1013) (Quick-Connect size 1 x 0.250" or 2 x 0.110"). For Ring Tongue compatible blocks add "9" to the end of the catalog number (Example: ZBE1029).
- Cannot stack additional contact blocks onto these blocks.

### Table 19.160: Light Modules (with screw clamp terminal connections)★▼

Description	Supply Voltage	Color of Light Source	Catalog Number	\$ Price	
		White	ZBVJ1		
		Green	ZBVJ3		
	12 Vac/Vdc	Red	ZBVJ4	52.00	
		Yellow	ZBVJ5		
		Blue	ZBVJ6		
		White	ZBVB1		
		Green	ZBVB3		
	24 Vac/Vdc	Red	ZBVB4	52.00	
		Yellow	ZBVB5		
		Blue	ZBVB6		
		White	ZBVG1		
- +octed		Green	ZBVG3		
Protected	110-120 Vac	Red	ZBVG4	52.00	
1 FD		Yellow	ZBVG5		
		Blue	ZBVG6		
		White	ZBVBG1	,	
		Green	ZBVBG3		
	24-120 Vac/Vdc	Red	ZBVBG4	52.00	
		Yellow	ZBVBG5		
		Blue	ZBVBG6		
		White	ZBVM1	,	
		Green	ZBVM3		
	230-240 Vac	Red	ZBVM4	52.00	
		Yellow	ZBVM5		
		Blue	ZBVM6		
Direct supply for BA9s (2.4 W max. bulb not included—see page 19-61)	< 250 Vac/Vdc	_	ZBV6	33.20	

- Electrical components with connection by printed circuit board pins are available. Refer to Catalog 9001CT0001 for more details. Electrical components with connection by plug-in connector are available. Refer to Catalog 9001CT0001 for more details.





ZB5AZ009

#### 2.00 m 5 1.00 m 5 1.00 m 10 1.00 m 1

ZBE1015



### Table 19.161: Spring Terminal Products for XB5 22 mm Push Buttons

### **Body/Mounting Collar**

For Use With	Catalog Number	\$ Price
Contact block or light module	ZB5AZ009	5.40

### Contact Blocks A

Spring Terminal Connection	ns, Contacts for Standard Application	ns			
Description	Type of Contact	N/O	<b>→</b> N/C	Catalog Number	\$ Price
	Oliveral -	1	-	ZBE1015	18.00
	Single	_	1	ZBE1025	18.00
		1	-	ZB5AZ1015	24.00
Contact blocks		_	1	ZB5AZ1025	24.00
	Single with body/mounting collar	2	-	ZB5AZ1035	42.00
	222,iodi.milg oolidi	_	2	ZB5AZ1045	42.00
		1	1	ZB5AZ1055	42.00

### Light Modules A

Description	Supply Voltage	Color of Light Source	Catalog Number	\$ Price
		White	ZBVJ15	57.00
		Green	ZBVJ35	57.00
	12 Vac/Vdc	Red	ZBVJ45	57.00
		Orange	ZBVJ55	57.00
		Blue	ZBVJ65	57.00
		White	ZBVB15	57.00
Integral LED (to combine with	24 Vac/Vdc	Green	ZBVB35	57.00
		Red	ZBVB45	57.00
eads for integral LED)		Orange	ZBVB55	57.00
protected		Blue	ZBVB65	57.00
"EN		White	ZBVG15	57.00
		Green	ZBVG35	57.00
	110-120 Vac	Red	ZBVG45	57.00
		Orange	ZBVG55	57.00
		Blue	ZBVG65	57.00
		White	ZBVM15	57.00
		Green	ZBVM35	57.00
	230-240 Vac	Red	ZBVM45	57.00
		Orange	ZBVM55	57.00
		Blue	ZBVM65	57.00

<sup>▲</sup> Additional blocks **cannot** be attached to the back of these contact blocks or light modules.



\$ Price

2.00

3.40

14.20

3.40

3.40

\$ Price

2.00

3.40

ZBY2313

ZBY2326

ZBY2323

7BY2322

ZBY2306

ZBY2309

ZBY2334

ZBY2327

ZBY2303

ZBY2304

ZBY2366

ZBY2307

**Catalog Number** 

ZBZ33

**7BY6101** 

ZBY6102

Table 19.162: Standard (30 x 40 mm) Legend Holders for 8 x 27 mm Legends



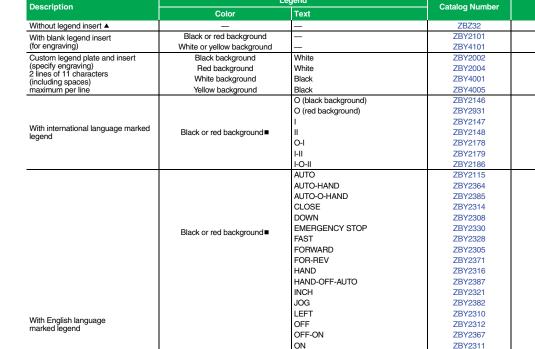
ZBZ32



ZBY•101



ZBY2303





ZBZ33



ZBY610•

For legends, see page 19-59.

With blank legend insert

Start functions: white letters on black background. Stop functions: white letters on red background (unless otherwise specified above).

OPEN

POWER ON

REVERSE

RIGHT

SLOW

START

STOP

UP

STOP-START

RUN

RESET (red background)

RESET (black background)

Black or red background

White or yellow background





**B Z** 4



**B** Y•H101

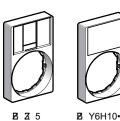


Table 19.164: 30 x 40 mm legend holder (flush mounting with bezel) for 8 x 27 mm legends

For use with

Circular and square heads

Circular and square heads

	•	` ,	•	
	Description ◆	Color	Catalog Number	\$ Price
	Without legend	_	ZBZ34	2.00
1	With blank legend	Black or red background	ZBY2H101	3.40
ı	With blank legend	White or yellow background	ZBY4H101	3.40

### Table 19.165: 30 x 50 mm legend holder (flush mounting with bezel) for 18 x 27 mm legends

<b>Description</b> ♦	Color	Catalog Number	\$ Price
Without legend	_	ZBZ35	4.20
With blank legend	Black or red background	ZBY6H101	5.40
	White or yellow background	ZBY6H102	5.40

For custom legends, please see page 19-59



### Table 19.166: Marked Legends for 8 x 27 mm (for 30 x 40 mm legend holders ZBZ32)

0 1	
ZBY02178	
_	

ZBY02303

Color	Marking	Text	Catalog Number	\$ Price	
		O (black background)	ZBY02146		
		O (red background)	ZBY02931		
		l I	ZBY02147		
	International	II	ZBY02148	1.70	
		O-I	ZBY02178		
		1-11	ZBY02179		
		I-O-II	ZBY02186		
		AUTO	ZBY02115		
		AUTO-HAND	ZBY02364		
		AUTO-O-HAND	ZBY02385		
		CLOSE	ZBY02314		
		DOWN	ZBY02308		
	English	EMERGENCY STOP	ZBY02330		
	Liigiisii	FAST	ZBY02328		
		FORWARD	ZBY02305		
		FOR-REV	ZBY02371		
	HAND-OFF-AUTO ZBY02	ZBY02316			
Diods or red bookers and t		ZBY02387			
Black or red background▲		INCH	ZBY02321		
		JOG	ZBY02382		
		LEFT	ZBY02310		
		OFF	ZBY02312	1.70	
		OFF-ON	ZBY02367		
		ON	ZBY02311		
	OPEN POWER ON RESET (red background) RESET (black background)	OPEN	ZBY02313		
		POWER ON	ZBY02326		
			RESET (red background)	ZBY02323	
		ZBY02322			
		REVERSE	ZBY02306		
		RIGHT	ZBY02309		
		RUN	ZBY02334		
		SLOW	ZBY02327		
		START	ZBY02303		
		STOP	ZBY02304		
		STOP-START	ZBY02366		
		UP	ZBY02307		

Start functions: white letters on black background. Stop functions: white letters on red background (unless otherwise specified above).

### Table 19.167: Legends for Customer Engraving (inserts only)

Description	For use with	For use with Color 1		Catalog Number	\$ Price
0 14 07 110111	20 v 40 mm la sand halders	Black or red background	White	ZBY0101	
8 x 27 mm	30 x 40 mm legend holders	White or yellow background	Black	ZBY0102	1.70
18 x 27 mm	30 x 50 mm legend holders	Black or red background	White	ZBY5101	1.70
18 X 27 mm	30 x 30 min legend holders	White or yellow background	Black	ZBY5102	

### Table 19.168: Legends for Factory Engraving (inserts only)

Description	For use with	Color Text		Catalog Number	\$ Price
8 x 27 mm		Black background	White	ZBY01002	
Custom legend/insert only		Red background	White	ZBY01004	
(specify engraving) 2 lines of 11 characters	00 10 1 11 11	White background	Black	ZBY01001	40.00
(including spaces) maximum per line Example: ZBY01002 marked "Robot"	30 x 40 mm legend holders	Yellow background	Black	ZBY01005	12.20
18 x 27 mm		Black background	White	ZBY05002	
Custom legend/insert only (specify engraving) 3 lines of 11 characters (including spaces) maximum per line Example: ZBY05002 marked "Robot"		Red background	White	ZBY05004	
		White background	Black	ZBY05001	40.00
	30 x 50 mm legend holders	Yellow background	Black	ZBY05005	12.20

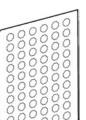


Table 19.169: Sheets of Legends for Push Buttons, Switches, and Pilot Lights

Description	Marking	Text	Catalog Number	\$ Price	
	Blank-Round		ZBY1101	6.20	
	Blank-Square legends		ZBCY1101	6.20	
	-	0	ZBY1146		
		1	ZBY1147		
		II	ZBY1148	10.40	
Sheets of 66 circular	International	III	ZBY1149		
peel-off transparent self-		STOP	ZBY1304		
adhesive legends				1	ZBY1912
		HAND	ZBY1316		
	Faciliah	OFF	ZBY1312	10.40	
	English	ON	ZBY1311	10.40	
		START	ZBY1303		
SiS Label Software	Legend Design Software: English, F	rench, German, Spanish, Italian	XBY2U	104.00	

	)
ZBA∙	

ZBY1101



For use with	Type of Push	Color	Catalog Number	\$ Price
	1	White	ZBA1	
	Ī	Black	ZBA2	
	Ī	Green	ZBA3	2.00
	Flush	Red	ZBA4	2.00
		Yellow	ZBA5	
		Blue	ZBA6	
ZB5AA0 push button heads		6 colors ▲	ZBA9	4.20
ZBSAAU push bullon neads		White	ZBL1	
		Black	ZBL2	
		Green	ZBL3	2.00
	Extended	Red	ZBL4	2.00
		Yellow	ZBL5	
		Blue	ZBL6	
		6 colors ▲	ZBL9	4.20

Table 19.171: Push Button Caps-Marked



F	Torre of Breek	Mari	king	Cap Color		\$ Price
For use with	Type of Push	Text	Color	Cap Color	Catalog Number	
		1 =	White	Green	ZBA331	
		· •	Black	White	ZBA131	
		START ■	White	Green	ZBA333	
		SIARI =	Black	White	ZBA133	
		ON	White	Green	ZBA341	
		ON	Black	White	ZBA141	
		UP ■	Black	White	ZBA343	
		DOWN■	White	Black	ZBA344	
ZB5AA0 Flush push button heads		• (	White	Green	ZBA345	
	Flush	$\bigcirc$	White	Black	ZBA245	4.20
		$\Leftrightarrow$	White	Green	ZBA346	
			Black	White	ZBA334◆	
		1	White	Black	ZBA335♦	
		0-	140.7	Red	ZBA432	
		O■	White	Black	ZBA232	
		0700-	140.7	Red	ZBA434	
		STOP■	White	Black	ZBA234	
		OFF	\A/I+'+-	Red	ZBA435	
		OFF	White	Black	ZBA235	
		R■	White	Blue	ZBA639	

- Set of 6 different colored caps: white, black, green, red, yellow, blue.

  Double injection molded marking.

  Cap supplied not clipped-in, allowing orientation of arrow in any one of 4 directions: ↑,↓, ← or →

2.00

4.40

3.40









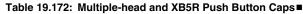






ZBA79

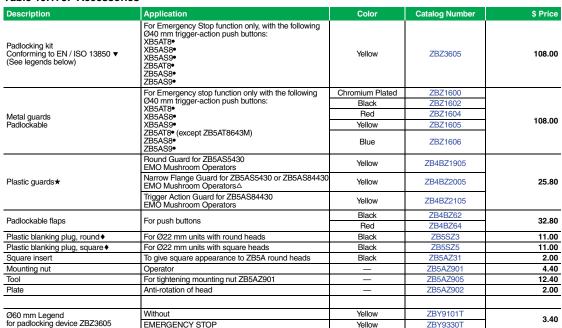
ZBZ3605



For use with	Type of Push	Marking	Cap Color	Catalog Number	\$ Price
		Unmarked		ZBA71	4.00
		"I" black	White	ZBA7131	5.30
		"→" black	vviille	ZBA7134	5.30
		"+" black		ZBA7138	5.30
		Unmarked		ZBA72	4.00
		"O" white		ZBA7232	5.30
	Flush	"+" white	Black	ZBA7233	5.30
		"→" white		ZBA7235	5.30
Double push button heads		"I" white		ZBA7237	5.30
Tripe push button heads ZB4RZA0		Unmarked	Green	ZBA73	4.00
ZB5RZA0		"I" white		ZBA7331	5.30
		"+" white		ZBA7333	5.30
		" <b>↑</b> " white		ZBA7335	5.30
		"II" white		ZBA7336	5.30
		Unmarked	Red	ZBA74	4.00
		"O" white	neu	ZBA7432	5.30
		Unmarked	Yellow	ZBA75	4.00
		Unmarked	Blue	ZBA76	4.00
		Assorted	10 colors◆	ZBA79	3.00

- Sold in lots of 10.
- Set of 10 different caps: white, black, green, red, yellow, blue, white "I" on green background, black "I" on white background, white "O" on red background, white "O" on black background.

#### Table 19.173: Accessories





ZBZ160•





ZB5SZ3

- Mounting nut included with blanking plug.
- For additional information, refer to publication 9001DB0601R6/06.
- Standard circular legends are not compatible with this product. Use special legends ZBY• •T listed above.

**EMERGENCY STOP** 

Maximum panel thickness is 2.5 mm.

### Table 19.174: BA9s Bulbs and Associated Accessories





XBFX13



Description	Characteristics	Catalog Number	\$ Price
	6 V, 1.2 W	DL1CB006	
Replacement bulbs (Type BA9s)	12 V, 2 W	DL1CE012	11.00
Incandescent	24 V, 2 W	DL1CE024	11.00
mod no soon	120-130 V, 2.4 W	DL1CE130	
Neon bulbs	120–130 V	DL1CF110	15.20
	230-240 V	DL1CF220	15.20
Bulb extractor	_	XBFX13	11.00
Lens cap tightening tool	Illuminated push buttons with flush push	ZBZ8	6.20
Power driver bits for mounting and wiring (package of 5)	Cross headed screw (POZIDRIV type 1)	ZB4BZ905	52.00
Mounting Adapter	For mounting 22 mm push button in 30 mm knockout	ZBZ41	10.40

Yellow

ZBY9330T



ZBDD2



	Description	For use with	Color & Material	Sold in Lots of	Catalog Number	\$ Price
		XB5 plastic mushroom head push button ▲, Ø40 mm or Ø60 mm	Red Silicone	2	ZBZ48	
			Black EPDM	2	ZBZ28	12.40
			Yellow EPDM	2	ZBZ58	

<sup>▲</sup> Only when mounted on control stations. Use special legends ZBY• •T.

### Table 19.176: Boot for standard selector switch handle

Description	For use with	Catalog Number	\$ Price
Boot for standard handle	ZB5A••	ZBDD2	12.40

### Table 19.177: Replacement Keys

Description	Key Number	Catalog Number	\$ Price
	455	ZBG455	
Set of 2 keys	421E	ZBG421E	
	458A	ZBG458A	11.00
	520E	ZBG520E	
	3131A	ZBG3131A	
	455	ZBG455P	
Set of 2 keys, One of which is supplied booted (rubber boot)	421E	ZBG421EP	
	458A	ZBG458AP	23.40
	520E	ZBG520EP	
	3131A	ZBG3131AP	

### Table 19.178: Clear Boots

14510 15.170.	Tubic 10.176. Cical Books					
Description	For use with	Material	Catalog Number	\$ Price		
Single boots	Booted push buttons with circular head		ZBP0	12.40		
Single boots	Booted push buttons with circular head used in food industry applications		ZBP0A	12.40		
Double boots	Double-headed push buttons, two flush	Silicone	ZBA708	10.80		
Double boots	Double-headed push buttons, one flush + one projecting		ZBA709	10.80		
Triple boot	Triple-headed push buttons, two flush + one projecting		ZBA710	10.80		

### Table 19.179: Colored boots

Description	Color	Catalog Number	\$ Price
	Black Green	ZB2 BP012 ZB2 BP013	
Single boot (can be replaced without dismantling the head)	Red	ZB2 BP014	13.00
(can be replaced without dismantling the nead)	Yellow	ZB2 BP015	

Color

Catalog Number

### Table 19.180: Lens Caps

For use with

Lens caps for Protected LED™ light modules			
Pilot lights	White Green Red Yellow Blue	ZBV0113 ZBV0133 ZBV0143 ZBV0153 ZBV0163	5.40
Illuminated push buttons with flush push	White Green Red Yellow Blue	ZBW9113 ZBW9133 ZBW9143 ZBW9153 ZBW9163	5.40
Illuminated push buttons with extended push	White Green Red Yellow Blue	ZBW9313 ZBW9333 ZBW9343 ZBW9353 ZBW9363	5.40
Circular lens caps for BA9s light modules			
Pilot lights	White Green Red Yellow Blue Clear	ZBV011 ZBV013 ZBV014 ZBV015 ZBV016 ZBV017	5.40
Illuminated push buttons with flush push	White Green Red Yellow Blue Clear	ZBW911 ZBW913 ZBW914 ZBW915 ZBW916 ZBW917	5.40
Illuminated push buttons with extended push	White Green Red Yellow Blue Clear	ZBW931 ZBW933 ZBW934 ZBW935 ZBW936 ZBW937	5.40
Square lens caps for Protected LED light modules (ZB5C operators only)			
Pilot lights	White Green Red Yellow Blue	ZBCV0113 ZBCV0133 ZBCV0143 ZBCV0153 ZBCV0163	9.40
Illuminated push buttons with flush push	White Green Red Yellow Blue	ZBCW9113 ZBCW9133 ZBCW9143 ZBCW9153 ZBCW9163	9.40
Illuminated push buttons with extended push	White Green Red Yellow Blue	ZBCW9313 ZBCW9333 ZBCW9343 ZBCW9353 ZBCW9363	9.40





ZBA709





















XB5RFA02



ZBRT1



ZB4RZA0







ZB5RTA4

### Table 19.181: Ready-to-use Packs▲

Description	Transmitter Type	Voltage Receiver V	Receiver Type	Catalog Number	\$ Price
Packs include:	Ø 22 mm plastic head + 1 set of 10 different colored caps	~/==	√/ Programmable receiver with:		510.00
- 1 push button/transmitter - 1 receiver The push button and receiver are factory-paired	Ø 22 mm metallic head + 1 set of 10 different colored caps	24 to 240 - 2 relay outputs type RT 3A♦		XB4RFA02	510.00
	Ø 22 mm plastic head	Non-programmable receiver with:		XB5RFB01	210.00
, p	Ø 22 mm metallic head	24	- 1 relay output type RT 3A★	XB4RFB01	210.00
Packs include: - 1 push button/transmitter in	Ø 22 mm plastic head + 1 set of 10 different colored caps	~/ <del></del> 24 to 240	Programmable receiver with: - 2 relay outputs type RT 3A ◆	XB5RMA04	590.00
handy box▼ - 1 receiver The push button and receiver are factory-paired■	Ø 22 mm metallic head + 1 operator head	<del></del> 24	Non-programmable receiver with: - 1 relay output type RT 3A★	XB5RMB03	290.00

Table 19.182: Transmitter Components for Wireless, Batteryless Push Buttons

Description	Type of Push	Cap Color	Catalog Number	\$ Price
Transmitter for wireless, batteryless push buttons△ □	-	-	ZBRT1	110.00
Spring return push button heads for	Plastic	Without cap♦	ZB5RZA0	18.60
transmitter ZBRT1	Metal	Without cap♦	ZB4RZA0	10.00
		White	ZB5RTA1	
		Black	ZB5RTA2	
		Green	ZB5RTA3	
	Plastic	Green with white "I"	ZB5RTA331	130.00
	Plastic	Red	ZB5RTA4	
		Red with white "O"	ZB5RTA432	
Wireless, batteryless push buttons		Yellow	ZB5RTA5	
including:		Blue	ZB5RTA6	
<ul> <li>a transmitter fitted with mounting collar</li> <li>a spring return push button head with</li> </ul>		White	ZB4RTA1	
clipped-in cap☆		Black	ZB4RTA2	
		Green	ZB4RTA3	130.00
	Metal	Green with white "I"	ZB4RTA331	
	Metal	Red	ZB4RTA4	
		Red with white "O"	ZB4RTA432	
		Yellow	ZB4RTA5	
		Blue	ZB4RTA6	

- Wireless and batteryless push button and receiver, factory-paired. For additional components, these devices can be field-paired.
- Supplied with output function set to momentary. Outputs programmable to maintained and Start-Stop.

- Supplied with output intended set of mieritary outputs programmable to maintain Non-programmable momentary output function.

  Supplied with a magnet.

  Mounting collar ZB5AZ009 (plastic) or ZB4BZ009 (metal) to be ordered separately.

  Only heads ZB4RZA0 and ZB5RZA0 are mechanically compatible.

  Cap to be ordered separately: see Table 19.184 on page 19-64.

  This cap is fitted by Schneider Electric and cannot be removed (risk of damage).

### Harmony™ XB5R Plastic and XB4R Metal Wireless, Batteryless Push Buttons

Refer to Catalog **DIA4ED2060507BEN-US** 



Table 19.183: Programmable Receivers

Description	Output Type	Voltage Receiver V	Catalog Number	\$ Price
Programmable receivers equipped with: - 2 buttons ("Scroll-through", "Ok") - 6 indicating LEDs (power ON, outputs, signal strength)	4 PNP outputs, 200 mA / 24 V	<del></del> 24	ZBRRC	430.00
	2 relay outputs type RT 3A▲	√/ 24 to 240	ZBRRA	430.00

Table 19.184: Caps for Harmony Push Button Heads ZB5RZA0 and ZB4RZA0

Description	Background Color	Marking	Sold in lots of	Catalog Number	\$ Price
		Without	10	ZBA71	4.00
	White	"I" (black)	10	ZBA7131	5.30
	Write	"t" (black)	10	ZBA7134	5.30
		"+" (black)	10	ZBA7138	5.30
		Without	10	ZBA72	4.00
		"O" (white)	10	ZBA7232	5.30
		"+" (white)	10	ZBA7233	5.30
		"₽" (white)	10	ZBA7235	5.30
Sets of 10 different colored caps with		"I" (white)	10	ZBA7237	5.30
identical marking■	Green	Without	10	ZBA73	4.00
		"I" (white)	10	ZBA7331	5.30
		"+" (white)	10	ZBA7333	5.30
		"企" white	10	ZBA7335	5.30
		"II" (white)	10	ZBA7336	5.30
	Red	Without	10	ZBA74	4.00
	Red	"O" (white)	10	ZBA7432	5.30
	Yellow	Without	10	ZBA75	4.00
	Blue	Without	10	ZBA76	4.00
Set of 10 different colored caps with different markings■	White, black, green, red, yellow, blue, white "I" on green background, black "I" on white background, white "O" on red background, white "O" or black background		10	ZBA79	3.00

### Table 19.185: Boxes for Wireless, Batteryless Push Buttons

Description	For use with:		Sold in lots of	Catalog Number	\$ Price
Handy box, plastic, empty ◆ ★	Mobile wireless,batteryless push buttons	1 cut-out	1	ZBRM01	80.00
Empty enclosures ▼	Mounted or on-board wireless,batteryless push	1 cut-out	1	XALD01H7	32.80
	buttons	2 cut-outs	1	XALD02H7	38.20

### Table 19.186: Accessories

Description	escription For use with:		Sold in lots of	Catalog Number	\$ Price
External antenna △	Between transmitter and receiver, used to increase the range and/or get around obstacles	~/ 24 to 240 V - 5m cable - 1 power-ON LED - 2 LEDs reception/transmission	1	ZBRA1	170.00
Mounting collar		Plastic	10	ZB5AZ009	5.40
Mounting collar		Metal	10	ZB4BZ009	5.40
Legend plate, 27 x 8 mm, for engraving	For adhering to handy box ZBRM01	Self-adhesive, blank, black background	10	ZBY0101T	1.70

Supplied with output function set to momentary Outputs programmable to maintained and Start-Stop. Cap can be clipped-in at  $90^\circ$  steps, through  $360^\circ$ .

Discount Schedule

- Cannot be used for wired contacts (no cable gland outlet).
- Supplied with a magnet.

  Box equipped with cable gland outlets, compatible with Harmony ZB5 push button heads.
- Not wired to the receiver.









ZBA79



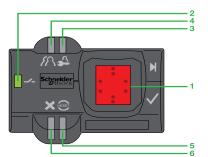
ZBRM01



XALD02H7













### **Biometric Switches**

The fingerprint-reading biometric switch is designed for use in industry to restrict access to systems or machines. No interface is required to program or operate the switch: it is an independent unit.

Two types of products are available:

- Maintained biometric switches, Type XB5S1B, with two fixed states
- Momentary biometric switches, Type XB5S2B, with pulse output

The biometric switch is aimed at two types of users:

- The administrator who manages the registration and deletion of fingerprints
- The operator who, once registered, uses the product as a control unit

The product is of monolithic design (a single plastic housing) and is mounted by a nut (hand-tightened without the need for tools) in a standard 22 mm diameter hole. It operates on a 24 Vdc supply.

The product connects to the power supply and to the control output (relay or PLC) with a 2 meter cable or with an M12 connector.

It can be installed on a flat, horizontal, or vertical surface.

Two protective covers are available (see table below)

- One to protect the active face of the sensing screen. This cover is attached with a self-adhesive hinge
- One made of 12 gauge stainless steel designed to cover the entire switch which protects the
  entire switch from the outdoor environment (rain, sleet, snow, sunlight, UV protection). It also gives
  some protection from someone trying to break into the switch

### Description

The product consists of a dark gray housing, with the following on its front face:

- A sensing screen (1) that allows the registration of fingerprints and subsequent recognition of the registered fingerprints
- A green LED output state indicator (2), which illuminates when the output is activated (N.O. solid state contact)
- An orange LED (3), indicating an administrator's Registration mode
- An orange LED (4), indicating an operator's Registration mode
- A red Reset LED (5), which indicates in Delete mode that the administrator is deleting all or part of the memory
- A red LED (6) which flashes to indicate an unrecognized fingerprint or incorrect operation

### Table 19.187: Complete Units

Description	Output	Connection	Catalog Number	\$ Price
** : : : : : : : : : : : : : : : : : :	PNP	2 m cable	XB5S1B2L2	580.00
Maintained biometric switch, 24 Vdc	PNP	M12 connector	XB5S1B2M12	595.00
Momentary biometric switch, 24 Vdc	PNP	2 m cable	XB5S2B2L2	580.00
with 0.5 s output pulse	FINE	M12 connector	XB5S2B2M12	595.00

### Table 19.188: Accessories

Description	Function	Catalog Number	\$ Price
Protective cover, translucent and self-adhesive	Protection of the sensing screen	ZB5SZ70	10.00
Mounting nut, Ø 22 mm	Replacement part	ZB5SZ71	6.00
Legend plate, 28 x 7 mm, self-adhesive, blank, with black background, for engraving		ZBY0101T	1.70
Mounting adapter	Allows this product to mount in a 30 mm mounting hole	ZBZ41	10.40
Stainless-steel protective cover	Protects switch from outside elements and vandalism	ZB5SZ72	220.00

### **XB5S Biometric Switches** Refer to Catalog DIA4ED2060507BEN-US



Table 19.189: Biometric Switch Specifications

Biometric Switch, Types >	(B5S1B**** and XB5S2B****				
Product certifications		UL, CSA, ( E IEC 61000-6-2 / IEC 61000-6-4			
Degree of protection	Conforming to EN/IEC 60529	IP 65, NEMA 1, 2, 3, 3R, 12			
Ambient air temperature	Storage	-25 to +70°C			
Ambient air temperature	Operation	-5 to +50°C			
Vibration resistance	Conforming to IEC 60068-2-6	1 gn, 9 to 500 Hz. Amplitude 3 mm, 5 to 9 Hz			
Electric shock resistance	Conforming to IEC60068-2-27	50 gn, duration 11 ms			
Connection method	Cable	Length: 2 m, 3-wire, pre-wired			
Connection method	Connector	M12			
Materials	Housing	Polyamide PA66			
Materials	Cable	PvR 3 x 0.34 mm <sup>2</sup>			
Memory capacity	•	200 records (100 users, operators, or administrators, each registering 2 fingerprints)			
Output state indicator		Green LED			
Short-circuit protection		By gG fuse, 250 mA			
Rated supply voltage		24 Vdc with protection against reverse polarity			
Voltage limits (including ripple	9)	20–30 Vdc			
Switching capacity		≤ 200 mA with protection against overloads and short-circuits			
Residual voltage, closed state	е	<u>≤</u> 1 V			
No-load current consumption		≤ 50 mA			
	First-up	<2s			
Delays	Response time	<1s			
	Recovery time	<1s			

NOTE: Momentary switch has 0.5 s output pulse.

Figure 19.1: Connections

M12

1 (+) BU: Blue 3 (-) BN: Brown 4 Output BK: Black

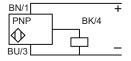
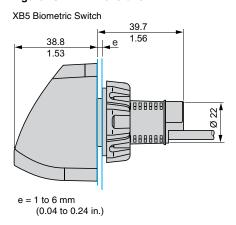
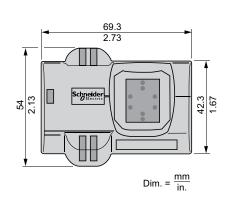
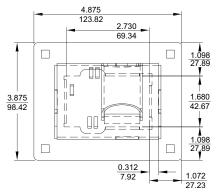


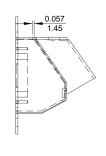
Figure 19.2: Dimensions

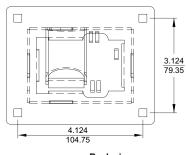




### Stainless-Steel Cover







Back view (for mounting)



### Table 19.190: Non-Illuminated Momentary Push Button Operators UL Types 4, 13/NEMA 4, 13

For use in hazardous locations—See page 19-87.

Contact blocks and legend plate not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.

0 1						g, -	р. с с.		,
Descriptio	n	Color	Operator with 1 N.O. and 1 N.C. Contact (KA1)	\$ Price	Operator with 1 N.O. Contact (KA2)	Operator with 1 N.C. Contact (KA3)	\$ Price	Operator Only with No Contacts	\$ Price
		Black	KR1BH13		KR1BH5	KR1BH6		KR1B	
		Red	KR1RH13		KR1RH5	KR1RH6	]	KR1R	Ī
	F # 0 .	Green	KR1GH13		KR1GH5	KR1GH6	] [	KR1G	ĺ
	Full Guard	Universal ▲	KR1UH13		KR1UH5	KR1UH6		KR1U	I
9001KR1B		Other ■	KR1∎H13		KR1∎H5	KR1∎H6		KR1■	ı
300114115		Black	lack KR3BH13		KR3BH5	KR3BH6		KR3B	Ì
		Red	KR3RH13		KR3RH5	KR3RH6		KR3R	t
		Green	KR3GH13		KR3GH5	KR3GH6		KR3G	İ
	No Guard	Universal ▲	KR3UH13	89.00	KR3UH5	KR3UH6	66.00	KR3U	38.60
9001KR3B		Other ■	KR3■H13		KR3■H5	KR3■H6		KR3■	
		Black	KR2BH13		KR2BH5	KR2BH6	1	KR2B	
		Red	KR2RH13		KR2RH5	KR2RH6		KR2R	t
		Green	KR2GH13		KR2GH5	KR2GH6	1	KR2G	İ
	Extended Guard	Universal ▲	KR2UH13		KR2UH5	KR2UH6	1	KR2U	İ
9001KR2B		Other■	KR2■H13		KR2■H5	KR2■H6		KR2■	
000		Snap-In Plast	ic Mushroom Butto	n			<u> </u>		
		Black	KR4BH13		KR4BH5	KR4BH6	112.00	KR4B	81.00
		Red	KR4RH13		KR4RH5	KR4RH6	112.00	KR4R	81.00
		Red ♦	KR4R05H13	138.00	KR4R05H5	KR4R05H6	119.00	KR4R05	86.00
	1-3/8 in. (35 mm)	Green	KR4GH13	100.00	KR4GH5	KR4GH6	112.00	KR4G	81.00
	Diameter Mushroom Button	Other ★	KR4★H13		KR4★H5	KR4★H6	112.00	KR4★	81.00
	Musiliooni Bullon	Black	KR24BH13		KR24BH5	KR24BH6	112.00	KR24B	01.00
		Red	KR24RH13		KR24RH5	KR24RH6	112.00	KR24R	†
9001KR4B		Green	KR24GH13	138.00	KR24GH5	KR24GH6		KR24G	81.00
		Other*	KR24★H13		KR24★H5	KR24★H6		KR24★	+
_			al Mushroom Butto	n with Set		TUILLYATIO	<u> </u>	INILTA	
	1-1/2 in. (40 mm)	Black	_		_	_	1 1	9001KR24BM	
A DE	Diameter	Red	_			_	1	9001KR24RM	<b>†</b>
	Mushroom Button			_			1 - 1		90.00
9001KR24BM		Green	_		_	_		9001KR24GM	
		Snap-In Plast	ic Mushroom Butto	n					
		Black	KR5BH13		KR5BH5	KR5BH6	112.00	KR5B	81.00
		Red	KR5RH13		KR5RH5	KR5RH6	119.00	KR5R	81.00
	0.4(4 in (57)	Red ♦	KR5R05H13 ◆	138.00	KR5R05H5 ◆	KR5R05H6 ◆	112.00	KR5R05 ♦	86.00
	2-1/4 in. (57 mm) Diameter	Green	KR5GH13		KR5GH5	KR5GH6	112.00	KR5G	81.00
	Mushroom Button	Other★	KR5★H13		KR5★H5	KR5★H6	112.00	KR5★	81.00
	Musiliooni Bullon	Black	KR25BH13		KR25BH5	KR25BH6		KR25B	
		Diack			KR25RH5	KR25RH6		KR25R	
9001KR5B		Red	KR25RH13	138.00			112 00	KHZJH	81 00
9001KR5B			KR25RH13 KR25GH13	138.00	KR25GH5	KR25GH6	112.00	KR25G	81.00
9001KR5B		Red Green Other★	KR25RH13 KR25GH13 KR25★H13		KR25GH5 KR25★H5		112.00		81.00
9001KR5B		Red Green Other★ Screw-in Meta	KR25RH13 KR25GH13		KR25GH5 KR25★H5	KR25GH6	112.00	KR25G KR25★	81.00
9001KR5B	2-3/8 in. (60 mm)	Red Green Other★ Screw-in Meta Black	KR25RH13 KR25GH13 KR25★H13		KR25GH5 KR25★H5	KR25GH6	112.00	KR25G KR25★ 9001KR25BM	81.00
9001KR5B	Diameter '	Red Green Other★ Screw-in Meta	KR25RH13 KR25GH13 KR25★H13		KR25GH5 KR25★H5	KR25GH6	112.00	KR25G KR25★	
9001KR5B		Red Green Other★ Screw-in Meta Black	KR25RH13 KR25GH13 KR25★H13		KR25GH5 KR25★H5	KR25GH6	112.00	KR25G KR25★ 9001KR25BM	101.00

- The universal push button operators contain one each of the following color inserts: black, red, green, yellow, orange, blue and white.
- See Table 19.191 for color code.

  Knob has the words "Emergency Stop" in raised letters highlighted in white for readability.
- See Table 19.191 for color code.

### Table 19.191: Color Codes

Color	KR1, 2, 3 Place Color Code in Type Number ■	KR4, 5, 24, 25 Place Color Code in Type Number ★
Blue	L	L
Yellow	Y	Y
White	W	_
Orange	S	S
Gray	E	_

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

www.schneider-electric.us

### Table 19.192: 30 mm Multifunction Operators

NOTE: When ordering, add prefix 9001 to the catalog number.

	Description *		Color	With 2 N.C. Contacts (1 KA3, 1 KA5)	With 1 N.O. & 1 N.C. Contact (1 KA1)	\$ Price	Without Contacts ☆	\$ Price
Non-Illuminated Push-	-Pull Mushroom Operators	•						
			Red Green Other ▼	KR8RH25 KR8GH25 KR8▼H25	111	142.00	KR8R KR8G KR8▼	86.00
KR9	P894H13	2 Position, Plastic Head 1-5/8 in. (40 mm), Screw-0n Maintained Pull Maintained Push ◑	Red ⊖ Green Other ▼	  - 	KR9RH13 KR9GH13 KR9▼H13	188.00	KR9R KR9G KR9▼	129.00
	crew Style	2 Position , Plastic Head 1-5/8 in. (40 mm), Screw-0n Head with Set Screw Maintained Pull Maintained Push ◑	Red	_	KR9R94H13	194.00	KR9R94	134.00
			Black	_	<u> </u>	_	9001KR9BM94	
	11	2 Position, Metal Head 1-1/2 in. (40 mm) Diameter	Red	_		_	9001KR9RM94	138.00
90011	KR9RM94		Green	_		_	9001KR9GM94	
						_	9001KR9BM95	
- 6	19	2 Position, Metal Head 2-3/8 in. (60 mm) Diameter	Red	_	_	_	9001KR9RM95	149.00
90011	KR9RM95		Green	_		_	9001KR9GM95	143.00
	cription	Color	With 1 N.O. & 1 N.C. Contact (KA1)	\$ Price	With 2 N.O. & 2 N.C. Contacts (KA2)	\$ Price	Without Contacts	\$ Price
Non-Illuminated Turn-	to-Release Mushroom Ope	erators			_		_	
9001KR16H2 Trigger Action	2 Position, Plastic Head Turn-to-Release Trigger Action	Red	KR16H13	172.00	KR16H2	218.00	KR16	113.00



# 9001KR9P1 1.625 in. Diameter Knob For 1-3/8 in. or 2-1/4 in. Diameter Knob \* Includes Type KN379 Legend Plate Marked Pull To Start Push To Stop

Screw-On Plastic I	lluminated Push-Pull Mushroom Opera	ntors				
Description *	Voltage	With Red Knob and 2 N.C. Contacts (1 KA3, 1 KA5)	With Other Color Knob and 2 N.C. Contacts (1 KA3, 1 KA5)	\$ Price	With Other Color Knob Without Contacts ☆	\$ Price
3 Position Illuminated Momentary Pull Maintained Neutral Momentary Push ♦	110-120 V, 50-60 Hz Other—Transformer, LED, Flashing □ Other—Full Voltage, Resistor, Neon ◊	KR8P1RH25 KR8P△RH25 KR8P△RH25	KR8P1▼H25 KR8P△▼H25 KR8P△▼H25	267.00 267.00 215.00	KR8P△▼	201.00 201.00 171.00
Description *	Voltage	With Red   Knob and 1 N.O. & 1 N.C. Contact (KA1)	With Other Color Knob and 1 N.O. & 1 N.C. Contact (KA1)	\$ Price	With Other Color Knob Without Contacts	\$ Price
2 Position Illuminated Maintained Pull Maintained Push	110-120 V, 50-60 Hz Other—Transformer, LED, Flashing □ Other—Full Voltage, Resistor, Neon ◊	KR9P1RH13 KR9P△RH13 KR9P△RH13	KR9P1▼H13 KR9P△▼H13 KR9P△▼H13	316.00 316.00 257.00	KR9P△▼	243.00 243.00 215.00

- Choose one color from the Color Codes table here, and insert the color code in Type number. **Example:** KR9 with a yellow knob = KR9Y
- Add the voltage assembly code as chosen from page 19-86. **Example: KR8P** with a 277 V 50–60 Hz voltage = **KR8P8**
- The knob must be the same color as the LED light module chosen, for example, for a green LED, use a green knob.
- On neon light modules, use clear knobs only.

- On neon light modules, use clear knobs only.

  These operators can be ordered complete with contact blocks. For maximum block usage, see page 19-88. Add the "H" number chosen from page 19-88 to the end of the operator Type number and add the cost of the "H" number to the operator cost.

  KR11UH1 has 1 KA1 (1 N.O., 1 N.C.) and KR12UH1H1 has 2 KA1 (2 N.O., 2 N.C.).

  To obtain a red knob with "Push Emergency Stop" printed on the red knob—substitute "R05" in place of "R" and add \$2.10 to the price.

  For 1-3/8 in. or 2-1/4 in. Dia. Knob:
  a) Order Type -20 or -21 knob from page 19-92.
  b) Order 9001K54 adapter (no charge)—allows Type -20 or -21 knob to fit on push pull operators. Voids UL and NEMA 6 rating.
  c) Can order assembled operator by adding color code to Type -20 or -21. Example: 9001KR9R would be 9001KR9R20 or 9001KR9R21. No price adder.
- See page 19-67 for contact sequences.
- See Table 19.193.

Table 19.193: Color Codes

Color	KR8, KR9
Black <b>⊙</b>	В
Red	R
Green	G
Blue	L
Yellow	Y
White	W
Orange <b>○</b>	S
Clear	С
Amber	A
Gray	_
Those colors are not available on illuming	atad puch pull aparatora

These colors are not available on illuminated push-pull operators.

Table 19.194: Contact Sequences

		Pull	Ctr	Push
(KA1)	KA3	X	0	0
(NAI)	KA2	0	0	X
		9001 KR8RH25		
144	10	9001 KR8RH25		0
KA		9001 KR8RH25 X	0	0
K/		. v I	O X	0

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.



### Table 19.195: Illuminated Momentary Push Button Operators UL Types 4, 13/NEMA 4, 13

For use in hazardous locations—See page 19-87. Legend plate and contact block not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.

Descripti	on	Voltage and Frequency	Style	With Red Color Cap and 1 N.O. and 1 N.C. Contact (KA1)	With Green Color Cap and 1 N.O. and 1 N.C. Contact (KA1)	\$ Price □	With Other Color Cap Without Contact Block ▲	\$ Price ◊
		110-120 V, 50-60 Hz	Transformer	K1L1RH13	K1L1GH13	231.00	K1L1▼	184.00
		220-240 V, 50-60 Hz	Transformer	K1L7RH13	K1L7GH13	231.00	K1L7▼	184.00
		24-28 Vac/Vdc	Full Voltage	K1L35RH13	K1L35GH13	198.00	K1L35▼	138.00
	Full Guard Illuminated Push Button Clear Plastic Top		Transformer or Flashing	K1L■RH13	K1L■GH13	231.00	K1L■▼	184.00
AL PER			Full Voltage	K1L■RH13	K1L■GH13	198.00	K1L■▼	138.00
		For other voltages see Table ■	Resistor or Neon◆	K1L■RH13	K1L■GH13	198.00	K1L■▼	138.00
9001K1L1		see ladie ■	LED ★	K1L■RH13	K1L■GH13	231.00	K1L■▼	184.00
		110-120 V, 50-60 Hz	Transformer	K3L1RH13	K3L1GH13	231.00	K3L1▼	184.00
-		220-240 V, 50-60 Hz	Transformer	K3L7RH13	K3L7GH13	231.00	K3L7▼	184.00
100		24-28 Vac/Vdc	Full Voltage	K3L35RH13	K3L35GH13	198.00	K3L35▼	138.00
	Full Guard		Transformer or Flashing	K3L■RH13	K3L■GH13	231.00	K3L■▼	184.00
	Illuminated Push Button		Full Voltage	K3L■RH13	K3L■GH13	198.00	K3L■▼	138.00
	Metal Top	For other voltages	Resistor or Neon ♦	K3L■RH13	K3L■GH13	231.00	K3L■▼	138.00
9001K3L1		see Table ■	LED ★	K3L■RH13	K3L■GH13	231.00	K3L■▼	184.00
		110-120 V, 50-60 Hz	Transformer	K2L1RH13	K2L1GH13	217.00	K2L1▼	153.00
22		220-240 V, 50-60 Hz	Transformer	K2L7RH13	K2L7GH13	217.00	K2L7▼	153.00
		24-28 Vac/Vdc	Full Voltage	K2L35RH13	K2L35GH13	184.00	K2L35▼	125.00
	No Guard		Transformer or Flashing	K2L■RH13	K2L■GH13	217.00	K2L■▼	153.00
	Illuminated		Full Voltage	K2L■RH13	K2L■GH13	184.00	K2L■▼	125.00
	Push Button	For other voltages	Resistor or Neon ◆	K2L■RH13	K2L■GH13	184.00	K2L■▼	125.00
9001K2L1		see Table ■	LED ★	K2L■RH13	K2L■GH13	217.00	K2L■▼	153.00
		110-120 V, 50-60 Hz	Transformer	K2L1R20H13	K2L1G20H13	217.00	•	
		220-240 V, 50-60 Hz	Transformer	K2L7R20H13	K2L7G20H13	217.00		
	1-3/8 in. (35 mm)	24-28 Vac/Vdc	Full Voltage	K2L35R20H13	K2L35G20H13	184.00		
C INTERNA	Illuminated		Transformer or Flashing	K2L■R20H13	K2L■G20H13	217.00	Order K2L	■▼
(III) 17 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Mushroom, Screw-On		Full Voltage	K2L■R20H13	K2L■G20H13	184.00	Above 4	7
The state of the	Plastic Head	For other voltages see Table ■	Resistor or Neon ◆	K2L■R20H13	K2L■G20H13	184.00		
9001K2LR20		see lable =	LED ★	K2L■R20H13	K2L■G20H13	217.00		
		110-120 V, 50-60 Hz	Transformer	K2L1R21H13	K2L1G21H13	217.00		
		220-240 V, 50-60 Hz	Transformer	K2L7R21H13	K2L7G21H13	217.00		
A VIEW	2-1/4 in. (57 mm)	24-28 Vac/Vdc	Full Voltage	K2L35R21H13	K2L35G21H13	184.00		
A. 1	Illuminated Mushroom.		Transformer or Flashing	K2L■R21H13	K2L■G21H13	217.00	Order K2L	
E	Screw-On	For other velter	Full Voltage	K2L■R21H13	K2L■G21H13	184.00	Above 4	7
	Plastic Head	For other voltages see Table ■	Resistor or Neon ♦	K2L■R21H13	K2L■G21H13	184.00		
9001K2LR21		222 1300 =	LED ★	K2L■R21H13	K2L■G21H13	217.00		

- These operators can be ordered complete with contact blocks. For maximum block usage, see page 19-88. Add the "H" number chosen from page page 19-88 to the end of the operator type number and add the cost of the "H" number to the operator cost. Add the voltage assembly code as chosen from Table 19.248 or Table 19.249 on page 19-86. **Example:** K2L with 240 Vac/Vdc = K2L25
- On neon light modules, use clear color caps only.
- The cap must be the same color as the LED light module chosen, e.g., for red LED, use red color cap.

  Add the color code as chosen from the color cap table. **Example**: K2L25♦ with a blue 13€ mushroom button = K2L25L20 The only difference between a no guard (K2L♦) operator and mushroom button operator is the color cap.
- Price includes operator, light module, contact block, and color cap. Price includes operator, light module, and color cap.

### Table 19.196: Color Caps

Color	Color Codes						
Color	▼ K1L, K2L, K3L	▼ 1-3/8 in. Mushroom	▼ 2-1/4 in. Mushroom				
Red Green Blue Yellow White Clear Amber	R G L Y W C A	R20 G20 L20 Y20 W20 C20 A20	R21 G21 L21 Y21 W21 C21 A21				

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

	Contac	t Bl	ock Required				1 — Contact Closed 0 — Contact Open				
Contact Block Position	Quant KA1 or	ity a	nd Type 2 or KA3	Mount on Side KA1 or KA2 or KA3		Left	Right	Left	Right		
KA1			KA3	KA1 #2	KA1		KA3 #2	1	0	0	1
		or	KA2 O O	#2 or	KA2 #2	0	1	1	0		
Operator Locating Notch	KA1		KA3	KA1	or -	KA3 #1	1	0	0	1	
Top View	0 0	or	KA2 O O	#1		KA2 #1	0	1	1	0	
19-73	•			•	•	•		E		D	

Non-Illuminated Operators	Cat. No.	Cat. No.	\$ Price
Manual Return ▲, Operator Only (without contact blocks)	'		
Without Knob	KS11	KS12	42.80
With Knob (select style and color from Table 19.198 below)	KS11*	KS12*	42.80
Key Operated with E10 Key (Code1,2,3)	KS11K**	KS12K**	138.00
Operator with Contact Blocks and Standard black knob			
With 1 KA1 on Side #2	KS11BH13	<u> </u>	106.00
With 1 KA1 on Side #1	KS11BH1	_	106.00
With 1 KA1 on Side #1 and 1 KA1 on side #2	KS11BH2	_	152.00
Spring Return from Left ▲, Operator Only (without contact blocks)			
Without Knob	KS25	<u> </u>	71.00
With Knob (select style and color from Table 19.198)	KS25*	_	71.00
Key Operated with E10 Key (Code 2 only)★	KS25K2	_	167.00
Spring Return from Right ▲, Operator Only (without contact blocks)			
Without Knob	_	KS34	71.00
With Knob (select style and color from Table 19.198 below)	_	KS34*	71.00
Key Operated with E10 Key (Code 1 only)	_	KS34K1	167.00

Illuminated Operators	Cat. No.	Cat. No.	\$ Price
Manual Return ▲, Operator Only (without contact blocks)	· ·		
Without Knob, 110-120V 50-60 Hz Transformer	K11J1	K12J1	158.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	K11J1R	K12J1R	167.00
With Other Color Knob and other voltage Light Module ■ ◆	K11J■◆	K12J■♦	167.00
Spring Return from Left ▲, Operator Only (without contact blocks)			
Without Knob, 110-120V 50-60 Hz Transformer	K25J1	_	185.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	K25J1R	_	197.00
With Other Color Knob and other voltage Light Module ■ ◆	K25J■◆	_	197.00
Spring Return from Right ▲, Operator Only (without contact blocks)			
Without Knob, 110-120V 50-60 Hz Transformer	_	K34J1	185.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	_	K34J1R	197.00
With Other Color Knob and other voltage Light Module ■ ◆	_	K34J■◆	197.00

- These operators can be ordered complete with contact blocks. Add the "H code" from page 19-88 as needed for your application.
- Add the voltage assembly code as chosen from page 19-86. Example: K25J with 208 Vac = K25J3. Add the knob color code from Table 19.198. For LED, knob color must match LED. Add the key withdrawal code from Table 19.199.

Table 19.198: Selector Switch Assembly Code and Knob Cat. No.

Color	Standa	rd Knob	Gloved H	\$ Price	
	◆ Knob Code	Cat. No.	◆ Knob Code	Cat. No.	\$ FIICE
Black	В	B11	FB	B25	
Red	R	R8	FR	R24	
Green	G	G8	FG	G24	
Yellow	Y	Y8	FY	Y24	9.90
Blue	L	L8	FL	L24	9.90
White	W	W8	FW	W24	
Amber	Α	A8	FA	A24	
Clear	С	C8	FC	C24	



Table 19.199: ★ Key Withdrawal Codes

Code	Position
1	Left Only
2	Right Only
3	Left and Right

NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories, see pages 19-85 through 19-92.

www.schneider-electric.us

Table 19.200: 3-Position Selector Switches

NOTE: When ordering, add prefix 9001 to the catalog number.

Contact Block   Position   Posi	Contact B	Block Required						1 - Contact	Closed 0-	Contact Ope	en			
Contact   Position	Oomaat 2	nook riequired			Center	Center	Center				_	Center	Center	
Position   Type   Side   Left Right   Left		Quantity	Mou	unt		Connon		,	, control		,			
Non-diaminated Operations   Non-diameter   Non-di				n de	7 . 7	Left Right	Left Right	Left Right	Left Right			Left Right	V = V	
Fig. 2   1   1   0   0   1   0   0   1   0   0		KA3		1,,,,										
Non-Illuminated Operators		or	KA1	#2	1 0 0	1 0 0	0 0 1	1 0 0	1 0 0	1 0 0	1 0 0	0 1 0	1 1 0	
Continue	Side 1	0 0	#2   01	KA2	0 1 1	0 0 1	0 1 0	0 1 0	0 0 1	0 1 1	0 1 1	1 0 0	0 0 1	
19-73   B	Operator Locating		KA1	KA3 #1	0 0 1	1 0 0	0 0 1	1 0 0	0 1 0	0 0 1	1 0 1	0 0 1	0 1 1	
Non-Illuminated Operators	Top View		#1 0	KA2	1 1 0	0 0 1	0 1 0	0 1 0	0 0 1	1 0 0	0 1 0	0 1 0	1 0 0	
Manual Return, Operator Only (without contact blocks)	19-73		•		В	С	D	E	F	G	J	L	М	
With Knob (select style and color from table 19,168 below)   KS42   KS43   KS44   KS45   KS46   KS47   KS49   KS401   KS402   \$3.00	Non-Illuminated Operators				Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	\$ Price
With Knob (select style and color from table 19,168 below)	Manual Return, Operator Only	(without contact blo	cks) 🔺											
Coperated with E10 Key (Code 4 through 10)					KS42	KS43	KS44	KS45	KS46	KS47	KS49	KS401	KS402	43.00
With I KA1 on Side #2 (H13)	With Knob (select style and color	from table 19.168 below	/)		KS42♦	KS43♦	KS44♦	KS45♦	KS46♦	KS47♦	KS49♦	KS401 ♦	KS402♦	53.00
With 1 KA1 on Side #2 (H13)	Key Operated with E10 Key (Cod	e 4 through 10) ▼			KS42K▼	KS43K▼	KS44K▼	KS45K▼	KS46K▼	KS47K▼	KS49K▼	KS401K▼	KS402K▼	138.00
With 1 KA1 on Side #1 and 1 KA1 on side #2 (H2)   K\$43BH1   K\$4	Operator with Contact Blocks	and Standard black I	mob ★											
With 1 KA1 on Side #1 and 1 KA1 on side #2 (Hz)   KS42BH2   KS43BH2   KS44BH2   KS45BH2   KS45BH2   KS47BH2   KS49BH2   KS40BH2   KS4														106.00
Spring Return from Left to Center, Operator Only (without contact blocks)	. ,													
With Knob (select style and color from table 19.168 below)   KS62	With 1 KA1 on Side #1 and 1 KA1 on side #2 (H2)						KS44BH2	KS45BH2	KS46BH2	KS47BH2	KS49BH2	KS401BH2	KS402BH2	152.00
With Knob (select style and color from table 19.168 below)   KS62 €   KS63 € KS64 € KS65K	Spring Return from Left to Center, Operator Only (without contact			ct blocks) 🛦										
Key Operated with £10 Key (Code 5, 6 or 9 only)														71.00
## Spring Return from Right to Center, Operator Only (without contact blocks) ★  ## Without Knob  ## KS72			/)											
Without Knob   KS72							KS64K▼	KS65K▼	KS66K▼	KS67K▼	KS69K▼	KS601K▼	KS602K▼	167.00
With Knob (select style and color from table 19.168 below)   KS72		Center, Operator Only	(withou	it cont					ı					
Key Operated with £10 Key (Code 4, 5 or 7 only)														
Spring Return from Both Sides to Center, Operator Only (without contact blocks)			/)											
Without Knob         KS52         KS53         KS54         KS55         KS56         KS57         KS59         KS501         KS502         71.00           With Knob (select style and color from table 19.168 below)         KS52		• • • • • • • • • • • • • • • • • • • •					KS74K▼	KS75K▼	KS76K▼	KS77K▼	KS79K▼	KS701K▼	KS702K▼	167.00
With Knob (select style and color from table 19.168 below)   KS52		s to Center, Operator	Only (v	vithou										
Key Operated with £10 Key (Code 4, 5 or 7 only)   KS52K▼ KS53K▼ KS53K▼ KS55K▼ KS56K▼ KS56K▼ KS57K▼ KS59K▼ KS50K			,											
Illuminated Operators			/)											
Manual Return, Operator Only (without contact blocks) ▲           Without Knob, 110-120V 50-60 Hz Transformer         K42J1         K43J1         K44J1         K45J1         K46J1         K47J1         K49J1         K401J1         K402J1         158.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K42J1R         K43J1R         K44J1R         K45J1R         K46J1R         K47J1R         K49J1R         K401J1R         K402J1R         K402J1R         K40J1R         K45J1R         K46J1R         K47J1R         K49J1R         K401J1R         K402J1R         K402J1R         K40J1R         K45J1R         K46J1R         K47J1R         K49J1R         K40J1JR         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K47J1R         K49J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K60J1R         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R	key Operated with E10 key (Cod	e 4, 5 or 7 only)			KS52K▼	K553K▼	K554K▼	K555K▼	KS56K▼	KS5/K▼	K559K▼	K5501K▼	K5502K▼	167.00
Manual Return, Operator Only (without contact blocks) ▲           Without Knob, 110-120V 50-60 Hz Transformer         K42J1         K43J1         K44J1         K45J1         K46J1         K47J1         K49J1         K401J1         K402J1         158.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K42J1R         K43J1R         K44J1R         K45J1R         K46J1R         K47J1R         K49J1R         K401J1R         K402J1R         K402J1R         K40J1R         K45J1R         K46J1R         K47J1R         K49J1R         K401J1R         K402J1R         K402J1R         K40J1R         K45J1R         K46J1R         K47J1R         K49J1R         K40J1JR         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K47J1R         K49J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K40J1R         K60J1R         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R         K60J1R	Illuminated Operators				Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	\$ Price
Without Knob, 110-120V 50-60 Hz Transformer         K42J1         K43J1         K44J1         K45J1         K46J1         K47J1         K49J1         K401J1         K402J1         158.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K42J1R         K43J1R         K44J1R         K45J1R         K46J1R         K47J1R         K49J1R         K401J1R         K402J1R         167.00           With Other Color Knob and other voltage Light Module ■ ◆         K42J■ ◆         K42J■ ◆         K44J1R         K45J1R         K46J1R         K47J■ ◆         K49J■ ◆         K401J1R         K402J1R         K402J□ ◆         158.00           Spring Return from Left to Center, Operator Only (without contact blocks)	Manual Return. Operator Only	(without contact blo	cks) ▲											
With Standard Red Knob, 110-120V 50-60 Hz Transformer         K42JIR         K43JIR         K44JIR         K45JIR         K46JIR         K47JIR         K49JIR         K40JIR         K40JIR         K40JIR         K40JIR         K40JIR         K46JIR         K47JIR         K49JIR         K40JIR         K60JIR		•			K42J1	K43J1	K44J1	K45J1	K46J1	K47J1	K49J1	K401J1	K402J1	158.00
With Other Color Knob and other voltage Light Module ■ ◆       K42J■ ◆       K42J■ ◆       K44J■ ◆       K45J■ ◆       K46J■ ◆       K47J■ ◆       K49J■ ◆       K40J■ ◆ <td></td> <td></td> <td>er</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			er											
Without Knob, 110-120V 50-60 Hz Transformer         K62J1         K63J1         K64J1         K65J1         K66J1         K67J1         K69J1         K601J1         K602J1         185.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K62J1R         K63J1R         K64J1R         K65J1R         K66J1R         K67J1R         K69J1R         K601J1R         K602J1R         197.00           With Other Color Knob and other voltage Light Module ■ ◆         K62J■ ◆         K62J■ ◆         K64J1R         K66J1R         K67J1R         K69J1R         K601J1R         K602J1R         197.00           Spring Return from Right to Center, Operator Only (without contact blocks)	·													
Without Knob, 110-120V 50-60 Hz Transformer         K62J1         K63J1         K64J1         K65J1         K66J1         K67J1         K69J1         K601J1         K602J1         185.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K62J1R         K63J1R         K64J1R         K65J1R         K66J1R         K67J1R         K69J1R         K601J1R         K602J1R         197.00           With Other Color Knob and other voltage Light Module ■ ◆         K62J■ ◆         K62J■ ◆         K64J1R         K66J1R         K67J1R         K69J1R         K601J1R         K602J1R         197.00           Spring Return from Right to Center, Operator Only (without contact blocks)				conta	ct blocks) 4									
With Other Color Knob and other voltage Light Module ■ ◆       K62J■ ◆       K62J■ ◆       K66J■ ◆       K66J■ ◆       K66J■ ◆       K66J■ ◆       K60J■ ◆       K70J□					K62J1	K63J1	K64J1	K65J1	K66J1	K67J1	K69J1	K601J1	K602J1	185.00
Spring Return from Right to Center, Operator Only (without contact blocks) ▲         Without Knob, 110-120V 50-60 Hz Transformer       K72J1       K73J1       K74J1       K75J1       K76J1       K77J1       K79J1       K701J1       K702J1       185.00         With Standard Red Knob, 110-120V 50-60 Hz Transformer       K72J1R       K73J1R       K74J1R       K75J1R       K77J1R       K79J1R       K701J1R       K702J1R       K702J1R       197.00         With Other Color Knob and other voltage Light Module ■ ◆       K72J■ ◆       K72J■ ◆       K74J■ ◆       K75J■ ◆       K76J■ ◆       K70J■ ◆       K701J■ ◆       K702J■ ◆       167.00         Spring Return from Both Sides to Center, Operator Only (without contact blocks) A         Without Knob, 110-120V 50-60 Hz Transformer       K53J1       K53J1       K54J1       K55J1       K56J1       K57J1       K50J1       K50J1       K50J1       K50J1R       K50J1R       K50J1R       K50J1R       K50J1R       K50J1R       K50J1R       K50J1R       K50J1R       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B       K50J1B <t< td=""><td colspan="4">With Standard Red Knob, 110-120V 50-60 Hz Transformer</td><td>K62J1R</td><td>K63J1R</td><td>K64J1R</td><td>K65J1R</td><td>K66J1R</td><td>K67J1R</td><td>K69J1R</td><td>K601J1R</td><td>K602J1R</td><td>197.00</td></t<>	With Standard Red Knob, 110-120V 50-60 Hz Transformer				K62J1R	K63J1R	K64J1R	K65J1R	K66J1R	K67J1R	K69J1R	K601J1R	K602J1R	197.00
Without Knob, 110-120V 50-60 Hz Transformer         K72J1         K73J1         K74J1         K75J1         K76J1         K77J1         K70J1         K70J1         K702J1         185.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K72J1R         K73J1R         K74J1R         K75J1R         K76J1R         K77J1R         K79J1R         K701J1R         K702J1R         197.00           With Other Color Knob and other voltage Light Module ■ ◆         K72J■ ◆         K72J■ ◆         K74J■ ◆         K75J■ ◆         K76J■ ◆         K77J■ ◆         K70J■ ◆         K701J■ ◆         K702J■ ◆         167.00           Spring Return from Both Sides to Center, Operator Only (without contact blocks)           Without Knob, 110-120V 50-60 Hz Transformer         K52J1         K53J1         K54J1         K55J1         K56J1         K57J1         K50J1         K50J1         K50J1         K50J1R         K50J1R         K50J1R         K50J1R         K50J1R         K50J1R         K50J1R         K50J1R         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B         K50J1B	With Other Color Knob and other voltage Light Module ■ ◆				K62J■◆	K62J■◆	K64J <b>■</b> ♦	K65J <b>■</b> ♦	K66J <b>■</b> ♦	K67J <b>■</b> ♦	K69J <b>■</b> ♦	K601J■◆	K602J■◆	167.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer       K72J1R       K73J1R       K74J1R       K75J1R       K76J1R       K77J1R       K70J1R       K50J1R       K50J1R       K50J1       K50J1R <td>Spring Return from Right to C</td> <td>Center, Operator Only</td> <td>(withou</td> <td>it cont</td> <td>act blocks)</td> <td><b>A</b></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Spring Return from Right to C	Center, Operator Only	(withou	it cont	act blocks)	<b>A</b>								
With Other Color Knob and other voltage Light Module ■ ◆       K72J■ ◆       K72J■ ◆       K75J■ ◆       K76J■ ◆       K79J■ ◆       K70J■ ◆       K50JJ■ ◆       K50JJI       K50JJI       K50JJI       K50JJI       K50JJI       K50JJI       K50JJIR	Without Knob, 110-120V 50-60 H	z Transformer			K72J1	K73J1	K74J1	K75J1	K76J1	K77J1	K79J1	K701J1	K702J1	185.00
Spring Return from Both Sides to Center, Operator Only (without contact blocks) ▲           Without Knob, 110-120V 50-60 Hz Transformer         K52J1         K53J1         K54J1         K55J1         K56J1         K57J1         K50J1         K50J1         185.00           With Standard Red Knob, 110-120V 50-60 Hz Transformer         K52J1R         K53J1R         K54J1R         K55J1R         K56J1R         K57J1R         K59J1R         K501J1R         K502J1R         197.00           With Other Color Knob and other voltage Light Module ■ ◆         K52J■ ◆         K53J■ ◆         K54J■ ◆         K55J■ ◆         K57J■ ◆         K59J■ ◆         K50J■ ◆ <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>197.00</td></t<>														197.00
Without Knob, 110-120V 50-60 Hz Transformer         K52J1         K53J1         K54J1         K55J1         K56J1         K57J1         K50J1         K50J1         H500J1         H	With Other Color Knob and other	voltage Light Module ■	+		K72J <b>■</b> ♦	K72J <b>■</b> ♦	K74J <b>■</b> ♦	K75J <b>■</b> ♦	K76J <b>■</b> ♦	K77J <b>■</b> ♦	K79J <b>■</b> ♦	K701J <b>■</b> ♦	K702J <b>■</b> ♦	167.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer       K52J1R       K53J1R       K54J1R       K55J1R       K56J1R       K57J1R       K59J1R       K501J1R       K502J1R       197.00         With Other Color Knob and other voltage Light Module ■ ◆       K52J■◆       K53J■◆       K54J■◆       K55J■◆       K55J■◆       K57J■◆       K50J■◆       K50JJ■◆       K502J■◆       167.00	Spring Return from Both Side	s to Center, Operator	Only (v	vithou	t contact bl	ocks) ▲								
With Other Color Knob and other voltage Light Module ■ ♦ K52J■ ♦ K53J■ ♦ K54J■ ♦ K55J■ ♦ K55J■ ♦ K50J■ ♦ K50J■ ♦ K50J■ ♦ K50J■ ♦ K502J■ ♦	Without Knob, 110-120V 50-60 H	z Transformer			K52J1	K53J1	K54J1	K55J1	K56J1	K57J1	K59J1	K501J1	K502J1	185.00
														197.00
		* *								K57J <b>■</b> ♦	K59J <b>■</b> ♦	K501J <b>■</b> ♦	K502J <b>■</b> ♦	167.00

- These operators can be ordered complete with contact blocks.00 Add the "H code" from page 19-88 as needed for your application. Add the voltage assembly code as chosen from page 19-86. Example: K25J■ with 208Vac = K25J3. Add the knob color code from Table 19.201. For LED, knob color must match LED.

For other color knobs replace the B with knob color code from Table 19.201.

Add the key withdrawal code from table Table 19.202. Example: KS43K▼ with key withdrawal in the right position only = KS43K6.

### Table 19.201: Selector Switch Assembly Code and Knob Cat. No.

Color	Standard K	nob	Gloved Hand			
Coloi	♦ Knob Code	Cat. No.	♦ Knob Code	Cat. No.	\$ Price	
Black	В	B11	FB	B25		
Red	R	R8	FR	R24		
Green	G	G8	FG	G24		
Yellow	Y	Y8	FY	Y24	9.90	
Blue	L	L8	FL	L24	9.90	
White	W	W8	FW	W24		
Amber	A	A8	FA	A24		
Cloar	_	0	EC	C34		

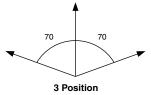


Table 19.202: ▼ Key Withdrawal Codes

Code	Position
4	Left Only
5	Center Only
6	Right Only
7	Left and Center
8	Left and Right
9	Center and Right
10	Left, Center, and Right
	4 5 6 7 8 9

NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories, see pages 19-85 through 19-92.

Class 9001 / Refer to Catalog 9001CT1103



Table 19.203: 4-Position Selector Switches

NOTE: When ordering, add prefix 9001 to the catalog number.

Contact Block Required								
Contact Block Position	Quantity KA1 or KA	and Type A2 or KA3	Mount on Side KA1 or KA2 or KA3			1—Contact Closed 0—Contact Open		
	KA1	KA3	KA1	or	KA3 #2	1 0 0 0		
Side 2 Side 2 Side 1		KA2	#2		KA2 #2	0 0 1 0		
	KA1	KA3	KA1		KA3 #1	0 0 0 1		
Top View		KA2	#1	or	KA2 #1	0 1 0 0		
Cam (see page 19-73)	•	•				Н		

Non-Illuminated Operators	Cat. No.	\$ Price
Manual Return ▲, Operator Only (without contact blocks)	<u>'</u>	
Without Knob	KS88	42.80
With Knob (select style and color from table 19.168 below)	KS88 ♦	53.00
Key Operated with E10 Key (Codes 11, 12, 13, 14, 15)	KS88K★	138.00

Illuminated Operators	Cat. No.	\$ Price						
Manual Return ▲, Operator Only (without contact blocks)								
Without Knob, 110-120V 50-60 Hz Transformer	KS88J1	158.00						
With Standard Red Knob, 110-120V 50-60 Hz Transformer	KS88J1R	167.00						
With Other Color Knob and other voltage Light Module ■ ◆	KS88J■◆	158.00						

- These operators can be ordered complete with contact blocks. Add the "H code" from page 19-88 as needed for your application.
- Add the voltage assembly code as chosen from page 19-86. Example: K25J■ with 208Vac = K25J3. Add the knob color code from table 19.204. For LED, knob color must match LED.
- Add the key withdrawal code from Table 19.205.

### Table 19.204: Selector Switch Assembly Code and Knob Cat. No.

Color	Standar	d Knob	Gloved Ha	\$ Price	
	♦ Knob Code	Cat. No.	♦ Knob Code	Cat. No.	3 FIICE
Black	В	B11	FB	B25	
Red	R	R8	FR	R24	
Green	G	G8	FG	G24	
Yellow	Υ	Y8	FY	Y24	9.90
Blue	L	L8	FL	L24	9.90
White	W	W8	FW	W24	
Amber	Α	A8	FA	A24	
Clear	С	C8	FC	C24	

### Table 19.205: ★ Key Withdrawal Codes

Code	Position  47  48  47  47  4Position
11	1 and 4
12	4 only
13	1 only
14	1, 2, 3 and 4
15	2, 3, and 4

\$ Price

201.00

287.00

314.00

399.00

### **Potentiometers with Dial Plate**

Table 19.206: Potentiometers with Dial Plate (not UL listed)—Maximum Voltage 300 Vac





Single Potentiometer									
Suffix ▼	Resistance	Suffix ▼	Resistance						
01	50 Ω	07	5 kΩ						
02	100 Ω	08	10 kΩ						
04	500 Ω	09	25 kΩ						
05	1 kΩ	13	500 kΩ						
39	2 kΩ	37	750 kΩ						
06	2.5 kΩ	14	1 ΜΩ						
<b>Tandem Potentiome</b>	ter								
Suffix ▼		Resistance							
Sullix ¥		Front	Rear						
82		1 kΩ 1 kΩ							

For the complete part number, add the suffix from Table 19.207 to the catalog number from Table 19.206. Example: 9001K2105.

Any potentiometer with a shaft 7/8" long and 1/4" diameter may be used with these operators

NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories. See pages 19-85 through 19-92.

Suttons Type K, KX, and SK Selector Switch Guide

Class 9001 / Refer to Catalog 9001CT1103

NOTE: When ordering, add prefix 9001 to the catalog number.

Table 19.208: 2 Position Selector Switch

		require equence—	Use Cam Type	Use Contact Block Type	Mount on side no. (See page 19-88)	
,	1	0	E	KA3	1 or 2	
	•	U	D	KA2	1 or 2	
	0	1	E	KA2	1 or 2	
	U	'	D	KA3	1 or 2	

### Step No. 1

Determine the contact sequence(s) required. Set up a target table like the one shown for the example below.

Shown below is a simplified method of selecting a selector switch to

Contact Sequence 0—contact open 1—contact closed	×	<b>†</b>	1
А	1	0	0
В	0	1	0
С	0	0	1

meet almost any combination of contact sequences.

### Step No. 2

Look for a cam type common to all sequences in Table 19.208, Table 19.209, or Table 19.210. For the example above, Table 19.209 would be used. For the contact sequences A (1 0 0), B (0 1 0) and C (0 0 1) of the example above, cam types F and L are common to all three sequences.

#### Step No. 3

Next, use the cam type common to all the sequences (if several cam types are common, choose one) to find the operator type number. Go to the proper page number as indicated in the table below:

Number of Positions	Push Button Line	Page Number
2	Type K, Type SK, Type KX	19-70, 19-80, 19-88, 19-95, 19-97
3	Type K, Type SK, Type KX	19-71, 19-81, 19-88, 19-95, 19-97
4	Type K, Type SK, Type KX	19-72, 19-82, 19-93

If for the example above a manual return operator with a standard black knob is required and:

The F cam type is chosen, the operator type number is:

- Type K—Class 9001 Type KS46B (from page19-71)
- Type SK—Class 9001 Type SKS46B (from page 19-81)
- Type KX—Class 9001 Type KXSDFB (from page 19-97)

The L cam type is chosen, the operator type number is:

- Type K—Class 9001 Type KS401B (from page 19-71)
- Type SK—Class 9001 Type SKS401B (from page 19-81)
- Type KX—Class 9001 Type KXSDLB (from page 19-97)

### Step No. 4:

Determine the contact blocks required by using the same table in Step No. 2.

If, for the example above, the F cam type is chosen:

- Use a 9001KA3 mounted on side no. 2 for sequence A (1 0 0).
- Use a 9001KA3 mounted on side no. 1 for sequence B (0 1 0).
- Use a 9001KA2 mounted on side no. 1 or 2 for sequence C (0 0 1).

If, for the example above, the L cam type is chosen:

- Use a 9001KA2 mounted on side no. 2 for sequence A (1 0 0).
- Use a 9001KA2 mounted on side no. 1 or a 9001KA3 mounted on side no. 2 for sequence B (0 1 0).
- Use a 9001KA3 mounted on side no. 1 for sequence C (0 0 1).

One Type KA1 double circuit block can be used in place of one Type KA2 single circuit block plus one Type KA3 single circuit block mounted on the same side.

Table 19.209: 3 Position Selector Switch

conta	you requact seque	ire nce—		Use Cam Type				Use Contact Block Type	Mount on side no. (See page 19-88)				
								G			М	KA2	1
										L		KA2	2
1	0	0		С		Ε						KA3	1
			В	С		Ε	F	G	J			KA3	2
			В					G	J			KA5▲	2
					D	Ε			J	L		KA2	1
0	1	0			D	Ε						KA2	2
U	'	U					F					KA3	1
										L		KA3	2
				С			F					KA2	1 or 2
			В		D			G		L		KA3	1
0	0	1			D							KA3	2
			В									KA5▲	1
											М	KA2	2
			В									KA2	1
1	1	0		С			F					KA5▲	1 or 2
											М	KA3	2
			В					G	J			KA2	2
0	1	1						G				KA5▲	1
U	'	'								L		KA5▲	2
											М	KA3	1
									J			KA3	1
1	0	1			D	Ε			J	L		KA5▲	1
					D	Ε						KA5▲	2

Table 19.210: 4 Position Selector Switch

CO	If you ontact se	require equence	∍—	Use Cam	Use Contact	Mount on side no.			
K	K	1	1	Туре	Block Type	(See page 19-88)			
1	0	0	0	Н	(A) KA3	2			
0	1	0	0	Н	(B) KA2	1			
0	0	1	0	Н	(C) KA2	2			
0	0	0	1	Н	(D) KA3	1			
1	0	0	1	Н	A & D Wired in Parallel				
1	1	0	0	Н	A & B W	ired in Parallel			
0	1	1	0	Н	B&CW	ired in Parallel			
0	0	1	1	Н	C&DW	ired in Parallel			
1	1	1	0	Н	,	Wired in Parallel			
0	1	1	1	Н	B, C & D \	Wired in Parallel			
1	0	1	0	Н	A & C W	ired in Parallel			
0	1	0	1	Н	B & D Wired in Parallel				
1	1	0	1	Н	KA5▲ 2				
1	0	1	1	Н	H KA5▲ 1				

Type KA5 must be the last block on either side. If more than one KA5 is required on either side—contact your local Square D sales office.

Type KA5 must be the last block on either side. If more than one KA5 is required on either side—contact your local Square D sales office.

For Outline Dimensions see Catalog 9001CT1103

$$KA1 = KA3 + KA2$$
 $0 = 0 = 0 + 0$ 

### When ordering, please specify:

- Quantity
- Class Number
- Type or Catalog Number

### Table 19.211: Pilot Lights—UL Types 4, 13/NEMA 4 & 13

For use in hazardous locations—See page 19-87. Legend plates not included.

NOTE: When ordering, add prefix 9001 to the catalog number.

Description	Voltage	Style	With Red Fresnel Color Cap	With Green Fresnel Color Cap	With Other Color Cap	\$ Price	Without Color Cap	\$ Price
	110-120 V, 50-60 Hz 220-240 V, 50-60 Hz 24-28 Vac/Vdc	Transformer Transformer Full Voltage	KP1R31 KP7R31 KP35R31	KP1G31 KP7G31 KP35G31	KP1■ KP7■ KP35■	153.00 153.00 125.00	KP1 KP7 KP35	143.00 143.00 116.00
Standard Pilot Light (Plastic Fresnel Color Cap Shown)	For other voltages see page 19-86.	Transformer, Flashing or LED ◆ Full Voltage, Neon or Resistor ★	KP▲R31 KP▲R31	KP▲G31 KP▲G31	KP▲■ KP▲■	153.00 125.00	KP▲ KP▲	143.00 116.00
	110–120 V, 50–60 Hz 220–240 V, 50–60 Hz 24–28 Vac/Vdc	Transformer Transformer Full Voltage	KT1R31 KT7R31 KT35R31	KT1G31 KT7G31 KT35G31	KT1■ KT7■ KT35■	197.00 197.00 167.00	KT1 KT7 KT35	185.00 185.00 158.00
Push-To-Test Pilot Light (Glass Color Cap Shown)	For other voltages see page 19-86.	Transformer, Flashing or LED ◆ Full Voltage, Neon or Resistor ★	KT▲R31 KT▲R31	KT▲G31 KT▲G31	KT▲■ KT▲■	197.00 167.00	KT▲ KT▲	185.00 158.00
	120 Vac Only 24–28 Vac Only for other voltages	Resistor ▼ Full Voltage ▼	KTR38R31 KTR35R31	KTR38G31 KTR35G31	KTR38■ KTR35■	197.00 197.00	KTR38 KTR35	185.00 185.00
Remote Test Pilot Light (Glass Color Cap Shown)	See page 19-86.▼	Full Voltage or Resistor ▼	KTR <b>≜</b> R31	KTR▲G31	KTR▲■	197.00	KTR▲	185.00

- Add the voltage assembly code as chosen from Table 19.248 or Table 19.249 on 19-86. EXAMPLE: KTAR31 with 208 Vac red LED = KT37LRR31

  Add the color code as chosen from Table 19.212. EXAMPLE: KP1 with a blue fresnel cap = KP1L31

  The cap must be the same color as the LED light module chosen, e.g., for green LED, use green color cap.

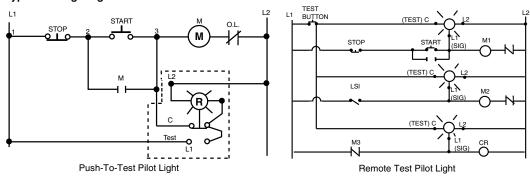
- On neon light modules, use clear color caps only.

  On remote test pilot lights use only full voltage or resistor voltage assembly codes. Do not choose LED, neon or transformer codes. For AC use only.

### Table 19.212: Color Caps

Color	Plastic Fresnel	Plastic Domed	Glass
Amber	A31	A9	A6
Blue	L31	L9	L6
Clear	C31	C9	C6
Green	G31	G9	G6
Red	R31	R9	R6
White	W31	W9	W6
Yellow	Y31	Y9	Y6

### **Typical Wiring Diagram**



NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.





Without Latch



With Latch

Table 19.213: Joy Stick Operators—UL Types 4, 13/NEMA 4, 13 for use in hazardous locations. See page 19-87. Contact blocks and legend plate not included unless noted.

**NOTE:** When ordering, add prefix 9001 to the catalog number.

		Description	Operator With Contacts	\$ Price	Operator Without Contacts ▲	\$ Price	
		Momentary Contact—	Without Latch	K71H7		K71	
A	3 Position—	Spring Return to Center	With Latch	K70H7	326.00	K70	252.00
Center Off	Maintained Contact	Without Latch	K73H7	326.00	K73	252.00	
•		Mairitained Contact	With Latch	K72H7		K72	
		Momentary Contact—	Without Latch	K31H8		K31	
405	3 Position—	Spring Return to Center	With Latch	K30H8	326.00	K30	252.00
<del>&lt;•&gt;</del>	Center Off	Maintained Contact	Without Latch	K33H8		K33	
		Mairitairied Contact	With Latch	K32H8		K32	
		Momentary Contact—	Without Latch	K35H2		K35	
$\blacktriangle$	5 Position—	Spring Return to Center	With Latch	K34H2	435.00	K34	309.00
❤	Center Off	Maintained Contact	Without Latch	K37H2	435.00	K37	
		iviairitairied Contact	With Latch	K36H2		K36	

These operators can be ordered complete with contact blocks—a total of four (4) contact blocks can be used. Add the "H" number chosen from page 19-88 to the operator type number and add the cost of the "H" number to the operator cost.

### **Table 19.214: Contact Arrangements**

Opera	Operator Block B		Contact Block	Contact	Handle position (with reference to Nib)							
Positio	ns	Type	Location	Contact	1	2	OFF	3	4			
	_	KA3	POS 1 (3)	Α	_	1	0	_	0			
<del>&lt;•&gt;</del>	3	KA3	POS 2 (4)	Α	_	0	0	_	1			
<u> </u>	3	KA2	POS 1 (3)	В	1	_	0	0	_			
₹		KA2	POS 2 (4)	В	0	_	0	1	_			
		KA1	POS 1 (3)	Α	0	1	0	0	0			
❖	5	IVAI	1 00 1 (0)	В	1	0	0	0	0			
₩	,	KA1	POS 2 (4)	Α	0	0	0	0	1			
		10/11	( )	В	0	0	0	1	0			
			(1) (	Contact Clos	ed (0) Co	ontact Open						

The joy stick operator is ideal for applications where only one circuit is to be energized at one time. The three position joy stick closes one circuit in each Up-Down or Right-Left position with all circuits open in center position. The five position operator closes one circuit in each Up, Down, Left and Right position with all circuits open in center position.

 Momentary contact operators are spring return to
 the center position. Maintained operators remain in position and must be returned manually.
 Operators with latch cannot be operated until the
 latch button in center of handle is pressed.



Selector Push Button 9001KQ

Key Operated Push Button 9001KR For use in hazardous locations—See page 19-87. Legend plate and contact block not included. **Inserts** are field convertible. For colors not listed, order operator without insert, plus separate color insert from page 19-92. Up to two Type KA contact blocks can be mounted in tandem (total of four blocks). Selector push buttons cannot be illuminated.

Table 19.215: Selector Push Button Operators—UL Types 4, 13/NEMA 4, 13

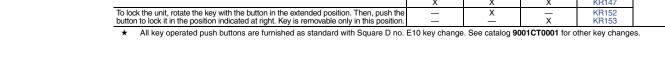
Contact	Block		Two Position Operators									
Requi	red			0-	-Contac	t Open	1—Cor	ntact Clo	sed F	—Free	D—De	pressed
Quantity and	Mount on	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	
Туре	Side	FD	FD	FD	FD	FD	FD	FD	FD	FD	FD	
میں		0 0	1 0	0 0	1 0	0 0	1 1	1 1	1 0	1 0	0 0	Ouden Orate at Blacks
O O 1 KA1	#2	0 1	0 1	0 1	0 0	0 1	0 0	0 0	0 1	0 1	0 1	Order Contact Blocks From Pages 19-85 and 19-87
<b>می</b> ن		0 0	1 1	0 0	1 0	1 1	0 0	1 0	1 1	1 1	0 0	
O O 1 KA1	#1	0 1	0 0	0 1	0 0	0 0	0 1	0 1	0 0	0 0	0 1	
Cam	+		P	ı	R		s		Т	,	7	
Color Insert		Ty	ре	Ту	ре	Ту	ре	Ту	ре	Ту	ре	\$ Price
Without Insert ■ Black		KQ11 KQ12		KC	13	KC	Q14	KC	Q15	80.		
		KQ	11B	KQ	12B	KQ	13B	KQ	14B	KQ15B		81.

- Order color inserts from page 19-92.
- Cams are not interchangeable.

For use in hazardous locations. See page 19-87. Key operated push buttons are used wherever unauthorized use of a push button is discouraged. Examples are locking a Start push button in the extended position or locking a Stop push button in the depressed position. The operator can also be locked in the flush position—holding all contacts open. Up to two Type KA contact blocks can be mounted in tandem (total of four blocks). Legend Plate and Contact Block Not Included ("X" = locked position) ★

Table 19.216: Key Operated Push Button – UL Types 4, 13/NEMA 4, 13

Description	L	ockable Positio	ıs	Time	\$ Price
Description	Extended	Flush	Depressed	Туре	\$ FIICE
Push button operable only with key in lock. Key is removable in locked position only.	<u>x</u> _ x	$\frac{\overline{x}}{x}$		KR131 KR132 KR133 KR137	
Push button operable with or without key in lock. Push button can be locked with key only. Key removable in both locked or unlocked position.	<u>x</u> _ x	$\frac{\overline{x}}{x}$		KR141 KR142 KR143 KR147	125.00
To lock the unit, rotate the key with the button in the extended position. Then, push the button to lock it in the position indicated at right. Key is removable only in this position.	_	<u>x</u>	X	KR152 KR153	



### Class 9001 / Refer to Catalog 9001CT1103

Table 19.217: Illuminated and Non-Illuminated Dual Operators Meets UL Type 13/NEMA 13 and UL Type 6/NEMA 6, which UL and NEMA consider an equivalent to UL Type 4/NEMA 4. For use in hazardous locations—See page 19-87. Legend plate and contact blocks not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.





	Description	Color	Contacts (2 KA2)	1 N.C. Contact (KA2, KA3)	\$ Price	Contacts ★	\$ Price
	Momentary Dual Function	Universal ▲ Green-Red Other ■	KR6UH7 KR6GRH7 KR6■H7	KR6UH37 KR6GRH37 KR6■H37	138.00	KR6U KR6GR KR6■	81.00
	Momentary Interlocked Dual Function	Universal▲ Green-Red Other ■	KR67UH7 KR67GRH7 KR67■H7	KR67UH37 KR67GRH37 KR67■H37	184.00	KR67U KR67GR KR67■	125.00
-	Maintained Interlocked Dual Function	Universal ▲ Green-Red Other ■	KR7UH7 KR7GRH7 KR7■H7	KR7UH37 KR7GRH37 KR7■H37	184.00	KR7U KR7GR KR7■	125.00
	Description	Color		Contacts (KA1)	\$ Price	Without Contacts ★	\$ Price
	Both Buttons Maintained Interlocked Assembly	Universal ♦ Other ★	_	KR11UH1 KR11★H1	178.00	KR11U KR11★	120.00
	One Button Momentary One Button Maintained Interlocked Assembly	Universal ◆ Other★	_	KR12UH1H1 KR12★H1H1	273.00	KR12U KR12★	162.00

- Universal for KR6, KR67, KR7 includes 2 inserts each of black, red and green
- Choose one color for each button. R = red, G = green, B = Black. Example: 9001KR6 with left red and right black = 9001KR6RB. See Table 19.193.
- Universal for KR11, KR12 includes 2 each of black, red, green, yellow, orange, blue, white.

  Choose one color for each button from Table 19.193 and insert color code in type number. Example: 9001KR11 with top button gray and bottom button orange = 9001KR11ES



**Emergency Break-Glass** Operator 9001K15

### Table 19.218: Emergency Break-Glass Operator— UL 4. 13/NEMA 4. 13▼

is broken with the hammer, button returns to a normal extended position.

Туре	\$ Price
K15	125.00
perator is held in a depressed position	by a glass disc. When the glass disc

Package of 5 discs included with operator. For enclosed versions see page 19-106.

### Table 19.219: 9001K15 Replacement Parts

Description	Part Number	\$ Price
Yellow bumper	3105211101	14.30
Hammer and chain	3105206750	57.30
Lower ring nut	6512232801	16.70
Top ring nut	9001K40	4.40
Package of 5 replacement discs	9001K57	16.70
Clip to hold hammer	2540902240	2.60





Push-on Push-off Module 9001K85

### Table 19.220: Rocker Arm Operating Lever

\$ Pric	Туре
77.0	K50

Allows two standard push buttons to be operated independently of each other. Price does not include push buttons or legend plates. Order push buttons and legend plates from pages 19-67, 19-89, and 19-90—specify which marking is to be inverted.

### Table 19.221: Alternate Action—Push-on, Push-off Module

				Туре													\$ Price
				K85													42.80
T1 :		 _	-				-		_	_	-		_	 	 _		

This module can be added to standard 9001 Type K, KX, SK or T momentary push button operators. Contact blocks mounted behind this module (maximum of 2) are held in the depressed position when the operator is pressed once, and released to their normal position when the operator is pressed again. For a N.C. circuit, use a 9001KA3 or the N.C. contact of either a 9001KA4 or 9001KA6.





Time Delay Push Button 9001KRD

		-	-	
		Type (Al	l Colors)	
Description	Full Guard	Extended Guard	No Guard	\$ Price
Timed Contact 1 N.O. and 1 N.C.	KRD1UH1	KRD2UH1	KRD3UH1	277.00
O O O O O O O O O O O O O O O O O O O	KRD1UH2	KRD2UH2	KRD3UH2	514.00

Timing period is adjustable from 0.1 second to 60 seconds and begins after button has been released. Devices include a pack of seven color inserts for color coding the push button. See 19-92 for Universal color insert. Contacts are quick make-

When mounted in top or bottom hole of a Type K enclosure, device requires one additional space below or above operator. When mounted other than in top or bottom hole, device may require two additional spaces, one above and one below operator. Closing plates must be installed on unused holes.



Table 19.223: Wobble Stick

For easy operation of any standard push button.

	•
\$ Price	Туре
42.80	K8

Table 19.224: Non-Illuminated Momentary Push Button Operators UL Types 4, 4X, 13/NEMA 4, 4X, 13. For use in hazardous locations—See page 19-87. Contact blocks and legend plate not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.

					ien ordenny, ad	'		_
Description	Color	Operator with 1 N.O. and 1 N.C. Contact (KA1)	\$ Price	Operator with 1 N.O. Contact (KA2)	Operator with 1 N.C. Contact (KA3)	\$ Price	Operator Only No Contacts ▼	\$ 1
	Black	SKR1BH13	89.00	SKR1BH5	SKR1BH6	66.00	SKR1B	3
	Red	SKR1RH13	89.00	SKR1RH5	SKR1RH6	66.00	SKR1R	;
	Green	SKR1GH13	89.00	SKR1GH5	SKR1GH6	66.00	SKR1G	;
	Universal ▲	SKR1UH13	89.00	SKR1UH5	SKR1UH6	66.00	SKR1U	
9001SKR1B Full Guard	Other ■	SKR1■H13	89.00	SKR1■H5	SKR1■H6	66.00	SKR1■	
i dii ddaid	Black	SKR3BH13	89.00	SKR3BH5	SKR3BH6	66.00	SKR3B	
	Red	SKR3RH13	89.00	SKR3RH5	SKR3RH6	66.00	SKR3R	
	Green	SKR3GH13	89.00	SKR3GH5	SKR3GH6	66.00	SKR3G	
	Universal ▲	SKR3UH13	89.00	SKR3UH5	SKR3UH6	66.00	SKR3U	
9001SKR3B	Other ■	SKR3■H13	89.00	SKR3■H5	SKR3■H6	66.00	SKR3■	
No Guard								
	Black	SKR2BH13	89.00	SKR2BH5	SKR2BH6	66.00	SKR2B	
(3)	Red	SKR2RH13	89.00	SKR2RH5	SKR2RH6	66.00	SKR2R	
	Green	SKR2GH13	89.00	SKR2GH5	SKR2GH6	66.00	SKR2G	
	Universal ▲	SKR2UH13	89.00	SKR2UH5	SKR2UH6	66.00	SKR2U	
9001SKR2B Extended Guard	Other ■	SKR2■	89.00	SKR2■H5	SKR2■H6	66.00	SKR2■	
-	Snap-In Mushr	oom Button						
	Black	SKR4BH13	138.00	SKR4BH5	SKR4BH6	112.00	SKR4B	
	Red	SKR4RH13	138.00	SKR4RH5	SKR4RH6	112.00	SKR4R	
	Red ◆	SKR4R05H13	142.00	SKR4R05H5	SKR4R05H6	119.00	SKR4R05	
	Green	SKR4GH13	138.00	SKR4GH5	SKR4GH6	112.00	SKR4G	
	Other ★	SKR4★H13	138.00	SKR4★H5	SKR4★H6	112.00	SKR4★	
9001SKR4B		hroom Button wit						
1-3/8 in. (35 mm)	Black	SKR24BH13	138.00	SKR24BH5	SKR24BH6	112.00	SKR24B	
Mushroom Button	Red	SKR24RH13	138.00	SKR24RH5	SKR24RH6	112.00	SKR24R	
	Green	SKR24GH13	138.00	SKR24GH5	SKR24GH6	112.00	SKR24G	
	Other ★	SKR24★H13	138.00	SKR24★H5	SKR24★H6	112.00	SKR24★	
		oom Button, Plas						
	Black	SKR5BH13	138.00	SKR5BH5	SKR5BH6	112.00	SKR5B	
	Red	SKR5RH13	138.00	SKR5RH5	SKR5RH6	112.00	SKR5R	
	Red ◆	SKR5R05H13	142.00	SKR5R05H5	SKR5R05H6	119.00	SKR5R05	
	Green	SKR5GH13	138.00	SKR5GH5	SKR5GH6	112.00	SKR5G	
	Other ★	SKR5★H13	138.00	SKR5★H5	SKR5★H6	112.00	SKR5★	
		hroom Button wit		• •				
9001SKR5	Black	SKR25BH13	138.00	SKR25BH5	SKR25BH6	112.00	SKR25B	
2-1/4 in. (57 mm) Mushroom Button	Red	SKR25RH13	138.00	SKR25RH5	SKR25RH6	112.00	SKR25R	
Macricolli Dattoll	Green	SKR25GH13	138.00	SKR25GH5	SKR25GH6	112.00	SKR25G	
	Other ★	SKR25★H13	138.00	SKR25★H5	SKR25★H6	112.00	SKR25★	

### Table 19.225: Color Codes

Color	■ SKR1, 2, 3 Place Color Code in Type Number	★ SKR4, 5, 24, 25 Place Color Code in Type Number
Blue	L	L
Yellow	Y	Y
White	W	_
Orange	S	S
Gray	E	=

- The universal push button operators include one each of the following color inserts: black, red, green, yellow, orange, blue and white.
- See Table 19.225.
- Knob has the words "Emergency Stop" in raised letters highlighted in white for readability.
- See Table 19.225.
- These operators can be ordered complete with contact blocks. For maximum block usage, see page 19-88. Add the "H" number chosen from page 19-88 to the end of the operator type number and add the cost of the "H" number to the operator cost.

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

Class 9001 / Refer to Catalog 9001CT1103 www.schneider-electric.us

### Table 19.226: 30 mm Multifunction Operators UL Types 4, 4X, 13/NEMA 4, 4X, 13

NOTE: When ordering, add prefix 9001 to the catalog number.

Non-Illuminated Push-Pul	Non-Illuminated Push-Pull Screw-on Mushroom Operators, Plastic Head												
	Description	Color	With 2 N.C. Contacts (1 KA3, 1 KA5)	With 1 N.O./1 N.C. Contact (1 KA1)	\$ Price	Without Contacts €	\$Price						
	3 Position												
TO START TO STOP		Red	SKR8RH25	_		SKR8R	86.00						
	Momentary Pull- Maintained Neutral- Momentary Push ▽	Green	SKR8GH25	_	142.00	SKR8G							
		Other □	SKR8□H25	_		SKR8□							
9001SKR9R	2 Position△												
Non-Illuminated 1-5/8 in. Diameter Knob Includes Type KN179WP Legend Plate Marked Pull To Start Push To Stop		Red	_	SKR9RH13		SKR9R							
	Maintained Pull- Maintained Push	Green	_	SKR9GH13	188.00	SKR9G	129.00						
		Other □	_	SKR9□H13		SKR9□							
Non-Illuminated Turn-to-R	elease Mushroom Operators												

Non-Illuminated Turn-to-Release Mushroom Operators												
Description	Color	With 1 N.O. Contact (KA1)	\$ Price	With 2 N.O./2 N.C. Contacts (2 KA1)	\$ Price	Without Contacts	\$Price					
2 Position, Plastic Head Turn-to-Release Trigger Action	Red	SKR16H13	172.00	SKR16H2	218.00	SKR16	113.00					
•	Description  2 Position, Plastic Head Turn-to-Release	Description Color  2 Position, Plastic Head Turn-to-Release Red	Description Color With 1 N.O. Contact (KA1)  2 Position, Plastic Head Turn-to-Release Red SKR16H13	Description Color With 1 N.O. Contact (KA1) S Price  2 Position, Plastic Head Turn-to-Release Red SKR16H13 172.00	Description         Color         With 1 N.O. Contact (KA1)         \$ Price         With 2 N.O./2 N.C. Contacts (2 KA1)           2 Position, Plastic Head Turn-to-Release         Red         SKR16H13         172.00         SKR16H2	Description         Color         With 1 N.O. Contact (KA1)         \$ Price         With 2 N.O./2 N.C. Contacts (2 KA1)         \$ Price           2 Position, Plastic Head Turn-to-Release         Red         SKR16H13         172.00         SKR16H2         218.00	Description Color With 1 N.O. Contact (KA1) SPrice N.C. Contacts (2 KA1) SPrice Without Contacts  2 Position, Plastic Head Turn-to-Release Red SKR16H13 172.00 SKR16H2 218.00 SKR16					

Screw-On Plastic Illuminated Push-Pull Mushroom Operators									
Illuminated	Description	Voltage	With Red Knob and 2 N.C. Contacts (1 KA3, 1 KA5)	With Other Color Knob and 2 N.C. Contacts	\$ Price	With Other Color Knob Without Contacts ♀	\$ Price		
	3 Position								
	Momentary Pull- Maintained Neutral- Momentary Push ❖	110-120 V, 50-60 Hz	SKR8P1RH25	SKR8P1□H25		SKR8P1□	201.00		
		Other—Transformer, LED, Flashing ☆	SKR8P♦RH25	SKR8P♦□H25	267.00	SKR8P◊□			
		Other—Full Voltage, Resistor, Neon ▽	SKR8P♦RH25	SKR8P♦□H25	215.00	SKR8P◊□	171.00		
	Description	Voltage	With Red △ Knob and 1 N.O. & 1 N.C. Contact (KA1)	With Other Color Knob and 1 N.O. & 1 N.C. Contact (KA1)	\$ Price	With Other Color Knob Without Contacts	\$ Price		
9001SKR9P1 Illuminated 1-5/8 in. Diameter Knob Includes Type KN179WP Legend Plate Marked Pull to Start Push To Stop	2 Position								
	Maintained Pull- Maintained Push	110-120 V, 50-60 Hz	SKR9P1RH13	SKR9P1□H13		SKR9P1□	243.00		
		Other—Transformer, L.E.D., Flashing ☆	SKR9P♦RH13	SKR9P♦□H13	316.00	SKR9P◊□			
		Other—Full Voltage, Resistor, Neon ▽	SKR9P♦RH13	SKR9P◊□H13	257.00	SKR9P◊□	215.00		

- To obtain a red knob with "Push Emergency Stop" printed on the red knob—substitute R05 in place of "R" and add \$2.10 to the price. Choose one color from Table 19.227 and insert the color code in the Type number. Example: SKR9□ with a yellow knob = SKR9Y
- Add the voltage assembly code as chosen from page 19-86. Example: SKR8P \u2220 with 277 V 50-60 Hz = SKR8P8
  The knob must be the same color as the LED light module chosen; e.g., for green LED, use green knob.
- On neon light modules, use clear knobs only.
- These operators can be ordered complete with contact blocks. For maximum block usage, see page 19-88. Add the "H" number chosen from page 19-88 to the end of the operator type number and add the cost of the "H" number to the operator cost.
- SKR11UH1 has 1 KA1(1 N.O., 1 N.C.) and SKR12UH1H1 has 2 KA1 (2 N.O., 2 N.C.).
- For positions, refer to Tables 19.228 and 19.229.

### Table 19.227: Color Codes

Color	SKR11, SKR12	SKR8, SKR9
Black <b>●</b>	В	В
Red	R	R
Green	G	G
Blue	L,	L
Yellow	Y	Y
White	W	W
Orange <b></b>	S	S
Clear	_	С
Amber	_	Α
Gray	E	

These colors are not available on illuminated push-pull operators.

### Table 19.228: Positions for 9001SKR8RH1 or H13

#### PULL CTR PUSH KA3 0 0 (KA1) 0 0 Χ

### Table 19.229: Positions for 9001SKR8H25

	9001SKR8H25					
	PULL	CTR	PUSH			
KA3	Х	0	0			
KA5	Х	Х	0			
KA2	0	0	X			

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

# Type SK Corrosion Resistant Illuminated Operators

Class 9001 / Refer to Catalog 9001CT1103

Table 19.230: Illuminated Push Button Operators UL Types 4, 4X, 13/NEMA 4, 4X, 13 For use in hazardous locations—See page 19-87. Legend plate not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.

Description		Voltage and Frequency	Style	With Red Color Cap and 1 N.O. and 1 N.C. Contact (KA1)	With Green Color Cap and 1 N.O.and 1 N.C. Contact (KA1)	\$ Price □	With Other Color Cap Without Contact Blocks ▲	\$ Price ◊
(A-174)		110-120 V, 50-60 Hz	Transformer	SK1L1RH13	SK1L1GH13	231.00	SK1L1	158.00
		220-240 V, 50-60 Hz	Transformer	SK1L7RH13	SK1L7GH13	231.00	SK1L7	158.00
		24-28 Vac/Vdc	Full Voltage	SK1L35RH13	SK1L35GH13	198.00	SK1L35	129.00
	Full Guard		Transformer, Flashing	SK1L■RH13	SK1L■GH13	231.00	SK1L ■	158.00
	Illuminated Push Button		Full Voltage	SK1L■RH13	SK1L■GH13	198.00	SK1L ■	129.00
	F usi	For other voltages	Resistor, Neon ♦	SK1L■RH13	SK1L■GH13	198.00	SK1L ■	129.00
9001SK1L1		See Table ■	LED ▼	SK1L■RH13	SK1L■GH13	231.00	SK1L ■★	158.00
- 0.000		110-120 V, 50-60 Hz	Transformer	SK2L1RH13	SK2L1GH13	217.00	SK2L1	143.00
1- 1- 0		220-240 V, 50-60 Hz	Transformer	SK2L7RH13	SK2L7GH13	217.00	SK2L7	143.00
- 15. 15 July 1		24-28 Vac/Vdc	Full Voltage	SK2L35RH13	SK2L35GH13	184.00	SK2L35	116.00
TV F	No Guard		Transformer, Flashing	SK2L■RH13	SK2L■GH13	217.00	SK2L ■	143.00
	Illuminated		Full Voltage	SK2L■RH13	SK2L■GH13	184.00	SK2L ■	116.00
	Push Button	For other voltages	Resistor, Neon ♦	SK2L■RH13	SK2L■GH13	184.00	SK2L ■	116.00
9001SK2L1		See Table ■	LED▼	SK2L■RH13	SK2L■GH13	217.00	SK2L ■★	143.00
		110-120 V, 50-60 Hz	Transformer	SK2L1R20H13	SK2L1G20H13	217.00		
- Jan		220-240 V, 50-60 Hz	Transformer	SK2L7R20H13	SK2L7G20H13	217.00		
20.27	1-3/8 in.	24-28 Vac/Vdc	Full Voltage	SK2L35R20H13	SK2L35G20H13	184.00		
	(35 mm)		Transformer, Flashing	SK2L■R20H13	SK2L■G20H13	217.00		
	Illuminated Mushroom,		Full Voltage	SK2L■R20H13	SK2L■G20H13	184.00	Order SK2L	<b>■★</b> △
	Screw-On	For other voltages	Resistor, Neon ♦	SK2L■R20H13	SK2L■G20H13	184.00		
9001SK2L1R20	Plastic Head	See Table ■	LED ▼	SK2L■R20H13	SK2L■G20H13	217.00		
		110-120 V, 50-60 Hz	Transformer	SK2L1R21H13	SK2L1G21H13	217.00		
		220-240 V, 50-60 Hz	Transformer	SK2L7R21H13	SK2L7G21H13	217.00		
	2-1/4 in.	24-28 Vac/Vdc	Full Voltage	SK2L35R21H13	SK2L35G21H13	184.00		
	(57 mm) Illuminated		Transformer, Flashing	SK2L■R21H13	SK2L■G21H13	217.00		
	Mushroom,		Full Voltage	SK2L■R21H13	SK2L■G21H13	184.00	Order SK2L	<b>■★</b> △
The state of the s	Screw-On	For other voltages	Resistor, Neon ♦	SK2L■R21H13	SK2L■G21H13	184.00		
9001SK2L1R21	Plastic Head	See Table ■	LED ▼	SK2L■R21H13	SK2L■G21H13	217.00		

- These operators can be ordered complete with contact blocks. For maximum block usage, see page 19-88. Add the "H" number chosen from page 19-88 to the end of the operator type number and add the cost of the "H" number to the operator cost.
- Add the voltage assembly code as chosen from page 19-86. **EXAMPLE: SK2L** with 240 Vac/Vdc = SK2L25. On neon light modules, use clear color caps only.

- The cap must be the same color as the LED light module chosen e.g., for red LED, use red color cap.

  Add the color code as chosen from the color cap table below. **EXAMPLE: SK2L25v with a blue 1-3/8 in. mushroom button = SK2L25L20.**The only difference between a no guard (SK2L) operator and mushroom button operator is the color cap.
- Price includes operator, light module, contact blocks and color cap.
- Price includes operator, light module and color cap.

Table 19.231: Color Caps

Color	Color Codes							
Color	SK1L/SK2L	1-3/8 in. (35 mm) Mushroom	2-1/4 in. (57 mm) Mushroom					
Red	R	R20	R21					
Green	G	G20	G21					
Blue	L	L20	L21					
Yellow	Y	Y20	Y21					
White	W	W20	W21					
Clear	С	C20	C21					
Amber	A	A20	A21					

NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

Table 19.232: 2-Position Selector Switches

NOTE: When ordering, add prefix 9001 to the catalog number.

Contact Block Required						1—Contact Closed 0—Contact Open			
Contact Block Position	Quantit KA1 or	Quantity and Type Mount on Side KA1 or KA2 or KA3 KA1 or KA2 or KA3		Left	# Right	Left	Right		
	KA1	KA3	KA1		KA3 #2	1	0	0	1
Side 2 Side 1		or KA2	#2	or	KA2 #2	0	1	1	0
	KA1	KA3	KA1		KA3 #1	1	0	0	1
Operator Locating  Top View	000	or KA2	#1	or	KA2 #1	0	1	1	0
Cam (see page 19-73)		•				E	Ē		D

Non-Illuminated Operators	Туре	Туре	\$ Price
Manual Return ▲, Operator Only (without contact blocks)	<u> </u>		
Without Knob	SKS11	SKS12	42.80
With Knob (select style and color from Table 19.233 below)	SKS11♦	SKS12♦	53.00
Operator with Contact Blocks and Standard black knob	·		
With 1 KA1 on Side #2	SKS11BH13	_	106.00
With 1 KA1 on Side #1	SKS11BH1	_	106.00
With 1 KA1 on Side #1 and 1 KA1 on side #2	SKS11BH2	_	152.00
Spring Return from Left ▲, Operator Only (without contact blocks)			
Without Knob	SKS25	_	71.00
With Knob (select style and color from Table 19.233 below)	SKS25♦	_	81.00
Spring Return from Right ▲, Operator Only (without contact blocks)			
Without Knob	<u> </u>	SKS34	71.00
With Knob (select style and color from Table 19.233 below)	_	SKS34♦	81.00

Illuminated Operators	Туре	Туре	\$ Price
Manual Return ▲, Operator Only (without contact blocks)			
Without Knob, 110-120V 50-60 Hz Transformer	SK11J1	SK12J1	158.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	SK11J1R	SK12J1R	167.00
With Other Color Knob and other voltage Light Module ■ ◆	SK11J■♦	SK12J■◆	167.00
Spring Return from Left ▲, Operator Only (without contact blocks)			
Without Knob, 110-120V 50-60 Hz Transformer	SK25J1	_	185.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	SK25J1R	_	197.00
With Other Color Knob and other voltage Light Module ■ ◆	SK25J <b>■</b> ♦	_	197.00
Spring Return from Right ▲, Operator Only (without contact blocks)			
Without Knob, 110-120V 50-60 Hz Transformer	<u> </u>	SK34J1	185.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	_	SK34J1R	197.00
With Other Color Knob and other voltage Light Module ■ ◆	1-	SK34J <b>■</b> ♦	197.00

- These operators can be ordered complete with contact blocks. Add the "H code" from page 19-88 as needed for your application.
- Add the voltage assembly code as chosen from page 19-86. Example: K25J■ with 208Vac = K25J3

  Add the knob color code from Table 19.233. For LED, knob color must match LED.

Table 19.233: Selector Switch Assembly Code and Knob Cat. No.

Color	Standard	Knob	Gloved Hai	\$ Price	
Color	♦ Knob Code	Cat. No.	♦ Knob Code	Cat. No.	\$ FIICE
Black	В	B11	FB	B25	
Red	R	R8	FR	R24	
Green	G	G8	FG	G24	
Yellow	Y	Y8	FY	Y24	9.90
Blue	L	L8	FL	L24	9.90
White	W	W8	FW	W24	
Amber	Α	A8	FA	A24	
Clear	С	C8	FC	C24	



NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories. See pages 19-85 through 19-92.

Discount Schedule



www.schneider-electric.us

#### Table 19.234: 3-Position Selector Switches

NOTE: When ordering, add prefix 9001 to the catalog number.

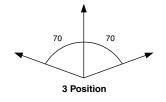
Contact	Block Requir	rod			_				1_C	ontact Closed		tact Open	F. C 0001	to the catalog	
Contact	Diock nequir	eu				Center	Center	Center	Center	Center	Center	Center	Center	Cente	ar .
Contact	Quantit	у		lount		Center	Center	Center	Center	Center	Cerner	Center	Center	Cerne	"
Block Position	and Type		,	on Side		XIX	*11	<b>*</b> 1/	<b>*</b> 1/	*11	*11	*11	*11	<b>★1</b> .	1
	KA1	KA3	KA1		(A3 #2	1 0 0	1 0 0	0 0 1	1 0 0	1 0 0	1 0 0	1 0 0	0 1 0	1 1	0
Side 2 Side 1		KA2	#2	۱	(A2 #2	0 1 1	0 0 1	0 1 0	0 1 0	0 0 1	0 1 1	0 1 1	1 0 0	0 0	1
Operator Locating Notch  Top View	KA1		KA1		(A3 #1	0 0 1	1 0 0	0 0 1	1 0 0	0 1 0	0 0 1	1 0 1	0 0 1	0 1	1
Top view	0 0 1.	KA2	#1	ŀ	(A2 #1	1 1 0	0 0 1	0 1 0	0 1 0	0 0 1	1 0 0	0 1 0	0 1 0	1 0	0
Cam (see page 19-73)		•				В	С	D	E	F	G	J	L	М	
Non-Illuminated Operators	s					Type	Type	Туре	Туре	Туре	Туре	Type	Туре	Type	\$ Price
Manual Return, Operator		t conta	ct blo	ocks)	<b>A</b>	71		71				71			
Without Knob	o, (ou	i ooma	J. 13.1.	one,		SKS42	SKS43	SKS44	SKS45	SKS46	SKS47	SKS49	SKS401	SKS402	42.80
With Knob (select style and o	color from Tabl	e 19 23	5 held	nw)		SKS42♦	SKS43♦	SKS44◆	SKS45♦	SKS46♦	SKS47♦	SKS49♦	SKS401 ♦	SKS402 ♦	53.00
Operator with Contact Blo						OI TO 12 V	CITO 10 V	CROTT	CITO-10 V	ONO 10 V	CITO 17 V	ONO 10 V	0101017	ONO TOE V	00.00
		iluaru L	JIACK	KIIOL		OKO 40 DI 14 0	OKO 40DI I40	OKO 44BU46	OKO 4EDI I40	OKO 40DI I40	01/04701140	OKO 40 DI I40	OKO 404 DI 140	SKS402BH13	400.00
With 1 KA1 on Side #2 (H13)	)					SKS42BH13	SKS43BH13 SKS43BH1	SKS44BH13 SKS44BH1	SKS45BH13 SKS45BH1	SKS46BH13 SKS46BH1	SKS47BH13 SKS47BH1	SKS49BH13 SKS49BH1	SKS401BH13 SKS401BH1	SKS402BH13	106.00 106.00
With 1 KA1 on Side #1 (H1)	IVA1 on side	#0 (LIO)				SKS42BH2		SKS44BH2	SKS45BH1		SKS47BH1	SKS49BH1	SKS401BH1	SKS402BH1	152.00
With 1 KA1 on Side #1 and 1		_ , ,	S I	/!Al-			•	3N344BHZ	3K343BH2	33K340BHZ	3K347BH2	3K349BHZ	3K3401BH2	3N3402BH2	152.00
Spring Return from Left to	o Center, Ope	erator C	חוע (חוע	(with	out c				0.400-	01/000	01/04=	01/000		01/0000	
Without Knob		10.00		,		SKS62	SKS63	SKS64	SKS65	SKS66	SKS67	SKS69	SKS601	SKS602	71.00
With Knob (select style and c						SKS62♦	SKS63♦	SKS64◆	SKS65♦	SKS66♦	SKS67♦	SKS69♦	SKS601♦	SKS602◆	81.00
<b>Spring Return from Right</b>	to Center, O	perator	Only	y (wit	hout										
Without Knob						SKS72	SKS73	SKS74	SKS75	SKS76	SKS77	SKS79	SKS701	SKS702	71.00
With Knob (select style and o	color from Tabl	le 19.23	5 belo	ow)		SKS72♦	SKS73♦	SKS74♦	SKS75♦	SKS76♦	SKS77♦	SKS79♦	SKS701 ♦	SKS702◆	81.00
Spring Return from Both	Sides to Cen	ter, Op	erato	r Onl	y (wi	ithout conta	act blocks) 4	<b>L</b>							
Without Knob						SKS52	SKS53	SKS54	SKS55	SKS56	SKS57	SKS59	SKS501	SKS502	71.00
With Knob (select style and o	color from Tabl	le 19.23	5 belo	ow)		SKS52♦	SKS53♦	SKS54◆	SKS55♦	SKS56♦	SKS57♦	SKS59♦	SKS501 ♦	SKS502◆	81.00
Illuminated Operators						Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре	\$ Price
Manual Return, Operator			ct blo	ocks)	<b>A</b>										
Without Knob, 110-120V 50-						SK42J1	SK43J1	SK44J1	SK45J1	SK46J1	SK47J1	SK49J1	SK401J1	SK402J1	158.00
With Standard Red Knob, 11						SK42J1R	SK43J1R	SK44J1R	SK45J1R	SK46J1R	SK47J1R	SK49J1R	SK401J1R	SK402J1R	167.00
With Other Color Knob and o						SK42J■◆	SK43J■◆	SK44J■♦	SK45J■◆	SK46J■◆	SK47J■◆	SK49J■◆	SK401J <b>■</b> ♦	SK402J■◆	167.00
Spring Return from Left to			Only (	(with	out c			Olection	0145= 11	OV65.:	OLCE ::	OV65 !:	01/07:11	01405511	407.55
Without Knob, 110-120V 50-						SK62J1	SK63J1	SK64J1	SK65J1	SK66J1	SK67J1	SK69J1	SK601J1	SK602J1	185.00
With Standard Red Knob, 11						SK62J1R	SK63J1R	SK64J1R	SK65J1R	SK66J1R	SK67J1R	SK69J1R	SK601J1R	SK602J1R	197.00
With Other Color Knob and o		_				SK62J■◆	SK63J■◆	SK64J■◆	SK65J■◆	SK66J■◆	SK67J■◆	SK69J■◆	SK601J■◆	SK602J■◆	197.00
Spring Return from Right			Only	y (wit	nout			1 24-41			0.455			0.0000	
Without Knob, 110-120V 50-						SK72J1	SK73J1	SK74J1	SK75J1	SK76J1	SK77J1	SK79J1	SK701J1	SK702J1	185.00
With Standard Red Knob, 11						SK72J1R	SK73J1R	SK74J1R	SK75J1R	SK76J1R	SK77J1R	SK79J1R	SK701J1R	SK702J1R	197.00
With Other Color Knob and o						SK72J■◆	SK73J■◆	SK74J■♦	SK75J■◆	SK76J■◆	SK77J■◆	SK79J■◆	SK701J■◆	SK702J■◆	197.00
Spring Return from Both			erato	r Onl	y (w										
Without Knob, 110-120V 50-						SK52J1	SK53J1	SK54J1	SK55J1	SK56J1	SK57J1	SK59J1	SK501J1	SK502J1	185.00
With Standard Red Knob, 11	0-120V 50-60	Hz Tran	sform	ner		SK52J1R	SK53J1R	SK54J1R	SK55J1R	SK56J1R	SK57J1R	SK59J1R	SK501J1R	SK502J1R	197.00

- SK52J■♦ SK53J■♦ SK54J■♦ SK55J■♦ SK55J■♦ SK56J■♦ SK57J■♦ SK59J■♦ SK501J■♦ SK502J■♦ **197.00** With Other Color Knob and other voltage Light Module ■ ◆ These operators can be ordered complete with contact blocks. Add the "H code" from page 19-88 as needed for your application.
  - Add the voltage assembly code as chosen from page 19-86. Example: K25J

    Add the knob color code from Table 19.235 below. For LED, knob color must match LED. For other color knobs replace the B with knob color code from Table 19.235 below.

#### Table 19.235: Selector Switch Assembly Code and Knob Cat. No.

Color	Standard	Knob	Gloved Hai	\$ Price	
	♦ Knob Code	Cat. No.	♦ Knob Code	Cat. No.	3 FIICE
Black	В	B11	FB	B25	
Red	R	R8	FR	R24	
Green	G	G8	FG	G24	
Yellow	Υ	Y8	FY	Y24	9.90
Blue	L	L8	FL	L24	9.90
White	W	W8	FW	W24	
Amber	Α	A8	FA	A24	
Clear	С	C8	FC	C24	



NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories. See pages 19-85 through 19-92.

Class 9001 / Refer to Catalog 9001CT1103

Cam (see page 19-73)

н

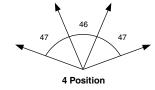
Non-Illuminated Operators	Туре	\$ Price
Manual Return ▲, Operator Only (without contact blocks)		
Without Knob	SKS88	42.80
With Knob (select style and color from Table 19.237 below)	SKS88♦	52.65

Illuminated Operators	Туре	\$ Price
Manual Return ▲, Operator Only (without contact blocks)		
Without Knob, 110-120V 50-60 Hz Transformer	SK88J1	158.00
With Standard Red Knob, 110-120V 50-60 Hz Transformer	SK88J1R	167.00
With Other Color Knob and other voltage Light Module ■ ◆	SK88J■ ♦	167.00

- These operators can be ordered complete with contact blocks. Add the "H code" from page 19-88 as needed for your application. Add the voltage assembly code as chosen from page 19-86. Example: K25J■ with 208Vac = K25J3 Add the knob color code from Table 19.237. For LED, knob color must match LED

#### Table 19.237: Selector Switch Assembly Code and Knob Cat. No.

Color	Standard	Knob	Gloved Hai	nd Knob	\$ Price
	♦ Knob Code	Cat. No.	♦ Knob Code	Cat. No.	\$ FIICE
Black	В	B11	FB	B25	
Red	R	R8	FR	R24	
Green	G	G8	FG	G24	
Yellow	Y	Y8	FY	Y24	9.90
Blue	L	L8	FL	L24	9.90
White	W	W8	FW	W24	
Amber	Α	A8	FA	A24	
Clear	С	C8	FC	C24	



# **Potentiometers with Dial Plate**

Table 19.238: Potentiometers with Dial Plate (not UL listed)—Maximum Voltage 300 Vac

Power	Description	Ratings	Туре	\$ Price
	Operator Only, for Single Potentiometer		SK20	201.00
2 W	Operator with Single Potentiometer	NEMA 4. 13	SK21	287.00
2 VV	Operator Only, for Tandem Potentiometer	INCIVIA 4, 13	SK22	314.00
	Operator with Tandem Potentiometer	,	SK23	399.00

## Table 19.239: Potentiometer Suffixes

Single Potentiometer							
Suffix ★	Resistance	Suffix ★	Resistance				
01	50 Ω	07	5 kΩ				
02	100 Ω	08	10 kΩ				
04	500 Ω	09	25 kΩ				
05	1 kΩ	13	500 kΩ				
39	2 kΩ	37	750 kΩ				
06	2.5 kΩ	14	1 ΜΩ				
Tandem Potent	tiometer						
Suffix ★	Resistance						
Suilix X		Front	Rear				
82 $1 \text{ k}\Omega$ $1 \text{ k}\Omega$							

For the complete part number, add the suffix from Table 19.239 to the catalog number from Table 19.238. Example: 9001K2105.

Any potentiometer with a shaft 7/8 in. long and 1/4 in. diameter may be used with these operators.

Discount Schedule

NOTE: To select and order Contact Blocks, Light Modules, Knobs, and Accessories. See pages 19-85 through 19-92.

19-82

Table 19.240: Pilot Lights-UL Types 4, 4X, 13/NEMA 4, 4X, 13. For use in hazardous locations, see page 19-87. Legend plate not included.

NOTE: When ordering, add prefix 9001 to the catalog number.

Description		Voltage	Style	With Red Fresnel Color Cap	With Green Fresnel Color Cap	With Other Color Cap	\$ Price	Without Color Cap	\$ Price
		110-120 V, 50-60 Hz	Transformer	SKP1R31	SKP1G31	SKP1■	153.00	SKP1	143.00
1000	Standard	220-240 V, 50-60 Hz	Transformer	SKP7R31	SKP7G31	SKP7■	153.00	SKP7	143.00
TIV	Pilot Light	24-28 Vac/Vdc	Full Voltage	SKP35R31	SKP35G31	SKP35■	125.00	SKP35	116.00
	(Fresnel color cap shown)	For other voltages	Transformer, Flashing or LED ♦	SKP▲R31	SKP▲G31	SKP▲■	125.00	SKP▲	116.00
9001SKP1	see Table ▲		Full Voltage, Neon or Resistor★	SKP▲R31	SKP▲G31	SKP▲■	125.00	SKP▲	116.00
		110-120 V, 50-60 Hz	Transformer	SKT1R31	SKT1G31	SKT1■	197.00	SKT1	185.00
	Push-To-Test Pilot Light (Fresnel color cap shown)	220-240 V, 50-60 Hz	Transformer	SKT7R31	SKT7G31	SKT7■	197.00	SKT7	185.00
		24-28 Vac/Vdc	Full Voltage	SKT35R31	SKT35G31	SKT35■	167.00	SKT35	158.00
and the		For other voltages	Transformer, Flashing or LED ♦	SKT≜R31	SKT▲G31	SKT▲■	197.00	SKT▲	158.00
9001SKT1		see Table ▲	Full Voltage, Neon or Resistor★	SKT≜R31	SKT▲G31	SKT▲■	197.00	SKT▲	158.00
		120 Vac Only	Resistor	SKTR38R31	SKTR38G31	SKTR38■	197.00	SKTR38	185.00
9001SKTR38	Remote Test	24-28 Vac Only	Full Voltage	SKTR35R31	SKTR35G31	SKTR35■	197.00	SKTR35	185.00
	Pilot Light (Fresnel color cap shown)	For other voltages see Tables ▲■▼	Full Voltage or Resistor	SKTR▲R31	SKTR▲G31	SKTR▲■	197.00	SKTR▲	185.00

- Add the voltage assembly code as chosen from Table 19.248 or Table 19.249 on page 19-86.

  EXAMPLE: SKT+R31 with 208 Vac red LED voltage = SKT37LRR31.

  Add the color code as chosen from the color cap table below.

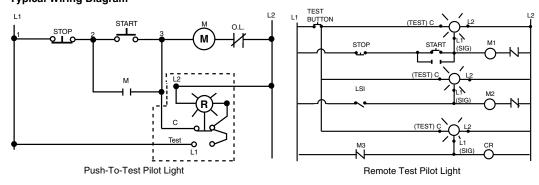
  EXAMPLE: SKP1+ with a blue fresnel cap = SKP1L31.

  The cap must be the same color as the LED light module chosen, e.g., for a green LED, use a green color cap.
- On neon light modules, use clear color caps only.
- Use only full voltage or resistor voltage assembly codes on remote test pilot lights. Do not choose LED, neon or transformer codes. For AC use only.

#### Table 19.241: Color Caps

Color	■ Plastic Fresnel	■ Plastic Domed
Amber	A31	A9
Blue	L31	L9
Clear	C31	C9
Green	G31	G9
Red	R31	R9
White	W31	W9
Yellow	Y31	Y9

# **Typical Wiring Diagram**



NOTE: To select and order contact blocks, light modules, and accessories, see pages 19-85 through 19-92.

# **Type SK Corrosion Resistant Multifunction Operators**

Class 9001 / Refer to Catalog 9001CT1103



by Schneider Electric www.schneider-electric.us

# Table 19.242: Multifunction Operators—UL Types 4, 4X, 13/NEMA 4, 4X, 13

For use in hazardous locations—See page 19-87.
Legend plate and contact blocks not included unless otherwise noted.

NOTE: When ordering, add prefix 9001 to the catalog number.

Interlocked Assembly	Description	Color	Contacts	\$ Price	Without Contacts	\$ Price
	Interlocked Assembly	Universal ▲	SKR11UH1	178.00	SKR11U	120.00
	Both Buttons Maintained	Other ■	SKR11■H1	170.00	SKR11■	120.00
	Interlocked Assembly One Button Momentary	Universal ▲	SKR12UH1H1		SKR12U	
9001SKR11U	Interlocked Assembly One Button Maintained	Other ■	SKR12■H1H1	273.00	SKR12■	162.00
	12 includes 2 seeb of block rad groon w					

- Universal for SKR11,12 includes 2 each of black, red, green, yellow, orange, blue, white.

  Choose one color for each button. R = red, G = green, B = Black.

  Example: 9001SKR11 with top button gray and bottom button orange = 9001SKR11ES. See Table 19.227

Class 9001 / Refer to Catalog 9001CT1103

Type K, SK and KX Electrical Components

www.schneider-electric.us The Class 9001 Type KA contact blocks are Fingersafe® contact blocks

(meeting VDE 0106 Part 100). They have one screw mounting and captive (backed out) plus/minus terminal screws. These contact blocks are double-break, direct-acting contacts. Because of the wiping action of these contacts, they are suitable for use with programmable controllers. All contact blocks listed below accept up to 2 #12-#24 AWG solid or stranded wires. Recommended tightening torque for screw terminals is 7 lb-in.

Table 19.243: Standard Contact Blocks

Description	Symbol	Туре	\$ Price
(Clear Cover)	Direct-Acting	KA1	42.80
(Green Cover)	<b>-</b>	KA2	21.50
(Hed Cover)	Direct-Acting	KA3	21.50
(Clear Cover)	O.L.O O.y.O N.O. Contact Early Closing	KA4	42.80
(Hed Cover)	N.C. Contact Late Opening	KA5	21.50
(Green Cover)	Q.y.O N.O. Contact Early Closing	KA6	21.50

#### **Table 19.244: Additional Circuit Arrangements**

Sequencing ▲ N.O. Contact of KA4 closes before N.O. Contact on KA1	0 <b>L</b> 0 0 y 0 KA4	O L O O O KA1	Order One Type KA4 and One Type KA1	85.60
Overlapping ▲ N.O. Contact of KA4 closes before N.C. Contact of KA5 Opens	0 <b>L</b> 0 0 y 0 KA4	OLO KA5	Order One Type KA4 and One Type KA5	64.30

For push buttons or two-position selector switches only. For sequencing or overlapping contacts on other operators, refer to catalog **9001CT0001**.

Symbol	Binde	ict Blocks wi r Head Screv t Fingersafe)	Gold Flashed Contacts with Standard Pressure Wire Terminals		
	Туре	Quantity■	\$ Price	Туре	\$ Price
<b>01</b> 0	KA21	25–Up	42.80	KA31	71.00
•	KA22	25–Up	25–Up <b>21.50</b>		35.60
010	KA23	25–Up	25–Up <b>21.50</b>		35.60
O.L.O O.y.O N.O. Early Closing	KA24	25–Up	25–Up <b>42.80</b>		71.00
N.C. Contact Late Opening	KA25	25–Up	21.50	KA35	35.60

Minimum order quantity is 25. The price represents one individual contact block.

#### Contact blocks listed below are not Fingersafe, but provide:

- Terminals that accept ring tongue/fork tongue connectors
- Short single circuit contact blocks (0.75" deep vs. 0.97" deep on the Fingersafe)
- Same as old style Series G product available prior to March, 1989.
- For assembled operators, use form Y238 (add to catalog number as suffix, for example: 9001KRU1H13Y238)



Table 19.245: Contact blocks (not Fingersafe)

Symbol	Туре	\$ Price	Symbol	Туре	\$ Price
010	KA1G	42.80	O V O N.O. Contact Early Closing	KA4G	42.80
0 0	KA2G	21.50	N.C. Contact Late Opening	KA5G	21.50
010	KA3G	21.50	O y O N.O. Contact Early Closing	KA6G	21.50

## Table 19.246: Contact blocks with Quick-Connect terminals (not Fingersafe)

Symbol	Туре	\$ Price
0 0	KA12	35.60
٠	KA13	35.60

Dimensions . . . . . . . . . . . . . . . . . Catalog 9001CT0001

#### Table 19.247: Maximum Current Ratings for Control Circuit Contacts—Types KA1-KA6, KA21-KA25, KA31-KA35, KA1G-KA6G

				AC				DC				
V		Indu	octive (NEMA / UL Ty 35% Power Facto	rpe A600) or	Resistive 75% Power	Inductive and Resistive (NEMA Q600)						
Ť	Make		Break	C	Continuous	Factor Make, Break and Continuous	ontinuous Make and Break				Continuous	
	Amperes	VA	Amperes	VA	Carrying Amperes	g Amperes		KA1	KA2 KA3	KA4	KA5 KA6	Carrying Amperes
120	60		6.0							ĺ		
240	30	7200	3.0	720	10	10	125 250	0.55 0.27	0.55 0.27		_	2.5
480	15	7200	1.5	720	10	10	600	0.10	0.10		_	2.5
600	12		1.2									

For use in hazardous locations—See page 19-87.

- With neon type light modules, use a clear color cap only.
- With LED light modules, use either a clear color cap or a cap the same color as the LED.

#### Table 19.248: Standard Light Modules for Types K, SK, and KX Control Units ■

NOTE: When ordering, add prefix 9001 to the catalog number.



		Light M	odule	Voltage		Replacement Lamp		
Voltage	Description	Туре	\$ Price	Assembly Code	Rating	Part Number ■	\$ Price	
All	Full Voltage (without Bayonet Base Lamp)	KM40	78.00	40	_	None	_	
6 Vac/Vdc	Full Voltage	KM31	86.00	31	.9 VA	2550101020	12.45	
6 Vac/Vdc	LED Red	KM31LR	116.00	31LR		6508805201	42.75	
6 Vac/Vdc	LED Green	KM31LG	116.00	31LG		6508805203	42.75	
6 Vac/Vdc	LED Yellow	KM31LY	116.00	31LY		6508805202	28.50	
12-14 Vac/Vdc	Full Voltage	KM32	86.00	32	1.2 VA	2550101037	12.45	
12-14 Vac/Vdc	LED Red	KM32LR	116.00	32LR		6508805201	42.75	
12-14 Vac/Vdc	LED Green	KM32LG	116.00	32LG		6508805203	42.75	
12-14 Vac/Vdc	LED Yellow	KM32LY	116.00	32LY		6508805202	28.50	
18 Vac/Vdc	Resistor	KM33	86.00	33	1.4 VA	2550101037	12.45	
24-28 Vac/Vdc	Full Voltage	KM35	86.00	35	1.2 VA	2550101002	12.45	
24-28 Vac/Vdc	LED Red	KM35LR	116.00	35LR	.28 VA	6508805210	42.75	
24-28 Vac/Vdc	LED Green	KM35LG	116.00	35LG	.28 VA	6508805212	42.75	
24-28 Vac/Vdc	LED Yellow	KM35LY	116.00	35LY	.28 VA	6508805211	42.75	
24-28 Vac/Vdc	LED White	KM35LW	116.00	35LW	.28 VA	6508805214	42.75	
24-28 Vac/Vdc	LED Blue	KM35LL	116.00	35LL	.28 VA	6508805213	42.75	
48 Vac/Vdc	Full Voltage	KM36	86.00	36	2.6 VA	2550101025	12.45	
110-120 V, 50-60 Hz	LED Red	KM1LR	143.00	1LR		6508805201	42.75	
110-120 V, 50-60 Hz	LED Green	KM1LG	143.00	1LG		6508805203	42.75	
110-120 V, 50-60 Hz	LED Yellow	KM1LY	143.00	1LY		6508805202	42.75	
110-120 V, 50-60 Hz	Transformer	KM1	116.00	1	2.4 VA	2550101020	12.45	
110-120 V, 50-60 Hz	Flashing	KMF1	116.00	F1	.85 VA	2550101036	16.50	
120 Vac/Vdc	Full Voltage/Resistor	KM38	86.00	38	3.0 VA	2550101027	12.45	
120 Vac/Vdc	Neon ▲	KM11	86.00	11	0.2 VA	2550101013	32.85	
120 Vac/Vdc	LED Red	KM38LR	116.00	38LR	1.4 VA	6508805210	42.75	
120 Vac/Vdc	LED Green	KM38LG	116.00	38LG	1.4 VA	6508805212	42.75	
120 Vac/Vdc	LED Yellow	KM38LY	116.00	38LY	1.4 VA	6508805211	42.75	
120 Vac/Vdc	LED White	KM38LW	116.00	38LW	1.4 VA	6508805214	42.75	
120 Vac/Vdc	LED Blue	KM38LL	116.00	38LL	1.4 VA	6508805213	42.75	
208–220 V, 50–60 Hz	Transformer	KM3	116.00	3	2.5 VA	2550101020	12.45	
208-220 V, 50-60 Hz	LED Red	KM3LR	143.00	3LR		6508805201	42.75	
208–220 V, 50–60 Hz	LED Green	KM3LG	143.00	3LG		6508805203	42.75	
208-220 V, 50-60 Hz	LED Yellow	KM3LY	143.00	3LY		6508805202	42.75	
208–220 V, 50–60 Hz	LED White	KM3LW	143.00	3LW		6508805215	42.75	
208–220 V, 50–60 Hz	LED Blue	KM3LL	143.00	3LL		6508805216	42.75	
220-240 V, 50-60 Hz	Transformer	KM7	116.00	7	2.0 VA	2550101020	12.45	
220-240 V, 50-60 Hz	LED Red	KM7LR	143.00	7LR		6508805201	42.75	
220-240 V, 50-60 Hz	LED Green	KM7LG	143.00	7LG		6508805203	42.75	
220-240 V, 50-60 Hz	LED Yellow	KM7LY	143.00	7LY		6508805202	42.75	
220-240 V, 50-60 Hz	LED White	KM7LW	143.00	7LW		6508805215	42.75	
220-240 V, 50-60 Hz	LED Blue	KM7LL	143.00	7LL		6508805216	42.75	
240 Vac/Vdc	Resistor	KM25	86.00	25	6.0 VA	2550101027	12.45	
240 Vac/Vdc	Neon ▲	KM12	86.00	12	0.3 VA	2550101013	32.85	
277 V, 50–60 Hz	Transformer	KM8	116.00	8	2.4 VA	2550101020	12.45	
380–480 V, 50–60 Hz	Transformer	KM5	116.00	5	2.8 VA	2550101020	12.45	
480 Vac/Vdc	Neon ▲	KM14	86.00	14	0.5 VA	2550101013	32.85	
550–600 V, 50–60 Hz	Transformer	KM6	116.00	6	2.5 VA	2550101020	12.45	

- Not for use on KX operators.
- For use with all operators except KX and remote test pilot.

NOTE: Light modules are available in other voltages. For additional information, refer to Catalog 9001CT0001.

For use in hazardous locations—See page 19-87.

- Reduces the depth of illuminated push buttons with contact blocks by over 33%.
- With LED light modules, use a cap that is the same color as the LED.

#### Table 19.249: Shallow Depth Light Modules For Types K and SK Control Units •



Voltage	Description	Light Module		Voltage Assembly	Rating	Replacement Lamp		
	Description	Туре	\$ Price	Code	Haung	Part Number	\$ Price	
	Full Voltage	KM55	86.00	55	1.2 VA	2550101002	12.45	
24–28 Vac/Vdc	LED Red	KM55LR		55LR		6508805204	40.75	
24-26 Vac/Vuc	LED Green	KM55LG	116.00	55LG	0.5 VA	6508805206	42.75	
	LED Yellow	KM55LY		55LY		6508805205		
	Full Voltage	KM58	86.00	58	3.0 VA	2550101027	12.45	
110-120 Vac/Vdc	LED Red	KM58LR		58LR		6508805204	40.75	
110-120 Vac/Vuc	LED Green	KM58LG	116.00	58LG	0.5 VA	6508805206	42.75	
	LED Yellow	KM58LY		58LY		6508805205		

For use with all operators except KX and remote test pilot.



E78403 NKCR



LR25490 3211 03





by Schneider Flectric www.schneider-electric.us

#### 30 mm Push Buttons

Hazardous locations do not always require the use of explosion-proof equipment like the Class 9001 Type BR control stations. Selecting the most appropriate device for the location can save you money. For more information on the types of hazardous locations, contact your local electrical inspector.

Table 19.250: Square D Offering According to Class, Division, and Group

	For		0.5
Class	Division	Group(s)	Use
- 1	1	Α	Intrinsically Safe System
1	1	B, C, D	1. 9001 BR station
	'	D, O, D	Intrinsically Safe System
1	2	Α	9001 K, SK, KX control stations     with restrictions ▲
			Intrinsically Safe System
			1. 9001 BR station
1	2	B, C, D	2. 9001 K, SK, KX control stations with restrictions ▲
			Intrinsically Safe System
П	1	E, F, G	1. 9001 BR station
	'	L, 1, G	Intrinsically Safe System
			<ol> <li>9001 BR station</li> </ol>
II	2	E, F	2. 9001 K, SK, KX control stations with restrictions ▲
			Intrinsically Safe System
			1. 9001 BR station
II	2	G	2. 9001 K, SK, KX control stations with restrictions ■
			Intrinsically Safe System
			1. 9001 BR Station
Ш	1, 2	_	2. 9001 K, SK, KX control stations with restrictions ■
			Intrinsically Safe System

- Any Class 9001 Type K, SK or KX operator can be used in an area classified as Class I, Division 2 hazardous locations, if:

  1. Only logic (KA40 series) or power (KA50 series) reed contact blocks

  - 1. Only logic (KA40 series) or power (KA50 series) feed contact blocks are used.

    2. All Type K and SK illuminated operators are UL approved for use in Class I Division 2 areas. ♦

    3. Type KX illuminated operators do not use 4 lamp light modules, or 2 lamp light modules other than the transformer type. ♦

    4. The operators are mounted in any NEMA 4 & 13 enclosures.
- Any Class 9001 Type K, SK, or KX operator mounted in a Class 9001 Type KY, KYSS, KYAF, SKY enclosure may be used, except potentiometer operators.
- Add Form Y243 to single lamp Push-To-Test pilot lights. Note: For ▲ and ■: UL Listed: File E10054(N), CCN NOIV.

Table 19.251: Hazardous Locations (see page 19-87)











# Type K, SK and KX Electrical Components

Class 9001 / Refer to Catalog 9001CT1103

NOTE: When ordering, add prefix 9001 to the catalog number. All contact blocks listed below accept #12-18 solid or stranded wire.

Table 19.252: Hermetically Sealed Logic Reed Contact Blocks △ Suitable for use on low energy level circuits

Description	Symbol	Туре	\$ Price
	<b>E</b> Å:	KA41	86.00
	<b>\</b>	KA42	42.80
	E	KA43	42.80
10 (2)	Ė	KA44	86.00
	;}^ <b>\</b> ;	KA45	86.00

Max. Vac/Vdc	Maximum Load						
IVIAA. VAC/VUC	Resistive	Inductive	Continuous				
32/30	.25 A	.10 A	.5 A				
120/100	8 VA	3 VA	.5 A				

The maximum number of logic and/or power reed contact blocks per operator is as indicated on individual selection tables for standard contact blocks, except:

- On 3 position selector switches with cams C, D, E, F, G, L, or M, mount reed blocks on one side only (either side), maximum 2 in tandem.
- On 4 position selector switches, mount reed blocks on one side only (either side), maximum 2 in tandem.
- On joysticks or on Type KR8 or SKR8 push-pull operators, mount reed blocks on one side only (either side), maximum 2 in tandem

Table 19.253: Hermetically Sealed Power Reed Contact Blocks  $\triangle$ 

Description	Symbol	Type	\$ Price
	<b>~</b> :	KA51	143.00
A P	Name	KA52	101.00
	<b>^_</b>	KA53	101.00
10 /2	÷	KA54	143.00
	:\^\4:	KA55	143.00

	AC NEMA C300 ★							
Volts	Ma	ike	Brea	Continuous				
	Α	VA	Α	VA	Carrying Amperes			
120	10.00	1200	1.000	120	3.0			
240	5.00	1200	.500	120	5.0			

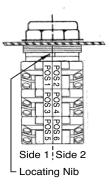
Ì			DC	NEMA Q150	▼	
	Volts	Ma	ike	Brea	Continuous Carrying	
		Α	VA	Α	VA	Amperes
	115	.50	58	.50	58	3.0

The power reed contact blocks can be used with standard industrial relays and starters through NEMA Size 4. Minimum voltage is 5 V and the minimum current is 1 mA.

- Inductive Rating-35% Power Factor.
- Inductive and Resistive Ratings
- Not for use in pendant stations.

www.schneider-electric.us

**Example:** A Type KR1B push button with 2 Type KA1 contact blocks would be Class 9001 Type KR1BH2.



The design of the Class 9001 Type KA contact blocks allows them to be mounted side by side and/or in tandem. This enables you to specify an operator and a particular arrangement of contact blocks (shipped completely assembled) with a single Type number.

Table 19.254: "H" Codes

Suffix No. (Add to Operator	\$ Price			Posi	tions		
Type)	\$ FIICE	1	2	3	4	5	6
H1 H2 H3 H4	28.50 57.00 86.00 114.00	KA1 KA1 KA1 KA1	KA1 KA1 KA1	KA1 KA1	KA1		
H5 H6 H7 H8	14.30 14.30 28.50 28.50	KA2 KA3 KA2 KA3	KA2 KA3				
H9 H10 H11 H12	57.00 42.80 86.00 57.00	KA4 KA4 KA1 KA2	KA1 KA5 KA1 KA3	KA2	KA1 KA3		
H13 H14 H15 H16	28.50 14.30 42.80 42.80	KA2 KA2	KA1 KA3 KA3 KA3	KA2	KA3		
H17 H18 H19 H21	71.00 71.00 143.00 28.50	KA1 KA3 KA1 KA2	KA1 KA1 KA1 KA3	KA2 KA3 KA1	KA1	KA3 KA1	
H23 H24 H25	171.00 42.80 28.50	KA1 KA1 KA5	KA1 KA2 KA3	KA1	KA1	KA1	KA1

NOTE: For "H" Codes not shown in this table, contact your local Schneider Electric Customer Care Center.

Table 19.255: Dimensions When Using Contact Blocks

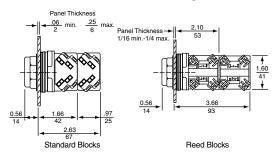


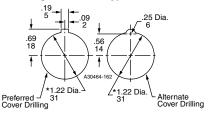
Table 19.256: Basic Operators (Without Color Caps, Mushroom Buttons, Knobs, Selector Switch Cams, Contact Blocks, Light Modules, or Legend Plates)

Description		For UL Types/NEMA			
Description	1, 3R, 4, 12, 13	4, 4X, 13	\$ Price		
Non-Illuminated Push Button (Extended Guard)	KR2	SKR2	38.55		
Non-Illuminated Push Button (No Guard)	KR3	SKR3	38.55		
Non-Illuminated Push Button (Mushroom Button/Screw-On)	KR20	SKR20	38.55		
Non-Illuminated Dual Push Button (Momentary)	KR6	_	78.00		
Non-Illuminated Dual Push Button (Momentary Interlocked)	KR67	-	121.50		
Non-Illuminated Dual Push Button (Maintained Interlocked)	KR7	_	121.50		
Momentary Pull—Maintained Neutral— Momentary Push	KR8 ▲★	SKR8 ▲	75.00		
Maintained Pull—Maintained Push	KR9 ▲★	SKR9 ▲	120.00		
Illuminated Push Button (Full Guard—Plastic Top)	K1L ■	SK1L ■	42.75		
Illuminated Push Button and Push-To-Test (No Guard)	K2L ■ ♦	SK2L■ ◆	28.65		
Illuminated Push Button (Full Guard—Metal Top)	K3L ■	_	42.75		
Standard Pilot Light	KP	SKP	28.65		
3 Position Maintained Selector Switch	KS4 ▲	SKS4 ▲	36.30		
3 Position Spring Return Both Sides To Center— Selector Switch	KS5 ▲	SKS5 ▲	64.80		
3 Position Spring Return Left To Center— Selector Switch	KS6 ▲	SKS6 ▲	64.80		
3 Position Spring Return Right To Center— Selector Switch	KS7 ▲	SKS7 ▲	64.80		
A Operator can be converted to an illumina	tad anara		ands or slave		

- Operator can be converted to an illuminated operator by removing the liner (6512240601) and adding a light module.
- Operator can be converted to a non-illuminated operator by adding liner (6512240601).
- Operator includes jumper wires for push-to-test conversion
- These operators can be supplied with 1-3/8 in or 2-1/4 in dia. mushroom buttons. For 1-3/8 in.: add () 20 to type number. The () refers to the color chosen—see page 19-92. For 2-1/4 in.: Add () 21 to type number. The () refers to the color chosen—see page 19-92. Voids UL and NEMA 6 Rating.

NOTE: When ordering, add prefix 9001 to the catalog number.

#### Mounting Hole for All Types K, SK, and KX Control Units



\*Units also mount in 1.20 dia.

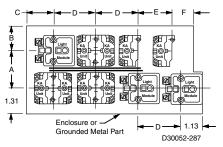
Dual Dimensions: INCHES

Hole Punch: Use Greenlee Tool #60242 to punch mounting hole and notch.

#### **Maximum Contact Block Usage**

(Includes Types K, SK and KX)

- 2 blocks mounted side by side only: Any 2, 3 or 4 position spring return selector switch (non-illuminated, illuminated or keyed).
- 2 blocks mounted in tandem on one side only: Any 2 operator interlocked push button.
- 2 blocks mounted in tandem (total of four blocks): Any selector push button, keyed push button, 2, 3, or 4 position maintained selector switch (non-illuminated, illuminated or keyed), push-pull operators (non-illuminated or illuminated), joy stick, dual push button.
- 3 blocks mounted in tandem (total of six blocks): Single momentary push buttons (non-illuminated or illuminated).



#### Min. Centerline Spacing, Type K & SK Control Units

Legend		- 7  -		erline S			
Plate	Plate Orientation Posit Standard Push Button 1.375 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 375 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 2.25 in. Dia. Mushroom 375 in. Dia. Mushroom 2.25 in. Dia. Mushroom 375 in. Dia. Mushroom 381 in. Dia. Mushroom 392 in. Dia. Mushroom 393 in. Dia. Mushroom 394 in. Dia. Mushroom 395 in. Dia. Mushroom 396 in. Dia. Mushroom 396 in. Dia. Mushroom 397 in. Dia. Mushroom 398 in. Dia. Mushroom 398 in. Dia. Mushroom 399 in. Dia. Mushroom 399 in. Dia. Mushroom 399 in. Dia. Mushroom 399 in. Dia. Mushroom 399 in. Dia. Mushroom 390 in. Dia. Mushroom 391 in. Dia. Mushroom 391 in. Dia. Mushroom 392 in. Dia. Mushroom 393 in. Dia. Mushroom 396 in. Dia. Mushroom 396 in. Dia. Mushroom 397 in. Dia. Mushroom 398 in. Dia. Mushroom	Α	В	С	D	E	F
Legend	Plate Orientation Positi	on #1					
	Standard Push Button	1.75	1.31	1.44	2.25	1.69	0.88
KN2	1.375 in. Dia. Mushroom	1.75	1.31	1.44	2.25	1.69	0.88
KN5	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.75	1.31	1.44	2.25	1.69	0.88
	Standard Push Button	2.00	1.31	1.44	2.25	1.75	0.88
KN3 KN4 KN6	1.375 in. Dia. Mushroom	2.00	1.31	1.44	2.25	1.75	0.88
	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	2.00	1.31	1.44	2.25	1.75	0.88
-	Standard Push Button	1.94	1.31	1.44	2.25	1.62	0.88
KNIA	1.375 in. Dia. Mushroom	1.94	1.31	1.44	2.25	1.62	0.88
KIN4	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
KN6	Selector Switch Knobs	1.74	1.31	1.44	2.25	1.62	0.88
Legend KN2	Standard Push Button	2.38	1.62	1.44	2.25	2.25	1.12
	1.375 in. Dia. Mushroom	2.38	1.62	1.44	2.25	2.25	1.12
	2.25 in. Dia. Mushroom	2.38	1.62	1.44	2.25	2.25	1.12
	Selector Switch Knobs	2.38	1.62	1.44	2.25	2.25	1.12
Legeno	Plate Orientation Positi	on #2		,			
	Standard Push Button	1.62	1.31	1.44	2.25	1.75	0.88
	1.375 in. Dia. Mushroom	1.62	1.31	1.44	2.25	1.75	0.88
KN5	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.62	1.31	1.44	2.25	1.75	0.88
	Standard Push Button	1.75	1.31	1.44	2.25	2.00	0.88
KN3		1.75	1.31	1.44	2.25	2.00	0.88
Legend KN2	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.75	1.31	1.44	2.25	2.00	0.88
	Standard Push Button	1.62	1.31	1.44	2.25	1.94	1.00
KNIA	1.375 in. Dia. Mushroom	1.62	1.31	1.44	2.25	1.94	1.00
KN2 KN5	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.62	1.31	1.44	2.25	1.94	1.00
	Standard Push Button	2.25	1.31	1.62	2.38	2.38	0.88
KNE	1.375 in. Dia. Mushroom	2.25	1.31	1.62	2.38	2.38	0.88
KN6  Legend  KN2  KN5  KN3	2.25 in. Dia. Mushroom	2.25	1.31	1.62	2.38	2.38	1.12
	Selector Switch Knobs	2.25	1.31	1.62	2.38	2.38	0.88

Table 19.257: Legend Plates

NOTE: When ordering, add prefix 9001 to the catalog number.

	7: Legend				stic Legend Pla Types K and S			<b>TE:</b> When ord	ioning, ada pr	Alumii for use v	num Legend vith Type K 0	Plates Operators
Standard Markings		1-3/4" Square			2-1/4" Square			2-1/2" Square		Black Legend	Black Legend	Blue Legend
	Silver Legend with Black Letters	White Legend with Black Letters	Black Legend with White Letters	Silver Legend with Black Letters	White Legend with Black Letters	Black Legend with White Letters	Silver Legend with Black Letters	White Legend with Black Letters	Black Legend with White Letters		0	
For Push Butto	n or Pilot Light	t								KN200	KN300	KN800
Blank	KN200SP	KN200WP	KN200BP	KN100SP	KN100WP	KN100BP	KN700SP	KN700WP	KN700BP	KN200	KN300	KN800
Blank (red)	KN200RP ■	KN200RP ■	KN200RP ■	KN100RP ■	KN100RP ■	KN100RP ■	KN700RP ■	KN700RP ■	KN700RP ■	KN200R ▲	KN300R ▲	KN800R ▲
Start	KN201SP	KN201WP	KN201BP	KN101SP	KN101WP	KN101BP	KN701SP	KN701WP	KN701BP	KN201	KN301	KN801
Stop On	KN202RP ■ KN203SP	KN202RP ■ KN203WP	KN202RP ■ KN203BP	KN102RP ■ KN103SP	KN102RP ■ KN103WP	KN102RP ■ KN103BP	KN702RP ■ KN703SP	KN702RP ■ KN703WP	KN702RP ■ KN703BP	KN202 ▲ KN203	KN302 ▲ KN303	KN802 ▲ KN803
Off	KN204RP ■	KN203WF ■	KN204RP ■	KN1033F KN104RP ■	KN103WF KN104RP ■	KN103BP ■	KN7033F KN704RP ■	KN704RP ■	KN703BF KN704RP ■	KN203 ▲	KN303 ▲	KN804 ▲
merg. Stop	KN205RP ■	KN205RP ■	KN205RP ■	KN105RP ■	KN105RP ■	KN105RP ■	KN705RP ■	KN705RP ■	KN705RP ■	KN205 ▲	KN305 ▲	KN805 ▲
orward	KN206SP	KN206WP	KN206BP	KN106SP	KN106WP	KN106BP	KN706SP	KN706WP	KN706BP	KN206	KN306	KN806
Reverse	KN207SP	KN207WP	KN207BP	KN107SP	KN107WP	KN107BP	KN707SP	KN707WP	KN707BP	KN207	KN307	KN807
Close	KN208SP	KN208WP	KN208BP	KN108SP	KN108WP	KN108BP	KN708SP	KN708WP	KN708BP	KN208	KN308	KN808
Open Oown	KN209SP KN210SP	KN209WP KN210WP	KN209BP KN210BP	KN109SP KN110SP	KN109WP KN110WP	KN109BP KN110BP	KN709SP KN710SP	KN709WP KN710WP	KN709BP KN710BP	KN209 KN210	KN309 KN310	KN809 KN810
Jp	KN2103F KN211SP	KN211WP	KN211BP	KN111SP	KN111WP	KN111BP	KN710SP KN711SP	KN711WP	KN710BF KN711BP	KN210	KN310	KN811
Fast	KN212SP	KN212WP	KN212BP	KN112SP	KN112WP	KN112BP	KN712SP	KN712WP	KN712BP	KN212	KN312	KN812
Slow	KN213SP	KN213WP	KN213BP	KN113SP	KN113WP	KN113BP	KN713SP	KN713WP	KN713BP	KN213	KN313	KN813
ligh	KN214SP	KN214WP	KN214BP	KN114SP	KN114WP	KN114BP	KN714SP	KN714WP	KN714BP	KN214	KN314	KN814
-ow	KN215SP	KN215WP	KN215BP	KN115SP	KN115WP	KN115BP	KN715SP	KN715WP	KN715BP	KN215	KN315	KN815
nch	KN216SP	KN216WP	KN216BP	KN116SP	KN116WP	KN116BP	KN716SP	KN716WP	KN716BP	KN216	KN316	KN816
n log	KN217SP KN218SP	KN217WP KN218WP	KN217BP KN218BP	KN117SP KN118SP	KN117WP KN118WP	KN117BP KN118BP	KN717SP KN718SP	KN717WP KN718WP	KN717BP KN718BP	KN217 KN218	KN317 KN318	KN817 KN818
log log For.	KN219SP	KN219WP	KN219BP	KN119SP	KN119WP	KN119BP	KN719SP	KN719WP	KN719BP	KN219	KN319	KN819
Jog Rev.	KN220SP	KN220WP	KN220BP	KN120SP	KN120WP	KN120BP	KN720SP	KN720WP	KN720BP	KN220	KN320	KN820
Lower	KN221SP	KN221WP	KN221BP	KN121SP	KN121WP	KN121BP	KN721SP	KN721WP	KN721BP	KN221	KN321	KN821
Out	KN222SP	KN222WP	KN222BP	KN122SP	KN122WP	KN122BP	KN722SP	KN722WP	KN722BP	KN222	KN322	KN822
Reset	KN223SP	KN223WP	KN223BP	KN123SP	KN123WP	KN123BP	KN723SP	KN723WP	KN723BP	KN223	KN323	KN823
Run	KN224SP	KN224WP	KN224BP	KN124SP	KN124WP	KN124BP	KN724SP	KN724WP	KN724BP	KN224	KN324	KN824
Start Jog Fest	KN225SP	KN225WP	KN225BP	KN125SP	KN125WP	KN125BP	KN725SP	KN725WP	KN725BP	KN225 KN226	KN325 KN326	KN825
rest Raise	KN226SP KN227SP	KN226WP KN227WP	KN226BP KN227BP	KN126SP KN127SP	KN126WP KN127WP	KN126BP KN127BP	KN726SP KN727SP	KN726WP KN727WP	KN726BP KN727BP	KN227	KN326 KN327	KN826 KN827
Decrease	KN228SP	KN228WP	KN228BP	KN128SP	KN128WP	KN128BP	KN728SP	KN728WP	KN728BP	KN228	KN327	KN828
ncrease	KN229SP	KN229WP	KN229BP	KN129SP	KN129WP	KN129BP	KN729SP	KN729WP	KN729BP	KN229	KN329	KN829
_eft	KN230SP	KN230WP	KN230BP	KN130SP	KN130WP	KN130BP	KN730SP	KN730WP	KN730BP	KN230	KN330	KN830
Right	KN231SP	KN231WP	KN231BP	KN131SP	KN131WP	KN131BP	KN731SP	KN731WP	KN731BP	KN231	KN331	KN831
Cycle Start	KN232SP	KN232WP	KN232BP	KN132SP	KN132WP	KN132BP	KN732SP	KN732WP	KN732BP	KN232	KN332	KN832
Feed Start	KN233SP	KN233WP	KN233BP	KN133SP	KN133WP	KN133BP	KN733SP	KN733WP	KN733BP	KN233	KN333	KN833
Cycle Stop Motor Run	KN234SP KN236SP	KN234WP KN236WP	KN234BP KN236BP	KN134SP KN136SP	KN134WP KN136WP	KN134BP KN136BP	KN734SP KN736SP	KN734WP KN736WP	KN734BP KN736BP	KN234 KN236	KN334 KN336	KN834 KN836
Motor Stop	KN237SP	KN237WP	KN237BP	KN137SP	KN130WP	KN137BP	KN737SP	KN737WP	KN737BP	KN237	KN337	KN837
Power On	KN238SP	KN238WP	KN238BP	KN138SP	KN138WP	KN138BP	KN738SP	KN738WP	KN738BP	KN238	KN338	KN838
Pull To Start	N1/A				KN179WP							
Push To Stop	N/A	N/A	N/A	KN179SP	KN179WP	KN179BP	KN779SP	KN779WP	KN779BP	N/A	KN379	N/A
For Selector Sv	vitch or Selecto	or Push Button										
ForRev.	KN239SP	KN239WP	KN239BP	KN139SP	KN139WP	KN139BP	KN739SP	KN739WP	KN739BP	KN239	KN339	KN839
Hand-Auto.	KN240SP	KN240WP	KN240BP	KN140SP	KN140WP	KN140BP	KN740SP	KN740WP	KN740BP	KN240	KN340	KN840
High-Low	KN241SP	KN241WP	KN241BP	KN141SP	KN141WP	KN141BP	KN741SP	KN741WP	KN741BP	KN241	KN341	KN841
Jog-Run VanAuto.	KN242SP KN243SP	KN242WP KN243WP	KN242BP KN243BP	KN142SP KN143SP	KN142WP KN143WP	KN142BP KN143BP	KN742SP KN743SP	KN742WP KN743WP	KN742BP KN743BP	KN242 KN243	KN342 KN343	KN842 KN843
vianAuto. Off-On	KN243SP KN244SP	KN243WP KN244WP	KN243BP KN244BP	KN143SP KN144SP	KN143WP KN144WP	KN143BP KN144BP	KN743SP KN744SP	KN743WP KN744WP	KN743BP KN744BP	KN243 KN244	KN343 KN344	KN844
On-Off	KN245SP	KN245WP	KN245BP	KN145SP	KN145WP	KN145BP	KN745SP	KN745WP	KN745BP	KN245	KN345	KN845
Open-Close	KN246SP	KN246WP	KN246BP	KN146SP	KN146WP	KN146BP	KN746SP	KN746WP	KN746BP	KN246	KN346	KN846
Raise-Lower	KN247SP	KN247WP	KN247BP	KN147SP	KN147WP	KN147BP	KN747SP	KN747WP	KN747BP	KN247	KN347	KN847
Run-Jog	KN248SP	KN248WP	KN248BP	KN148SP	KN148WP	KN148BP	KN748SP	KN748WP	KN748BP	KN248	KN348	KN848
Slow-Fast	KN250SP	KN250WP	KN250BP	KN150SP	KN150WP	KN150BP	KN750SP	KN750WP	KN750BP	KN250	KN350	KN850
Start-Stop Jp-Down	KN251SP KN253SP	KN251WP KN253WP	KN251BP KN253BP	KN151SP KN153SP	KN151WP KN153WP	KN151BP KN153BP	KN751SP KN753SP	KN751WP KN753WP	KN751BP KN753BP	KN251 KN253	KN351 KN353	KN851 KN853
Low-High	KN253SP KN254SP	KN254WP	KN253BP KN254BP	KN153SP KN154SP	KN153WP KN154WP	KN153BP KN154BP	KN753SP KN754SP	KN754WP	KN754BP	KN253 KN254	KN353	KN854
Stop-Start	KN2545F KN255SP	KN255WP	KN255BP	KN154SP KN155SP	KN154WF KN155WP	KN154BP KN155BP	KN754SP KN755SP	KN754WP	KN754BP	KN254 KN255	KN354 KN355	KN855
Left-Right	KN256SP	KN256WP	KN256BP	KN156SP	KN156WP	KN156BP	KN756SP	KN756WP	KN756BP	KN256	KN356	KN856
On-Auto	KN276SP	KN276WP	KN276BP	KN176SP	KN176WP	KN176BP	KN776SP	KN776WP	KN776BP	KN276	KN376	KN876
Auto-Off-Hand	KN258SP	KN258WP	KN258BP	KN158SP	KN158WP	KN158BP	KN758SP	KN758WP	KN758BP	KN258	KN358	KN858
ForOff-Rev.	KN259SP	KN259WP	KN259BP	KN159SP	KN159WP	KN159BP	KN759SP	KN759WP	KN759BP	KN259	KN359	KN859
Hand-Off-Auto.	KN260SP	KN260WP	KN260BP	KN160SP	KN160WP	KN160BP	KN760SP	KN760WP	KN760BP	KN260	KN360	KN860
ManOff-Auto. Open-Off-Close	KN262SP KN263SP	KN262WP KN263WP	KN262BP KN263BP	KN162SP KN163SP	KN162WP KN163WP	KN162BP KN163BP	KN762SP KN763SP	KN762WP KN763WP	KN762BP KN763BP	KN262 KN263	KN362 KN363	KN862 KN863
Up-Off-Down	KN264SP	KN264WP	KN264BP	KN164SP	KN163WF	KN164BP	KN764SP	KN764WP	KN764BP	KN264	KN364	KN864
Low-Off-High	KN265SP	KN265WP	KN265BP	KN165SP	KN165WP	KN165BP	KN765SP	KN765WP	KN765BP	KN265	KN365	KN865
Jog-Stop-Run	KN267SP	KN267WP	KN267BP	KN167SP	KN167WP	KN167BP	KN767SP	KN767WP	KN767BP	KN267	KN367	KN867
High-Low-Off	KN270SP	KN270WP	KN270BP	KN170SP	KN170WP	KN170BP	KN770SP	KN770WP	KN770BP	KN270	KN370	KN870
High-Off-Low	KN277SP	KN277WP	KN277BP	KN177SP	KN177WP	KN177BP	KN777SP	KN777WP	KN777BP	KN277	KN377	KN877
Auto-ManOff	KN278SP	KN278WP	KN278BP	KN178SP	KN178WP	KN178BP	KN778SP	KN778WP	KN778BP	KN278	KN378	KN878

# Type K and SK Accessories

Class 9001 / Refer to Catalog 9001CT1103

SQUARE D by Schneider Electric www.schneider-electric.us

NOTE: When ordering, add prefix 9001 to the catalog number.

Position #1

Table 19.262: Min. Centerline Spacing, Type K & SK Control Units

Legend Plate	Operator		Cen	terline S	Spacing	(in.)	
Legenu Flate	Operator	Α	В	С	D	Ε	F
Legend Plate Or	ientation Position #1	<u> </u>					
	Standard Push Button	1.75	1.31	1.44	2.25	1.69	0.88
KN2	1.375 in. Dia. Mushroom	1.75	1.31	1.44	2.25	1.69	0.88
KN5	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.75	1.31	1.44	2.25	1.69	0.88
	Standard Push Button	2.00	1.31	1.44	2.25	1.75	0.88
KN3	1.375 in. Dia. Mushroom	2.00	1.31	1.44	2.25	1.75	0.88
KNO	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	2.00	1.31	1.44	2.25	1.75	0.88
	Standard Push Button	1.94	1.31	1.44	2.25	1.62	0.88
KN4	1.375 in. Dia. Mushroom	1.94	1.31	1.44	2.25	1.62	0.88
INIT	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.74	1.31	1.44	2.25	1.62	0.88
	Standard Push Button	2.38	1.62	1.44	2.25	2.25	1.12
KN6	1.375 in. Dia. Mushroom	2.38	1.62	1.44	2.25	2.25	1.12
1410	2.25 in. Dia. Mushroom	2.38	1.62	1.44	2.25	2.25	1.12
	Selector Switch Knobs	2.38	1.62	1.44	2.25	2.25	1.12



Position #2

Legend Plate Orio	Legend Plate Orientation Position #2						
	Standard Push Button	1.62	1.31	1.44	2.25	1.75	0.88
KN2 KN5 KN3	1.375 in. Dia. Mushroom	1.62	1.31	1.44	2.25	1.75	0.88
	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.62	1.31	1.44	2.25	1.75	0.88
	Standard Push Button	1.75	1.31	1.44	2.25	2.00	0.88
KNIS	1.375 in. Dia. Mushroom	1.75	1.31	1.44	2.25	2.00	0.88
KINO	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
MAS	Selector Switch Knobs	1.75	1.31	1.44	2.25	2.00	0.88
	Standard Push Button	1.62	1.31	1.44	2.25	1.94	1.00
KNIA	1.375 in. Dia. Mushroom	1.62	1.31	1.44	2.25	1.94	1.00
IXIV <del>4</del>	2.25 in. Dia. Mushroom	2.25	1.31	1.44	2.25	2.25	1.12
	Selector Switch Knobs	1.62	1.31	1.44	2.25	1.94	1.00
	Standard Push Button	2.25	1.31	1.62	2.38	2.38	0.88
KN6	1.375 in. Dia. Mushroom	2.25	1.31	1.62	2.38	2.38	0.88
INIO	2.25 in. Dia. Mushroom	2.25	1.31	1.62	2.38	2.38	1.12
	Selector Switch Knobs	2.25	1.31	1.62	2.38	2.38	0.88

# Table 19.263: Special Legend Plates

	Standard Markings			
Туре	Green	Red		
KN500	Blank	Blank		
KN501	Start	Stop		
KN502	On	Off		
Туре	Black	Black		
KN520	Blank	Blank		
KN521	Start	Stop		
KN522	On	Off		
KN523	Forward	Reverse		
KN524	24 Up Down			
KN525	High Low			
KN526	Open	Close		

#### Table 19.258: Legend Plates-Special Marking

		•			
Legend Plate	Description		Туре	\$ Price	
	Standard Markings		See page 19-89	4.40	
KN100()P		Silver Field, Black Letters	KN199SP		
(Plastic) ▲ 2.25 in	Special Marking	White Field, Black Letters	KN199WP	18.50	
2.25 III Square	■ Special Marting	Red Field, Black Letters	KN199RP		
- 4		Black Field, White Letters	KN199BP		
	Star	ndard Markings	See page 19-89	4.40	
KN200 Aluminum	Special Marking	Black Field	KN299	40.50	
Aluminum	•	Red Field	KN299R	18.50	
	Star	Standard Markings		4.40	
KN200()P		Silver Field, Black Letters	See page 19-89 KN299SP		
(Plastic) ▲ 1.7 in. Special Ma	Special Marking	White Field, Black Letters	KN299WP	40.50	
Square	•	Red Field, Black Letters	KN299RP	18.50	
o qua. o		Black Field, White Letters	KN299BP		
	Star	ndard Markings	See page 19-89	4.40	
KN300 Aluminum	Special Marking	Black Field	KN399		
Aluminum	■ Special Marting	Red Field	KN399R	18.50	
KN400		Blank	KN400	8.60	
Aluminum	Any Marking ■		KN499	22.80	
		Standard Markings		4.40	
KN500 Aluminum	0	Black Field	KN599		
Aluminum	Special Marking	Green Red Field	KN519	18.50	
	B	Black Field	KN600		
KN600	Blank	Red Field	KN600R	9.90	
Aluminum	Any Marking	Black Field	KN699		
	•	Red Field	KN699R	22.80	
	Star	ndard Markings	Select from page 19-89	4.40	
KN700()P		Silver Field, Black Letters	KN799SP		
(Plastic) ▲ 2.5 in.	Special Marking	White Field, Black Letters	KN799WP	40.50	
Square	•	Red Field, Black Letters	KN799RP	18.50	
Oquaio		Black Field, White Letters	KN799BP		
	Star	ndard Markings	Select from page 19-89	4.40	
KN800	Special Marking	Blue Field	KN899	40.50	
Aluminum	- Franking	Red Field	KN899R	18.50	
KN900		Blank	KN900	4.40	
Aluminum	A	ny Marking	KN999	18.50	
▲ Other	colors available (se	, ,	•		

- Other colors available (see Table 19.259).
- Specify marking required.

#### Table 19.259: Plastic Legend Plates—Other Colors

	Plate Color	Letter Color	1.7 in. Square	2.25 in. Square	2.5 in. Square	\$ Price
	Yellow	Black	KN200YP	KN100YP	KN700YP	
Blank Legend	Green		KN200GP	KN100GP	KN700GP	4.40
Plates	Blue	White	KN200LP	KN100LP	KN700LP	
	Red		KN200CP	KN100CP	KN700CP	
Special	Yellow	Black	KN299YP	KN199YP	KN799YP	
Engraved	Green		KN299GP	KN199GP	KN799GP	18.50
Legend	Blue	White	KN299LP	KN199LP	KN799LP	10.50
Plates	Red		KN299CP	KN199CP	KN799CP	

## Table 19.260: Maximum Number of Lines and Characters for Type KN Legend Plates

Туре	KN100	KN200	KN300	KN400	KN500	KN600	KN700	KN800	KN900
Max. No. of Characters per Line	16	14	18	18	8 per field	22	17	18	18 per pos.
Max. No. of Lines	2	1	3	2	2 per field	4	2	2	1 per pos.

The maximum number of characters and lines is a practical maximum, based on a minimum size of characters to facilitate easy reading.

## Table 19.261: Circular Legends for Emergency Stop Mushroom Heads (yellow background)

Diameter	Text	Catalog Number	\$ Price
60 mm	_	9001KN9100	
60 mm	EMERGENCY STOP	9001KN9330	4.40
00	_	9001KN8100	4.40
90 mm	EMERGENCY STOP	9001KN8330	

- Legend plate has red background with silver letters.
- Legend plate has red background with black letters.

  For Pricing Information.....page 19-90



by Schneider Electric ww.schneider-electric.us

# Table 10 264. Badlack Attachments

# NOTE: When ordering, add prefix 9001 to the catalog number.

	Used On	Description	Туре	\$ Price
	Type K non-illuminated push button — Standard or mushroom (KR4, KR5 mushroom buttons only).	Holds button in depressed position and can be padlocked.	K4	42.80
	Types K and SK non-illuminated push buttons with or	Holds button in depressed position	K5	71.00
6	without protective boots.	when padlocked.	K97	42.80
	Types K and SK non-illuminated push buttons, cover type attachment. KR, SKR	Attachment can be padlocked. Does not hold button in depressed position.	K6	42.80
	Types K and SK push buttons, cover type attachment.	Spring loaded cover cannot be padlocked. Does not hold button in depressed position.	K60	57.00
	Types K and SK push-pull operator and illuminated push buttons. KR8, KR9	Holds button in depressed position and can be padlocked.	K62	71.00
	KR11U and KR12U Interlocked Assembly	Holds maintained button in depressed position and can be padlocked.	K96	42.80
	Type KR9 & SKR9 Push-Pull operators— Non-Illuminated and Illuminated	Holds button in depressed position. Can be padlocked.	K162	59.00

#### Table 19.265: Mushroom Button Guards

0					0			
for 1.375 in. Mu	Aluminum Mushroom Guard for 1.375 in. Mushroom Button Operator (KR4, KR24)		Yellow Plastic Extended Mushroom Guard for 1.375 in. and 1.625 in. Mushroom Button Operators			Aluminum Mushroom Guard for 2.25 in. Mushroom Button Operator		
Type	\$ Price	Туре	Used On	\$ Price	Туре	Used On	\$ Price	
K48	57.00	K56■	KR4, SKR4	57.00	K68	KR5	57.00	
N40	57.00	K56♦M <b>▲</b>	KR8, KR9, SKR8, SKR9	68.00	K685	KR25	68.00	

- The mushroom guard has finger holes for push-pull operators. B=Black G=Green R=Red Y=Yellow
- R=Red Y=Yellow

Table 19.266: Padlock Attachments				
	Used On	Description	Туре	\$ Price
	Types K and SK selector switches and potentiometers (will not work with gloved-hand knob).	Cover type attachment that can be padlocked to keep unauthorized personnel from tampering with the operator.	K7	42.80
	Types K and SK selector switches and potentiometers (will not work with gloved-hand knob).	Same as 9001K7 but with spring loaded lockout cover.	K107	56.00
	Types K and SK illuminated push buttons (with or without guard) and key operated push buttons.	Cover type attachment that can be padlocked to keep unauthorized personnel from tampering with the operator.	K108	42.80
	Types K and SK illuminated push buttons (with or without guard) and key operated push buttons.	Same as 9001K108 but with spring loaded lockout cover.	K109	57.00
	Types K and SK maintained push-pull operators using 1.375 in. dia. mushroom buttons (-20 series as shown on page 19-92).	Cover type attachment that holds mushroom button in depressed position and can be padlocked.	K110	54.00

# Table 19.267: Protective Boots







These Type KU protective boots are recommended for very dirty environments or severe hose down, but they are not required for UL Type 4 rating on the Type K operators or UL Type 4 or 4X rating on the Type SK operators. The K1 wrench (see page 19-93) is required for installation of these boots.

For Non-Illuminated Push Buttons★			Clear Color for	Туре	\$ Price
Color	Type	\$ Price	Standard knob selector switch	KU17	42.80
Black	KU1			KU18	
Red	KU2		Gloved-hand cap for use on standard knob selector switch		42.80
Blue	KU3	28.70	KIOD SCIECTO SWITCH		
Brown	KU4			KU27	
Green	KU5		Standard pilot light and maintained contact push buttons		42.80
Yellow	KU6		paon battorio		
Clear	KU7		Push-to-test and illuminated push button	KU37	42.80
Clear	KU8	42.80	without guard		42.80
(Provides Full Guard)		uard)	Illuminated push button with guard	KU47	57.00
A 111	(1107 f	allock allocated as	and a standard and a standard and a standard and a standard and a standard and a standard and a standard and a		

Use KU27 for maintained contact push buttons.

#### Table 19.268: Closing Plates



Description	Туре	\$ Price
Gray	K51 <b>▼</b>	14.00
Black	K52▼	14.30

Meets UL and NEMA 1, 2, 3, 4, 4X, 6, 12 and 13.

#### Dimensions see catalog 9001CT0001

by Schneider Electric www.schneider-electric.us

Class 9001 / Refer to Catalog 9001CT1103

Table 19.269: Accessories

NOTE: When ordering add prefix 9001 to the catalog number

Table 19.209. Accessories				
Description	Color	Туре	Package Qty.	\$ Price Each
	Black Blue Gray Green Orange Red	T8BK T8BE T8GY T8GN T8OE T8RD	10	.72
Color inserts for	Universal ▲	T8U	7	5.70
KR1, KR2, KR3, SKR1, SKR2, SKR3, KR11, KR12, SKR11, SKR12, KRD, T, TRD	White	T8WH	10	.70
•	Yellow Black Blue Green Orange Red	T8YW K16B K16L K16G K16S K16R	1	42.80
1.375 in. Snap-in Mushroom knob for	Red ■	K16R05		47.60
KR4 and SKR4 ◆	Yellow Black Blue Green Orange Red	K16Y K17B K17L K17G K17S K17R	1	42.80
2-1/4 in. Snap-in Mushroom knob for	Red ■	K17R05		42.80
KR5 and SKR5 ★	Yellow	K17Y		42.80
1-3/8 in. Screw-on Mushroom knob for KR24 and SKR24▼	Black Blue Green Orange Red Yellow	K92B K92L K92G K92S K92R K92Y	1	42.80
2-1/4 in. Screw-on Mushroom knob for KR25 and SKR25 △	Black Blue Green Orange Red Yellow	K93B K93L K93G K93S K93R K93Y	1	42.80
Push-Pull Knobs for	Amber Black □ Blue Clear Green Orange □ Red	A22 B23 L22 C22 G22 S23 R22	1	9.90
KR8, KR9, SKR8, SKR9 Operators	Red ▽	R2205		15.80
	White Yellow	W22 Y22		9.90
40	Black Green Red	B19 G19 R19	10	1.40
Color Inserts for Dual Function Operators KR6, KR7, KR67	Universal ◊	U19		8.60
Standard Color  Caps for Illuminated Push Buttons K1L, K2L, K3L, SK1L, SK2L	Amber Blue Clear Green Red White Yellow	A7 L7 C7 G7 R7 W7	1	9.90
Knob for KR9R94	Red	R94	1	9.90
Metal Knob for KR24	Red Green Black	K92RM K92GM K92BM	1	51.00
Metal Knob for KR25	Red Green Black	K93RM K93GM K93BM	1	63.00
Metal Knob for KR9 (40 mm)	Red Green Black	K94RM K94GM K94BM	1	51.00
Metal Knob for KR9 (60 mm)	Red Green Black	K95RM K95GM K95BM	1	63.00

•	Includes one each of the following color inserts: Black, Red, Green, Yellow, Orange, Blue, and White.
---	---

- $^{\prime\prime}$  EMERGENCY STOP" is in raised letters and hot stamped white across the front of the mushroom button.
- The mushroom button cap listed here may be assembled to a 9001KR1U or SKR1U to form a 9001KR4 or SKR4. The mushroom button cap listed here may be assembled to a 9001KR1U or SKR1U to form a 9001KR5 or SKR5.
- The mushroom button cap listed here may be assembled to a 9001KR20 to form a 9001KR24 or SKR20 to form a 9001SKR24.
- The mushroom button cap listed here may be assembled to a 9001KR20 to form a 9001KR25 or a SKR20 to form a 9001SKR25.

- These color asps are opaque and are for use on non-illuminated operators only.

  Includes two of each of the following color inserts: Black, Red, and Green.

  May be used on KR8 and KR9 operators. Order mushroom button and K54 adapter (no charge) from page 19-88. Using the K54 adapter voids Type 6 rating.

  Red knob with "Push Emergency Stop" marked on top of knob.

<b>NOTE:</b> When ordering, add prefix 9001 to the catalog number.				
Description	Color	Туре	Package Qty.	\$ Price Each
1-3/8 in. Mushroom Knob for Illuminated Push Buttons K2L, SK2L ☆	Amber Blue Clear Green Red White Yellow	A20 L20 C20 G20 R20 W20 Y2	1	9.90
2-1/4 in. Mushroom Knob for Illuminated Push Buttons K2L, SK2L ☆	Amber Blue Clear Green Red White Yellow	A21 L21 C21 G21 R21 W21 Y21	1	9.90
Plastic Fresnel Pilot Light Lens for KP, KT, SKP, SKT	Amber Blue Clear Green Red White Yellow	A31 L31 C31 G31 R31 W31 Y31	1	9.90
Domed Plastic Pilot Light Lens for KP, KT, SKP, SKT	Amber Blue Clear Green Red White Yellow	A9 L9 C9 G9 R9 W9	1	9.90
Glass Pilot Light Lens for KP, KT	Amber Blue Clear Green Red White Yellow	A6 L6 C6 G6 R6 W6 Y6	1	9.90
Standard Selector Switch Knob for K and SK Selector Switches	Amber Black □ Blue Clear Green Orange □ Red White Yellow	A8 B11 L8 C8 G8 S11 R8 W8 Y8	1	9.90
Gloved-Hand Selector Switch Knob for K and SK Selector Switches	Amber Black □ Blue Clear Green Orange □ Red White Yellow	A24 B25 L24 C24 G24 S25 R24 W24 Y24	1	9.90
Color Inserts for KQ and TQ Selector Push Buttons	Black Blue Green Orange Red White Yellow	T5BK T5BE T5GN T5OE T5RD T5WH T5YW	10	1.40
	Cam	Туре	\$ Pri	ce Each
Selector Switch Cams	BCDEFGHJLM	K13B K13C K13D K13E K13F K13G K13H K13J K13J K13L		6.30

by Schneider Electric www.schneider-electric.us

#### Table 19.270: Ring Nuts

Used On	Туре	Used On	Туре	\$ Price
K1L	K44	SK1L	SK44	18.50
K30-K37	K45	_	_	4.40
K70-K73	K45	_	_	4.40
K20, K21, K22, K23	K45	SK20, SK21, SK22, SK23	SK45	4.40
K20, K21, K22, K23 ♦	SK46	SK20, SK21, SK22, SK23 ♦	SK46	4.40
K2L	K49	SK2L	SK49	4.40
K3L (complete)	K111	_	_	18.50
K3L (metal top only)	6515802701	_	_	12.00
KP, KTR	K41	SKP, SKTR	SK41	4.40
KR1	K41	SKR1	SK41	4.40
KR11	K42	SKR11	SK42	4.40
KR12 ▲	K42	SKR12 ▲	SK42	4.40
KR12 ■	K41	SKR12 ■	SK41	4.40
KR13, 14, 15	K55	_	_	4.40
KR2	K42	SKR2	SK42	4.40
KR20	K49	_	_	4.40
KR24	K49	_	_	4.40
KR25	K49	SKR25	SK49	4.40
KR3	K40	SKR3	SK40	4.40
KR4	K41	SKR4	SK41	4.40
KR5	K41	SKR5	SK41	4.40
KR6	K47	_	_	4.40
KR67	K47	_	_	4.40
KR7	K47	_	_	4.40
KR8	K58	SKR8	6509704401	4.40
KR9	K41	SKR9	SK41	4.40
KS	K45	SKS	SK45	4.40
KS ◆	SK46	SKS ♦ SKRU11 SKRU1,2,3,4,5,10	SK46 SK41 SK40	4.40
KT	K49	SKT	SK49	4.40

- Maintained button of two button operator.
- Momentary button of two button operator.
- Secondary ring nut (holds knob on selector switch or potentiometer).

Table 19.271: Replacement Lamps For Series A-F (black) **Light Modules** 

Light	Lamp Number	Square D Replacement Lamps			
Module Type	(ANSI)	Part Number	\$ Price		
KM1	GE44★	_	_		
KM2	GE1490	2550101003	12.45		
KM3	GE44★	_	_		
KM4	GE1490	2550101003	12.45		
KM5	GE44★	_	_		
KM6	GE44★	_	_		
KM7	GE44★	_	_		
KM8	GE44★	_	_		
KM9	GE755	2550101020	12.45		
KM11	CMDK1A5	2550105014	33.00		
KM12	CMDK1A5	2550105014	33.00		
KM13	CMDK1A5	2550105014	33.00		
KM14	CMDK1A5	2550105014	33.00		
KM15	CMDK1A5	2550105014	33.00		
KM21	SYL12PSB	2550105003	16.50		
KM22	SYL12PSB	2550105003	16.50		
KM23	SYL28PSB	2550105008	16.50		
KM25	SYL120PSB	2550105005	16.50		
KM31	SYL6PSB	2550105007	16.50		
KM32	SYL12PSB	2550105003	16.50		
KM34	SYL24PSB	2550105004	16.50		
KM35	SYL28PSB	2550105008	16.50		
KM36	SYL48PSB	2550105009	16.50		
KM37	SYL60PSB	2550105010	16.50		
KM38	SYL120PSB	2550105005	16.50		

GE44 and GE755 are interchangeable (GE755 gives longer life). If a GE44 lamp is ordered, a GE755 (2550101020) will be substituted. For a replacement lamp in a current series light module see the light module listing on page 19-86.

#### NOTE: When ordering, add prefix 9001 to the catalog number.

#### Table 19.272: Repair Parts

Description	Part Number	\$ Price
E10 Key	2941101100	9.90
Gray cap for KR11, KR12, SKR11, or SKR12	3105217001	13.80
Clear plastic top (only) for 9001K44 & SK44 Ring Nut	4487D63XI	7.95
Gasket for Type K and SK Push-Pull Knob	6509701801	1.95
Gasket for Plastic Illuminated Lens	6509701901	3.90
Gasket for Type K and SK selector switch knob	3105406401	1.95
Black Compensating Gasket (Type K and SK	6509702001	3.90
Operators		
Liner for Non-Illuminated Operators	6509704901	N/C
Locking Thrust Washer	6512231201	3.90
Nylon Spacer	6509705001	5.10
Locking Thrust Washer (Std. Type SK Operator)	6512240601	3.90
Push-Pull Mushroom Adapter ▼	K54	N/C
Rubber Boot for Joystick	6512243201	7.20
Knob on Joysticks without latch	4458D20X3	12.90
Knob for SK Potentiometer	3105404408	10.65
Fingersafe™ Cover for 9001KM	6508804101	3.00

Allows Type -20 and -21 mushroom color caps to be used on push-pull operators. Use of 9001K54 voids Type 6 rating.

#### Table 19.273: KU Replacement Ring Nuts (Threaded Inside and Out)

Used On	Part Number	\$ Price
KU1 through KU8, KU27, KU37, KU47	3105204101	4.35
KU17, KU18	3105205901	10.65

#### Table 19.274: Interlock

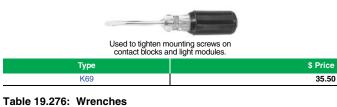


For mechanically interlocking two push buttons so that only one button can be depressed at a time. A Type K3 attachment is furnished with the 9001 KR11, KR12, SKR11, SKR12 SKR11 and SKRP11 operators. However, these are maintained operators and the K3 interlock serves to release one of the buttons when the other is depressed. When used with momentary contact buttons, the K3 interlock does not hold the buttons in the depressed position. It simply prevents pushing both buttons at the same time. the depressed position. It simply prevents pushing both buttons at the same time.

The Type K3 interlock is mounted behind the operators. Operators not included.

Туре	\$ Price
K3	28.65

Table 19.275: Screwdriver





For more information, see Instruction Bulletin No. 30072-100-10.

1 C/O

1 C/O

1 C/O

BQUARE D

KXRB1AH1

KXRB1GH1

KXRB1RH1

217.00

217.00

217.00

Description

Non-Illuminated

Illuminated

Legend Marking

Start

Stop

blank

blank

blank

blank

blank blank

blank

blank

blank

Table 19.277: Push Buttons—Single, with Contacts

**Button Color** 

Green Red

Amber

Green

Blue

Amber

Green

Amber

Green

Red

Red

NOTE: When ordering, add prefix 9001 to the catalog number.							
	Contacts	Voltage	Туре	\$ Price			
	1 N/O	1-	KXRA133	64.00			
	1 N/C		KXRA134	64.00			
	2 C/O		KXRAAH2	138.00			
	2 C/O		KXRAGH2	138.00			
	2 C/O		KXRALH2	138.00			
	1 C/O	24	KXRB34AH1	184.00			
	1 C/O	24	KXRB34GH1	184.00			
	1.0/0	2/	KYRR3/IRH1	184.00			

110/120

110/120

110/120

ole 19.278: Push Buttons—Dual, with Contacts

	Tab
	Des
	Mon
Consultant of the last of the	Mon

Description	Top Button (#1)	Lower Button (#2)	cutton (#2) Contacts		\$ Price
Momentary	Start (Green)	Stop (Red)	2 C/O	KXRC111	171.00
Momentary	Start (Green)	Stop (Red)	1 N/O, 1 N/C	KXRC136	129.00
Momentary	Up (Green)	Down (Green)	2 N/O	KXRD140	135.00
Momentary	blank (Blue)	blank (Blue)	2 N/O	KXRDLLH7	139.00
Maintained▲	Start (Green)	Stop (Red)	1 C/O	KXRE115	171.00
Maintained ▲	On (Blue)■	Off (Blue)■	3 C/O	KXRELLH3	273.00
Maintained ▲	On (Blue)■	Off (Blue)■	3 C/O	KXRELLH3	273.00
Maintained ▲	On (Blue)■	Off (Blue)■	2 C/O	KXRELLH2	277.00

Pilot Light at 110-120 V, 50-60 Hz Transformer

# Table 19.279: Push Buttons—Dual with One Pilot Light and Contacts

Description	Top Button (#1)	Middle Lens (#2)	Lower Button (#3)	Contacts	Voltage	Туре	\$ Price
Momentary	Start (Green)	On (Red)	Stop (Red)	2 C/O	110/120	KXRG117	314.00
Momentary	Start (Green)	On (Red)	Stop (Red)	1 N/O, 1 N/C	110/120	KXRG137	270.00
Maintained ▲	Start (Green)	On (Red)	Stop (Red)	1 C/O	110/120	KXRJ119	329.00

#### Table 19.280: Push Buttons—Dual with Two Pilot Lights and Contacts



Pilot Lights at 110-120 V, 50-60 Hz Transformer

Description	Top Button (#1)	Left Lens (#2)	Right Lens (#3)	Lower Button (#4)	Contacts	Voltage	Туре	\$ Price
Momentary	Start (Green)	On (Red)	Off (Green)	Stop (Red)	2 C/O	110/120	KXRL121	485.00
Momentary	Start (Green)	On (Red)	Off (Green)	Stop (Red)	1 N/O, 1 N/C	110/120	KXRL138	441.00
Momentary	Start (Green)	On (Red)	Off (Green)	Stop (Red)	2 C/O	24	KXRL34GRGRH2	451.00
Momentary	Start (Green)	On (Red)	Off (Green)	Stop (Red)	1 N/O, 1 N/C	24	KXRL34GRGRH37	494.00

- Maintained operators are mechanically interlocked
- Text is vertical

Discount

Schedule



# Push Buttons, 30 mm Square

# Table 19.281: Selector Switches—with Contacts

NOTE: When ordering, add prefix 9001 to the catalog number.

Description	Legend	Knob	Contacts			Contacts		ts	Туре	\$ Price
2-position, maintained	Off-On	Black 1 0		KXSA125	99.00					
2-position, maintained	Oll-Oll	DIACK	0	1		KASA125	99.00			
2-position, maintained	Off-On	Black	1	0		KXSA139	78.00			
3-position, maintained	Hand-Off-Auto	Black	1	0	0	KXSD126	99.00			
3-position, maintained	nanu-On-Aut0	DIAUK	0	0	1	KASD120	99.00			



110-120 V, 50-60 Hz Transformer



110–120 V, 50–60 Hz. Transformer



110–120 V, 50–60 Hz Transformer

Table 19.282: Pilot Lights

Description	Voltage	Lens 1*	Lens 2*	Lens 3*	Lens 4*	Туре	\$ Price
Single	24	Amber				KXPA35A	125.00
Single	24	Red				KXPA35R	125.00
Single	24	Green				KXPA35G	125.00
Single	24	White				KXPA35W	125.00
Single	110/120	Amber				KXPA1A	153.00
Single	110/120	Red				KXPA1R	153.00
Single	110/120	Green				KXPA1G	153.00
Single	110/120	White				KXPA1W	153.00
Dual	24	Amber	Amber			KXPB34AA	219.00
Dual	24	Red	Red			KXPB34RR	219.00
Dual	24	Green	Green			KXPB34GG	219.00
Dual	24	White	White			KXPB34WW	219.00
Dual	24	Red	Green			KXPB34RG	219.00
Dual	110/120	Amber	Amber			KXPB1AA	278.00
Dual	110/120	Red	Red			KXPB1RR	278.00
Dual	110/120	Green	Green			KXPB1GG	278.00
Dual	110/120	White	White			KXPB1WW	278.00
Dual	110/120	Red	Green			KXPB1RG	278.00
Quad	24	White	Amber	Green	Red	KXPC34WAGR	552.00
Quad	110/120	White	Amber	Green	Red	KXPC1WAGR	552.00
Quad	110/120	White	Blue	Green	Red	KXPC1WLGR	552.00

<sup>\*</sup> Lenses are blank (no markings)



Table 19.283: Potentiometers

Description	Power	Resistance	Туре	Price
Single	2 W	3.2 kΩ	KXBB06	287.00
Single	2 W	5 kΩ	KXBB07	287.00
Single	2 W	10 kΩ	KXBB08	287.00
Tandem	2 W	$5  k\Omega /  5  k\Omega$	KXBD83	399.00



Push Button	Action	Lens Color (1)	Lens Color (2)	Туре	Price
Single Push Button					
		Amber	_	KXRAA	38.60
		Green	_	KXRAG	38.60
Non-Illuminated	Momentary	Blue	_	KXRAL	38.60
		Red	_	KXRAR	38.60
		White	_	KXRAW	38.60
		Amber	_	KXRB35A	125.00
		Green	_	KXRB35G	125.00
Illuminated 24 V	Momentary	Blue	_	KXRB35L	125.00
		Red	_	KXRB35R	125.00
		White	_	KXRB35W	125.00
		Amber	_	KXRB38A	125.00
		Green	_	KXRB38G	125.00
Illuminated 110/120 V	Momentary	Blue	_	KXRB38L	125.00
		Red	_	KXRB38R	125.00
		White	_	KXRB38W	125.00
Dual Push Button					
		Green	Red	KXRCGR	77.00
	Momentary + Interlock	White	White	KXRCWW	77.00
Non-Illuminated		Green	Green	KXRCGG	77.00
NOI-IIIUITIII ateu		Green	Red	KXREGR	120.00
	Maintained + Interlock	White	White	KXREWW	120.00
		Green	Green	KXREGG	120.00



Table 19.285: Dual Push Button with Pilot Light—without Contacts A



Action	Voltage	Lens Color (1)	Lens Color (2)	Lens Color (3)	Lens Color (4)	Туре	Price
With One Pilo	t Light						
	24 Vac/dc	Red	White	Green	_	KXRG35RWG	188.00
Momentary	24 Vac/dc	Green	White	Green	_	KXRG35GWG	188.00
Morneritary	110/120 Vac/dc	Red	White	Green	_	KXRG38RWG	188.00
	110/120 Vac/dc	Green	White	Green	_	KXRG38GWG	188.00
	24 Vac/dc	Red	White	Green	_	KXRH35RWG	221.00
Momentary +	24 Vac/dc	Green	White	Green	_	KXRH354GWG	221.00
Interlock	110/120 Vac/dc	Red	White	Green	_	KXRH38RWG	221.00
	110/120 Vac/dc	Green	White	Green	_	KXRH38GWG	221.00
	24 Vac/dc	Red	White	Green	_	KXRJ35RWG	243.00
Maintained +	24 Vac/dc	Green	White	Green	_	KXRJ35GWG	243.00
Interlock	110/120 Vac/dc	Red	White	Green	_	KXRJ38RWG	243.00
	110/120 Vac/dc	Green	White	Green	_	KXRJ38GWG	243.00
With Two Pilo	t Lights						
	24 Vac/dc	Red	White	White	Green	KXRL35RWWG	324.00
Managara	24 Vac/dc	Red	Red	Green	Green	KXRL35GGRR	324.00
Momentary	110/120 Vac/dc	Red	White	White	Green	KXRL38RWWG	324.00
	110/120 Vac/dc	Red	Red	Green	Green	KXRL38GGRR	324.00
	24 Vac/dc	Red	White	White	Green	KXRM35RWWG	368.00
Momentary +	24 Vac/dc	Red	Red	Green	Green	KXRM35RRGG	368.00
Interlock	110/120 Vac/dc	Red	White	White	Green	KXRM38RWWG	368.00
	110/120 Vac/dc	Red	Red	Green	Green	KXRM38RRGG	368.00



Order contact blocks separately (See Table 19.287 on Page 19-97)



Table 19.286: Selectors—without Contacts ▲

NOTE: When ordering, add prefix 9001 to the catalog number.

Description		Voltage	Knob Color	Туре	\$ Price
	Non-Illuminated	_	Black	KXSAEB	53.00
	Illuminated	24 Vac/dc	Red	KXSJE35R	138.00
	Illuminated	24 Vac/dc	Green	KXSJE35G	138.00
	Illuminated	24 Vac/dc	White	KXSJE35W	138.00
O Desiries Maintained	Illuminated	120 Vac/dc	Red	KXSJE38R	138.00
2-Position, Maintained	Illuminated	120 Vac/dc	Green	KXSJE38G	138.00
	Illuminated	120 Vac/dc	White	KXSJE38W	138.00
	Key (Withdraw L)	_	N/A	KXSRE1	140.00
	Key (Withdraw R)	_	N/A	KXSRE2	138.00
	Key (Withdraw Both)	_	N/A	KXSRE3	138.00
	Non-Illuminated	_	Black	KXSDCB	53.00
3-Position, Maintained	Key (Withdraw C)	_	N/A	KXSVC5	138.00
	Key (Withdraw All)	_	N/A	KXSVC10	138.00
4-Position, Maintained	Non-Illuminated	_	Black	KXSHHB	58.00

<sup>▲</sup> Order contacts separately (See Table 19.287)

# Table 19.287: Contact Blocks—Purchase Separately

	Description	Туре	\$ Price
(Clear Cover)	1 N/O, 1 N/C	KA1	42.80
(Green Cover)	1 N/O	KA2	21.50
(Red Cover)	1 N/C	KA3	21.50
(Clear Cover)	1 N/C, 1 N/O (Early Make)	KA4	42.80
(Red Cover)	1 N/C (Late Break)	KA5	21.50
(Green Cover)	1 N/O (Early Make)	KA6	21.50

Table 13.2	LOO. LC	genu ri	ates for r	usii but	tons or	i iiot Ligi	its
			Use	d On			
	1.23 31 Square	1.23	0.56 14		1.23	0.56 - 14	
Marking	Α	B C (vertic	,	D	E	F	\$ Price
	Α	В	С	D	E	F	
	KXRA, KXRB KXRN, KXRP KXPA, KXPC KXTA, KXTB KXTE	KXRC, KXRD KXRE, KXRF	KXPB KXTD ∳	KXRG, KXRH KXRJ, KXRK▲	KXRG, KXRH KXRJ, KXRK KXRL, KXRM KXTC ■	KXRL, KXRM KXTC ▲	
Blank Start Stop On Off Emerg. Stop Forward Reverse Close Open Down Up Jog Reset Run Cycle Start Motor Run Power On	KXN100 KXN101 KXN102 KXN103 KXN104 KXN106 KXN106 KXN109 KXN111 KXN111 KXN118 KXN123 KXN124 KXN132 KXN132 KXN134 KXN134 KXN138	KXN200 KXN201 KXN202 KXN203 KXN204 KXN205 KXN206 KXN207 KXN208 KXN209 KXN211 KXN211 KXN218 KXN223 KXN224 KXN224 KXN232 KXN236 KXN238	KXN200 KXN201V KXN202V KXN203V KXN204V KXN205V KXN206V KXN207V KXN208V KXN210V KXN211V KXN211V KXN213V KXN223V KXN223V KXN232V KXN232V KXN232V KXN238V	KXN300 KXN301 KXN302 KXN303 KXN304 KXN305 KXN306 KXN307 KXN308 KXN310 KXN311 KXN311 KXN318 KXN322 KXN324 KXN324 KXN3324 KXN332 KXN3324 KXN3324 KXN338	KXN400 KXN401 KXN402 KXN403 KXN404 KXN406 KXN406 KXN409 KXN411 KXN418 KXN423 KXN423 KXN424 KXN432 KXN436 KXN436 KXN438	KXN500 KXN501 KXN502 KXN503 KXN504 KXN505 KXN506 KXN507 KXN508 KXN509 KXN511 KXN511 KXN518 KXN522 KXN524 KXN524 KXN532 KXN532 KXN536 KXN538	4.40
Special- Marking	KXN199	KXN299	KXN299V	KXN399	KXN499	KXN599	18.50

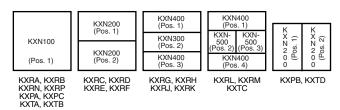
- These legend inserts are for the pilot lights in the center of the operator.
- These legend inserts are for the push button portion of the operator. These legend inserts have vertical printing.

19

#### Table 19.289: Legend Plates for Selector Switches

	_		
	Used	On	
Marking	1.33 34 Square 0.76 19 KXN-600	1.33 34 Square 0.76 19 1 KXN-700	\$ Price
	KXSA, KXSB, KXSC, KXSD, KXSE, KXSF, KXSG, KXSH, KXSJ, KXSK, KXSL, KXSM, KXSN, KXSO, KXSP, KXSQ	KXSR, KXSS, KXST, KXSV, KXSW, KXSX, KXSY, KXSZ	
Blank ForRev. Hand-Auto Man-Auto Off-On On-Off Open-Close Start-Stop Auto-Off-Hand Hand-Off-Auto Man-Off-Auto Man-Off-Auto	KXN600 KXN639 KXN640 KXN643 KXN643 KXN644 KXN646 KXN651 KXN651 KXN658 KXN660 KXN660	KXN700 KXN739 KXN740 KXN743 KXN744 KXN745 KXN746 KXN751 KXN758 KXN758 KXN760 KXN760	4.40
Special Marking	KXN699	KXN799	18.50

**INCHES Dual Dimensions:** 



NOTE: When ordering, add prefix 9001 to the catalog number.

#### Table 19.290: Letter Height For Standard Legends

	in.	mm
KXN100	1•4	6
KXN200	3 <b>•1</b> 6	4.75
KXN300	3 <b>•1</b> 6	4.75
KXN400	3 <b>•1</b> 6	4.75
KXN500	3 <b>•</b> 16	4.75
KXN600	1€	3
KXN700	1€	3

#### Table 19.291: Maximum Number of Lines and Characters For Type KXN Legend Inserts

	tter ight	Number of	KXN199	KXN299 Horizontal	KXN299 Vertical	KXN399	KXN499	KXN599
in.	mm	OI		Honzontai	vortioui			
		Characters per Line	7	7	3	7	7	3
14	6	Lines per Legend Insert	4	2	4	1	1	1
		Characters per Line	9	9	4	9	9	4
3•16	4.75	Lines per Legend Insert	5	2	6	2	1	2
		Characters per Line	14	14	5	14	14	6
1-8	3	Lines per Legend Insert	8	4	9	3	2	3

Table 19.292: Maximum Number of Lines and Characters for Type KXN699 and KXN799 Legend Plates

Position	Letter Height		Characters Per Marking Area		
	in.	mm	A and C	В	
B	3 <b>1</b> 6	4.75	6	6	
A	18	3	8	9	
B	3 <b>1</b> 6	4.75	10	5	
A	18	3	13	7	

All Type KX push buttons and pilot lights have a blank insert as standard. These blank inserts can be custom marked using a marking pen, a mechanical lettering set, press letters, or a tape lettering machine that marks a tape which can then be transferred to the blank insert.

To have legend inserts installed into the operators, order the operator as normal and then indicate where to install the legend inserts using the numbered positions shown on the operator ordered.

9001KXRL1GRGRH2 with a 9001KXN 401 in position 1 9001KXN 503 in position 2 9001KXN 504 in position 3 9001KXN 402 in position 4 Example:

#### Table 19.293: Closing Plate



#### Table 19.294: Boots

For Use On	Туре	\$ Price
All KX** push buttons and pilot lights	KXAKU7	28.70
All KX** selector switches and potentiometers	KXAKU17B	42.80

#### Table 19.295: Shrouds

= = =	Description	For Use On	Color	Туре	\$ Price
	Full Shroud	All push buttons and	Red	KXAK41R	7.20
	i dii Orii odd	pilot lights	Black	KXAK41B	7.20
			Red	KXAK40R	7.20
	Short Shroud	Any KX operator	Black	KXAK40B	7.20

#### Table 19.296: Lamp and Lens Removal Kit

	Туре	\$ Price
Used to remove lamp and lens on all illuminated operators and pilot lights.	KXALLRT	21.50

#### NOTE: When ordering, add prefix 9001 to the catalog number.

#### Table 19.297: Button Covers

Table 19.297.	Button Covers				
Description	For Use On	Color	Type	Code	\$ Price
Includes 2-KXN200	KXPB KXTD	Red Green Amber Blue White	KXAC28▲ KXAC28▲ KXAC28▲ KXAC28▲ KXAC28▲	R■ G■ A■ L■ W■	9.90
Includes KXN400	KXTC (Position 1 & 4)	Red Green Amber Blue White	KXAR4 KXAG4 KXAA4 KXAL4 KXAW4	R G A L W	9.90
Includes KXN500	KXTC (Position 2 & 3) ó	Red Green Amber Blue White	KXAR5 KXAG5 KXAA5 KXAL5 KXAW5	R G A L W	9.90
Includes 1–KXN100	KXPC	Red Green Amber Blue White	KXAC48 ♦ KXAC48 ♦ KXAC48 ♦ KXAC48 ♦	R <b>★</b> G <b>★</b> A <b>★</b> L <b>★</b> W <b>★</b>	9.90
Includes KXN100	KXRA KXRB	Red Green Amber Blue White	KXAR1 KXAG1 KXAA1 KXAL1 KXAW1	R G A L W	6.60
Includes KXN100	KXRN KXRP	Red Green Amber Blue White	KXARM1 KXAGM1 KXAAM1 KXALM1 KXAWM1	R G A L W	17.10
Includes KXN200	KXRC KXRD KXRE KXRF	Red Green Amber Blue White	KXAR2 KXAG2 KXAA2 KXAL2 KXAW2	R G A L W	9.90
Includes KXN300	KXRG (Position 2) KXRH (Position 2) KXRJ (Position 2) KXRK (Position 2)	Red Green Amber Blue White	KXAR3 KXAG3 KXAA3 KXAL3 KXAW3	R G A L W	9.90
Includes KXN400	KXRG (Position 1 & 3) KXRH (Position 1 & 3) KXRJ (Position 1 & 3) KXRK (Position 1 & 3) KXRL (Position 1 & 4) KXRM (Position 1 & 4)	Red Green Amber Blue White	KXAR4 KXAG4 KXAA4 KXAL4 KXAW4	R G A L W	9.90
Includes KXN500	KXRL (Position 2 & 3) KXRM (Position 2 & 3)	Red Green Amber Blue White	KXAR5 KXAG5 KXAA5 KXAL5 KXAW5	R G A L W	9.90
Includes KXN100	КХРА	Red Green Amber Blue White	KXAR8 KXAG8 KXAA8 KXAL8 KXAW8	R G A L W	9.90
Includes KXN100	KXTA KXTB	Red Green Amber Blue White	KXAR1 KXAG1 KXAA1 KXAL1 KXAW1	R G A L W	9.90

- KXN100 White KXAW1 W

  Each KXAC28 includes a clear cover and 1 each of all colors. If the same color is required for position #1and #2 of the KXPB operator, order 2 of Type KXAC28.

  When specifying color codes—the first will be installed in #1 and the second in #2. The price for BOTH color codes is \$6.60.

  Each KXAC48 includes a clear cover and 1 each of all colors. If the same color is required for position #1and #2 of the KXPC operator, order 2 of Type KXAC48.

  When specifying color codes—the first will be installed in #1, the second in #2, the third in #3 and the fourth in #4. The price for ALL FOUR color codes is \$6.60.

  Two required per operator. When ordering an assembled operator—specify two code numbers. The first code will be assembled into #1 and the second code will be assembled into #2.

Marking

Start

Stop

Stop on red legend

**Catalog Number** 

XALD101H29H7

XALD111H29H7

XALD164H29H7

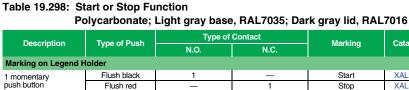
\$ Price

73.00

73.00

84.00





Red



XALD101H29H7



XALK174H7





XALD211H29H7



19

XALD321H29H7

Table 19.299: Emergency Stop or Emergency Off Function Polycarbonate; Light gray base, RAL7035; Yellow lid, RAL1012

Description	Tuna	Type of	Contact	Catalog Number	\$ Price
Description	Туре	N.O.	N.C.	Catalog Number	\$ Price
1 mushroom head	Standard ▲	_	1	XALK174H7	117.00
push button Ø 40 mm, red Turn-to-release	Trigger action ■	_	1	XALK178H7	147.00
1 mushroom head	Standard ▲	_	1	XALK184H7	147.00
push button Ø 40 mm, red Key release (Key No. 455)	Trigger action ■	_	1	XALK188H7	147.00
1 mushroom head push button Ø 40 mm, red Push-pull	Standard ▲	_	1	XALK194H7	99.00

1

Emergency Off (IEC 60364-5-53)

Marking on Legen 1 mushroom head push button Ø 40 mm, momentary

Emergency Stop (EN / IEC 13850)

Table 19.300: Start-Stop Function

Polycarbonate; Light gray base, RAL7035; Dark gray lid, RAL7016

Description	Type of Push	Type of Contact		Text	Catalog Number	\$ Price	
۱	Description	Type of Pusit	N.O. N.C.		\$ Frice		
Ī		1 flush black	1	_	Start	XALD211H29H7	73.00
:	2 momentary push buttons	1 flush red	_	1	Stop	AALDZ I II IZBI II	73.00
-		1 flush black	1	_	Forward	XALD251H29H7	73.00
	1 flush black		1	_	Reverse	AALDZ51HZ9H7	73.00

Table 19.301: Three Function

Polycarbonate; Light gray base, RAL7035; Dark gray lid, RAL7016

Description	Type of Push	Type of Contact		Text	Catalog Number	\$ Price
Description	Type of Pusit	N.O.	N.C.	lext	Catalog Nulliber	\$ FIICE
		1	_	Open		
		_	1	Stop	XALD351H29H7	143.00
		1	_	Close		
3 momentary	1 flush black	1	_	Forward		143.00
push buttons	1 flush red	_	1	Stop	XALD311H29H7	
(no markings)	1 flush black	1	_	Reverse		
		1	_	Up		
		_	1	Stop	XALD321H29H7	143.00
		1	_	Down		

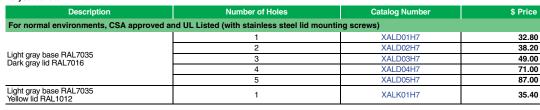
Discount Schedule

# www.schneider-electric.us

# **Control Stations and Enclosures**

# Table 19.302: Empty Enclosures ▲

Polycarbonate





XALD02H7

ZENL1111

Table 19.303: Electrical Block and Accessories (for mounting on metal plate at back of enclosure) ▲

Description	Туре	Color	Catalog Number	\$ Price
ctrical blocks with screw c	lamp terminal connections			
Metal-plate-mounting	N.O. contact	_	ZENL1111	16.6
contact blocks	N.C. contact	_	ZENL1121	16.4
		White	ZALVB1	
		Green	ZALVB3	
	24 Vac/Vdc	Red	ZALVB4	52.0
		Yellow	ZALVB5	
Light blocks with		Blue	ZALVB6	
		White	ZALVG1	
protected		Green	ZALVG3	
1 (-1)	120 Vac	Red	ZALVG4	52.0
		Yellow	ZALVG5	
		Blue	ZALVG6	
		White	ZALVM1	
		Green	ZALVM3	
	230 Vac	Red	ZALVM4	52.0
		Yellow	ZALVM5	
		Blue	ZALVM6	

For customer assembly using XB5 operators and standard screw-terminal contact blocks, see Push Buttons—ZB5 22 mm starting on page 19–45. Either mounting method can be used: contact block ZENL mounting on metal plate, or contact block ZBE mounting on operator with mounting collar.



ZALV••

ZB5SZ3

Table 19.304: Accessories for electrical blocks

Description	Application	Catalog Number	\$ Price
Blanking plug	Ø 22 mm units	ZB5SZ3	11.00
Nut	Head mounting	ZB5AZ901	4.40
Grounding terminal	Grounding	XALZ09	5.40
Key	For tightening nut	ZB5AZ905	12.40



ZB5AZ905

Table 19.305: Undrilled Enclosures, Glass-Reinforced Polyester

	H x W	Dimensions	Catalog Number	\$ Price	
	Гуре	IN	mm		\$ FIICE
		3.34 x 5.75	85 x 146	XAPA1100	110.00
NEMA 4, 4X, 13	Without hinges	3.34 x 8.90	85 x 226	XAPA2100	180.00
Usable depth 3.27 in. (83 mm)		5.95 x 9.49	151 x 241	XAPA3100	284.00
	With hinges	5.95 x 9.49	151 x 241	XAPA4100	378.00
		For XAPA1100		XAPZ100	22.00
Undrilled Grounding Plate	Sheet steel with ground screw	For XAPA2100		XAPZ200	24.60
		For XAPA3100	and 4100	XAPZ300	32.00



XAPA1100

Table 19.306: Drilled Insulated Enclosures, Glass-Reinforced Polyester ■

		Ď.
W		
	_	
	•	ı
		•

XAPA1104

_	Number of	Number	of Rows	H x W Dir	mensions		
Туре	Knockouts 22 mm	Vertical	Horizontal	IN	mm	Catalog Number	\$ Price
NEMA 4, 4X, 13	1	1	1	3.35 X 5.75	85 X 146	XAPA1110	114.00
Usable depth	2	1	2	3.35 X 5.75	85 X 146	XAPA1120	114.00
3.27 in. (83 mm) 1.58 in. (40 mm)	4	2	2	3.35 X 5.75	85 X 146	XAPA1104	114.00
centerline	8	2	4	3.35 X 8.90	85 X 226	XAPA2108	182.00
spacing of holes	16	4	4	5.94 X 9.49	151 X 241	XAPA3116	390.00
				For XAPA1110		XAPZ110	22.00
				For XAPA1120 For XAPA1104		XAPZ120	22.00
Drilled Grounding Pla	ate	Sheet steel with g	round screw			XAPZ104	22.00
				For XAPA2108		XAPZ208	24.60
				For XAPA3116		XAPZ316	32.00

Uses standard XB5 products from pages 19-42 through 19-62. Do not use ZENL style contact blocks.



**Enclosures** 

**Control Stations and** 

XAPG39400

# Table 19.307: Undrilled Die Cast Enclosures (Painted Gray RAL7032)

Type Materi	Material	Usable Depth		HxWxD	Dimensions	Catalog Number	S Price
	Material	IN	mm	IN	mm	Catalog Number	\$ FIICE
				3.15 x 3.15 x 2.03	80 x 80 x 51.5	XAPG19100	110.00
	Zinc	1.93	49	5.12 x 3.15 x 2.03	130 x 80 x 51.5	XAPG29100	120.00
				6.89 x 3.15 x 2.03	175 x 80 x 51.5	XAPG39100	142.00
NEMA 4, 13		2.93	74.5	3.15 x 3.15 x 3.03	80 x 80 x 77	XAPG19400	110.00
INCIVIA 4, 13				5.12 x 3.15 x 3.03	130 x 80 x 77	XAPG29400	120.00
				6.89 x 3.15 x 3.03	175 x 80 x 77	XAPG39400	142.00
				8.66 x 3.15 x 3.03	220 x 80 x 77	XAPG49400	174.00
	Aluminum	2.93	2.93	12.20 x 3.35 x 3.03	310 x 85 x 77	XAPG59400	262.00

Table 19.308: Drilled Die Cast Enclosures (Painted Gray RAL7032) ▲

н	0	0
ı		
ı		
ı		
Я		-

XAPG29703



XAPE302

_		Usable	Depth	Number of	HxWxDI	Dimensions	Catalog Number	45.	
Туре	Material	IN	mm	22 mm holes	IN	mm	g	\$ Price	
				2	3.15 x 3.15 x 2.03	80 x 80 x 51.5	XAPG19702	120.00	
NEMA 4, 13		1.93	49	3	5.12 x 3.15 x 2.03	130 x 80 x 51.5	XAPG29703	142.00	
1.18 in. (30 mm) centerline	Zinc			4	6.90 x 3.15 x 2.03	175 x 80 x 51.5	XAPG39704	174.00	
spacing of holes	ZIIIC			2	3.15 x 3.15 x 3.03	80 x 80 x 77	XAPG19802	120.00	
for horizontal mount		2.93	74.5	3	5.12 x 3.15 x 3.03	130 x 80 x 77	XAPG29803	142.00	
				4	6.90 x 3.15 x 3.03	175 x 80 x 77	XAPG39804	174.00	
					1	3.15 x 3.15 x 2.03	80 x 80 x 51.5	XAPG19201	110.00
		1.93	1.93	2	5.12 x 3.15 x 2.03	130 x 80 x 51.5	XAPG29202	120.00	
NEMA 4, 13				3	6.90 x 3.15 x 2.03	175 x 80 x 51.5	XAPG39203	142.00	
1.58 in. (40 mm) centerline	Zinc			1	3.15 x 3.15 x 3.03	80 x 80 x 77	XAPG19501	110.00	
spacing of holes		2.93	74.5	2	5.12 x 3.15 x 3.03	130 x 80 x 77	XAPG29502	120.00	
for vertical mount		2.93		3	6.90 x 3.15 x 3.03	175 x 80 x 77	XAPG39503	142.00	
				4	8.66 x 3.15 x 3.03	220 x 80 x 77	XAPG49504	174.00	
A Can use either	Aluminum	2.93	74.5	5	12.20 x 3.35 x 3.03	310 x 85 x 77	XAPG59505	268.00	

XAPE303

#### Table 19.309: Drilled Flush Plates ■

	Tuno	Material	Number of	HxWxDI	Dimensions	Catalog Number	S Price
Туре	Material	22 mm holes	IN	mm		3 FIICE	
		Anodized Aluminum	1	2.83 x 2.83	72 x 72	XAPE301	52.00
	NEMA 4, 13		2	4.13 x 2.83	105 x 72	XAPE302	60.00
	1.18 in. (30 mm) centerline spacing of holes		3	5.43 x 2.83	138 x 72	XAPE303	68.00
			4	6.73 x 2.83	171 x 72	XAPE304	82.00
			5	8.03 x 2.83	204 x 72	XAPE305	98.00

Can use either XB4 or XB5 products.

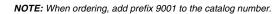
# Table 19.310: Optional Back Box (for finger protection, if required)

Туре	Material	For Use With	Catalog Number	\$ Price
		Flush plate XAPE301	XAPE901	
		Flush plate XAPE302 XAPE902		32.80
Protective rear covers	Insulating Fiberglass	Flush plate XAPE303	XAPE903	32.00
		Flush plate XAPE304	XAPE904	
		Flush plate XAPE305	XAPE905	60.00



# 30 mm Control Stations and Enclosures

#### Table 19.311: Control Stations





NEMA 1 Surface Mounting Type BG201



NEMA 1 Flush Mounting (w/o pullbox) Type BF201



Type BW243



NEMA 7 and 9 Type BR103

No. of But-	Nameplate Markings and Features		Surface Mounting NEMA1		Stainless Steel Flush Plate ■		Watertight and Dusttight NEMA4		For Hazardous Locations NEMA 7 & 9 ◆	
tons		<b>A</b>	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price
	Start	1	BG101	86.00	BF101	116.00	BW146	270.00	BR101	363.00
	Stop	3	BG102	86.00	BF102	116.00	BW147	270.00	_	_
	Stop (Mushroom Button)	3	BG103	99.00	_	_	BW151	287.00	BR103	378.00
1	Stop (Lockout)	3	BG104	129.00	_	_	BW148	270.00	BR104	363.00
'	Universal (w/o legend insert)	16	BG107	83.00	BF107	111.00	BW159	269.00	BR107	360.00
	Off-On (Selector Switch)	19	BG111	86.00	_	_	_	_	_	_
	Hand-Off-Auto (Selector Switch)	17	BG112	86.00	_	_	_	_	_	_
	Universal Selector Switch (w/o legend insert)	19 or 17	BG114	83.00	_	_	_	_	_	_
	Start-Stop	145	BG201	86.00	BF201	116.00	BW240	270.00	BR204	363.00
	Start-Stop (for latching Applications)	146	BG202	107.00	_	_	BW252	270.00	BR202	363.00
	Start-Stop (Mushroom on Stop)	145	BG203	99.00	_	_	BW250	287.00	BR203	378.00
	Start-Stop (Lockout on Stop)	145	BG204	129.00	_	_	BW241	270.00	BR204	363.00
	Start-Stop (Mushroom on both)	145	BG205	116.00	_	_	BW246	300.00	BR205	392.00
	Forward-Reverse	146	BG206	107.00	_	_	BW242	270.00	_	_
	Open-Close	146	BG207	107.00	_	_	BW244	270.00	_	_
2	Up-Down	146	BG208	107.00	BF208	135.00	BW243	270.00	BR208	363.00
	Raise-Lower	146	BG209	107.00	_	_	BW253	270.00	_	_
	On-Off	145	BG210	86.00	BF210	116.00	BW245	270.00	_	_
	On-Off	146	BG211	107.00	BF211	135.00	BW254	270.00	_	_
	Universal (w/o legend inserts)	25	BG214	78.00	_	_	BW260	264.00	BR214	356.00
	Start-Stop (Maintained Contact)	10	BG215	129.00	BF215	158.00	BW255	314.00	BR215	405.00
	On -Off (Maintained Contact)	10	BG216	129.00	BF216	158.00	BW256	314.00	BR216	405.00
	Universal (Maintained contact w/o legend inserts)	10	BG218	122.00	_	_	_	_	BR218	399.00
	Fast-Slow-Stop	109	BG301	171.00	_	_	_	_	_	_
	Forward-Reverse-Stop	109	BG302	171.00	_	_	_	_	_	_
	Opn-Close-Stop	109	BG303	171.00	BF303	207.00	_	_	_	_
3	Raise-Lower-Stop	109	BG304	171.00	_		_		_	
3	Up-Down-Stop	109	BG305	171.00	BF305	207.00	_		_	
	Start-Jog-Stop	109	BG316	171.00	_		_		_	
	Universal (w/o legend inserts)	8	BG307	162.00	_		_		_	
	Start-Stop, Red Pilot Light: 120Vac/dc	145 & 121	BG308	314.00	BF308	342.00	_		_	

- See Table 19.314 on page 19-104.
  Uses standard 2.0 or 2.13 in. deep wall boxes, single gang for Types BF1 and BF2, two gang for Type BF3
  Also rated for Class I, Division I and II, Groups B, C, or D; Class II, Division I and II, Groups E, F, or G

#### Table 19.312: Accessories

Description	Color	Туре	\$ Price
Mushroom Caps for NEMA 1	Red	B301	14.30
Mushroom Caps for NEMA 4	Red	B303	14.30
Lockout Kit for NEMA 1	_	B321	42.80
Pilot Light Lenses, NEMA 1 Surface Mount	Red	B331	10.70
Pilot Light Lenses, NEMA 1 Surface Mount	Green	B332	10.70
Pilot Light Lenses, NEMA 1 Flush Mount	Red	B341	10.70
Pilot Light Lenses, NEMA 1 Flush Mount	Green	B342	10.70
Replacement Covers for BW240 ▼	_	BWD219	17.90
Replacement Covers for BW241 ★▼	_	BWD220	35.60
Replacement Covers for BW242-BW260 ▼	_	BWD219	17.90
★ Includes factory installed	d lockout	on the cove	ar

Includes factory installed lockout on the cover. Replacement case/covers are not available for Type BR devices.

# Table 19.313: Interchangeable Push Button Legend Inserts

Start         B101         B161         B259         B282         3.60           Stop         B102         B162         B260         B283         3.60           Fast         B103         —         —         —         3.60           Slow         B104         —         —         —         3.60           Forward         B105         —         B255         —         3.60           Reverse         B106         —         B256         —         3.60           Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           Off         B116         B175         B257         —         3.60           Hand         B117         —         B265         —         3.60	Marking	Surface Mount	For NEMA 4 or 7/9 Lever Type	For NEMA 4 Round Button	Mushroom Button	\$ Price
Fast         B103         —         —         —         3.60           Slow         B104         —         —         —         3.60           Forward         B105         —         B255         —         3.60           Reverse         B106         —         B256         —         3.60           Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60 <tr< td=""><td>Start</td><td>B101</td><td>B161</td><td>B259</td><td>B282</td><td>3.60</td></tr<>	Start	B101	B161	B259	B282	3.60
Slow         B104         —         —         —         3.60           Forward         B105         —         B255         —         3.60           Reverse         B106         —         B256         —         3.60           Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Hand         B117         —         B265         —         3.60           Hand         B117         —         B265         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Stop	B102	B162	B260	B283	3.60
Forward         B105         —         B255         —         3.60           Reverse         B106         —         B256         —         3.60           Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60         3.60           Up         B111         —         B253         B276         3.60         3.60           Down         B112         —         B254         B277         3.60 <td>Fast</td> <td>B103</td> <td></td> <td>_</td> <td>_</td> <td>3.60</td>	Fast	B103		_	_	3.60
Reverse         B106         —         B256         —         3.60           Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Slow	B104	_	_	_	3.60
Open         B107         —         B263         —         3.60           Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Forward	B105	_	B255	_	3.60
Close         B108         —         B264         —         3.60           Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Reverse	B106	_	B256	_	3.60
Raise         B109         —         B261         —         3.60           Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Open	B107		B263	_	3.60
Lower         B110         —         B262         3.60           Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Close	B108	_	B264	_	3.60
Up         B111         —         B253         B276         3.60           Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Raise	B109	_	B261	_	3.60
Down         B112         —         B254         B277         3.60           On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Lower	B110		B262		3.60
On         B115         B175         B257         —         3.60           Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Up	B111	_	B253	B276	3.60
Off         B116         B176         B258         —         3.60           Hand         B117         —         B265         —         3.60           Auto         B118         —         B266         —         3.60           Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Down	B112	_	B254	B277	3.60
Hand     B117     —     B265     —     3.60       Auto     B118     —     B266     —     3.60       Jog     B119     —     —     3.60       Blank (Black)     B129     B189     B251     B251     3.60	On	B115	B175	B257	_	3.60
Auto     B118     —     B266     —     3.60       Jog     B119     —     —     —     3.60       Blank (Black)     B129     B189     B251     B251     3.60	Off	B116	B176	B258	_	3.60
Jog         B119         —         —         —         3.60           Blank (Black)         B129         B189         B251         B251         3.60	Hand	B117	_	B265	_	3.60
Blank (Black) B129 B189 B251 B251 <b>3.60</b>	Auto	B118	_	B266	_	3.60
_ ` '	Jog	B119	_	_	_	3.60
Blank (Red) B129R B189R B252 B252 <b>3.60</b>	Blank (Black)	B129	B189	B251	B251	3.60
	Blank (Red)	B129R	B189R	B252	B252	3.60

Replacement Interiors... page 19-104
Electrical Contact Ratings page 19-104



Class 9001 / Refer to Catalog 9001CT1104





Type BGC214 (Type BGC contact block assemblies include cover.)



Type BGB214



BOC361

#### Table 19.314: Replacement Interiors For Type B **Standard Duty Push Button Stations**

NOTE: When ordering, add prefix 9001 to the catalog number.

For Control Station Types	on	Contact Symbol	Contact Block Assembly ▲ Type	\$ Price	Terminal Block Wiring Receptacle Type	\$ Price
BF101-BF107		16	BOC107	39.20	BFB107	42.80
BF111-BF114		19 or 17	BOC114	39.20	BFB114	42.80
BF121-BF123		121	BOC123	147.00	BFB123	42.80
BF201-BF214		25	BOC214	35.60	BFB214	42.80
BF215-BF218		10	BOC218	78.00	BFB214	42.80
BF221-BF224		7 or 19 & 121	BOC224	234.00	BFB224	64.00
BF225-BF226		17 or 19 & 16	BOC226	57.00	BFB226	64.00
BF301-BF307		8	BOC214 & BOC107	35.60 39.20	BFB214 & BFB107	42.80 42.80
BF308-BF309		25 & 121	BOC214 & BOC123	35.60 147.00	BFB214 & BFB123	42.80 42.80
BF310-BF313		10 & 121	BOC218 & BOC123	78.00 147.00	BFB214 & BFB123	42.80 42.80
BF314-BF315		17 or 19 & 25	BOC214 & BOC114	35.60 39.20	BFB214 & BFB114	42.80 42.80
BG101-BG107		16	BGC107	39.20	BGB107	42.80
BG111-BG114		17 or 19	BGC114	39.20	BGB114	42.80
BG121-BG123		121	BGC123	147.00	BGB123	42.80
BG201-BG214		25	BGC214	35.60	BGB214	42.80
BG215-BG218		10	BGC218	78.00	BGB214	42.80
BG221-BG224		17 or 19 & 121	BGC224	234.00	BGB224	64.00
BG225-BG226	i	17 or 19 & 16	BGC226	57.00	BGB226	64.00
BG301–BG307 BG316–BG326		8	BGC307	39.20	BGB307	57.00
BG308-BG309		25 & 121	BGC309	212.00	BGB309	86.00
BG310-BG313		10 & 121	BGC313	242.00	BGB309	86.00
BG314-BG315		17 or 19 & 25	BGC315	75.00	BGB315	86.00
BR101-BR107		16	BOC107	39.20	BFB107	42.80
BR202-BR214	1	25	BOC214	35.60	BFB214	42.80
BR215-BR219		10	BOC218	78.00	BFB214	42.80
BW101-BW107	'	16	BOC107	39.20	BFB107	42.80
BW202-BW214	ļ.	25	BOC214	35.60	BFB214	42.80
BW215-BW218	3	10	BOC218	78.00	BFB214	42.80
BW146-BW159	)	16	BOC360	126.00		
BW240-BW260	)	25	BOC361	126.00		
BW255-BW258		10	BOC362	126.00	ontact block assemblies and termina	

Contact block assemblies for all Type BG stations include cover and contact block. Replacement contact block assemblies and terminal block wiring receptacles for push buttons have provision for 1 N.O. & 1 N.C. circuit on each button. Unneeded circuits need not be wired.

Order separate legend plates, if required, from listing on page 19-103.

C-Shaped Mor for 9001B	C-Shaped Mounting Bracket for 9001BR Interior						
Catalog Number	\$ Price						
3110112001 8.3							

#### Table 19.315: Electrical Contact Ratings ■

			DC—NEMA P600						
			Induc 35% Powe			Resistive 75% Power Factor		Inductive	and Resistive
Volts	Make		Bre	eak	Continuous Carrying	Make, Break and Continuous	Volts	Make and Break	
	A	VA	A	VA	Amperes	Carrying Amperes		Amperes	Carrying Amperes
120 240 480 600	30.5 15 7.5 6	3600 3600 3600 3600	3.75 1.5 .75 .6	360 360 360 360	5 5 5 5	5 5 5 5 5	120 240 600	1.1 0.55 0.2	5 5 5

OSHA Regulation, Section 1910.70, Overhead and Gantry Cranes, limits the voltage of pendant push buttons to 150 Vac or 300 Vdc.

# **Contact Symbols**

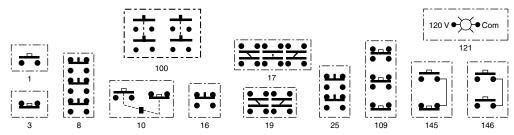


Table 19.316: Empty Enclosures (for Customer Assembly) NOTE: When ordering, add prefix 9001 to the catalog number.

UL Types 1, 3 and 13/ NEMA 1, 3, and 13			UL Types 1 NEMA 1,	UL Types 1, 3, 4 and 13/ NEMA 1, 3, 4 and 13  UL Types 1, 3, 4, 4X and 13/ NEMA 1, 3, 4, 4X and 13					
						•		Polymeric (Pleatie)	
No of	Shee	et Steel	Die Cast Zinc		Stainless Steel (304)		Polymeric (Plastic)		
Holes	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
1	KYAF1	143.00	KY1	143.00	KYSS1	257.00	SKY1	171.00	
2	KYAF2	158.00	KY2 ▲	158.00	KYSS2	270.00	SKY2	201.00	
3	KYAF3	185.00	KY3 ▲ 185.00		KYSS3	372.00	SKY3	228.00	
4	KYAF4	228.00	KY4 ▲	228.00	KYSS4	485.00	SKY4	269.00	
6	KYAF6	287.00	KY6	287.00	KYSS6	714.00	SKY6	287.00	

<sup>▲</sup> Only KN200 series legend plates will fit upright on these enclosures with their long axis vertical.

NOTE: See Table 19.319 on Page 19-106 for Assembled Control Stations



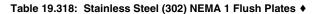
KYG1Y (mushroom head not included)

#### Table 19.317: Guarded Enclosures

UL Types 1, 3, 4 and 13/ NEMA 1, 3, 4 and 13										
No of Holes		Die Cast Zinc								
No of Holes	Cover Color	Box Color	Туре	\$ Price						
1	Gray	Gray	KYG1 ■	150.00						
1	Yellow	Gray	KYG1Y ■	150.00						

<sup>■</sup> Includes 1" NPT threaded conduit opening.

NOTE: See Table 19.319 on Page 19-106 for Assembled Control Stations





K26

No of Holes	Description	Туре	\$ Price
1	1 Hole flush plate, cover screws, insulating liners	K25	28.70
2	2 Hole flush plate, cover screws, insulating liners	K26	42.80
3	3 Hole flush plate, cover screws, insulating liners	K27	57.00
4	4 Hole flush plate, cover screws, insulating liners	K28	86.00

To be used with a standard 2 x 3 in. general purpose switch box. A 2.5 in. deep switch box should be used if two Type KA contact blocks are mounted side by side. If two Type KA contact blocks are mounted in tandem, a 3.5 in. deep box should be used.

NOTE: When ordering, add prefix 9001 to the catalog number.







Type KYSS300



Type SKY201





Type KYG1Y2

Uses 9001K metal operators and metal legend plates.

Guarded Enclosure (Yellow Cover) with Red Turn-To Release Mushroom

- Uses 9001K metal operators and plastic legend plates.
- Uses 9001SK plastic operators and plastic legend plates.
  Control Station consists of components that are UL listed for use in Class 1, Division 2, Groups A, B, C, or D. Includes 1" NPT threaded conduit opening.

KYG1Y2 ▼

KYG1Y

KR16

No of			Cc	Consists of			
Holes	Operator Style and Features	Туре	\$ Price	Enclosure	Operators	Contact Blocks	Legend Plates
UL Ty	rpes 1, 3, 4 and 13/NEMA 1, 3, 4 and 13 Die Cast Zinc End	losure▲					
	Selector Switch (3 Pos Maintained)	KYK111	243.	KY1	KS43B	KA1	Hand-Off-Auto
0	Selector Switch (2 Pos Maintained)	KYK110	243.	KY1	KS11B	KA1	Off-On
Ĭ	Push Button (Momentary)	KYK11	228.	KY1	KR1B	KA1	Start
1	Push Button (Momentary)	KYK13	228.	KY1	KR1R	KA1	Stop
l ' -	Mushroom Button (Momentary)	KYK14	270.	KY1	KR4R	KA1	Stop
Į.	Push Button (with Lockout)	KYK15	270.	KY1	KR3R, K4	KA1	Stop
8	Break Glass Operator	KYK116	329.	KY1	K15	KA1	To Stop—Break Glass
	Break Glass Operator (Red Enclosure)	KYK117	329.	KY1S1	K15	KA1	To Stop—Break Glass
	2 Push Buttons (Lockout on Stop)	KYK224	372.	KY2	KR1B, KR3R, K4	KA1, KA1	Jog-Stop
	2 Push Buttons	KYK218	329.	KY2	KR1B, KR3R	KA1, KA1	On-Off
	2 Push Buttons	KYK26	329.	KY2	KR1B, KR1B	KA1, KA1	Open-Close
0	2 Push Buttons	KYK25	329.	KY2	KR1B, KR1B	KA1, KA1	Up-Down
2	2 Push Buttons 2 Push Buttons (with Sealed Contacts) ★	KYK21 KYK223	329. 527.	KY2 KY2	KR1B, KR3R KR1B, KR3R	KA1, KA1 KA51, KA51	Start-Stop Start-Stop
	2 Push Buttons (Lockout on Stop)	KYK23	372.	KY2	KR1B, KR3R, K4	KA1, KA1	Start-Stop
	2 Push Buttons (Maintained/Interlocked)	KYK27	329.	KY2	KR11GR	KA1	Start-Stop
	1 Push Button, 1 Mushroom Button	KYK22	372.	KY2	KR1B, KR4R	KA1, KA1	Start-Stop
	3 Push Buttons	KYK31	441.	KY3	KR1B, KR1B, KR3R	KA1, KA1, KA1	Forward; Reverse; Stop
l	3 Push Buttons (Lockout on Stop)	KYK326	485.	KY3	KR1B, KR1B, KR3R, K4	KA1, KA1, KA1	Forward; Reverse; Stop
	3 Push Buttons (With Sealed Contacts & Lockout on Stop) ★	KYK322	783.	KY3	KR1B, KR1B, KR3R, K4	KA51, KA51, KA51	Forward; Reverse; Stop
3	3 Push Buttons	KYK33	441.	KY3	KR1B, KR1B, KR3R	KA1, KA1, KA1	Open; Close; Stop
	Red 120v Pilot Light, 2 Push Buttons	KYK317	471.	KY3	KP1R31, KR1B, KR3R	KA2, KA3	Start; Stop
	3 Push Buttons	KYK32	441.	KY3	KR1B, KR1B, KR3R	KA1, KA1, KA1	Up; Down; Stop
	3 Push Buttons (Lockout on Stop)	KYK325	485.	KY3	KR1B, KR1B, KR3R, K4	KA1, KA1, KA1	Up ; Down; Stop
UL Ty	rpes 1, 3, 4 and 13/NEMA 1, 3, 4 and 13—Stainless Steel (	(304) ■					
	Push Button (Momentary)	KYSS101	342.	KYSS1	KR1B	KA1	Start
١.	Push Button (Momentary)	KYSS103	320.	KYSS1	KR1B	KA3	Stop
1	Selector Switch (2 Pos Maintained)	KYSS110	356.	KYSS1	KS11B	KA1	Off-On
l.	Selector Switch (3 Pos Maintained)	KYSS111	356.	KYSS1	KS43B	KA1	Hand-Off-Auto
	2 Push Buttons	KYSS201	422.	KYSS2	KR1B, KR3R	KA1, KA3	Start; Stop
	2 Push Buttons (Lockout on Stop)	KYSS203	491.	KYSS2	KR1B, KR3R, K5	KA1, KA3	Start; Stop
2	2 Push Buttons (Maintained with Interlock)	KYSS210	441.	KYSS2	KR11U	KA1, KA1	Start; Stop
	2 Push Buttons	KYSS205	441.	KYSS2	KR1B, KR1B	KA1, KA1	Up; Down
UL Ty	pes 1, 3, 4. 4X and 13/NEMA 1, 3, 4, 4X and 13—Stainles	s Steel (304	) •				
•	Push Button (Momentary)	KYSK101	342.	KYSS1	SKR1B	KA1	Start
	Push Button (Momentary)	KYSK103	320.	KYSS1	SKR3R	KA3	Stop
1	Selector Switch (2 Pos Maintained)	KYSK110	356.	KYSS1	SKS11B	KA1	Off-On
	Selector Switch (3 Pos Maintained)	KYSK111	356.	KYSS1	SKS43B	KA1	Hand-Off-Auto
	2 Push Buttons	KYSK201	422.	KYSS2	SKR1B, SKR3R	KA1, KA3	Start; Stop
2	2 Push Buttons (Lockout on Stop)	KYSK203	491.	KYSS2	SKR1B, SKR3R, K5	KA1, KA3	Start; Stop
4	2 Push Buttons (Maintained with Interlock)	KYSK210	441.	KYSS2	SKR11U	KA1, KA1	Start; Stop
	2 Push Buttons	KYSK205	441.	KYSS2	SKR1B, SKR1B	KA1, KA1	Up; Down
UL Ty	pes 1, 3, 4. 4X and 13/NEMA 1, 3, 4, 4X and 13—Polymer	ic (Plastic)	<b>*</b>				
	Selector Switch (3 Pos Maintained)	SKY111	270.	SKY1	SKS43B	KA1	Hand-Off-Auto
	Selector Switch (2 Pos Maintained)	SKY110	270.	SKY1	SKS11B	KA1	Off-On
1	Selector Switch (2 Pos Maintained with Sealed Contacts) ★	SKY122	372.	SKY1	SKS11B	KA51	Off-On
	Push Button (with Lockout)	SKY105	306.	SKY1	SKR3R, K5	KA3	Stop
	2 Push Buttons	SKY201	350.	SKY2	SKR1B, SKR3R	KA1, KA3	Start-Stop
	2 Push Buttons (Lockout on Stop)	SKY203	422.	SKY2	SKR1B, SKR1R, K5	KA1, KA3	Start-Stop
2	2 Push Buttons (With Sealed Contacts) ★	SKY223	570.	SKY2	SKR1B, SKR3R	KA51, KA51	Start-Stop
	2 Push Buttons (With Sealed Contacts) ★	SKY222	570.	SKY2	SKR1B, SKR3R	KA51, KA51	On-Off
	2 Push Buttons	SKY205	372.	SKY2	SKR1B, SKR1B	KA1, KA1	Up-Down
	3 Push Buttons	SKY302	464.	SKY3	SKR1B, SKR1B, SKR3R	KA1, KA1, KA3	Up-Down-Stop
3	3 Push Buttons	SKY303	464.	SKY3	SKR1B, SKR1B, SKR3R	KA1, KA1, KA3	Open-Close-Stop
	Red 120v Pilot Light, 2 Push Buttons	SKY315A	531.	SKY3	SKP1R31, SKR1B, SKR3R	KA1, KA3	Start-Stop
UL Ty	rpes 1, 3, 4 and 13/NEMA 1, 3, 4 and 13 Die Cast Zinc End	losures wit	th Integra	al Guard			
1	Guarded Enclosure (grey) with 120V Red LED Pilot Light	KYG11 ▼	250.	KYG1	KP38LRR9	_	order separately
J	Guarded Enclosure (grey) with 120V Green LED Pilot Light	KYG12 ▼	250.	KYG1	KP38LGG9		order separately
1	Guarded Enclosure (Yellow Cover) with Red Push-Pull Mushroom	KYG1Y1 ▼	275.	KYG1Y	KR9R	KA3	Push to Stop/ Pull to Start
	WIGOTOOTT		<b> </b>				i dii to otart

**Emergency Stop** 

КАЗ



# **Tower Lights and Beacons**

# Table 19.320: XVR Pre-Wired Rotating Mirror Beacons



XVR 08 •••



XVR 10 •••



XVR 12•••



XVR 13•••



XVR ZR1





XVC Z13



Diameter (mm)	Sound Option	Enclosure Rating	Voltage	Color	Catalog Number	\$ Price
				Red	XVR 08J04	
				Orange	XVR 08J05	
			12 Vac/Vdc	Green	XVR 08J03	
004	ACH I	IP 23		Blue	XVR 08J06	180.00
Ø 84	Without buzzer	(IP 65 with accessories)		Red	XVR 08B04	180.00
			041/	Orange	XVR 08B05	
			24 Vac/Vdc	Green	XVR 08B03	
				Blue	XVR 08B06	
				Red	XVR 10J04	
			40 ) / 0 /-!-	Orange	XVR 10J05	
			12 Vac/Vdc	Green	XVR 10J03	
0.400	VACUL A le	IP 23		Blue	XVR 10J06	007.00
Ø 106	Without buzzer	(IP 55 with accessories)		Red	XVR 10B04	207.00
			2414 241	Orange	XVR 10B05	
			24 Vac/Vdc	Green	XVR 10B03	
				Blue	XVR 10B06	
		Without buzzer IP 23	12 Vac/Vdc	Red	XVR 12J04	198.00
				Orange	XVR 12J05	
				Green	XVR 12J03	
Ø 400	VACUL A le			Blue	XVR 12J06	
Ø 120	vvitnout buzzer		24 Vac/Vdc	Red	XVR 12B04	
				Orange	XVR 12B05	
				Green	XVR 12B03	
				Blue	XVR 12B06	
				Red	XVR 12J04S	
			12 Vac/Vdc	Orange	XVR 12J05S	
			12 vac/vac	Green	XVR 12J03S	
Ø 120	With buzzer	IP 23		Blue	XVR 12J06S	216.00
0 120	with buzzer	IF 23		Red	XVR 12B04S	216.00
			24 Vac/Vdc	Orange	XVR 12B05S	
			24 Vac/Vuc	Green	XVR 12B03S	
				Blue	XVR 12B06S	
			10.Vdo	Red	XVR 13J04	
Ø 130	Without buzzer	IP 23	12 Vdc	Orange	XVR 13J05	270.00
שו ש	vvitriout buzzer	Resistant to vibration	24 Vdc	Red	XVR 13B04	
			24 VUC	Orange	XVR 13B05	

# Table 19.321: XVR Accessories

Description	Diameter (mm)	Height (mm)	Catalog Number	\$ Price
	84	_	XVR ZR1	
Reflecting prism	106		XVR ZR2	
	120/130		XVR ZR3	36.00
Rubber base	84	_	XVR Z081	
to increase the IP degree of protection	106		XVR Z082	
Mount tube and base	106, 120 and 130	300	XVC Z13	270.00
L-shape mounting bracket	84, 106 and 120		XVC Z23	27.00

\$ Price





Description	Light source (included)	) Voltage	Signaling colors ▲		Catalan Number	\$ Price
Description			Steady	Flashing	Catalog Number	\$ Price
With support tube mounting						
.,			R	-	XVC 4B1	157.50
			R, O	=	XVC 4B2	198.00
		24 Vdc	R, O, G	-	XVC 4B3	229.50
			R, O, G, B	=	XVC 4B4	283.50
Without buzzer	LED for steady		R, O, G, B, C	-	XVC 4B5	352.50
Williout Duzzei	light only		R	-	XVC 4M1	181.50
			R, O	-	XVC 4M2	228.00
		100-240 Vac	R, O, G	-	XVC 4M3	264.00
			R, O, G, B	-	XVC 4M4	379.50
			R, O, G, B, C	-	XVC 4M5	379.50
·		24 Vdc	R	R	XVC 4B15S	240.00
			R, O	R, O	XVC 4B25S	271.50
			R, O, G	R, O, G	XVC 4B35S	309.00
			R, O, G, B	R, O, G, B	XVC 4B45S	378.00
With buzzer	LED for steady or		R, O, G, B, C	R, O, G, B, C	XVC 4B55S	441.00
+ flashing light	flashing light •		R	R	XVC 4M15S	276.00
			R, O	R, O	XVC 4M25S	312.00
		100-240 Vac	R, O, G	R, O, G	XVC 4M35S	355.50
			R, O, G, B	R, O, G, B	XVC 4M45S	435.00
			R, O, G, B, C	R, O, G, B, C	XVC 4M55S	507.00
For base mounting						
			R	_	XVC 4B1K	117.00
	LED for steady		R, O	_	XVC 4B2K	154.50
Without buzzer	light only	24 Vdc	R, O, G	_	XVC 4B3K	189.00
			R, O, G, B	-	XVC 4B4K	255.00
			R, O, G, B, C	-	XVC 4B5K	331.50



XVC Z11



XVC Z01

XVC 1B5K XVC 1B5SK



XVC Z13



XVC Z23

Description	Diameter mm	Minimum height to be added mm	Catalog Numbe
Die-cast metal mounting base (for use with XVC4●● and XVC4●●5S with	90	32	XVC 711

39.00 support tube) Plastic mounting base (for use with XVC4, XVC4•• and XVC4••5S—customer must discard the support tube) 24.5 XVC Z01 64.50

# Table 19.324: XVC Tower Lights — 100 mm diameter (4 inches)

December 1	Links a company	Voltage	Signaling colors ▲		Ostala a Namaban	A Dulas
Description	Light source (included)	Vdc	Steady	Flashing	Catalog Number	\$ Price
For base mounting						
			R	R	XVC 1B1K	631.50
			R, O	R, O	XVC 1B2K	685.50
		24	R, O, G	R, O, G	XVC 1B3K	739.50
			R, O, G, B	R, O, G, B	XVC 1B4K	793.50
Without buzzer	LED for steady or		R, O, G, B, C	R, O, G, B, C	XVC 1B5K	847.50
With flashing light	flashing light •		R	R	XVC 1M1K	726.00
		100-240 Vac	R, O	R, O	XVC 1M2K	787.50
			R, O, G	R, O, G	XVC 1M3K	850.50
			R, O, G, B	R, O, G, B	XVC 1M4K	912.00
			R, O, G, B, C	R, O, G, B, C	XVC 1M5K	975.00
			R	R	XVC 1B1SK	703.50
			R, O	R, O	XVC 1B2SK	757.50
		24	R, O, G	R, O, G	XVC 1B3SK	811.50
			R, O, G, B	R, O, G, B	XVC 1B4SK	865.50
With buzzer	LED for steady or		R, O, G, B, C	R, O, G, B, C	XVC 1B5SK	919.50
+ flashing light	flashing light •		R	R	XVC 1M1SK	808.50
			R, O	R, O	XVC 1M2SK	871.50
		100-240 Vac	R, O, G	R, O, G	XVC 1M3SK	933.00
			R, O, G, B	R, O, G, B	XVC 1M4SK	996.00
			R, O, G, B, C	R, O, G, B, C	XVC 1M5SK	1057.50

- Signaling colors: R = Red, G = Green, O = Orange, B = Blue, C = Clear. The colors are listed in the mounting order of the illuminated units from top to bottom.
- Flashing light function selected by wiring or programming.

#### Table 19.325: Accessories for XVC1

Table 19.323: Accessories for XVC4

Description	Diameter mm	Height mm	Catalog Number	\$ Price
Mount tube and base	140	300	XVC Z13	270.00
L-shape mount bracket	_	_	XVC Z23	27.00

490.50



# Tower Lights and Beacons

#### Table 19.326: XVC6 Tower Lights, 60 mm diameter (2.375 inches)



## Table 19.327: Accessories for XVC6

Description	Diameter mm	Minimum height to be added mm	Catalog Number	\$ Price
Die-cast metal mounting base for XVC6B• and XVC6B•SS with support tube.	100	30	XVC Z02	27.00
Stamped metal mounting base for XVC6B• K and XVC6B•5SK	84	21.6	XVC Z12	45.00

R, O, G, B, C

R, O, G, B, C

XVC 6M55SK

- Signaling colors: R = Red, G = Green, O = Orange, B = Blue, C = Clear. The colors are listed in the mounting order of the illuminated units from top to bottom.
- Flashing light function selected by wiring or programming.







XVBL3•



XVBL4B•



XVBL6B• 5 Joule



XVBL8B• 10 Joule

Description	Light Source and Voltage	Color	Catalog Number	\$ Price
Complete unit, includes:		Green	XVBL33	
	Bulb (10 W max)	Red	XVBL34	
1 lens unit	not included	Amber	XVBL35	444.00
1 base unit (direct or tube mounting)	250 V max	Blue	XVBL36	114.00
	(must order bulb separately ◆)	Clear	XVBL37	
		Yellow	XVBL38	

Table 19.329: XVB Beacons with Flashing Light (one flash per second)

Description	Light Source and Voltage	Color	Catalog Number	\$ Price
		Green	XVBL4B3	
	Bulb (10 W max)	Red	XVBL4B4	
	not included 24 Vac	Amber	XVBL4B5	
	24 vac 24–48 Vdc	Blue	XVBL4B6	
Complete unit, includes:	(must order bulb separately ♦)	Clear	XVBL4B7	
1 lens unit		Yellow	XVBL4B8	193.50
1 base unit (direct or tube	Bulb (10 W max) not included 48–230 Vac (must order bulb separately ◆)	Green	XVBL4M3	193.50
mounting)		Red	XVBL4M4	
		Amber	XVBL4M5	
		Blue	XVBL4M6	
		Clear	XVBL4M7	
		Yellow	XVBL4M8	

Table 19.330: XVB Beacons with 10 Joule Strobe (2.75 in./70 mm diameter) ▲

Description	Light Source and Voltage	Color	Catalog Number ■	\$ Price
		Green	XVBL8B3	
		Red	XVBL8B4	
	Strobe 24 Vac/Vdc	Amber	XVBL8B5	
	(includes bulb)	Blue	XVBL8B6	
Complete unit, includes:	(molades bails)	Clear	XVBL8B7	
1 lens unit		Yellow	XVBL8B8	366.00
1 base unit (direct or tube	Strobe 120 Vac (includes bulb)	Green	XVBL8G3	300.00
mounting)		Red	XVBL8G4	
		Amber	XVBL8G5	
		Blue	XVBL8G6	
		Clear	XVBL8G7	
		Yellow	XVBL8G8	

- Important: Discharge tube elements are not suitable for continuous-operation signaling due to temperature rise caused by the discharge tube. For 5 Joule units, specify XVBL6••, instead of XVBL8•• (\$190.00). For bulbs, see Table 19.336 on page 19-112.

**NOTE:** There are no replacement lenses for strobes.



# Tower Lights and Beacons

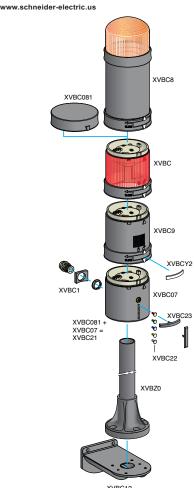


Table 19.331: XVB Lens Units for Steady Light

Description	Light Source and Voltage	Color	Catalog Number	\$ Price
Illuminated lens unit		Green	XVBC33	
	Bulb (10 W max)	Red	XVBC34	
	not included 250 Vac/Vdc max (must order bulb separately ■)	Orange	XVBC35	60.60
		Blue	XVBC36	00.00
		Clear	XVBC37	
		Yellow	XVBC38	

Table 19.332: XVB Lens Unit for Flashing Light

Description	Voltage	Color	Catalog Number	\$ Price
	D II (10111 )	Green	XVBC4B3	
	Bulb (10 W max) not included	Red	XVBC4B4	
	24 Vac	Orange	XVBC4B5	
	24-48 Vdc	Blue	XVBC4B6	
	(must order bulb separately ■)	Clear	XVBC4B7	141.00
Illuminated lens unit		Yellow	XVBC4B8	
iliuminaleu lens unil		Green	XVBC4M3	141.00
	Bulb (10 W max)	Red	XVBC4M4	
	not included 48–230 Vac	Orange	XVBC4M5	
	(must order bulb	Blue	XVBC4M6	
	separately ■)	Clear	XVBC4M7	
		Yellow	XVBC4M8	

Note: There are no replacement lenses units for the XVBC8 es strobes.

# Table 19.333: XVB Lens Units with 10 Joule Strobe

Description	Light Source and Voltage	Color	Catalog Number ▲	\$ Price
		Green	XVBC8B3	
		Red	XVBC8B4	
	Strobe 24 Vac/Vdc	Orange	XVBC8B5	
	(includes bulb)	Blue	XVBC8B6	
		Clear	XVBC8B7	
Lens unti with integral		Yellow	XVBC8B8	313.50
10 Joule strobe	Strobe 120 Vac (includes bulb)	Green	XVBC8G3	313.30
		Red	XVBC8G4	
		Orange	XVBC8G5	
		Blue	XVBC8G6	
	()	Clear	XVBC8G7	
		Yellow	XVBC8G8	

- For 5 Joule units, specify XVBC6\*\*, instead of XVBC8\*\* (\$155.00). For bulbs, see Table 19.336 on page 19-112.

# Table 19.334: Audible Sounder Units

Description	Supply Voltage	Catalog Number	\$ Price
Sounder unit 90 dB at 1 m	12-48 Vac/Vdc	XVBC9B	217.50
Adjustable from 75–90 dB	120–230 Vac	XVBC9M	342.00

#### Table 19.335: Base Units + Cover

Description	Catalog Number	\$ Price
Base unit + cover for direct or tube mounting, bottom or side cable entry (includes gasket)	XVBC21	60.60







XVBC12





Table 19.336: XVB Accessories

Description	Charac	teristics	Coteles	Number	\$ Price
Description	in.	mm	Catalog	Number	\$ Price
But a later to the second	4.72	120	XVBZ02	XVBZ02A ▲	18.75
Black tube with integral black plastic mounting base (includes gasket)	15.75	400	XVBZ03	XVBZ03A ▲	37.50
(moraco gaster)	31.50	800	XVBZ04	XVBZ04A ▲	75.00
	3.94	100	XVB	C020	11.70
Support tube concealment cover	15.75	400	XVB	C030	34.50
	31.50	800	XVB	C040	62.10
Wall mount bracket (metal)	For direct mounting on base XVBC11 + tube XVBC0•	e unit or with tulip	XVB	8C12	48.45
	12 Vac/Vdc		DL1	BLJ	
Incandescent bulbs	24 Vac/Vdc		DL1	BLB	
bayonet type BA 15d, 10 Watts	48 Vac/Vdc		DL1	BLE	
bayoner type Britisa, to trade	120 Vac/Vdc		DL1	BLG	
	230 Vac/Vdc		DL1		8.10
	12 Vac/Vdc		DL1	BEJ	0.10
Incandescent bulbs	24 Vac/Vdc			BEB	
bayonet type BA 15d, 7 Watts	48 Vac/Vdc			BEE	
	120 Vac/Vdc			BEG	
	230 Vac/Vdc		DL1BEM		
		White	DL1E	BDB1	
	24 Vac/Vdc	Green		BDB3	
		Red		BDB4	
		Blue		BDB6	
0 0		Yellow		BDB8	
Steady-On LED bulbs bayonet type BA 15d		Amber		BDB5	108.00
(sold as single) ■		White		BDG1	100.00
		Green		BDG3	
	120 Vac	Red		3DG4	
	120 Vac	Blue	DL1E	BDG6	
		Yellow		BDG8	
		Amber		BDG5	
		White	DL1E		
		Green Red		3KB3 3KB4	
	24 Vac/Vdc	Amber	DL1E	BKB5	
		Blue		BKB6	
Flashing LED bulbs		Yellow		BKB8	139.50
-		White Green	DL1E	BKG1 BKG3	
	120 Vac	Red	DL1E	3KG4	
	120 Vac	Amber		BKG5	
		Blue Yellow		3KG6 3KG8	
Adapter	With CM12 (p. 13.5) cable	gland, for cable size		BC14	7.80
for side entry through base unit	of 0.4 to 0.55 in. (10 to 14 r				
Conduit adapter	1/2 in. NPT (for customer s	upplied tubing)	XVB	3C00	3.15



Aluminum tube.

For 240 Vac, replace the B or G in the catalog number with M—for example, DL1BDM1. For flashing LEDs, refer to catalog 9001CT0001.

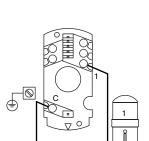
# Table 19.337: XVB Accessories

XVBC22	3.15
XVBC23	12.45
_	

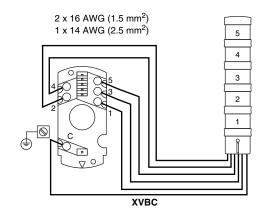
# Wiring Diagrams, Base Units

Screw terminals

Torque to 4.4 in-lb (0.5 N•m)



**XVBL** 





XVEC21

# **Tower Lights and Beacons**

XVEC3

XVEC9

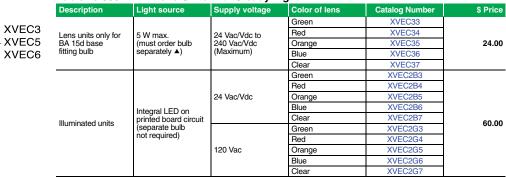
XVBZ0●

XVBC12

XVDC02

XVEZ13

# Table 19.338: XVE Lens Units with Steady Light



Order clear incandescent bulb separately. See Table 19.336 on Page 19-112.

## Table 19.339: XVE Lens Units with Flashing LED

Description	Light source	Supply voltage	Color of lens	Catalog Number	\$ Price
			Green	XVEC5B3	
			Red	XVEC5B4	
		24 Vac/Vdc	Orange	XVEC5B5	
	Integral LED on		Blue	XVEC5B6	90.00
	printed board circuit		Clear	XVEC5B7	
Illuminated units	(separate bulb	120 Vac	Green	XVEC5G3	
	not required)		Red	XVEC5G4	
			Orange	XVEC5G5	
			Blue	XVEC5G6	
			Clear	XVEC5G7	

# Table 19.340: XVE Lens Units with Strobe Light

Description	Light source	Supply voltage	Color of lens	Catalog Number	\$ Price
			Green	XVEC6B3	
			Red	XVEC6B4	
		24 Vac/Vdc	Orange	XVEC6B5	
	not required)		Blue	XVEC6B6	105.00
Lens units with integral 1 Joule strobe			Clear	XVEC6B7	
light		120 Vac	Green	XVEC6G3	
9			Red	XVEC6G4	
			Orange	XVEC6G5	
			Blue	XVEC6G6	
			Clear	XVEC6G7	

#### Table 19.341: XVE Audible Sounder Units

Description		Supply Voltage	Catalog Number	\$ Price
		24 Vac/Vdc	XVEC9B	
Audible Sounder Units	85dB	120 Vac	XVEC9G	90.00
		230/240 Vac	XVEC9M	

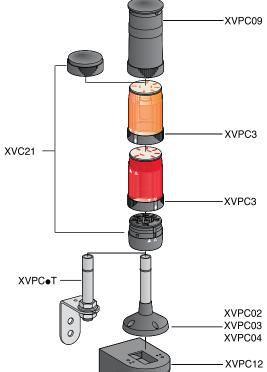
## Table 19.342: XVE Base Units and Covers

Discount Schedule

Discription	Catalog Number	\$ Price
Base unit + snap on cover for NEMA and UL Type 12, IP42 rating	XVEC21	24.00
Base unit + screw mounting cover for IP54 rating (includes 5 O-ring seals for lens units and 1 gasket for base unit)	XVEC21P	30.00

# Table 19.343: XVE Accessories

Description	Height under base unit in. (mm)	Color	Catalog Number	\$ Price	
Plastic mounting bases	0.78 (20)	Black	XVEZ13	12.00	
Flastic mounting bases	3.93 (100)	Black	XVDC02	15.00	
	3.15 (80)	Black aluminium	XVBZ02	18.75	
Mounting bases comprising:	` ′	Aluminium	XVBZ02A		
Ø 25 mm aluminium	15.7 (400) 31.5 (800)	Black aluminium	XVBZ03	37.50	
support tube +		Aluminium	XVBZ03A		
black plastic mounting support		Black aluminium	XVBZ04	75.00	
		Aluminium	XVBZ04A		
Description	Electrical characteristics		Catalog Number	\$ Price	
Clear incandescent bulbs with	4 W, z 24 Vac/Vdc		DL1BEBS		
BA 15d base fitting for lens units type XVE C3p	5 W, z 120 Vac/Vdc		DL1EDGS	6.15	
	5 W, z 230 Vac/Vdc		DL1BEMS		
Description			Catalog Number	\$ Price	
Wall mount bracket (metal)			XVBC12	48.45	



Description	Color	Catalog Number	\$ Price
Base unit and cover	Black	XVPC21	
Base unit and cover	Off-white	XVPC21W	48.00
Base unit and cover (with ring-tongue compatible terminal)	Off-white	XVPC21WR	

Table 19.345: XVP Lens Units

Description	Ring Color	Light Source and Voltage	Lens Color	Catalog Number	\$ Price	
Steady or Flashing						
50 mm steady lens unit (See Table 19.347 on page 19-115 and Table 19.348 on page 19-115 for LEDs and incandescent bulbs)	Black	Bulb (7 W max) not included 250 V (must order bulb separately 🏝)	Green Red Amber Blue Clear Yellow	XVPC33 XVPC34 XVPC35 XVPC36 XVPC37 XVPC38	43.50	
	Off-white	Bulb (7 W max) not included 250 V max (must order bulb separately 🏝)	Green Red Amber Blue Clear Yellow	XVPC33W XVPC34W XVPC35W XVPC36W XVPC37W XVPC38W	43.50	
Strobe						
Black  Lens unit with integral strobe  Off-white	Disab	Strobe 24 Vdc 0.3 Joule (separate bulb not required)	Green Red Amber Blue Clear Yellow	XVPC6B3 XVPC6B4 XVPC6B5 XVPC6B6 XVPC6B7 XVPC6B8		
	ыаск	Strobe 120 Vac 0.6 Joule (separate bulb not required)	Green Red Amber Blue Clear Yellow	XVPC6G3 XVPC6G4 XVPC6G5 XVPC6G6 XVPC6G7 XVPC6G8	186.00	
	Off white	Strobe 24 Vdc 0.3 Joule (separate bulb not required)	Green Red Amber Blue Clear Yellow	XVPC6B3W XVPC6B4W XVPC6B5W XVPC6B6W XVPC6B7W XVPC6B8W	186.00	
	OII-WNITE	Strobe 120 Vac 0.6 Joule (separate bulb not required)	Green Red Amber Blue Clear Yellow	XVPC6G3W XVPC6G4W XVPC6G5W XVPC6G6W XVPC6G7W XVPC6G8W		

<sup>▲</sup>For bulbs see Table 19.336 on page 19-112.

# Table 19.346: XVP Audible Sounder Units

Description	Ring Color	Supply Voltage	Catalog Number	\$ Price
50 mm sounder unit (IP40 NEMA 1) Ten tone selections, 75–85 dB at 1 m	Black	24 Vdc	XVPC09B	156.00
		120 Vac	XVPC09G	
		230 Vac	XVPC09M	
	Off-white	24 Vdc	XVPC09BW	130.00
		120 Vac	XVPC09GW	
		230 Vac	XVPC09MW	

# www.schneider-electric.us

### **Tower Lights and Beacons**

### Table 19.347: XVP LED Bulbs







Description	Voltage	Color	Catalog Number	\$ Price	
Steady-On LED bulb	24 Vac/Vdc	White Green Red Amber Blue Yellow	DL1BDB1 DL1BDB3 DL1BDB4 DL1BDB5 DL1BDB6 DL1BDB8	108.00	
ŕ	120 Vac	White Green Red Amber Blue Yellow	DL1BDG1 DL1BDG3 DL1BDG4 DL1BDG5 DL1BDG6 DL1BDG8		
Flashing LED bulb	24 Vac/Vdc	White Green Red Amber Blue Yellow	DL1BKB1 DL1BKB3 DL1BKB4 DL1BKB5 DL1BKB6 DL1BKB8	139.50	
	120 Vac	White Green Red Amber Blue Yellow	DL1BKG1 DL1BKG3 DL1BKG4 DL1BKG5 DL1BKG6 DL1BKG8	139.50	
Incandescent bulbs Bayonet type BA 15d, 7 W	12 Vac/Vdc 24 Vac/Vdc 48 Vac/Vdc 120 Vac/Vdc 230 Vac/Vdc	Clear Clear Clear Clear Clear	DL1BEJ DL1BEB DL1BEE DL1BEG DL1BEM	8.10	

XVPC03T

Table 19.348: XVP Accessories



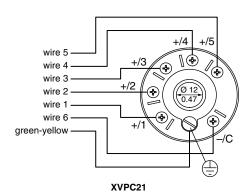
XVPC02

Description	Color	Charac	teristics	Catalog Number	\$ Price
Description	Color	IN	mm	Catalog Number	\$ FIICE
		4	100	XVPC02T	32.55
Mounting tube with bracket	Silver	10	250	XVPC03T	40.35
		16	400	XVPC04T	48.00
		4	100	XVPC02	32.55
	Black	10	250	XVPC03	48.00
Manuscriptor and a social and the form		16	400	XVPC04	48.00
Mounting tube with tulip base		4	100	XVPC02W	40.35
	Off-white	10	250	XVPC03W	40.35
		16	400	XVPC04W	48.00
\A(-11 + (-1 + (-1 +	Black	_		XVPC12	15.60
Wall mounting bracket (plastic)	Off-white	I —		XVPC12W	15.60
Bulb mounting and removal tool	_	_		XVPCX13	7.80



### **Wiring Diagram**

Cable Connections, Supply line maximum: 1.5 mm<sup>2</sup> (16 AWG)



19-116

Refer to Catalog 9001CT1002





XVS14BMW

### Table 19.349: XVS Sirens and Electronic Alarms

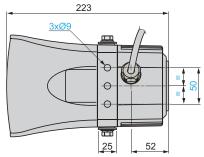
Description	Voltage	Color	Catalog Number	\$ Price
Multisound siren 105 dB, 43 tones	12/24 Vdc	White	XVS 14BMW	360.00
Electronic alarms 90 dB, 16 tones Panel Mount DIN72	12/24 Vac/Vdc	PNP, Black	XVS 72BMBP	
		PNP, White	XVS 72BMWP	180.00
		NPN, Black	XVS 72BMBN	180.00
		NPN, White	XVS 72BMWN	

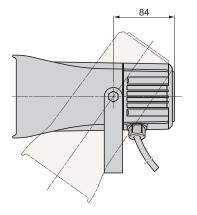
### Table 19.350: Dimensions (mm)

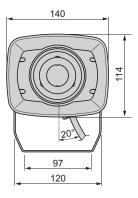


XVS72BM

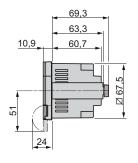
# XVS 14BMW

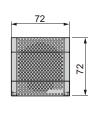






### XVS 72BM●●





www.schneider-electric.us

This pre-assembled, two-button station now comes complete with internal and external strain relief. Oversized finger grips on the rear of the enclosure make it easy to grip and operate.

- Well suited for standard hoist applications
- Push button legend inserts
- Field-installable mushroom button
- Full cover gasket, to exclude harmful contaminants

### Table 19.351: BW90 and BW100 Pendant Stations - with cord connector and strain relief



BW90 / BW100

Description	Legend Insert	Mechanical	Enclosure Color				Contact	Replacement Interior ■		
	Markings	Interlock	Yellow	Black	Red	\$ Price	Symbol	9001 Type	Contact Symbol	\$ Price
	Up-Down	Yes	BW92Y	BW92B	BW92R	136.00	146	BOC368	146	
	Forward-Reverse	Yes	BW93Y	BW93B	BW93R	130.00	146	BOC368	146	
	On-Off ▲	Yes	BW94Y	BW94B	BW94R	180.00	10	BOC358	147	90.00
	Start-Stop	No	BW95Y	BW95B	BW95R	136.00 180.00	145	BOC359	25	90.00
0:	Start-Stop ▲	Yes	BW96Y	BW96B	BW96R		10	BOC358	147	
Single Speed	On-Off ▲	No	BW97Y	BW97B	BW97R	136.00	146	BOC359	25	
	Up-Down	Yes	BW98Y	BW98B	_	147.00	100	_	_	_
	without Inserts	Yes	BW90YU	BW90BU	BW90RU	130.00	147	BOC366	25	
	without Inserts	No	BW91YU	BW91BU	BW91RU	130.00	25	BOC359	25	90.00
	without Inserts A	Yes	BW94YU	BW94BU	BW94RU	172.00	147	BOC358	147	
Two Speed	without Inserts	Yes	BW100YU	BW100BU	BW100RU	195.00	150	BOC367	150	158.00
iwo opeeu	Up-Down	Yes	BW102Y	BW102B	BW102R	202.00	150	BOC367	150	155.00

- Maintained Contact
- Includes gasket



**BWSR** 

Table 19.352: Hanger Bracket

Description	Form	\$ Price
External Bracket (cannot be field installed)	Y236	10.50

Table 19.354: Replacement Enclosures

Description	Color	Туре	\$ Price
	Yellow	BWRY	
Box & Cover with 4 screws	Red	BWRR	54.00
	Black	BWRB	

Table 19.355: Strain Relief Replacement

Description	Туре	\$ Price
Strain Relief Replacement	BWSR	10.00

Table 19.353: Interchangeable Legend Inserts ◆

Moulding	Tune	© Puise
Marking	Туре	\$ Price
Start	B259	
Stop	B260	
Forward	B255	
Reverse	B256	
Open	B263	
Close	B264	
Raise	B261	3.60
Lower	B262	0.00
Up	B253	
Down	B254	
On	B257	
Off	B258	
Blank - black	B251	
Blank - red	B252	

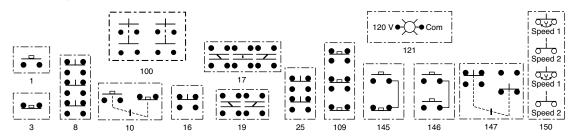
Order must specify a quantity of 10 or multiples of 10.



Table 10.000. Electroal contact ratings A									
	AC—NEMA B600							DC-NEMA	P600
			Induc 35% Powe		Resistive 75% Power Factor Inductive at				and Resistive
Volts	Ma	ike	Bre	eak	Continuous			Make and Break	Continuous
	Α	VA	Α	VA	Amperes	Continuous Carrying Amperes		Amperes	Carrying Amperes
120 240 480 600	30.5 15 7.5 6	3600 3600 3600 3600	3.75 1.5 .75 .6	360 360 360 360	5 5 5 5	5 5 5 5	120 240 600	1.1 0.55 0.2	5 5 5

OSHA Regulation, Section 1910.70, Overhead and Gantry Cranes, limits the voltage of pendant push buttons to 150 Vac or 300 Vdc.

### **Contact Symbols**

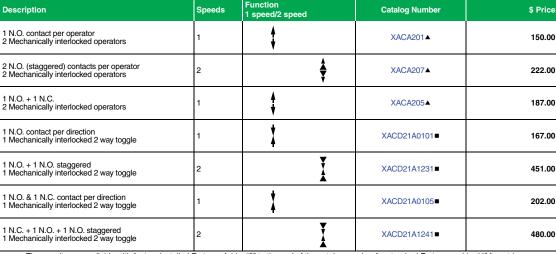


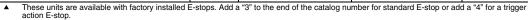
NOTE: When ordering, add prefix 9001 to the catalog number.

XAC pendant stations are designed for standard- or medium-duty control circuit applications.

- Single- or two-speed versions
- Double insulated
- Shock and corrosion resistant
- 2, 4, 6, 8, 12 element versions
- Ease of operation

### Table 19.357: Pistol Grip Stations





These units are available with a factory installed E-stop. Use XACD22 ••• for a standard E-stop or XACD24••• for a trigger action E-stop. Note: Legends are required to achieve NEMA4 rating.

### Table 19.358: General Purpose Pendants ◆ ★

XACA02H7	100.00
70 107 1021 17	192.00
XACA03H7	220.00
XACA04H7	250.00
XACA06H7	306.00
XACA08H7	382.00
XACA12H7	478.00
	XACA03H7 XACA04H7 XACA06H7 XACA08H7

Standard enclosures include internal mounting plate, cable sleeve for 8 to 26 mm, internal cable clamp, suspension ring and cable tie. For ordering information on custom built XACA pendants, visit our website at www.Schneider-Electric.us.

To place a custom pendant order, use the worksheet on page 19-121 as a guide. Orders must be placed through the Product Selector in Quote to Cash. There is a 10% charge for assembly.





XACA06



XACA03 with operators

# www.schneider-electric.us

### Table 19.359: Contact Blocks for Operators in Cover





ZB2BE10 XENG37





XENG1191

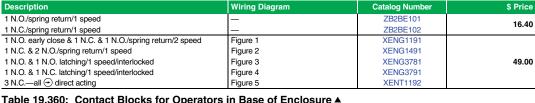


Table 19.300. Collact blocks for Operators	III Dase of Efficiosure =	
1 N.O./1 speed	XACS101	28.60
1 N.C./1 speed	XACS102	20.00
2 N.O./1 speed	XACS103	
2 N.C./1 speed	XACS104	38.20
1 N.O. & 1 N.C./1 speed	XACS105	

Cannot be used with XACA03 pendant.

### Wiring Diagrams

**Pendant Stations** 





0 0 0



Figure 4

N/C + N/C + N/Cwith positive opening operation



Table 19.361: Operators ■



**Booted Push Button** 

Description	Color	Catalog Number	\$ Price
	White	XACA9411	
	Black	XACA9412	
	Green	XACA9413	
Booted push button	Red	XACA9414	8.20
	Yellow	XACA9415	
	Blue	XACA9416	
	Brown	XACA9419	

### Table 19.362: Mushroom Operators



Mushroom Head

Description	Mushroom Size	Color	Catalog Number	\$ Price
Mushroom head, momentary	30 mm	Red	ZA2BC44	36.80
Mushroom head, push to maintain/turn-to-release	30 mm	Red	ZA2BS44	79.00
wids moon fread, push to maintain turn-to-release	40 mm	Red	ZA2BS54	79.00
Mushroom head, push to maintain/turn-to-release	30 mm	Red	ZA2BS834	
(trigger action) ◆	40 mm	Red	ZA2BS844	
Much value and hand much to maintain/key turn to value as	30 mm	Red	ZA2BS74	112.00
Mushroom head, push to maintain/key turn-to-release	40 mm	Red	ZA2BS14	112.00
Mushroom head, push to maintain/key turn-to-release (trigger action) ♦	40 mm	Red	ZA2BS944	



Selector Switch

### Table 19.363: Selector Switches and Wobble Stick

Description	Color	Catalog Number	\$ Price
Selector switch/2 position—maintained★	Black	ZA2BD2	30.00
Selector switch/3 position—maintained★	Black	ZA2BD3	30.00
Selector switch/2 position—maintained key operated—key removal from LT or RT position★	NA	ZA2BG4	112.00
Selector switch/3 position—maintained key operated—key removal from LT or RT position★	NA	ZA2BG5	112.00
Wobble stick (bottom mounting recommended)	Black	ZA2BB2	102.00
Wobble Stick (bottom mounting recommended)	Pod	7A0DD4	102.00

### Table 19.364: Pilot Light Components

Description	Color	Catalog Number	\$ Price
Direct supply base/without lamp (for 6 to 120 V applications) (AC/DC) ▼	_	ZB2BV006	24.60

- Booted push buttons are for cover mounting only. All other operators can be mounted on cover or bottom.
- Trigger action mushroom heads are tamper proof in that a change of contact state is not possible by teasing or floating the operator.
- Not for use with XEN G contact blocks.
- For lamps, see page 19-120.



Selector Switch

(key operated)

Wobble Stick



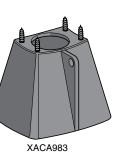














### Table 19.365: Enclosure Accessories

Description	Catalog Number	\$ Price
Blank hole plug	ZB2SZ3	13.60
Mechanical interlock (momentary). For use with XAC booted operators only	XACA009	8.20
Screw adapter for self-supporting cable	XACB961	6.80
Low suspension ring for single row station	XACA971	19.20
Protective guard for bottom mounted mushroom head	XACA982	19.20
Protective guard for bottom mounted selector switch or key switch	XACA983	27.40

### Table 19.366: Lamps

Туре	Voltage	Watts	Catalog Number	\$ Price
	6 Vac/Vdc	1.2	DL1CB006	
Replacement bulbs	12 Vac/Vdc	2.0	DL1CE012	
(Type BA9s)	24 Vac/Vdc	2.0	DL1CE024	11.00
Incandescent	48 Vac/Vdc	2.4	DL1CE048	
	130 Vac/Vdc	26	DL1CF130	

### Table 19.367: LED, BA9s Base

Туре	Color	Voltage	Catalog Number	\$ Price
	Green	6 Vac/Vdc	DL1CJUS0063	
	Red	6 Vac/Vdc	DL1CJUS0064	
	Amber	6 Vac/Vdc	DL1CJUS0065	
	Green	24 Vac/Vdc	DL1CJUS0243	
	Red	24 Vac/Vdc	DL1CJUS0244	
LED, BA9s base for Direct Supply blocks	Amber	24 Vac/Vdc	DL1CJUS0245	25.00
Внест вирру вюска	White	24 Vac/Vdc	DL1CJ0241	
	Blue	24 Vac/Vdc	DL1CJ0246	
	Green	120 Vac/Vdc	DL1CJUS1203	
	Red	120 Vac/Vdc	DL1CJUS1204	
	Amber	120 Vac/Vdc	DL1CJUS1205	

### Table 19.368: PVC Standard Legend Plates 30 x 40 mm

Text▲	Catalog Number	\$ Price	Text▲	Catalog Number	\$ Price	Text▲	Catalog Number	\$ Price
Bridge Forward	ZB2BY2343		Left	ZB2BY2310		Stop	ZB2BY2304	
Bridge Reverse	ZB2BY2344		Low	ZB2BY2336		Stop Start	ZB2BY2366	
Close	ZB2BY2314		Lower	ZB2BY2337		Trolley Right	ZB2BY2345	
Down	ZB2BY2308		Man Auto	ZB2BY2372		Trolley Left	ZB2BY2346	
Emergency Stop	ZB2BY2330		Off	ZB2BY2312		Up	ZB2BY2307	
Fast	ZB2BY2328		On	ZB2BY2311		Up Down	ZB2BY2370	
Forward	ZB2BY2305		Off On	ZB2BY2367		Up-O-Down	ZB2BY2389	
For Rev	ZB2BY2371		Open	ZB2BY2313		North	6516002379	
For-O-Rev	ZB2BY2384		Open Close	ZB2BY2376		South	6516002380	
Hand Off Auto	ZB2BY2387	4.20	Open-O-Close	ZB2BY2388	4.20	East	6516002381	4.20
High	ZB2BY2338		Out	ZB2BY2339		West	6516002382	
High Low	ZB2BY2369		Power On	ZB2BY2326				
Hoist Down	ZB2BY2342		Raise	ZB2BY2335				
Hoist Up	ZB2BY2341		Reset▲	ZB2BY2323				
In	ZB2BY2503		Reverse	ZB2BY2306				
Inch	ZB2BY2321		Right	ZB2BY2309				
Jog For	ZB2BY2381		Run	ZB2BY2334				
Jog Rev	ZB2BY2380		Slow	ZB2BY2327				
Jog Run	ZB2BY2365		Start	ZB2BY2303				

All nameplates are black with white lettering except "Stop", "Emergency Stop" and "Reset" which are red with white lettering. For black "Reset" change final digit of catalog number to 2.

Туре	Description		Catalog Number	\$ Price
PVC blank legend	Blank Blank	Black or red background—30 mm x 40 mm Yellow or white background—30 mm x 40 mm	ZB2BY2101 ZB2BY4101	4.20
PVC custom engraved	Special engraving■ Special engraving■	Black background, white letters—30 mm x 40 mm White background, black letters—30 mm x 40 mm	ZB2BY2002 ZB2BY4001	17.80

Please specify lettering when ordering. Two lines with 11 characters (including spaces) maximum on each plate.

19-120

## **Type XACA Worksheet**

Use this worksheet to assist in component selection. Custom orders for XACA pendant stations must be placed through the Product Selector in Quote to Cash. There is a 10% charge for assembly.

### **XACA Order Guide Instructions**

Custom built pendant stations

- 1. Determine the number of operators needed, then choose an enclosure with a corresponding number of holes.
- 2. Select the type of operator, contact block, and appropriate nameplate for each function required.
- Check for special functions that may be required. These items could include mechanical interlocks, adapters for self-supporting cable, lower support rings, protective guards, etc.

Catalog number of enclosure	XACA		
Mechanical interlock (draw a vertical line between the 2 units to be interlocked ♠)	Legends	Contact blocks and pilot light bodies	Push button Pilot light or Blanking plug
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
	of enclosure  Mechanical interlock (draw a vertical line between the 2 units to be interlocked )  1  2  3  4  5  6  7  8  9  10  11	Mechanical interlock (draw a vertical line between the 2 units to be interlocked )  1  2  3  4  5  6  7  8  9  10  11	Mechanical interlock (draw a vertical line between the 2 units to be interlocked \$\frac{\times}{\text{obs}}\$)  1  2  3  4  5  6  7  8  9  10  11

## Mechanical Interlock (XACA009)









Impossible Combinations

Unit mounted in base of station (facing downwards)					
_	13				

### **Attachments**

Position	Туре	Catalog No.
14	Adapters for self-supporting cable type BBAP (available only with cable sleeve Ø8–26 mm)	XACB961
15	Lower support ring	XACA971
16	Protective guard for base mounted selector switch or 40 mm emergency-stop push button	XACA982
17	Protective guard for key switch	XACA983

www.schneider-electric.us

This line of pendant stations consists of polymeric enclosures (2 through 10 units), push button units (1 through 5 speed) and laminated legend plates. All enclosures have an extra single unit space near the top which permits the installation of a toggle switch, a Type SK operator or pilot light, or a warning label. All enclosures come with a stainless steel hanger bracket and internal strain relief post. Enclosures are yellow and have a threaded opening in the top.

**NOTE:** When ordering, add prefix 9001 to the catalog number.

Table 19.369: Enclosure Catalog Numbers

Number of	Conduit Entrance	Enclosure Only▲	\$ Price	Enclosure For Assembled Station■	\$ Price
Buttons	Size	Cat. No.		Cat. No.	
2 4 6 8 10	3/ <sub>4</sub> "-14 NPT 3/ <sub>4</sub> "-14 NPT 1"-11 <sup>1</sup> / <sub>2</sub> NPT 1 <sup>1</sup> / <sub>4</sub> "-11 <sup>1</sup> / <sub>2</sub> NPT 1 <sup>1</sup> / <sub>4</sub> "-11 <sup>1</sup> / <sub>2</sub> NPT	SKYP2 SKYP4 SKYP6 SKYP8 SKYP10	189.00 239.00 287.00 356.00 428.00	SKYP20 SKYP40 SKYP60 SKYP80 SKYP100	•

- Class 9001 SK push-to-test pilot lights and remote test pilot lights will not fit in these enclosures
- Assembled pendant stations consist of an enclosure, operators and legend plates. All custom orders must include the pendant key sheet available as shown on page 19-123.
- The price of an assembled pendant SKYP station includes the enclosure and components plus a 10% assembly charge. (Example: 9001 SKYP2 (\$189), + SKRU1 (\$129), + SKN201 (\$8.60) = \$326.60 + 10% = \$360.



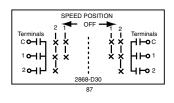
Table 19.370: Push Button Units

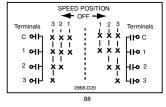
9

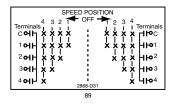
6	Number of Buttons per Unit	Description	Contact Symbol – See Below	Cat. No.★	\$ Price
	2	Single Speed – Momentary Interlocked	7	SKRU1	129.00▼
	2	Single Speed – Momentary Non- Interlocked	5	SKRU10	107.00▼
	2	Single Speed – Maintained Interlock	10	SKRU11	149.00▼
A.E.	2	Two Speed – Momentary Interlocked	87	SKRU2	270.00△
	2	Three Speed – Momentary Interlocked	88	SKRU3	320.00△
	2	Four Speed – Momentary Interlocked	89	SKRU4	341.00△
	2	Five Speed – Momentary Interlocked	90	SKRU5	356.00△

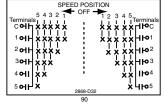
- Types SKRU 1, 10 and 11 use Type KA contact blocks. Types SKRU 2 thru 5 are factory enclosed contact blocks
- Boot part number is 9001KU1.
- Boot part number is 9001KU37

Multispeed Contact Symbols (X = Contact Closed) Figure 19.3:









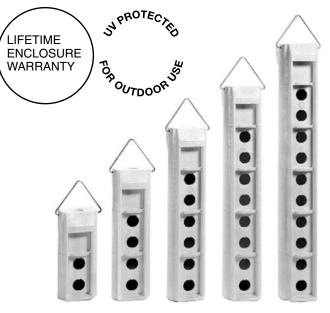


Table 19.371: Legend Plate Catalog Numbers

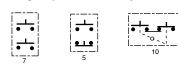
	Where Used	Marking	Cat. No.	\$ Price
HO I STOOWN	For SKRU1 through SKRU11	Blank-Blank Hoist: Up-Down Trolley: East-West Trolley: FwdRev. Trolley: North-South Bridge: FwdRev. Bridge: East-West Bridge: North-South Start-Stop Reset-Stop Aux Hoist: Up-Down Power: On-Off	SKN200 SKN201 SKN201 SKN202 SKN203 SKN204 SKN205 SKN206 SKN207 SKN208 SKN209 SKN210 SKN211	8.60
		Specify Marking	SKN299 <b>●</b>	37.20
(B) 11	With toggle switch□ in top space of	Blank Off-On On-Off	SKN500☆ SKN544☆ SKN545☆	12.90
	enclosure	Specify Marking	SKN599☆	27.00
	With 9001SK♦ operator or pilot light in top space of enclosure	Blank On Off Emerg. Stop Run Power On Off-On	SKN100∇ SKN103 SKN104 SKN105 SKN124 SKN138 SKN144	4.40
		Specify Marking	SKN199∇	18.50

- Can be supplied by Square D as Class 9001 Type SKSTS1- includes boot for NEMA Type 4X
- See 9001SK on pages 19-77 thru 19-84.
- ☆ Includes legend plate, gasket and ground plate to be used with toggle switch. Tri-laminated legend plate having a yellow or red background on a black core.
- 19 characters each side max.

### Table 19.372: Closing Plate Catalog Number

Cat. No.	\$ Price
SK52	14.30

Figure 19.4: **Single Speed Contact Symbols** 



Worksheet for Custom Assembled Pendant . . . . . . . . . Page 19-123

Space for tog-

ale switch ①, a

Type SK opera-

tor or pilot light,

or a warning label. Use SKN-5

or SKN-1 leg-

end plates.

# Schneider Blectric

## Type SKYP Worksheet



Use this worksheet to assist in component selection. SKYP Custom Pendant orders must be placed through the Product Selector in Quote to Cash. There is a 10% charge for assembly.

2 SKN201

1 SKRU1

2 SKN201

3

3

Class 9001

Type SKYP -

A)

B)

C)

A)

B)

- Operator or Closing Plate. Example - SKRU1
- 2. Legend Plate Type Number Example SKN201
- Legend Plate Marking ▲

   Used Only if Special Marking is Required Example:

Line 2 - SKN299

Line 3 - A.) Hoist

B.) FWD

C.) REV

### **ENCLOSURES - NEMA 4X, 13**

Size	Conduit Entrance Size	Enclosure for Assembled Station ▲
	3126	Туре
2 Button	<sup>3</sup> / <sub>4</sub> " -14 NPT	SKYP20
4 Button	<sup>3</sup> / <sub>4</sub> " -14 NPT	SKYP40
6 Button	1" -14 NPT	SKYP60
8 Button	1 <sup>1</sup> / <sub>4</sub> " -11 <sup>1</sup> / <sub>2</sub>	SKYP80
10 Button	1 <sup>1</sup> / <sub>4</sub> " -11 <sup>1</sup> / <sub>2</sub>	SKYP100

<sup>▲</sup> Assembled pendant stations consist of an enclosure, operators, and legend plates.

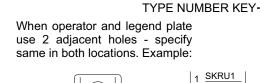
### PUSH BUTTON UNITS - NEMA / UL 4X. 13

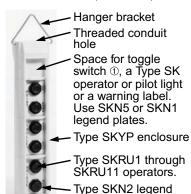
Number of Buttons per Unit	Description	Contact Symbol	Туре
2	Single Speed - Momentary Interlocked	7	SKRU1
2	Single Speed - Momentary Non-Interlocked	5	SKRU10
2	Single Speed - Maintained Interlocked	10	SKRU11
2	Two Speed - Momentary Interlocked	87	SKRU2
2	Three Speed - Momentary Interlocked	88	SKRU3
2	Four Speed - Momentary Interlocked	89	SKRU4
2	Five Speed - Momentary Interlocked	90	SKRU5

### **CLOSING PLATE**

Type	
SK52	

The price of the total station consists of the price of each individual component plus a 10% charge for assembly.



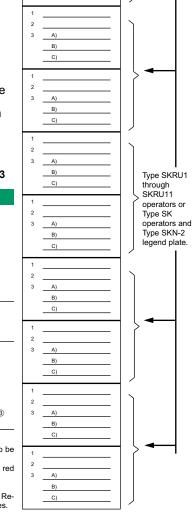


### LEGEND PLATES - NEMA / UL 4X, 13

plate

Where Used	Marking	Туре
For SKRU1 through SKRU11	Blank-Blank Hoist: Up-Down Trolley: East-West Trolley: FwdRev. Trolley: North-South Bridge: FwdRev. Bridge: North-South Start-Stop Reset-Stop Specify Marking	SKN200   SKN201   SKN202   SKN203   SKN204   SKN205   SKN206   SKN207   SKN207   SKN209   SKN299   SKN299
With Toggle Switch ① in Top Space of Enclosure	Blank Off-On On-Off Specify Marking	SKN500 ② SKN544 ② SKN545 ② SKN599 ②
With Type SK Operator ▲ or Pilot Light in Top Space of Enclosure	Blank On Off Emerg. Stop Run Power On Off-On Specify Marking (Red Background)	SKN100 ③ SKN103 SKN104 SKN105 SKN124 SKN138 SKN144 SKN199 ③ SKN199R ③

- ① Available as 9001SKSTS1
- Includes legend plate, gasket and ground plate to be used with toggle switch.
   Tri-laminated legend plate having a vellow or red
- Tri-laminated legend plate having a yellow or red background on a black core.
- 19 characters each side.
- ▲ Class 9001 Type SK Push-To-Test Pilot lights and Remote Test Pilot lights will not fit in these enclosures.



Class 9002



Heavy Duty Industrial Foot Switches—Oiltight, Watertight, Dusttight and Driptight Enclosure, NEMA 2, 4 and 13

## **A** DANGER

### **HAZARDOUS APPLICATIONS**

Do not use foot switches on machines without point-of-operation protection.

Failure to follow these instructions will result in death, serious injury, or equipment damage.

### **Foot Switch Selection**

Foot switches are used to control many industrial processes, while leaving the operator's hands free to perform other functions. The type or model of foot switch suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications more than one foot switch may be required, as when two or more persons are operating a machine. In these cases, safe practice and regulations require that the foot switches be wired in series making it necessary that each operator's foot switch be actuated before the machine will cycle.

Only the user can be aware of all the conditions and factors present during setup, operation and maintenance of the machine; therefore, only the user can determine which foot switch(es) can be properly used. When selecting a foot switch for a particular application, the user should refer to the applicable ANSI standards and OSHA regulations. The National Safety Council's Accident Prevention Manual also provides much useful information.

In some applications, such as power presses, additional operator protection such as point-of-operation guarding must be provided when a foot switch is used as an actuator. This is necessary since the operator's hands and other parts of the body are free to enter the pinch point area and serious injury can occur. The shielding provided on foot switches cannot protect an operator from injury. For this reason the foot switch cannot be substituted for or take the place of point-of-operation protection.

A Trilingual Danger Sign regarding the need for point-of-operation protection is supplied with each foot switch. The sign incorporates three languages: English, Spanish and French. Additional copies of the sign are available by contacting your Square D sales office.



Type AW Fully Shielded Foot Switch with Oversized Pedal Shield, Side Shields and Safety Door. The Safety Door is interlocked with the pedal to prevent operation due to shock or vibration. It prevents accidental pedal operation by requiring a simple but intentional motion to lift the door before inserting the foot.



AW2

Type AW Foot Switch with

Top Pedal Shield and Side

Shields

AW117 Type AW with Oversized Pedal Shield, Side Shields and Safety Door

AW1
Type AW Foot Switch

without Pedal Shield

Operating Temperature: -30 to +60 °C (-22 to +140 °F)

NOTE: When ordering, add prefix "9002" to the catalog number.

### Table 19.373: Foot Switch Catalog Numbers

Description	Features	Fully Shielded with Oversized Pedal Shield, Side Shields and Safety Door		With Oversized Pedal Shield and Side Shields		With Pedal Shield and Side Shields		UNSHIELDED (See Warning note★)	
		Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
Single Pole■ Double Throw	Spring Return With Mechanical Latch	AW117	750.00 —	AW132	750.00 —	AW2 AW7	363.00 527.00	AW1	396.00 —
Two Pole ■ Double Throw	Spring Return With Mechanical Latch	AW124▲	903.00	AW133	903.00	AW14 AW15	527.00 692.00	AW13	575.00 —
Two Stage ■ (One Pole Each Stage) Table 1	Spring Return With Mechanical Latch in 1st Stage With Mechanical Latch in 2nd Stage	AW119	930.00	AW134	930.00	AW6 AW9 AW10	543.00 705.00 705.00	AW5	590.00 —
Four Stage ■ (One Pole Each Stage) Table 2	Spring Return	AW123	1295.00	_	_	AW22	912.00	AW21	995.00
Single Pole Single Throw	Maintained Contact—Push On/Push Off	_	_	_	_	AW12	527.00	AW11	575.00
Replacement Cover Assembly	— ONC included direct action contacts	AC5	363.00	AC7	363.00	AC8◆	140.00	AC1	153.00

2 N.O. and 2 N.C. isolated, direct acting contacts.

- A single pole snap switch that contains two double break contact elements (1 N.O. and 1 N.C.) must be used on circuits of same polarity.

  A double pole snap switch contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set that contains two double break contact elements (1 N.O. and 1 N.C.) must be used on circuits of same polarity.
- For replacement cover drilled to accept latch. For Series C foot switches order AC9. Price is \$182.00 No replacement cover available for Series A or B devices drilled to accept latch. AC8 is spring return only.
- \* WARNING: These foot switches must not be used to operate machines or equipment where the possibility of operator injury exists. Typical uses include Emergency Stop functions, "Dead Man" controls, signal functions (lights, bells, etc.).



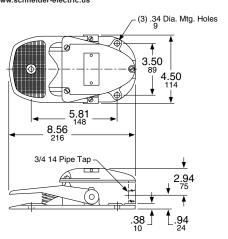
File CCN E42259 NKCR



File Class LR25490 184 N 13.1U

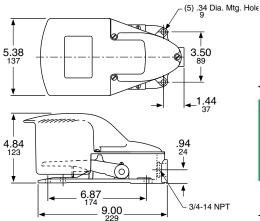
For **replacement parts** for Class 9002 Type AW: See instruction bulletin 65013-010-31. For **contact symbol tables**, see page 19-125

# Schneider Electric www.schneider-electric.us



**Foot Switches** 

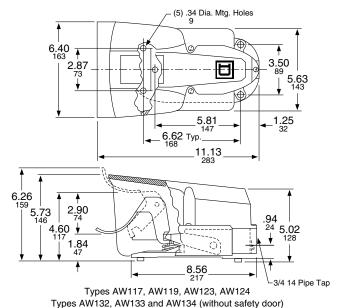
Types AW1, AW5, AW11, AW13 and AW21



Types AW2, AW6, AW12, AW14 and AW22

Dual Dimensions: INCHES Millimeters

### **Approximate Dimensions**



Typoc / 111 102, / 111 100 and / 111 10 1 (milliout outerly does, /

### Table 19.374: Maximum Current Ratings For Control Circuit Contacts

		AC Amperes				DC Amperes			
Туре	Volts	Inductive		Resistive 75% Power Factor	Volts	Inductive and Resistive			
				Make, Break		Make ar	nd Break		
		Make	Break	and Continuous		Single Throw	Double Throw	Continuous	
AW1 through AW10, AW117, AW119, AW132	120 240 480 600	40 20 10 8	15 10 6 5	15 10 6 5	125 250 600	2.0 0.5 0.1	0.5 0.2 0.02	15 15 15	
AW13, AW14, AW15, AW133	120 240 480 600	30 15 7.5 6	3 1.5 0.75 0.6	3 1.5 0.75 0.6	125 250 600 —	1.0 0.3 0.1	0.2 0.1 —	10 10 10 —	
AW11, AW12	115 230	36 18	6 3	_	125 250	2.2 1.1	_	_	
AW21, AW22, AW123	120 240 480 600	15.0 7.5 3.75 3.0	1.5 0.75 0.375 0.3	10 10 10 10				_ _ _	
AW124	120 240 480 600	60 30 15 12	6 3 1.5 1.2	10 10 10 10	120 240 600	1.1 0.55 0.2	_	10 10 10	

Note: Double throw switches are rated 250 Vdc maximum.

### Table 19.375: Contact Symbol—Two Stage

Sn	ap Switch		Pedal				
Unit	Circuit	Up	Half Down	Full Down			
_	A1	0	1	1			
1	B1	1	0	0			
2	A2	1	1	0			
	B2	0	0	1			
Note: 0 = Open 1 = Closed							

Table 19.376: Contact Symbol—Four Stage

			,				
Snap	Switch	Pedal Position					
Unit	Circuit		Up	<b>→</b> Do	own		
	1A1	0	0	1	1	1	
	1B1	1	1	0	0	0	
!	2A1	0	1	1	1	1	
	2B1	1	0	0	0	0	
2	1A2	1	1	1	0	0	
	1B2	0	0	0	1	1	
	2A2	1	1	1	1	0	
	2B2	0	0	0	0	1	

CP1

**Approvals** 

Cam switch model A





	Off-On/On-Off switches	1 to 6-pole	1 to 6-pole						
	Stepping switches	2 to 12-position, 1 to 4-pole	-						
	Changeover switches	1 to 5-pole	1 to 4-pole						
Functions	Measurement switches	Voltmeter and ammeter	<del></del>						
i unctions	Reversing switches	2 and 3-pole	2 and 3-pole						
	Reversing star-delta switches	Star-delta	Star-delta						
	Pole change switches	2 and 3-speed	2-speed						
Convention (Ith)	al rated thermal current	20 A	32 A	50 A	63 A	115 A	150 A		
Rated insul	ation voltage (Ui)	690 V	690 V	690 V	690 V	690 V	690 V		
		AC-3 - 3-phase	AC-3 - 3-phase	AC-3 - 3-phase	AC-3 - 3-phase	AC-3 - 3-phase	AC-3 - 3-phase		
<b></b>		230 V - 2.2 kW - 8.3 A	230 V - 5.5 kW	230 V - 7.5 kW	230 V - kW	230 V - 5 kW	230 V - 22 kW		
Electrical o	perating characteristics	AC - 15	AC - 15	AC - 15	-	=	=		
		230 V - 4 A	230 V - 14 A	230 V - 6 A					
Eront plata	degree of protection	IP 40	— IP 40 — Complete switches						
Front plate	degree of protection	IP 65 (with seal)							
Product cor	mposition	Complete switches and custom							
		Adaptable sub-assemblies							
Compatibili	ity	Ø 22 control and signalling units	-						
	Front manuation	Multi-fixing	Du 4 halaa an 40 mm			Du 4 balan an CO m			
Mounting	Front mounting	Single Ø 22 hole	By 4 holes on 48 mm centers			by 4 noies on 66 m	By 4 holes on 68 mm centers		
	Rear mounting	Screw fixing, 4 holes on 36 mm centers	Screw fixing, 4 holes	on 48 mm centers		Screw fixing, 4 hole	Screw fixing, 4 holes on 68 mm centers		
Front plate	dimensions (mm)	45 x 45	64 x 64			88 x 88			
Front plate dimensions (mm) 60 x 60 (adaptable sub-assemblies)		104 x 04 88 x 88							
Black and red standard and long handles Key operator									
			Black standard hand	lo.					
Operating h	neads	Metallic head	Metallic legend, black						
		Metallic legend with black marking or	i i i i i i i i i i i i i i i i i i i	-· <b>3</b>					
		black legend with white marking							
		111 004							

cULus EN/IEC 60947-3

Type K30-K150

K30

K50

### Instructions for the Key Sheet on page 19-127

From the chart below, choose the switching angle as determined on the key sheet (see page 19-127). This identifies the angular location and the position numbers for the various positions of the rotary cam switch. Zero degrees or straight up is always position 1. Use these position numbers when completing the target table.

EN/IEC 60947-3

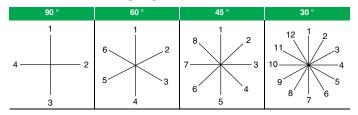
Type K2 Class 9003, K2

EN/IEC 60947-5-1

Terminals on the cam switch have the same numbers as the terminal numbers on the target table. Contact 1-2 is a single contact.

NOTE: When indicating a contact closure, place "X" within the square as shown in the contact sequence example.

### Table 19.378: Switching Angle Chart



### **Explanation of the Contact Sequence Example Below**

K115

K150

All Rights Reserved

Contact 1-2 is open in all positions except position 2.

K63

- Contact 3-4 is closed from the 2nd through the 4th position. The contact does not open while switching from one position to another.
- Contacts 5-6 and 7-8 overlap between positions 2 and 3. 3.
- Contact 9-10 is closed in positions 2 and 3. It is open momentarily while switching between positions 2 and 3.
- Contact 11-12 closes mementarily when switching from position 2 to position 3. This contact is not closed in position 2 or position 3.

NOTE: Position 1 is an off position

Figure 19.5: Contact Sequence Example

			Positions						
		1	_	2	_	3	_	4	_
С	1-2			Х					
0	3-4			Х	х	Х	х	Х	
n t	5-6				х	Х			
а	7-8			Х	х				
C t	9-10			Х		х			
s	11-12				х				

Incomplete part numbers. Contact your local supplier for assistance.

Class 9003

# Schneider Electric www.schneider-electric.us

Customer

### **Rotary Cam Switches**

See Instructions on page 19-126.

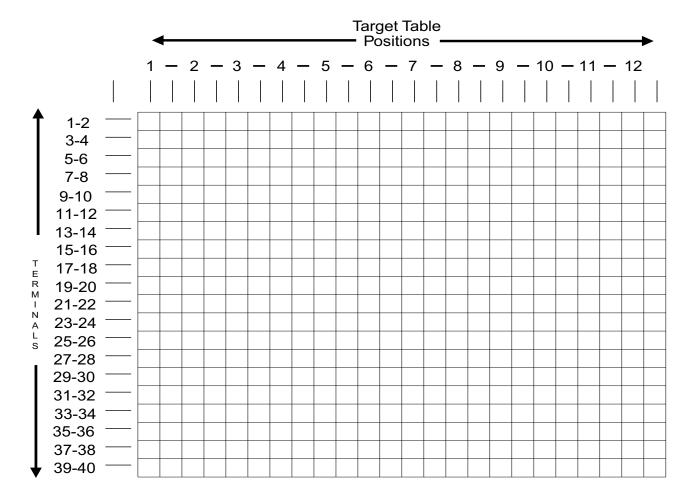
	1	FO NO	
		F,O. NO.	
	P.O. Number	Qty	

### To order custom cam switches:

- 1. Indicate the contact size at right (9003 K2)
- Indicate the desired switching angle at right. If the switching angle is not indicated, the factory will determine the angle from the table to the right.
- 3. From the example shown on page 19-126, fill in the target table on page 19-128.
- 4. Indicate the operator/handle type.
- If the operator/handle bezel has a legend and legend marking is desired, indicate the legend marking on the back of this form.
- 6. If a separate legend is required, indicate the legend type on the right and the marking on the back of this form.

Switching Angle	Maximum Number of Positions	See Ordering Instructions at Left		
90 °	4	2-3		
60 °	6	4-5		
45 °	8	6-7		
30 °	12	8-12		
Contact size	Class 9003	Type <b>K</b> 2		
Switching angle		Туре		
Operator/Handle type	Class 9003	Туре		
Separate legend	Class 9003	Туре		

NOTE: See page 19-126 for target table explanation



# **Electronic Sensors and Machine Cabling**



Photoelectric Sensors, p. 20-2



Proximity Sensors, p. 20-5



Ultrasonic Sensors, p. 20-10

### **Osisense Photoelectric Sensors**

XUB T	ubular	20-2
XUM N	Miniature	20-4
XUK a	nd XUX Compact	20-4

### **Osisense Inductive Proximity Sensors**

XS Plastic Rectangular	20-5
XS General Purpose Tubular	20-6
XS Basic and Basic Plus Series	20-8

### **Osisense Capacitive Proximity Sensors**

XT Proximity	20-9

### **Ultrasonic Sensors**

Accessories	20-10
XUV Label Sensor	20-10
XXV18—Barrel, Ø18 mm	20-10
Virtu™ VM1—Dual Mount, Ø 18 mm and Flat Format	20-11
Virtu™ VM18—Barrel, Ø18 mm	20-11
Virtu™ 30—Barrel, Ø30 mm	20-12
SM900 (1, 2, and 8 m)	20-12

A single product that adapts to most environments.

For multi-mode models (XUB0, XUM0, XUK0, and XUX0) that are programmable to function as Diffuse, Diffuse/Background Suppression, Polarized Retroreflective, or Thru-Beam Receivers, consult the feature. the factory.





Precabled, PvR, 2 m ♦

Catalog No.

XU8M18MA230

XU8M18MB230

XU5M18MA230

XU5M18MB230

XU9M18MA230

XU9M18MB230

XU2M18MA230

XU2M18MB230

24-240

25

10-200

XUB Tubular Sensors		XUB•A 18 mm plastic	XUB•B 18 mm metal	
	Proximity diffuse (adjustable)	0.6 m (2.0 ft)	0.6 m (2.0 ft)	
Llaghia agraina diatana	Polarized retroreflective	2 m (6.6 ft)	2 m (6.6 ft)	
Usable sensing distance	Retroreflective	4 m (13.1 ft)	4 m (13.1 ft)	
	Thru-beam	15 m (49 ft)	15 m (49 ft)	
Mounting (mm)		M 18 x 1	M 18 x 1	
Enclosure: M (metal), P (plastic) / Dimensions (mm) Ø x L or W x H x D		P/M 18 x 46	P/M18x46	
Setup LEDs Temperature range		_	_	
		−25 to +55 °C (−13 to +131 °F)		
Degree of protection (conforming to IEC 60529):		IP65, IP67 (XUK: IP65)		

Table 20.2: Sensors for DC Applications (Solid State Output: Transistor)

Connection		Precabled, PvR, 2 m ♦	M12 connector	Precabled, PvR, 2 m ♦	M12 connector	
		Catalog No.	Catalog No.	Catalog No.	Catalog No.	
	N.O.		XUB5APANL2	XUB5APANM12	XUB5BPANL2	XUB5BPANM12
	Froximity uniuse, adjustable	Proximity diffuse, adjustable  N.C.	XUB5APBNL2	XUB5APBNM12	XUB5BPBNL2	XUB5BPBNM12
	Polarized retroreflective	N.O.	XUB9APANL2	XUB9APANM12	XUB9BPANL2	XUB9BPANM12
Receiver or Transmitter/Receiver,	Polarized retrorellective	N.C.	XUB9APBNL2	XUB9APBNM12	XUB9BPBNL2	XUB9BPBNM12
3-wire PNP ▲	Retroreflective	N.O.	XUB1APANL2	XUB1APANM12	XUB1BPANL2	XUB1BPANM12
	Retrorenective	N.C.	XUB1APBNL2	XUB1APBNM12	XUB1BPBNL2	XUB1BPBNM12
	Thru-beam N.O	N.O.	XUB2APANL2R	XUB2APANM12R	XUB2BPANL2R	XUB2BPANM12R
	N.C.		XUB2APBNL2R	XUB2APBNM12R	XUB2BPBNL2R	XUB2BPBNM12R
Transmitter			XUB2AKSNL2T	XUB2AKSNM12T	XUB2AKSNL2T	XUB2AKSNM12T
Supply voltage limits, min/max (V) including ripple			10–36	10–36	10–36	10–36
Switching frequency (Hz)			500	500	500	500
Common characteristics for DC versions			Switching capacity, max (mA): 100 / Overload and short-circuit protection / LED output state			

Diffuse with adjustable background suppression

- For version with NPN output, change "P" to "N". For example: XUB1APANL2 would become XUB1ANANL2.
- These sensors do not incorporate overload or short-circuit protection. A 0.4 A fast-acting fuse must be connected in series with the load.
- For a 5 m cable, change L2 to L5. For example, XUMB5APANL2 becomes XUMB5APANL5.

Connection

System

New!

#### Metal Body Sensors for Two-Wire AC ■ or DC Applications (Solid-State Output: Transistor) Table 20.3:

NC

NO

NC

NO

NC

NO

NC









XUZC80

Switching capacity (mA) ■ A 50 x 50 mm reflector XUZC50 is included with a polarized retroreflective system.

Thru-beam▼

Polarized retrofeflective \*

Diffuse

XUZA118







XZCP1241L2 XZCP1141L2

#### Table 20.4: **Accessories**

Rated supply voltage (Vac/Vdc)

Switching frequency (Hz)

		mm	Catalog No.
Reflectors	24 x 21	XUZC24	
	Ø 80	XUZC80	
	50 x 50	XUZC50	
		Material	Catalog No.
Mounting brackets for XUB	Die Cast Zinc	XUZA118	
Mounting brackets for AOB		Plastic	XUZA218
		90°	Straight
		Catalog No.	Catalog No.
	M8 (4-Pin)	XZCP1041L2	XZCP0941L2
Cables, 2 m, without LED △ Suitable plug-in female connectors, including pre-wired versions	M12 (4-pin)	XZCP1241L2	XZCP1141L2
outlable plug-in lemale conflectors, including pre-wired versions	1/2"-20UNF	XZCP1965L2	XZCP1865L2

For 5 or 10 meter lengths, replace 2 in the cable catalog number with 5 or 10.

1/2"-20UNF Connector

Catalog No.

XU8M18MA230K

XU8M18MB230K

XU5M18MA230K

XU5M18MB230K

XU9M18MA230K

XU9M18MB230K

XU2M18MA230K

XU2M18MB230K

24-240

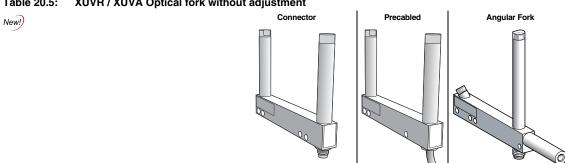
25

10-200

Includes a thru-beam transmitter and receiver

### **Osisense Photoelectric** Sensors

#### Table 20.5: XUVR / XUVA Optical fork without adjustment



Sensing Characteristics		Thru-beam			
Sensing range, mm (in.)		2–180 (0.08 –7.09)			
Sensing frequency		4000 Hz			
Minimum size of object detected,	Passageway 2–120 mm	0.8 (0.03)	1.2 (0.05)		
mm (in.)	Passageway ≥ 150 mm	1 (0.04)	1.5 (0.06)		
Fork type		XUVR•	XUVA•		
Power Requirements					
Supply voltage		12–24 Vdc			
Max. load		100 mA with overload and short-circuit protection			
Environmental					
Operating temperature range		-10 to +60 °C (+14 to +140 °F)			
Environmental protection ratings		IP65 and IP67			
Construction					
Materials Case		Painted aluminum and polyamide			

Catalog Number

XUVR0605PANM8

XUVR0605NANM8

XUVR0605PBNM8

XUVR0605NBNM8

### Catalog numbers of forks type XUVR•

Connection—Precabled, length 2 m. Depth (B): 40 mm (1.18 in.) Passageway (A) Function Output Catalog Number 30 mm (1.18 in.) NO PNP XUVR0303PANL2

PNP

NPN

PNP

NPN

Function Output

Connection-M8, 3-Pin. Depth (B): 60 mr

NO

NC

Passageway (A)

50 mm (1.97 in.)

# 3-Wire NO or NC function PNP or NPN ouput В 0 0 A = B =

Passageway (A)	Function	Output	Catalog Number
Connection—M8, 3	-Pin. Dept	h (B): 120 mr	n (4.72 in.)
	INC	NPN	XUVR0608NBNM8
80 mm (3.15 in.)	NC	PNP	XUVR0608PBNM8
00 (0 45 ! )	NO	NPN	XUVR0608NANM8
	NO	PNP	XUVR0608PANM8

= Passageway		NO	PNP	XUVR1212PANM8
= Depth	120 mm (4.72 in.)	NO	NPN	XUVR1212NANM8
	120 11111 (4.72 111.)	NC	PNP	XUVR1212PBNM8
		INC	NPN	XUVR1212NBNM8
		NO	PNP	XUVR1218PANM8
	180 mm (7.09 in.)	INO	NPN	XUVR1218NANM8
	160 11111 (7.09 111.)	NC	PNP	XUVR1218PBNM8
		INC	NIDNI	VI IVD1010NIDNIMO

Catalog	numbers	of forks t	ype XUVA•
---------	---------	------------	-----------

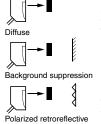
3-wire NO fund PNP ou	
0	
A = Pas	ssageway

Connection—M8 connector, 3-Pin

Passageway (A)	Function	Output	Catalog Number
50 mm (1.97 in.)	NO	PNP	XUVA0505PANM8
80 mm (3.15 in.)	NO	PNP	XUVA0808PANM8
120 mm (4.72 in.)	NO	PNP	XUVA1212PANM8
150 mm (5.91 in. )	NO	PNP	XUVA1515PANM8

www.schneider-electric.us

### Table 20.6: XUM Miniature, XUK and XUX Compact



Thru-beam

A single product that adapts to most environments.

For multi-mode models (XUB0, XUM0, XUM0, XUK0, and XUX0) that are programmable to function as Diffuse, Diffuse/Background Suppression, Polarized Retroreflective, or Thru-Beam Receivers, consult the factory.









Sensors		XUM Miniature Design	XUK Compact Design 50 x 50	XUX Compact Design		
	Proximity diffuse (adjustable sensitivity)	1 m (3.28 ft)	1 m (3.2 ft) ▲	2.1 m (6.8 ft)		
Usable	Polarized retroreflective	5 m (16.40 ft) ♦	5 m (16.4 ft) ▲	11 m (36 ft)		
sensing distance Retroreflective		_	7 m (23.0 ft) ▲	14 m (46 ft)		
	Thru-beam	15 m (49.21 ft)	30 m (98 ft) ▲	40 m (131.2 ft)		
Mounting (m	m)	direct: mounting centers 25.5, M3 screws				
	// (metal) P (plastic) / (mm) Ø x L or W x H x D	P / 10.8 x 34 x 20	P / 18 x 50 x 50	P/30 x 92 x 71		
Setup LEDs		⊗ ⊗		⊗		
Common cha	aracteristics	LED output state indicator and power on LED (⊗): yes				

Excess gain of 2.

	C Applications output: Transistor)		Catalog No.					
Connection			Precabled, PVC, 2 m	M8 connector	Precabled, PVC, 2 m	M12 connector	Screw terminals, ISO 16 cable gland	M12 connector
Transmitter			XUM2AKCNL2T	XUM2AKCNM8T	XUK2AKSNL2T	XUK2AKSNM12T	XUX0AKSAT16T	XUX0AKSAM12T
		N.O.	_	_	XUK5APANL2	XUK5APANM12	XUX5APANT16	XUX5APANM12
	Proximity diffuse,	N.C.	_	_	XUK5APBNL2	XUK5APBNM12	XUX5APBNT16	XUX5APBNM12
	adjustable	N.O./N.C. convertible	XUM5APCNL2	XUM5APCNM8	_	_	-	-
		N.O.	_	_	XUK9APANL2	XUK9APANM12	XUX9APANT16	XUX9APANM12
Receiver or	Polarized retroreflective	N.C.	_	=	XUK9APBNL2	XUK9APBNM12	XUX9APBNT16	XUX9APBNM12
Transmitter/ Receiver, 3-wire PNP ■	Foldrized retrorellective	N.O./N.C. convertible	XUM9APCNL2	XUM9APCNM8	_	=	_	
	Retroreflective	N.O.	_	_	XUK1APANL2	XUK1APANM12	XUX1APANT16	XUX1APANM12
	Retroreflective	N.C.	_	_	XUK1APBNL2	XUK1APBNM12	XUX1APBNT16	XUX1APBNM12
	Thru-beam	N.O.	_	_	XUK2APANL2R	XUK2APANM12R	XUX2APANT16R	XUX2APANM12R
		N.C.	_	=	XUK2APBNL2R	XUK2APBNM12R	XUX2APBNT16R	XUX2APBNM12R
		N.O./N.C. convertible	XUM2APCNL2R	XUM2APCNM8R	_	_	_	l
Supply voltage	limits, min/max (V) including	ripple	10–30	10–30	10–30	10-30	10–36	10–36
Switching frequ	ency (Hz)		1000	1000	250	250	250	250
Common chara	cteristics for DC versions		indicator (⊗): yes / power on LED (⊗): yes					
Multi-current/r	nulti-voltage sensors for A	AC/DC applications, 2	0-264 Vac/Vdc, inclu	ding ripple (relay o	utput, 1 C/O, 3 A)			
Connection			_	_	Precabled, 2 m	_	Screw terminals ISO 16 cable gland	_
Transmitter			_	_	XUK2ARCNL2T	_	XUX0ARCTT16T	_
	Diffuse	N.O. + N.C.	_	_	XUK5ARCNL2	_	XUX5ARCNT16	_
	Polarized retroreflective	N.O. + N.C.	_	_	XUK9ARCNL2	_	XUX9ARCNT16	
Receiver	Retroreflective	N.O. + N.C.	_	_	XUK1ARCNL2	_	XUX1ARCNT16	
	Thru-beam	N.O. + N.C.	_	_	XUK2ARCNL2R	_	XUX2ARCNT16R	
Switching frequ	ency (Hz)			_	20	_	20	
LED output stat	e indicator(🔕) / power on LE	D (🔇)	_	_	⊗/⊗	_	⊗/⊗	_

- For version with NPN output, change "P" to "N". For example, XUM5APCNL2 would become XUM5ANCNL2.
- With XUZC50 reflector.

Note: M8 is not Snap-C compatible.

See page 20-2 for suitable plug-in cables with female connectors.

### General Purpose, Plastic Case, Limit Switch Style, 5-Position Turret Head

Osisense Inductive

**Proximity Sensors** 

#### **General Specifications** Table 20.7:

Product certifications	UL, CSA, C€
Degree of protection conforming to IEC 60529	IP67
Operating temperature	−25 to +70 °C (−13 to +158 °F)

### **DC Supply**

#### Table 20.8: **Catalog Numbers**

Nominal sensing distance Sn. mm (in.)		15 (0.59)	Increased range 20 (0.79)	15 (0.59)	20 (0.79)	Increased range 40 (1.57)	20 (0.79)
4-wire	PNP, NO + NC	XS7C40PC440H7	XS7C40PC449H7	=	XS8C40PC440H7	XS8C40PC449H7	=
(complementary outputs)	NPN, NO + NC	XS7C40NC440H7	XS7C40NC449H7	_	XS8C40NC440H7	XS8C40NC449H7	_
2-wire	NO	_		XS7C40DA210H7	_		XS8C40DA210H7
(non-polarized)	NO or NC programmable	_	<del>-</del>	XS7C40DP210H7	_	_	XS8C40DP210H7
Weight, kg (lb)		0.220 (0.49)	0.220 (0.49)	0.220 (0.49)	0.220 (0.49)	0.220 (0.49)	0.220 (0.49)

#### Table 20.9: Supplemental Specifications

Table 20.3. Sup	piementai specifications							
Connection ▲		Screw terminals, clamping capacity: 2 or 4 x 1.5 mm <sup>2</sup> (16 AWG) ■						
Operating zone, mm (ir	n.)	0-12 (0-0.47)	0-16 (0-0.63)	0-12 (0-0.47)	0-16 (0-0.63)	0-32 (0-1.26)	0-16 (0-0.63)	
Repeat accuracy		≤3% of effective s	sensing distance (Sr)					
Differential travel		3-20% of effective	e sensing distance (Sr)					
Status indication	Output	Yellow LED		Yellow LED	Yellow LED		Yellow LED	
Status indication	Supply on	Green LED		_	Green LED		_	
Rated supply voltage		12–48 Vdc with protection against reverse polarity						
Voltage limits (includin	g ripple)	10-58 Vdc						
Current consumption,	no-load	≤ 10 mA		_	≤ 10 mA		_	
Switching capacity with	overload and short-circuit protection	0-200 mA		1.5-100 mA	0–200 mA		1.5-100 mA	
Residual current, open	state	_		≤ 0.5 mA	_		≤ 0.5 mA	
Voltage drop, closed st	ate	≤2 V		≤4 V	≤2 V		≤4 V	
Maximum switching fre	equency	1000 Hz		1500 Hz	1000 Hz	500 Hz	800 Hz	
_	First-up	≤5 ms		≤ 5 ms	≤ 5 ms	≤ 5 ms	≤ 5 ms	
Delays	Response	≤ 0.3 ms		≤ 2 ms	≤ 0.3 ms	< 1 ms	≤ 2 ms	
	Recovery	≤ 0.7 ms		≤ 5 ms	≤ 0.7 ms	< 1 ms	≤ 7 ms	

### Plug-in, AC or DC supply

### Table 20.10: Catalog Numbers

rabio zorror Gatarog	able 201101 Galatog Hambers							
		AC	AC/DC	AC	AC/DC			
Nominal sensing distance Sn, mm (in.)		15 (0.59)		20 (0.79)				
2-wire AC	NO or NC programmable	XS7C40FP260H7		XS8C40FP260H7	_			
2-wire AC or DC universal model	NO or NC programmable	_	XS7C40MP230H7	_	XS8C40MP230H7			
Weight, kg (lb)		0.220 (0.49)	0.220 (0.49)	0.220 (0.49)	0.220 (0.49)			

Connection		Screw terminals, clamping c	Screw terminals, clamping capacity 2 x 1.5 mm <sup>2</sup> (16 AWG) ▲■					
Operating zone, mm (	in.)	0-12 (0-0.47)		0-16 (0-0.63)				
Repeat accuracy		≤3% of effective sensing dist	ance (Sr)					
Differential travel		3–20% of effective sensing of	listance (Sr)					
Output state indicatio	n	Yellow LED						
Rated supply voltage with protection agains		24-240 Vac, 50/60 Hz	24–240 Vac, 50/60 Hz or 24–210 Vdc	24-240 Vac, 50/60 Hz	24–240 Vac, 50/60 Hz or 24–210 Vdc			
Voltage limits (including ripple)		20-264 Vac	20-264 Vac or Vdc	20-264 Vac	20-264 Vac or Vdc			
Current consumption	, no-load	_						
Switching capacity ◆		5–500 mA (2 A inrush) ♦	5–300 mA AC or 5–200 mA DC ◆	5–500 mA (2 A inrush) ◆	5–300 mA AC or 5–200 mA DC ◆			
Residual current, ope	n state	≤ 1.5 mA	0.8 mA on 24 V 1.5 mA on 120 V	≤ 1.5 mA	0.8 mA on 24 V 1.5 mA on 120 V			
Voltage drop, closed	state	≤ 5.5 V						
Maximum switching for	requency	25 Hz	AC: 25 Hz; DC: 50 Hz	25 Hz	AC: 25 Hz; DC: 50 Hz			
	First-up	≤ 120 ms			•			
Delays	Response	≤ 30 ms						
	Recovery	≤ 20 ms						

- Delete H7 suffix for PG13 conduit entry.
- Cable gland not included with sensor. For suitable metric version PG13 cable gland (XSZPE13), see page 2/131 of 9006CT1007.
- These sensors do not incorporate overload or short-circuit protection. A 0.4 mA fast-acting fuse (XUZE04) must be connected in series with the load.

20-5

Refer to Catalog 9006CT1007

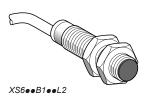


Table 20.12: General Purpose, Long Case, Increased Range, Flush Mountable, 3-Wire DC, Solid-State Output

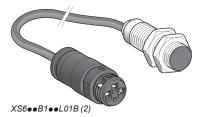
Sensors, 3-wire 12-4	8 V <del></del> , long	case mo	del			
Sensing Distance Sn,	Function	Output	Connection	We	ight	Catalog No.
mm (in.)	runction	Output	Connection	kg	(lb)	Catalog No.
8, threaded M8 x 1						
		PNP	Precabled (2 m) ▲	0.035	(80.0)	XS608B1PAL2
	NO	FINE	M12 connector	0.015	(0.03)	XS608B1PAM1
	INO	NPN	Precabled (2 m) ▲	0.035	(80.0)	XS608B1NAL2
2.5 (0.10)		INFIN	M12 connector	0.015	(0.03)	XS608B1NAM1
2.3 (0.10)		PNP	Precabled (2 m) ▲	0.035	(80.0)	XS608B1PBL2
	NC	1 141	M12 connector	0.015	(0.03)	XS608B1PBM1
	140	NPN	Precabled (2 m) ▲	0.035	(80.0)	XS608B1NBL2
			M12 connector	0.015	(0.03)	XS608B1NBM1
12, threaded M12 x	1					
		PNP	Precabled (2 m) ▲	0.075	(0.17)	XS612B1PAL2
	NO	FINE	M12 connector	0.020	(0.04)	XS612B1PAM1
	INO	NPN	Precabled (2 m) ▲	0.075	(0.17)	XS612B1NAL2
(0.16)		141.14	M12 connector	0.020	(0.04)	XS612B1NAM1
(55)		PNP	Precabled (2 m) ▲	0.075	(0.17)	XS612B1PBL2
	NC		M12 connector	0.020	(0.04)	XS612B1PBM1
	1.10	NPN	Precabled (2 m) ▲	0.075	(0.17)	XS612B1NBL
			M12 connector	0.020	(0.04)	XS612B1NBM1
18, threaded M18 x	1					
			Precabled (2 m) ▲	0.100	(0.22)	XS618B1PAL2
			M12 connector	0.040	(0.09)	XS618B1PAM1
		PNP	Remote screw term. connector	0.100	(0.22)	XS618B1PAL018
			Remote DIN 43650 connector	0.100	(0.22)	XS618B1PAL01
	NO		Remote M18 connector	0.100	(0.22)	XS618B1PAL01
		NPN	Precabled (2 m) ▲	0.100	(0.22)	XS618B1NAL
			M12 connector	0.040	(0.09)	XS618B1NAM1
			Remote screw term. connector	0.100	(0.22)	XS618B1NAL01I
3 (0.31)			Remote DIN 43650 connector	0.100	(0.22)	XS618B1NAL0
		PNP	Precabled (2 m) ▲	0.100	(0.22)	XS618B1PBL2
			M12 connector	0.040	(0.09)	XS618B1PBM1
			Remote screw term. connector	0.100	(0.22)	XS618B1PBL018
	NC		Remote DIN 43650 connector	0.100	(0.22)	XS618B1PBL01
	140		Precabled (2 m) ▲	0.100	(0.22)	XS618B1NBL
		NPN	M12 connector	0.040	(0.09)	XS618B1NBM1
			Remote screw term. connector	0.100	(0.22)	XS618B1NBL01E
			Remote DIN 43650 connector	0.100	(0.22)	XS618B1NBL01
30, threaded M30 x	1.5					
			Precabled (2 m) ▲	0.205	(0.45)	XS630B1PAL2
			M12 connector	0.145	(0.32)	XS630B1PAM1
		PNP	Remote screw term. connector	0.205	(0.45)	XS630B1PAL01E
			Remote DIN 43650 connector	0.205	(0.45)	XS630B1PAL01
	NO		Remote M18 connector	0.205	(0.45)	XS630B1PAL01
			Precabled (2 m) ▲	0.205	(0.45)	XS630B1NAL
		NPN	M12 connector	0.145	(0.32)	XS630B1NAM1
		INFIN	Remote screw term. connector	0.205	(0.45)	XS630B1NAL018
5 (0.59)			Remote DIN 43650 connector	0.205	(0.45)	XS630B1NAL0
J (U.Ja)			Precabled (2 m) ▲	0.205	(0.45)	XS630B1PBL
			M12 connector	0.145	(0.32)	XS630B1PBM1
		PNP	Remote screw term. connector	0.205	(0.45)	XS630B1PBL01I
			Remote DIN 43650 connector	0.205	(0.45)	XS630B1PBL0
	NC		Remote M18 connector	0.205	(0.45)	XS630B1PBL01
			Precabled (2 m) ▲	0.205	(0.45)	XS630B1NBL
		NPN	M12 connector	0.145	(0.32)	XS630B1NBM1
		INFIN	Remote screw term.connector	0.205	(0.45)	XS630B1NBL01E
		l	Remote DIN 43650 connector	0.205	(0.45)	XS630B1NBL01

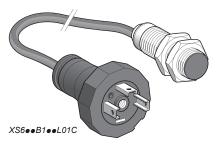
- For a 5 m cable replace L2 with L5; for a 10 m cable replace L2 with L10. For example, XS608B1PAL2 becomes XS608B1PAL5 with a 5 m cable.
- Protective cable gland included with remote screw terminal connector.

Description	Fan was with	For use with sensors		ight	
Description	For use with	sensors	kg	(lb)	Catalog No.
	Ø8		0.006	(0.01)	9006PA08
000	Ø 12		0.006	(0.01)	9006PA12
90° metal mounting bracket	Ø 18	Ø 18		(0.02)	9006PA18
	Ø 30	Ø 30			9006PA30
	Cables			Mounting	Bracket
Description	90°	Straight	with Ind	exing Pin fo	or Tubular Senso
Plug-in female connectors, including pre-wired versions 2 m, without LED					
	Catalog No.	Catalog No.			Catalog No.
M8	XZCP0666L2	XZCP0566L2	M	12	XSZB112
M12	XZCP1241L2	XZCP1141L2	M	18	XSZB118
U20	XZCP1965L2	XZCP1865L2		30	XSZB130







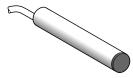






### Osisense™ Inductive **Proximity Sensors**

New!)



XS506B1●●L2



XS508B1•€L2



XS512B1●●M12



XS518B1●●M12



XS518B1•••L2



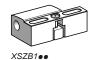


Table 20.14: Sensors, 3-wire 12-24 Vdc, Short Case Model

Sensing Distance	Function	Outrout	Commontion	We	ight	Catalog	
Sn, mm (in.)	Function	Output	Connection	kg	(lb)	Number	
Ø 6.5, plain							
			Precabled (2 m) ▲	0.035	(0.08)	XS506B1PAL2	
		PNP	M8 connector	0.025	(0.06)	XS506B1PAM8	
	NO		M12 connector	0.025	(0.06)	XS506B1PAM12	
		NPN	Precabled (2 m) ▲	0.035	(0.08)	XS506B1NAL2	
1.5 (0.06)		INPIN	M8 connector	0.025	(0.06)	XS506B1NAM8	
(0.00)		PNP	Precabled (2 m) ▲	0.035	(0.08)	XS506B1PBL2	
	NC	PINP	M8 connector	0.025	(0.06)	XS506B1PBM8	
	INC	NPN	Precabled (2 m) ▲	0.035	(0.08)	XS506B1NBL2	
		INPIN	M8 connector	0.025	(0.06)	XS506B1NBM8	
Ø 8, threaded M8 $x$	1						
			Precabled (2 m) ▲	0.035	(80.0)	XS508B1PAL2	
		PNP	M8 connector	0.025	(0.06)	XS508B1PAM8	
	NO		M12 connector	0.025	(0.06)	XS508B1PAM12	
	INO		Precabled (2 m) ▲	0.035	(0.08)	XS508B1NAL2	
		NPN	M8 connector	0.025	(0.06)	XS508B1NAM8	
1.5			M12 connector	0.025	(0.06)	XS508B1NAM12	
(0.06)			Precabled (2 m) ▲	0.035	(0.08)	XS508B1PBL2	
		PNP	M8 connector	0.025	(0.06)	XS508B1PBM8	
	NC		M12 connector	0.025	(0.06)	XS508B1PBM12	
	INC	NPN	Precabled (2 m) ▲	0.035	(0.08)	XS508B1NBL2	
			M8 connector	0.025	(0.06)	XS508B1NBM8	
			M12 connector	0.025	(0.06)	XS508B1NBM12	
Ø 12, threaded M12	x 1						
		PNP	Precabled (2 m) ▲	0.075	(0.17)	XS512B1PAL2	
	NO	PINP	M12 connector	0.035	(0.08)	XS512B1PAM12	
	INO	NO	NPN	Precabled (2 m) ▲	0.075	(0.17)	XS512B1NAL2
2		NPN	M12 connector	0.035	(0.08)	XS512B1NAM12	
(80.0)		PNP	Precabled (2 m) ▲	0.075	(0.17)	XS512B1PBL2	
	NO	FINE	M12 connector	0.035	(0.08)	XS512B1PBM12	
	NC	NPN	Precabled (2 m) ▲	0.075	(0.17)	XS512B1NBL2	
		INFIN	M12 connector	0.035	(0.08)	XS512B1NBM12	
Ø 18, threaded M18	x 1						
		PNP	Precabled (2 m) ▲	0.120	(0.26)	XS518B1PAL2	
	NO	FINE	M12 connector	0.060	(0.13)	XS518B1PAM12	
	NO	NPN	Precabled (2 m) ▲	0.120	(0.26)	XS518B1NAL2	
5	L	INFIN	M12 connector	0.060	(0.13)	XS518B1NAM12	
(0.20)		PNP	Precabled (2 m) ▲	0.120	(0.26)	XS518B1PBL2	
	NC	LINE	M12 connector	0.060	(0.13)	XS518B1PBM12	
	INC	NPN	Precabled (2 m) ▲	0.120	(0.26)	XS518B1NBL2	
		INPIN	M12 connector	0.060	(0.13)	XS518B1NBM12	
Ø 30, threaded M30	x 1.5	·					
		PNP	Precabled (2 m) ▲	0.205	(0.45)	XS530B1PAL2	
	NO	FINE	M12 connector	0.145	(0.32)	XS530B1PAM12	
	NO		Precabled (2 m) ▲	0.205	(0.45)	XS530B1NAL2	
10		NPN	M12 connector	0.145	(0.32)	XS530B1NAM12	
(0.39)		DNID	Precabled (2 m) ▲	0.205	(0.45)	XS530B1PBL2	
	NC	PNP	M12 connector	0.145	(0.32)	XS530B1PBM12	
	NC	NIDNI	Precabled (2 m) ▲	0.205	(0.45)	XS530B1NBL2	
		NPN	M12 connector	0.145	(0.32)	XS530B1NBM12	
				-			

For a 5 m cable replace L2 with L5; for a 10 m cable replace L2 with L10. Example: XS508B1PAL2 becomes XS508B1PAL5 with a 5 m cable.

### Table 20.15: Accessories

Tubic Ed. 10. Add	C00011C0				
Description	For use with sensors	We	ight	Catalan Number	
Description	For use with sensors	kg	(lb)	Catalog Number	
	Ø 6.5 (plain)	0.005	(0.01)	XSZB165	
	Ø8	0.006	(0.01)	XSZB108	
Mounting brackets	Ø 12	0.006	(0.01)	XSZB112	
	Ø 18		(0.02)	XSZB118	
	Ø 30	0.020	(0.02)	XSZB130	

Table 20.16: Basic Plus, XS ••• B3 New!



Ø 18, threaded M18 x 1

8 (0.31)

Three-wire 12-24 V ==, flush mountable

NO

NC

NPN

PNP









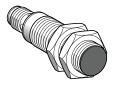


Characteristics	Flush M	ountable	Flush Mountable	Flush Mountable	Flush Mountable	Flush Mountable		
Sensing range	2 mm (0-0.08 in.	.)	2 mm (0-0.08 in.)	4.0 mm (0-0.15 in.)	8.0 mm (0.31 in.)	15.0 mm (0.59 in.)		
Switching frequency	2500 Hz		2500 Hz	2500 Hz	1000 Hz	500 Hz		
Shock resistance	50 gn, duration 1	1 ms	50 gn, duration 11 ms	50 gn, duration 11 ms	50 gn, duration 11 ms	50 gn, duration 11 ms		
Vibration resistance (10–55 Hz)	25 gn, amplitude ± 2 mr	n	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm		
Power Requirements								
Supply voltage	12-24 (10-36 ma	ax) Vdc with prote	ction against reverse pol	arity, overload, and shor	t circuit			
Switching capacity	50	mA	50 mA		100 mA			
Specifications			XS1eeB3eeM8, XS1e	•B3••M12, XS1••B3	••L2			
	Ø 6.5 and Ø 8		0-2.0 mm ( 0-0.07 in.)					
Operating zone	Ø 12		0-4.0 mm (0-0.15 in.)					
Operating zone	Ø 18		0–8.0 mm ( 0–0.31 in.)					
	Ø 30		0–15 mm (0–0.59 in.)					
Degree of protection	Conforming to IE	C 60529	IP65 and IP67					
Operating temperature			-25 to +70 °C (-13 to ⋅	+158 °F)				
Materials	Case		Nickel-plated brass					
ivialeriais	Cable (XS1●●B3	BeeLe only)	PvR 3 x 0.34 mm <sup>2</sup> (22 AWG), except Ø 6.5 and Ø 8: 3 x 0.11 mm <sup>2</sup> (27 AWG)					
Vibration resistance	Conforming to IE	C 60068-2-6	25 gn, amplitude ± 2 mm (10 to 55 Hz)					
Shock resistance	Conforming to IE	C 60068-2-27	50 gn, duration 11 ms					
Rated supply voltage			12–24 Vdc with protection against reverse polarity					
Switching capacity			≤ 200 mA with overload	and short-circuit protec	tion			
	Ø 6.5, Ø 8, and Ø	ð 12	2500 Hz					
Maximum switching frequency	Maximum switching Ø 18		1000 Hz					
почистоу	Ø 30		500 Hz					
Sensing Distance Sn, mm (in.)	Function	Output	Connection	Sold in lots of	Weight kg (lb)	Catalog Number		









XS118B3●●M12



nequency	Ø 30		500 Hz				
Sensing Distance Sn,	Function	Output	Connection	Sold in	Weight		Catalog Number
mm (in.)	T dilotion	Output	Comiconon	lots of	kg	(lb)	outding Humber
Ø 8, threaded M8 x 1					·		
Three-wire 12-24 V,	flush mounta	ıble					
			Precabled (2 m) ▲	1	0.070	(0.15)	XS108B3PAL2
		PNP	M8 connector	1	0.030	(0.06)	XS108B3PAM8
	NO		M12 connector	1	0.060	(0.13)	XS108B3PAM12
	NO		Precabled (2 m) ▲	1	0.070	(0.15)	XS108B3NAL2
		NPN	M8 connector	1	0.030	(0.06)	XS108B3NAM8
· (0.07)			M12 connector	1	0.060	(0.13)	XS108B3NAM12
2 (0.07)		PNP	Precabled (2 m) ▲	1	0.070	(0.15)	XS108B3PBL2
NC			M8 connector	1	0.030	(0.06)	XS108B3PBM8
			M12 connector	1	0.060	(0.13)	XS108B3PBM12
	NC		Precabled (2 m) ▲	1	0.070	(0.15)	XS108B3NBL2
		NPN	M8 connector	1	0.030	(0.06)	XS108B3NBM8
			M12 connector	1	0.060	(0.13)	XS108B3NBM12
) 12, threaded M12 x 1							
hree-wire 12-24 Vdc,	flush mounta	ble					
		DATE:	Precabled (2 m) ▲	1	0.090	(0.19)	XS112B3PAL2
		PNP	M12 connector	1	0.030	(0.06)	XS112B3PAM12
	NO	NIDAL	Precabled (2 m) ▲	1	0.090	(0.19)	XS112B3NAL2
(0.45)		NPN	M12 connector	1	0.030	(0.06)	XS112B3NAM12
(0.15)		DUD	Precabled (2 m) ▲	1	0.090	(0.19)	XS112B3PBL2
		PNP	M12 connector	1	0.030	(0.06)	XS112B3PBM12
	NC		Precabled (2 m) ▲	1	0.090	(0.19)	XS112B3NBL2
	NPN	M12 connector	1	0.030	(0.06)	XS112B3NBM12	

0.030

0.110

0.060

0.110

0.060

0.110

0.060

(0.06)

(0.24)

(0.13)

(0.24)

(0.13)

(0.24)

(0.13)

M12 connector

Precabled (2 m) ▲

Precabled (2 m) ▲

Precabled (2 m) ▲

M12 connector

M12 connector

M12 connector

		NPN Precabled (2 m)		1	0.110	(0.24)	XS118B3NBL2
		INFIN	M12 connector	1	0.060	(0.13)	XS118B3NBM12
Ø 30, threaded I	M30 x 1.5						
Three-wire 12-2	4 V ः, flush mour	ntable					
	PNP	Precabled (2 m) ▲	1	0.180	(0.39)	XS130B3PAL2	
	NO	FINE	M12 connector	1	0.130	(0.28)	XS130B3PAM12
	INO	NPN	Precabled (2 m) ▲	1	0.180	(0.39)	XS130B3NAL2
15 (0.59)	15 (0.50)	INFIN	M12 connector	1	0.130	(0.28)	XS130B3NAM12
15 (0.59)		PNP	Precabled (2 m) ▲	1	0.180	(0.39)	XS130B3PBL2
	NC	FINE	M12 connector	1	0.130	(0.28)	XS130B3PBM12
		NPN Preci	Precabled (2 m) ▲	1	0.180	(0.39)	XS130B3NBL2
			M12 connector	1	0.130	(0.28)	XS130B3NBM12
▲ Fora5m	cable replace I 2 w	vith I 5: for a 10 m	cable replace I 2 with I 10	Example: XS106F	R3PAL2 hecom	es XS106B3P4	1 5 with a 5 m cable

20-8

XS112B3NBM12

XS118B3PAL2

XS118B3PAM12

XS118B3NAL2

XS118B3NAM12

XS118B3PBL2

XS118B3PBM12



Table 20.17: Acessories, Basic Plus, XS ••• B3

	,	,					
Mounting Bracket			Mounting Bracket w/ Ir	ndexing Pin for Cy	lindrical Sensors		
	Sensor Body	Catalog No.		Diameter	Catalog No.		
	M8	9006PA08		M6	XSZB165		
-	M12	9006PA12		M8	XSZB108		
	M18	9006PA18		M12	XSZB112		
	M30	//30 9006PA30		M18	XSZB118		
	IVIOU	SUUUFASU		M30	XSZB130		
Cables	See M8 and M12	See M8 and M12 connector cables on page 20-6.					



Table 20.18: General Purpose, Long Case, Tubular, Increased Range, Flush Mountable,

2-Wire AC of Sensors, 2-wire 24–240 V 元, long					
Sensing Distance Sn, mm (in.)		Connection	Catalog Number	We kg	ight (lb)
Ø 12, threaded M12 x 1				ng	()
•	NO	Precabled (2 m) ▲	XS612B1MAL2	0.075	(0.17)
4 (0.40)	NO	1/2"-20UNF connector	XS612B1MAU20	0.025	(0.06)
4 (0.16)	NC	Precabled (2 m) ▲	XS612B1MBL2	0.075	(0.17)
	NC	1/2"-20UNF connector	XS612B1MBU20	0.025	(0.06)
Ø 18, threaded M18 x 1					
		Precabled (2 m) ▲	XS618B1MAL2	0.100	(0.22)
		1/2"-20UNF connector	XS618B1MAU20	0.060	(0.13)
	NO	Remote screw terminal connector	XS618B1MAL01B ◆	0.100	(0.22)
		Remote DIN 43650A connector	XS618B1MAL01C	0.100	(0.22)
8 (0.31)		Remote M18 connector	XS618B1MAL01G	0.100	(0.22)
6 (0.31)		Precabled (2 m) ▲	XS618B1MBL2	0.100	(0.22)
		1/2"-20UNF connector	XS618B1MBU20	0.060	(0.13)
	NC	Remote screw terminal connector	XS618B1MBL01B ◆	0.100	(0.22)
		Remote DIN 43650A connector	XS618B1MBL01C	0.100	(0.22)
		Remote M18 connector	XS618B1MBL01G	0.100	(0.22)
Ø 30, threaded M30 x 1.5					•
		Precabled (2 m) ■	XS630B1MAL2	0.205	(0.45)
		1/2"-20UNF connector	XS630B1MAU20	0.145	(0.32)
	NO	Remote screw terminal connector	XS630B1MAL01B ◆	0.205	(0.45)
		Remote DIN 43650A connector	XS630B1MAL01C	0.205	(0.45)
15 (0.59)		Remote M18 connector	XS630B1MAL01G	0.205	(0.45)
15 (0.59)		Precabled (2 m) ■	XS630B1MBL2	0.205	(0.45)
		1/2"-20UNF connector	XS630B1MBU20	0.145	(0.32)
	NC	Remote screw terminal connector	XS6 30B1MBL01B ◆	0.205	(0.45)
		Remote DIN 43650A connector	XS6 30B1MBL01C	0.205	(0.45)
		Remote M18 connector	XS6 30B1MBL01G	0.205	(0.45)
Accessories					
				We	ight
Description		For use with sensors	Catalog Number	kg	(lb)
		Ø 12	XSZB112	0.006	(0.01)
Mounting brackets		Ø 18	XSZB118	0.010	(0.02)
3		Ø 30	XSZB130	0.020	(0.04)

- For a 5 m cable, replace **L2** with **L5**; for a 10 m cable, replace **L2** with **L10**. Example: XS612B1MAL2 becomes XS612B1MAL5 with a 5 m cable.
- Available in ø8 plastic with double insulation. See page 2/30 of 9006CT1007.
- Protective cable gland included with remote screw terminal connector.

### Table 20.19: Osisense Capacitive Proximity Sensors, Cylindrical Stainless Steel, DC







Ø M30 threaded M30 x 1.5

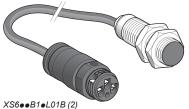
	1	-	
	Ø M12 threaded M12 x 1	Ø M18 threaded M18 x 1	
0 1 01 1 1 1			

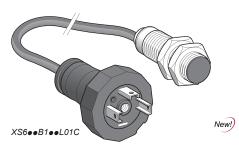
Sensing Characteristics					
Sensing Range	2 mm (0.078 in.)	5 mm (0.197 in.)	10 mm (0.394 in.)		
Switching Frequency	300	200	150		
Shock Resistance	Conforming to IEC 60068-2	-27: 30 gn, 11 ms			
Vibration Resistance	Conforming to IEC 60068-2	-6 10 gn, +/- 1 mm (10–55 Hz	z)		
Power Requirements					
Supply Voltage	30 mm: 24 Vdc (12–30 Vdc limits)		32 mm: 24–240 Vac (20–264 Vac limits)		
Max. Load	200 mA				
Environment	·				
Operating Temperature Range	-25 +70 °C (-13 +158 °F)	−25 +70 °C (−13 +158 °F)			
Product Certification	CE, ETL				
Environmental Protection Ratings	IP67, NEMA 4X (Indoor Use	e Only), IP65 (Ø M12 PCM ar	nd Ø18 PCM)		
Connection	Precabled, PvC (2 m)				
Catalog Numbers					
Housing Material	Stainless Steel	Nickel	Plated Brass		
Cable (flush mountable)	Catalog No.	Catalog No.	Catalog No.		
3-wire / PNP / N.O. function	XT112S1PAL2	XT118B1PAL2	XT130B1PAL2		
3-wire / NPN / N.O. function	XT112S1NAL2	XT118B1NAL2	XT130B1NAL2		
4-wire / PNP / N.O./N.C. function	XT112S1PCL2	XT118B1PCL2	XT130B1PCL2		
Connector (flush mountable)		M12	·		
4-wire / PNP / N.O./N.C. function	XT112S1PCM12	XT118B1PCM12	XT130B1PCM12		

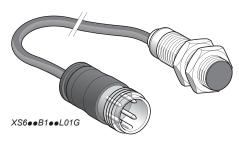




XS6••B1••U20





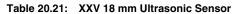




### Table 20.20: XUV Label Sensor



Sensing Characteristics	
Nominal Sensing Distance	3 mm (0.12 in.)
Switching Frequency	500 Hz
Power Requirements	
Supply Voltage	12-24 Vdc (10-30 Vdc limits)
Max. Load	100 mA
Environmental	
Operating Temperature Range	+5 to +55 °C (+41 to +131 °F)
Environmental Protection Ratings	IP65, NEMA 4X (indoor use only), 5, 12, 12k, 13
Construction	
Flat Profile Dimensions (W x H x D)	92.5 x 47.3 x 16.0 mm (3.64 x 1.86 x 0.63 in.)
Housing Material	Aluminium
Transducer	Glass Epoxy
Connection	Catalog No.
M8 Connector	XUVU06M3KCNM8
Precabled (2 m)	XUVU06M3KCNL2





Sensing Character	istics			
Nominal Sensing Dist	ance	2 mm to 50.8 mm (0.08 in. to 2.0 in.)		
Switching Frequency		80 Hz		
Power Requiremen	ts			
Supply Voltage		12–24 Vdc		
Max. Load		200 mA		
Environmental				
Operating Temperatur	re Range	0 to 60 °C (32 to 140 °F)		
Environmental Protect	tion Ratings	NEMA Type 4 and 13, and IP67		
Construction				
Barrel Dimensions (Ø	x L)	18 x 1 x 43.2 mm (0.71 x 0.04 x 1.70 in.)		
Housing Material		Nickel Plated Brass		
Transducer		Glass Epoxy		
Connection		Catalog No.		
Cable		Precabled, PvC (2 m)		
PNP	N.O.	XXV18B1PAL2		
FINE	N.C.	XXV18B1PBL2		
NPN	N.O.	XXV18B1NAL2		
INFIN	N.C.	XXV18B1NBL2		
Connection		M12		
PNP	N.O.	XXV18B1PAM12		
FINP	N.C.	XXV18B1PBM12		
NPN	N.O.	XXV18B1NAM12		
INF'IN	N.C.	XXV18B1NBM12		

Table 20.22: Sensor Accessories

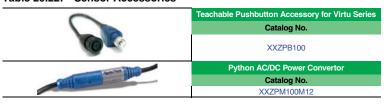


Table 20.23: Mounting Brackets

M12 9006PA12	
W112 9006PA12	
M18 9006PA18	
M30 9006PA30	

Table 20.24: Accessories







		mm	Catalog No.
Reflectors	24 x 21	XUZC24	
	Ø 80	XUZC80	
		50 x 50	XUZC50
		Material	Catalog No.
Mounting Brackets for XUB	Die Cast Zinc	XUZA118	
Mounting Brackets for AOB		Plastic	XUZA218
		90°	Straight
		Catalog No.	Catalog No.
Cables (PUR), 2 m, without LED ★ Suitable plug-in female connectors, including pre-wired versions	M8 (4-Pin)	XZCP1041L2	XZCP0941L2
	M12 (4-pin)	XZCP1241L2	XZCP1141L2
Cultable plug-in lemale confidences, including pre-wired versions	1/2- 20UNF	XZCP1965L2	XZCP1865L2

For 5 or 10 meter lengths, replace 2 in the cable catalog number with 5 or 10.









XZCP1241L2

XZCP1141L2

Specifications



### Table 20.25: Specifications and Catalog Numbers





	Virtu™	VM1	and	VM <sub>1</sub>	8
--	--------	-----	-----	-----------------	---

Specifications									
Sensing Characteristics									
Sensing Range	51-508 mm (2-20 in.)								
Max. Switching Frequency	300 Hz								
Power Requirements									
Supply Voltage	12–24 Vdc								
Supply Current	40 mA (excluding load)					-			
Environmental Ratings	, , , , , , , , , , , , , , , , , , , ,								
Operating									
Temperature	–30 to 70 °C (–22 to 158 °F)								
Environment	NEMA 4X (indoor use only), IP67								
Construction									
VM18 Barrel, ØxL	18 x 1 x 77.62 mm (0.709 x 3.06 in.)								
VM1 Dual Mount	Ø 18 mm and Flat Format 43.7 x 18 x	59.7 mm (1.7	2 x 0.70 x 2.35 in.)						
Housing Material	PBT Resin	•	,						
Transducer	Glass Epoxy								
Output Type			Catalog Numl	per					
				ible	Quick Di	sconnect			
	Output		Dual Mount	Barrel	Dual Mount	Barrel			
		N.O.	VM1PNO	VM18PNO	VM1PNOQ	VM18PNOQ			
	PNP Sourcing	N.C.	VM1PNC	VM18PNC	VM1PNCQ	VM18PNCQ			
		N.O.	VM1NNO	VM18NNO	VM1NNOQ	VM18NNOQ			
	NPN Sinking	N.C.	VM1NNC	VM18NNC	VM1NNCQ	VM18NNCQ			
Proximity		N.O.							
	PNP Sourcing	N.C.	VM1PTO	VM18PTO	VM1PTOQ	VM18PTOQ			
		N.O.							
	NPN Sinking	N.C.	VM1NTO	VM18NTO	VM1NTOQ	VM18NTOQ			
		PNP	VM1PPI0000	VM18PPI0000	VM1PPI0000Q	VM18PPI0000C			
	Off at loss of echo and at powerup	NPN	VM1NPI0000	VM18NPI0000	VM1NPI0000Q	VM18NPI00000			
Dual-Level			VM1PPI1000	VM18PPI1000	VM1PPI1000Q	VM18PPI10000			
Pump In Normally Open	On at loss of echo and at powerup	PNP NPN	VM1NPI1000	VM18NPI1000	VM1NPI1000Q	VM18NPI10000			
Normany Open	Hold on loss of echo,	PNP	VM1PPI2000	VM18PPI2000	VM1PPI2000Q	VM18PPI2000C			
	Off at powerup	NPN	VM1NPI2000	VM18NPI2000	VM1NPI2000Q	VM18NPI20000			
		PNP	VM1PPO0000	VM18PPO0000	VM1PPO0000Q	VM18PPO00000			
	Off at loss of echo and at powerup	NPN	VM1NPO0000	VM18NPO0000	VM1NPO0000Q	VM18NPO00000			
Dual-Level		PNP	VM1PPO1000	VM18PPO1000	VM1PPO1000Q	VM18PPO10000			
Pump Out Normally Open	On at loss of echo and at powerup	NPN	VM1NPO1000	VM18NPO1000	VM1NPO1000Q	VM18NPO10000			
Normany Open	Hold on loss of echo,	PNP	VM1PPO2000	VM18PPO2000	VM1PPO2000Q	VM18PPO20000			
	Off at powerup	NPN	VM1NPO2000	VM18NPO2000	VM1NPO2000Q	VM18NPO20000			
		Voltage 0–1 For Direct/	0 Vdc with Tempera Inverse models, char	ature Compensation nge VD or VI to VA.	n				
	Direct, 0 V at loss of echo and at pow	erup	VM1VD0000	VM18VD0000	VM1VD0000Q	VM18VD0000Q			
	Inverse, 0 V at loss of echo and at por	werup	VM1VI0000	VM18VI0000	VM1VI0000Q	VM18VI0000Q			
	Direct, 10 V at loss of echo and at por	werup	VM1VD1000	VM18VD1000	VM1VD1000Q	VM18VD1000Q			
	Inverse, 10 V at loss of echo and at po	owerup	VM1VI1000	VM18VI1000	VM1VI1000Q	VM18VI1000Q			
	Direct, hold on loss of echo, 0 V at po	werup	VM1VD2000	VM18VD2000	VM1VD2000Q	VM18VD2000C			
	Inverse, hold on loss of echo, 0 V at p	owerup	VM1VI2000	VM18VI2000	VM1VI2000Q	VM18VI2000Q			
	Direct, hold on loss of echo, 10 V at p	owerup	VM1VD3000	VM18VD3000	VM1VD3000Q	VM18VD3000C			
\	Inverse, hold on loss of echo, 10 V at	powerup	VM1VI3000	VM18VI3000	VM1VI3000Q	VM18VI3000Q			
Analog			20 mA with Tempera Inverse models, char						
	Direct, 4 mA at loss of echo and at po		VM1CD0000	VM18CD0000	VM1CD0000Q	VM18CD00000			
	Inverse, 4 mA at loss of echo and at p	•	VM1CI0000	VM18Cl0000	VM1CI0000Q	VM18CI0000Q			
	Direct, 20 mA at loss of echo and at p		VM1CD1000	VM18CD1000	VM1CD1000Q	VM18CD1000C			
	Inverse, 20 mA at loss of echo and at		VM1CI1000	VM18CI1000	VM1CI1000Q	VM18CI1000Q			
	Direct, hold on loss of echo, 4 mA at p		VM1CD2000	VM18CD2000	VM1CD2000Q	VM18CD2000C			
	Inverse, hold on loss of echo, 4 mA at		VM1CI2000	VM18Cl2000	VM1Cl2000Q	VM18CI2000Q			
	Direct, hold on loss of echo, 20 mA at		VM1CD3000	VM18CD3000	VM1CD3000Q	VM18CD30000			
	Inverse hold on loss of echo 20 mA :	at nowerup	VM1Cl3000	VM18Cl3000	VM1Cl3000Q	VM18Cl3000Q			

VM1Cl3000

Inverse, hold on loss of echo, 20 mA at powerup

VM18Cl3000Q

VM1Cl3000Q

VM18Cl3000

## Sensors www.schneider-electric.us

### Table 20.26: Specifications and Catalog Numbers







Virtu™ 30 mm

M30 30 mm (1 or 2 m)

M30 30 mm (8 m)

				30 mm (1 or 2	m)	30 mm (8	m)		
Specifications									
Sensing Characteris	stics								
Sensing Range	102-1000 mm (4-39 in.)		51 mm to 1 m (	2–39 in.); 119 mm to	2 m (4.7–79 in.)	304.8 mm to 8 m (12-315 in.)			
Sensing Frequency	180 kHz		200 kHz			75 kHz			
Power Requirement	s ·								
Supply Voltage	12-24 Vdc discrete, 15-24 Vd	dc analog	12-24 Vdc disc	rete; 15–24 Vdc ana	alog	12–24 Vdc discrete; 15–24 Vdc analog			
Supply Current	40 mA discrete, 90 mA analog	•	80 mA (excludir			80 mA (excluding load)			
Environmental Ratir		,		,		, , ,			
	ĭ		0 to 50 °C (32 to	o 122 °F) discrete		-20 to 60 °C (-4 to 140 °F)			
Operating Temperatur	e 0 to 70 °C (32 to 158 °F)		–20 to 60 °C (–	4 to 140 °F) analog		TF option: -40 to 60 °C (-40 to			
Environment	NEMA 4X (indoor use only), I	P67	NEMA 4X (indo	or use only), IP67		NEMA 4X (indoor use only), IP6	7		
Construction									
Barrel, ØxL	30 x 1 x 95.26 mm (1.18 x 3.7	75 in.)	30 x 1 x 95 mm	(1.18 x 3.74 in.)		30 x 1 x 116 mm (9.18 x 4.58 in	.)		
Housing Material	PBT Resin		PEI Resin			PEI Resin			
Transducer	Glass Epoxy		Silicon Rubber	or Fluorosilicone		Glass Epoxy			
Output Type			1 m / 2 m			8 m			
	Description	Catalog No.	Description		Catalog No.	Description	Catalog No.		
	PNP Sourcing N.O.	XX6V3A1PAM12		Connector	SM950A100000	·			
	PNP Sourcing N.C.	XX6V3A1PBM12	1 m	Cable	SM900A100000	Cable	SM900A800000		
Proximity Output	NPN Sinking N.O.	XX6V3A1NAM12	+	Connector	SM950A400000		+		
	NPN Sinking N.C.	XX6V3A1NBM12	2 m	Cable	SM900A400000	Connector	SM950A800000		
	Connector	7010707111211112	Cable 1 m ▲	Cable	PNP, NO	Cable 8 m	PNP, NO		
	Normally	Opon			SM902A100000	Pump-out latch	SM902A800000		
	Hold on loss of echo; Off on p		<u> </u>		Pump-out latch Pump-out latch w/alarm		SM902A100000 SM902A1560000	Pump-out latch w/alarm	SM902A8560000
	PNP	XX2V3A1PGM12	Pump-out latch, w/setpoint		SM902A1760000	Pump-out latch, w/setpoint	SM902A8360000 SM902A8760000		
Dual-Level	NPN	XX2V3A1PGM12			Pump-in latch		SM902A1760000 SM902A110000	Pump-in latch	SM902A8760000
Pump In				Pump-in latch w/alarm SM902A1460000		<u>'</u>			
	PNP	ff on loss of echo; Off on power up  PNP XX2V3A1PFM12			SM902A1460000 SM902A1660000	Pump-in latch w/alarm	SM902A8460000 SM902A8660000		
	NPN	XX2V3A1PFM12 XX2V3A1NFM12	Pump-in latch, v	w/setpoint	SM902A1260000 SM902A1260000	Pump-in latch, w/setpoint  Dual setpoint	SM902A8660000		
	Hold on loss of echo; Off on p		Dual alarm		SM902A1260000 SM902A1360000	Dual alarm	SM902A8360000		
	PNP				Ų.				
		XX2V3A1PJM12	Connector		PNP, NO	Connector	PNP, NO		
		NPN         XX2V3A1NJM12         Pump-out latch         SM952A100000           on loss of echo; Off on power up         Pump-out latch w/alarm         SM952A1560000				Pump-out latch	SM952A800000		
						Pump-out latch w/alarm	SM952A8560000		
Dual-Level Pump Out			Pump-out latch, w/setpoint		SM952A1760000	Pump-out latch, w/setpoint	SM952A8760000		
i ump out	NPN	XX2V3A1NHM12	Pump-in latch	/ 1	SM952A110000	Pump-in latch SM952A81000 Pump-in latch w/alarm SM952A84600			
			Pump-in latch v		SM952A1460000				
			Pump-in latch,	w/setpoint	SM952A1660000	Pump-in latch, w/setpoint	SM952A8660000		
			Dual setpoint		SM952A1260000	Dual setpoint	SM952A8260000		
			Dual alarm		SM952A1360000	Dual alarm	SM952A8360000		
	Quick Disconnect		Cable 1 m ▲		,	Cable 8 m			
	0–20 mA	Catalog No.	Voltage		Catalog No.	Voltage	Catalog No.		
	Direct/Inverse slope	XX9V3A1C4M12	Auto slope		SM906A180000	Auto slope	SM906A880000		
	Direct output	XX9V3A1D4M12	Direct slope		SM906A110000	Direct slope	SM906A810000		
	Inverse output	XX9V3A1E4M12	Inverse slope		SM906A100000	00 Inverse slope SM906A8000			
	4–20 mA		Current			Current			
	Direct/Inverse slope	XX9V3A1C2M12	Auto slope		SM906A190000	Auto slope	SM906A890000		
	Direct output	XX9V3A1D2M12	Direct slope		SM906A130000	Direct slope	SM906A830000		
	Inverse output	XX9V3A1E2M12	Inverse slope		SM906A120000	· · · · · · · · · · · · · · · · · · ·			
Analog	0-5 Vdc		Connector			Connector			
• •	Direct/Inverse slope	XX9V3A1F3M12	Voltage			Voltage			
	Direct output	XX9V3A1G3M12	Auto slope		SM956A180000	Auto slope	SM956A880000		
	Inverse output	XX9V3A1H3M12	Direct slope		SM956A110000	Direct slope	SM956A810000		
	0–10 Vdc	AAO VOATI IOIVITZ			SM956A100000	•	SM956A800000		
		)((() (() 4 ) = · · · · ·	Inverse slope		OUUUUI Aaceivic	Inverse slope	ONIONARGENIE		
	Direct/Inverse slope	XX9V3A1F1M12	Current		,	Current	_		
	Direct output	XX9V3A1G1M12	Auto slope		SM956A190000	Auto slope	SM956A890000		
	Inverse output	XX9V3A1H1M12	Direct slope		SM956A130000	Direct slope	SM956A830000		
					SM956A120000	Inverse slope	SM956A820000		

For the 2 m version, change model from SMxxxA1xxxxx to SMxxxA4xxxxx.

# **Section 21**

### **Limit Switches**



### **Encapsulated Miniature**

### **Industrial Snap Switches**





9007MS, 21-8

9007A, p. 21-6

### Modular, Miniature and Compact





**XCMD**, 21-14

XCKD, 21-14





**XCKP**, 21-14

**XCKT**, 21-15

### **Compact General Duty**





XCKL, 21-22

**9007C**, p. 21-32

### **Heavy Duty Industrial**





**9007C**, p. 21-26

**XCKJ**, 21-40

### Severe Duty





**9007T**, 21-37

L100, 21-39

### **Part Numbers**

9007A and 9007C	Basic snap switch without enclosures with or without operators	21-6
9007MS and 9007ML	Encapsulated switches with NEMA 6P rating and 10 A contacts	21-8
XCMD	Osisense miniature metal modular	21-14
XCMN	Osisense compact non-modular	21-14
XCKD	Osisense compact metal modular	21-14
ХСКР	Osisense compact plastic modular	21-14
хскт	Osisense compact plastic with 2 side-cable entries and modular head	21-15
XCDR	Osisense compact metal with manual reset	21-15
XCPR	Osisense compact plastic with manual reset	21-15
ZCE, ZCY	Osisense component heads and lever arms	21-16
ZCD, ZCMC, ZCMD, ZCP, ZCPE	Osisense component bodies, cable plug assemblies, and conduit entries	21-17
XCKN, XCNR	Osisense compact, plastic, non-modular	21-18
XCKS	Standard body, plastic, double insulated	21-19
XCKL	Compact general duty, metal, with direct opening contacts	21-22
хскј	Precision switches with direct acting contacts to meet most international standards	21-26
9007C	Heavy duty, oiltight, watertight switches, with compact types available	21-32
9007T and 9007FT	Severe duty, oiltight mill and foundry switches with 20 A contacts	21-37
L100/L300	Severe duty, oiltight mill and foundry switches with up to 3 circuits	21-39



### Schneider Electric www.schneider-electric.us

Design		Miniatu	re			Compact	
Catalog number	9007 A/O	9007 MS/ML	XCMN	XCMD	XCKP	XCKD	XCKL
Page	21-6	21-8	21-14	21-14	21-14	21-14	21-22















				3 00			1
Enclosure	Open, plastic	Metal body, metal head	Plastic, double insulated	Metal	Plastic, double insulated	Metal	Metal
Features	A variety of operators are available.	Bottom or side cable entry. Full range of operating heads. See page 21-8.	Mounting by the bo	ody or by the head			1 conduit entry
Modularity	Selected operators	Operator	_	Head, body, lever, and c	onnector		Head, body, and lever
Conforming to standards			_	_	CENELEC: EN 50047		_
Body dimensions (w x h x d), mm (in.)	29.0 x 63.5 x 21.0 (1.14 x 2.5 x 0.83)	40.1 x 44.4 x 15.8 (1.58 x 1.75 x 0.62)	30 x 50 x 16 (1.18 x 1.97 x 0.63	)	31 x 65 x 30 (1.22 x 2.56 x 1.18)		52 x 72 x 30 (2.05 x 2.83 x 1.18)
Head	Linear	Linear or rotary	Rotary movement, Rotary movement,	inear movement, plunger Rotary movement, lever Rotary movement, multi-directional A Rame heads for ranges XCMD, XCKD, XCKP and XCKT			
Contact blocks							
2 snap action contacts 🗪	_	_	N.C. + N.O.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.
2 snap action contacts	_	_	N.C. + N.O.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.
3 snap action contacts	_	_	_	N.C. + N.C. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.
3 snap action contacts	_	_	_	N.C. + N.C. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.
4 snap action contacts 🗪	_	_	_	N.C. + N.C. + N.O. + N.O.	_	_	_
4 snap action contacts	_	_	_	N.C. + N.C. + N.O. + N.O.	_	_	_
2 slow break contacts break before make	_	_	_	N.C. + N.O.	N.C. + N.O.	N.C. + N.O.	N.C. + N.O.
2 slow break contacts break before make	_	_	_	N.C. + N.O.	N.C. + N.O.	N.C. + N.O.	N.C. + N.O.
2 slow break contacts make before break	_	_	_	_	N.O. + N.C.	N.O. + N.C.	N.O. + N.C.
2 slow break contacts make before break	_	_	_	_	N.O. + N.C.	N.O. + N.C.	N.O. + N.C.
2 slow break contacts simultaneous	_	_	_	_	N.C. + N.C.	N.C. + N.C.	N.C. + N.C.
2 slow break contacts simultaneous	_	_	_	_	N.O. + N.O.	N.O. + N.O.	N.O. + N.O.
3 slow break contacts break before make	_	_	_	N.C. + N.C. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.
3 slow break contacts break before make	_	_	_	N.C. + N.C. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.
2 snap action contacts	N.C. + N.O., N.O. + N.O.	N.C. + N.O.	_	_	_	_	_
4 snap action contacts	N.C. + N.C., N.O. + N.O.	_	_	_	_	_	_
Insulation voltage (Ui) / thermal current (Ithe)	See page 21-6	300 Vac/Vdc 10 A (standard)	Screw terminal 2 contacts: 400 V/6 A	Pre-cabled 2 contacts: 400 V/6 A 3 contacts: 400 V/4 A 4 contacts: 400 V/3 A	Screw terminal: 2 contacts: 500 V/10 A 3 contacts: 400 V/6 A Connector: Integral M12, 4-pin: 250 V/3 A	Screw terminal: 2 contacts: 500 V/10 A 3 contacts: 400 V/6 A Connector: Integral M12, 5-pin: 60 V/4 A	Screw terminal: 2 contacts: 500 V/10 A 3 contacts: 400 V/6 A
Enclosure rating IP = IEC enclosure rating IK = EN shock test standard	None	NEMA Types 1, 2, 4, 6, 6P, 12, 13 IP67	NEMA Types 1, 2, 13 IP 65, IK 04	NEMA Types 1, 2, 4X, 6, 12 IP 66, IP 67, IP 68, IK 06	NEMA Types 1, 2, 4, 6, 6P, 12, 13 IP 66, IP 67, IK 04	NEMA Types 1, 2, 4, 6, 12, 13 IP 66, IP 67, IK 06	NEMA Types 1, 2, 4, 6, 6P, 12, 13 IP 66, IK 06
Electrical connection	Screw terminal or Faston® connector	Pre-wired cable or M12 connector	Pre-wired cable	Pre-cabled. Connector: Integral or remote M12 or remote 7/8" 16UN	ector: M16, M20, Pg 11, PG 13, 1/2" NPT, or PF 1/2 connector:		Screw terminal: M20 or 1/2" NPT

<sup>▲</sup> Flexible operators do not guarantee direct (positive) opening operation.

Design		Standard Duty Industrial	Severe Duty M	lill and Foundry	
Catalog number	9007C	XCKJ	xcks	9007T/FT	L100/L300
Page	21-32	21-32	21-19	21-37	21-39
		di any di	in o		To care of
		Burney Market Ma	CONTRACTOR OF THE PARTY OF THE		A E D Collection The Collection of the Collectio
Enclosure	Metal, diecast, zinc alloy	Metal	Plastic, double insulated	Metal	Metal
Features	Plug-in body	Fixed or plug-in body, -40 °C (-40 °F) or +120 °C (+248 °F) versions	_	Extra heavy duty contact ratings	<ul> <li>Extra heavy duty contact ratings</li> <li>High temperature option, unique in the marketplace</li> </ul>
Modularity	Head, body, and lever			Lever	
Conforming to standards / Product certifications	UL 508, C22-2-14-95, NEMA 250, IEC 60947, EN 60947-1, EN 60947-5-1	CENELEC: EN 50041	CENELEC: EN 50041	NEMA A600 UL508 UL Listed, CSA Certified	NEMA A600 UL508 UL Listed, CSA Certified
Body dimensions (w x h x d), mm (in.)	Standard: 39 x 102 x 45 (1.54 x 4.02 x 1.77) Compact: 39 x 80 x 45 (1.54 x 3.15 x 1.77)	40 x 77 x 44 (1.57 x 3.03 x 1.73) 42.5 x 84 x 36 (1.67 x 3.31 x 1.42)	40 x 72.5 x 36 (1.57 x 2.85 x 1.42)	58.7 x 114.3 x 64.5 (2.31 x 4.5 x 2.54)	58.7 x 126 x 53.3 (2.31 x 4.95 x 2.10)
Head	Linear movement, plunger Rotary movement, lever Multi-directional movement (wobble stick, cat whisker) •	Linear movement, plunger Rotary movement, lever Rotary movement, multi-directional ◆	Linear movement, plunger Rotary movement, lever Rotary movement, multi-directional ◆	Rotary movement, lever	Rotary movement, lever
Contact blocks				_	Various options available for
2 snap action contacts 🗪	_	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	_	L100, 2- and 3-pole devices.
2 snap action contacts	_	N.C. + N.O.; N.C. + N.C.	N.C. + N.O.; N.C. + N.C.	_	_
3 snap action contacts	_	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	_	_
3 snap action contacts	_	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.	_	_
4 snap action contacts	_	_	_	_	_
4 snap action contacts	_	_	_		_
2 slow break contacts break before make	_	N.C. + N.O.	_	_	_
2 slow break contacts break before make	_	N.C. + N.O.	_	_	_
2 slow break contacts make before break	_	N.O. + N.C.	_	_	_
2 slow break contacts make before break	_	N.O. + N.C.	_	_	_
2 slow break contacts simultaneous	_	N.C. + N.C.	_	_	_
2 slow break contacts simultaneous	_	N.O. + N.O.	N.O. + N.O.	_	_
3 slow break contacts break before make	_	N.C. + N.C. + N.O. ; N.C. + N.O. + N.O.	N.C. + N.C. + N.O.; N.C. + N.O. + N.O.		_
3 slow break contacts	_	N.C. + N.C. + N.O. ;	N.C. + N.C. + N.O.;	_	_
break before make  1 slow break contact Form Y1561 ▲	1 N.C	N.C. + N.O. + N.O. —	N.C. + N.O. + N.O. —		_
2 snap action contacts	1 N.O. + 1 N.C.	2 C/O	2 C/O	1 N.C. + 1 N.O.■	1 N.C. + 1 N.O.■
4 snap action contacts	2 N.O. + 2 N.C. ; 2 N.O. + 2 N.C. , neutral position;	_	_	convertible sequence —	Some conversions possible  —
Insulation voltage (Ui) and thermal current (Ithe)	2 N.C. + 2 N.C. , two stage  Ui = 600 V, except: 9007C62, 9007C66, 9007C68 (Ui = 250 V) and 9007C84, 9007C86 (Ui = 125 V)  Ithe = 10 A, except: 9007C84, 9007C86 (Ithe = 2.5 A)	Screw terminal 2 contacts: 500 V/10 A 3 contacts: 400 V/6 A  Connector Integral M12, 5-pin: 60 V / 4 A Integral 7/8" 16UN: 250 V / 6 A	Screw terminal 2 contacts: 500 V/10 A 3 contacts: 400 V/6 A	600 V 20 A (AC/DC)	600 V 20 A (AC), 5 A (DC)
Enclosure rating IP = IEC enclosure rating IK = EN shock test standard	IP 67 conforming to IEC 60529, NEMA Types 2, 4, 6, 6P, 12, 13	NEMA Types 1, 2, 4, 12 IP 66, IK 07	IP 65, IK 03	NEMA Types 1, 2, 4, 12, 13 IP65, 66, 67	NEMA Types 1, 4, 13 IP65, 66
Electrical connection	Cable entry 1/2"-14 NPT, M20 x 1.5 ISO cable entry Connector Integral 5-pin mini-connector	Screw terminal M20 x 1.5, PG13, or 1/2" PT Connector Integral M12 or 7/8" 16UN	Screw terminal M20 x 1.5 or PG13	Cable entry 1/2" NPT or PG13.5	Cable entry 1/2" NPT or 3/4" NPT Other options available Connector 7/8" 16UN or Cannon MS3102E20-AP or equal; other options available

Single pole only. Refer to page 21-29 for details.
For other contact options, see catalog 9006CT1007.
Flexible operators do not guarantee direct (positive) opening operation.

**Enclosure Ratings** Table 21.1:

					٠									
Time		NEMA Style							IEC Style					
Туре	1	2	3	4	4X	6	6P	7	9	12	13	IP65	IP66	IP67
9007C	•	•		•		•	•			•	•	•	•	•
9007CR	•	•		•		•	•	•	•	•	•			
9007FT	•	•		•						•	•	•	•	•
L100/L300	•			•							•	•	•	
9007MS/ML ◆	•	•	•	•		•	•			•	•			•
9007T	•	•		•						•	•	•	•	•
XCKJ	•	•	•	•						•			•	
XCKL	•	•	•	•						•			•	
XCKN & XCNR					•					•		•		
XCKP & XCKT ■	•			•						•		•		
XCKS, XCMN												•		
XCMD, XCKD					•		•			•	•		<b>A</b>	•

- Indicates NEMA or IEC Type Rating available for each product.
  For indoor use only—not UV protected.
  Enclosure ratings are NEMA 1, 2, 3, 4, 6, 6P, 12, and 13 except for option 21 (low force) which is NEMA 1 only. The 9007 MS/ML05 (omni-directional operation) enclosure ratings are NEMA 1, 2, 12, and 13

**Table 21.2:** Sealing

	Material				
	Standard shaft seals on lever types	Fluorocarbon rubber (FKM)			
9007C, CR	Plunger and wobble stick boots	Neoprene; Fluorocarbon optional			
	All other seals	Nitrile (Buna N); Fluorocarbon optional			
R.B.Denison™ L	PVC				
	Shaft seal	Nitrile (Buna N)			
9007T and FT	Cover gasket	Nitrile (Buna N)			
	Base plate gasket	Cellulose fiber laminate			
XCKJ, XCKL, XCKS	XCKJ, XCKL, XCKS				
XCMD, XCKD, XCK	Nitrile (Buna N) and silicon				

Table 21.3: **Ambient Temperature Ranges** 

The low temperatures listed below are based on the absence of freezing moisture or water. Care should be taken to avoid sub-freezing temperatures where dripping or splashing water is present and to avoid bringing a cold switch into a warm humid atmosphere and then back into sub-freezing temperatures. The water or moisture can freeze around the switch lever arm or plunger and cause jamming.

Туре	Low Temperature	High Temperature at Full Rated Load		
9007 C				
Lever Type	-20 °F (-28.9 °C)	+185 °F (+85 °C)		
Plunger & Wobble Stick Type	0 °F (-17.8 °C)	+185 °F (+85 °C)		
9007 FT★, T	-10 °F (-23 °C)	+185 °F (+85 °C)		
HL100/HL300	0 °F (-17.8 °C)	+350 °F (+177 °C)		
L100/L300	0 °F (-17.8 °C)	+200 °F (+93 °C)		
9007 MS/ML	-4 °F (-20 °C)	+221 °F (+105 °C)		
XCKJ, XCKL, XCKP, XCKT	-13 °F (-25 °C)	+158 °F (+70 °C)		
XCMN, XCKN, XCNR	-13 °F (-25 °C)	+158 °F (+70 °C)		
xcks	-13 °F (-25 °C)	+158 °F (+70 °C)		
XCMD	-13 °F (-25 °C)	+158 °F (+70 °C)		

The Type FT will withstand hot falling sand up to +300°F (+149 °C); however, ambient temperature for the FT switch is the same as the Type T above (+185 °F, +85 °C). Do not use in higher temperature ambients.

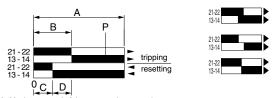
Some switches are available with higher or lower temperature limits, by selecting special versions or special options. Refer to the respective product sections for further information. (Ex.: 9007MS/ML, see page 21-9.)

Table 21.4: **Electrical Contact Ratings** 

AC—NEMA A600						DC				
	Max. Current—35% Power Factor						Maximum Current			
Volts	Ma	ıke	Bre	eak	Continuous	Volts	Make or	Make or Break Contin		
	Α	VA	Α	VA	Carrying Amperes		Α	VA	Carrying Amperes	
120	60	7200	6	720	10	125	1.1/0.55 ▼	138/69 ▼	5/2.5 ▼	
240	30	7200	3	720	10	I	_	_	_	
480	15	7200	1.5	720	10	250	0.27	67.5	2.5	
600	12	7200	1.2	720	10	600	0.10	60	2.5	

Type C52 compact unit ratings at 125 Vdc—same ratings as C54, CF53 and CR53 at other voltages

#### Table 21.5: **Contact Function Diagrams**



Make-before-break (overlapping) SPDT The normally open contact closes before the normally closed contact opens.

Break-before-make (offset) SPDT The normally closed contact opens before the normally open contact closes.

Simultaneous make and break—SPDT The normally closed contact opens at the same time as the normally open contact closes.

A=Maximum travel of the operator in mm or degrees.
B=Tripping travel of the contact.
C=Reset travel.

D=B-C=Differential travel

P=Point from which positive opening is assured

Table 21.6: Wiring Diagrams

	•	5										
•	•					<b>→</b>	<u>▼ ▼</u> ○	• • • • • • • • • • • • • • • • • • •	<u>▼</u> ▼ • • • • • • • • • • • • • • • • • •		· • • • • • • • • • • • • • • • • • • •	
Form A	Form B	Form C	Form AA	Form BB	Form CC	Form X	Form Y	Form Zb	Form Z	Form XX	Form YY	Form ZZ
SPST-NO	SPST-NC	SPDT	DPST-NO	DPST-NC	DPDT	SPST- NO-DB	SPST- NC-DB	SPDT-DB Isolated Contacts	SPDT-DB	DPST- NO-DB	DPST- NC-DB	DPDT-DB

Contact Configurations—Direct opening contacts meet IEC 60947-5-1 requirements.

For contacts used in safety applications (end of travel, emergency stop device, etc.) the assurance of direct opening is required (see IEC 204, EN 60204 or NF C 79-130) after each test. The opening of the contact must be verified by testing with an impulse voltage (2500 V).

Table 21.7: Maximum Current Ratings for Control Circuit Contacts—All Types

		Direct Opening			AC-	–50 or 60 l	-lz			DC		AC/DC
Switch	Contacts	Contacts Meet IEC 60947-5-1		Ind	luctive 35%	Power Fa	ctor	Resistive 75% Power Factor		Inductive a	nd Resistive	Continuous
Туре	Contacts	Requirements	٧	M	ake	Br	eak	Make and	٧	Make and Bi	reak Amperes	Carrying Amperes
		U		A	VA	A	VA	Break Amperes		Single Pole	Double Pole	· ·
L100/L300	SPDT with 2 or 3 Contacts Form Z	No	120 240 480 600	150 75 37.5 30	18000 18000 18000 18000	20 12.5 6.25 5	2400 3000 3000 3000	6 3 1.5 1.2	125 250 600	1.1 0.55 0.2 —	_	20/5
XCKD 2 Contacts	SPDT Form Zb	Yes	120 240	60 30	7200 7200	6 3	720 720	6 3	125 250	0.55 0.27	_	10/2.5
XCKD 3 Contacts	3 Pole Form Zb	Yes	120 240	30 15	3600 3600	3 1.5	360 360	3 1.5	125 250	0.22 0.11	_	5/1.0
XCKJ	SPDT Form Z	No	120 240	60 30	7200 7200	6 3	720 720	6 3	125 250	0.55 0.27	_	10
Plug-in	2 SPDT Form ZZ	No	480 600	15 12	7200 7200	1.5 1.2	720 720	1.5 1.2	600	0.1	_	10 10
KCKJ	SPDT Form Zb	Yes	120 240	60 30	7200 7200	6 3	720 720	6 3	125 250	0.55 0.27	_	10/2.5 10
Non-plug-in	2 SPDT Form ZZ	No	120 240	60 30	7200 7200	6 3	720 720	6 3	125 250	0.55 0.27	_	10/2.5 10
XCKL	SPDT Form Zb	Yes	120 240	60 30	7200 7200 7200	6 3	720 720	6 3	125 250	0.55 0.27	_	10
XCKN	2 Pole	Yes	120 240	60 30	7200 7200 7200	6 3	720 720 720	6 3	125 250	0.55 0.27	_	10/2.5
XCKP	SPDT Form Zb	Yes	120 240	60 30	7200 7200 7200	6	720 720 720	6	125 250	0.55	_	10/2.5
2 Contacts XCKP	3 Pole Form Zb	Yes	120	30	3600	3	360	3	125	0.27	_	5/1.0
3 Contacts XCKT	SPDT	Yes	240 120	15 60	7200	1.5	360 720	1.5 6	250 125	0.11 0.55	_	10/2.5
2 Contacts XCKT	Form Zb  3 Pole Form Zb	Yes	240 120	30 30	7200 3600	3	720 360	3	250 125	0.27 0.22	_	5/1.0
COMD	2,3 or 4 Pole	Yes	240 120	15 30	3600 3600	1.5	360 360	1.5 3	250 125	0.11 0.22	_	5/1.0
2-4 Contacts CCMN	Form Zb SPDT	Yes	240 120	15 30	3600 3600	1.5 3	360 360	1.5 3	250 125	0.11 0.22	_	5/1.0
2 Contacts KCNR	Form Zb 2 Pole	Yes	240 120	15 60	3600 7200	1.5 6	360 720	1.5 6	250 125	0.11 0.55		10/2.5
9007AO1, AC	SPST, Form X or Y (rated 0.5 hp @ 110 and 200 Vac)	No	120 240 480 600	30 40 20 10 8	7200 4800 4800 4800 4800	15 10 6 5	720 1800 2400 2880 3000	3 15 10 6 5	250 125 250 600	0.27 0.5 0.25 0.05	0.25 0.1 —	15
9007AO2, AO6, AB, AP	SPDT, Form Z  SPST, Form X or Y (rated 0.5 hp @ 110 and 200 Vac) SPDT, Form Z	No	120 240 480 600	40 20 10 8	4800 4800 4800 4800	15 10 6 5	1800 2400 2880 3000	15 10 6 5	125 250 600	2.0 0.5 0.1	0.5 0.2 0.02 —	15
9007CO3, CO6, CB, CC, CP	DPST Form AA or BB DPDT Form ZZ	No	120 240 480 600	30 15 7.5 6	3600 3600 3600 3600	3 1.5 0.75 0.6	360 360 360 360	3 1.5 0.75 0.6	125 250 600	1.0 0.3 0.1	0.2 0.1 —	10
	SPST Form Y1561 Slow break	Yes	120 240 480 600	60 30 15 12	7200 7200 7200 7200 7200	6 3 1.5 1.2	720 720 720 720 720	6 3 1.5 1.2	125 250 600	0.55 0.27 0.1 —	_	10/2.5
9007C	SPDT Form Z	No	120 240 480 600	60 30 15 12	7200 7200 7200 7200 7200	6 3 1.5 1.2	720 720 720 720 720	6 3 1.5 1.2	125 250 600 —	0.55 0.27 0.1 —	0.22 0.11 — —	10/2.5
	DPDT Form ZZ	No	120 240 480 600	60 30 15 12	7200 7200 7200 7200 7200	6 3 1.5 1.2	720 720 720 720 720	6 3 1.5 1.2	125 250 600 —	0.22 0.11 — —	0.22 0.11 — —	10/1.0
9007MS	SPDT Form C	No	120 240	60.0 30.0	7200 7200	6.0 3.0	720 720	_	_	_	_	10 (AC) / 5 (Res. @ 28 V
007ML	SPDT Form Z	No	120 240	60.0 30.0	7200 7200	6.0 3.0	720 720	_	-	_	_	10 (AC) / 5 (Res. @ 28 V
0007T and FT	SPDT Quick Make and Break Form Z	No	120 240 480 600	150 75 37.5 30	18000 18000 18000 18000	20 12.5 6.25 5	2400 3000 3000 3000	20 12.5 6.25 5.0	125 250 600 —	5.0 1.0 0.2 —	_	20
	All Slow Make and Break Form Z	No	120 240 480 600	60 30 15 12	7200 7200 7200 7200 7200	6 3 1.5 1.2	720 720 720 720 720	6 3 1.5 1.2	_	_	_	20
lectrical Symb	ols For Contacts	Form Z	a: the 2 cor	ntacts are th	ne same pol	arity.		Form Z	b: the 2 con	tacts are electric	ally separate.	
Symbols for Dir	rect Opening	Simplifie	ed Version					Comple	ete symbol			

Note: Alternate Current Ratings—Several product lines offer special versions or options with alternate contact configurations or contact materials, which may result in current ratings that differ from those listed above. Refer to the respective product sections for further information.

### **Industrial Snap Switches Without Enclosures**

Industrial snap switches have been incorporated in many Square D products such as timers, specialty push buttons, foot switches, operating mechanisms, door interlocks, motor control centers, limit switches, and many other control

Recommended Actuator: An adjustable actuator is recommended. If nonadjustable actuator is used, a resilient type or a mechanical stop should be used to prevent "bottoming" of button mechanism.

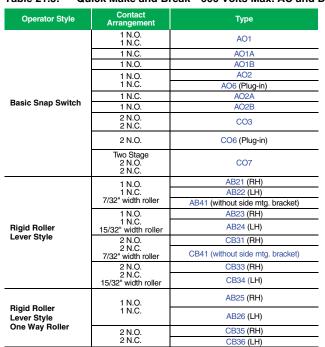
Adjustable Actuator Overtravel: Minimum recommended overtravel in both trip and reset directions is 0.015 in.

Adjustable Actuator Total Travel: Maximum differential limit plus 0.030 in. (Example: 0.076 in. for Type AO2.)

Nonadjustable Actuator Total Travel: Fully retracted—at least 0.139 in. for Type AO1 and 0.160 in. for Types AO2 and CO3 from mounting surface. Fully engaged—at least 0.061 in. but not closer than 0.045 in. from mounting surface.

Contact Configurations: Single-pole snap switches that contain two double-break contact elements (1 N.O. and 1 N.C.) must be used on circuits of the same polarity. Double-pole snap switches contain two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double-break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of the same polarity.





Operator Style	Contact Arrangement	Туре
0.11.12.01.1	1 N.O. 1 N.C.	AC1
Cabinet Door Style	2 N.O. 2 N.C.	CC1
	1 N.O. 1 N.C.	AP221
Plunger Style Panel Mounting	2 N.O. 2 N.C.	CP221
	Operator Only	AP201 🗆
	1 N.O. 1 N.C.	AP321
Roller Plunger Style Panel Mounting	2 N.O. 2 N.C.	CP321
Non-Oiltight	Arrangement   1 N.O.	CP324 △
	Operator Only	AP301 🗆
	Arrangement  1 N.O. 1 N.C. 2 N.O. 2 N.C. 1 N.O. 1 N.C. 2 N.O. 2 N.C. Operator Only  1 N.O. 2 N.C. Operator Only  1 N.O. 2 N.C. Operator Only  1 N.O. 2 N.C. Operator Only  1 N.O. 1 N.C. 2 N.O. 2 N.C. Operator Only  1 N.O. 1 N.C. 2 N.O. 2 N.O. 2 N.O. 2 N.C. Operator Only	AP304 △□
		AP323
	1 N.C.	AP325 △
Roller Plunger Style	2 N O	CP323
Panel Mounting Oiltight		CP325 △
- · · · · · · · · · · · · · · · · · · ·		AP303 □
	Operator Only	AP305 △□
		AP222
Mushroom Button Style Panel Mounting		CP222
	, ,	AP202 □

- Δ Roller turned 90° from standard (perpendicular to mounting holes).
- For use with Type AO and CO basic switches.





Type AB21



Type AP222 with 2358C22G6 mushroom button

#### Table 21.9: Maximum Current Ratings For Control Contacts—All Types

		AC—50 or 60 Hz					DC				
Switch Type			Inductive 35% Power Factor			Resistive 75% Power Factor		Inductive and Resistive		AC or DC	
	Contacts ◊	Voltage	Make Break		eak	Make and	Voltage	Make and Break Amperes		Continuous	
			A	VA	A	VA	Break Amperes		Single Pole	Double Pole	Carrying Amperes
AO1, AC	SPDT Form Z SPST Form X or Y	120 240 480 600	40 20 10 8	4800 4800 4800 4800	15 10 6 5	1800 2400 2880 3000	15 10 6 5	125 250 600 —	0.5 0.25 0.05 —	0.25 0.1 — —	15 15 15 15
AW, AO2, and AO6, AB, AP	SPDT Form Z SPST Form X or Y	120 240 480 600	40 20 10 8	4800 4800 4800 4800	15 10 6 5	1800 2400 2880 3000	15 10 6 5	125 250 600	2.0 0.5 0.1	0.5 0.2 0.02 —	15 15 15 15
AW, CO3, and CO6, CB, CC, CP	DPDT Form ZZ DPST Form AA or BB	120 240 480 600	30 15 7.5 6	3600 3600 3600 3600	3 1.5 0.75 0.6	360 360 360 360	3 1.5 0.75 0.6	125 250 600	1.0 0.3 0.1	0.2 0.1 —	10 10 10 10

Do **not** meet IEC 60947-5-1 requirements for direct opening contacts.

.....14–22 AWG Acceptable Wire Size . . . Recommended Terminal Clamp Torque ...... 6–9 lb-in (0.7–1.0 N•m)





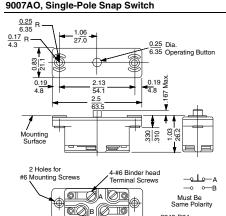




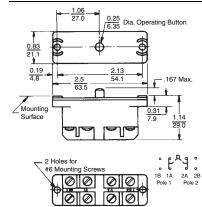
## Approximate Dimensions and Operating Data, 9007AO, CO, AP, and CP

**Industrial Snap Switches** 

### 9007AO, Single-Pole Snap Switch



### 9007CO, Two-Pole Snap Switch



Dual Dimensions	inches
Dadi Dimonolono	mm

	Operating Data, in. (mm)				
AO1, 1A, 1B	AO2, 2A, 2B				
0.057-0.074 (1.4-1.8) 0.015-0.025 (0.6-0.6) 0.103-0.125 2.6-3.2) 7-11 oz (0.05-0.08 N) 0.25 lb (0.11 kg)	0.057-0.074 (1.4-1.8) 0.035-0.046 (0.9-1.16) 0.103-0.125 (2.6-3.2) 10-14 oz (0.07-0.1 N) 0.25 lb (0.11 kg)				
000	0.057-0.074 (1.4-1.8) 0.015-0.025 (0.6-0.6) 0.103-0.125 2.6-3.2) 7-11 oz (0.05-0.08 N)				

	Operating Data, in. (mm)				
	CO3	C07			
Pre-travel 1st stage Pre-travel 2nd stage Differential Total travel Operating force Shipping weight	0.057-0.074 (1.4-1.8) 	0.035–0.060 (0.9–1.5) 0.060–0.085 (1.5–2.1) ▲ 0.010–0.020 (0.25–0.50) 			

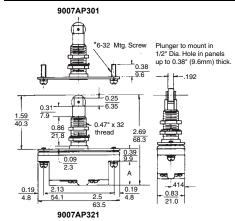
Separation between first and second stage trip points is 0.020-0.025 (0.5-0.6).

2242-D24

### 9007AP201, 221, and CP221

# 9007AP201 6-32 Mtg. Screw Plunger to mount in 1/2" Dia. Hole in panels up to 0.38" (9.6mm) thick. 0.47" x 32 thread 0.80 20.3 9007AP221

### 9007AP301, 303, 304, 305, 321, 323, 324, 325, and CP321, 323, 324, 325



Туре	Dimension A				
AP221	0.70 (17.8)				
CP221	0.80 (20.3)				
Onevetion Date in (mm)					

	AP221	CP221
Pretravel Differential Overtravel Total travel Operating force Shipping weight	0.070-0.089 (1.8-2.2) 0.035-0.046 (0.9-1.2) 0.161-0.180 (4.1-4.6) 0.231-0.269 (5.8-6.8) 10-14 oz (0.07-0.1 N) 0.25 lb (0.11 kg)	0.070-0.089 (1.8-2.2) 0.025-0.046 (0.9-1.2) 0.161-0.180 (4.1-4.6) 0.231-0.269 (5.8-6.8) 7-12 oz (0.05-0.08 N) 0.25 lb (0.11 kg)

Туре	Dimension A
AP321, 323, 324, 325	0.70 (17.8)
CP321, 323, 324, 325	0.80 (20.3)

	Operating Data, in. (mm)						
	AP321, 324	AP323, 325	CP321, 324	CP323, 325			
Pretravel Differential Total travel Operating force	0.060-0.150 (1.5-3.8) 0.035-0.046 (0.9-1.2) 0.200-0.340 (5.1-8.6) 20 oz (0.14 N)	0.060-0.150 (1.5-3.8) 0.035-0.046 (0.9-1.2) 0.200-0.340 (5.1-8.6) 28 oz (0.2 N)	0.060-0.150 (1.5-3.8) 0.025-0.046 (0.9-1.2) 0.200-0.340 (5.1-8.6) 26 oz (0.18 N)	0.060-0.150 (1.5-3.8) 0.035-0.046 (0.9-1.2) 0.200-0.340 (5.1-8.6) 28 oz (0.2 N)			



The heavy-duty, miniature MS limit switch is completely encapsulated and intended for difficult applications such as machine tools, earth moving equipment, and general transportation. 9007MS04S0084

The switch has 40 mm mtg hole centers.

### Table 21.10: Specifications

rabio zirror opoonii	Janono	
Temperature range (The minimum temperatures	-4 °F to +221 °F (-20 °C to +105 °C)	
listed are based on the absence of freezing moisture or water.)	For -40 °F / -40 °C minimum temperature, se Forms 21 and 80 in Table 21.13 on page 21-5 $$	
Enclosure rating	NEMA 1, 2, 4, 6, 6P, 12, 13, IP67	
Vibration resistance	10 G (75–1200 Hz)	
Shock resistance	35 G	
Contact Characteristics		
Rated thermal current	10 A (standard)	
Rated insulation voltage	300 Vac and Vdc (standard)	
Gold contact switching ratings	0.1A, 24 Vdc; 0.24 VA	
Cable	#18 AWG SJTO	

	Electrical Ratings/SPDT Form C (MS Type)			
MS Circuit—Form C	Sil	Gold Contacts		
1 N.O1 N.C.	Vac	Make	Break	
	120	60 A	6 A	100 mA @
n	240	30 A	3 A	125 Vac
GRN. 2 RED	10.0 An	30 mA 28 Vdc		
GRN. PT RED	DC Contact Rating: 5 A (Res), 28 Vdc			20 700

ML Circuit—Form Z	Electrical Ratings/SPDT-DB Form Z (ML Type)			
	Silver Contacts			
1 N.O1 N.C.	Vac	Make	Break	
	120	60 A	6 A	
RED OFFETTO WHT. GRN.	240	30 A	3 A	
BLK, OLO OF ORG.	10.0 Amperes, Continuous			
	DC Contact Rating: 5 A (Res), 28 Vdc			

Table 21.11: Selection (append prefix 9007 to the catalog number)

Description / Functional Diagram■	мѕ	ML	Operating Force/Torque	Contact Form	Contact Type	Catalog Number ▲
Top plunger				<u>'</u>		
	.070" max.	.080" max.	80 oz	SPDT Form C	Silver	MS01S0100
	Bk-W Bk-Rd Bk-W	Bk-Rd Bk-Rd Bk-W	80 oz	SPDT Form C	Gold	MS01G0100
	0 [.004*]← .19* max. min.	0  .03"   19" max. min.	80 oz	SPDT Form Z	Silver	ML01S0100
arallel roller plunger				1		l
$\Box$	Bk-Rd	.080" max. Bk-Rd	80 oz	SPDT Form C	Silver	MS02S0100
	Bk-Rd Bk-W 19*	Bk-Rd Bk-W 19"	80 oz	SPDT Form C	Gold	MS02G0100
	max. min.	max. min.	80 oz	SPDT Form Z	Silver	ML02S0100
ross roller plunger			I	I		I
$\Lambda$	Bk-Rd Bk-W	Bk-Rd Bk-W	80 oz	SPDT Form C	Silver	MS03S0100
🖯	Bk-W 0  .004"  19"	Bk-W 0   .03"   ■ .19"	80 oz	SPDT Form C	Gold	MS03G0100
	max. min.	max. min.	80 oz	SPDT Form Z	Silver	ML03S0100
otary lever, CW and CCW	35°	40°	48 oz-in	SPDT Form C	Silver	MS04S0100
Not included (see Table 21.14 on	Bk-Rd Bk-W Bk-Rd	Bk-Rd Bk-W Bk-Rd	48 oz-in	SPDT Form C	Gold	MS04G0100
page 21-9)	5°   70°	20°   ₹ 70°	48 oz-in	SPDT Form Z	Silver	ML04S0100
nnidirectional—wire whisker (	NEMA 1 2 12 13 only)		40 02-111	OI DITTOINI2	Olivei	WIE0430100
л	15°					
	Bk-Rd Bk-W	] <b>E</b>	15 oz-in	SPDT Form C	Silver	MS05S0100
	Bk-Rd Bk-W 5° ► 15°	1	15 oz-in	SPDT Form C	Gold	MS05G0100
ushing mounted—top plunger						
Д	.070" max.	.080" max.	80 oz	SPDT Form C	Silver	MS06S0100
	Bk-Rd Bk-W 0 1004*1 .19*	Bk-Rd Bk-W	80 oz	SPDT Form C	Gold	MS06G0100
	max. min.	0  .03"   19" max. min.	80 oz	SPDT Form Z	Silver	ML06S0100
ushing mounted—parallel rolle	er plunger	0001	20.00	CDDT Form C	Cibron	MC0700100
	Bk-Rd Bk-W	Bk-Rd Bk-W	80 oz	SPDT Form C SPDT Form C	Silver	MS07S0100
	Bk-Rd Bk-W 0 1.004" 19"	Bk-Rd Bk-W 19" 19"	80 oz	SPDT Form Z		MS07G0100
ushing mounted—cross roller	nlunger	max. min.	80 oz	SPD1 FORM 2	Silver	ML07S0100
A	.070" max.	.080° max.	80 oz	SPDT Form C	Silver	MS08S0100
	Bk-W Bk-Rd Bk-W 0 1004] 19"	Bk-W Bk-Rd Bk-W 0 1.03* 1.19* max. min.	80 oz	SPDT Form C	Gold	MS08G0100
	0 I,004"I⊫ .19° 0 I,03° I⊨ max. min. max.		80 oz	SPDT Form Z	Silver	ML08S0100
djustable top plunger						
	.070" max.	.080" max.	80 oz	SPDT Form C	Silver	MS09S0100
	Bk-Rd Bk-W	Bk-Rd Bk-W	80 oz	SPDT Form C	Gold	MS09G0100
	0  .004"  <b>-4</b> .19" max. min.	0  .03"   .19" max. min.	80 oz	SPDT Form Z	Silver	ML09S0100

- For available options and part number explanations, see page 21-9. Add options to the end of the catalog number. Up to three options may be added, if applicable. If the application includes oil, booted switches are recommended. See page 21-9.









### **Encapsulated Miniature, Lever Arms and Options**

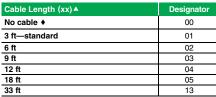
Table 21.12: Selection—Booted Devices (append prefix 9007 to the catalog number)

Description / Functional Diagram	мѕ	ML	Operating Force/Torque	Contact Form	Contact Type	Catalog▲ Number ■
Booted top plunger				•		
A	.070" max.	.080" max.	80 oz	SPDT Form C	Silver	MS10S0100
	Bk-W Bk-Rd Bk-W	Bk-W Bk-Rd Bk-W	80 oz	SPDT Form C	Gold	MS10G0100
	0 .004"	0   .03"   ■ .19" max. min.	80 oz	SPDT Form Z	Silver	ML10S0100
Booted parallel roller pl	unger					
Bk-Rd Bk-W Bk-Rd	.070" max.	Bk-W Bk-Rd	80 oz	SPDT Form C	Silver	MS12S0100
			80 oz	SPDT Form C	Gold	MS12G0100
	0  .004* 19° 0  .03* - max. min. max.		80 oz	SPDT Form Z	Silver	ML12S0100
Booted cross roller plur	nger					
A	.070" max.	.080" max.	80 oz	SPDT Form C	Silver	MS13S0100
	Bk-W Bk-Rd Bk-W	Bk-W Bk-Rd Bk-W	80 oz	SPDT Form C	Gold	MS13G0100
	0  .004*  <b>-4</b> .19* max. min.	0  .03"   .19" max. min.	80 oz	SPDT Form Z	Silver	ML13S0100

- See available options below. Add to the end of the catalog number. Up to three options may be added, if applicable.
- This catalog number is for devices with a standard cable and no options. See Table 21.13 for other cable length selections and general options.

### Table 21.13: Cable Length and General Options Designators: 9007MS01Sxxyy

Replace xx and yy in the catalog number above with the designators in the tables below. Some combinations of cable lengths and options are unavailable; consult Schneider Electric.



Use with options 54, 55, and 82.

General Options (yy) ▲	Designator
#16 AWG SJTO cable (MS only)	02
Side entrance #18 AWG SJTO cable	06
Gray #18 AWG SJTO cable	10
#18 AWG individual conductors	11
Male 4 pin mini-connector with 3 ft cable (MS only)	12
Low force (18 oz), low temp (-40 °F / -40 °C ), NEMA 1 only	21
High Pre-travel—adds 0.030	30
Male 4 pin micro-connector in housing (DC type) (MS only)	54
Male 5 pin micro-connector (DC type) (ML only)	55
Low temperature (-40 °F / -40 °C), 9007MS04 (NEMA 1 only)	80
Tapped holes in top of plunger housing (MS and ML)	81
Male 4 pin micro-connector in housing (AC type) (MS only)	82
Black #18 AWG SJTO cable (ML only)	83
Male 4-pin micro-connector in housing (AC type) (no cable	84



Shown with side entrance

cable, option 06

Lever

Table 21.14: Style 7 Levers—0.75 in. (19 mm) diameter, nylon or steel roller (9007 prefix is not required on lever catalog numbers)

	Length				Number mm) Wide	Catalog Number 3/4 in. (19 mm) Wide	Catalog Number 1 in. (25 mm) Wide
inch	(mm)	Nylon	Steel	Nylon	Steel	Nylon	Nylon
0.875	(22.23)	7A2N	7A2	7B2N	7B2	7F2N	7J2N
1.375	(34.93)	7A3N	_	7B3N	_	7F3N	7J3N
1.5	(38.10)	7A1N	7A1	7B1N	_	7F1N	7J1N
1.75	(44.45)	7A7N	_	7B7N	_	7F7N	7J7N
2.00	(50.8)	7A4N	_	7B4N	_	7F4N	7J4N

Note: Lever tightening torque for mounting the lever on the shaft: minimum 17 lb-in.

Other levers available. See catalog 9006CT1007. For inside (reverse) roller option at no charge, replace 7 with 7X. (Ex: 7A2N changes to 7XA2N.)

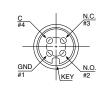
Table 21.15: Specialty Arms (9007 prefix is not required on lever catalog numbers)

Description	Catalog Number
Style 7D adjustable length 1-3/8" to 3-3/8"—0.75" diameter, 1/4" wide, metal roller	7D
Style 7DN adjustable length 1-3/8" to 3-3/8"—0.75" diameter, 1/4" wide, nylon roller	7DN
Style 7S spring nylon, 6" rod, 0.3" diameter	7S
Style 7N nylon rod, 5" long, 0.3" diameter	7N

Note: Lever tightening torque for mounting the lever on the shaft: minimum 17 lb-in.

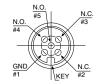


9007MS04S0084

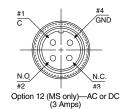


Male plug (face) pin-outs

Option 54 (MS only)—DC



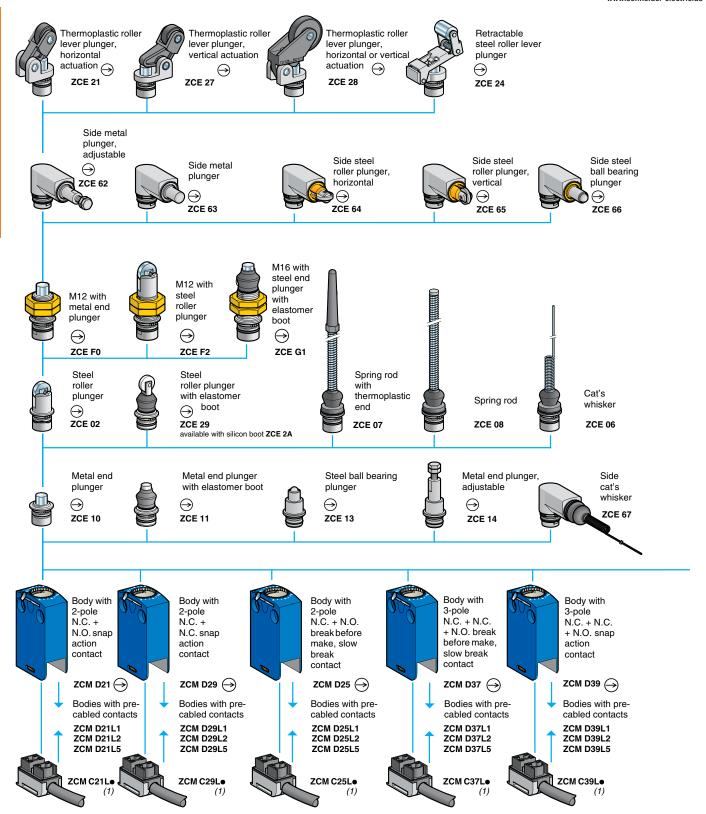
Option 55 (ML only)—DC



Option 82 (MS only)-AC Option 84 (MS only)—AC

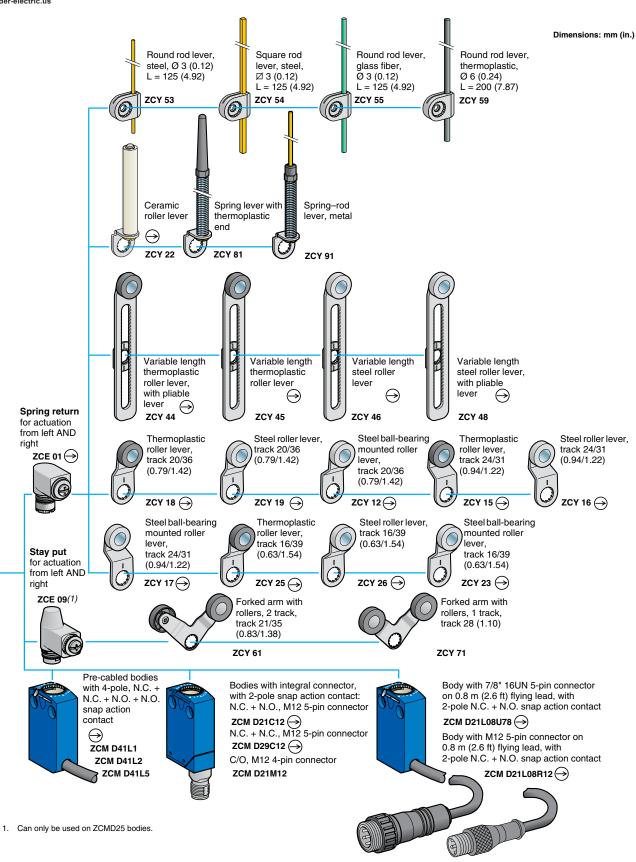
Note: DC connectors are rated 3 A, 250 Vac/Vdc.

LIMIT SWITCHES



Pre-cabled connection components: replace the "•" in the catalog number with the required cable length in meters, either 1, 2, 3, 5, 7 or 10.
 Example: ZCMC21L• becomes ZCMC21L7 for a 7 m (23.0 ft) cable.
 Note: only cable lengths of 1, 2 and 5 m (3.3, 6.6, and 16.4 ft) are available for pre-cabled connection components ZCMC37L• and ZCMC39L•.

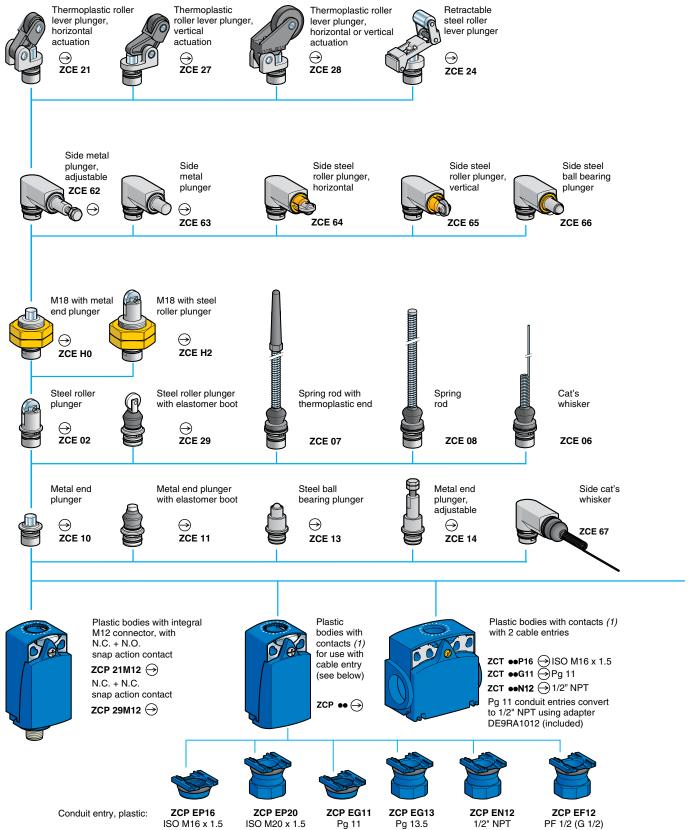




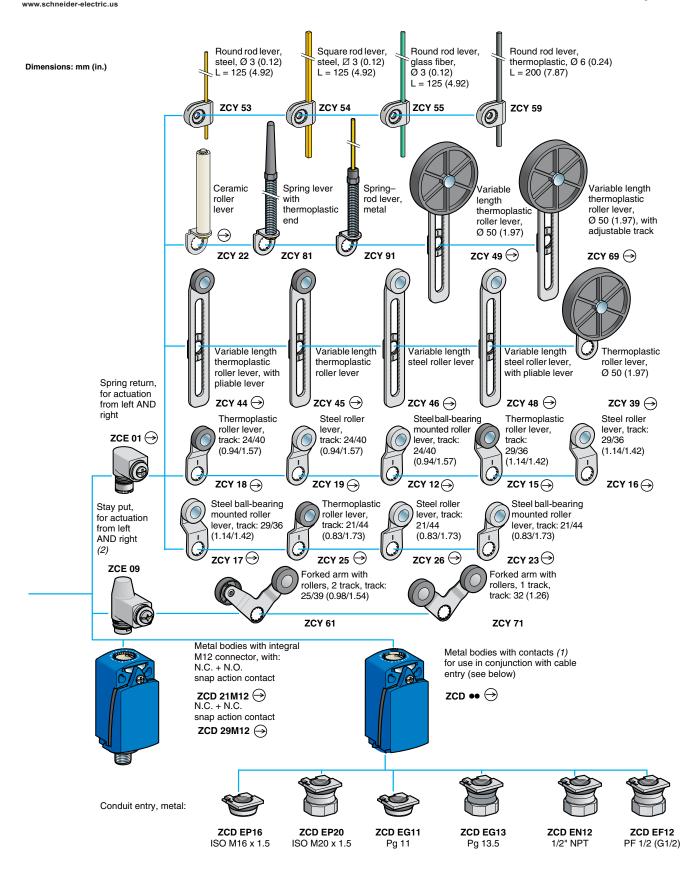
LIMIT SWITCHES

## Refer to Catalog 9006CT1007





1. For further details, see catalog 9006CT1007.



<sup>1.</sup> For further details, see catalog 9006CT1007.



## Miniature, Precabled Limit Switches, Metal

#### Table 21.16: XCMD Modular and XCMN Non-Modular

OsiSense xcmd, xcmn	Steel Roller Plunger	Plastic Roller Lever	Variable Length Plastic Roller Lever	M12 Head Steel Roller Plunger	Cat Whisker	End Plunger (non-modular)
B B C 2-pole contact N.C. + N.O. snap action  B S S S S S S S S S S S S S S S S S S						
Actuation speed (m/s)	0.5	1.5	1.5	0.1	1	0.5
Switches conforming to IEC 60947-5-1 section 3	yes	yes	yes	yes	no	yes
Degree of protection conforming to IEC 60529	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP65
Rated operational characteristics	Vac 15; B 300 (Ue = 240	V, le = 1.5 A) / Vdc 13; R	300 (Ue = 250 V, le = 0.1	A)		
Cable entry		rection, length = 1 m (other				pre-cabled length = 1 m
Mounting holes—in. (mm)	0.79 (20)	0.79 (20)	0.79 (20)	0.79 (20)	0.79 (20)	0.79 (20)
Body dimensions—in. (mm), W x D x H	1.18 x 0.63 x 2.32 (30 x 16 x 59)	1.18 x 0.63 x 2.32 (30 x 16 x 59)	1.18 x 0.63 x 2.32 (30 x 16 x 59)	1.18 x 0.63 x 2.32 (30 x 16 x 59)	1.18 x 0.63 x 2.32 (30 x 16 x 59)	1.18 x 0.63 x 2.32 (30 x 16 x 59)
Ordering information	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
2-pole, N.C. + N.O. snap action	XCMD2102L1	XCMD2115L1	XCMD2145L1	XCMD21F2L1	XCMD2106L1	XCMN2110L1
2-pole, N.C. + N.O. break before make, slow break	XCMD2502L1	XCMD2515L1	XCMD2545L1	XCMD25F2L1	XCMD2506L1	_
Evaleded view	2000 21 10					

#### Exploded view ...... page 21-10

#### Compact, Modular Limit Switches, Metal or Plastic

#### Table 21.17: XCKD and XCKP Compact, 30 mm Wide, Conforming to Standard EN 50047

OsiSense XCKP	Metal End Plunger	Plastic Roller Lever Horizontal Actuation	M18 Head Metal End Plunger	Plastic Roller Lever	Variable Length Plastic Roller Lever	Rubber Roller Lever Ø 50 mm	Cat Whisker
Property of the contact N.C. +	0.0	2.5					
Actuation speed (m/s)	0.5	1	0.5	1.5	1.5	1.5	1
Switches conforming to IEC 60947-5-1 section 3	yes	yes	yes	yes	yes	yes	no
Degree of protection conforming to IEC 50 529	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67	IP66 and IP67
Rated operational characteristics	Vac 15; A 300 (Ue = 240	V, le = 3 A) / Vdc 13; Q 3	00 (Ue = 250 V, le = 0.27	A)			
Cable entry	1 tapped entry for 1/2" N						
Mounting holes (mm)	20	20	M18 x 1	20	20	20	20
Body dimensions (mm) W x D x H	30 x 30 x 73	30 x 30 x 73	30 x 30 x 73	30 x 30 x 73	30 x 30 x 73	30 x 30 x 73	30 x 30 x 73
Ordering information	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
XCKD Metal, 30 mm	n Wide						
2-pole, N.C.+ N.O. snap action	XCKD2110N12	XCKD2121N12	XCKD21H0N12	XCKD2118N12	XCKD2145N12	XCKD2139N12	XCKD2106N12
2-pole, N.C.+ N.O. break before make, slow break	XCKD2510N12	XCKD2521N12	XCKD25H0N12	XCKD2518N12	XCKD2545N12	XCKD2539N12	XCKD2506N12
XCKP Plastic, 30 m	ım Wide, Double Ins	sulated					
2-pole, N.C.+ N.O. snap action	XCKP2110N12	XCKP2121N12	XCKP21H0N12	XCKP2118N12	XCKP2145N12	XCKP2139N12	XCKP2106N12
2-pole, N.C.+ N.O. break before make, slow break Exploded view	XCKP2510N12	XCKP2521N12	XCKP25H0N12	XCKP2518N12	XCKP2545N12	XCKP2539N12	XCKP2506N12

Exploded view . . . . . . page 21-12



## Modular, Miniature and Compact

Refer to Catalog 9006CT1007

#### Compact Limit Switches with 2 Cable Entries and Modular Head

Table 21.18: XCKT Compact, Plastic, 2 Cable Entries, Standard, 40 mm

OsiSense xckt	Metal End Plunger	Metal Roller Plunger	Plastic Roller Lever
	00.00	00.00	0
Actuation speed (m/s)	0.5	0.5	1.5
Switches conforming to IEC 60947-5-1 section 3	yes	yes	yes
Degree of protection conforming to IEC 60529	IP66 and IP67	IP66 and IP67	IP66 and IP67
Rated operational characteristics	Vac 15; A 300 (Ue = 240 V, Ie = 3	3 A) / Vdc 13; Q 300 (Ue = 250 V, le	e = 0.27 A)
Cable entry	Two Pg 11 cable entries. One 1/2	" NPT adapter, DE9RA1012, is inc	sluded.
Mounting holes—in. (mm)	0.79 or 1.57 (20 or 40)	0.79 or 1.57 (20 or 40)	0.79 or 1.57 (20 or 40)
Body dimensions—in. (mm), W x D x H	2.36 x 1.18 x 2.4 (60 x 30 x 61)	2.36 x 1.18 x 2.4 (60 x 30 x 61)	2.36 x 1.18 x 2.4 (60 x 30 x 61)
Ordering information	Cat. No.	Cat. No.	Cat. No.
Complete switch 2-pole, N.C. + N.O. snap action	XCKT2110N12	XCKT2102N12	XCKT2118N12

#### Modular, Compact Limit Switches with Manual Reset

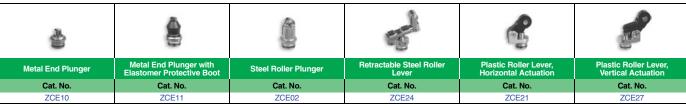
#### Table 21.19: XCDR and XCPR Compact, Metal or Plastic, with Manual Reset, 30 mm

OsiSense XCDR and XC	:PR	Metal End Plunger	Plastic Roller Lever Horizontal Actuation	Plastic Roller Lever Vertical Actuation			
Actuation speed (m/s)		0.5	1	1			
Switches conforn	ning to IEC 60947-5-1 section 3	yes	yes	yes			
Degree of protect	tion conforming to IEC 60529	IP66 and IP67	IP66 and IP67	IP66 and IP67			
Rated operationa	l characteristics	Vac 15; A 300 (Ue = 240 V, Ie = 3 A) / Vdc 13; Q 300 (Ue = 250 V, Ie = 0.27 A)					
Cable entry		1 tapped entry for 1/2" NPT					
Mounting holes-	-in. (mm)	0.79 (20)	0.79 (20)	0.79 (20)			
Body dimensions	:—in. (mm), W x D x H	1.18 x 1.18 x 3.74 (30 x 30 x 95)	1.18 x 1.18 x 3.74 (30 x 30 x 95)	1.18 x 1.18 x 3.74 (30 x 30 x 95)			
Ordering inform	mation	Cat. No.	Cat. No.	Cat. No.			
XCDR Metal							
	2-pole, N.C. + N.O. snap action	XCDR2110N12	XCDR2121N12	XCDR2127N12			
Complete switch 2-pole, N.C. + N.O. break before make, slow break		XCDR2510N12	XCDR2521N12	XCDR2527N12			
XCPR Plastic, Double Insulated							
	2-pole, N.C. + N.O. snap action	XCPR2110N12	XCPR2121N12	XCPR2127N12			
Complete switch  2-pole, N.C. + N.O. break before make, slow break		XCPR2510N12	XCPR2521N12	XCPR2527N12			

**LIMIT SWITCHES** 

#### Common Head and Levers for XCMD, XCKD, XCKP, XCKT

#### Table 21.20: Metal Plunger and Multi-Directional Heads



Bushing Mounted	Bushing Mounted	Bushing Mounted	Bushing Mounted		1	
				8	8	
M12 Head Metal Plunger■	M18 Head Metal Plunger▲	M12 Head Steel Roller Plunger▲	M18 Head Steel Roller Plunger▲	Spring Lever	Spring Lever with Plastic End	Cat Whisker
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
ZCEF0	ZCEH0	ZCEF2	ZCEH2	ZCE08	ZCE07	ZCE06

Table 21.21: Metal Rotary Heads and Levers

Table 21.21: Metal	<u> </u>					
0				8		
Rotary Head without Lever, Spring Return, for Actuation from RH or LH Side	Rotary Head without Lever, Stay Put, for Actuation from RH or LH Side ♦	Plastic Roller Lever, Track: 24/31 mm (ZCMD) 29/36 mm (ZCD/P/T)■	Steel Roller Lever, Track: 24/31 mm (ZCMD) 29/36 mm (ZCD/P/T)■	Plastic Roller Lever, Track: 16/39 mm (ZCMD) 21/44 mm (ZCD/P/T)■	Steel Roller Lever, Track: 16/39 mm (ZCMD) 21/44 mm (ZCD/P/T)■	Plastic, Roller Lever, Track: 20/36 mm (ZCMD) 24/40 mm (ZCD/P/T)▲
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
ZCE01	ZCE09	ZCY15	ZCY16	ZCY25	ZCY26	ZCY18
	ê					
Steel Roller Lever, for Track: 20/36 mm (ZCMD) 24/40 mm (ZCD/P/T)▲	Ceramic Roller Lever	Variable Length, Rigid Plastic Roller Lever	Variable Length, Bendable Plastic Roller Lever	Variable Length, Rigid Steel Roller Lever	Variable Length, Bendable Steel Roller Lever	Metal Spring Lever
_ ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,						
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	Cat. No.	Cat. No. ZCY45		Cat. No. ZCY46		
Cat. No.			Cat. No.		Cat. No.	Cat. No.
Cat. No.					Cat. No.	Cat. No.
Cat. No. ZCY19  Plastic Roller Lever Ø 50 mm	Adjustable Plastic Roller Lever Ø 50 mm	ZCY45  Square Steel Rod Lever,  3 mm, length = 125 mm	Round, Glass Fiber Rod Lever, Ø 3 mm length = 125 mm	Round Plastic Rod Lever, 0 6 mm, length = 200 mm	Cat. No. ZCY48  Recommended for Use with ZCE09 Head  Forked Lever Arm with 2 Tracks: 25/39 mm	Cat. No.  ZCY91  Recommended for Use with ZCE09 Head  Forked Lever Arm with 1 Track: 32 mm
Cat. No. ZCY19  Plastic Roller Lever	Adjustable Plastic Roller Lever	ZCY45  Square Steel Rod Lever.	ZCY44  Round, Glass Fiber Rod Lever, Ø 3 mm	ZCY46  Round Plastic Rod Lever.	Cat. No. ZCY48  Recommended for Use with ZCE09 Head	Cat. No.  ZCY91  Recommended for Use with ZCE09 Head

- Recommended for use with body ZCD... / ZCP... / ZCT...
  Recommended for use with body: ZCMD...
- Can only be used on ZCMD25 bodies.



Refer to Catalog 9006CT1007

NOTE: Metal components must be used with metal bodies. Plastic components must be used with plastic bodies.

Table 21.22: Miniature, Metal Body/Contact Assemblies

www.schneider-electric.us

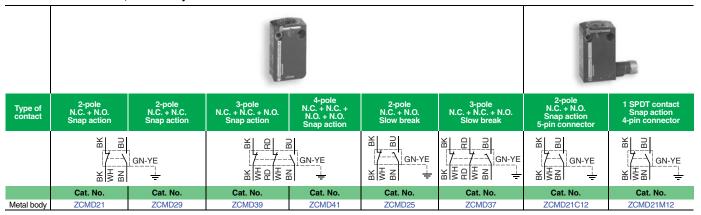


Table 21.23: Connection of Miniature Body/Contact Assemblies

Specific pre-cabled connection components			No.			4 3	4 0 3 11
Length (m)	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	1 2	1 = Common
1	ZCMC21L1	ZCMC29L1	ZCMC39L1	ZCMC25L1	ZCMC37L1	1 – 2 = N.C. 3 – 4 = N.O.	2 = N.C.
2	ZCMC21L2	ZCMC29L2	ZCMC39L2	ZCMC25L2	ZCMC37L2	5 = Ground	3 = Ground 4 = N.O.
5	ZCMC21L5	ZCMC29L5	ZCMC39L5	ZCMC25L5	ZCMC37L5	o = arouna	4 = 14.0.
Exploded view	w		page 21-10				

Table 21.24: Compact, Metal or Plastic Body/Contact Assemblies



## **Connection of Compact Body/Contact Assemblies**

Interchangeable cable entry							
	ISO M16	ISO M20	Pg 11	Pg 13.5	1/2" NPT	PF 1/2 NPSF	Deutsch Connector
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Metal	ZCDEP16	ZCDEP20	ZCDEG11	ZCDEG13	ZCDEN12	ZCDEF12	_
Plastic	ZCPEP16	ZCPEP20	ZCPEG11	ZCPEG13	ZCPEN12	ZCPEF12	ZCPED44

Plastic conduit entries shown. Order plastic conduit entries for plastic bodies (XCKP/ZCP). Order metal conduit entries (chrome color) for metal bodies (XCKD/ZCD). Metal conduit entries do not fit on plastic bodies.

Exploded view . . . . . page 21-12

Refer to Catalog 9007CT1007

Table 21.26: XCKN Compact Plastic, Non-Modular, 30 mm Wide

Osisense Limit Switches     Column						
√						
break before make, slow break		Metal end plunger	Plastic roller plunger for lateral cam approach	Plastic roller plunger for cross cam approach	Thermoplastic ro  Horizontal actuation in 1 direction	ller-lever plunger Vertical actuation in 1 direction
Switch actuation		On end	By 30° cam			
Type of actuation						
Maximum actuation speed		0.5 m/s (1.64 ft/s)	0.3 m/s (0.99 ft/s)		0.1 m/s (3.28 ft/s)	
Minimum force of forgue ——	r tripping	15 N (3.37 lb)	12 N (2.70 lb)		6 N (1.35 lb)	
F0	r positive opening	30 N (6.75 lb)	20 N (4.50 lb)	0.005 (0.440)	10 N (2.25 lb)	0.070 (0.454)
Weight, kg (lb)		0.065 (0.143)	0.065 (0.143)	0.065 (0.143)	0.070 (0.154)	0.070 (0.154)
Ordering Information (sold in packs of 20)		Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
2 pole N.C. + N.O. snap action	a a le	XCKN2110P20	XCKN2102P20 XCKN2502P20	XCKN2103P20 XCKN2503P20	XCKN2121P20 XCKN2521P20	XCKN2127P20
2 pole N.C. + N.O., break before make, slow bre 2 pole N.C. + N.C. snap action	зак	XCKN2510P20 XCKN2910P20	XCKN2902P20 XCKN2902P20	XCKN2903P20 XCKN2903P20	XCKN2521P20 XCKN2921P20	XCKN2527P20 XCKN2927P20
	otary, ermoplastic	Rotary, variable length thermoplastic	Rotary, thermoplastic	Rotary, variable length, thermoplastic	Multi-directional,	Multi-directional,
	ller-lever	roller-lever	roller-lever, Ø 50 mm	roller-lever, Ø 50 mm	spring rod	cat's whisker
Switch actuation By	/ 30° cam				By any moving part	
Type of actuation					<b>→</b>	
Maximum actuation speed 1.5	5 m/s (4.92 ft/s)				1 m/s (3.28 ft/s), any dire	ection
	1 N•m (0.89 lb-in)				0.13 N•m (0.11 lb-in)	
	15 N•m (1.33 lb-in)				_	
5 ; 5 t ;	085 (0.187)	0.090 (0.198)	0.110 (0.243)	0.115 (0.254)	0.085 (0.187)	0.075 (0.165)
Ordering Information (sold in packs of 20)	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
2 pole N.C. + N.O. snap action	XCKN2118P20	XCKN2145P20	XCKN2139P20	XCKN2149P20	XCKN2108P20	XCKN2106P20
2 pole N.C. + N.O., break before make, slow break	XCKN2518P20	XCKN2545P20	XCKN2539P20	XCKN2549P20	XCKN2508P20	XCKN2506P20
2 pole N.C. + N.C. snap action	XCKN2918P20	XCKN2945P20	XCKN2939P20	XCKN2949P20	XCKN2908P20	XCKN2906P20

#### Table 21.27: XCNR Compact Plastic, Non-Modular, with Manual Reset, 30 mm Wide

2 pole N.C. + N.O.						
77 2 pole N.C. + N.C.		Metal end plunger		Thermoplastic re	oller-lever plunger	Rotary head,
2 8	5 8		Plastic roller plunger	Horizontal actuation in 1 direction	Vertical actuation in 1 direction	thermoplastic roller-lever plunger
Switch actuation		On end	By 30° cam			
Type of actuation						<del>-</del> 0
Maximum actuation speed		0.5 m/s (1.64 ft/s)	0.3 m/s (0.99 ft/s)	0.1 m/s (3.28 ft/s)	•	1.5 m/s (4.92 ft/s)
Minimum force of torque	For tripping	15 N (3.37 lb)	12 N (2.70 lb)	6 N (1.35 lb)		0.1 N•m (0.89 lb-in)
Willimani force of torque	For positive opening	30 N (6.74 lb)	20 N (4.50 lb)	10 N (2.25 lb)		0.15 N•m (1.33 lb-in)
Weight, kg (lb)		0.080 (0.18)	0.080 (0.18)	0.085 (0.19)	0.090 (0.20)	0.100 (0.22)
Ordering Information (sold in	packs of 20)	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
2 pole N.C. + N.O.snap action		XCNR2110P20	XCNR2102P20	XCNR2121P20	XCNR2127P20	XCNR2118P20
2 pole N.C. + N.O. break before	e make, slow break	XCNR2510P20	XCNR2502P20	XCNR2521P20	XCNR2527P20	XCNR2518P20
2 pole N.C. + N.C. snap action		XCNR2910P20	XCNR2902P20	XCNR2921P20	XCNR2927P20	XCNR2918P20

#### Table 21.28: Cable Entries and Contact Configurations

	M20	Order with suffix P20 for 1 entry tapped to M20 x 1.5 mm for ISO cable entry. Clamping capacity 7 to 13 mm (0.28 to 0.51 in.)
Cable entry	Pg 11	Replace P20 suffix with G11suffix, 18.6 x 1.41
Cable entry	1/2" NPT	Replace P20 suffix with G11 suffix. Order 1/2" NPT adapter DE91012
	Other cable entries	For other cable entries, including complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult your local sales office.
Other contact con	figurations	For other 2- and 3-pole configurations, please consult your local sales office.
Function diagram	s	See catalog 9006CT1007.



## **Light Duty Industrial,** Standard Body, Plastic

#### XCKS Standard Body, Plastic, Double Insulated

#### Table 21.29: Environmental Specifications

Conforming to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
Conforming to standards	Machine assemblies	IEC 60204-1, EN 60204-1
Approvals		UL, CSA, CCC
Ambient air temperature	For operation	- 25 to +70 °C (-13 to +158 °F)
Ambient air temperature	For storage	- 40 to +70 °C (-40 to +158 °F)
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10–500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 65 conforming to IEC 60529; IK 03 conforming to EN 50102
Repeat accuracy		0.05 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry	Depending on model	Tapped entry for PG 13 conduit thread. To convert to 1/2" NPT, use adapter DE9RA1212. For ISO M20 x 1.5, add H29 to the end of the catalog number. Example: XCKS101 becomes XCKS101H29.
Materials		Plastic (body and head)

#### Table 21.30: Selection, Plunger and Rotary Heads

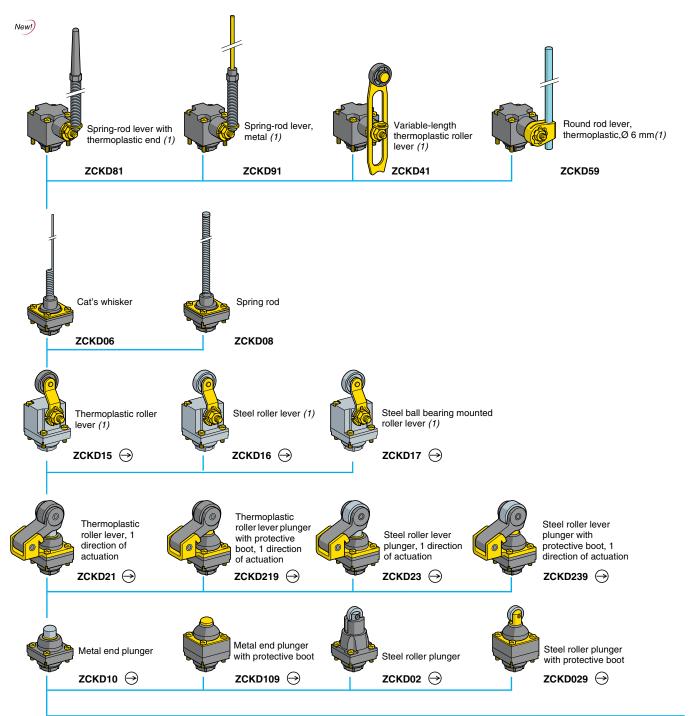
2-pole N.C. + N.O. snap action  2-pole N.C. + N.O. break before make, slow break	Form B A	Form C A	Form A A				Form D A
2-pole N.C. + N.C.	Metal end plunger	Steel roller plunger	Thermoplastic roller lever ◆	Elastomer roller lever, Ø 50 mm (1.97 in.) ♦	Variable length thermoplastic roller lever ◆	Variable length elastomer roller lever, Ø 50 mm (1.97 in.) ♦	Round thermoplastic rod lever, Ø 6 mm (0.24 in.) ★ ▼
Ordering Information■	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
2-pole N.C. + N.O. snap action (XE2SP2151)	XCKS101 →	XCKS102 →	XCKS131 →	XCKS139	XCKS141	XCKS149	XCKS159
2-pole N.C. + N.O. break before make, slow break (XE2NP2151)	XCKS501	XCKS502	XCKS531	XCKS539	XCKS541	XCKS549	XCKS559
2-pole N.C. + N.C. snap action (XE2SP2141)	ZCKS9 + ZCKD01 →	ZCKS9 + ZCKD02	ZCKS9 + ZCKD31 →	ZCKS9 + ZCKD39	ZCKS9 + ZCKD41	ZCKS9 + ZCKD49	ZCKS9 + ZCKD59
2-pole N.C. + N.C. simultaneous, slow break (XE2NP2141)	ZCKS7 + ZCKD01 →	ZCKS7 + ZCKD02 →	ZCKS7 + ZCKD31 →	ZCKS7 + ZCKD39	ZCKS7 + ZCKD41	ZCKS7 + ZCKD49	ZCKS7 + ZCKD59
Weight, kg (lb)	0.095 (0.209)	0.105 (0.231)	0.145 (0.320)	0.150 (0.331)	0.155 (0.342)	0.155 (0.342)	0.150 (0.331)
Contact operation	N.C. contact with mounted and using a	positive opening operat conforming operator.	ion, when properly	_			

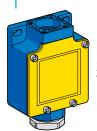
#### Table 21.31: Specifications

Switch actua	tion	On end	By 30° cam			By any moving part
Type of actua	ation		<b>→</b>	<del>-</del>		
Maximum ac	tuation speed	0.5 m/s (1.64 ft/s)		1.5 m/s (4.92 ft/s)		1 m/s (3.28 ft/s)
Minimum	For tripping	15 N (3.37 lb)	12 N (2.70 lb)	0.15 N•m (1.33 lb-in)		
force or torque	For positive opening	45 N (10.12 lb)	36 N (8.09 lb)	0.3 N•m (2.66 lb-in)	-	_
Cable entry		1 entry tapped M20 x 1.5 mm for ISO cable entry, clamping capacity 7 to 13 mm (0.28 to 0.51 in.) To convert PG 13 to 1/2" NPT, use adapter <b>DE9RA1212</b> . For ISO M20 x 1.5, add <b>H29</b> to the end of the catalog number. Example: <b>XCKS101</b> becomes <b>XCKS101H2</b>			ecomes XCKS101H29.	

- Form conforming to EN 50041. See page 6/92 of catalog 9006CT1007. Switches with gold contacts or eyelet type connections: please consult your local sales office.
- Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer. Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting. Value taken with actuation by moving part at 100 mm (3.94 in.) from the mounting.

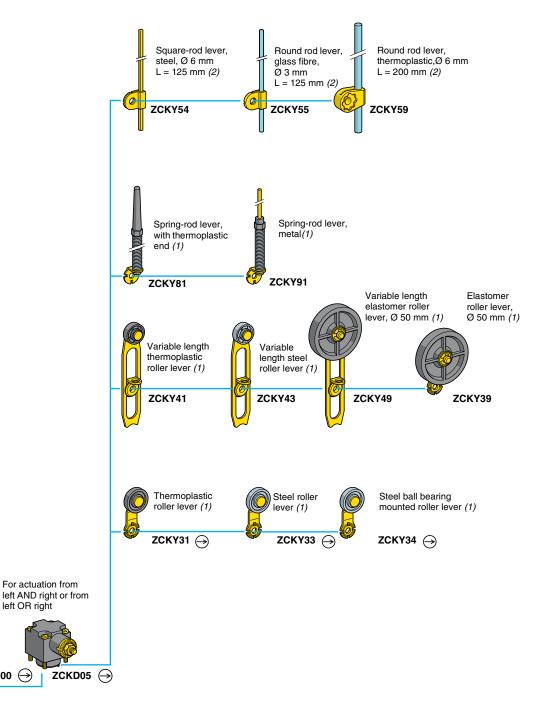






Body with 2-pole contact and one 1/2" NPT cable entry using the included adapter, DE9RA1012

ZCKL1/L5/L6/L7 → ZCKL8H7



Head assuring positive opening operation when used with a conforming lever.

left OR right

ZCKG00 →

- Adjustable throughout  $360^\circ$  in  $5^\circ$  steps, or in  $90^\circ$  steps by reversing the notched washer.
- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

XCKL110H7

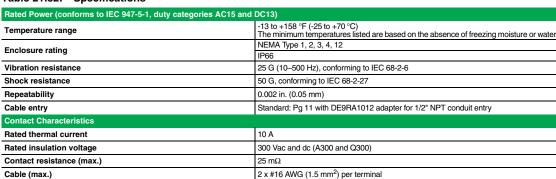
10 A fuse type SC. Outside U.S. use gl or N.

## Schneider Electric

#### **XCKL**

XCKL is a compact, general-duty limit switch for applications such as machine tools and material handling.

#### Table 21.32: Specifications



#### **Complete Switches**

## Table 21.33: Lever Operated

Short circuit protection (customer supplied)



XCKL10011H7

Description ▲	Functional Diagram	Operating Torque/Force	Contact Configuration	Catalog Number
Programmable head CW and/or CCW–snap action Delrin® roller lever–adjustable in 5° or 45° in increments (reversible mounting).	21-22 13-14	14.2 oz-in	SPDT (N.O. + N.C.) snap	XCKL10011H7
The interior of the control of	21-22 13-14 0 ►111° ► 90°	14.2 oz-in	SPDT (N.O. + N.C.) slow	XCKL50011H7
Adjustable length roller lever–adjustable in 5° or 45° increments (reversible mounting).	21-22 13-14	14.2 oz-in	SPDT (N.O. + N.C.) snap	XCKL10041H7
igoredot	21-22 13-14 0 ►11° ► 90°	14.2 oz-in	SPDT (N.O. + N.C.) slow	XCKL50041H7
CW and CCW, Delrin roller lever	21-22 13-14	21.3 oz-in	SPDT (N.O. + N.C.) snap	XCKL115H7
CW and CCVV, Denin Toller level	21-22 13-14 0 ►111° ► 70°	21.3 oz-in	SPDT (N.O. + N.C.) slow	XCKL515H7
One way lever-Delrin roller (→)	21-22 13-14	25.3 oz-in	SPDT (N.O. + N.C.) snap	XCKL121H7
One way level-bellin foller	21-22 13-14 0 N.05 M	25.3 oz-in	SPDT (N.O. + N.C.) slow	XCKL521H7



XCKL115H7

Table 21.34: Omnidirectional

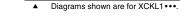
Description A	Functional Diagram	Operating Torque/Force	Contact Configuration	Catalog Number
Wobble stick-steel rod	21-22 13-14	1.84 oz-in	SPDT (N.O. + N.C.) snap	XCKL106H7
	21-22 13-14 0  14° 4	1.84 oz-in	SPDT (N.O. + N.C.) slow	XCKL506H7



XCKL110H7

Table 21.35: Plunger Operated

Description ▲	Functional Diagram	Operating Torque/Force	Contact Configuration	Catalog Number
Pod plumger (	21-22 13-14	35.6 oz	SPDT (N.O. + N.C.) snap	XCKL110H7
Hod pluriger	Rod plunger → 13-14 13-		SPDT (N.O. + N.C.) slow	XCKL510H7
Poller plunger ( )	.07 .177(P)	35.6 oz	SPDT (N.O. + N.C.) snap	XCKL102H7
Roller plunger (→)  19-14 19-14 19-14 19-14 0   →  .034 -		35.6 oz	SPDT (N.O. + N.C.) slow	XCKL502H7



Exploded view page 21-20 Lever arms page 21-23





File CCN E39281 NKCR



File LR440 Class 3211-



Acceptable Wire Sizes: 14–24 AWG Recommended Terminal Clamp Torque: 13 lb-in

**Building a Complete Switch** 

Body Head ZCKL1H7 + ZCKD15 = XCKL115H7

Body Head ZCKL5 H7+ ZCKD02 = XCKL502H7

Body Head Lever ZCKL1H7+ ZCKG00+ ZCKY11=

complete switches.

Some combinations are not available as

Complete Switch = Body (with contact assembly) + Head + Lever

Examples:

Note:



XCKL10011H7



#### Table 21.36: Bodies-Electric



ZCKL1H7, ZCKL5H7



ZCKD15,16,17H7





ZCKD02H7



ZCKY11H7 ZCKY43H7





ZCKY51H7 ZCKY71H7



Components	Contacts	Catalog Number
Body: Single pole, double break, 1 N.O. + 1 N.C.	Silver	ZCKL1H7
Snap action, positive opening, same polarity	Gold Flashed	ZCKL18H7
Body: Single pole, double break, 1 N.O. + 1 N.C. Slow make, slow break isolated	Silver	ZCKL5H7

#### Table 21.37: Rotary Heads

Components		Catalog Number
Programmable head ■ CW and/or CCW	Select lever arm separately	ZCKG00
Offset Delrin roller lever ▲		ZCKD15
Offset steel roller lever▲		ZCKD16
Offset ball-bearing roller lever ▲		ZCKD17

Replacement arms are not available separately. Order complete head as a replacement. See page 21-22.

Table 21.38: Plunger Heads

Description	Catalog Number
Rod plunger	ZCKD10
Booted rod plunger	ZCKD109
Roller plunger	ZCKD02
Booted roller plunger	ZCKD029
One-way lever—Delrin roller	ZCKD21
Steel roller	ZCKD23

Table 21.39: Omnidirectional Heads

Description	Catalog Number
Cat whisker—steel rod ♦	ZCKD06
Wobble spring—steel spring ◆	ZCKD08

Replacement cat whiskers and wobble extensions are not available separately. Order complete head as a replacement.

#### Table 21.40: Replacement Parts

Description	Catalog Number
Contact block for ZCKL1	XESP2151
Contact block for ZCKL5	XENP2151
Gold flashed contact block for ZCKL18	XESP2158
Pg 11 to 1/2" NPT conduit entry adapter	DE9RA1012

#### Table 21.41: Levers (for use with ZCKG00 heads only—these arms will not fit ZCKD heads)

Description	Size	Adjustment ▼ Increments	Catalog Number
Delrin roller	0.9 in. diameter, 0.2 in. wide, 1.6 in. long	5° or 45°	ZCKY11
Steel roller	0.9 in. diameter, 0.2 in. wide, 1.6 in. long	5° or 45°	ZCKY13
Ball bearing roller	0.9 in. diameter, 0.2 in. wide, 1.6 in. long	5° or 45°	ZCKY14
Adjustable length Delrin roller★	0.74 in. diameter, 0.2 in. wide, 4.2 in. long (max.)	5° or 90°	ZCKY41
Steel roller	0.74 in. diameter, 0.2 in. wide, 4.2 in. long (max.)	5° or 90°	ZCKY43
Steel rod, square★	1/8 in. side, 5.4 in. long (max.)	5° or 45°	ZCKY51
Fiberglass rod, round★	1/8 in. diameter, 5.4 in. long (max.)	5° or 45°	ZCKY52
Steel rod, round★	1/8 in. diameter, 5.4 in. long (max.)	5° or 45°	ZCKY53
Plastic rod, round★	1/4 in. diameter, 8.4 in. long (max.)	5° or 45°	ZCKY59
Fork, 2 track Delrin roller	0.9 in. diameter, 0.2 in. wide for ZCKE092	5° or 45°	ZCKY71
Coil spring lever ★	4.41 in. (112 mm)	5° or 45°	ZCKY81
Spring rod lever★	7.05 in. (179 mm)	5° or 45°	ZCKY91

Flexible operators do not guarantee positive opening operation.

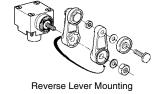
Reverse mounting (for ZCKG00 head)—The higher increment (45° or 90°) is a positive opening contact feature which ensures no loss of mechanical effort between the actuation point and the moving contact bridge of the N.C. contact even if the lever is loosely mounted on the head shaft.

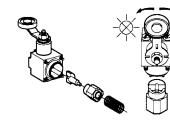
Acceptable Wire Sizes: 14-24 AWG

Recommended Terminal Clamp Torque: 13 lb-in

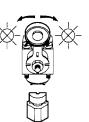
#### **ZCKG00 Programming**

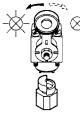
The ZCKG00 head is field convertible to CW, CCW, or CW/CCW.













42259 NKCR

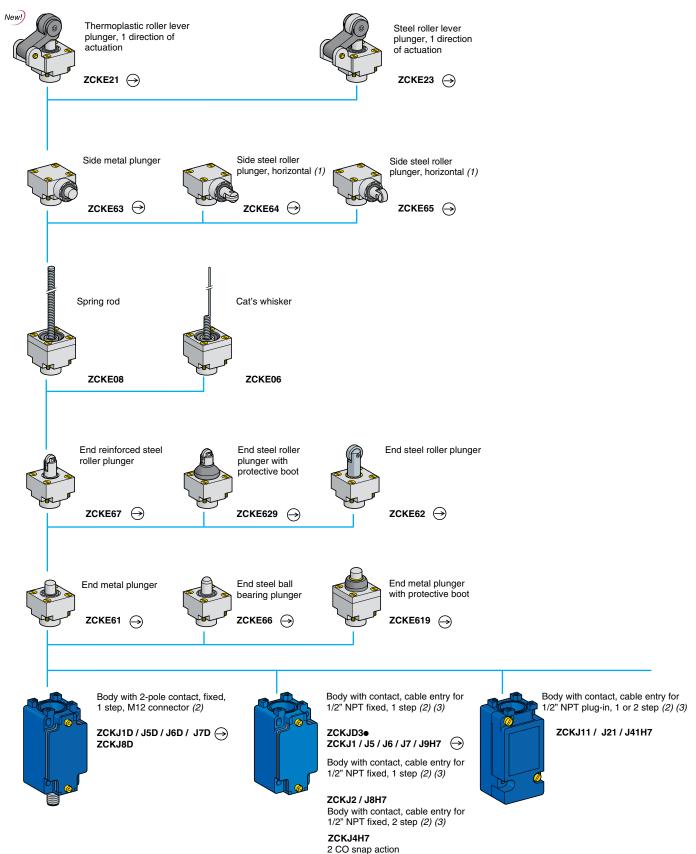


3211 03

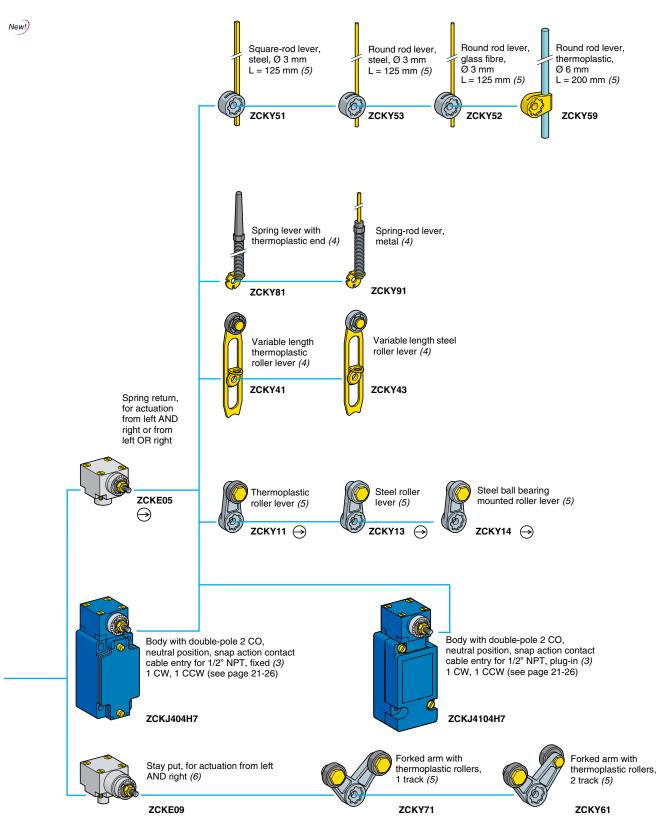


**LIMIT SWITCHES** 





- Cannot be used with bodies ZCKJ4H7 and ZCKJ41H7. (1)
- (2) For further information, see page 21-27.
- For a cable entry tapped ISO M20 x 1.5, change H7 to H29. Example: ZCKJ1H7 becomes ZCKJ1H29. For a cable entry tapped Pg 13.5, delete H7 from the catalog number. Example: JCKJ1H7 becomes ZCKJ1.



- Head assuring positive opening operation when used with a conforming lever. *⊕* (4)
- Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting. (5)
- Suitable for bodies with contacts ZCKJ1 / J2 / J31 / J39H7.

Schneider Electric

XCKJ fixed body type precision switches with an SPDT configuration have direct opening contacts to meet most international standards.

#### Table 21.42: Specifications







XCKJ10541H7



XCKJ161H7



XCKJ110511H7



Lever Operated

XCKJ1167H7



Rated Power (conforms to IEC	C 947-5-1, duty categories AC15 and DC13)
Temperature range	-13 to +158 °F (-25 to +70 °C); optional -40 to +248 °F (-40 to +120 °C). The minimum temperatures listed are based on the absence of freezing moisture or water.
Enclosure rating	NEMA 1,2,3,4,12; IEC Type IP66
Vibration resistance	25 G (10–500 Hz), conforming to IEC 68-2-6
Shock resistance	50 G, conforming to IEC 68-2-27
Repeatability (max.)	0.0004 in. (0.01 mm)
Cable entry	1/2" NPT standard
Contact Characteristics	
Rated thermal current	10 A, conforming to UL 508, CSA C22-2 No.14, IEC 337-1, NFC 63-140, VDE 0660-200
Rated insulation voltage	Non-plug-in: 300 Vac (A300) and DC (Q300) Plug-in: 600 Vac (A600) and DC (Q600)
Contact resistance (max)	Non-plug-in: 25 m $\Omega$ Plug-in: 45 m $\Omega$
Cable (max.)	2 x 16 AWG (1.5 mm <sup>2</sup> ) per terminal—1 x #16 AWG for 2 SPDT (2 N.O., 2 N.C.)
Short circuit protection	10 A fuse type SC; Form I Class J or equivalent. Outside US use type gl or N.

Table 21.43: Complete Switches, XCKJ

Table 21.43. Complete Switches, ACRO								
Description and Functional Diagram	Operating Torque	Contact Type		Direct Opening	Catalog Number			
Non-plug-in Housings								
Delrin roller lever adjustable in 5° or 45° increments (reversible mountings)								
	33.3 oz-in	SPDT	(N.O. + N.C.)	Y 🔺	XCKJ10511H7			
Lever operated	33.3 oz-in	2 SPDT	(2 N.O. + 2 N.C.)	N	XCKJ20511H7			
	Adjustable length—Delrin roller lever adjustable in 5° or 90° increments							
23° 58°(P)	33.3 oz-in	SPDT	(N.O. + N.C.)	N	XCKJ10541H7			
13-14 21-22	33.3 oz-in	2 SPDT	(2 N.O. + 2 N.C.)	N	XCKJ20541H7			
13-14 90°	Adjustable length—1/8 i	Adjustable length—1/8 in. diameter steel rod adjustable in 5° or 45° increments						
11°	33.3 oz-in	SPDT	(N.O. + N.C.)	N	XCKJ10553H7			
	Adjustable length—1/4 i	n. plastic rod a	djustable in 5° or 45° incre	ements				
	33.3 oz-in	SPDT	(N.O. + N.C.)	N	XCKJ10559H7			
Neutral Position One SPDT contact switch per dir Past 20° CCW, contact 2 (21-22 /			-14) switches.					
		ı						

	,				
11-12 13-14 11-12 13-14 11-12 13-14 0 H11 <sup>-1</sup> 90°	26.6 oz-in	2 SPDT (2 N.O. + 2 N.C.)		2 SPDT (2 N.O. + 2 N.C.) N	
Plunger Operated  21-22  .08° .185(P)	Rod plunger 48 oz	SPDT	(N.O. + N.C.)	Y 🛦	XCKJ161H7
13-14 21-22 13-14 0   - 24	Steel roller plunger 48 oz	SPDT	(N.O. + N.C.)	Y.	XCKJ167H7
Plug-in Housings					

Delrin roller lever adjustable in  $5^{\circ}$  or  $45^{\circ}$  increments (reversible mountings)

Adjustable length Delrin roller lever adjustable in 5° or 90° increments

(N.O. + N.C.)

SPDT

13-14	,				
11-12 13-14	33.3 oz-in	SPDT	(N.O. + N.C.)	N	XCKJ110541H7
Neutral Position One SPDT contact switch per dire Levers not included.	ction. Past 20° CW, conta	oct 1 (11-12 / 13-	14) switches. Past 20° CC	W, contact 2 (21-22 / 23-	24) switches.
20° 11-12 13-14 11-12 13-14 11-12 13-14 11-12 20° 20° 23-22 23-24 24 24 25 25 25 25 25 25 25 25 25 25 25 25 25	26.6 oz-in	2 SPDT	(2 N.O. + 2 N.C.)	N	ZCKJ4104H7
Plunger Operated .08"	Rod plunger 48 oz	SPDT	(N.O. + N.C.)	N	XCKJ1161H7
11-12 13-14 11-12 13-14	Steel roller plunger 48 oz	SPDT	(N.O. + N.C.)	N	XCKJ1167H7
				•	

<sup>▲</sup> Direct opening contacts meet IEC 947-5-1 requirements for positive opening contacts. →

33.3 oz-in

XCKJ110511H7



# Heavy Duty / Industrial Metal Body

#### Table 21.44: Non-plug-in



ZCKJ1H7 Non-plug-in

Silver Contacts (10 A)				Direct Opening (-)	Catalog Number
1 Step	SPDT	(N.O. + N.C.)	Snap action	Y▲	ZCKJ1H7
1 Step	SPDT	(isolated N.O. + N.C.)	Slow break-before-make	Y▲	ZCKJ5H7
1 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ2H7
2 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ4H7
Gold Flashed Contact	ts (low power circuits r	nax. 12 V, 0.1 A)			
1 Step	SPDT	(N.O. + N.C.)	Snap action	Y▲	ZCKJ18H7
1 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ28H7
High Temperature: +2	48 °F (+120 °C)				
1 Step	SPDT	(N.O. + N.C.)	Snap action	Y▲	ZCKJ15H7
1 Step	2 SPDT	(N.O. + N.C.)	Snap action	N	ZCKJ25H7
Neutral Position	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ4045H7

#### Table 21.45: Plug-in

1	0	-
1	×	OX:J
	9	Total Control
1	riv.	
1	-	3

ZCKJ11H7 Plug-in

XZCP1141L\*

Silver Contacts (10 A)		Direct Opening	Catalog Number		
1 Step	SPDT	(N.O. + N.C.)	Snap action	N	ZCKJ11H7
1 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ21H7
2 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ41H7
High Temperature: +2	48 °F (+120 °C)				
1 Step	SPDT	(N.O. + N.C.)	Snap action	N	ZCKJ115H7
1 Step	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ215H7
Neutral Position	2 SPDT	(2 N.O. + 2 N.C.)	Snap action	N	ZCKJ41045H7

Table 21.46: Wiring Options

	Catalog Number	Pins	Suffix
Mini style male receptacle	ZCKJ1/J11/J5H7	5 pins	547
(For example, to order a ZCKJ1H7 body with a mini-style connector option, the part number is ZCKJ1547.)	ZCKJ2/J4/J21/J41H7	9 pins	947

#### Table 21.47: Plug and Cable Assemblies

Matching plug and cable assemblies for the mini style receptacle options may be ordered as follows:

Description	Cable Length	Pins	Matches Receptacle Option	Catalog Number
3 ft	3 ft			BH2053
	6 ft	5	547	BH2056
Plug and cable	12 ft			BH20512
	3 ft			BH2093
	6 ft	9	947	BH2096
	12 ft			BH20912
	6.56 ft			XZCP1141L2
Pre-wired connector, female	16.40 ft	4	XCSDMR•L / XCSDMP•L	XZCP1141L5
lemale	32.81 ft			XZCP1141L10

<sup>▲</sup> Direct opening contacts meet IEC 947-5-1 requirements for positive opening contacts when using → head.

#### **Building a Complete Switch**

Complete Switch = Body (with contact assembly) + Head + Lever Example:

Body		Head		Lever		
ZCKJ1H7	+	ZCKE05	+	ZCKY11	=	XCKJ10511H7

Non-Plug-in Bo	dy ZCKJ1H7	Rotary Head ZCKE05 with Operating Lever ZCKY	ZCKJ*D
(1) 33.5 44	2xO5.3 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0)	62 57 41	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
	File E39281 CCN NKCR	File LR44087 Class 3211-03	:€

Acceptable Wire Sizes: 14–24 AWG Recommended Terminal Clamp Torque: 13 lb-in





33 oz-in, 0.25 N

ZCKE09

#### Table 21.48: Lever-Operated Heads

Contact Operation with Switch Bodies:	1 Step ZCKJ1▲ / J11 / J2 / J21H7	2 Step ZCKJ4 / J41H7	1 Step ZCKJ5H7 ▲	Operating Force/Torque	Catalog Number
Standard operation 1 Step CW and/or CCW	21·22 13·14 21·22 13·14 0     90°		21-22 33° 40°(P) 13-14 33° 90°		
2 Step 11-12, 13-14 first step		11-12 13-14 11-12 13-14 0 5°   90°		33 oz-in, 0.25 N	ZCKE05
21-22, 23-24 second step		21-22 23-24 21-22 23-24 0			
ZCKE05 Programming					
	CW and CCW	CW	CW and CCW	•	ccw

Note: Neutral position head ZCKE04 is not available separately. Order the head and body subassemblies from page 21-26.

#### Table 21.49: Plunger-Operated Heads

Maintained operation

Contact Operation with Switch Bodies:	1 Step ZCKJ1▲/J11/J2/J21/H7	2 Step ZCKJ4 / J41H7	1 Step ZCKJ5H7 ▲	Operating Force/Torque	Catalog Number
Top rod plunger	21-22 13-14 21-22 13-14 0	11-12 13-14 11-12 13-14 0 ► 035° ► .24°	08 .135(P) 21-22 13-14 0 .125 .24*	48 oz 18 N	ZCKE61
Ball-bearing top plunger		21-22		48 oz 18 N	ZCKE66
Steel roller plunger		21-22 23-24 0 ► 035" 24"		48 oz 18 N	ZCKE67
One-way Delrin roller based on actuation by 30° cam	21-22 13-14		.114 .193(P) 21-22	48 oz 18 N	ZCKE21
One way steel roller based on actuation by 30° cam	21-22 13-14 0 N05" N		0 .182	48 oz 18 N	ZCKE23
Side rod plunger	21-22 13-14 21-22 13-14 0		21-22 13-14 0 .106 .217	48 oz 18 N	ZCKE63
Side steel roller-plunger, horizontal based on actuation by 30° cam	21-22 13-14 21-22 13-14		.6 .107(P) 21-22 13-14	48 oz 18 N	ZCKE64
Side steel roller-plunger, vertical based on actuation by 30° cam	13-14 0 H <sub>.035</sub> H		0 .109	48 oz 18 N	ZCKE65

▲ Direct opening → when used with any head on this page except ZCKE09 (maintained operation).

ZCKE086



# Heavy Duty / Industrial Metal Body

Refer to Catalog 9006CT1007

ZCKE085

Table 21.50: Omnidirectional Heads

Contact Operation with Switch Bodies:	1 Step ZCKJ1, J11,J2,J21	2 Step ZCKJ4, J41	1 Step ZCKJ5	Operating Force/Torque	Catalog Number
Cat whisker-steel ▲	21-22 13-14		21-22 13-14	18.4 oz-in, 0.13 N	ZCKE06
Wobble coil springs ▲	21-22 13-14 0   100		0 45°	18.4 oz-in, 0.13 N	ZCKE08

<sup>▲</sup> Flexible operators do not guarantee direct (positive) opening operation.

Table 21.51: Operating Heads—for extended temperature ranges

		Catalog Number			
Description		Low temperature ■ -40 °F to +158 °F (-40 °C to +70 °C)	High temperature ■ -13 °F to +248 °F (-25 °C to +120 °C)		
l aven ananatad	Standard operations	ZCKE056	ZCKE055		
Lever operated	Maintained operations	ZCKE096	ZCKE095		
	Top rod plunger	ZCKE616	ZCKE615		
	Ball-bearing top plunger	ZCKE666	ZCKE665		
	Top roller plunger	ZCKE676	ZCKE675		
Diunger energted	One way Delrin roller	ZCKE216	ZCKE215		
Plunger operated	One way steel roller	ZCKE236	ZCKE235		
	Side rod plunger	ZCKE636	ZCKE635		
	Side steel roller plunger-horizontal	ZCKE646	ZCKE645		
	Side steel roller plunger-vertical	ZCKE656	ZCKE655		
Omnidirectional	Cat whisker	ZCKE066	ZCKE065		
Jiiiiiuii ectional	Wahhla asil apring	7CVE006	ZCVE00E		

<sup>■</sup> The minimum temperatures listed are based on the absence of freezing moisture or water.

Wobble coil spring

#### Table 21.52: Replacement Parts

<b>Description</b> (see page 21-27 for contact description)	Direct Opening →	Catalog Number
Contact block for ZCKJ1H7	Y	XE2SP2151
Contact block for ZCKJ2H7	N	XESP2021
Contact block for ZCKJ4H7	N	XESP2031
Contact block for ZCKJ5H7	Y	XE2NP2151
Contact block for ZCKJ18H7 (gold flashed)	Y	XE2SP2158
Contact block for ZCKJ28H7 (gold flashed)	N	XESP2028
Plug-in module for ZCKJ11H7 (includes contact block)	N	ZCKJ01H7
Plug-in module for ZCKJ21 (includes contact block)	N	ZCKJ02H7
Plug-in module for ZCKJ41 (includes contact block)	N	ZCKJ04H7
Base receptacle for ZCKJ11H7	_	ZCKJ019H7
Base receptacle for ZCKJ21H7	_	ZCKJ029H7
Base receptacle for ZCKJ41H7	_	ZCKJ029H7

#### Table 21.53: Lever Arms

Description	Adjustment Increments	Catalog Number
Adjustable or Flexible Operators ♦		
Adjustable Delrin roller, 0.74 in. diameter, 0.2 in. wide, 3 in. long (max.)	5° or 90°	ZCKY41
Adjustable steel roller, 0.74 in. diameter, 0.2 in. wide, 3 in. long (max.)	5° or 90°	ZCKY43
Adjustable rod-square, steel, 1/8 in. side, 5.4 in. long (max.)	5° or 45°	ZCKY51
Adjustable rod-round, fiberglass, 1/8 in. diameter, 5.4 in. long (max.)	5° or 45°	ZCKY52
Adjustable rod-round, steel, 1/8 in. diameter, 5.4 in. long (max.)	5° or 45°	ZCKY53
Adjustable rod-round, plastic, 1/4 in. diameter, 8.4 in. long (max.)	5° or 45°	ZCKY59
Coil spring lever	5° or 90°	ZCKY81
Spring rod lever	5° or 90°	ZCKY91
Reverse Mounting		
Delrin roller 0.9 in. diameter, 0.2 in. wide, 1.6 in. long	5° or 45° ★	ZCKY11
Steel roller 0.9 in. diameter, 0.2 in. wide, 1.6 in. long	5° or 45° ★	ZCKY13
Ball bearing roller 0.9' diameter, 0.2 in. wide, 1.6 in. long	5° or 45° ★	ZCKY14
Fork, 2 track, Delrin roller, 0.9 in.diameter, 0.2 in. wide for ZCK-E09	5° or 45° ★	ZCKY61
Fork, 1 track, Delrin roller, 0.9 in. diameter, 0.2 in. wide for ZCK-E09	5° or 45° ★	ZCKY71

<sup>♦</sup> Adjustable and flexible operators do not guarantee positive opening operation.

Non-plug-in Style Contact Block



XE2SP2151



.....



ZCKY51/52/53/59



ZCKY61



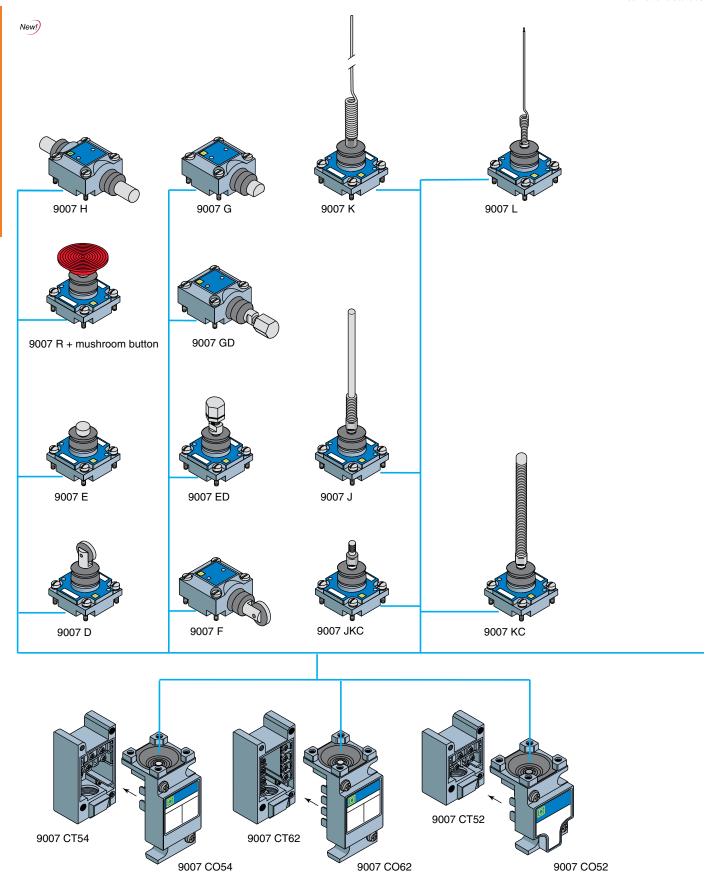
ZCKY71



ZCKY81

ZCKY91

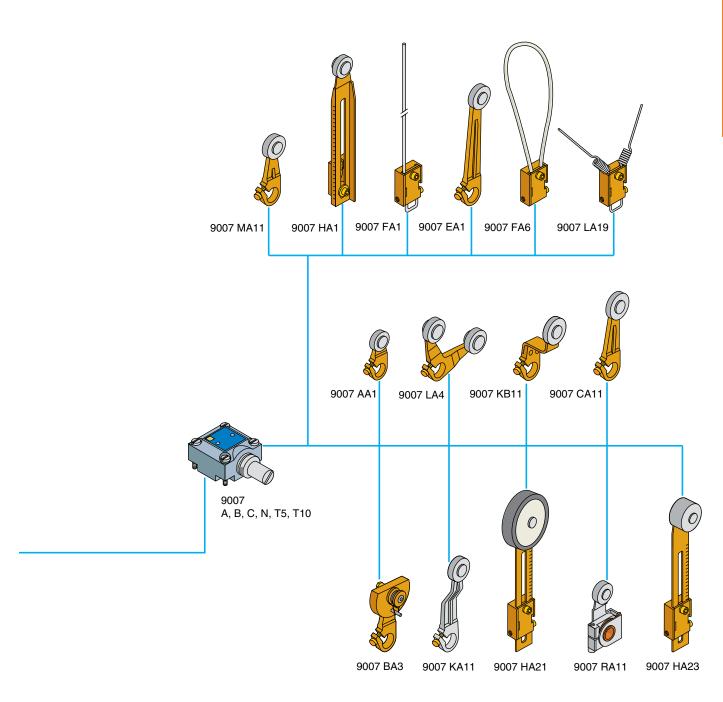
<sup>\*</sup> Reverse mounting: The higher increment (45°) is a direct (positive) opening contact feature which ensures no loss of mechanical effort between the actuation point and the moving contact bridge of the direct (positive) contact (N.C.) even if the lever is loosely mounted.



NOTE: Order the mushroom operator cap from Table 21.56 on page 21-33.







NOTE: Head 9007C is for use with levers LA19 and LA4.

Class 9007 / Refer to Catalog 9006CT1007

#### Oiltight, Watertight Switches—Standard and Compact Bodies

#### Table 21.54: All Type C Switches Rated NEMA 6P and UL Type 6P

	Side Plunger Rotary Lever Arm						unger				
Select Turret Head		Standard Pre-travel Spring Return	Low Differential Spring Return	Neutral Standard Pre-travel Spring Return	Position Low Differential Spring Return	Light Operating Torque Spring Return	Maintained Contact	Side Roller- Plunger Spring Return Vertical Roller Type	Side Push- Rod Plunger Spring Return	Side Push- Rod Plunger Adjustable ◆ Spring Return	Side Push- Rod Plunger Maintained Contact
		CW & CCW ▲	CW & CCW ▲	CW & CCW	CW &	CW & CCW ▲	CW (Trip) CCW (Reset)			Co	16
Select Basic Switch	Contacts	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре
	1 N.O. 1 N.C.	C54B2	C54A2	_	_	C54N2	C54C	C54F	C54G	C54GD	C54H
Standard Box	2 N.O. 2 N.C.	C62B2	C62A2	_	_	C62N2	C62C	C62F	C62G	C62GD	C62H
Plug-in	2 N.O.–2 N.C. Neutral Position	_	_	C68T10	C68T5	_	_	_	_	_	_
	2 N.O.–2 N.C. Two Stage	C66B2	C66A2	_	_	C66N2	_	C66F	C66G	C66GD	_
Compact Box Plug-in	1 N.O. 1 N.C.	C52B2	C52A2	_	_	C52N2	C52C	C52F	C52G	C52GD	C52H
UL Listed for Hazardous	1 N.O. 1 N.C.	CR53B2	CR53A2	_	_	CR53N2	CR53C	CR53F	CR53G	CR53GD	CR53H
Location Division I	2 N.O. 2 N.C.	CR61B2	CR61A2	_	_	CR61N2	CR61C	CR61F	CR61G	CR61GD	CR61H
Class I Groups B, C, D	2 N.O.–2 N.C. Neutral Position	_	_	CR67T10	CR67T5	_	_	-	_	_	_
Class II Groups E, F, G	2 N.O. –2 N.C. Two Stage	CR65B2	CR65A2	_	_	CR65N2	_	CR65F	CR65G	CR65GD	_
Head Only (Exam	ple: 9007B)	В	Α	T10	T5	N	С	F	G	GD	Н
	Pre-travel	10°	5°	10°	5°	10°	45°	0.08 in. (2 mm)			0.14 in. (3.6 mm)
	Pre- Stage	10°	5°	_	_	10°	_		0.08 in. (2 mm)		_
	travel Two Stage  Stage  Travel First to Second Stage	2-1/2°	1-1/2°	_	_	2-1/2°	_	C	0.02 in. (0.5 mm)		_
Nominal Operating	Total Travel	90°	90°	90°	90°	90°	90°	C	0.25 in. (6.3 mm)		0.25 in. (6.3 mm)
Data	Differential	4°	2°	4°	2°	4°	_	C	0.03 in. (0.8 mm)		_
	Reverse Overtrave	90°	90°	90°	90°	90°	_				
	Operating Torque/Force— 1 Pole & 2 Pole	4 lb-in (0.45 N•m)	4 lb-in (0.45 N•m)	4 lb-in (0.45 N•m)	4 lb-in (0.45 N•m)	25 oz-in (0.18 N•m)	3 lb-in (0.34 N•m)	4 lb (0.45 N•m)			7 lb (0.80 N•m)
Repeat Accuracy — Linear travel of cam (1-1/2 in. lever arm)				•	_						
Plug-in Replacem	ent Units						oase, substitut	e the letters "CC	" for the first "	'C" in the type	number.
Example: Open type replacement for Type C54B2 is Type C054B2.  Acceptable Wire Sizes: 12–22 AWG  Acceptable Wire Sizes: 12–22 AWG  Recommended Terminal Clamp Torque: 7 lb-in (0.80 N•m)  Example: Open type replacement for Type C54B2 is Type C054B2.  These devices are factory set to operate the contacts in both the CW and CCW directions. Mode of operation is field convertible to CW only or CCW only operation, change the "2" at the end of the type number (Example: C54B2 becomes C54B1).  Can be converted to horizontal roller type in the field. To order horizontal roller version add the letter "H" at the end of the equivalent vertical roller version type number (Example: C54B2 becomes C54B1).  To lock the nut in the desired position, crimp the slot near the bottom of the nut.						ample: C54B2					

Selection Mode Arrow



#### Mode Change—Lever Arm Type

Mode of operation is easily convertible to clockwise, counterclockwise, or both. Simply point the arrow to the letters representing the desired direction—CW, CCW, or CW/CCW. All parts are captive.

Exploded view	page 21-30
Lever arms pa	age 21-34, 21-3
Electrical ratings	page 21-
Special features	age 21-35, 21-36



## **Heavy Duty Industrial** Single- and Two-Pole

Table 21.55: All Type C Switches Rated NEMA 6P And UL Type 6P

Select Turret He	Head Top Plunger Wobble Stick Plug-							n-In					
	au		Top Roller- Plunger Spring Return	Top Push- Rod Plunger Spring Return	Top Push-Rod Plunger Adjustable ■ Spring Return	Palm Operated ▲	Universal ★	Wobble Stick Delrin ♦ Extension ★	Wobble Stick Wire Extension ★	Wobble Stick Coil Spring Extension ★	Cat Whisker	Plug-in Unit without Head	Plug-in Receptacle Only
						80- <b>(</b> )					-		
Select Basic Switch	Contact	ts	Type	Type	Type	Type	Type	Туре	Туре	Type	Type	Туре	Туре
	1 N.O. 1 N.C.		C54D	C54E	C54ED	C54R▲	C54JKC	C54J	C54K	C54KC	C54L	CO54	CT54
Standard	2 N.O. 2 N.C.		C62D	C62E	C62ED	C62R▲	C62JKC	C62J	C62K	C62KC	C62L	CO62	CT62
Box Plug-in	2 N.O	2 N.C. Position	_	_	_	_	_	_	_	_	_	CO68	CT62
	2 N.O		C66D	C66E	C66ED	C66R▲	C66JKC	C66J	C66K	C66KC	C66L	CO66	CT62
Compact Box Plug-in	1 N.O. 1 N.C.		C52D	C52E	C52ED	C52R▲	C52JKC	C52J	C52K	C52KC	C52L	CO52	CT52
UL Listed for Hazardous	1 N.O. 1 N.C.		CR53D	CR53E	CR53ED	CR53R▲	CR53JKC	CR53J	CR53K	CR53KC	CR53L	_	_
Location Division I	2 N.O. 2 N.C.		CR61D	CR61E	CR61ED	CR61R▲	CR61JKC	CR61J	CR61K	CR61KC	CR61L	_	_
Class I Groups B, C, D	2 N.O Neutral	2 N.C. Position	_	_	_	_	_	_	_	_	_	_	_
Class II Groups E, F, G	2 N.O.– Two Sta		CR65D	CR65E	CR65ED	CR65R▲	CR65JKC	CR65J	CR65K	CR65KC	CR65L	_	
Head Only			D	Е	ED	R▲	JKC	J	K	KC	L	_	-
	Pre-trave	el First			. (2 mm)		10° (Any Direction)				20°	_	
	Pre- travel Two	Stage First to			. (2 mm)			· · ·	Direction)		20°	_	
Nominal	Stage	Second Stage			(0.06 mm)				4°		5°	_	
Operating	Total Tra				(6.3 mm) (0.5 mm)				0° 3°		90° 6°	_	
Data		Overtravel			— (0.5 min)				_		_	_	
		Force— nd 2 Pole	3 lbs. (0.34 N•m)			3 lb-in (0.34 N•m)			7 oz-in (0.05 N•m)	_	_		
		Accuracy — avel of cam	± 0.001 in. (0.03 mm)				_				_	_	_
Plug-in Replacen	nent Units		To order the Example: O	basic switch a pen type replac	nd head withou cement for Type	t the plug-in re C54D is Type	ceptacle base, CO54D.	substitute the	letters CO for t	he first C in the	Type number.		
Recommended Te	Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clamp Torque: 7 lb-in (0.80 N•m)    Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clamp Torque: 7 lb-in (0.80 N•m)    Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clamp Torque:   To lock the nut in the desired position, crimp the slot near the bottom of the nut.   Delrin® is a registered trademark of DuPont. Not for use outdoors.   Wobble stick extensions are available separately for the universal head or as replacements for complete devices. See Table 21.57.												

#### Table 21.56: Mushroom Button For Palm Operated Turret Head

Color	1-3/8 in. Dia. Button Type No.	2-1/4 in. Dia. Button Type No.
Black	2358C6G3	2358C22G2
Red	2358C6G2	2358C22G3
Green	2358C6G6	2358C22G6
Yellow	2358C6G8	2358C22G8

Table 21.57: Wobble Stick Extensions

Description	Catalog Number
Delrin extension	9007WJ
Wire extension	9007WK
Coil spring extension	9007WKC





LR25490 3211-03







LR26817 3218-02



Compact Body



Hazardous Location



Standard Body

#### Lever Arms for 9007AW and 9007C Heavy Duty / Industrial Limit Switches

Standard roller is hardened oil-impregnated sintered iron. Bold-face Type numbers indicate the most commonly used lever arms.

#### Table 21.58: Cast Zinc Lever Arms



Recommended in place of Types BA7, CA7, DA7, EA7 and MA7 lever arms with steel rollers. If necessary, the latter arms can be furnished at an additional cost.

#### Table 21.59: Flat Steel Lever Arms

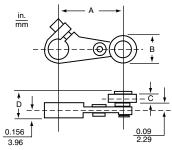
0	Length of Arm (A)	Standard Roller 5/8" Dia. (B) 1/4" Wide (C)	Standard Roller 5/8" Dia. (B) 5/8" Wide (C)	Nylon Roller 3/4" Dia. (B) 1/4" Wide (C)	Nylon Roller 1" Dia. (B) 1/4" Wide (C)	No Roller
•	` ′	Туре	Туре	Туре	Туре	Туре
Flat Steel	7/8" 1-3/8" 1-1/2" 2" 2-1/2" 3"	AA1S BA1S ————————————————————————————————————	AA2S BA2S — CA2S DA2S EA2S	 MA18S 	BA4S CA4S DA4S EA4S	AAOS BAOS — CAOS DAOS EAOS

#### Table 21.60: 90° Forked Cast Zinc Lever Arms

0	Roller Position	Standard Rollers 3/4" Dia. (B) 1/4" Wide (C)	Standard) Rollers 5/8" Dia. (B) 1/4" Wide (C	Nylon Rollers 3/4" Dia. (B) 1/4" Wide (C)	Nylon Rollers 3/4" Dia. (B) 1" Wide (C)	Ball Bearing Rollers 11/16" Dia. (B) 1/4" Wide (C)
- PER		Туре	Туре	Туре	Туре	Туре
John .	Rollers on Same Side	LA4	LA1	LA16	LA10	LA7
0	R.H. Roller on Opposite Side	LA5	LA2	LA17	LA11	LA8
90° Forked Arm 1-1/2" Length	L.H. Roller on Opposite Side	LA6	LA3	LA18	LA12	LA9

Approximate shipping weights range from 1/8 to 1/4 lb.

## **Cast Zinc Lever Arm Dimensions**



A = Length of Lever Arm

B = Roller Diameter

C = Roller Width D = C + 5/16"

See the tables on this page for A, B, and C dimensions.

#### Table 21.61: One-Way Cast Zinc Roller Lever Arm

	Roller, 1-1/4" Dia. (B) 1/4" Wide (C)						
	Length	Cast Arm	Flat Steel Arm				
1011	of Arm	Туре	Туре				
One-Way Roller Lever Arm	1-3/8" 1-1/2" 2" 2-1/2" 3"	BA3 MA3 CA3 DA3 EA3	BA3S CA3S DA3S EA3S				

#### Table 21.62: One-Way Lever Arms

			Roller		
Length of Arm		Standard 3/4" Dia. (B) 1/4" Wide (C)	/4" Dia. (B) 3/4" Dia. (B) 1-1/16" Dia.		Rod Type
(0)		Туре	Type	Туре	Туре
One-Way	1-1/2"	RA11	RA18	RA9	
Lever Arm	5"	=	_	=	FA2

Table 21.63: Offset-style Cast Zinc Lever Arms

Offset Lever Arm	Dia. (B)	Width (C)	Туре		
		Standard Roller			
2" Length 7/16" Offset	5/8 5/8 3/4 3/4	1/4 5/8 1/4 5/8	<b>KA1</b> KA2 KA11 KA12		
	Ball Bearing				
	11/16	1/4	KA9		
		Nylon			
	3/4 3/4	1/4 1	KA18 KA21		
1-1/2" Length		Standard Roller			
7/8" Offset	3/4 3/4	1/4 1/4	KB11 KB15 ■		

Roller inside.

#### Table 21.64: Rod Type Lever Arms

••	
Rod, in. (mm)	Туре
10 (254) Stainless Steel Rod 12 (304) Spring Rod, Steel 18 (304) Spring Rod, Steel 12 Spring Rod, Delrin Looped Delrin Rod	<b>FA1</b> <b>FA3</b> FA4 <b>FA5</b> FA6
90° Forked Rod 2-1/2" Spring Rods, Steel	LA19

Dimensions... . page 21-35

For more information on LA19, refer to catalog 9006CT1007.

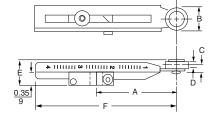
**Heavy Duty Industrial** Single- and Two-Pole

#### **Lever Arms**

Standard roller is hardened oil-impregnated sintered iron. Bold-face type numbers indicate the most commonly used lever arms.

Table 21.65: Adjustable Length Lever Arms

Lever Arm, Length Adjustable from 7/8" to 4"									
		Roller							
Description	Without Roller	Standard 5/8" Dia. 1/4" Wide	Standard 5/8" Dia. 5/8" Wide	Nylon 5/8" Dia. 1/4" Wide	Ball Brg. 11/16" Dia. 1/4" Wide	Nylon ▲ 1" Dia. 5/8" Wide	Delrin 1-5/8" Dia. 1/4" Wide	Nylon 2" Dia. 1/4" Wide	Rubber Tire 2-1/8" Dia. 1/2" Wide
	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре
Non-bendable	HA0	HA1	HA2	HA4	HA24	HA22	_	_	_
Bendable	HA9	HA5	HA6	HA8	HA25	HA23	HA20	HA26	HA21



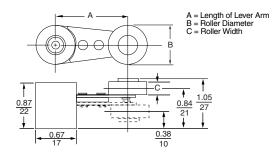
Recommended in place of Types HA3 and HA7 lever arms with steel rollers. If necessary these arms can be furnished at an additional cost.

Table 21.66: 360° Angular Adjustable Lever Arms

Length	Standard		Standard	Nylon	Nylon	Ball Bearing
	5/8" Dia.		3/4" Dia.	5/8" Dia.	3/4" Dia.	11/16" Dia.
	1/4" Wide		1/4" Wide	1/4" Wide	1/4" Wide	1/4" Wide
of Arm				Roller Outside		
	Туре	Туре	Туре	Туре	Туре	Туре
7/8"	AA1M	AA5M	AA11M	AA8M	AA18M	AA9M
1-3/8"	BA1M	BA5M	BA11M	BA8M	BA18M	BA9M
1-1/2"	MA1M	MA5M	MA11M	MA8M	MA18M	MA9M
2 "	CA1M	CA5M	CA11M	CA8M	CA18M	CA9M
2-1/2"	DA1M	DA5M	DA11M	DA8M	DA18M	DA9M
3 "	EA1M	EA5M	EA11M	EA8M	EA18M	EA9M

Note: Roller can be changed in the field from roller outside to roller inside position or vice versa.

Approximate shipping weights range from 1/8 to 1/4 lb.



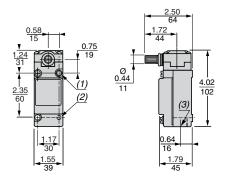
#### **Special Features**

#### Table 21.67: Special Features (do not apply to Type CR unless noted)—Field Installable

Description	Don't November
Description	Part Number
Conduit Seal Only5 hole sealConduit seal fits in conduit entrance and excludes liquids9 hole seal	3103248801 3103281501
Adapters	
Switch with adapter plate permitting substitution of any Type C switch with standard box for any Type T switch with Style B baseplate	Form Y147
Adapter plate kit only (plate plus mounting screws) for above	Class 9007 Type BT1
Adapter plate to allow direct substitution of Type C plunger switches for Type B plug-in plunger switches— use only if there is a problem in lining up cam tracks  Standard Box Compact Box	Class 9007 Type CT10 ■ Type CT13 ◆
Adapter plate kit permitting direct substitution of any Type C lever arm switch with standard box for ANY Type AW lever arm switch	Class 9007 Type CT11
Metric conduit-connection adapter—male 1/2" NPT on one end, female 20 mm on the other end	Class 9007 Type CT12

- Dimensions: 0.22 x 2.94 x 1.54 in.
- Dimensions: 0.22 x 2.07 x 1.54 in.

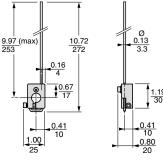
#### Rotary lever arms 9007C---- A, B, C, N, T5, T10



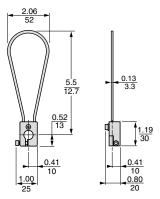
Dual dimensions:

- 2 x 0.20/5 x 0.22/6 HLS. 2 x 10-24 Tapped HLS Back Mtg 0.29/7 DP.
- 1/2 14 NPT.

## Rod type lever arms 9007FA1







## Table 21.68: Special Features (do not apply to Type CR unless noted)—Not Field Installable, Except Where Noted

#### Special Features

#### opcolar i catarco

#### Optional Shaft Equipped With 9007T / 9007FT Hub:

Any lever arm Type C, CF or CR switch can be furnished with an optional shaft and hub combination which will accept the lever arms normally used with Type T and FT limit (position) switches. To order, add S9 as suffix to the device type number. For example, to order a 9007 C54B2 with this modification, order as a 9007 C54B2-S9. For details about the switches and lever arms that can be furnished with this modification, see catalog 9007CT1007.



Add **S9** as a suffix to the catalog number

Form

Cat. No. 9007S9

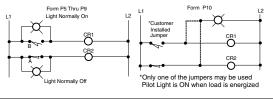
#### **Hub Only:**

Can be field installed on any Type C lever type switch.

 LED Pilot Light, 24-120 Volts AC or DC on Plug-In Type Switch (Type C52, C54, C62, C64, C66, or C68):

 Form P5 Thru P9
 L1
 Form P10
 L2
 Addition of LED pilot light in Microbial Pilot Light Normally On

 L1
 L2
 1
 L2
 L2
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L2
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L2
 L3
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L2
 L3
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L3
 L3
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L3
 L3
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L3
 L3
 Addition of LED pilot light in Microbial Pilot Light Normally On
 L3
 L3
 Addition of LED pilot light Normally On
 L3
 L3
 Addition of LED pilot light Normally On
 L3
 L3
 L3
 L3
 Addition of LED pilot light Normally On
 L3
 L3
 L3
 L3
 Addition of LED pilot light Normally On
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3
 L3



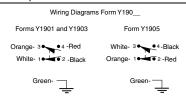
Addition of LED pilot light in parallel with N.O. contact (light normally on) P5 Addition of LED pilot light in parallel with N.C. contact (light normally off) P6 Addition of two LED pilot lights, one in parallel with N.O. contact (light normally on), one in parallel with N.C. contact (light normally off) P7 Addition of two LED pilot lights in parallel with N.O. contacts (lights normally on) (Types C62, C64, C66 or C68 only) P8 Addition of two LED pilot lights in parallel with N.C. contacts (lights normally off) (Types C62, C64, C66, or C68 only) P9 Addition of one isolated LED pilot light (light on when load is energized) (Type C54 only. Not available with Y1901.) P10 Plug-in limit (position) switch furnished with pre-wired mini 5 pin male receptacle. For use with Brad Harrison female portable plug No. 41306, 41307, or 41308 (or equal). (Not available with P10 or for hazardous locations.) Y1901 Same as Y1901 but with different wire color coding Y1905 Same as Y1901 but with tamperproof screws on head and body Y1903

 Tamperproof Screws—Complete Switch Only
 Same as Y1901 but with tamperproof screws on head and Other versions with different wiring diagrams per automotive requirements are available. Contact your local Schneider Electric field office.

Mating plug and cables available.

**Pre-Wired Receptacle** 

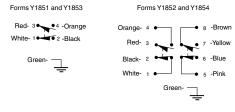
Single Pole



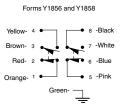


Potted Limit (Position) Switch Or Plug-In Receptacle Only:	
<ul> <li>With Individual Wires</li> <li>Single pole plug-in limit (position) switch or receptacle pre-wired with five #16 wires 5 ft long and wire entry completely sealed with epoxy resin</li> <li>Double pole plug-in limit (position) switch or receptacle pre-wired with nine #16 wires 5 ft long and wire entry completely sealed with epoxy resin</li> </ul>	Y1841 Y1842
<ul> <li>With STOWA Cord</li> <li>Single pole plug-in limit (position) switch or receptacle pre-wired with five conductor #16 STOWA cord 8 ft long and wire entry completely sealed with epoxy resin</li> <li>Same as Y1851 but with different wire color coding</li> <li>Double pole plug-in limit (position) switch or receptacle pre-wired with nine conductor #16 STOWA cord 8 ft long and wire entry completely sealed with epoxy resin</li> <li>Same as Y1852 but with different wire color coding</li> </ul>	Y1851 Y1855 Y1852 Y1856
Tamperproof Screws—Complete Switch Only	
<ul> <li>With Individual Wires</li> <li>Same as Y1841 but with tamperproof screws on head and body</li> <li>Same as Y1842 but with tamperproof screws on head and body</li> </ul>	Y1843 Y1844
With STOWA Cord Same as Y1851 but with tamperproof screws on head and body Same as Y1852 but with tamperproof screws on head and body Same as Y1855 but with tamperproof screws on head and body Same as Y1856 but with tamperproof screws on head and body	Y1853 Y1854 Y1857 Y1858

Other versions with different wiring diagrams for automotive requirements are available.









Low Temperature—Lever Types Only: Limit (Position) switch will operate in an ambient temperature range of -40 to +185 °F (standard limit range is -20 to +185 °F). Minimum temperature is based on the absence of freezing moisture or water.	switch ambient temper	rature	Y128		
Fluorocarbon Rubber (FKM) Gaskets And Seals					
Substitute fluorocarbon rubber gaskets and seals on: Lever arm type, standard box (shaft seals on lever arm types are fluorocarbon rubber as standard) Lever arm type, compact box (shaft seals on lever arm types are fluorocarbon rubber as standard) Plunger type, standard box Plunger type, compact box Substitute fluorocarbon rubber box only on plunger type switches					
Note: Fluorocarbon rubber has been shown to resist sunlight aging problems.					
Direct Acting Contacts	8		Y1561		
Substitution of direct acting contact unit for snap switch of single-pole switch:  One pole, normally closed, slow-make slow-break, direct acting contact mechanism substituted for standard snap switch on Types C52, C54, CF53, and CR53 devices.  This mechanism was designed for use in emergency overtravel applications. The movable contact of this basic switch unit is acted upon directly by the actuating mechanism of the limit switch—it does not depend on the force exerted by a snap-switch blade or a spring to open the circuit. Because these contacts are slow-make slow-break, they are best suited for applications where they are not actuated during normal operation, but only if abnormal overtravel is encountered.  ** The direct acting contacts described above come standard on the 9007CLS1 hoist overtravel switch.		Direct Acting Contact Mechanism (shown without cover)			



Table 21.69: Complete with Base Plate, Without Lever Arm (bold type numbers indicate the most commonly used switches)

					Universal Type			
		No. 1	No. 2	No. 3★	No. 4	No. 5	No. 6	No. 7★
Select the Operati Sequence	ing	Single-Pole Double-Throw Spring-Return CW Only	Single-Pole Double-Throw Spring-Return CW Only	Single-Pole Double-Throw Maintained Contact	Single-Pole Double-Throw Spring-Return Neutral Position	Single-Pole Double-Throw Spring-Return CCW Only	Single-Pole Double-Throw Spring-Return CCW Only	Single-Pole Double-Throw Maintained
Select the Basic Switch		Initial Position and CCW  A B O O CW  A B O O O O O O O O O O O O O O O O O O	Initial Position and CCW  Initial Position and CCW  A B O O O O O O O O O O	Spring return of arm to initial position, contact position maintained until operated in reverse direction CCW CW  A B A B  O O O D  If high speed cam or snap-back is present use No. 12	Initial Position  A B  O O  O  CCW  CW  A B A B  O O O O  O	Initial Position and CW  A B  CCW  A B  CO  CO  CO  CO  CO  CO  CO  CO  CO  C	Initial Position and CW  A B  O D  Intermediate Position CCW  A B A B  O D  O D  O D  O D  O D  O D  O D  O	If high speed cam or snap-back is present use No. 12  A B  CW  A B  CW
	Base Plate	Туре	Туре	Туре	Туре	Туре	Туре	Туре
Surface Mountin	ng A B C D	TUA1 TUB1 TUC1 TUD1	TUA2 TUB2 TUC2 TUD2	TUA3 TUB3 TUC3 TUD3	TUA4 <b>TUB4</b> TUC4 TUD4	TUA5 TUB5 TUC5 TUD5	TUA6 TUB6 TUC6 TUD6	TUA7 TUB7 TUC7 TUD7
Pr	re-travel	14°	Int. Pos. 9°, Final 16°	7°	6°	14°	Int. Pos. 9°, Final 16°	10°
NominalTot	tal-travel	88°	88°	81°	81°	88°	88°	85°
	ferential	12°	5°	7°	5°	12°	5°	12°
	er. Torque	12 lb-in	12 lb-in	12 lb-in	12 lb-in	12 lb-in	12 lb-in	2.5 lb-in
	Accuracy	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.
o convert sequen he base plate, po late and latches. he positioning pla atches as shown.	sitioning Reassemble ate and					B	B	

				Universal Type				Standard Type	
		No. 8★	No. 9	No. 10	No. 11	No. 12	No. 1	No. 2	No. 3
Select Operating S	equence	Single-Pole Maintained Double-Throw Neutral Position	Single-Pole Double-Throw Spring-Return Slow Make Slow Break	Single-Pole Double-Throw Spring-Return Slow Make Slow Break	Single-Pole Double-Throw Spring-Return Slow Make Slow Break	Single-Pole Double-Throw Maintained	Single-Pole Double-Throw Spring-Return CW & CCW	Single-Pole Double-Throw Spring-Return CW & CCW	Single-Pole Double-Throw Spring-Return CW & CCW Slow Make Slow Break
Select Basic Switch		Initial Position If high speed cam or snap-back is present use No. 12  A B O O O CCW CW A B A B O O O O O O	Initial Position and CCW  A B  O O  CW  A B  O O	Initial Position  A B  O O  O  CCW CW  A B A B  O O O  O O	Initial Position and CW  A B  O O  CCW  A B  O O	CCW A B O C CW A B O O	Initial Position  A B  O O  CCW & CW  A B  O D	Initial Position  A B  O O  CW & CCW Intermediate Final Position  A B A B  O O O O O O O O O O O O O O O O O O	Initial Position  A B  O O  CW & CCW  A B  O O  O O
	Base Plate	Туре	Туре	Туре	Туре	Туре	Туре	Туре	Туре
Surface Mounting	A B C D	TUA8 TUB8 TUC8 TUD8	TUA9 TUB9 TUC9 TUD9	TUA10 TUB10 TUC10 TUD10	TUA11 TUB11 TUC11 TUD11	TUA12 TUB12 TUC12 TUD12	TSA1 TSB1 TSC1 TSD1	TSA2 TSB2 TSC2 TSD2	TSA3 TSB3 TSC3 TSD3
Pre	-travel	6°	12°	3°	12°	45°	14°	Int. Pos. 9°, Final 16	9°
INUITINIAI	al-travel	81°	87°	81°	87°	90°	89°	89°	89°
- T	erential	10°	0°	0°	0°	0°	12°	Int. Pos. 5.5°, Final 7.5°	5°
	: Torque	2.5 lb-in	12 lb-in	12 lb-in	12 lb-in	8 lb-in	10 lb-in	10 lb-in	10 lb-in
	Accuracy ■		±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.	±0.004 in.
To convert sequence he base plate, pos blate and latches. R he positioning plate atches as shown.	itioning leassemble	101	A		B	Not Adjustable			A S

- Pre-travel listed may vary up to 5° additional for universal switches or up to 2° additional for standard switches due to the free travel of the lever arm at the initial position.

the initial position.

Linear travel of cam on 1-1/2 in. lever arm.

Remove the spring from the positioning plate.

Sequence 3, 7, and 8 devices are available but are not recommended where high speed cams or lever arm snap-back is present.

The application should be checked and No. 12 sequence substituted where possible.

To obtain a Type FT Foundry Switch, change the "T" at the beginning of the equivalent Type number to "FT" (for example, TUB1 changes to FTUB1).

Lever arms.....page 21-38

## Class 9007 Type T and FT, Oiltight

Table 21.70: Lever Arms for Types T and FT Limit Switches or Type C with S9 Hub



9007TUB4



9007FTUB4

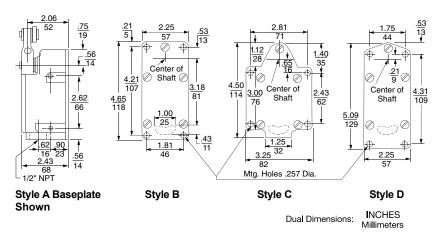
	Туре						
	Length of Arm	5 H 5 H	5 0 1000	Roller Dia. (in.)			
Type of Arm	(in.)	Roller Position	Roller Width	3/4	1	1-3/8	
	1-1/2	Front or Back	1/4	B1	B2	B3	
	1-1/2	Front or Back	1/2	B12	B13	B14	
	2-1/2	Front or Back	1/4	B7	B8	B9	
	2-1/2	Front or Back	1/2	B22	B23	B24	
Straight	2-7/8	None	None	Without Roller B21	_	_	
	5	Front or Back	1/4	B19	_	_	
	Adj.	Does not include a lever arm clamp or rod. Lever arm clamp is required—use 9007 R16 or R17, plus a customer-supplied rod.	1/4	R18	R19	R20	
1-1/2		Inside Offset	1/4	C1	C2	C3	
Offset	1-1/2	Outside Offset	1/4	D1	D2	D3	
	1.7/0	Outside Offset	1/4	E4	E5	E6	
	1-7/8	Inside Offset	1/4	F4	F5	F6	
	1-1/2	Rollers on Same Side	1/4	J1	J2	_	
120° Forked	1-1/2	LH Roller on Opposite Side	1/4	K1	K2	_	
	1-1/2	RH Roller on Opposite Side	1/4	N1	N2	_	
	1-1/2	Rollers on Same Side	1/4	X1	X2	_	
90° Forked	1-1/2	RH Roller on Opposite Side	1/4	Y1	Y2	_	
	1-1/2	LH Roller on Opposite Side	1/4	Z1	<b>Z</b> 2	_	
Cable	1-1/2	None	None		Y3		
Operated	2-1/2	With eyebolt (1/4 in. I.D.) instead of roller	None		B27		
Rod	Adj. Clamp for 3/16 in. Rod (rod not included) None		R16				
Hou	Adj.	Clamp for 1/4 in. Key Stock (key stock not included)  None		R17			
Weld-On	3-1/2	None None		G10			
1-Way Roller	1-1/2	Outside Offset	1/4		D4		
Conveyor	8-7/16	1-1/2 in. dia. 3-3/4 in. Delrin roller. For use with Type T and	FT only.		R21		
Side Guide	o-//16	7/8 in. dia. 3-3/4 in. Delrin roller. For use with Type T, FT, or	C with S9.	R22			

Table 21.71: Separate Base Plates

Style	Mounting Holes	Part Number
A	None▲	2934D32G1
В	End	2934D14G1
С	Side	2934D33G1
D	End	2934D34G1

No mounting holes in base plate. Side mounting holes in switch case must be used.

For all Type T and FT: Acceptable Wire Sizes: 14–18 AWG Recommended Terminal Clamp Torque: 13–16 lb-in









# Severe Duty, Oiltight Mill and Foundry

#### R.B.Denison™ Lox-Switch™ L



L300WS2M1

#### Table 21.72: General Specifications

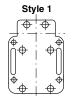
Temperature range	0 to +200 °F (-17 to +93 °C) standard. For high and low temperature options, see Table 21.79 on page 21-40. Minimum temperatures are based on the absence of freezing moisture or water.
Enclosure rating	NEMA 1, 4, and 13; IP 65, 66
Vibration resistance	30G max. (10–55Hz)
Repeatability	.03°
Cable entry	1/2" NPT standard double circuit, 3/4" NPT triple circuit
Contact Characteristics	
Rated thermal current	20 A
Rated insulation voltage	600 Vac and Vdc
Wire (max.)	1 x 12 AWG or 2 x 14 AWG per screw terminal

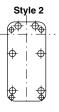
Table 21.73: Switching Ratings: A600 (AC), P600 (DC)

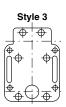
Contact Rating	Maximum current (A)					Maximum								
Designation	120	0 V	12	5 V	24	0 V	25	0 V	48	0 V	≤ 60	00 V	V	Ά
(M=Make, B=Break)	M	В	М	В	М	В	М	В	М	В	M	В	М	В
A600 (AC)	60	6.00	_	_	30	3.00	_	_	15	1.50	12	1.20	7200	720
P600 (DC)	_	_	1.1	1.1	_	_	0.55	0.55			0.2	0.2	138	138

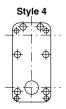
Table 21.74: Type L Selection

Mounting Plates, L100 and L300 Models









Other selections are available.	Refer to catalog 9006CT1007.
---------------------------------	------------------------------

Description	Contact Diagram	Operating Torque	Cat. No.
Snap-action CW		190 oz-in (1.34 N∙m)	L100WS2M1
Spring return	1 L	190 oz-in (1.34 N∙m)	L300WS2M1
Snap-action CCW	1 4	190 oz-in (1.34 N∙m)	L100WS2M2
Spring return	1년   <b>1</b> 3 1년   123 2년   <b>1</b> 4 2년   124	190 oz-in (1.34 N∙m)	L300WS2M2
Maintained contact ▲ CW and CCW		45 oz-in (0.32 N∙m)	L100WS2M3
Snap action	1 Lg	45 oz-in (0.32 N∙m)	L300WS2M3
Snap action CW		190 oz-in (1.34 N∙m)	L100WDR2M4
Spring return	5 D D 3 5 D D 3 6 D D 4 6 D D D 7 4	190 oz-in (1.34 N∙m)	L300WDR2M4
Neutral position ▲ N.OCW, N.OCCW		170 oz-in (1.2 N∙m)	L100WNS2M26
Spring return Snap action		170 oz-in (1.2 N∙m)	L300WNS2M26
Neutral position ▲ N.OCW, N.OCCW		170 oz-in (1.2 N∙m)	L100WNSL2M29
Maintained in CW only		170 oz-in (1.2 N∙m)	L300WNSL2M29
2 Step Sequence CW Spring return, Snap action, 2 N.O.		150 oz-in (1.06 N∙m)	L525WDR2M56
2 Step Sequence CCW Spring return, Snap action, 2 N.O.	1 L	150 oz-in (1.06 N∙m)	L525WDL2M57
2 Step Sequence CW Spring return, Snap action, 2 N.C.	1 L 5 1 L 5 1 L 5 1 L 5 5 2 C C 6 2 C C 6	150 oz-in (1.06 N∙m)	L525WDL2M58
2 Step Sequence CCW Spring return, Snap action, 2 N.C		150 oz-in (1.06 N∙m)	L525WDR2M59
2 Step Sequence CW Spring return Snap action N.O./N.C	1 L 3 1 L 3 1 L 3 3 1 L 3 3 2 C 9 7 4 2 C 9 7 4	150 oz-in (1.06 N∙m)	L100WS0S2M60

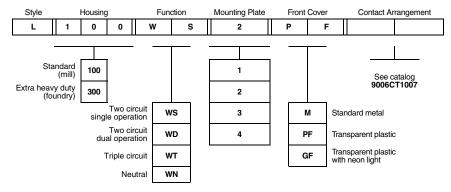
<sup>▲</sup> The lever must not be allowed to snap freely from any overtravel position.

## **Interpreting the Catalog Numbers**

Use the table below to interpret the catalog numbers of the L100/L300 switches. Do not generate new catalog numbers from the table. If the required contact sequence is not listed, contact your local field office.

The only modifications to the existing catalog numbers are:

- Mounting Plates—Style 1, 2, 3 or 4
- Front Covers—Metal, transparent plastic, or transparent plastic with a neon light.
- Special Features—Select from catalog 9006CT1007 and add to the type number.





.62

Style A

3.00

Rolling Pin

Ministyle male receptacle

Table 21.75: Steel Roller Lever Arms (0.25 in. wide, 0.75 in. dia.)

Lever Number	Length (L)	
Level Nullibel	mm	in.
AA	(38.1)	1.50
AH	(50.8)	2.00
AO	(63.5)	2.50
AK	(69.8)	2.75
AB	(76.2)	3.00
AM	(101.6)	4.00
۸D	(152.4)	6.00

Table 21.77: Rolling Pin

For use with 2 step switches for conveyor or belt applications

Length (L), In.	Lever Number	
2.25 (75.1)		AL1650
2.25 (75.1)	(Teflon for high temperature applications)	AL16501
3 (50.8)		AL1802

Table 21.76: Lever Arm Options

Description	Suffix
1 in. diameter roller	1
1-1/4 in. diameter roller	4
1-1/2 in. diameter roller	2
Nylon roller	N
Ball bearing roller (3/4 in. diameter)	R
Stainless steel roller pin nylon roller	NS
Ex: AB1: ABR	

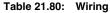
#### Table 21.78: Roller, Adjustable

from 2 to 4 in. (0.25 in. wide, 0.75 in. diameter)

Length (L), In. (mm)	Lever Number
Adjustable 2 to 4 (50.8 to 101.6)	AL2820

Table 21.79: Housing options ▲

Description	Examples	Prefix Adder or Modifier
3/4" conduit opening: Available on 2 circuit switches. Standard on 3 circuit switches.	L100WS2M1 changes to GL100WS2M1	G
High temperature 0 to +350 °F ★ Metal front cover only	L100WS2M1 changes to HL100WS2M1	Н
Low temperature -20 to +200 °F ★	L100WS2M1 changes to TL100WS2M1	T
High shock. Available only on operating sequences 1, 2, 4, 5, 7-11, 13, 14.	L100WS2M1 changes to L526WS2M1 L300WS2M1 changes to L326WS2M1	526/326
Gold contacts	L100WS2M1 changes to L522WS2M1 L300WS2M1 changes to L322WS2M1	522/322



Description		Examples	Prefix Adder or Modifier
Straight male receptacle 4 pin ■	Factory prewired	L100WS2M1 changes to PL100WS2M1	Р
90° Angle male receptacle 4 pin ■	Factory prewired—facing right	L100WS2M1 changes to APL100WS2M1	AP
Ministyle male receptacle ◆	8 A max., 5 pin (double circuit) 7 A max., 7 pin (triple circuit)	L100WS2M1 changes to <b>B</b> L100WS2M1	B B
Potted and prewired	5 wires, 6 ft long 5 wires, 12 ft long 5 wires 18 ft long	L100WS2M1 changes to L100WS2M1P L100WS2M1 changes to L100WS2M1P12 L100WS2M1 changes to L100WS2M1P18	P P12 P18

Table 21.81: Accessories

Description		Catalog Number
Sealed female plug and cable for P and	AP receptacles	
	4 ft	1010004
4 pins, 16 AWG STO cable, 60 °C	6 ft	1010006
	10 ft	10100010
Sealed female plug and cable for ministy	/le receptacle (B)	
	3 ft cable	BH2053
5 pins, 16 AWG STO cable, 105 °C	6 ft cable	BH2056
	12 ft cable	BH20512

Table 21.82: Front covers

Description	Designator
Standard metal	М
Transparent plastic cover with metal frame	PF
Transparent plastic cover with metal frame and Neon indicator light (not connected)	GF

- Other options available—contact your Schneider Electric representative for details.

  Receptacle is a 4 pin male APL/PL-SWTS, Cannon part # MS3102E20-4P-F79 or equal.

  Ministyle male receptacles are: 5-pin, Brad Harrison #41310 (or equal); 7-pin, Brad Harrison #42805 (or equal)
- The minimum temperatures listed are based on the absence of freezing moisture or water.



90° angle male receptacle

# Back to Product Index Section Listing

## Section 22

## Pressure, Vacuum, and Float Switches







Electronic Pressure Sensors XMLG (p. 22-4), XMLK (p. 22-4), XMLF (p. 22-8)



9012G Industrial Pressure Switch p. 22-13



9012G Machine Tool Pressure Switch p. 22-14



XMLA Electromechanical Pressure Switch p. 22-10



9016G Vacuum Switch p. 22-19



9013F Water Pump Switch p. 22-21



9013G Air Compressor Switch p. 22-22



9036D Open Tank Float Switch p. 22-23



9037H Closed Tank Float Switch p. 22-25

#### Electronic—Industrial

	Electronic Pressure Sensors	XMLG	22-4
IVEW!	Electronic Pressure Transmitters	XMLK	22-6
	Electronic Pressure Sensors	XMLF	22-8

#### Electromechanical—Industrial

Pressure Switches	XMLA, B, C, D Compact International	22-10
	9012G General Industrial	22-13
	9012G Machine Tool	22-14
	9012G Dual Stage and Differential	22-15
Vacuum Switches	9016GAW, GAR	22-19

#### Electromechanical—Commercial

Vacuum Switches	9016GVG	22-19
Pressure Switches	9013FHG—Air Compressor	22-20
	9013FRG, FSG, FYG—Water Pump	22-21
	9013G—Air Compressor	22-22
Float Switches	9036D, G—Open Tank	22-23
	9036FG—Open Tank	22-24
	9037E—Closed Tank	22-24
	9037H—Closed Tank	22-25
	9038A—Alternators, Open Tank	22-26
	9038C—Alternators, Closed Tank	22-26
	9038D—Alternators, Closed Tank	22-27

#### **Accessories and Renewal Parts**

Accessories and Renewal Parts Kits Class 9998, for Class 9012–9038 22-28



Application

Electronic















Product Family	XMLG	XMLK	XMLF	XMLA, B, C, D	9012G	9016G
Type of Installation/ Application	Control circuits	Control circuits Pumping applications	Control circuits	Control circuits	Control circuits	Control/power circuits
Fluids Controlled	Air, water, hydraulic oils, corrosive fluids	Air, fresh water, 0 to + 80 °C (32 to 176 °F)	Air, water, hydraulic oils, cor	rosive fluids		
Type of Operation and Features	Pressure/vacuum switches and transmitters Analog output 4–20 mA or 0–10 V	Pressure transmitters Analog output, 4–20 mA or 0–10 V	Pressure/vacuum switches and transmitters Configurable units with digital display Analog output 4–20 mA Regulation between 2 trip points (adjustable differential)	Pressure/vacuum switches Detection of single trip point (nonadjustable differential) Regulation between 2 trip points (adjustable differential)	Pressure switches Detection of single trip point (nonadjustable differential) Regulation between 2 trip points (adjustable differential) 2-stage	Vacuum switches  Regulation between 2 trip points (adjustable differential)
Size/Range	-14.5 to 5800 psi	0 to 25 bar or 0 to 300 psi, depending on the model	-14.5 to 8700 psi	-14.5 to 7250 psi	0.2 to 9000 psi	0 to 29 in. of Hg
Type of Output	Analog, 4–20 mA or 0–10 V Digital, PNP or NPN normally closed ( N.C.) output	Analog, 4–20 mA or 0–10 V	Analog, 4–20 mA Digital, PNP or NPN, 200 mA, relay output 2 A	Snap action contacts SPDT or DPDT 10 A continuous	Snap action contacts SPDT or DPDT 10 A continuous	Snap action contacts SPDT 10 A continuous DPST horsepower rated
Electrical Connection	M12 connector or Integrated quick connection	M12, DIN 43650 A or Metri-Pack connector ▲	M12 connector, Snap-C compatible SAE 7/8-16 UN2A	Cable entry for Pg 13 (DIN PG13.5) cable gland, ISO M20, 1/2" NPT, and 1/2" PF	1/2" -14 NPT Cable entry 20 mm	9016G: 1/2" -14 NPT Cable entry 20 mm 9016GVG NEMA Type 1 and 3R: 3 knockouts for 1/2 in. conduit NEMA Type 7 and 9: 2 conduit entries, 3/4"-14 NPT
Fluid Connection	G 1/4" BSP internal, 1/4" NPT internal SAE 7/16"-20 UNF female	G 1/4 A (male) conforming to ISO7 or 1/4"-18 NPT male ▲	G 1/4" BSP internal, 1/4" NPT internal SAE 7/16"-20 UNF female	G 1/4" BSP internal, 1/4" NPT internal 1/4"-18 NPT external	1/4" - 18 NPTF internal 7/16"-20 UNF-2B internal G 1/4" BSP internal G 1/4"-19 BSP internal	G 1/4" BSP internal, 1/4" NPT internal 1/4"-18 NPT external
Fluid Characteristics	Hydraulic oils, air, fresh water, sea water, corrosive fluids from –15 to +125 °C (5 to +257 °F)	Air, fresh water, 0 to + 80 °C (32.0 to 176.0 °F)	Hydraulic oils, air, fresh water, sea water, corrosive fluids from -15 to +80 °C (5 to +176 °F)	Hydraulic oils, air, fresh water, sea water, steam, corrosive fluids, viscous products, 32 to 320 °F (0 to 160 °C) depending on the model	Hydraulic oils, air, fresh water, sea water, corrosive fluids from -26 to +120 °C (-15 to +250 °F) depending on the model	Hydraulic oils, air, fresh water, sea water, from –26 to +120 °C (–15 to +250 °F) depending on the model
Enclosure Rating	IP66, IP67 conforming to IEC/EN 60529, NEMA 4	IP65 conforming to IEC/EN60529, NEMA 4	IP67 conforming to IEC/EN 60529, NEMA 4/6/12/13	Screw terminal models: IP66 conforming to IEC 529, NEMA 4	NEMA Type 4, 4X, 7, 9, 13	<b>9016G</b> : NEMA Type 4, 4X, 7, 9, 13 <b>9016GVG</b> : NEMA Type 1
Dimensions of Case, in. (mm) width x height x depth	dia. 0.90 x 2.76 (dia. 22.8 x 70.1 mm)	dia. 1.40 x 3.10 (dia. 36 x 79.5)	1.81 x 4.45 x 2.28 in. (46 x 113 x 58 mm)	4.45 x 1.38 x 2.95 in. (113 x 35 x 75 mm) NEMA 4: 3.50 x 3.60 x 2.63 in. (89 x 91 x 67 mm)	NEMA 1: 2.06 x 5.03 x 2.75 in. (52 x 128 x 70 mm) NEMA 4: 3.50 x 3.60 x 2.63 in. (89 x 91 x 67 mm)	Control circuit: same as 9012G Power circuit: same as 9013G
Conforming to Standards	CE, IEC/EN 60947-1, IEC/EN 60947-5-1, EN 50081-1, EN 50082-2, EN 61000-6-2	CE, IEC/EN 60947-1, IEC/EN 60947-5-1 EN 50081-1, EN 50082-2, EN 61000-6-2	CE, IEC/EN 60947-1, IEC/EN 60947-5-1, EN 50081, EN 50082, EN 61000-6-2, EN 61000-4-2/3/4/5/6/8/11	CE, IEC/EN 60947-5-1, VDE 0660-200, UL 508, CSA C22-2 No. 14	NEMA A600 UL508	NEMA A600 UL508
Certifications	UL Listed, CSA Certified	UL: File E97729, CCN NKPZ CSA: File 240515, Class 3211-03	UL Listed, CSA Certified	UL B300 - R300 Listed. CSA B300 - R300, (BV, GL, RINA, LROS pending)	UL Listed, CSA Certified	UL Listed, CSA Certified
Catalog Number	XMLG	XMLK	XMLF	XMLA, XMLB, XMLC, XMLD	9012GA, 9012GC, 9012GG, 9012GH, 9012GK, 9012GM, 9012GR, 9012GS, 9012GT, 9012GN, 9012GP, 9012GQ	9016GA, 9016GV

 $<sup>\</sup>blacktriangle$   $\;\;$  For other connections, consult the Sensor Competency Center.

# Pressure, Vacuum, and Float Switches

Class 9013, 9036, 9037, 9038 / Refer to Catalog 9013CT9701 or 9034CT9701

Application

Electromechanical Pressure Switches Electromechanical Float Switches











Product Family	9013F 9013G		9036D, 9036F	9036G	9037	9038
Type of Installation/ Application	Power circuits Power circuits		Power circuits	Power circuits	Power circuits	Power circuits
Fluids Controlled	Fresh water, air		Fresh or sea water, hydr	raulic oils; suitable for corr	osive fluids except for cast	iron bushing (shown above)
Type of Operation and Features	Pressure switches Detection of single trip point (fixed differential) Regulation between 2 trip points (adjustable differential)  Pressure switches Regulation between 2 trip points (adjustable differential)		Liquid level control in <b>Open</b> tanks— either pumping in or pumping out of tank	Liquid level control in <b>Open</b> tanks— either pumping in or pumping out of tank	Liquid level control in Closed tanks for condensate, return heating water, fuel oil, etc.	Liquid level control in <b>Open</b> or <b>Closed</b> tanks—two pumps alternate, and both pumps run in peak demand Non-alternating option also available
Size/Range (psi)	6 to 200 psi	10 to 250 psi	Light duty	Medium duty	_	_
Type of Output	2-pole, snap action contacts HP rated	2-pole, snap action contacts HP rated	2-pole, snap action contacts HP rated	2-pole, snap action contacts HP rated	2-pole, snap action contacts HP rated	2 sets of 2-pole, snap action contacts HP rated
Electrical Connection	2 open side entries, 0.88 in. diameter, with two flats	NEMA Type 1 and 3R: 3 knockouts for 1/2 in. conduit NEMA Type 7 and 9: 2 conduit entries, 3/4"-14 NPT	4 screw terminals  NEMA Type 1: 2 open side entries, 0.88 in. diameter, with two flats  NEMA Type 4, 7, 9: 2 cable entries, 3/4-14 conduit entry  9036FG: 2 cable entries, 0.88 in. (22.4 mm) with 0.84 in. (21.3 mm) across flat	4 screw terminals  NEMA Type 1: 3 knockouts for 1/2 in. conduit entry  NEMA Type 4, 7, 9: 2 cable entries, 3/4-14 conduit entry	4 screw terminals  NEMA Type 1: 2 open side entries, 0.88 in. diameter, with two flats  NEMA Type 4, 7, 9: 2 cable entries, 3/4-14 conduit entry	8 screw terminals  NEMA Type 1: 4 knockouts for 1/2 in. (9038 AG) or 3/4 in. conduit entry  NEMA Type 4, 7, 9: 2 cable entries, 3/4-14 conduit entry
Fluid Connection	1/4" NPSF internal, 1/4" NPT external, plus other options 1/4" NPSF internal, 1/4" NPT external		Open tank	Open tank	Closed tank	Open tank (9038A) Closed tank (9038C, D)
Fluid Characteristics	Fresh water, air		Fresh water, sea water, hydraulic oils (and corrosive fluids, depending on the model) with a density $\geq 0.8$			
Enclosure Rating	NEMA Type 1 NEMA Type 3R IP20	NEMA Type 1, 3R, 7, 9 IP20	NEMA Type 1, 4, 7, 9	NEMA Type 1, 4, 7, 9	NEMA Type 1, 4, 7, 9	NEMA Type 1, 4 , 7, 9
Dimensions of Case width x height x depth in. (mm)	3.76 x 2.8 x 2.78 in. (95.5 x 71.12 x 70.6 mm) 3.68 x 3.85 x 3.44 in. (93.47 x 97.79 x 87.37 mm		See page 22-23	See page 22-23	See pages 22-24, 22-25	See page 22-26
Conforming to Standards	NEMA A600 UL508	1A A600 UL508 NEMA A600 UL508		NEMA A600 UL508	NEMA A600 UL508	NEMA A600 UL508
Certifications	UL Listed, CSA Certified UL Listed, CSA Certified		UL Listed, CSA Certified	UL Listed, CSA Certified	UL Listed, CSA Certified	UL Listed, CSA Certified
Catalog Number	9013FS, 9013FR, 9013FH, 9013FT, 9013FY	9013GS, 9013GH, 9013GM	9036DG, 9036DW, 9036DR, 9036FG	9036GG, 9036GW, 9036GR	9037EG, 9037EW, 9037ER, 9037HG, 9037HW, 9037HR	9038AG, 9038AW, 9038AR, 9038CG, 9038CW, 9038CR, 9038DG, 9038DW, 9038DR

www.schneider-electric.us

XMLG pressure transmitters and pressure switches are characterized by their ceramic pressure-measuring cell. The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge silk-screened on the ceramic. The change in resistance is then processed by the integrated electronics, providing either a digital or analog output signal.

Table 22.1: Specifications



Enclosure Rating	IP66, IP67 conforming to IEC/EN 60529, NEMA 4
Ambient Temperature (Operation)	-15 to +85 °C (+5 to +185 °F)
Media Temperature	-15 to +125 °C (+5 to +257 °F)
Precision (Linearity, Repeat Accuracy, Hysteresis)	Transmitters: <0.3%; pressure/vacuum switches: <1%
Repeat Accuracy (PNP/NPN output)	0.1% of the measuring range
Current Consumption	Transmitters: < 20 mA Pressure/vacuum switches: < 4 mA
Maximum Load Current	Transmitters: < 20mA Pressure/vacuum switches: 150 mA switching capacity
Rated Voltage	12/24 V for transmitters and pressure/vacuum switches
Voltage Limits	24 V for transmitters and pressure/vacuum switches
Fluids Controlled	Hydraulic oils, air, fresh/sea water, corrosive fluids from -15 to +125 °C (+5 to +257 °F)
Materials in Contact with Fluid	Ceramic Al <sub>2</sub> O <sub>3</sub> , stainless steel type AISI 303, Viton <sup>®</sup> FPM, PPS (leakage protection for P> 40 bar)
Output Response Time	< 2 ms

Interpretation of the Catalog Number (example: XMLG100D23TQ) Table 22.2:



XMLG	100			D	2	3	TQ
Units without Display, 22.8 mm diameter	Rated Pressure Range			Electrical	Output	Fluid Connection	Bulk
	Code	psi	bar	Connection	Output	Fluid Collifection	Pack
	M01	-14.5 to 0	-1 to 0	<b>D</b> : M12	1: DC Analog, 4-20 mA, shunt calibration	1: G 1/4 A	
	001	0 to 14.5	0 to 1	Q: Integrated	2: Analog, 4–20 mA	(BSP male)	
	006	0 to 87.0	0 to 6	quick connect	3: Solid state, NPN	3: 1/4" NPT male	
	010	0 to 145	0 to 10		4: Solid state, PNP	7: 7/16-20 UNF male	
	016	0 to 232.1	0 to 16		7: Analog, 0-10 V (bulk packs only)		
	025	0 to 362.5	0 to 25		11: DC Analog, 0-10 V shunt calibration		
	100	0 to 1450	0 to 100				
	160	0 to 2329.6	0 to 160				
	250	0 to 3625	0 to 250				
	400	0 to 5800	0 to 400				

NOTE: Use this table only to interpret the catalog number. Some combinations are not available.

XMLG•••Q **Quick Connect** 

Table 22.3: Selection

				Catalog Number ▲■		
Rated Pressure Range		Fluid Connection	Electrical Connection	Analog Output, 4–20 mA	Analog Output, 0–10 Vdc	
-14.5 to 0 psi	-1 to 0 bar			XMLGM01D23	XMLGM01D73	
0 to 14.5 psi	0 to 1 bar			XMLG001D23	XMLG001D73	
0 to 87 psi	0 to 6 bar			XMLG006D23	XMLG006D73	
0 to 145 psi	0 to 10 bar			XMLG010D23	XMLG010D73	
0 to 232 psi	0 to 16 bar	1/4" NPT Male	M12	XMLG016D23	XMLG016D73	
0 to 362.5 psi	0 to 25 bar	1/4 NPT Male	WIIZ	XMLG025D23	XMLG025D73	
0 to 1450 psi	0 to 100 bar			XMLG100D23	XMLG100D73	
0 to 2320 psi	0 to 160 bar			XMLG160D23	XMLG160D73	
0 to 3625 psi	0 to 250 bar			XMLG250D23	XMLG250D73	
0 to 5800 psi	0 to 400 bar			XMLG400D23	XMLG400D73	

- For devices with a switch output or 0–10 Vdc analog output, contact the Sensor Competency Center at 1-800-435-2121.

  For a bulk package (25 units), add TQ to the end of the catalog number. The minimum order quantity is 50 units (two bulk packs). When ordering, specify the individual number of units, NOT the number of bulk packs. Minimum order quantity for factory ordered individual items (non-stock) is 50 pieces.

**NOTE:** For units with a solid-state output, the settings must be specified for each order.

Table 22.4: Wiring Configurations (M12)

Output	Pin 1	Pin 3	Pin 4
Analog, 4-20 mA	+ Power supply	Output	_
Analog, 0-10 Vdc	+ Power supply	Output	Ground
Solid State, NPN	+ Power supply	Ground	Output
Solid State, PNP	+ Power supply	Ground	Output





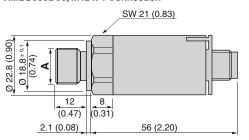


For wiring diagrams, refer to Table 22.5 on page 22-5.

For connectors and cables, see Table 22.15 on page 22-9.

Figure 22.1: Dimensions, in. (mm)

#### XMLGeeeDee, M12 x 1 Connection



Dimension A	
XMLG•••D2••1	G 1/4 A (BSAP Male)
XMLG•••D2••3	1/4" NPT Male
XMLG•••D2••7	7/16-20 UNF Male

#### XMLGeeeQee, Integrated Quick Connection

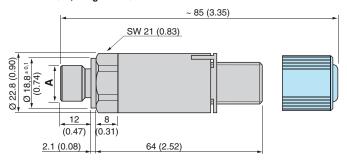
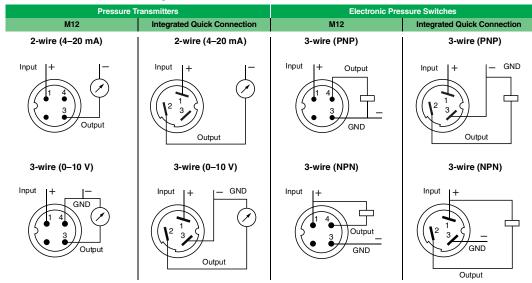


Table 22.5: Connector Wiring



For wiring configurations, refer to Table 22.4 on page 22-4.

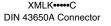
Refer to Catalog 9014CT0201



Type XMLK pressure transmitters are characterized by their ceramic pressure-measuring cell. The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge silk-screened on the ceramic. The change in resistance is then processed by the integrated electronics to provide an analog output signal.

#### Table 22.6: **Environmental Specifications**

Enclosure Rating		IP65 conforming to IEC/EN 60529, NEMA 4		
	For Operation	0 to + 80 °C (32 to 176 °F)		
Ambient Air Temperature	For Storage	−25 to + 85 °C (13 to 185 °F)		
Precision (Resolution)		Combined sum of linearity, hysteresis, and repeat accuracy <± 0.5% of the measuring range		
Precision (nesolution)		Setting tolerance of zero point and measuring range limit < ± 1% of the measuring range		
Repeat Accuracy		± 0.3% of the measuring range		
Current Consumption		4–20 mA: < 20 mA 0–10 V: < 6 mA		
Rated Supply Voltage		24 Vdc		
Voltage Limits		4–20 mA: 8–33 V 0–10 V: 16.2–33 V		
Fluids or Products Controll	ed	Air, fresh water (0 to + 80 °C / 32 to 176 °F)		
Materials in Contact with Fluid		Steel, type AISI 303 (stainless steel) nitrile (NBR)		
Output Response Time		< 2 ms		



#### Table 22.7: Interpretation of the Catalog Number

XMLK	100			Р	2	D	2	3	TQ
Units Without	Rat	Rated Pressure			O Dina	Electrical	Cutavit	Fluid Commention	Bulk
Display	Code	psi	bar	Pressure	O-Ring	Connection	Output	Fluid Connection	Pack
36 mm (1.42 in.) diameter	006		0–6	B: bar	2: NBR	C: DIN 43650A	2: Analog, 4–20 mA	1: G 1/4 A (male)	
diameter	010		0–10	P: psi	(Nitrile)	D: M12	7: Analog, 0-10 V	3: 1/4"-18 NPT (male)	
	016		0–16			P: Metri-Pack			
	025		0–25						
	100	0–100							
	150	0–150							
	200	0–200							
	300	0-300							

NOTE: Use this table only to interpret the catalog number. Some combinations are not available.

#### Table 22.8: Selection

Rated Pressure Range	Catalog Number ▲						
	4–20 mA Analog Output			0–10 Vdc Analog Output			
	DIN	M12	Metri-Pack	DIN	M12	Metri-Pack	
Bar Version, G 1/4 A Male Fl	uid Connector						
0-6 bar (0-87 psi)	XMLK006B2C21	XMLK006B2D21	_	XMLK006B2C71	XMLK006B2D71	_	
0-10 bar (0-145 psi)	XMLK010B2C21	XMLK010B2D21	_	XMLK010B2C71	XMLK010B2D71	_	
0-16 bar (0-232 psi)	XMLK016B2C21	XMLK016B2D21	_	XMLK016B2C71	XMLK016B2D71	_	
0-25 bar (0-362.5 psi)	XMLK025B2C21	XMLK025B2D21	_	XMLK025B2C71	XMLK025B2D71	_	
PSI Version, 1/4"-18 NPT Ma	le Fluid Connector						
0-100 psi (0-6.9 bar)	XMLK100P2C23	XMLK100P2D23	XMLK100P2P23	XMLK100P2C73	XMLK100P2D73	XMLK100P2P73	
0-150 psi (0-10.3 bar)	XMLK150P2C23	XMLK150P2D23	XMLK150P2P23	XMLK150P2C73	XMLK150P2D73	XMLK150P2P73	
0-200 psi (0-13.8 bar)	XMLK200P2C23	XMLK200P2D23	XMLK200P2P23	XMLK200P2C73	XMLK200P2D73	XMLK200P2P73	
0-300 psi (020.7 bar)	XMLK300P2C23	XMLK300P2D23	XMLK300P2P23	XMLK300P2C73	XMLK300P2D73	XMLK300P2P73	

For a bulk package (25 units), add TQ to the end of the catalog number. The minimum order quantity is 50 units (two bulk packs). When ordering, specify the individual number of units, **not** the number of bulk packs. Minimum order quantity for factory ordered individual items (non-stock) is 50 pieces.



XMI K Metri-Pack Connector

#### Wiring Configurations (M12) Table 22.9:

Output	Pin 1	Pin 3	Pin 4
Analog, 4-20 mA	+ Power supply	Output	_
Analog, 0-10 Vdc	+ Power supply	Output	Ground
Solid State, NPN	+ Power supply	Ground	Output
Solid State, PNP	+ Power supply	Ground	Output







For wiring diagrams, refer to Table 22.5 on page 22-5.

www.schneider-electric.us

For connectors and cables, see Table 22.15 on page 22-9.

Table 22.10: Dimensions

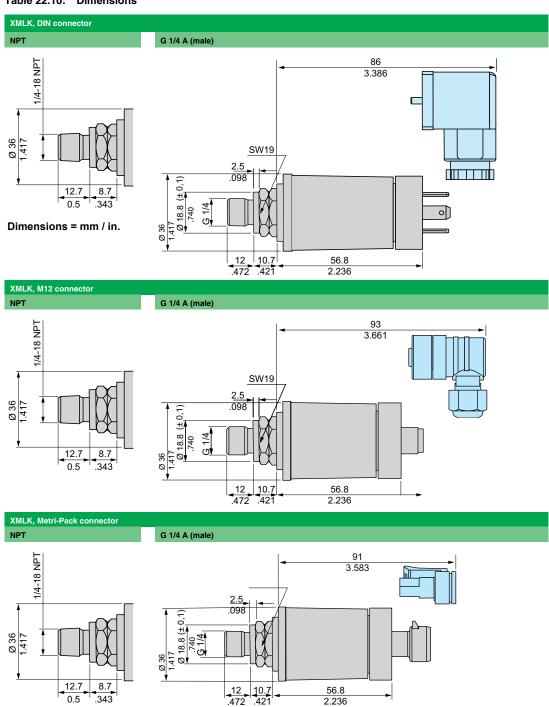
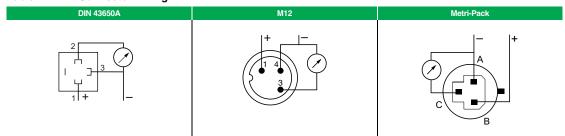
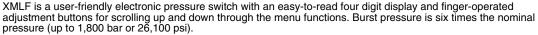


Table 22.11: Connector Wiring



Refer to Catalog 9014CT0201



- DC versions are protected against reverse polarity, short circuit, and overvoltage.
- DC versions are double insulated.
- Response time display: 3 levels (slow-normal-fast).

#### Available in four versions:

- Universal sensor with 1 analog output (4-20 mA) and 1 digital output
- Universal sensor with 1 analog output (1-10 V) and 1 digital output
- Dual stage sensor, 2 digital outputs, 24 Vdc (17-33 Vdc)
- Electronic pressure switch with relay output, 120 Vac (102-132 Vac)

The XMLF electronic pressure switch can be set without any tools once connected to a 24 Vdc power supply. It is ergonomically designed to be easy to hold and to set. The pressure connection is on the bottom of the switch and the electrical connector on the top, giving the switch a slim, straight-through profile. It has built-in water hammer resistance. It is available in AC and DC versions, each of which feature a 4-digit LED display. It is programmable to display either bar or psi. Digital solid state outputs are programmable as NPN or PNP, and N.O. or N.C.

Window mode (FEN) allows the switch to operate between selected minimum and maximum settings. Outputs change state when the pressure ranges outside the window settings.

#### Table 22.12: Specifications

		IP67 NEMA 4, 6, 12, 13	
Ambient Air Temperature for Operation		DC Models: –25 to +80 °C (–13 to + 176 °F) AC Models: –25 to +80 °C (–13 to + 176 °F)	
Media Temperature		-15 to +80 °C (+5 to + 176 °F)	
	Analog Output	⊴0.6% of the measurement range, output offset < 200 mV	
Precision	Digital Output	⊴0.6% of the measurement range	
Repeat Accuracy (PNP/NPN or	ıtput)	⊴0.5% of the measurement range	
Maximum Load Current		DC: 200 mA for 17–33 Vdc; AC: 2.5A AC15 C300	

#### Table 22.13: Interpretation of the Catalog Number (example: XMLF100D2026)

XMLF	100			D	2	02	6
Configurable	F	Rated pressu	re	Electrical	With Viewing	Output	Fluid Connection
Comigurable	Code	psi	bar	Connection	Window	Output	Fluid Connection
	M01	-14.5 to 0	-1 to 0	D: M12 DC only		01: DC Analog 4-20 mA, shunt	5: 1/4" BSP female
	002	0 to 36.25	0 to 2.5	E: 7/8-16 UN2A		calibration	6: 1/4" NPTF female
	010	0 to 145	0 to 10	AC only		02: DC Analog 4–20 mA,	9: SAE 7/16-20
	016	0 to 232	0 to 16			digital single stage	UNF female
	025	0 to 362.5	0 to 25			11: DC Analog 0-10 V,	
	040	0 to 580	0 to 40			shunt calibration	
	070	0 to 1015	0 to 70			12: DC Analog 0–10 V,	
	100	0 to 1450	0 to 100			digital single stage	
	160	0 to 2320	0 to 160			03: DC digital dual stage	
	250	0 to 3625	0 to 250			04: AC Relay 120 V	
	400	0 to 5800	0 to 400				
	600	0 to 8700	0 to 600				

NOTE: Use this table only to interpret the catalog number. Some combinations are not available.

#### Table 22 1/1: Selection

Table 22.14: Selection				
Catalog Number	Range	Output	Pressure Connection	Electrical Connection
AC Versions				
XMLF010E2046	0 to 145 psi	Relay (2.5 A)	1/4" NPT Female	SAE7/8-16UNF
XMLF070E2046	0 to 1015 psi	Relay (2.5 A)	1/4" NPT Female	SAE7/8-16UNF
DC Versions				
XMLFM01D2026	-14.5 to 0 psi		1/4" NPT Female	M12
XMLF010D2026	0 to 145 psi	Analog with	1/4" NPT Female	M12
XMLF070D2029	0 to 1015 psi	single stage	SAE7/16-20 Female	M12
XMLF400D2029	0 to 5800 psi		SAE7/16-20 Female	M12
XMLF010D2039	0 to 145 psi		SAE7/16-20 Female	M12
XMLF070D2039	0 to 1015 psi		SAE7/16-20 Female	M12
XMLF400D2039	0 to 5800 psi	Dual stage Relay (2.5 A)	SAE7/16-20 Female	M12
XMLF010D2036	0 to 145 psi	,	1/4" NPT Female	M12
XMLF070D2036	0 to 1015 psi		1/4" NPT Female	M12



E164865 CCN NKPZ



File LR44087 Class 3211-03









Catalog Number





XZCP1141L•





XZCR1511041C



XZCC12FDM40B



XZCC43FCP40B







XZCR1512041C.

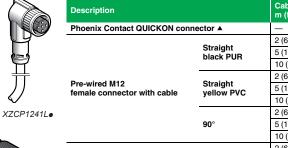
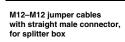


Table 22.15: Connectors and Cables



		` '	U \ /	
Phoenix Contact QUICKON conn	_	_	XMLGZ001	
		2 (6.6)	115 (4.06)	XZCP1141L2
	Straight black PUR	5 (16.4)	270 (9.52)	XZCP1141L5
	Didok i Oil	10 (32.8)	520 (18.34)	XZCP1141L10
		2 (6.6)	90 (3.17)	XSZCD101Y
Pre-wired M12 female connector with cable	Straight yellow PVC	5 (16.4)	190 (6.70)	XSZCD102Y
Terriale definication with dable	yellow i vo	10 (32.8)	370 (13.05)	XSZCD103Y
	90°	2 (6.6)	115 (4.06)	XZCP1241L2
		5 (16.4)	270 (9.52)	XZCP1241L5
		10 (32.8)	520 (18.34)	XZCP1241L10
B : 1501140111		2 (6.6)	185 (6.53)	XZCP1764L2
Pre-wired 7/8" 16UN, female connector with cable	Straight	5 (16.4)	460 (16.23)	XZCP1764L5
Terriale definication with dable		10 (32.8)	900 (31.75)	XZCP1764L10
	Straight female	1 (3.3)	65 (2.29)	XZCR1511041C1
M12–M12 jumper cables with straight male connector,	connector	2 (6.6)	95 (3.35)	XZCR1511041C2
for splitter box	90° female	1 (3.3)	65 (2.29)	XZCR1512041C1
	connector	2 (6.6)	95 (3.35)	XZCR1512041C2

Connector incorporating IDCs (insulation displacement connectors) for quick, direct, in-line connection to cable without a screwdriver or soldering iron.

#### Table 22.16: Accessories

Description		Weight g (oz)	Catalog Number
M12 female connector, metal clamping ring,	Straight	20 (0.71)	XZCC12FDM40B
with screw terminal connections	Elbowed	20 (0.71)	XZCC12FCM40B
DIN 43650A female connector, with screw terminal c	onnections	35 (1.23)	XZCC43FCP40B
Sealing gasket		15 (0.48)	XMLZL010
Mounting bracket	37 (1.19)	XMLZL008	
Cooler for versions with 1/4" BSP fluid connection		370 (11.90)	XMLZL009



XZCC12FCM40B

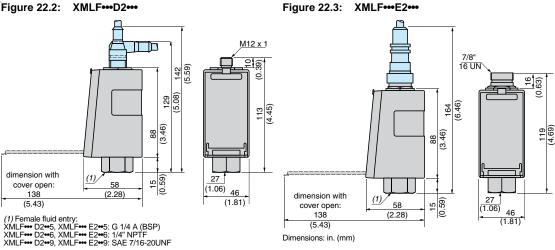
Table 22.17: Wiring Configurations

Version	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
AC (5-pin E)	Power supply	Power supply	Ground	+ Relay	- Relay
DC (4-pin D), analog or single stage	+ Power supply	4–20 mA	- Power supply	Single stage	
DC (4-pin D), dual stage	+ Power supply	Second stage	- Power supply	First stage	

#### Table 22.18: Electrical Connections

	AC Connector	DC Connector				
	1. L1 Power	Analog	Dual Stage			
	1 5 2. L2 Power	$\begin{pmatrix} 2 & 1 \\ \bullet & \bullet \end{pmatrix}$ 1. + Power Supply	1. + Power Supply			
Wiring	3. Ground	2. 4–20 mA	2. 2nd Stage Solid-State Output			
	2 4 4. Relay	3 4 3. – Power Supply	3 Power Supply			
	5. Relay	4. Solid State, PNP or NPN	4. 1st Stage Solid-State Output			
Data d Occurrence	1001/ (100 1001/ ) 110 110	24 Vdc (17–33 Vdc), Analog PNP–NPN, N.O. Outputs, 4 Wire				
Rated Supply Voltage	120 Vac (102–132 Vac), N.O. – N.C. Relays, Output 2.5 A, 5 Wire	24 Vdc (17–33 Vdc), Analog + Shunt Calibration, 4 Wire				
Tomage		24 Vdc (17–33 Vdc), Dual Stage N.O. –N.C., PNP–NPN Outputs, 4 Wire				
Display	values up to 1200 bar). If the pressure is to point from -1 to 2.5 bar (-14.5 to 36.25);	cuit up to a value of twice the maximum pressure size of the origher than 130% of the pressure range, the display blinks. Tho one digit after the decimal from 10 to 70 bar (145 to 1015); a display shows no values below 2% at the beginning of the sc	ne display shows two digits after the decimal and no digits after the decimal from 100 to			

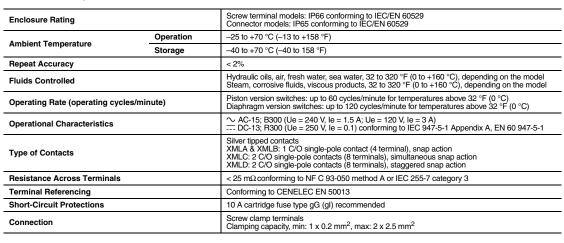
Figure 22.2: XMLF•••D2•••



Dimensions: in. (mm)

- External pressure setting window available
- 1 N.O.-1 N.C. snap acting contacts standard
- Temperature range: -13 to +158 °F (-25 to +70 °C)
- Enclosure rating: IP65 with plug-in connector, IP66 with terminal connections
- Operating rate: up to 120 operations per minute for diaphragm and 60 per minute for piston
- Media connection: 1/4" NPT
   Conduit connection: 1/2" NPT

#### Table 22.19: Specifications







**XMLB** 

XMLD

Pressure Switch Catalog Number	Zinc Alloy	Stainless Steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminum
XMLAM01V / XML M02V /	Х	X 🛦	_	<u> </u>	Х	_	1 —	_
XMLBM03S••••	_	X 🛦	_	_	_	Х	_	_
XML•M05A••••	Х	X 🛦	_	_	Х	_	_	_
XMLBL05S****	_	X■	_	_	_	Х	_	_
XML•L35R••••	_	X ■	_	Х	_	_	Х	_
XML•L35S••••	_	X■	_	_	_	Х	_	_
XML•001S••••	_	X ■	_	_	_	Х	_	_
XML•002A••••	Х	_	_	_	Х	_	_	_
XML•002B••••	_	_	_	Х	_	_	Х	_
XMLA004A****	Х	_	_	_	Х	_	_	_
XMLB004A****	Х	_	_	_	Х	_	_	_
XML•004B••••	_	_	_	Х	_	_	Х	_
XML•010A••••	Х	_	_	_	Х	_	_	_
XML•010B••••	_	_	Х	_	_	_	Х	_
XML•020A•••• / XML•035A••••	Х	_	_	_	Х	_	_	Х
XML•020B•••• / XML•035B••••	_	_	X	_	_	_	Х	_
XML•070D•••• / XML•160D••••	_	_	X	Х	_	Х	Х	_
XML•300D••••	_	_	X	Х	_	Х	Х	_
XML•500D••••	_	_	X1	Х	_	Х	Х	_

- ▲ X2GNiMo 17-12-2 (AISI 316L)
- X8GNiS 18-09 (AISI 303)

Table 22.21: Interpretation of the Catalog Number (example: XMLD070D1S13)

XML	D	070			D	1	S	1	3	
	Contacts	Rated	Pressure		Actuator	Scale	<b>Electrical Connection</b>	Output	Fluid Connecti	on
	Contacts     A Fixed differential, single-pole contact     B Adjustable differential, single-pole contact     C 2 adjustable differential, single-pole contacts, simultaneous     D 2 fixed differential, single-pole contacts, staggered	Code L05 L35 M01 M02 M03 M05 001 002 004 010 020 035 040 070 160	psi 0 to 0.725 0 to 5.075 -14.5 to -4.06 -14.5 to -2.03 -2.9 to -0.29 -7.25 to 72.5 0 to 14.5 0 to 36.25 0 to 58 0 to 145 0 to 290 0 to 507.5 0 to 1015 0 to 2320	bar 0 to 0.05 0 to 0.35 -1 to -0.28 -1 to -0.14 -0.2 to -0.02 -0.5 to 5 0 to 1 0 to 2.5 0 to 4 0 to 10 0 to 20 0 to 35 0 to 4 0 to 10 0 to 20 0 to 35 0 to 40 0 to 70 0 to 160	Diaphragm  A Hydraulic oil, air, fresh water, sea water (0 to 70 °C)  B Hydraulic oil, air, fresh water, sea water (0 to 160 °C)  C Corrosive fluids  P Viscous fluids  R Hydraulic oil, air (0 to 160 °C)  S Fresh/sea water, corrosive fluids (0 to 160 °C)  Vacuum  V Hydraulic oil, air, fresh water, sea water (0 to 70 °C)  T Hydraulic oil, air, fresh water, sea water (0 to 160 °C)	Scale  1 Without  2 With	S Without connector (not available on solid-state devices) C Square / DIN 43650 D M12 Micro connector	Output 1 Contacts	Fluid Connecti Fluid  1 1/4 Gas  2 1/4 Gas  3 1/4 in. NPTF  4 PT 1/4 (JIS B0203)	Type 13 (PG 13,5)
		300 500	0 to 4350 0 to 7250	0 to 300 0 to 500	D Hydraulic oil E Fresh / sea water					

**NOTE:** Use this table only to interpret the catalog number. Some combinations are not available.



www.schneider-electric.us

## **Terminal Diagrams**

## XMLA, XMLB

က	<b>←</b>	1 C/O
71	~ 4	single-pole
7		contact,
4	12	snap action

## **XMLC**

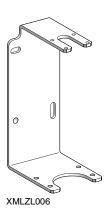
<u></u>	=L	733	٦ <u></u>
4	12	24	22

2 C/O single-pole contacts, simultaneous snap action

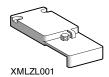
#### **XMLD**



2 C/O single-pole contacts, snap action (1 per stage)









## Table 22.22: Fixed Differential Catalog Numbers

Range on Increasing Pressure (psi)	Approximate Differential Across Range	Maximum Allowable Pressure	Catalog Number			
Fixed, 1 Single-Pole Contact (XMLA)						
-4.06 to -14.5	3.5	130.5	XMLAM01V2S13			
0.435 to 14.5	0.29 low / 0.58 high	32.62	XMLA001S2S13			
2.17 to 36.25	1.88	130.5	XMLA002A2S13			
5.8 to 58	5.07	130.5	XMLA004A2S13			
8.7 to 145	7.25	326.25	XMLA010A2S13			
10.2 to 290	5.8 low / 14.5 high	652.5	XMLA020A2S13			
21.75 to 507.5	18.12	1160	XMLA035A2S13			
72.5 to 1015	43.5 low / 108.75 high	2320	XMLA070D2S13			
145 to 2320	79.75 low / 261 high	5220	XMLA160D2S13			
290 to 4350	239.25 low / 507.5 high	9787.5	XMLA300D2S13			
435 to 7250	290 low / 652.5 high	16312.5	XMLA500D2S13			
Fixed, 2 Single-Pole Contacts, Stagg	ered (XMLD)					
0.84 to 5.07	0.44	32.62	XMLDL35S1S13			
-1.74 to -14.5	1.45	130.5	XMLDM02V1S13			
1.74 to 14.5	0.44 low / 1.02 high	32.62	XMLD001S1S13			
4.93 to 36.25	2.03 low / 2.76 high	130.5	XMLD002B1S13			
5.8 to 58	2.18 low / 2.76 high	130.5	XMLD004B1S13			
17.4 to 145	6.53 low / 8.7 high	326.25	XMLD010B1S13			
2.14 to 20	10.15 low / 18.85 high	652.5	XMLD020B1S13			
63.8 to 507.5	21.75 low / 37.7 high	1160	XMLD035B1S13			
136.3 to 1015	72.5 low / 137.75 high	2320	XMLD070D1S13			
239.25 to 2320	127.6 low / 290 high	5220	XMLD160D1S13			
522 to 4350	246.5 low / 609 high	9787.5	XMLD300D1S13			
594.5 to 7250	304.5 low / 942.5 high	16312.5	XMLD500D1S13			

Table 22.23: Adjustable Differential Catalog Numbers

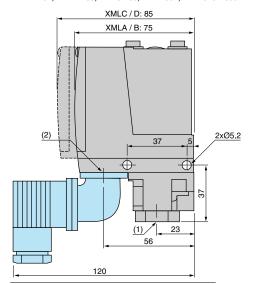
Range on Increasing Pressure (psi)	Approximate Differential Across Range	Maximum Allowable Pressure	Catalog Number
Adjustable, 1 Single-Pole Contact (X	(MLB)	<u>'</u>	
0.038 to 0.72	0.02 low / 0.06 high	1.63	XMLBL05S2S13
0.65 to 5.07	0.6 low / 0.72 high	32.62	XMLBL35R2S13
-2 to -14.5	1.9	130.5	XMLBM02V2S13
-0.29 to -2.9	0.26	29	XMLBM03S2S13
-7.25 to 72.5	7.25	163.12	XMLBM05A2S13
0.72 to 14.5	0.58 low / 0.87 high	32.62	XMLB001S2S13
4.35 to 36.25	2.32 low / 3.04 high	130.5	XMLB002A2S13
3.62 to 58	2.9 low / 3.62 high	130.5	XMLB004A2S13
10.15 to 145	8.26 low / 12.32 high	326.25	XMLB010A2S13
18.9 to 290	14.5 low / 23.2 high	652.5	XMLB020A2S13
50.75 to 507.5	24.65 low / 36.97 high	1160	XMLB035A2S13
101.5 to 1015	68.15 low / 127.6 high	2320	XMLB070D2S13
145 to 2320	134.85 low / 301.6 high	5220	XMLB160D2S13
319 to 4350	281.3 low / 536.5	9787.5	XMLB300D2S13
435 to 7250	333.5 low / 762.7 high	16312.5	XMLB500D2S13
Adjustable, 2 Single-Pole Contacts,	Simultaneous (XMLC)		
0.65 to 5.07	0.29 low / 0.51 high	32.62	XMLCL35S2S13
-2 to -14.5	1.89 low / 2.03 high	130.5	XMLCM02V2S13
-7.97 to 72.5	6.52	163.12	XMLCM05S2S13
0.725 to 14.5	0.43 low / 0.58 high	32.62	XMLC001S2S13
4.35 to 36.25	1.89 low / 2.47 high	130.5	XMLC002B2S13
4.35 to 58	2.18 low / 2.47 high	130.5	XMLC004B2S13
10.15 to 145	6.53 low / 10.15 high	326.25	XMLC010B2S13
18.85 to 290	10.15 low / 14.5 high	652.5	XMLC020B2S13
50.75 to 507.5	14.5 low / 21.75 high	1160	XMLC035B2S13
101.5 to 1015	65.25 low / 129.05 high	2320	XMLC070D2S13
174 to 2320	130.5 low / 304.5 high	5220	XMLC160D2S13
319 to 4350	232 low / 507.5 high	9787.5	XMLC300D2S13
435 to 7250	275.5 low / 754 high	16312.5	XMLC500D2S13

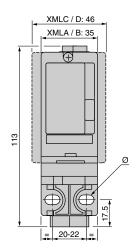
Table 22.24: Accessories for XML Pressure and Vacuum Switches

Description	For Use with Switches	Catalog Number
Rear mounting bracket For vibrations > 2 gn	XML•L35 XML•001	XMLZL006
Additional top support bracket For vibrations > 4 gn	XMLAM01 XML-M05 XMLA004 XML-010 XML-500	XMLZL002
Lead sealable protective cover To prevent unauthorized access to the adjustment screws and the switch cover mounting screw	XMLA XMLB	XMLZL001
Lead sealable protective cover To prevent unauthorized access to adjustment screws	All models	XMLZL011

Figure 22.4: Dimensions

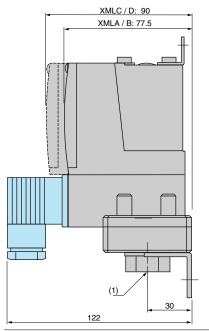
#### XMLAM01, XMLBM05, XMLCM05, XMLA004, X•ML010...500



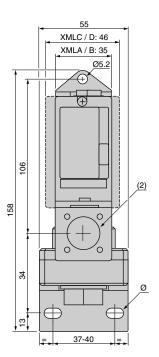


- (1) 1 fluid entry, tapped G 1/4 (BSP female) or 1/4" NPT (2) 1 electrical connections entry, tapped M20 x 1.5 or Pg 13.5, or 1/2" NPT O: 2 elongated holes Ø 5.2 x 6.7

#### XML•M02, XML•002, XMLB004, XMLC004, XMLD004



- (1) 1 fluid entry, tapped G 1/4 (BSP female) or 1/4" NPT
- (2) 1 electrical connections entry, tapped M20 x 1.5 or Pg 13.5, or 1/2" NPT Ø: 2 elongated holes Ø 10.2 x 5.2





NEMA 1

Open Type

# www.schneider-electric.us

## Table 22.25: Fixed Differential, Open Type or NEMA 1 Enclosure

UL Listed and CSA Certified As Industrial Control Equipment

Range On	Approximate Differential	Maximum Allowable Pressure	Open Type	NEMA 1 Type
Decreasing Pressure psig	at Mid-Range psig▲	psig	Туре	
Diaphragm Actuated—N	litrile (Buna-N) Diaphragm, Zinc	Plated Steel Housing		
0.2–10	0.4 ±0.1	100	GRO1	GRG1
1–40	1.2 ±0.3	100	GRO3	GRG3
1.5–75	2.2 ±0.4	240	GRO4	GRG4
3–150	4.2 ±1	475	GRO5	GRG5
5–250	7.4 ±2	750	GRO6	GRG6
13-425	13 ±3	850	GSO1	GSG1
20–675	19 ±5	2000	GSO2	GSG2
	Stainless Steel Piston. #303 Sta aphragm and O-Ring, Teflon <sup>®</sup> R			
20–1000	49 ±10	10000	GTO1	GTG1
90–2900	141 ±15	15000	GTO2	GTG2
170–5600	200 ±40	20000	GTO3	GTG3
270-9000	350 ±45	25000	GTO4	GTG4



UL Listed and CSA Certified As Industrial Control Equipment

Range On Decreasing Pressure psig	Approximate Mid-Range Differential Adds to Decreasing Set Point ▲	Maximum Allowable Pressure psig	Open Type	NEMA 1
Diaphragm Actuated—N	litrile (Buna-N) Diaphragm, Zino	Plated Steel Housing		
0.2–10	0.4–0.9	100	GNO1	GNG1
1–40	1.2–3.6	100	GNO3	GNG3
1.5–75	2.2-6.6	240	GNO4	GNG4
3–150	4.2–13.2	475	GNO5	GNG5
5–250	7.4–33.6	750	GNO6	GNG6
13–425	13–37.2	850	GPO1	GPG1
20–675	19–58.8	2000	GPO2	GPG2
	Stainless Steel Piston. #303 Sta ohragm and O-Ring, Teflon Reta			
20–1000	49–150	10000	GQO1	GQG1
90–2900	141–455	15000	GQO2	GQG2
170–5600	200–950	20000	GQO3	GQG3
270–9000	350-1400	25000	GQO4	GQG4

<sup>▲</sup> Determines operating point on rising pressure.

#### Table 22.27: Available Modifications

Modification	Applies to	Form
Standard Nitrile (Buna-N) diaphragm in #316 stainless	GNG1, GNO1, GRG1, GRO1 only	Q1
steel housing	All other GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q1
Ethylene propylene diaphragm in #316 stainless steel housing	Not available on GNG1, GNO1, GRG1, GRO1. Available on all other GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q3
Viton fluorocarbon diaphragm in #316 stainless	GNG1, GNO1, GRG1, GRO1 only	Q4
steel housing	All other GNG, GNO, GPG, GPO, GRG, GRO, GSG, GSO	Q4
1/4–18 NPT external thread pressure connection	GNG, GNO, GRG, GRO	Z
1/2–14 NPT external thread, 1/4–18 NPTF internal thread pressure connection. Standard actuator only.	GNG, GNO, GRG, GRO	Z16
7/16–20 UNF-2B internal thread pressure connection	GNG, GNO, GPG, GPO, GQG, GQO, GRG, GRO, GSG, GSO, GTG, GTO	Z18

#### Table 22.28: Class 9049 Accessories for Class 9012 Pressure Switches

Description	Applies to	Туре
Stainless steel surge reducer for use on oils, coolants, and hydraulic fluids (not recommended for air or water)	9012G	A26S

Acceptable Wire Sizes	
Electrical Rating	.page 22-16
Temperature Rating	.page 22-16
Renewal Parts Kits	.page 22-28



E12158 NKPZ



LR25490 3211-03





9012GAW5 NEMA 4, 4X, 13

Class 9012 single stage pressure switches are control circuit rated devices used in pneumatic or hydraulic systems on a wide variety of machine and process applications to protect the equipment and control or monitor the system

- Type G machine tool switches are available with NEMA Type 4, 4X, and 13 (IEC IP66) enclosure ratings.
- The NEMA 7 and 9 devices are UL listed for use in the following hazardous locations: Class I, Divisions 1 and 2, Groups C and D; and Class II, Divisions 1 and 2, Groups E, F, and G.
- Enclosure materials are cast aluminum.
- To ensure repeatability and minimize setting drift, pressure settings should fall within the middle 80 percent of the pressure range.

## Table 22.29: Fixed Differential ▲ NEMA 4, 4X, 13 Enclosure

UL Listed and CSA Certified As Industrial Control Equipment

22 Zaciona di la Cost Costanica si inducatina Costato. Zapistico in				
Range on Decreasing Pressure	■Approximate Differential at	Maximum Allowable	Single Pole Double Throw	Double Pole Double Throw
psig	Mid-Range psig	Pressure psig	Туре	Туре
Diaphragm A	ctuated—Nitrile (B	una-N) Diaphrag	m, Zinc Plated Steel	Housing
.2–10	0.6 ±0.1	100	GDW1	GDW21
1-40	1.6 ±0.4	100	GDW2	GDW22
1.5-75	3.0 ±0.5	240	GDW4	GDW24
3-150	6.0 ±0.8	475	GDW5	GDW25
5-250	10.0 ±1.5	750	GDW6	GDW26
13-425	16 ±3.5	850	GEW1	GEW21
20-675	27 ±5	2000	GEW2	GEW22
			303 Stainless Steel F Ion <sup>®</sup> Retaining Ring	lousing,
20-1000	59 ±9	10000	GFW1	GFW21
90-2900	170 ±15	15000	GFW2	GFW22
170-5600	289 ±55	20000	GFW3	GFW23
270-9000	495 ±70	25000	GFW4	GFW24

#### Table 22.30: Fixed Differential NEMA 7 & 9 Enclosure Class I & II, Division 1 & 2, Groups C, D, E, F, G

UL Listed As Industrial Control Equipment.
UL Marine Listed for use on vessels greater than 65 feet long where ignition protection is required.

Range on Decreasing	■Approximate Differential at	Maximum Allowable	Single Pole Double Throw	Double Pole Double Throw	
Pressure psig	Mid-Range psig	Pressure psig	Туре	Туре	
Diaphragm Ad	tuated-Nitrile (Bu	na-N) Diaphrag	m, Zinc Plated Steel	Housing	
0.2-10	1.0 ±0.1	100	GDR1	GDR21	
1-40	2.4 ±0.8	100	GDR2	GDR22	
1.5-75	4.5 ±1	240	GDR4	GDR24	
3-150	9 ±1.5	475	GDR5	GDR25	
5-250	15 ±3	750	GDR6	GDR26	
13-425	25 ±7	850	GER1	GER21	
20-675	41 ±10	2000	GER2	GER22	
	Piston Actuated—#440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton Fluorocarbon Diaphragm and O-ring, Teflon <sup>®</sup> Retaining Ring				
20-1000	89 ±18	10000	GFR1	GFR21	
90-2900	255 ±30	15000	GFR2	GFR22	
170-5600	578 ±110	20000	GFR3	GFR23	
270-9000	788 ±140	25000	GFR4	GFR24	

Acceptable Wire Sizes: 12–22 AWG Recommended Terminal Clamp Torque: 7 lb-in

Electrical Rating	page 22-16
Temperature Rating	page 22-16
Modifications	page 22-18
Accessories	page 22-18
Renewal Parts Kits	page 22-28
Dimensions	nage 22-17

File E12443 Haz. Loc. CCN NOWT G•R File E12158 CCN NKPZ G•O, G•G, G•W File E12158 CCN NTHT Marine Use, G•W

LR25490 Class 3211-03 G•W, G•O, G•G LR26817 Class 3218-02 G\*R

Complies with IEC 60957.5.1. 5C8.3.4 when protected with a Bussmann CCKTK-R-10 fuse.

#### Table 22.31: Adjustable Differential ▲ NEMA 4, 4X, 13 Enclosure

UL Listed and CSA Certified As Industrial Control Equipment

Range on Decreasing Pressure psig	■ Adjustable Differential Approximate at Mid-Range	Maximum Allowable Pressure psig	Single Pole Double Throw Type	Double Pole Double Throw Type
Diaphragm A	ctuated—Nitrile (Bu	una-N) Diaphrag	m, Zinc Plated Steel	Housing
.2-10	0.6-2	100	GAW1	GAW21
1–40	1.6-8	100	GAW2	GAW22
1.5–75	3.5-15	240	GAW4	GAW24
3-150	6.0-30	475	GAW5	GAW25
5-250	10.0-49	750	GAW6	GAW26
13-425	16–90	850	GBW1	GBW21
20–675	27-130	2000	GBW2	GBW22
	ted—#440 Stainless carbon Diaphragm		303 Stainless Steel H on <sup>®</sup> Retaining Ring	lousing,
20-1000	59-200	10000	GCW1	GCW21
90-2900	170-560	15000	GCW2	GCW22
170-5600	289-1260	20000	GCW3	GCW23
270-9000	495-1900	25000	GCW4	GCW24

#### Table 22.32: Adjustable Differential NEMA 7 & 9 Enclosure Class I & II, Division 1 & 2, Groups C, D, E, F, G

UL Listed As Industrial Control Equipment.
UL Marine Listed for use on vessels greater than 65 feet long where ignition protection is required.

Range on Decreasing Pressure psig	■Adjustable Differential Approximate at Mid-Range	Maximum Allowable Pressure psig	Single Pole Double Throw Type	Double Pole Double Throw Type
Diaphragm Actuated—Nitrile (Buna-N) Diaphragm, Zinc Plated Steel Housing				
0.2-10	1.0-2	100	GAR1	GAR21
1-40	2.4-8	100	GAR2	GAR22
1.5-75	4.5-15	240	GAR4	GAR24
3-150	9–35	475	GAR5	GAR25
5-250	15-49	750	GAR6	GAR26
13-425	25–90	850	GBR1	GBR21
20-675	41-130	2000	GBR2	GBR22
Diston Actuated—#440 Stainless Steel Diston, #303 Stainless Steel Housing				

20-675	41-130	2000	GBR2	GBR22	
Piston Actuated—#440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton Fluorocarbon Diaphragm and O-ring, Teflon® Retaining Ring					
20-1000	89–200	10000	GCR1	GCR21	
90-2900	255-560	15000	GCR2	GCR22	
170-5600	578-1260	20000	GCR3	GCR23	
270–9000 788–1900 25000 GCR4 GCR24					
Ear matrix threads, add M ofter the W on all types (offered at an additional cost)					

- For metric threads, add **M** after the **W** on all types (offered at an additional cost). To order a pg13.5 electrical conduit entry and a 1/4"-19 BSP pressure connection, add M12 to the end of the catalog number, as well as adding "M" after "W" for metric threads. M12 to the end of the catalog number, as well as adding the article of the end of the catalog number, as well as adding the article of the end
- The differential adds to the range setting and determines the operating point on rising

SPDT Each Stage

Туре

GKW1

GKW2

GKW4

GKW6

GLW1

GLW2

ning Ring GMW1

GMW2

GMW3

GMW4

100

100

240

475

750

850

2000

15000

20000

25000

Teflon<sup>®</sup>

Stage 2

1.5 ±0.4

6.0 ±1.5

8.0 ±2.0

12 ±3

21 ±5

 $30 \pm 7.5$ 

45 ±11

75 ±19

210 ±52

400 ±100

800 ±150



# www.schneider-electric.us

9012GGW1

9012GKW1

#### **Differential-Pressure Operation**

Pressure switches for differential-pressure operation monitor the change in the difference between two pressures. Type G differential-pressure switches are used in applications to signal that a predetermined pressure difference has been reached as a result of a widening or increasing difference between the two pressures. They can also signal that a predetermined pressure difference has been reached as a result of a narrowing or decreasing difference between the two pressures.

Table 22.33: Differential-Pressure Switches NEMA 4, 4X, 13 Enclosures

UL Listed and CSA Certified As Industrial Control Equipment

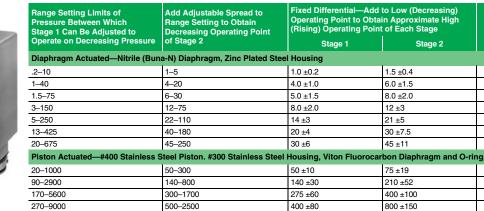
Working Pressure Range on Decreasing X (upper) Actuator	Adjustable Difference on Decreasing Pressure (adds to working pressure) Y (lower) Actuator	Adjustable Differential Actuates on Increasing Pressure (adds to adjustable difference)	Maximum Allowable Pressure psi	Single Pole Double Throw Type	Double Pole Double Throw Type	
Diaphragm Actuated—Nitrile (Buna	a-N) Diaphragm, Zinc Plated Stee	l Housing				
0–75	0.25–10	0.8–2	100	GGW1	GGW21	
0–175	0.5–36	5–15	240	GGW4	GGW24	
0–500	3–175	22–90	850	GHW1	GHW21	
Piston Actuated—#440 Stainless S	Piston Actuated—#440 Stainless Steel Piston. #303 Stainless Steel Housing, Viton <sup>®</sup> Fluorocarbon Diaphragm and O-ring, Teflon <sup>®</sup> Retaining Ring					
0–5000	15–825	80–200	7500	GJW1	GJW21	

## **Dual-Stage Operation**

Type G dual stage pressure switches are designed for use in applications where two separate pressure operations must be controlled by a single pressure monitoring device. These controls are most commonly used where dual functions are required or in sequencing applications such as alarm, followed by shutdown.

#### Table 22.34: **Dual-Stage Pressure Switch** NEMA 4, 4X, 13 Enclosure

UL Listed and CSA Certified As Industrial Control Equipment A



UL Marine Listed for use on vessels greater than 65 feet long where ignition protection is not required.

#### **Ordering Dual-Stage Pressure Switches**

1. Specify Class 9012 Type..., and indicate the high or low operating point for each stage within the limits shown in the above table. Example:

Class 9012 Type GKW4

Stage 1 at 30 psi decreasing pressure Stage 2 at 50 psi decreasing pressure

(20 psi spread)

Differential of each stage will be approximately as shown in the table above.

For available modifications see page 22-18. If one or more of these modifications are desired, add the appropriate Form to the Class and Type. Arrange form letters in alphabetical order when ordering more than one modification.

Acceptable Wire Sizes	
Electrical Rating.	nage 22-16
Temperature Rating	.page 22-16
Modifications	.page 22-18
Accessories	.page 22-18
Renewal Parts Kits	
Dimensions	.page 22-17



File E12158

File E12158 CCN NKPZ CCN NTHT - Marine Use



File I B25490

Class 3211-03

 $C \in$ 

www.schneider-electric.us

Table 22.35: Control Duty Circuit Ratings

AC—50 or 60 Hz				DC			AC or DC			
Contacts		Inc	ductive, 35%	Power Fac	tor	Resistive	Inductive and Resistive			
Contacts	V	Make Break		75% Power Factor	V	Make and Br	eak Amperes	Continuous Carrying Amperes		
		Α	VA	Α	VA	Make and Break Amperes		Single Throw	Double Throw	
	120	60	7200	6	720	6	120	0.55	0.22	10
SPDT	240	30	7200	3	720	3	250	0.27	0.11	10
SFDI	480	15	7200	1.5	720	1.5	600	0.10	_	10
	600	12	7200	1.2	720	1.2	_	_	_	_
	120	60	7200	6	720	6	125	0.22	0.22	10
DPDT	240	30	7200	3	720	3	250	0.11	0.11	10
DEDT	480	15	7200	1.5	720	1.5	600	_	_	10
	600	12	7200	1.2	720	1.2	_	_	-	_

Table 22.36: Type G Industrial

Contact Arrangement	Contact Symbol
1 N.O. – 1 N.C. (600 Vdc rating does not apply)	

Contacts are single pole, double throw—one circuit normally open and one circuit normally closed. These circuits are not electrically separate and can not be used on opposite polarities.

Table 22.37: Temperature Ratings

	Actuator	Minimum	Maximum
Ambient	All	-23 °C (-10 °F)	+85 °C (+185 °F)
	Diaphragm	-40 °C (-40 °F)	
Media	Piston	-26 °C (-15 °F)	+120 °C (+250 °F)
	All with Forms Q4 and Q14	-26 °C (-15 °F)	

Types GAW, GBW, GCW, GDW, GEW, GFW, GKW, **GLW, and GMW Machine Tool Switches** (except 1, 21)

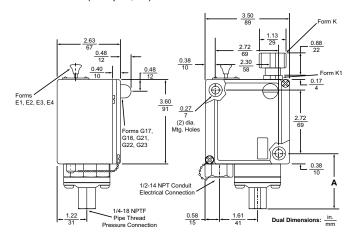


Table 22.38: Dimension A for G•W Switches

Туре	Dimension A, in. (mm)
GAW, GDW, GKW 2, 4, 5, 6 22, 24, 25, 26, 52, 54, 55, 56	2.33 (59)
GBW, GEW, GLW 1, 2, 21, 22, 51, 52	2.23 (57)
GCW, GFW, GMW 1, 2, 3, 4 21, 22, 23, 24, 51, 52, 53, 54	3.15 (80)

Table 22.39: Dimension A for G•R, Switches

Type / Tipo / Type	Dimension A, in. (mm)
GAR1, 2, 21, 22	2.02 (51.3)
GAR4, 5, 6, 24, 25, 26	1.42 (36.1)
GBR1, 2, 21, 22; GCR1, 21	1.32 (33.5)
GCR2, 3, 4, 22, 23, 24	2.24 (56.9)
GDR1, 2, 21, 22	2.02 (51.3)
GDR4, 5, 6, 24, 25, 26	1.42 (36.1)
GER1, 2, 21, 22; GFR1, 21	1.32 (33.5)
GFR2, 3, 4, 22, 23, 24	2.24 (56.9)

Table 22.40: Type G Machine Tool and Vacuum (except GVG)

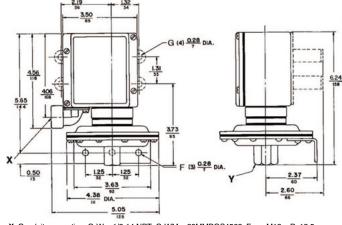
Туре	Contact Arrangement	Contact Symbol
Single Pole Double Throw	1 N.O1 N.C.	Same Polarity

Snap switch contains two double-break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of same polarity.

Туре	Contact Arrangement	Contact Symbol
Double Pole Double Throw	2 N.O.–2 N.C.	Ajuejod owes

Note: Snap switch contains two electrically separated sets of contact elements allowing use on circuits of opposite polarity. Each set contains two double break contact elements (1 N.O. and 1 N.C.) that must be used on circuits of the same polarity.

Types GAW, GDW, GKW 1, 21



X: Conduit connection: G•W = 1/2-14 NPT; G•WM = 20MMBGS4568, Form M12 = Pg13.5; DIN40430. Y: Pressure connection: G•W = 1/4-18 NPTF; G•WM = 8; Form M14 = G 1/4 BS 2779; RP1/4 ISO 711; R 1/4 DIN 2999; GJ 1/4 UN1339.

Figure 22.7: Types GAR, GBR, GCR, GDR, GER, and GFR

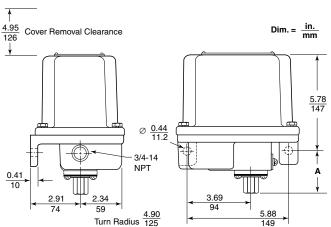
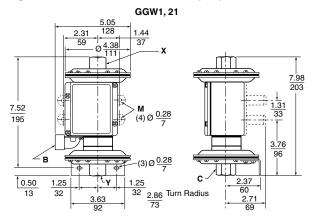


Figure 22.8: 9012G Dimensions, in. (mm)



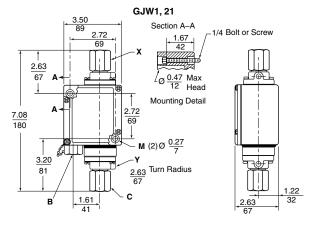


Figure 22.9: 9012GNO1, GRO1

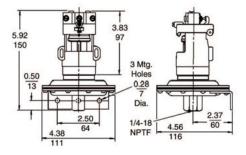
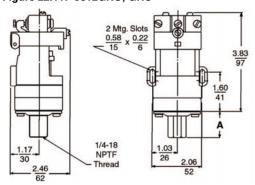
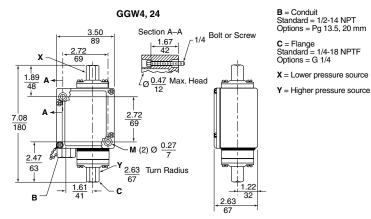


Figure 22.11: 9012GNO, GRO



Туре	Dimension A, in. (mm)
GNO, GRO 3, 4, 5, 6	1.41 (35.8)
GPO, GSO 1, 2, 3	1.31 (33.3)
GOO GTO 1 2 3 4	2 24 (56 9)



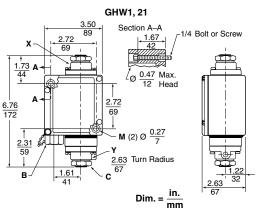


Figure 22.10: 9012GNG1, GRG1

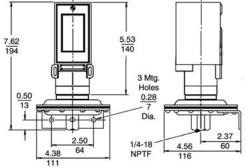
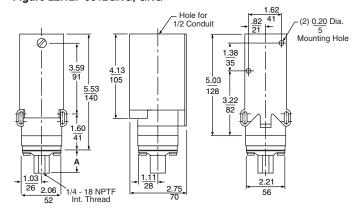


Figure 22.12: 9012GNG, GRG



Туре	Dimension A, in. (mm)
GNG, GRG 3, 4, 5, 6	1.41 (35.8)
GPG, GSG 1, 2, 3	1.31 (33.3)
GQG, GTG 1, 2, 3, 4	2.24 (56.9)

## **Machine Tool, Modifications and Accessories**

Class 9012 / Refer to Catalog 9012CT9701



Table 22.41: Factory Modifications for Class 9012 Pressure Switches

Modification	Applies to Pressure Switch Type		Form
Lock on rising pressure, manual reset only	Available on GDW, GDWM, GEW, GEWM, GFW, GFWM only		E3
120 Veg er Vde neen niet light	Available on all GAW-GMW, GAWM-GFWM with clear lens		G17
120 Vac or Vdc neon pilot light			G18
CANAL LAFE	For pilot light conversion kits:	with clear lens	G21
24 Vdc only LED	See 9998 PC-306–308. Complete Class and Type information required	with red lens	G22
24 Vdc LED pilot light with green lens	Class 9012 GAW–GMW and GAWM–GFWM, or Class 9016 GAW and Class 9025G		G23
SPDT snap switch rated 1.1 A at 125 Vdc (minimum differential doubles)	Available on GAR-GFR, GAW-GJW, GAWM-GFWM		НЗ
Prewired 5-pin Brad Harrison male receptacle #41310 or interchangeable Crouse-Hinds receptacle. For use with Brad Harrison female portable plug #41306, 41307, 41308, or equivalent.	Available on GAW–GJW single pole devices only		H10 or H11
Micro connector, 4-pin, for 24 Vdc pilot light	G•W (single pole only), except GAW2 and Form B2.		H17
External range adjustment (includes knob and range scale window)	GAW-GFW, GAWM-GFWM, GKW-GMW		K
External range adjustment slotted for screwdriver (includes range scale window)	GAW-GFW, GAWM-GFWM, GKW-GMW		K1
Pg 13.5 conduit thread and 1/4—19 BSP pressure connection	G•WM only		M12
	GGW1, GGW 21 only		Q1
	All other GGW, GHW only		Q1
Standard Nitrile (Buna-N) diaphragm in #316 stainless steel flange	GAR, GAW, GDR, GDW, GAWM, GDWM, GKW1, 21	only	Q1
	All other GAR, GBR, GDR, GER, GAW, GBW, GDW, GEW, GAWM, GBWM, GDWM, GEWM, GKW, GLW		Q1
	Available on all GGW, GHW except GGW1, 21		Q3
Ethylene propylene diaphragm in #316 stainless steel flange	Available on all GAR, GBR, GDR, GER, GAW, GBW, GDW, GEW, GAWM, GBWM, GDWM, GEWM, GKW, and GLW, except Types 1 and 21		Q3
	GGW1, 21 only		Q4
	All other GGW, GHW		Q4
Viton <sup>®</sup> fluorocarbon diaphragm in #316 stainless steel flange	GAR, GAW, GBR, GBW, GDR, GDW, GER, GEW, GA GDWM, GEWM, GKW1, 21 only	WM, GBWM,	Q4
	All other GAR, GAW, GBR, GBW, GDR, GDW, GER, GEW, GAWM, GBWM, GDWM, GEWM, GKW, GLW		Q4
Range scale window (standard with Forms K and K1)	GAW-GMW, GAWM-GFWM		V1
Special setting specified (If indicating only a fixed differential setting, specify whether this setting is on increasing or decreasing pressure.)	on All 9012G		Y1
1/4"-18 NPT external thread pressure connection	GAR, GAW, GDR, GDW, GGW, GKW Not available in combination with Forms Q1, Q3, Q4.		Z
1/2"-14 NPT external thread, 1/4"-18 NPTF internal thread pressure connection	GAR, GAW, GDR, GDW, GGW, GKW Not available in combination with Forms Q1, Q3, Q4.		Z16
7/16"-20 UNF-2B internal thread pressure connection	GAR-GFR; GAW-GMW Not available in combination with Forms Q1, Q3, Q4.		Z18

## Table 22.42: Factory Modifications for Renewal Parts Kits for Class 9012 Pressure Switches Suffixes for renewal parts kits, see page 22-28.

Modification	Applies to Parts Kit Type	Form
SPDT snap switch rated 1.1 A at 125 Vdc (minimum differential doubles)	PC313	НЗ
Standard Nitrila (Puna NI) diaphragm in #216 ataipleas ataal flance	PC177-179, PC268, 269	01
Standard Nitrile (Buna-N) diaphragm in #316 stainless steel flange	PC265-267	Q1
Ethylene propylene diaphragm in #316 stainless steel flange	PC177-178, PC268, 269	Q3
	PC266, 267	Q3
Vitan® fluorescent on displacements #21C stainless steel floores	PC177–178, PC268, 269	
Viton® fluorocarbon diaphragm in #316 stainless steel flange	PC265-267	Q4
1/4"-18 NPT external thread pressure connection	PC265-269	Z
1/2"-14 NPT external thread, 1/4"-18 NPTF internal thread pressure connection	PC265-269	Z16
7/16"-20 UNF-2B internal thread pressure connection	PC177, 178, PC265-273	Z18

## Table 22.43: Class 9049 Accessories for Class 9012 Pressure Switches

Description	Applies to Class	Туре
Stainless steel surge reducer for use on oils, coolants, and hydraulic fluids (not recommended for air or water)	9012G	A26S



## Type GAW—Sensitive Control Applications

9016GAW vacuum switches are provided with double throw contacts; normally open and normally closed circuits allow these controls to be used for standard or reverse action applications.

Standard devices can be mounted from the front with the bracket provided. Two mounting screws are required for a firm attachment to any smooth, flat surface. Allowance must be made for flange projection. Controls with Form F modification include two mounting feet with 9/32" mounting holes on 3-3/4" centers. Range and Differential adjustments are internal and exposed by removal of the front cover.

Maximum allowable positive pressure: 100 psig.

Diaphragms are oil resistant, nitrile butadiene (Buna N) rubber.

Electrical Ratings and Temperature Limitations—See page 22-14 for Type G machine tool.

Dimensions—See page 22-17.

Table 22.44: Class 9016, Diaphragm Actuated

Range on Adjustable Differential Pipe		Pipe	Enclosure		
Decreasing Vacuum	Adds to Range▲	Arrangement Tap	Тар	NEMA 4, 4X & 13	NEMA 7 & 9 ■
(In. of Hg)	(In. of Hg)	(NPTF)		Туре	Туре
0–28.7	At Minimum Range: 0.8–9 At Mid-Range: 1.3–7.4	1 N.O., 1 N.C.	1/4"-18	GAW1	GAR1
0–25	5–20	1 N.O., 1 N.C.	1/4"-18	GAW2	N/A
0–28.3	At Minimum Range: 1–9 At Mid-Range: 1.7–7.4	2 N.O., 2 N.C.	1/4"-18	GAW21	GAR21
0–25	5–20	2 N.O., 2 N.C.	1/4"-18	GAW22	N/A

Add Differential to Range to obtain the operating point on increasing vacuum (within vacuum limitations). The differential increases linearly over its range.
 The minimum differential doubles with NEMA 7 & 9 enclosures.

#### Table 22.45: Available Modifications

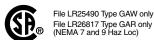
Description	Form
Mounting feet (GAW1 and GAW21 only)	F
Range scale window	V1
1/4"-18 NPT external thread pressure connection	Z
1/2"-14 NPT external thread, 1/4"-18 NPTF internal thread pressure connection (standard actuator only)	Z16



 File E12443 Haz Loc
 CCN NOWT G\*R

 File E12158
 CCN NKPZ G\*W

 File E12158
 CCN NTHT Marine Use, G\*W







Vacuum Switch

Class 9016 Type GVG1 Forms E, F

## Type GVG—Power Circuit Applications

The 9016GVG1 vacuum switch is a companion to the 9036GG and 9037GG float switches commonly used on vacuum heating pumps. Electrical ratings of float and vacuum switch types are equal.

## Table 22.46: Class 9016, Contacts Open on Increasing Vacuum

Cut-out Range	Approximate Adjustable Differential	Cut-in Range	Poles	Pressure	NEMA 1 Enclosure
(In. of Hg)	(In. of Hg)	(In. of Hg)	. 0.00	Connection	Туре
5–25	5–10	0–20	2	1/4"-18 NPSF	GVG1

Note: Maximum allowable positive pressure: 150 psig. In. of Hg = inches of mercury.

#### Table 22.47: Available Modifications

Description	Form
3-way lever—nameplate marked: Float only—Vacuum and Float—Continuous (factory modification only)	E
Mounting bracket (for retrofit, order 9049A53 bracket kit)	F
Reverse action—normally open contacts	R
1/4" male pipe connection (1/4"-18 NPT, external thread) (for retrofit, use 1/4" pipe nipple)	Z

#### Table 22.48: Electrical Ratings—9016GVG

Voltage		DC	
voitage	Single Phase	Polyphase	DC
110 V	2 hp	3 hp	1 hp
220 V	3 hp	5 hp	1 hp
440–550 V	5 hp	5 hp	_
32 V	_	_	1/2 hp

Note: Control Circuit Rating: A600

Table	22.49:	Vacuum	Codes

Settings (In. of Hg)	Code
3–8	J09
16.5–25	J10
17–22	J11
18–23	J12
20–25	J13
Specify other setting (minimum order quantity is 4 pieces)	J99

Ordering Information: Specify Class 9016 Type G. Give vacuum settings within the limits of the listings above.

For Setting Codes, see Table 22.49. If special features are desired, add the appropriate Form letter to the Class and Type. Arrange the Form letters in alphabetical order when ordering more than one special feature.



File E12158 CCN NKPZ

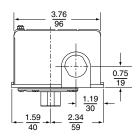


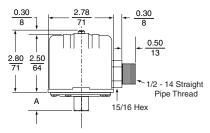
File LR2549

by Schneider Electric www.schneider-electric.us









Shown with Form T

Table 22.52: Type F-Net Weight, 1-1/8 lb

Switch Type	A		
Switch Type	in.	mm	
FHG2, 12, 22, 32, 42, 52 FRG2, FSG2, FYG2	2-29/32	23	
FHG3, 13, 33 FRG3, FSG3, FYG3	1-9/32	33	
FHG9, 19, 29, 39, 49, 59 FSG9, FYG9	1-3/32	28	

Table 22.53: Pressure Code (fixed differential)

Off at	Code
80 psi	J43
100 psi	J27
110 psi	J37
115 psi	J38
120 psi	J69
125 psi	J52
135 psi	J39
140 psi	J68
155 psi	J40
150 psi	J55
175 psi	J59
Specify other pressure (minimum order quantity is 4 pieces)	J99

The existence of a code does not imply that the code is available for any or all devices



File E12158 CCN NKPZ



UL Listed control equipment. Type 4 must have Form T; otherwise these Types are component recognized. If conduit or pressure line is rigid, UL; if both are flexible, UR.

Class 9013 Type FHG pressure switches are designed for the control of small electrically driven air compressors.

Class 9013 / Refer to Catalog 9013CT9701

- Contacts open on pressure rise.
- Diaphragm actuated.
- For application data, see page 22-16. For repair parts kits, see page 22-28.

Table 22.50: Selection Table

	Descripti	NEMA 1 Enclosure			
Adjustable	Approximate			Lower hp	Higher hp
Cut-out Range Increasing Pressure (psig)	Differential Fixed (psig)	Poles	Pressure Connection	Туре	Туре
			1/4" NPSF internal	FHG2	FHG22
40-100	20	2	3/8" NPSF internal	FHG3	_
40-100			1/4" four way	FHG4	FHG24
			1/4" NPT external	FHG9	FHG29
	30	2	1/4" NPSF internal	FHG12	FHG32
70-150			3/8" NPSF internal	FHG13	FHG33
70-150	30		1/4" four way	FHG14	FHG34
			1/4" NPT external	FHG19	FHG39
·			1/4" NPSF internal	FHG42	FHG52
100-200	40	2	1/4" four way	FHG44	FHG54
			1/4" NPT external	FHG49	FHG59

Table 22.51: Special Features and Modifications for Type FHG

Description	Form
Bulk pack	<b>A</b>
Addition of a second ground screw	G4■
Maintained manual cut-out lever (Auto-Off)	M1
Pulsation plug—factory order only (available only on 1/4-inch fittings, not to include 4-way)	Р
1/2" conduit bushing—1/2" long thread—on left	Т
Slip-on connectors (load side terminals only)	U
Slip-on connectors (line and load terminals)	U2
Factory sealed range stud	W
Two-way pressure release valve	X
Quick connect two-way pressure release valve (for use with Polyflow tubing)	X1
Black cover	Z22

- For bulk package quantities and Form numbers, see Table 22.61 on page 22-21. If a Form is not specified, devices will be shipped individually packaged.

  Can be field installed. Nameplate should then be marked with the Form letter and maintenance and ordering
- records corrected.

Table 22.54: Electrical Ratings For All 9013 Switches

Switch Type	Voltage	Single Phase AC	Polyphase AC ▼	DC	Control Circuit Rating	
FHG2, 9, 12, 13, 14, 19,	115	1-1/2 hp	2 hp	1/4 hp♦		
42, 43, 44, 49	230	2 hp	3 hp	1/4 hp♦	A600	
FSG, FSW	460/575	_	1 hp	_		
FHG22, 29, 32, 33, 34, 39,	115	2 hp	3 hp	1/2 hp★		
52, 54, 59	230	3 hp	5 hp	1/2 hp★	A600	
FYG, FYW	460/575	_	1 hp	_		
5000 0	32	_	_	_		
FRG One Pole All Form H	115	1 hp	_	1/4 hp	A300	
7.11 0.111 11	230	1 hp	_	1/4 hp		
	32	_	_	1/4 hp		
FRG Two Pole	115	1 hp	1 hp	1/4 hp	A300	
	230	1 hp	1 hp	1/4 hp		
	115	1 hp	_	1/2 hp		
All 9013G Form H	230	2 hp	_	1/2 hp	A600	
	460/575	2 hp	_	_		
	115	2 hp	3 hp	1 hp		
All 9013G, except Form H	230	3 hp	5 hp	1 hp	A600	
	460/575	5 hp	5 hp	_		

- DC rating does not apply to Form M4.
- 1/4 hp with Form MI.
- See 1993 NEC Article 430-84

## **Ordering Information**

- Specify Class 9013 Type FHG.
- Select pressure code from Table 22.53, and add the code designation to end of the Type number. Ensure that the pressure rating of the code falls within the limits of the device as shown in Table 22.50
- To order special features, add the appropriate Form designation to the Class and Type. Arrange Forms in alphabetical order when specifying more than one feature or modification.

Accessories . . . . . page 22-22



## **Commercial Pressure Switches**

Designed for the control of electrically driven water pumps. Diaphragm actuated.

- Type FSG is the standard water pump switch, suitable for all types of pumps: jets, submersible, reciprocating, etc.
- Type FYG is designed to meet higher horsepower and pressure requirements.
- Type FRG is reverse acting: contacts open on falling pressure.





Table 22.55: Pressure Codes▲

Standard Action Dev	vices	Reverse Action Devices		
Settings	Code	Settings	Code	
5–21 psi	J15	8.5–5.5 psi	J17	
8–20 psi	J16	10–5 psi	J36	
20–40 psi	J20	22-12 psi	J22	
20–50 psi	J18	22-16 psi	J19	
30–50 psi	J21	35–20 psi	J70	
40–60 psi	J24	40–20 psi	J23	
50-70 psi	J33	50–30 psi	J35	
55–85 psi	J34■	80–60 psi	J32■	
60–80 psi	J25	100–80 psi	J51■	
Specify other pressure	J99∎	150–120 psi	J64■	
Specify other pressure	J99 <b>■</b>	Specify other pressure	J99 <b>■</b>	

Table 22.56: **Maximum Allowable Pressure** for All 9013 Switches

Туре	Pressure
FHG, FSG, FYG, FSW, FYW, FRG	
	300 psig
	100 psig
GHR, GHW	250 psig

#### Table 22.57: Temperature Limitations for All 9013 Switches

Operation (Media)	Storage
Min36 °C (-33 °F)	Min36 °C (-33 °F)
Max. +125 °C (+257 °F)	Max. +125 °C (+257 °F)

#### **Ordering Information**

- Specify Class 9013 Type F.
- Select the pressure code from Table 22.55, and add the code designation to the end of the Type number. Ensure that the pressure rating of the code falls within the limits of the device as shown in Tables 22.58 and 22.59.
- To order special features, add the appropriate Form letter to the Class and Type. Arrange the Form letters in alphabetical order when ordering more than one special feature.

Electrical Ratings:	.page 22-20
Dimensions:	page 22-20
Renewal Parts Kits:	.page 22-28





File E12158 CCN NKPZ File LR25490

Note: Products on this page are UL Listed, however type numbers ending in 8, 10 or 20 (non rigid pressure lines) must have Form T or TI—otherwise these are UL component recognized.

- Existence of a code does not imply that the code is available for any or all devices. Minimum order quantity is 4 pieces.
- Must be mounted in vertical position to maintain enclosure rating.
- For bulk package quantities and Form numbers, see Table 22.61. If Form C•• is not specified, devices will be shipped individually packaged.
- Nylon pulsation plug can be field installed on types having 1/4" NPSF internal connector. Part number 1530S6G1 is one bag of 50 plugs.

#### Table 22.58: Standard Action: Contacts Open On Rising Pressure

Cut-out	Approximate	Cut-in		2 Pole				
Range	Adjustable	Range	Pressure Connection	NEMA 1	NEMA 3R♦			
(psig)	Differential (psig)	(psig)		Туре	Туре			
			1/4" NPSF internal	FSG2	FSW2			
20–65	15–30	5-45	1/4" NPT external	FSG9	FSW9			
20-03	15–30	5-45	1/4" bayonet (barbed)	FSG10	FSW10			
			90° elbow 1/4" bayonet	FSG20	FSW20			
20-50	10–30	10-30	1/4" NPSF internal	FSG22	FSW22			
20–60	10–30	10-45	1/4" NPT external	FSG29	FSW29			
9–30	6–20	3–10	1/4" NPSF internal	FSG42	FSW42			
9–30	6–20	3–10	1/4" NPT external	FSG49	FSW49			
25 00	25–80 20–30	5–60	1/4" NPSF internal	FSG52	=			
25-60		5-60	1/4" NPT external	FSG59	_			
34-65	15–30	19–45	(FSG1 through 20 with Form M4 is only available in this range)					
			1/4" NPSF internal	FYG2	FYW2			
25–80	20–30	5–60	1/4" NPT external	FYG9	FYW9			
23-60			1/4" bayonet (barbed)	FYG10	FYW10			
			90° elbow 1/4" bayonet	FYG20	FYW20			
39–80	20-30	19–60	(FYG1 through 20 with Form M4 is only available in this range)					
20-50	10–30	10–30	1/4" NPSF internal	FYG22	FYW22			
20-60	10–30	10–45	1/4" NPT external	FYG29	FYW29			
9–40	6–30	3–10	1/4" NPSF internal	FYG42	FYW42			
9–40	6–30	3–10	1/4" NPT external	FYG49	FYW49			

#### Table 22.59: Reverse Action: Contacts Open On Falling Pressure

Cut-in	Cut-in Approximate Range Adjustable (psig) Differential (psig)		Pressure	1-Pole	2-Pole
			Connection	Туре	Туре
			1/4" NPSF internal	FRG12	FRG2
23-65	15–30	8-45	3/8" NPSF internal	FRG13	FRG3
			1/4" NPT external	FRG19	FRG9
			1/4" NPSF internal	FRG32	FRG22
10–45 6–20	6–20	4–25	3/8" NPSF internal	FRG33	FRG23
			1/4" NPT external	FRG39	FRG29
6–14 5 Fixed	_	1–9	1/4" NPSF internal	FRG52	FRG42
			3/8" NPSF internal	FRG53	FRG43
			1/4" NPT external	FRG59	FRG49
40–100 20–30	20, 20	20–80	1/4" NPSF internal	FRG72	FRG62
	20-30	20-60	3/8" NPSF internal	FRG73	FRG63
			1/4" NPSF internal	FRG92	FRG82
65-150	30-45	35-120	3/8" NPSF internal	FRG93	FRG83
			1/4" NPT external	FRG99	FRG89

## Table 22.60: Special Features and Modifications for Type FSG, FYG & FRG Devices

Description	Applies to Types	Form	
Bulk package	All Type F	*	
One normally open—one normally closed contact	FRG 2-Pole only	Н	
Maintained manual cut-out lever (Auto-Off)	FSG, FYG	M1	
Momentary manual cut-in lever (Auto-Start)	FRG2-59 only	M3	
Low pressure cut-off (Auto-Start-Off) Operates at approximately 10 psig below cut-in and will turn off the pump	FSG, FYG	M4	
Maintained manual cut-in lever (Auto-On)	FRG2-59 only	M5	
Pulsation plug (Type 2 & 9 only)	FRG, FSG, FYG	P▼	
Plastic flange (max. temp. 120 °F) (max. pressure 80 psi)	FSG•, FYG•, FRG•	Q8	
Plastic flange (max. temp. 120 °F) (max. pressure 80 psi) Available only on Types FSG2, FYG2, FRG2, FSG•2, FYG•2, FRG•2	1/4" NPSF internal only		
1/2" conduit bushing, 1/2" long thread—on left	All Type F	Т	
Slip-on connectors (load side terminals only)	FSG, FYG	U	
Slip-on connectors (line and load terminals)	FSG, FYG	U2	
Black cover	FSG, FYG	Z22	

#### Table 22.61: Bulk Package Form Numbers for 9013F Pressure Switches

Description			Bulk Package Quantity					
Description			20	40	50	400	500	
	9013FHG (without 1/4" four-way)		C20		C50	_		
Product without	9013FHG4, 14, 24, 34, 44, 54 (with 1/4" four-way)	_	C20	_	C50	C400	_	
Forms M1, M3, M4,	9013FRG	_	C20	_	C50	_	_	
M5, T, X1	9013FSG	_	C20	-	C50	_		
	9013FYG	_	C20	_	C50	_		
	9013FHG (without 1/4" four-way)	_	C20	C40	_	_	_	
Product with	9013FHG4, 14, 24, 34, 44, 54 (with 1/4" four-way)		C20	C40	_	_	_	
Forms M1, M3,	9013FRG		C20	C40	_	_	_	
M4, M5	9013FSG		C20	C40	_	_	_	
	9013FYG	_	C20	C40	_	_	_	
	9013FHG (without 1/4" four-way)	C16	_	C40	_	_	_	
Donalous Assolute	9013FHG4, 14, 24, 34, 44, 54 (with 1/4" four-way)	C16	_	C40	_	_	_	
Product with Forms T. X1	9013FRG	C16	_	C40	-	_		
FUIIIS I, AI	9013FSG	C16	_	C40	_	_		
	9013FYG	C16	_	C40	_	_		
9013FHG9 Special	with Extended Flange	C16	_	_	_	_	C500	

Class 9013 / Refer to Catalog 9013CT9701





Pressure Switch

Shown with Form X

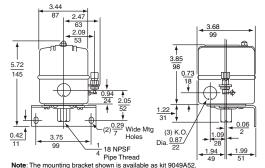
## Table 22.62: Pressure Codes

Code	Pressure Setting (Close-Open), psi
J20	20–40
J21	30–50
J23	40-20 (reverse action)
J24	40–60
J25	60–80
J26	70–90
J28	70–100
J29	75–100
J30	80–100
J31	90–120
J50	135–175
J51	100-80 (reverse action)
J53	100–125
J54	110–125
J56	110–150
J57	120–150
J58	125–150
J60	125–175
J61	130–175
J62	140–175
J63	145–175
J64	150-120 (reverse action)
J65	215–250
J99	Specify the required setting

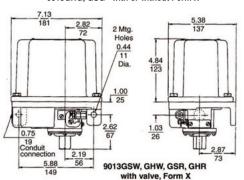
#### Ordering Information

- Specify Class 9013 Type G. Select the pressure code from Table 22.62, and add the code to the end of the Type number. Ensure that the pressure rating of the code falls within the limits of the device. See Table 22.63.
- To order special features, add the appropriate Form letter to the Class and Type. Arrange Form letters in alphabetical order when ordering more than one special feature.

Electrical Ratings.....page 22-20



9013GHG, GSG - with or without Form X



Class 9013 Type G Pumptrol pressure switches are designed to control electrically driven water pumps and air compressors. These devices cover higher electrical ratings for directly controlling motors in pump and compressor applications.

- Contacts open on pressure rise.
- Diaphragm actuated.
- For electrical ratings, see page 22-20. For repair parts kits, see page 22-28.



File E12158 CCN NKPZ

File E12443 CCN NOWT Haz Loc



File 25490 File 26817

Table 22.63: Selection Tables

Cut-out Range (psig)	Approximate Adjustable Differential (psig)	Cut-in Range (psig)	Enclosure	Poles	NPSF Internal Pressure Connection	Туре
10–35	4–8	5.5-30.5	NEMA 1 (General Purpose)	2	1/4	GMG2
20-80	15–30	5-60	NEMA 3R ▲ (Rainproof)	2	1/4	GSB2
					1/8	GSG1
20-80	15–30	5-60	NEMA 1 (General Purpose)	2	1/4	GSG2
- <u> </u>					3/8	GSG3
_			NEMA 7 & 9		1/8	GSR1
_			(Hazardous Locations)		1/4	GSR2
20–80	20-40	5-50	( in the second	2	3/8	GSR3
_ 20-00	20 40	3-30			1/8	GSW1
_			NEMA 4 (Watertight)		1/4	GSW2
_					3/8	GSW3
65–200	20-40	40–170	NEMA 3R ▲ (Rainproof)	2	1/4	GHB2
-			NEMA 1 (General Purpose)		1/8	GHG1
65–200	20-40	40-170		2	1/4	GHG2
_					3/8	GHG3
-			NEMA 7 & 9		1/8	GHR1
_			(Hazardous Locations)		1/4	GHR2
65–200	30–50	35-150	(	2	3/8	GHR3
_ 03-200	50-50	00-100			1/8	GHW1
_			NEMA 4 (Watertight)		1/4	GHW2
_					3/8	GHW3
80–250	25–45	32–215	NEMA 3R ▲ (Rainproof)	2	1/4	GHB5
					1/8	GHG4
80–250	24–45	32–215	NEMA 1 (General Purpose)	2	1/4	GHG5
-					3/8	GHG6
			NEMA 7 & 9		1/8	GHR4
			(Hazardous Locations)		1/4	GHR5
80–250	40-60	30–190	(	2	3/8	GHR6
00-200	10 00	00 100			1/8	GHW4
			NEMA 4 (Watertight)		1/4	GHW5
	1				3/8	GHW6

Must be mounted in vertical position to maintain enclosure rating.

## Table 22.64: Special Features and Modifications for Type G Devices

Description	Applies to	Form
Standard pack of 10 switches■	All Type G	C10
3-way lever (On-Auto-Off) (not compatible with Form X)	GHG, GMG, GSG	Е
1 N.O., 1 N.C. contact	All Type G	Н
Pulsation plug (not field replaceable.)	All Type G	Р
Reverse action (Select pressure code from reverse action table on page 22-21)	All Type G	R
Slip-on connectors (load side terminals only)	All Type G	U
Slip-on connectors (line and load terminals)	All Type G	U2
Two-way pressure release valve	GHB, GMG, GSB, GHG, GSG	Х
(Not compatible with Form E)	GHR, GHW, GSR, GSW	Х
1/4" male pipe thread on pressure connection	All Type G	Z
1/2"-14 NPT external 1/4"-18 NPT internal ♦	All Type G	Z16

- Available on GHB, GHG, GSB, and GSG.
  If Form C10 is not specified, devices will be shipped individually packaged
- UL Listed industrial control equipment.

#### Table 22.65: Class 9049 Accessories for Class 9013 Pressure Switches

Туре	Description	Applies to Class
A12	Two-way pressure release valve, replacement only. Cannot be added to switch that originally had no valve.	9013GHG, GSG, Form X only
A52	Mtg. bracket—replacing obsolete 9013A with 9013G	9013GHG, GSG
A53	Mtg. bracket—replacing obsolete 9013A with 9013G, or for current 9016GVG	9013GMG, 9016GVG
A56	Two-way pressure release valve. Replacement only. Cannot be added to switch that originally had no valve.	9013FHG, Form X only



www.schneider-electric.us

# **Open Tank or Sump Applications**

Ambient temperature ratings: Min. -30 °C (-22 °F); Max. +105 °C (+220 °F). For accessories, refer to page 22-28.

Table 22.66: Class 9036, 2-Pole, Single Lever Operated

Outliet Outliet	NEMA 1	NEMA 1 NEMA 4	
Contact Operation	Туре	Туре	Туре
Close on liquid rise	DG2	DW31	DR31
Open on liquid rise	DG2R	DW31R	DR31R
Close on liquid rise	GG2	GW1	GR1
Open on liquid rise	GG2R	GW1R	GR1R

Order the universal mounting bracket and float accessory kits separately from the Class 9049 Accessories section on page 22-28. Types GW and GR use a center-hole float. Devices with Form C use a center-hole float. All others use a tapped-at-top float.

#### Table 22.67: Modifications

Description	Factory Installed	Field Installed	
Description	Form	Class 9049 Kit	
Types DG, DW, DR			
Reverse action (Type DG)	R	A58	
Compensating spring (Type DG)	С	A19	
Compensating spring (Type DR, DW)	С	A20	
Compensating spring and reverse action	CR	Not available	
Types GG, GW, GR			
Compensating spring for Type GG2	С	9049A13	
Combination of compensating spring and reverse action (Type GG2)	CR	9049A13	
1 N.O., 1 N.C. contact configuration	Н	Not available	
Combination of comp. spring & 1 N.O., 1 N.C. contact for Type GG2	CH	Not available	
Reverse action (Type GR, GW)	R	Not available	

#### Table 22.68: Class 9049 Float Accessory Specifications (oz)

Item	Type A6	Type A6S	Type A6C	Type A6CS	Type A6A	Type A6CA
Net buoyancy  (in water) 7" float	60▲	60▲	70▲	70▲	60▲	70▲
Weight of 5 ft rod	18.5	16.9	18.5	16.9	6	6
Weight of extra ft of rod (per ft)	3.7	3.4	3.7	3.4	1.2	1.2
Total weight of stops	3 (2 stops)	3 (2 stops)	6 (4 stops)	6 (4 stops)	3 (2 stops)	6 (4 stops)

- Net buoyancy of float has been calculated with float 80% submerged, thus allowing 20% factor of safety.
- Buoyancy data is calculated for use in water. Consult factory for buoyancy data is need with a different specific gravity than water.

  When ordering float accessories, first specify the desired float accessory package, such as 9049A6 or 9049A6CS, then as a second item give the number of additional rod kits required. For example, for a 9049A6 with 15 ft of rod, order as follows: Item A = 9049A6, quantity = 1; Item B = 9049T1, quantity = 4.



Type DG2



Type GG



File No. E12158 File No. E12443 Haz Loc



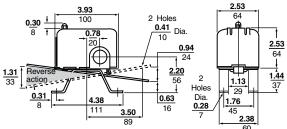
File LR25490 File LR26817 Haz Loc

Table 22.69: Maximum Forces at Which Switches Are Tested (oz)

Туре	Force Up To Trip	Force Down To Trip			Lever Length Position	Force Up to Trip	Force Down to Trip	Weight Supported with Compensating Spring at Max. Adjustment (oz)
DG2	9	8	60	GG2	Short	33	39	<b>*</b>
DG2 Form R	8	8	60	GG2	Long	21	27	100
DW31	8	8	66	GG2 Form R	Short	30	24	•
DW31 Form R	8	8	66	GG2 Form R	Long	22	16	150
DR31	8	8	66	GR1, GW1	Short	24	31	80
DR31 Form R			66	GR1, GW1	Medium	22	29	72
Dh31 Fulli h	0	0	00	GR1, GW1	Long	20	27	64

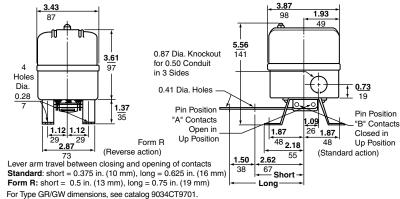
Compensating spring not effective in combination with Short lever length position.

#### Figure 22.13: Type DG Dimensions



Float lever travel between closing and opening of contacts: short = 1 in. (25 mm), medium = 1.12 (28 mm), long = 1.25 in. (31.8)

Figure 22.14: Type GG Dimensions



For Type DR/DW dimensions, see catalog 9034CT9701.

Table 22.70: Electrical Ratings for All Float Switches

Applies to Class and Tone	Control Circuit	S	ingle Phase	AC	Polyphase AC ★			DC		
Applies to Class and Type	Control Circuit	115 V	230 V	460/ 575 V	115 V	230 V	460/ 575 V	32 V	115 V	230 V
9036DG, DR, DW (2-pole), FG	A600	2 hp	3 hp	_	3 hp	5 hp	1 hp	1/4 hp	1/2 hp	1/2 hp
9036GG, GR, GW (2-pole)	A600	2 hp	3 hp	5 hp	3 hp	5 hp	5 hp	1/2 hp	1 hp	1 hp
9036G Form H (1 N.O., 1 N.C.)	A300	1 hp	2 hp	2 hp	_	_	_	_	1/2 hp	1/2 hp
9037EG, ER, EW; HG, HR, HW (2-pole)	A600	2 hp	3 hp	_	3 hp	5 hp	1 hp	1/4 hp	1/2 hp	1/2 hp
9038 All Devices (2-pole)	A600	2 hp	3 hp	_	3 hp	5 hp	1 hp	1/4 hp	1/2 hp	1/2 hp

See 1993 NEC Article 430-84



9036FG 9049A60

## Open Tank or Sump Applications, Float Switch, Class 9036 Type FG

The Class 9036 Type FG30 pedestal style float switch is designed for liquid level control with electric motor operated pumps either directly or through a magnetic starter. It can also be used to activate alarms in liquid level control systems. The upward or downward movement of the lever arm of the Class 9036 Type FG30 float switch controls the On and Off positions corresponding to the water level changes required to turn the pump or alarm on and off.

Ambient temperature ratings: Min. -30 °C (-22 °F); Max. +105 °C (+220 °F)

#### Table 22.71: Type FG Float Switch and Accessories

Description	Class	Туре
2-pole, NEMA 1, contacts close on liquid rise	9036	FG30
Plastic center hole float (1 required)	9049	A60
33.75 inch aluminum rod, 2 float stop assemblies and attaching hardware (1 required)	9049	A61

## Closed Tank, Class 9037 Type E

Type E switches are flange mounted and float movement is transmitted through a Quad-Ring® seal.

Build up the switch to meet your exact requirements from the basic switch, float rod, and float groups below. Switch may be assembled in the field to give contacts that open on liquid rise or close on liquid rise. Consult Schneider Electric for use in media with a different specific gravity than water.

Ambient temperature ratings: Min. -30 °C (-22 °F); Max. +105 °C (+220 °F)

Table 22.72: Class 9037 Type E

Auglication	Post Length	NEMA 1	NEMA 4	NEMA 7 & 9	
Application	L (in.)	Туре	Туре	Туре	
For minimum water level change	2-5/8	EG8	EW8	ER8	
For minimum water level change	4-11/16	EG10	_	_	
For maximum water level change	2-5/8	EG9	EW9	ER9	
i oi maximum water level change	4-11/16	EG13	EW13	<u> </u>	

Table 22.73: Class 9049 Floats for Type E Switches

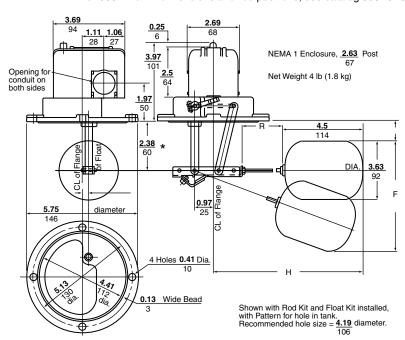
Description	Туре
#304 stainless steel	EF1
#316 stainless steel	EF2

Table 22.74: Class 9049 Float Rod Kits

Туре	A (in.)	F (in.)	R (in.)	H (in.)
ER1	1.00	4.75	1.75	8.25
ER2	1.00	4.75	2.5	9.00
ER3	1.00	4.75	3.50	9.50
ER5	1.00	4.75	5.25	11.75
ER7	1.00	5.00	7.25	13.75
ER12	1.00	5.75	12.25	18.75

Figure 22.15: Type EG Dimensions, in. (mm)

For 9037ER/EW dimensions and rod positions, see catalog 9034CT9701



Short length (Dimension L)

# 9049A61



9037EG with 9049ER3 Rod Kit



File No. E12158 and E12443 Haz Loc



File 25490 except Types ER8, ER9



www.schneider-electric.us

Type H switches are attached to the tank by means of a 2-1/2 in. screw-in bushing. An external pointer indicates the float position within the tank when the unit is mounted. Switches come complete with stainless steel float and rod. A Buna N Quad-Ring® seal is used between the float rod and sealing connector. Normal application is at atmospheric pressure, but where higher pressures are encountered, the switch will withstand tank pressures up to 50 psi at temperatures up to +220 °F. Occasional replacement of the Quad-Ring seal may be necessary. Ambient temperature ratings: Min. -30 °C (-22 °F); Max. +105 °C (+220 °F)

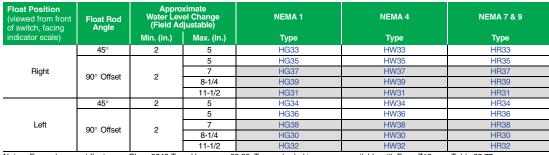
Table 22.75: Class 9037 Type H Contacts Close On Liquid Rise



Type HG35 Float on Right 90° Offset Rod

File No. E12158 and E12443 Haz Loc

File LR26817 Haz Loc



Note: For replacement floats, see Class 9049 Type H on page 22-28. Types shaded in gray are available with Form Z19; see Table 22.77.

Table 22.76: Type H Float Travel Distances

Float Rod Angle	R in. (mm)			1 mm)		2 mm)	l in. (	F mm)
	(11111)	(11111)	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
45°	_	6.22 (158)	2.25 (57)	4.50 (114)	2.00 (52)	4.50 (110)	4.25 (108)	9.00 (229)
	3.00 (76)	4.25 (108)	2.75 (70)	4.25 (108)	2.25 (57)	4.25 (108)	5.00 (127)	7.50 (191)
90° offset	4.25 (108)	5.50 (140)	3.50 (89)	5.50 (140)	2.75 (70)	4.00 (102)	6.25 (159)	9.50 (241)
90 Oliset	5.00 (127)	6.25 (159)	3.75 (95)	6.25 (159)	3.00 (76)	4.50 (110)	6.75 (171)	10.75 (273)
	7.00 (178)	8.25 (210)	4.75 (121)	8.25 (210)	3.75 (95)	5.75 (146)	8.50 (216)	14.00 (356)

Clearance from the centerline of the hub to the side of the tank.

Table 22.77: Available Modifications For Class 9037 Type H

Description	Form
Omit 2-1/2" tank connecting bushing	F3
Omit float	L
Reverse action, contacts open on rise	R
Viton® packing: 5 oz. float (diesel fuel) for Types shaded in gray in Table 22.75 above.	Z19
Viton packing (suitable for applications up to +250 °F)	Z20
#316 stainless steel float and Viton packing	Z21

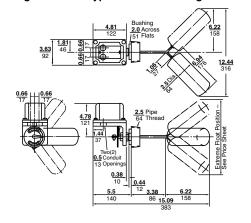
Figure 22.16: Type HG—45° Angle Dimensions

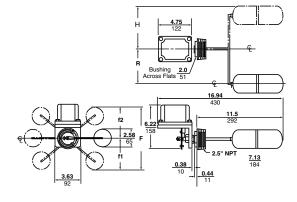
Figure 22.18: Type HR/HW—45° Angle Dimensions

INCHES **Dual Dimensions:** 

Figure 22.17: Type HG—90° Offset Dimensions

Figure 22.19: Type HR/HW—90° Offset Dimensions

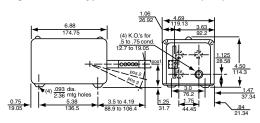




SQUARE D

Type AG1 Mechanical Alternator, Float Operated

Figure 22.20: Type A Dimensions, in. (mm)





Type CG36

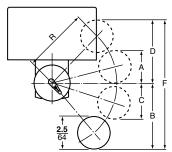


File No. E12158 excludes NEMA 7 & 9 products (9038AR, CR, and DR)



File LR25490 excludes NEMA 7 & 9 products (9038AR, CR, and DR)

## Figure 22.21: Travel Dimensions



Replacement Float:	
9049HF	page 22-28

Alternators are designed to provide motor alternation in the operation of two motors.

Class 9038 / Refer to Catalog 9034CT9701

Table 22.78: Class 9038 Type A

Application	Description	NEMA 1 Type	NEMA 4 Type	NEMA 7 and 9 Type
For open tank or sump systems using duplex pumps	Mechanical alternator float operated	AG1	AW1	AR1

For use with Class 9049 float accessories listed on page 22-28. Type AW and AR alternators must use center hole floats

Table 22.79: Operating Forces—Types AG, AR and AW

	Without Compensating		With Compensating Spring (Form C)				
		nsating ring orm C)	Maximum Weight of Rod and Stops Supported	Length of Rod Supported at the Maximum Adjustment			
Туре	Force Up■	Force Down	Note: AW1 and AR1 have compensating spring standard.	Brass ▲	Stainless Steel ▲	Aluminum •	
AG1 (min. lever ext.)	18 oz	20 oz	47 oz.	10 ft	12 ft	25 ft	
AG1 (max. lever ext.)	16	17	41	8	10	21	
AG1 Form R (min. lever ext.)	14	16	33	7	8	17	
AG1 Form R (max. lever ext.)	11	12	30	6	7	15	
AR1, AW1 (standard lever)	_	_	74	16	20	41	
AR1, Form R, AW1 Form R (std. lever)	_	_	85	19	23	47	

- Rod length has been determined using the weight of the rod material furnished on Class 9049 accessories (3/8" O.D. tubing).

  Other types of rod should be weighed and compared to the Maximum Weight of Rod column in Table 22.79.
- Add 2 oz for Form N5 High Water alarm

### Type C, Closed Tank, with Bushing

Flange mounted with bushing for control of liquid level within a closed tank. Build up the switch to meet your requirements from the basic switch, rod kit, and float kit groups below.

Type C switches are attached to the tank by means of a 2-1/2 in. screw-in bushing. An external pointer indicates the float position within the tank when the unit is mounted. Switches come complete with screw-in connector, stainless steel float and rod.

Table 22.80: Class 9038 Type C

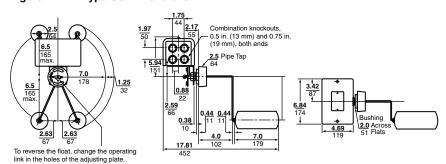
Float Position Viewed from Front of Switch	R in. (mm)		. Water Change	NEMA Type 1	NEMA Type 4	NEMA Type 7, 9
Facing Indicator Scale	(11111)	Min. (in.)	Max. (in.)	Type	Туре	Туре
Right	7 (178)	6.5 (165)	13 (330)	CG31	CW31	CR31
Left	7 (178)	6.5 (165)	13 (330)	CG32	CW32	CR32
Right	4.25 (108)	4 (102)	7.75 (197)	CG33	CW33	CR33
Left	4.25 (108)	4 (102)	7.75 (197)	CG34	_	CR34
Right	5 (127)	4.75 (121)	9.25 (235)	CG35	_	_
Left	5 (127)	4.75 (121)	9.25 (235)	CG36	CW36	CR36

#### Table 22.81: Type C Float Travel Adjustments

R in (mm)	A in. (mm)		in. (	B mm)	in. (	C mm)	l in. (	D mm)	l in. (	F mm)
in. (mm)	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
7 (178) ♦	2.5 (64)	5 (127)	5 (127)	7 (178)	2 (51)	4 (102)	5 (152)	7 (178)	10 (254)	14 (495)
5 (127) ■	2.25 (57)	3.75 (95)	4 (102)	5.25 (133)	2.75 (70)	3 (76)	4 (102)	5.25 (133)	8 (203)	10.5 (267)
4.25 (108) 🔺	2 (51)	3.5 (89)	3.5 (89)	4.75 (121)	2.5 (64)	3.75 (95)	3.5 (89)	4.75 (121)	7 (178)	9.5 (241)

- CG33, CG34, CW33, CW34, CR33, CR34 CG35, CG36, CW35, CW36, CR35, CR36
- CG31, CG32, CW31, CW32, CR31, CR32

#### Figure 22.22: Type CG Dimensions



## SQUARE D by Schneider Electric

www.schneider-electric.us



**Float Switches** 



File No. E12158 excludes NEMA 7 & 9 products (9038AR, CR, and DR)



excludes NEMA 7 & 9 products (9038AR, CR, and DR)

## Type D, Closed Tank, Top Mounted

Designed for applications where mounting is to be made at the top of a closed tank.

Table 22.82: Class 9038 Type D Contacts Close On Liquid Rise

Water Level Change	Hinge Post Dimension	NEMA 1	NEMA 4	NEMA 7 and 9	
water Level Change	"V" (in.)	Туре	Туре	Туре	
Min.	2-5/8	DG7	DW7	_	
Max.	2-3/8	DG8	DW8	DR8	
Min.	4-11/16	DG9	_	_	
Max.	4-11/16	DG10	_	_	

Table 22.83: Float Kits, For Use with Type D Switches

Size and Material Diameter x Length (in.)	Class and Type
3.625 x 4.50, #304 stainless steel	9049EF1
3.625 x 4.50, #316 stainless steel	9049EF2
2.50 x 7, #304 stainless steel	9049HF3
2.50 x 7, #316 stainless steel	9049HF4

Table 22.84: Float Rod Kit, **Class 9049** 

Туре	R (in.)	H (in.)	G (in.)	F (in.)
ER1	1.75	8.25	3.25	8.75
ER2	2.50	9.00	3.50	10.50
ER3	3.25	9.50	3.50	11.00
ER5	5.25	11.75	3.75	12.75
ER7	7.25	13.75	4.00	14.50
ER12	12.25	18.75	4.75	19.00

Table 22.85: Available Modifications for All Mechanical Alternators

Consult Schneider Electric for use in media with a different specific gravity than water.

Description	Form
Compensating spring (Type AG)	С
Omit 2-1/2 in. connecting bushing (Type CG, CR, CW)	F3
Omit float (Type CG, CR, CW)	L
Two-level non-alternating unit	N4
Addition of a third, high-water alarm circuit (Type AG, AR, AW, CG, DG only)	N5
High-water alarm circuit, 2-pole (Type CG only)	N25
Reverse action (contacts open on Rise)	R
Viton® packing, 5 oz. float (diesel fuel) (Type CG)	Z19
Viton packing (Type CG, CR, CW)	Z20
#316 stainless steel float and Viton packing (Type CG, CR, CW)	<b>Z</b> 21

Figure 22.23: Type DG Dimensions, in. (mm)

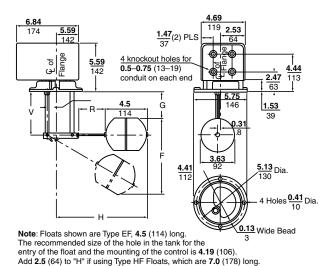


Table 22.86: Temperature Ratings for Class 9038

Description	Rating	
Ambient Temperature		-22 to 200 °F (-30 to 93 °C)
Media	Buna-N Seal	Up to 215 °F (102 °C)
	Viton <sup>®</sup> Seal	Up to 250 °F (121 °C

#### **Accessories for Float Switches**

To order, specify the Class and Type number of the kit.

Table 22.87: Class 9049 Accessories for Float Switches

Descript	ion		Applies to Class	Туре
		9036GG	A13	
Compens	ating Spring		9038AG	A15
			9036DR, DW	A20
	Dia. 3.62 in. (92 mm), length 4.5 in. (114 mm)	#304 stainless steel	9037E, 9038D	EF1
Float	Dia. 3.62 III. (92 IIIIII), Ierigii 4.3 III. (114 IIIIII)	#316 stainless steel	9037E, 9038D	EF2
1 IOat	Dia. 2.5 in. (64 mm), length 7 in. (178 mm)	#304 stainless steel	9037H, 9038C	HF3
	Dia. 2.3 iii. (04 min), lengur 7 iii. (176 min)	#316 stainless steel	9037H, 9038C	HF4
	7 in. tapped-at-top #304 stainless steel float, 5 ft rod, 2 stops	Brass rod	All 9036, 9038A	A6
	7 III. tapped-at-top #304 stainless steel float, 5 ft fou, 2 stops	Aluminum rod	All 9036, 9038A	A6A
	7 in. center-hole #304 stainless steel float, 5 ft rod, 4 stops	Brass rod	All 9036, 9038A	A6C
Float Kit	7 III. Ceriter-noie #304 stainless steer noat, 5 it rou, 4 stops	Aluminum rod	All 9036, 9038A	A6CA
	7 in. center-hole #316 stainless steel float, 5 ft stainless steel rod, 4 stainless steel stops		All 9036, 9038A	A6CS
	7 in. tapped-at-top #316 stainless steel float, 5 ft stainless steel rod, 2 s	stainless steel stops	All 9036, 9038A	A6S
Replacement float—7 in. round center-hole #304 stainless steel		9049A6C, A6CA	AF1	
Lever	Form R		9036DG	A58
	Replacing obsolete 9036A with 9036G		9036GG	A54
Mounting Bracket	Replacing 9036A (S or F1) with 9036G		9036GG	A55
Diagnot	Universal		All 9036, 9038AG, AR, AW	UMS1
		1-3/4 in. long	9037E, 9038D	ER1
		2-1/2 in. long	9037E, 9038D	ER2
Rod	Stainless steel	3-1/4 in. long	9037E, 9038D	ER3
Hou	Starriess steer	5-1/4 in. long	9037E, 9038D	ER5
		7-1/4 in. long	9037E, 9038D	ER7
		12-1/4 in. long	9037E, 9038D	ER12
		Brass rod	9049A6, A6C	T1
Rod Kit	Additional 2-1/2 ft section with connector	Aluminum rod	9049A6A, A6CA	T1A
		Stainless steel rod	9049A6S, A6CS	T1S

#### Renewal Parts for Class 9012-9038 Devices

Renewal parts are generally available for Pump Control Products with a numerical date code—for example, 172 (first quarter, 1972)—or a current date code. Parts are no longer available for devices manufactured before 1965.

To order, specify the Class and Type number of the kit.

Table 22.88: Class 9998 Renewal Parts Kits for Class 9012-9038 Devices

Description / Equ	ipment To Be Serviced9thI	Parts Kit Type
	9012GA, GD, GG, GK, GN, GR 5, 25, 55 Series C only	PC268▲
Actuator Assembly	9012GA, GD, GG, GK, GN, GR 6, 26, 36, 46, 56 Series C only	PC269▲
Actuator Assembly	9012GB, GE, GH1, 21, 31, 41, 51; GL, GP, GS1	PC177▲
	9012GB, GE, GH2, 22, 32, 42, 52; GL, GP, GS2	PC178▲
Contact Kit	9013FHG22, 29, 32, 39, 52, 59; 9013 FYG; 9036DG, DR, DW; 9037EG, ER, EW, HG, HR, HW30–39; 9038 All Types (2 kits Required;) obsolete 9013HHGY, HSGY; HSWY; 9037HG, HSG3, 4; 9035DG10, DW10 (This kit also contains a replacement diaphragm for pressure switches. The diaphragm fits pressure switch only.)	PC242
(2-Pole Contacts)	9013GHG, GSG, GHR, GSR, GMG; 9036GG, GR, GW; 9037GG Series C All except Forms H & R; 9016GVG, Form R	PC205
,	9013GHG, GSG, GSR, GMG; 9036GG, GR, GW; 9037GG, GR, GW Series C Form H only; 9016GVG, Form H	PC206
	9013GHG, GSG, GHR, GSR, GMG; 9036GR, GW: Series C Form R only; 9016GVG	PC207
Contact Replacement Kit	9013FHG2 thru 19, 42 thru 49, all FSG Complete contact replacement kit—includes new diaphragm	PC241
Diaphragm	9012GA, GD, GN, GR1, 21 Series C only	PC265▲
	9012GA, GD, GG, GK, GN, GR 2, 3, 22, 52 Series C only	PC266▲
	9012GA, GD, GG, GK, GN, GR4, 24, 54 Series C only	PC267▲
Assembly	Convoluted diaphragm assembly for 9013GHG, GSG: Series C	PC208
9013GHW, GSW; and GSW, GHR: Series C		PC211
	9016 GAW-1, 21	PC233
Gasket Kit	Contains all replaceable gaskets for all 9012 open, NEMA 1, 4, 4X, 13 devices	PC184
Pilot Light, 24 Vdc	9012, 9016G Forms G7, G8, G9, G10, G21, G22	PC305
	9012GC, GF, GJ, GQ, GT1, 21, 31, 41, 51 Series C only	PC270▲
Piston Assembly	9012GC, GF, GJ, GQ, GT2, 22, 32, 42, 52 Series C only	PC271▲
	9012GC, GF, GQ, GT4, 24, 34, 44, 54 Series C only	PC273▲
Seal Kit	Buna N, for Series A devices: 9037HG/HW/HR30-39; 9038CG/CW/CR31-36	PC337
Seai Kil	Viton®, for Series A devices with Form Z19 or Z20: 9037HG/HW/HR30–39; 9038CG/CW/CR31–36	PC338
Seal Tube Kit	Buna N Quad-Ring <sup>®</sup> , for Series C devices: 9037HG/HW/HR3–12; 9038CG/CW/CR1–6	
Seal Tube Kil	Viton Quad-Ring, for Series C devices: 9 037HG/HW/HR3–12; 9038CG/CW/CR1–6	PC333
Snap Switch	SPDT, for 9012GA, GB, GC, GD, GE, GF, GG, GH, GJ single pole; except Forms E2, E3, E4, H3: Series C only	PC313▲
Shap Switch	DPDT, for 9012GA, GB, GC, GD, GE, GF, GG, GH, GJ double pole; except Forms E2, E3, H6, H7: Series C only	PC314▲
Switch Mechanism	9036DR1, DW1 Series B	PC285

If one of these Form designations appears on the pressure switch nameplate, complete the 9998 PC number by adding that same Form suffix from page 22-18, and add the Form price to the kit price.



## **Section 23**

## **Relays and Timers**







**RXM**, p. 23-8

**RSL**, p. 23-2 /**RSB**, p. 23-3





**SSR**, p. 23-25

**8501X**, p. 23-22





CAD32, p. 23-16

9050JCK, p. 23-30





**RE7**, p. 23-28

**ABL8**, p. 23-37





REG24, REG48, REG96 p. 23-31

CA2SKE, p. 23-21





**SR2, SR3**, p. 23-39

RM17, RM35 p. 23-32

## **General Purpose Relays**

Zelio™ Interface Relays	RSL, RSB	23-2
Zelio™ Plug-in Relays, Sockets & Access.	RXM, RPM, RUM, RPF	23-4
Square D™ Plug-in	Class 8501 Type K	23-10
Square D <sup>™</sup> Alternating Plug-in	Class 8501 Type KA	23-11
Square D™ Miniature Plug-in	Class 8501 Type R	23-12
Square D™ Sockets	Class 8501 Type N	23-14
Square D™ Power	Class 8501 Type C	23-15

## **Industrial Relays**

TeSys™ IEC Style Relays	TeSys D	23-16
	TeSys K	23-19
	TeSys SK	23-21
TeSys™ IEC Style - Alternating Relays	CA2SKE	23-21
Square D™ NEMA Style Relays	Class 8501 Type X™	23-22

## **Solid State Relays**

Panel Mount	SSRP	23-25
DIN Mount	SSRD	23-25
SSR Accessories	SSRAH1, SSRAT1	23-25

## **Timers**

RE11	23-26
RE48	23-26
REXL	23-26
RE7, RE8, and RE9	23-27
Class 9050 Type JCK	23-30
	RE48 REXL RE7, RE8, and RE9

## **Control and Measurement Relays**

Zelio™ Temperature Controllers—24x48	REG24	23-31
Zelio <sup>™</sup> Temperature Controllers—48x48	REG48	23-31
Zelio <sup>™</sup> Temperature Controllers—48x96	REG96	23-31
Zelio™Current Measurement Relays	RM17JC andRM35JA	23-32
Zelio™ Phase Measurement Relays	RM17T and RM35T	23-33
Zelio™ Voltage Measurement Relays	RM17U and RM35U	23-34
Zelio™ Level Control Relays	RM35L	23-35
Zelio™ Pump Control Relays	RM35BA	23-35
Zelio™ Speed Control Relays	RM35S	23-36
Zelio™ Frequency Control Relays	RM35HZ	23-36
Zelio™ Temperature Control Relays	RM35AT	23-36

#### **Other Products**

Phaseo <sup>™</sup> DC Power Supplies	ABL1, ABL7, and ABL8	23-37
Zelio™ Analog Interface Modules	RM	23-38
Zelio™ Logic 2 Smart Relays	SR2, SR3	23-39
Zelio™ Solid-State Interface Modules	ABS	23-41
Zelio™ Electromechanical Interface	ABR	23-42





RSL 1PV••

RSL 1PR••





RSL 1AB••



RSL ZVA• RSL ZRA•

## Zelio™ Interface Relays

Zelio RSL slim interface relays save valuable panel space with a 6 mm width and have a 6 Amp general purpose load rating. Features include:

- Pre-assembled option: relay and socket are combined into one catalog number.
- Universal AC/DC sockets have built-in protection from transients and reverse polarity voltages (see catalog DIA3ED2090304EN-US for more detailed information).
- Accessories, which include isolators, ID tags, and bus jumper save valuable installation time.

#### Zelio RSL Slim Interface: Pre-assembled Relay + Socket (sold in lots of 10)

		Replacement Relays			
Socket Supply Voltage (Vac/Vdc)	Screw Conne	ctor	Spring Term	inal	
(120.122)	Catalog Number▲	\$ Price ea.	Catalog Number▲	\$ Price ea.	Catalog No.
12	RSL1PVJU	12.00	RSL1PRJU	12.00	RSL1AB4JD
24	RSL1PVBU	14.60	RSL1PRBU	15.70	RSL1AB4BD
48	RSL1PVEU	14.90	RSL1PREU	16.10	RSL1AB4ED
110	RSL1PVFU	14.90	RSL1PRFU	16.10	RSL1AB4ND
230	RSL1PVPU	14.90	RSL1PRPU	16.10	RSL1AB4ND

Relays are mounted on sockets equipped with LED and protection circuit.

#### Table 23.2: Zelio RSL Slim Interface: Relay Only (sold in lots of 10)

Relay Coil Voltage (Vdc)	Catalog Number	\$ Price ea.
12	RSL1AB4JD	6.20
24	RSL1AB4BD	7.70
48	RSL1AB4ED	7.90
60	RSL1AB4ND	7.90

Table 23.3: Zelio RSL Slim Interface: Socket Only (sold in lots of 10)

Socket	Socket Type					
Supply Voltage (Vac/Vdc)	Screw Connector		Spring Terminal		For use with relays:	
(Vac/Vdc)	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.		
12	DOI 71/44	7.00	DOI 7D44	0.00	RSL1AB4JD	
24	RSLZVA1	7.20	RSLZRA1	8.30	RSL1AB4BD	
48	RSLZVA2	7.20	RSLZRA2	8.30	RSL1AB4ED	
60	H5LZVA2	7.20	HOLZHAZ	6.30	RSL1AB4ND	
110	RSLZVA3	7.40	RSLZRA3	8.60	RSL1AB4ND	
230	RSLZVA4	7.40	RSLZRA4	8.60	RSL1AB4ND	

Table 23.4: **Socket Accessories** 

	11111
RSL Z2	THE PERSON NAMED IN

Description	Compatibility	Catalog Number	\$ Price ea.
ID tags (2 sheets of 64 tags)	With all sockets	RSLZ5	4.60
Bus jumper (10 x 20-pole jumpers)	With all sockets	RSLZ2	3.80
Butterfly isolator (10 isolators)	With all sockets	RSLZ3	3.70
A			

#### Approvals for RSL relays:









IEC 61810-1 RoHS Compliant

## Approvals for RSLZ sockets:







File 247510 Class 3211 07

Discount



IEC RoHS 61810-1 Compliant

**RELAYS AND TIMERS** 





RSB1A120JD Relay + RZM031FPD Socket + RSZE1S35M Module



RSB2A080BD Relay + RSZE1S48M Socket



RSB1A160BD Relay + RSZE1S48M Socket

## Zelio™ Plug-In Interface Relays

Zelio RSB interface relays and sockets provide the optimum combination of robust performance and space saving for the most demanding applications. Relays are rated at 8 A, 12 A, and 16 A (250 Vac / 28 Vdc). Features include:

- Optional protection modules for protection against electrical spikes
- Optional plastic hold-down ejector clips
- Socket or printed circuit board installation options

Table 23.5: Relays (sold in lots of 10)

		Nui	mber and type of contacts	Thermal current (Iti	h)	
Coil Voltage 1 C/O -12 A Res	les.	s. 1 C/O -16 A Res.		es. 2 C/O -8 A F		
	\$ Price ea.	Catalog Number▲	\$ Price ea.	Catalog Number▲	\$ Price ea.	
6 Vdc	RSB1A120RD	3,50	RSB1A160RD	4.20	RSB2A080RD	4.20
12 Vdc	RSB1A120JD	3.50	RSB1A160JD	4.20	RSB2A080JD	4.20
24 Vdc	RSB1A120BD	3.50	RSB1A160BD	4.20	RSB2A080BD	4.20
48 Vdc	RSB1A120ED	3.50	RSB1A160ED	4.20	RSB2A080ED	4.20
60 Vdc	RSB1A120ND	3.50	RSB1A160ND	4.20	RSB2A080ND	4.20
110 Vdc	RSB1A120FD	3.50	RSB1A160FD	4.20	RSB2A080FD	4.20
24 Vac	RSB1A120B7	3.50	RSB1A160B7	4.20	RSB2A080B7	4.20
48 Vac	RSB1A120E7	3.50	RSB1A160E7	4.20	RSB2A080E7	4.20
120 Vac	RSB1A120F7	3.50	RSB1A160F7	4.20	RSB2A080F7	4.20
220 Vac	RSB1A120M7	3.50	RSB1A160M7	4.20	RSB2A080M7	4.20
230 Vac	RSB1A120P7	3.50	RSB1A160P7	4.20	RSB2A080P7	4.20
240 Vac	RSB1A120U7	3.50	RSB1A160U7	4.20	RSB2A080U7	4.20

To order a relay complete with socket (sold in lots of 20): add suffix S to the catalog numbers selected above. Example: RSB 2A080RD + RSZ E1S48M becomes RSB 2A080RDS.

Table 23.6: Sockets – 12 A, 300 Vac

(sold in lots of 10)

Contact terminal arrangement	Connection	Relay type	Catalog Number	\$ Price ea.
Separate		RSB1A120••	RSZE1S35M	4.80
	Box lug connector	RSB1A160••■ RSB2A080••	RSZE1S48M	5.30

<sup>■</sup> When using the relay with socket RSZ E1S48M, terminals must be jumpered.

Table 23.7: Protection modules (sold in lots of 10)

Description	For use with	Voltage	Catalog Number	\$ Price ea.
Diode	All sockets	6-230 Vdc	RZM040W	2.40
RC circuit	All sockets	24-60 Vac	RZM041BN7	4.80
	All Sockets	110-240 Vac	RZM041FU7	4.80
		6-24 Vdc	RZM031RB	4.20
Diode + green LED	All sockets	24-60 Vdc	RZM031BN	4.20
		110-230 Vdc	RZM031FPD	6.00
Varistor + green LED		6-24 Vac/Vdc	RZM021RB	6.00
	All sockets	24-60 Vac/Vdc	RZM021BN	6.00
		110-230 Vac/Vdc	RZM021FP	6.00

Table 23.8: Accessories (sold in lots of 10)

Description	For use with	Catalog Number	\$ Price ea.
Plastic hold-down ejector clip	All sockets	RSZR215	.42
ID tags	All sockets	RSZL300	.30

#### Approvals for RSB relays:



File CCN





File 215736 Class 3211 07



IEC RoHS as of date 61810-1 Compliant code 0401

## Approvals for RSB sockets:



File SWI CN E172



File 212916 Class 3211 07 IEC 61984 RoHS as of date Compliant code 0501

RZM modules are RoHS compliant as of date code 0610.

For mounting track, see page 24-16.

RXM2AB2F7

RXM4GB2F7

## RXM

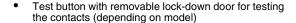
#### Refer to Catalog DIA3ED2090304EN-US

model)



## www.schneider-electric.us Green LED indication of relay status (depending on

- Mechanical indication of relay status (standard)
- Optional protection modules to protect against electrical spikes
- Bus jumpers for connecting multiple terminals reduce installation time



Zelio RXM miniature plug-in relays and sockets provide a

demanding applications ranging from 3A to 12A. Some of

complete system solution in response to the most

Zelio™ Plug-In Relays

the features include:

Table 23.9: Miniature relays without LED, with Test Button and Lock-Down Door (sold in lots of 10)

	Number and type of contacts - Thermal current (Ith)						
	2 C/O -12 A Res	i.	3 C/O - 10 A Res	5.	4 C/O - 8 A Re	s.	
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	
12 Vdc 24 Vdc 48 Vdc 110 Vdc 220 Vdc 24 Vac 48 Vac 120 Vac 230 Vac 240 Vac	RXM2AB1JD RXM2AB1BD RXM2AB1ED RXM2AB1ED RXM2AB1ED RXM2AB1E7 RXM2AB1E7 RXM2AB1E7 RXM2AB1E7	5.30 5.30 5.30 5.30 5.30 5.30 5.30 5.30	RXM3AB1JD RXM3AB1BD RXM3AB1ED RXM3AB1ED RXM3AB1F7 RXM3AB1E7 RXM3AB1E7 RXM3AB1F7 RXM3AB1P7	5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70	RXM4AB1JD RXM4AB1BD RXM4AB1ED RXM4AB1FD RXM4AB1MD RXM4AB1B7 RXM4AB1E7 RXM4AB1F7 RXM4AB1P7 RXM4AB1U7	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	

Table 23.10: Miniature relays with LED, Test Button, and Lock-Down Door (sold in lots of 10)

		Numbe	er and type of contacts -	Thermal current (It	h)	
	2 C/O -12 A Re	es.	3 C/O - 10 A R	es.	4 C/O - 8 A Re	es.
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.
12 Vdc 24 Vdc 48 Vdc 110 Vdc 125 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RXM2AB2JD RXM2AB2BD RXM2AB2ED RXM2AB2FD RXM2AB2B7 RXM2AB2E7 RXM2AB2F7 RXM2AB2P7	6.20 6.20 6.20 6.20 6.20 6.20 6.20 6.20	RXM3AB2JD RXM3AB2BD RXM3AB2ED RXM3AB2ED RXM3AB2B7 RXM3AB2E7 RXM3AB2F7 RXM3AB2F7	6.60 6.60 6.60 6.60 6.60 6.60 6.60	RXM4AB2JD RXM4AB2BD RXM4AB2ED RXM4AB2FD RXM4AB2GD RXM4AB2B7 RXM4AB2E7 RXM4AB2F7 RXM4AB2F7	6.80 6.80 6.80 6.80 6.80 6.80 6.80

Table 23.11: Miniature relays with LED, without Test Button and Lock-Down Door (sold in lots of 10)

	Number and type of contacts - Thermal current (Ith)						
	2 C/O -12 A Re	s.	3 C/O - 10 A Res	S.	4 C/O - 8 A Res.		
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	
12 Vdc	RXM2AB3JD	5.70	_	_	RXM4AB3JD	6.30	
24 Vdc	RXM2AB3BD	5.70	_	_	RXM4AB3BD	6.30	
48 Vdc	RXM2AB3ED	5.70	_	_	RXM4AB3ED	6.30	
110 Vdc	RXM2AB3FD	5.70	_	_	RXM4AB3FD	6.30	
125 Vdc	_	_	_	_	RXM4AB3GD	6.30	
24 Vac	RXM2AB3B7	5.70	_	_	RXM4AB3B7	6.30	
48 Vac	RXM2AB3E7	5.70	_	_	RXM4AB3E7	6.30	
120 Vac	RXM2AB3F7	5.70	_	_	RXM4AB3F7	6.30	
230 Vac	RXM2AB3P7	5.70	_	_	RXM4AB3P7	6.30	

Table 23.12: Miniature relays with low level contacts, without LED, with Test Button and Lock-Down Door (sold in lots of 10)

Loc	<b>ck-Down Door</b> (sold in lot	s of 10)	
Number and	type of contacts - Thermal currer	nt (Ith)	N
	4 C/O -3 A Res.		
Coil Voltage	Catalog Number	\$ Price ea.	Coil Vo
dc dc dc Vdc ac ac Vac Vac	RXM4GB1JD RXM4GB1BD RXM4GB1ED RXM4GB1FD RXM4GB1B7 RXM4GB1E7 RXM4GB1F7 RXM4GB1F7	6.00 6.00 6.00 6.00 6.00 6.00 6.00	12 Vdc 24 Vdc 48 Vdc 110 Vdc 125 Vdc 24 Vac 48 Vac 120 Vac

Table 23.13: Miniature relays with low level contacts, with LED, Test Button and Lock-Down Door (sold in lots of 10)

Number and type of contacts - Thermal current (lth) 4 C/O -3 A Res.					
					Coil Voltage Catalog Number \$ Price
12 Vdc	RXM4GB2JD	6.8			
24 Vdc	RXM4GB2BD	6.8			
18 Vdc	RXM4GB2ED	6.8			
I10 Vdc	RXM4GB2FD	6.8			
24 Vac	RXM4GB2B7	6.8			
18 Vac	RXM4GB2E7	6.8			
120 Vac	RXM4GB2F7	6.8			
230 Vac	RXM4GB2P7	6.8			
240 Vac	RXM4GB2U7	6.8			

Table 23.14: Miniature relays with low level contacts, with LED, without Test Button and Lock-Down Door (sold in lots of 10)

Number and type of contacts - Thermal current (ith)					
4 C/O -3 A Res.					
Coil Voltage Catalog Number \$ Price ea.					
12 Vdc 24 Vdc 48 Vdc 110 Vdc 125 Vdc	RXM4GB3JD RXM4GB3BD RXM4GB3ED RXM4GB3FD	6.30 6.30 6.30			
24 Vac 48 Vac 120 Vac 230 Vac	RXM4GB3B7 RXM4GB3E7 RXM4GB3F7 RXM4GB3P7	6.30 6.30 6.30 6.30			

For sockets and accessories, see page 23-5.

#### Approvals for Relays:



120 V

File CCN ▲





e E164 :N NLC :N NLC



File 230765 Class 3211 07



IEC 61810-1 RoHS









Table 23.15: Miniature relays (sold in lots of 100)



RXZE2M114M Socket + RXM4AB2P7 Relay

	Number and type of contacts - Thermal current (Ith)					
	2 C/O - 12 A Res.		4 C/O - 8 A Res.			
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea		
Without LED, with Test Button, and Lock-Down D	oor					
12 Vdc	_		RXM4AB1JDTQ	6.00		
24 Vdc	RXM2AB1BDTQ	5.30	RXM4AB1BDTQ	6.00		
48 Vdc	_	_	RXM4AB1EDTQ	6.00		
110 Vdc	_	_	RXM4AB1FDTQ	6.00		
220 Vdc		_	RXM4AB1MDTQ	6.00		
24 Vac	RXM2AB1B7TQ	5.30	RXM4AB1B7TQ	6.00		
48 Vac	<del>-</del>	_	RXM4AB1E7TQ	6.00		
120 Vac	RXM2AB1F7TQ	5.30	RXM4AB1F7TQ	6.00		
230 Vac	RXM2AB1P7TQ	5.30	RXM4AB1P7TQ	6.00		
With LED, Test Button, and Lock-Down Door						
24 Vdc	<u> </u>		RXM4AB2BDTQ	6.80		
24 Vac	RXM2AB2B7TQ	6.20	RXM4AB2B7TQ	6.80		
230 Vac	RXM2AB2P7TQ	6.20	RXM4AB2P7TQ	6.80		

Table 23.16: Miniature relays with LED without Test Button and Lock-Down Door (sold in lots of 100)

	Number and type of contacts - Thermal current (Ith)					
Coil Voltage	2 C/O - 12 A Res.		4 C/O - 8 A Res.			
	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.		
24 Vdc	RXM2AB3BDTQ	5.70	RXM4AB3BDTQ	6.30		
24 Vac	RXM2AB3B7TQ	5.70	RXM4AB3B7TQ	6.30		
230 Vac	RXM2AB3P7TQ	5.70	RXM4AB3P7TQ	6.30		

Table 23.17: Sockets (sold in lots of 10)



RXZE2S114M Socket + RXM4AB2F7 Relay

Contact terminal arrangement	Connection	Relay type	Catalog Number	\$ Price ea.
Mixed	Screw clamp terminals	RXM2•••••▲ RXM4•••••▲	RXZE2M114■	5.00
	Box lug connector	RXM2••••• RXM4•••••	RXZE2M114M■	5.00
		RXM2••••	RXZE2S108M♦	5.00
Separate	Box lug connector	RXM3••••	RXZE2S111M■	5.00
		RXM4••••	RXZE2S114M■	5.00

- When mounting relay RXM2\*\*\*\* on socket RXZE2M\*\*\*, the thermal current must not exceed 10 A.
- Thermal current Ith: 10 A Thermal current lth: 12 A

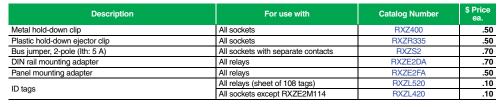
Table 23.18: Protection modules (sold in lots of 10)

	Description	Voltage	For use with	Catalog Number	\$ Price ea.
۰	Diode	6–250 Vdc	All sockets	RXM040W	1.90
_	BC circuit	24-60 Vac	All sockets	RXM041BN7	1.90
	AC circuit	110-240 Vac	All sockets	RXM041FU7	1.90
_		6-24 Vac/Vdc	All sockets	RXM021RB	1.90
	Varistor	24-60 Vac/Vdc	All sockets	RXM021BN	1.90
		110-240 Vac/Vdc	All sockets	RXM021FP	1.90

Table 23.19: Accessories (sold in lots of 10)



RXM041BN7





**Approvals for Sockets:** 



E172326 SWIV2, SWIV8

CP2



File 230765 Class 3211 07



IEC 61984

RoHS Compliant



## Zelio™ Plug-In Relays

Zelio RPM plug-in relays and sockets provide a complete system solution in response to the most demanding applications up to 15 A. Some of the features include:

- Test button with removable lock-down door for testing the contacts (depending on model)
- Green LED indication of relay status (depending on model)
- Mechanical indication of relay status (standard)
- Optional modules to protect against electrical spikes

#### Table 23.20: Power relays without LED, with Test Button and Lock-Down Door (sold in lots of 10)

	Number and type of contacts - Thermal current (Ith)									
	1 C/O - 15 A	Res.	2 C/O - 15 A Res.		3 C/O - 15 A Res.		4 C/O - 15 A Res.			
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.		
12 Vdc	RPM11JD	4.50	RPM21JD	6.00	RPM31JD	8.10	RPM41JD	10.00		
24 Vdc	RPM11BD	4.50	RPM21BD	6.00	RPM31BD	8.10	RPM41BD	10.00		
48 Vdc	RPM11ED	4.50	RPM21ED	6.00	RPM31ED	8.10	RPM41ED	10.00		
110 Vdc	RPM11FD	4.50	RPM21FD	6.00	RPM31FD	8.10	RPM41FD	10.00		
24 Vac	RPM11B7	4.50	RPM21B7	6.00	RPM31B7	8.10	RPM41B7	10.00		
48 Vac	RPM11E7	4.50	RPM21E7	6.00	RPM31E7	8.10	RPM41E7	10.00		
120 Vac	RPM11F7	4.50	RPM21F7	6.00	RPM31F7	8.10	RPM41F7	10.00		
230 Vac	RPM11P7	4.50	RPM21P7	6.00	RPM31P7	8.10	RPM41P7	10.00		



RPM22F7

RPM42BD

Table 23.21: Power relays with LED, Test Button and Lock-Down Door (sold in lots of 10)

	Number and type of contacts - Thermal current (Ith)								
	1 C/O - 15 A	A Res.	2 C/O - 15 A	2 C/O - 15 A Res.		Res.	4 C/O - 15 A Res.		
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	
12 Vdc	RPM12JD	5.30	RPM22JD	6.80	RPM32JD	9.00	RPM42JD	10.90	
24 Vdc	RPM12BD	5.30	RPM22BD	6.80	RPM32BD	9.00	RPM42BD	10.90	
48 Vdc	RPM12ED	5.30	RPM22ED	6.80	RPM32ED	9.00	RPM42ED	10.90	
110 Vdc	RPM12FD	5.30	RPM22FD	6.80	RPM32FD	9.00	RPM42FD	10.90	
24 Vac	RPM12B7	5.30	RPM22B7	6.80	RPM32B7	9.00	RPM42B7	10.90	
48 Vac	RPM12E7	5.30	RPM22E7	6.80	RPM32E7	9.00	RPM42E7	10.90	
120 Vac	RPM12F7	5.30	RPM22F7	6.80	RPM32F7	9.00	RPM42F7	10.90	
230 Vac	RPM12P7	5.30	RPM22P7	6.80	RPM32P7	9.00	RPM42P7	10.90	

Table 23.22: Power relays with LED, without Test Button and Lock-Down Door (sold in lots of 10)

	Number and type of contacts - Thermal current (ith)							
	1 C/O - 15 A Res.		2 C/O - 15 A	Res.	3 C/O - 15 A	Res.	4 C/O - 15 A	Res.
Coil Voltage	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.
12 Vdc	RPM13JD	5.00	RPM23JD	6.30	RPM33JD	8.30	RPM43JD	10.10
24 Vdc	RPM13BD	5.00	RPM23BD	6.30	RPM33BD	8.30	RPM43BD	10.10
48 Vdc	RPM13ED	5.00	RPM23ED	6.30	RPM33ED	8.30	RPM43ED	10.10
110 Vdc	RPM13FD	5.00	RPM23FD	6.30	RPM33FD	8.30	RPM43FD	10.10
125 Vdc	ı	_	_	_	ı	_	I	_
24 Vac	RPM13B7	5.00	RPM23B7	6.30	RPM33B7	8.30	RPM43B7	10.10
48 Vac	RPM13E7	5.00	RPM23E7	6.30	RPM33E7	8.30	RPM43E7	10.10
120 Vac	RPM13F7	5.00	RPM23F7	6.30	RPM33F7	8.30	RPM43F7	10.10
230 Vac	RPM13P7	5.00	RPM23P7	6.30	RPM33P7	8.30	RPM43P7	10.10





USTED US

File E164862 CCN ▲ NLDX, NLDX7 **C** 



File

Class 3211 07



C 61810-1 Complia

▲ When used with the appropriate socket

Table 23.23: Sockets (sold in lots of 10)

Contact terminal arrangement	Connection	Relay type	Catalog Number	\$ Price ea.
		RPM1•••	RPZF1	4.30
Mixed	Screw terminals	RPM2•••	RPZF2	5.50
Mixed		RPM3•••	RPZF3	6.30
		RPM4•••	RPZF4	7.30

## Approvals for Sockets:



CCN

E172326 SWIV2, SWIV8



File 230765 Class 3211 07



IEC 61984

RoHS Compliant







RXM041BN7

## Table 23.24: Protection modules (sold in lots of 10)

Description	Voltage	For use with	Catalog Number	\$ Price ea.
Diede	0.050.1/4-	RPZF1 RPZF2	RXM040W	1.90
Diode	6–250 Vdc	RPZF3 RPZF4	RUW240BD	2.60
	24-60 Vac	RPZF1 RPZF2	RXM041BN7	1.90
RC circuit	110-240 Vac	RPZF1 RPZF2	RXM041FU7	2.20
	110-240 vac	RPZF3 RPZF4	RUW241P7	2.20
	6–24 Vac/Vdc	RPZF1 RPZF2	RXM021RB	1.90
	24-60 Vac/Vdc	RPZF1 RPZF2	RXM021BN	1.90
Varistor	110-240 Vac/Vdc	RPZF1 RPZF2	RXM021FP	1.90
	24 Vac/Vdc	RPZF3 RPZF4	RUW242B7	2.70
	240 Vac/Vdc	RPZF3	RUW242P7	2.70



Table 23.25: Timer module ▲ (sold in lots of 1)

Description	Voltage	For Use With	Catalog Number	\$ Price
On-delay timer, interval timer, repeat cycle timer/starting on-delay, repeat cycle timer/starting off-delay, off-delay timer, one-shot timer, timing on de-energization, on-delay timer	24-240 Vac/Vdc	RPZF3 RPZF4	RUW101MW	47.10

See timer module description (selection of functions and time delays) in catalog DIA3ED2090304EN-US.



RPZ1DA



Table 23.26: Accessories (sold in lots of 10)

Description	For use with	Catalog Number	\$ Price ea.
Metal hold-down clip (for single-pole relays)	RPZF1	RPZR235	0.50
	RPM1•••	RPZ1DA	0.70
DIN roll mounting adaptor	RPM2•••	RXZE2DA	0.70
DIN rail mounting adapter ■	RPM3•••	RPZ3DA	0.70
	RPM4•••	RPZ4DA	0.70
	RPM1•••	RPZ1FA	0.50
Daniel may making a depater	RPM2•••	RXZE2FA	0.50
Panel mounting adapter	RPM3•••	RPZ3FA	0.50
	RPM4•••	RPZ4FA	0.50
ID tags (sheet of 108 tags)	All relays	RXZL520	0.10

<sup>■</sup> Test button and lock-down door become inaccessible

RUMF3AB2P7 Universal Relay



## Zelio™ Plug-In Relays

Zelio RUM plug-in relays and sockets provide a complete system solution in response to the most demanding applications up to 16 A. Some of the features include:

- Test button with lock-down door for testing the contacts (depending on model)
- Green LED indication of relay status (depending on model)
- Mechanical indication of relay status (standard)
- Optional protection modules to protect against electrical spikes
- Bus jumpers for connecting multiple terminals reduce installation time

Table 23.27: Relays for standard applications without LED, with Test Button and Lock-Down Door (sold in lots of 10)

		Number and	d type of contact	s - Thermal current (Ith)	
Pins	Coil Voltage	2 C/O -16 A Res.		3 C/O -16 A Res.	
		Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.
Cylindrical	12 Vdc 24 Vdc 48 Vdc 60 Vdc 110 Vdc 125 Vdc 220 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMC2AB1JD RUMC2AB1BD RUMC2AB1ED ————————————————————————————————————	10.10 10.10 10.10 10.10 10.10 10.10 10.10 10.10	RUMC3AB1JD RUMC3AB1BD RUMC3AB1ED RUMC3AB1FD RUMC3AB1FD RUMC3AB1FD RUMC3AB1BD RUMC3AB1B7 RUMC3AB1B7 RUMC3AB1E7 RUMC3AB1F7 RUMC3AB1F7	11.30 11.30 11.30 11.30 11.30 11.30 11.30 11.30 11.30
Flat	12 Vdc 24 Vdc 48 Vdc 110 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMF2AB1JD RUMF2AB1BD RUMF2AB1ED RUMF2AB1ED RUMF2AB1B7 RUMF2AB1E7 RUMF2AB1F7 RUMF2AB1F7 RUMF2AB1F7	10.10 10.10 10.10 10.10 10.10 10.10 10.10 10.10	RUMF3AB1JD RUMF3AB1BD RUMF3AB1ED RUMF3AB1ED RUMF3AB1B7 RUMF3AB1E7 RUMF3AB1F7 RUMF3AB1F7	11.30 11.30 11.30 11.30 11.30 11.30 11.30

Table 23.28: Relays for standard applications, with LED, Test Button, and Lock-Down Door (sold in lots of 10)

		Number and type of contacts - Thermal current (Ith)				
Pins	Coil Voltage	2 C/O -16 A Re	S.	3 C/O -16 A Res.		
		Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	
Cylindrical	12 Vdc 24 Vdc 48 Vdc 60 Vdc 110 Vdc 125 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMC2AB2JD RUMC2AB2BD RUMC2AB2ED RUMC2AB2ED RUMC2AB2E7 RUMC2AB2E7 RUMC2AB2E7 RUMC2AB2E7 RUMC2AB2P7	11.30 11.30 11.30 — 11.30 — 11.30 11.30 11.30	RUMC3AB2JD RUMC3AB2BD RUMC3AB2ED RUMC3AB2ED RUMC3AB2PD RUMC3AB2GD RUMC3AB2B7 RUMC3AB2E7 RUMC3AB2E7 RUMC3AB2E7 RUMC3AB2E7	12.50 12.50 12.50 12.50 12.50 12.50 12.50 12.50 12.50	
Flat	12 Vdc 24 Vdc 48 Vdc 110 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMF2AB2JD RUMF2AB2BD RUMF2AB2ED RUMF2AB2FD RUMF2AB2F7 RUMF2AB2E7 RUMF2AB2F7 RUMF2AB2F7	11.30 11.30 11.30 11.30 11.30 11.30 11.30	RUMF3AB2JD RUMF3AB2BD RUMF3AB2ED RUMF3AB2FD RUMF3AB2F7 RUMF3AB2F7 RUMF3AB2F7 RUMF3AB2F7	12.50 12.50 12.50 12.50 12.50 12.50 12.50 12.50	

Table 23.29: Relays for standard applications with LED, without Push Button, and Lock-Down Door (sold in lots of 10)

,		Numbers	and type of contacts	s - Thermal current (Ith)		
Pins	Coil Voltage	2 C/O -16 A Re		3 C/O -16 A Res.		
		Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.	
Cylindrical	12 Vdc 24 Vdc 48 Vdc 60 Vdc 110 Vdc 125 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMC2AB3JD RUMC2AB3BD RUMC2AB3ED RUMC2AB3FD RUMC2AB3FD RUMC2AB3E7 RUMC2AB3E7 RUMC2AB3F7	10.40 10.40 10.40 — 10.40 — 10.40 10.40 10.40	RUMC3AB3JD RUMC3AB3BD RUMC3AB3ED RUMC3AB3FD RUMC3AB3FD RUMC3AB3FD RUMC3AB3B7 RUMC3AB3E7 RUMC3AB3F7 RUMC3AB3F7 RUMC3AB3F7	11.60 11.60 11.60 11.60 11.60 11.60 11.60 11.60 11.60	
Flat	12 Vdc 24 Vdc 48 Vdc 110 Vdc 125 Vdc 24 Vac 48 Vac 120 Vac 230 Vac	RUMF2AB3JD RUMF2AB3BD RUMF2AB3ED RUMF2AB3FD RUMF2AB3B7 RUMF2AB3E7 RUMF2AB3F7 RUMF2AB3P7	10.40 10.40 10.40 10.40 10.40 10.40 10.40 10.40	RUMF3AB3JD RUMF3AB3BD RUMF3AB3ED RUMF3AB3FD RUMF3AB3FD RUMF3AB3B7 RUMF3AB3E7 RUMF3AB3F7 RUMF3AB3F7	11.60 11.60 11.60 11.60 11.60 11.60 11.60	

#### **Approvals for Relays:**





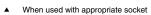




File 230765











RUZ C3M Socket+ RUMC3•••• Relay



RUW241P7



RUW101MW



RUZS2



RUZC200

#### Table 23.30: Sockets (sold in lots of 10)

Contact terminal arrangement	Connection	Relay type	Catalog Number	\$ Price ea.	
Mixed ▲		RUMC2••••	RUZC2M	3.50	
Wikeu 🛋		RUMC3****	RUZC3M	4.20	
	Box lug connector (screw terminals)	RUMC2****	RUZSC2M	4.50	
Separate ■		RUMC3****	RUZSC3M	5.00	
Separate =		RUMF2****	RUZSF3M	5.60	
		RUMF3****	NOZSF3IVI	5.60	

The inputs are mixed with the relay coil terminals, with the outputs located on the opposite side of the socket.

The inputs and outputs are separated from the relay coil terminals.

#### Table 23.31: Protection modules (sold in lots of 10)

Description	For use with	Voltage	Catalog Number	\$ Price ea.
Diode		6-250 Vdc	RUW240BD	2.20
RC circuit	All sockets	110-240 Vac	RUW241P7	2.20
Varistor	All Suckets	24 Vac/Vdc	RUW242B7	2.70
varision		240 Vac/Vdc	RUW242P7	2.70

#### Table 23.32: Timer module ♦ (sold in lots of 1)

Description	For use with	Voltage	Catalog Number	\$ Price
On-delay timer, interval timer, repeat cycle timer/starting on-delay, repeat cycle timer/starting off-delay, off-delay timer, one-shot timer, timing on de-energization, on-delay timer.	All sockets	24-240 Vac/Vdc	RUW101MW	47.10

♦ See timer module description (selection of functions and time delays) in catalog 8501CT0601.

#### Table 23.33: Accessories (sold in lots of 10)

Description	For use with	Catalog Number	\$ Price ea.
Metal hold-down clip	All sockets	RUZC200	1.20
Bus jumper, 2-pole (Ith: 5 A)	All sockets with separate contacts	RUZS2	0.70
ID togo	All relays (sheet of 108 tags)	RXZL520	0.10
ID tags	All sockets with separate contacts	RUZ420	0.10

#### **Approvals for Sockets:**







e 23076 ss 32110



IEC 61810-1

RoHS Compliant

## Zelio™ RPF Power Relays

RPF Zelio power relays respond to the most demanding applications up to 30 A. Features include:

- UL Listed
- Sealed construction
- Motor load ratings: 1hp @ 120 Vac / 3hp @ 240 Vac (N/O contacts only)
- Dual DIN rail and panel mounting capability
- Short circuit rating of 5,000 A @ 240 Vac (N/O contacts only)

#### Table 23.34: Power relays (sold in lots of 10)

	Number and type of contacts - Thermal current (Ith)							
Coil Voltage	2 N/O - 30	A▲ Res.	2 C/O - 30 A on N.O. / 3 A on N.C. ▲ Res.					
	Catalog Number	\$ Price ea.	Catalog Number	\$ Price ea.				
12 Vdc	RPF2AJD	10.40	RPF2BJD	10.90				
24 Vdc	RPF2ABD	10.40	RPF2BBD	10.90				
110 Vdc	RPF2AFD	10.40	RPF2BFD	10.90				
24 Vac	RPF2AB7	10.40	RPF2BB7	10.90				
120 Vac	RPF2AF7	10.40	RPF2BF7	10.90				
230 Vac	RPF2AP7	10.40	RPF2BP7	10.90				

 <sup>30</sup> A when mounted with 13 mm gap between two relays.
25 A when mounted side by side without a gap.

## RPF2BJD

#### **Approvals for Relays:**



File E43641 CCN NLDX, NLDX



File 040787 Class 3211-07



IEC 61810-1

RoHS Compliant

For mounting track, see page 24-16

## Class 8501 / Refer to Catalog 8501CT0301

#### Square D™ Plug-In Relays

8501K relays are designed for multipole switching applications at 240 Vac or lower. These relays have industry standard wiring and pin terminal arrangements which allow for their use as replacements for many competitive relays without wiring or hardware modifications.

- 12 A relays
- DPDT or 3PDT
- Manual operator/ green pilot light options .
- Motor load (hp) ratings
- DPDT latching models available
  - AC or DC operation
  - RoHS Compliant

#### Table 23.35: Type KF —Flange Mounted—Spade Terminals

	Input Voltage	Contact Arrangement	Options	Туре	\$ Price
, LUL	AC	DPDT	None Available	KF12★	24.60
D manual	50/60 Hz	50/60 Hz 3PDT None Available		KF13★	26.70
		DPDT		KFD12★	24.60
-	DC	3PDT	None Available	KFD13★	26.70

Table 23.36: Type KL—Latching Relay—Spade Terminals

	Input Voltage	Contact Arrangement	Options	Туре	\$ Price
Pieto.	AC 50/60 Hz	DPDT	None Available	KL12★	45.00
	DC	DPDT	None Available	KLD12★	45.00

**Voltage Codes and Stocked Relays** Table 23.37:

Time			tage 5	ge 50/60 Hz		Toma			DC V	oltage	•	
Туре	6	12	24	120	240	Туре	6	12	24	48	110	125
Voltage Codes	V35	V36	V14	V20	V24	Voltage Codes	V50	V51	V53	V56	V60	V63
KP12	S	S	S	S	S	KPD12	S	S	S	S		S
KP12P14		S	S	S	S	KPD12P14		S	S		S	S
KP13		S	S	S	S	KPD13		S	S	S	S	S
KP13P14			S	S	S	KPD13P14			S			
KU12		S	S	S	S	KUD12		S				
KU12M1						KUD12M1			S			
KU12P14			S	S		KUD12P14			S			
KU12M1P14			S	S		KUD12M1P14			S			
KU13		S	S	S	S	KUD13		S	S			S
KU13M1						KUD13M1						
KU13P14			S	S		KUD13P14						
KU13M1P14			S	S	S	KUD13M1P14			S			S
KF12			S	S	S	KFD12		S	S			
KF13			S	S		KFD13			S			
KL12			S	S		KLD12		S	S			
Notes C Cte	امماد					l .						

S = Stocked.

Factory order items require a minimum order quantity of 25 and have a lead time of 12 weeks

#### For 8501 KP, KU, and KF:







#### For 8501 KP, KU, and KL:



NI DX

When used with the appropriate 8501NR socket.

#### For 8501 KL:







**Pilot Light Option**—Available on Types KP and KU. Internal pilot lights are available in both AC and DC versions for positive indication of power to the coil. The pilot light is a green LED.

Manual Operator Option—Available on Type KU only. To facilitate speed circuit testing, a manual operator (test button) can be provided.

Coil VAC-3.0 VA

Coil VDC-1.4 Watts

Table 23.38: Type KP—Tubular Terminals

	Input Voltage	Contact Arrangement	Options	Туре	\$ Price
		DPDT	None	KP12★	39.00
and the co	AC 50/60	DPDT	Pilot Light	KP12P14★	45.00
-	Hz	3PDT	None	KP13★	47.30
No 9		3PDT	Pilot Light	KP13P14★	53.30
1		DPDT	None	KPD12★	39.00
No. of the last of	DC	DPDT	Pilot Light	KPD12P14★	45.00
O MILIT		3PDT	None	KPD13★	47.30
		3PDT	Pilot Light	KPD13P14★	53.30
•					

Table 23.39: Type KU—Spade Terminals

i abie 25.55.	Type K	o—Spaue	i Ci iiiiiiais		
	Input Voltage	Contact Arrangement	Options	Туре	\$ Price
		DPDT	None	KU12★	22.70
AMERICAN CE		DPDT	Manual Operator	KU12M1★	26.70
An ancies on		DPDT	Pilot Light	KU12P14★	28.70
1 5000	AC	DPDT	Manual Operator and Pilot Light	KU12M1P14★	30.80
Maria	50/60 Hz	3PDT	None	KU13★	24.60
-		3PDT	Manual Operator	KU13M1★	28.70
		3PDT	Pilot Light	KU13P14★	30.80
		3PDT	Manual Operator and Pilot Light	KU13M1P14★	35.00
		DPDT	None	KUD12★	22.70
		DPDT	Manual Operator	KUD12M1★	26.70
		DPDT	Pilot Light	KUD12P14★	28.70
	DC	DPDT	Manual Operator and Pilot Light	KUD12M1P14★	30.80
	DC	3PDT	None	KUD13★	24.60
		3PDT	Manual Operator	KUD13M1★	28.70
		3PDT	Pilot Light	KUD13P14★	30.80
		3PDT	Manual Operator and Pilot Light	KUD13M1P14★	35.00

Table 23.40: Contact Ratings (Contacts are Silver Tin Oxide)

			D	С			
	Туре	AC Volts	Resistive 75% PF Continuous Amperes	Нр	DC Volts	Resistive Amperes	
	KP	120	10 ♦	1/3	28	12	
	IXI	240	6.5 ■	1/2	20	12	
_	KU KF <b>★</b>	120	12	1/3	28	12	
	KF★	240	12	1/2	20	12	
	KL	120	10	1/3	28	10	
	KL	240	10	1/2	20	10	

Note: All 8501 K relays have a B300 rating.

- Socket is not required with Type KF relays.
- 3 pole devices have a 20 A max. total (sum of currents in all 3 poles), continuous rating. 3 pole devices have a 30 A max. total (sum of currents in all 3 poles), continuous rating.
- Voltage code must be specified to order this product. Refer to standard voltage codes listed in Table 23.37 and insert as shown in Table 23.41: How to Order.

## Table 23.41: How to Order

To Order Specify:	Ca	talog Num	ber
<ul><li>Class Number</li><li>Type Number</li></ul>	Class	Туре	Voltage Code
<ul> <li>Voltage Code (See Stocked Relay Table above)</li> </ul>	8501	KP12	V20

For sockets and accessories, see page 23-14. For track, see page 24-16.

**RELAYS AND TIMERS** 





## Square D™ Alternating Plug-In Relays

8501KA alternating relay is designed to minimize pump and motor wear by equalizing run time between parallel components in a multi-pump system.

The relay is controlled by an external control switch. The switch may be any type of contact closure; for example the contacts of a timing relay or the closure of a float switch. The 8501KA relay also has a toggle switch that allows the operator to lock one side of the duplex system in the "on" position.

- 12 A Resistive Rating
- SPDT or DPDT
- Toggle switch for load control
- **LED Load Indicators**
- Horsepower Rated
- AC and DC Control
- UL Listed w/ Square D Socket
- Rohs Compliant

## Table 23.42: Type KA — Alternating Relay

	Input Voltage	Contact Arrangement	Options	Туре	\$ Price
	AC & DC	SPDT	LED + Toggle	8501KA81***	93.00
A	AC & DC	DPDT	LED + Toggle + Cross Wired	8501KA82•••	95.00
III seased	AC & DC	DPDT (N.C.)	LED + Toggle	8501KA112***	94.00
	AC & DC	DPDT (N.O.)	LED + Toggle	8501KA112A•••	94.00

Table 23.43: Relay Availability

Type	А	AC Voltage		
Туре	12	24	120	240
Voltage Code	V36	V14	V20	V24
8501KA81***			S	
8501KA82•••			S	
8501KA112***			S	
8501KA112A***			S	

#### Notes:

- AC Voltage is 50/60 Hz
- S = Stocked. "S" items have a 2 week lead time and nominimum order requirement.
- All other part numbers are considered factory order (FO) and require a minimum order quantity of 25 and have a lead-time of 18 weeks

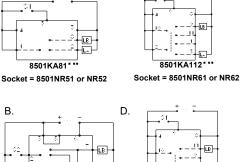
Table 23.44: Contact Ratings

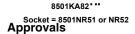
			A		DC		
	Туре	AC Volts	Resistive Amperes	HP	Pilot Duty	DC Volts	Resistive Amperes
	05041/404	120	12	1/3	_	20	10
	8501KA81***	240	12	1/2	B300	30	12

Table 23.45: Alternating Functions

Diagram	Toggle Switch Position	Detail S1 = Control Switch 1 S2 = Control Switch 2 LA = Load 1 LB = Load 2				
	Alternate	Closing S1 alternates the loads between LA and LB.				
A, C & D	Lock 1	LA is ON and LB is OFF. S1 is not used in this mode.				
	LA is OFF and LB is ON. S1 is not used in this mode.					
	Alternate	Closing S1 alternates the loads between LA an dLB. S2 will only control LA.				
	Lock 1	S1 will control LA and S2 will control LB				
В	Lock 2	S1 will control LB and S2 will control LA.				
The cross wired option allows extra system load capacity through simultaneous operation of both motors when needed (LA simultaneously when both S1 and S2 are closed-relay contacts are not isolated)						
ALL	Input voltage must applied at all times for proper alternation. Use of a solid state control switch for S1 or S2 may not initiate alternation correct S1 or S2 voltage must be from the same supply as the unit's input voltage (see wiring diagrams). Loss of input voltage resets the unit; LA becore the lead load for the next operation.					

## Wiring Diagrams and Dimensions





Socket = 8501NR61 or NR62









0

0

83.5





by Schneider Electric www.schneider-electric.us

## Square D™ Miniature Plug-in Relays

8501R miniature plug-in relays have a 10 A resistive rating, the same as the Type K plug-in relays, but are much smaller. The compact size of these relays makes them ideal for downsizing equipment and applications where space is at a premium.

- SPDT through 4PDT
- AC or DC operated
- Horsepower rated
- Socket compatible
- Manual operator/ green LED pilot light options
- Silver tin oxide contacts

Table 23.46: Contact Ratings
(Contact material is Silver Tin Oxide)

Туре	Voltage	Resistive Rating	Voltage	General Use Rating	Horsepower Rating	
8501BS41 ▲	120 Vac	15	120 Vac	10	1/3	@120 Vac
6501H541 <b>A</b>	240 Vac	12	240 Vac	10	1/3	@240 Vac
8501RSD41▲	28 Vdc	15	28 Vdc	15	_	
8501RS42▲	120 Vac	10	120 Vac	10	1/3	@120 Vac
0301N342 <b>=</b>	240 Vac	10	240 Vac	10	1/2	@240 Vac
8501RSD42▲	30 Vdc	10	28 Vdc	10	_	
8501RS43▲	120 Vac	10	150 Vac	10	_	
0301N343 <b>=</b>	277 Vac	10	250 Vac	6.6	_	
8501RSD43▲	28 Vdc	10	28 Vdc	10	_	
8501RS44▲	120 Vac	10	150 Vac	7.5	_	
0301N344 <b>≖</b>	277 Vac	10	250 Vac	5	_	
8501RSD44▲	28 Vdc	10	28 Vdc	10		

<sup>▲</sup> Relays have a B300 rating with UL.

Table 23.47: Voltage Codes and Stocked Relays

Type		AC Vo	Itage 5	0/60 Hz	:	Type		DC V	oltage	
Туре	6	12	24	120	240	туре	6	12	24	110
Voltage Code	V35	V36	V14	V20	V24	Voltage Code	V50	V51	V53	V60
RS41			S	S		RSD41		S	S	
RS41M1						RSD41M1				
RS41P14			S	S		RSD41P14			S	
RS41M1P14			S	S		RSD41M1P14			S	
RS42		S	S	S	S	RSD42		S	S	
RS42M1						RSD42M1				
RS42P14			S	S		RSD42P14		S	S	
RS42M1P14				S		RSD42M1P14			S	
RS43			S	S		RSD43			S	
RS43M1						RSD43M1				
RS43P14				S		RSD43P14				
RS43M1P14				S		RSD43M1P14				
RS44			S	S	S	RSD44		S	S	
RS44M1						RSD44M1				
RS44P14				S		RSD44P14			S	
RS44M1P14				S		RSD44M1P14				

Note: S = Stocked

Factory order items require a **minimum** order quantity of 25 and have a lead time of 12 weeks.

#### Table 23.52: Application Data

. 00.0 20.02.	Application Bata								
Class 8501 Type		RS41	RSD41	RS42	RSD42	RS43	RSD43	RS44	RSD44
	Pick-Up Time	20 ms N	/laximum		25 ms N	/laximum		20 ms	Maximum
Operating Data	Drop-Out Time	20 ms Maximum							
	Operating Temperature	-40°C to +70°C (	-40°F to +158°F)						
	Duty Cycle	Continuous							
	Voltage Range	AC coils +10%, -	15% of nominal DO	C coils +10%, -20°	% of nominal				
Coil	AC Coils-Inrush	9 VA	_	6.2 VA	_	10.3 VA	_	11.9 VA	_
	AC Coils-Sealed	1.5 VA	_	1.2 VA	_	1.7 VA	_	2.1 VA	_
	DC Coils	_	0.9 watts	_	0.9 watts	_	1.4 watts	_	1.5 watts
JR		E78351 NLDX2, NLDX8							
		211268 3218 07							
CE marked		yes							
RoHS Compliant		yes							
UL Listed		E78351 ♦ NLDX, NLDX7							

<sup>♦</sup> When used with the appropriate 8501NR socket.

For sockets and accessories, see page 23-14. For track, see page 24-16.

#### Table 23.48: SPDT with Silver Tin Oxide Contacts

	Input Voltage	Options	Туре	\$ Price
1		None	RS41■	29.60
Harris	AC 50/60	Manual Operator	RS41M1■	31.70
77810	Hz	Pilot Light	RS41P14■	37.20
		Manual Operator and Pilot Light	RS41M1P14■	39.30
		None	RSD41■	29.60
THE STATE OF THE S	DC	Manual Operator	RSD41M1■	31.70
		Pilot Light	RSD41P14■	37.20
		Manual Operator and Pilot Light	RSD41M1P14■	29.60

Table 23.49: DPDT with Silver Tin Oxide Contacts

	Input Voltage	Options	Туре	\$ Price
		None	RS42■	35.00
Dine !	AC 50/60	Manual Operator	RS42M1 ■	37.10
1	Hz	Pilot Light	RS42P14■	43.10
		Manual Operator and Pilot Light	RS42M1P14■	45.20
30		None	RSD42■	35.00
	DC	Manual Operator	RSD42M1■	37.10
		Pilot Light	RSD42P14■	43.10
		Manual Operator and Pilot Light	RSD42M1P14■	45.20

Table 23.50: 3PDT with Silver Tin Oxide Contacts

	Input Voltage	Options	Туре	\$ Price
		None	RS43■	39.30
	AC 50/60	Manual Operator	RS43M1■	41.40
.021212	Hz	Pilot Light	RS43P14■	47.60
The second		Manual Operator and Pilot Light	RS43M1P14■	49.90
		None	RSD43■	39.30
1000	DC	Manual Operator	RSD43M1■	41.40
		Pilot Light	RSD43P14■	47.60
		Manual Operator and Pilot Light	RSD43M1P14■	49.90

## Table 23.51: 4PDT with Silver Tin Oxide Contacts

	Input Voltage	Options	Туре	\$ Price
		None	RS44■	44.30
-	AC 50/60	Manual Operator	RS44M1■	46.20
21-14-	Hz	Pilot Light	RS44P14■	52.30
		Manual Operator and Pilot Light	RS44M1P14■	54.50
		None	RSD44■	44.30
Carlot Carlo	DC	Manual Operator	RSD44M1■	46.20
		Pilot Light	RSD44P14■	52.30
		Manual Operator and Pilot Light	RSD44M1P14■	54.50
■ Voltage cod	la must ha	enacified to order this product. Do	for to standard volt	tago codos

Voltage code must be specified to order this product. Refer to standard voltage codes listed in Table 23.47 and insert as shown in Table 23.53: How to Order.

#### Table 23.53: How to Order

To Order Specify:	Ca	atalog Num	ber
<ul><li>Class Number</li><li>Type Number</li></ul>	Class	Туре	Voltage Code
<ul> <li>Voltage Code (see Table 23.47)</li> </ul>	8501	RS42	V20



8501RSD14P14V53

8501RS14M1V14

8501RSD34V51

## Square D™ Miniature Plug-in Relays

8501R relays are suited for use as logic elements and power switching output devices. The short stroke motion of the armature provides long mechanical life required for high speed operation of control systems. Different contact compositions allow these relays to be used in a variety of applications. Fine silver (gold flashed) and bifurcated crossbar (gold overlay silver) are suitable for high contact reliability and low level switching requirements. Silver tin oxide is best suited for inductive loads. Class I Division II sealed relays can be used in specified hazardous locations.

- 1, 3, or 5 A versions
- 4PDT
- Complete socket line
- Horsepower rated
- AC or DC operation
- Manual operator/pilot light options

#### Table 23.54: 5 A Version

5 A	Input Voltage	Options	Туре	\$ Price
		None	RS14▲	32.70
For	AC	Manual Operator	RS14M1▲	35.00
	50/60	Pilot Light	RS14P14▲	40.90
	Hz	Manual Operator and Pilot Light	RS14M1P14▲	43.10
		None	RSD14▲	27.70
Contacts:	DC	Manual Operator	RSD14M1▲	30.80
Silver Tin Oxide		Pilot Light	RSD14P14▲	36.80
		Manual Operator and Pilot Light	RSD14M1P14▲	39.00

Table 23.55: 3 A Version

3 A	Input Voltage	Options	Туре	\$ Price
		None	RS4▲	32.70
For low level	AC	Manual Operator	RS4M1▲	35.00
cwitching 5	50/60	Pilot Light	RS4P14▲	40.90
	Hz	Manual Operator and Pilot Light	RS4M1P14▲	43.10
		None	RSD4▲	28.70
Contacts: Fine Silver	ver DC	Manual Operator	RSD4M1▲	30.80
(Gold Flashed)		Pilot Light	RSD4P14▲	36.80
		Manual Operator and Pilot Light	RSD4M1P14▲	39.00

Table 23.56: 1 A Version

1 A	Input Voltage	Туре	\$ Price
Best for Low Level Switching	AC 50/60 Hz	RS24▲	53.00
Bifurcated Silver Gold-Plated Contacts	DC	RSD24▲	53.00

Table 23.57: 5 A Version, Class I Division II

	,		
5 A, Hermetically Sealed	Input Voltage	Туре	\$ Price
5 Ampere Resistive ■ Silver Tin Oxide Contacts	AC 50/60 Hz	RS34▲	53.00
Suitable for Class I Division 2 Locations	DC	RSD34▲	53.00

- Voltage code must be specified to order this product. Refer to standard voltage codes shown in Table 23.59.
- Do not ground the frame.

#### **Pilot Light Option**

An internal green pilot light is available in both AC and DC versions for positive indication of power to the coil.

#### **Manual Operation Option**

To speed circuit testing, a manual operator (test button) can be provided. The relay can be manually switched to simulate normal operation.

NOTE: All Type R relays with a manual operator must be used on circuits of the same polarity.

Table 23.58: Contact Ratings (Contact material is Silver Tin Oxide)

Туре	Voltage	Continuous Current Rating	Horsepower Rating
RS4 ♦	120/240 Vac	3	1/10
RSD4◆	30 Vdc	3	_
RS14♦	120/240 Vac	5	1/6
RSD14◆	28 Vdc	5	_
RS24	120/240 Vac	1	1/16 (2.8 FLA)
RSD24	30 Vdc	1	_
RS34	120/240 Vac	5	_
RSD34	30 Vdc	5	_

RS4/RSD4, RS14/RSD14 have NEMA C300 pilot duty rating

#### Table 23.59: AC Voltage Codes and Stocked Relays

Type	AC Voltage 50/60 Hz						
Туре	6	12	24	48	120	240	
Voltage Code	V35	V36	V14	V17	V20	V24	
RS4			S		S		
RS4M1					S		
RS4P14					S		
RS4M1P14					S		
RS14		S	S		S		
RS14M1					S		
RS14P14					S		
RS14M1P14					S	S	
RS24					S		
RS34					S		

Table 23.60: DC Voltage Codes and Stocked Relays

Type	DC Voltage						
туре	6	12	24	48	110		
Voltage Code	V50	V51	V53	V56	V60		
RSD4		S	S				
RSD4M1							
RSD4P14			S				
RSD4M1P14			S				
RSD14		S	S		S		
RSD14M1			S				
RSD14P14		S	S		S		
RSD14M1P14		S	S				
RSD24			S				
RSD34		S	S				
Note: C - Stocked							

Note: S = Stocked.

Factory Order items require a minimum order quantity of 25 and have a lead time of 12 weeks.

## Table 23.61: Application Data

	Class 8501 Type	RS4	RSD4	RS14	RSD14	RS24	RSD24	RS34	RSD34
	Pick-Up Time		20 ms Maximum					13 n	ns Max.
Operating	Drop-Out Time		20 ms Maximum				6 m	s Max.	
Data	Operating Temperature Range		-40	OC to +70°	C (-40°F to +	158°F)		-40°C to +70°C (-40°F to +158°F)	
	Duty Cycle	Continuo	Continuous						
	Voltage Range		AC coils +10%, -15% of nominal and DC coils +10%, -20%				⊦10%, -20% of nomi	nal	
Coil	AC Coils—Sealed	1.2 VA	_	1.2 VA	_	1.2 VA	_	1.2 VA	_
	AC Coils—Inrush	6.2 VA	_	6.2 VA	_	6.2 VA	_	6.0 VA	_
	DC Coils	_	0.9 watt	_	0.9 watt	_	0.9 watt	_	0.9 watt
	UR	File: E	197072		CCN:	NRNT2		N/A	
	C UR US	File: E	197072	CCN: N	NRNT8 (Appr	oved but no	t marked)	File: E196809 CCN: NQMJ2, NQMJ8	
Approvals	CSA	File: 211268 Class: 3218 07		File: 211268 Class: 3218 06					
CE marked Y		Yes	Yes						
	RoHS Compliant	Yes	Yes						
	UL Listed	File E	78351	CCN NLD	X, NLDX7★				

When used with the appropriate 8501 NR Socket.

For sockets and accessories, see page 23-14.

For track, see page 24-16.

**RELAYS AND TIMERS** 

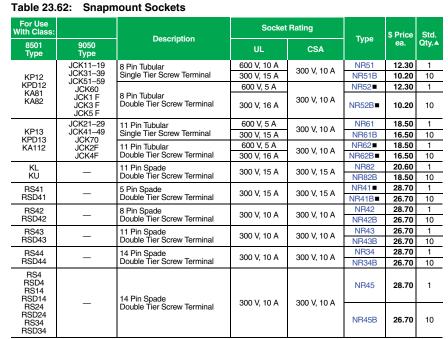
## Square D™ Sockets

8501NR sockets are designed for use with plug-in Class 8501 Type K, KA, and R relays, and 9050JCK timers. The 8501NR45 screw terminal sockets have pressure wire clamps that accept 1 or 2 #16–22 wires. All other sockets have pressure clamps that will accept 1 or 2 #12-22 wires.

The recommended tightening torque for all terminals is 7-8 lb-in.

- All devices stocked in central warehouse
- DIN track mount or direct panel mount
- Tubular sockets available in easy-to-wire single tier or double tier versions
- RoHS compliant





- Must be ordered in multiples of the quantity listed. Units provided in standard quantity of one are individually packaged; devices with B suffix have a standard quantity of 10 per bulk pack.

  Finger Safe

For DIN 3 mounting track and end clamps, see page 24-16, or refer to:

- NEMA Style terminal block section of catalog 9080CT9601
- IEC Style terminal block section of catalog 9080CT9901

Table 23.63: Socket Accessories

Socket	For Use With	Description	Туре	\$ Price ea.	Std. Pack ◆
8501NR51	8501KP12, KPD12	Hold Down Clip	NH51	1.00	10
030111031	9050JCK	Hold Down Spring	NH7	8.30	1
8501NR52	8501KP12, KPD12	Hold Down Clip	NH52	1.00	10
030 HNH32	9050JCK	Hold Down Spring	NH7	8.30	1
8501NR61	8501KP13, KPD13	Hold Down Clip	NH61	1.00	10
030111001	9050JCK	Hold Down Spring	NH7	8.30	1
8501NR62	8501KP13, KPD13	Hold Down Clip	NH52	1.00	10
030111102	9050JCK	Hold Down Spring	NH7	8.30	1
8501NR82	8501KU and KL	Hold Down Clip	NH82	1.00	10
8501NR41	8501RS41, RSD41	Hold Down Clip	Supplied with socket as standard	_	_
8501NR42	8501RS42, RSD42	Hold Down Clip	8501NH42	1.00	10
8501NR43	8501RS43, RSD43	Hold Down Clip	8501NH42	1.00	10
8501NR34	8501RS44, RSD44	Hold Down Clip	8501NH42	1.00	10
8501NR45	8501RS4, RSD4 8501RS14, RSD14 8501RS24, RSD24 8501RS34, RSD34	Hold Down Clip	8501NH45	1.00	10

Must be ordered in multiples of the quantity listed.

# 8501NR51



8501NR61





8501NR62 8501NR52





8501NR45





8501NR42







8501NR34

**How to Order** 

	To Order Specify:	Catalog	Number
•	Class Number	Class	Type
•	Type Number	8501	NR51B

#### Approvals:









RoHS as of date Compliant code 0639





8501CDO6V51

### Square D™ Power Relays

8501C relays are ideally suited for controlling single-phase motors, electric heaters, pumps, conveyors, material handling equipment, and other applications.

- 40 A contact rating
- **UL** listed CSA certified

CE approved

Motor load (hp) ratings

RoHS compliant

Durable open-frame construction

Table 23.64: Selection Table and Application Data

			Selection T	able			Application Data							
Contact Arrangement	Number of Fixed Contacts		AC Operated Coil Open Type		DC Operated Coil Open Type		Maximum Contact	Resistive Ampere Rating 75% Power Factor		Maximum Single Phase Horsepower			Maximum Coil Power Consumption	
	N.O.	N.C.	Туре	\$ Price	Туре	\$ Price	Voltage	277 Vac	600 V	120 V	230 V	600 V	AC Coil	DC Coil
AC Rated Conta	acts													
SPST	1	0	CO6▲	32.70	CDO6▲	32.70	600	40	10	2	2	2	10 VA	4 W
DPST	2	0	CO7 <b>▲</b>	51.30	CDO7▲	51.30	600	40	5	1.5	1.5	1.5	10 VA	4 W
SPST	0	1	CO8 <b>▲</b>	32.70	CDO8▲	32.70	600	40	10	2	2	2	10 VA	4 W
SPDT	1	1	CO15▲	57.30	CDO15▲	57.30	600	40	5	1.5	1.5	1.5	10 VA	4 W
DPDT	2	2	CO16▲	69.60	CDO16▲	69.60	600	40	5	1.5	1.5	1.5	10 VA	4 W
DC Rated Cont	DC Rated Contacts						110 V	220 V						
SPST	1	0	CO21▲	71.70	CDO21▲	71.70	500	20	8		N.A.		10 VA	4 W
DPDT	2	2	CO22▲	84.00	CDO22▲	84.00	325	10	4		N.A.		10 VA	4 W

Voltage codes must be specified to order this product. Refer to standard voltage codes listed in Table 23.66 and insert as shown in Table 23.68: How to Order.

### Table 23.65: Operating Data

Operating Voltages/ Voltage Range	AC coils – 6 through 480 volts, + 10/-15% of nominal at 25 °C DC coils – 6 through 110 volts, + 10/-20% of nominal at 25 °C					
Coil Duty	Continuous duty rated coils. (Non-replaceable)					
Operating Temp. Range	AC: -67 °F to +131 °F (-55 °C to +55 °C) DC: -67 °F to +131 °F (-55 °C to +55 °C)					
Storage Temp. Range	-67 °F to +212 °F (-55 °C to +100 °C)					

### Approvals:





218139 3211 04

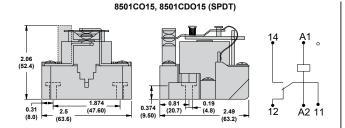


### Table 23.66: Voltage Codes and Stocked Relays

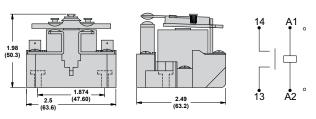
Class 8501			AC V	oltage	<del>50/6</del>	60 Hz			Class 8501	DC Voltage			
Type	6	12	24	120	208	240	277	480	Type	6	12	24	110
Voltage Code	V35	V36	V14	V20	V08	V24	V04	V29	Voltage Code	V50	V51	V53	V60
CO6		S	S	S	S	S	S	S	CDO6		S	S	
CO7		S	S	S	S	S	S	S	CDO7		S	S	
CO8			S	S		S	S	S	CDO8				
CO15			S	S	S	S	S	S	CDO15			S	
CO16		S	S	S	S	S	S	S	CDO16		S	S	S
CO21				S					CDO21			S	S
CO22	011			S					CDO22			S	S

Factory order items require a minimum order quantity of 25 and have a lead time of 12 weeks.

### **Approximate Dimensions and Wiring Diagrams**



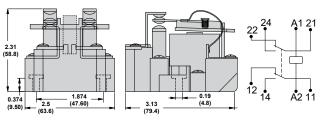
### 8501CO6, 8501CDO6, 8501CO8, 8501CDO8, 8501CO21, 8501CDO21 (SPST)



### Table 23.67: Class 9991 Enclosure

Tubio Zolott Glaco coot Eliciocato									
Туре	Description	\$ Price							
UE1	NEMA 1 sheet steel enclosure	29.60							

### 8501CO16, 8501CDO16, 8501CO22, 8501CDO22 (DPDT)



## 8501CO7, 8501CDO7 (DPST)

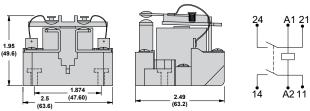


Table 23.68: How to Order

To Order Specify:	Catalog Number				
Class Number     Type Number	Class	Туре	Voltage Code		
Voltage Code     (See Stocked Relay Table above)	8501	CO6	V20		



### TeSys™ D IEC Style Relays

These 600 volt relays are approved for use around the world. TeSys D relays are usually mounted on 35 mm DIN 3 track, but can also be mounted directly to a panel. The fixed contacts in these relays have a NEMA A600 and Q600 ratings, in addition to the standard IEC ratings, making them suitable for use in most any control circuit. Low consumption versions of this relay are available for use with low level DC signals from a computer or a PLC. Adder decks can be added to a basic five pole relay to make it up to an 11 pole relay. The serrated silver-nickel contacts with wiping action provide excellent reliability in 12 or 24 volt control circuits. Special auxiliary contacts are available for switching low power down to 5 volts at 10 mA. Timer and mechanical latch attachments are available.



		Contact Compos	sition		o Dulan			
		Normally Open			\$ Price			
Terminal Type	Number of Contacts	\	7	Catalog Number	AC Coil	DC or Low Consumption Coil		
0	-	5	0	CAD50▲	62.00	110.00		
Screw Clamp	5	3	2	CAD32▲	62.00	110.00		
Caring Torminal	5	5	0	CAD503▲	62.00	110.00		
Spring Terminal	5	3	2	CAD323▲	62.00	110.00		
Ring Tongue	5	5	0	CAD506▲	62.00	110.00		
	5	3	2	CAD326▲	62.00	110.00		

Add the proper voltage code from Table 23.72 to the end of catalog number (for example, CAD50B7)

### Table 23.70: Instantaneous Auxiliary Contact Blocks (for use in normal operation environments)

	Maximum Nu Clip-or	mber per Device Mounting		Contact C	omposition			
Number of Contacts	Front	Left Side Only	Termination Type	Normally Open	Normally Closed	Catalog Number	\$ Price	
			Screw Clamp	2 1	0 1	LADN20 LADN11	20.70 20.70	
	1	_		2	0	LADN02 LADN203	20.70 20.70	
2			Spring Terminal	1 0	1 2	LADN113 LADN023	20.70 20.70	
	1 Not for DC devices		Screw Clamp	2 1 0	0 1 2	LAD8N20 LAD8N11 LAD8N02	20.70 20.70 20.70	
				4 3	0	LADN40 LADN31	41.50 41.50	
			Screw Clamp	2	2	LADN22 LADN13	41.50 41.50	
4 ■	1	_		0 4	4 0	LADN04 LADN403	41.50 41.50	
			Spring Terminal	3 2	1 2	LADN313 LADN223	41.50 41.50	
			Opining reminial	1	3	LADN133 LADN043	41.50 41.50 41.50	
4 ■	1	_	Screw Clamp	2 ♦	2 ♦	LADC22	41.50	
			Spring Terminal	2 ♦	2 ♦	LADC223	41.50	

Auxiliary contact blocks with four contacts cannot be used on relays with low consumption coils.

## Table 23.71: Instantaneous Auxiliary Contacts with Dust and Damp Protected Contacts (for use in particularly harsh industrial environments)

Number of Contacts			Co					
	Maximum Number per Device	$\Diamond$	力	¥	\	7	Catalog Number	\$ Price
	Front Mounting	Sealed		*	Normal			
		2	_	_	_	_	LA1DX20	65.00
2	1	_	2	_	_	_	LA1DX02	65.00
		2	_	2	_	_	LA1DY20	77.00
1 -	1	2	_	_	2	_	LA1DZ40	82.00
4 ▼	ı	2	_	_	1	1	LA1DZ31	82.00
	1	2 — 2 2	_	_ _	Nor — — — — 2 1	mal — — — — — — 1	LA1DX02 LA1DY20 LA1DZ40	

 <sup>★</sup> Grounding terminal points (2 terminals jumpered together; see diagram on page 8 of Catalog 8501CT0101).
 ▼ Auxiliary contact blocks with four contacts cannot be used on relays with low consumption coils.

### Table 23.72: Coil Voltage Codes

i abie 23.	Table 23.72: Coll Voltage Codes A												
AC 50/60 H	AC 50/60 Hz Coil (for additional voltage code options see page 7 of Catalog 8501CT0101).												
Volts	12	24	48	120	208	240	277	480	600				
Code	J7	B7	E7	G7	LE7	U7	W7	T7	X7				
DC Coil (co	DC Coil (coils have built in suppression as standard)												
Volts	12	24	36	48	60	72	110	125	220	250	440		
Code	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD		
DC Low Co	DC Low Consumption Coil (coils have built in suppression as standard)												
Volts	5	12	24	48	7	2							
Code	AL	JL	BL	EL	5	SL							

<sup>△</sup> Add the proper voltage code to the end of catalog number.

For replacement AC coils, see page 18-16. DC coils are not replaceable.



CAD32

CAD503



CAD323

### Approvals:



File E164353 CCN NKCR



File LR43364 Class 3211 03

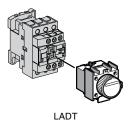


Includes 1 N.O. and 1 N.C. overlapping contact.



### TeSys™ D IEC Style

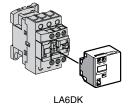
### Table 23.73: Time Delay Auxiliary Contact Blocks



Number and Type of Contacts	Maximum Number per Device Front Mounting	Time Delay Type	Termination Type	Range	Catalog Number	\$ Price
				0.1–3 s ▲	LADT0	131.00
			Screw Clamp	0.1–30 s	LADT2	131.00
			Screw Clamp	10-180 s	LADT4	131.00
		On Dalay		1–30 s ■	LADS2	131.00
	1	On-Delay	Spring Terminal	0.1–3 s ▲	LADT03	131.00
1 N.C. and 1 N.O.				0.1-30 s	LADT23	131.00
I N.C. and I N.C.				10-180 s	LADT43	131.00
				1–30 s ■	LADS23	131.00
				0.1–3 s ▲	LADR0	131.00
			Screw Clamp	0.1-30 s	LADR2	131.00
		O# D-I		10-180 s	LADR4	131.00
		Off-Delay		0.1–3 s ▲	LADR03	131.00
Lockout Cover, See page 7 of Catalog 8501CT0101.)			Spring Terminal	0.1-30 s	LADR23	131.00
			' -	10-180 s	LADR43	131.00

- With extended scale from 0.1 to 0.6 s. With switching time of 40 ms  $\pm$  15 ms between opening of the N.C. contact and closing of the N.O. contact.

### Table 23.74: Mechanical Latch Blocks ◆



LAD4

Unistabius Cantusi	Maximum Number per Device	Catalog Number	C Duine	
Unlatching Control	Front mounting	Catalog Number	\$ Price	
Manual or electrical	1	LA6DK10 ▼★	77.00	
iviariuai di electricai	ı	LAD6K10 ▼	77.00	

- Power should not be simultaneously applied or maintained to the mechanical latching block and the CAD relay. The duration of the control signal to the mechanical latching block and the CAD relay should be \$ 100 ms.
- Repair part for the preceeding version (non-TeSys) of this product. Not for use on CAD devices.

  Complete the catalog number by adding coil voltage code from Table 23.76. (for example, LA6DK10B)

### Table 23.75: Coil Suppressor Modules

These modules clip onto the right hand side of the control relay and the electrical connection is instantly made. Adding an input module is still possible.

### RC Circuits (Resistor-Capacitor)

- Effective protection for circuits highly sensitive to "high frequency" interference.
- Voltage limited to 3 Uc maximum and oscillating frequency limited to 400 Hz maximum.
- Slight increase in drop-out time (1.2 to 2 times the normal time).

For Mounting On:	Operational Voltage	Catalog Number	\$ Price
045.0/ )	24 to 48 Vac	LAD4RCE	26.20
CAD (Vac)	110 to 240 Vac	LAD4RCU	26.20

- Protection provided by limiting the transient voltage value to 2 Uc maximum.
- Maximum reduction of transient voltage peaks.
- Slight increase in drop-out time (1.1 to 1.5 times the normal time)

CAD (Vac)	24 to 48 Vac	LAD4VE	26.20
	50 to 127 Vac	LAD4VG	26.20
	110 to 250 Vac	LAD4VU	26.20

### Bidirectional Peak Limiting Diode

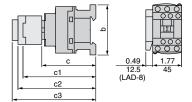
- Protection provided by limiting the transient voltage value to 2 Uc maximum.
- Maximum reduction of transient voltage peaks

045 44 )	24 Vac	LAD4TB	26.20
CAD (Vac)	72 Vac	LAD4TS	26.20

### Table 23.76: Coil Voltage Codes

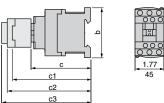
Voltage	24 Vac/Vdc	32/36 Vac/Vdc	42/48 Vac/Vdc	60/72 Vac/Vdc	100 Vac/Vdc	110/127 Vac/Vdc	220/240 Vac/Vdc	256/277 Vac/Vdc	380/415 Vac/Vdc
Voltage Code	В	С	E	EN	K	F	М	U	Q





		in. (mm)			
	CAD	32 50	323 503		
b		3.03 (77)	3.90 (99)		
С	Without cover or add-on blocks	3.31 (84)	3.31 (84)		
·	With cover, without add-on blocks	3.39 (86)	3.39 (86)		

### CAD (Vdc Coil) or (Low Consumption Vdc Coil)



		in. (mm)			
	CAD	32 50	323 503		
b		3.03 (77)	3.90 (99)		
С	Without cover or add-on blocks	3.66 (93)	3.66 (93)		
	With cover, without add-on blocks	3.74 (95)	3.74 (95)		
_					



### TeSys™ D IEC Style Relays

### Table 23.77: Cabling Accessory

	Catalog Number	\$ Price		
	Without coil suppression		LAD4BB	23.00
Mounting Adapter		24 to 48 Vac	LAD4BBVE	23.00
For adapting existing wiring to a new product	With coil suppression	50 to 127 Vac	LAD4BBVG	23.00
		110 to 250 Vac	LAD4BBVU	23.00

### Table 23.78: Electronic Serial Timer Modules A

• Mounted using adaptor LAD4BB, to be ordered separately, see listing above.

On-delay Type									
Operational Voltage	Time Delay	Catalog Number	\$ Price						
24 to 250 Vac	0.1 to 2 s	LA4DT0U	82.00						
	1.5 to 30 s	LA4DT2U	82.00						
	25 to 500 s	LA4DT4U	82.00						

<sup>▲</sup> For 24 V operation, the relay must be fitted with a 21 V coil (code Z7).

### Table 23.79: Auto-Man-Stop Control Modules

For local override operation tests with two-position "Auto-Man" switch and "O-I" switch					
Mounted using adaptor LAD4BB, to be ordered separately, see listing above.					
Operational Voltage	Catalog Number	\$ Price			
24 to 100 Vac	LA4DMK	35.00			

### Table 23.80: Accessories (ordered separately)

For Connection										
Description	For Mounting On:	Must be Ordered in Multiples of:	Catalog Number	\$ Price ea.						
For Marking										
Sheet of 64 self-adhesive blank labels 8 x 33	CAD, LAD (4 contacts), LA6DK	10	LAD21	5.20						
Sheet of 112 self-adhesive blank labels 8 x 12	LAD (2 contacts), LADT	10	LAD22	5.20						
For Protection										
Lockout cover	LADT, LADR	1	LA9D901	5.50						
Relay cover preventing access to the moving contact carrier	CAD	1	LAD9ET1	5.20						

### Table 23.81: Application Data

	Туре	CAD (Vac)		CAD (Vdc)	CAD (Vdc) Low Consumption		
Rated Insulation Voltage (Ui)	Conforming to IEC 60947-1-1 Overvoltage category III and degree of pollution 3	690 V		690 V	690 V		
· · · · · · · · · · · · · · · · · · ·	Conforming to UL, CSA	600 V	/	600 V	600 V		
Rated Impulse Withstand Voltage (Uimp)	Conforming to IEC 60947-1-1	6 kV		6 kV		6 kV	6 kV
Separation of Electrical Circuits	Reinforced insulation up to 400 V						
Conforming to Standards	IEC 60947-1-1, N-F C 63-140, VDE 0660, BS 4794. EN 60947-5-15						
Approvals		E164353					
Protective Treatment Conforming to IEC 68			"TH" (Tropical Finish). See page 23 of Catalog 8501CT0101 fo				
Degree of Protection Conforming to VDE 0106		Front face protected ag contact IP 2X		ainst direct finger	Protection against direct finger contact		

64.00

64.00

64.00

64.00



## www.schneider-electric.us

CA2KN22 • •

CA2KN403 • •

CA4KN405 • • •

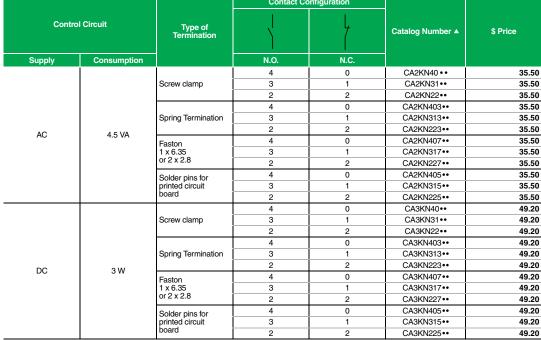
CA3KN407 • •

### TeSys™ K IEC Style Relays

### Table 23.82: Control Relays

- Mounting on 35 mm DIN 3 track or 4 screw direct mounting.
- Screws in open "ready-to-tighten" position

- NEMA A600, Q600
- IEC AC15, DC13



Complete catalog number by adding proper voltage code from Table 23.84 or Table 23.85 (for example, CA2KN40G7).

### Table 23.83: Low Consumption Control Relays

Compatible with programmable controller outputs.

DC

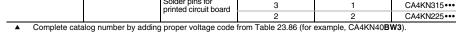
LED indicator incorporated. Wide range coil (70 to 130% Uc), suppressor fitted as standard.

1.8 W

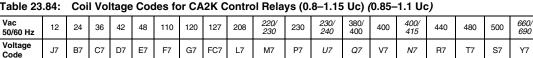
- Mounting on 35 mm DIN 3 track or 4 screw direct mounting. Screws in open "ready-to-tighten" position.
- CA4KN40 ••• 64.00 CA4KN31 ••• 64.00 CA4KN22 ••• 2 64.00 0 CA4KN403 • • • 64.00 CA4KN313 • • • 64.00 CA4KN223 ••• 64.00 CA4KN407 • • • 0 64.00 CA4KN317 • • • 64.00

CA4KN227 •••

CA4KN405 • • •



## Table 23.84:



3

2

4

3

4

3

4

0

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72. (Price Adder 9.50)

### Table 23.85: Coil Voltage Codes for CA3K Control Relays (0.8–1.15 Uc)

Screw clamp

Faston 1 x 6.35 or 2 x 2.8

Solder pins for

Spring Termination

Vdc	12	20	24	36	48	60	72	100	110	125	200	220	230	240	250
Voltage Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD
N. O. T. W. C. L. C. L. C. L. C. L. C. L. C. L. C. L. C. C. L. C. C. C. C. C. C. C. C. C. C. C. C. C.															

Note: Coil with integral suppression device available: add 3 to the code required. Example: JD3. (Price Adder 9.50)

### Table 23.86: Coil Voltage Codes for CA4K, Low Consumption Control Relays (Wide Range Coil: 0.7-1.3 Uc)

Vdc 12		24	48	72	
Voltage Code	JW3	BW3	EW3	SW3	

### Approvals:















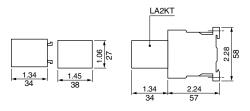
LA1KN20

LA1KN40



LA1KN403

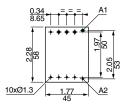
LA2KT electronic time delay contact blocks



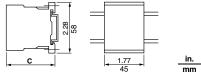
Approximate dimensions for CA2, CA3, CA4K control relays

# On panel 4xØ4 LA1-K

On printed circuit board



AM1DP200 or AM1DE200 mounting rail—35 mm DIN rail (see page 22-16 for additional DIN rail)



(	;	Product
in.	mm	Product
2.22	59	AM1DP200
2.60	66	AM1DE200

### TeSys™ K IEC Style Relays

Table 23.87: Instantaneous Auxiliary Contact Blocks ■ ◆

Clip-on Front Mounting, 1 Block Per Control Relay

	Contact Co	onfiguration		
Type of Connection	\	Catalog Number		\$ Price
	N.O.	N.C.		
	2	0	LA1KN20	14.20
	0	2	LA1KN02	14.20
	1	1	LA1KN11	14.20
Screw Clamp	4	0	LA1KN40▲	27.30
Screw Clamp	3	1	LA1KN31▲	27.30
	2	2	LA1KN22▲	27.30
	1	3	LA1KN13▲	27.30
	0	4	LA1KN04▲	27.30
•	2	0	LA1KN203	14.20
	1	1	LA1KN113	14.20
	0	2	LA1KN023	14.20
Coving Towningtion	4	0	LA1KN403▲	27.30
Spring Termination	3	1	LA1KN313▲	27.30
	2	2	LA1KN223▲	27.30
	1	3	LA1KN133▲	27.30
	0	4	LA1KN043▲	27.30
•	2	0	LA1KN207	14.20
	0	2	LA1KN027	14.20
_	1	1	LA1KN117	14.20
Faston 1 x 6.35	4	0	LA1KN407▲	27.30
or 2 x 2.8	3	1	LA1KN317▲	27.30
	2	2	LA1KN227▲	27.30
	1	3	LA1KN137▲	27.30
A Not to be used on CA4KN r	0	4	LA1KN047▲	27.30

- Not to be used on CA4KN relavs.
- Clip-on front mounting, 1 block per control relay.

  Auxiliary contact module not suitable for safety circuits.

### Table 23.88: Electronic Time Delay Contact Blocks

Relay output, with common point changeover contact	240 Vac/Vdc, 2 A maximum
Control voltage	0.85-1.1 Uc
Maximum switching capacity	250 VA or 150 W
Operating temperature	-10 to + 60°C (+14° F to 140° F)
Reset time	1.5 s during the time delay period, 0.5 s after the time delay.

### Table 23.89: Clip-on front mounting, 1 block per control Relay

Voltage (V)	Туре	Timing Range, s	Composition C.O.	Catalog No.	\$ Price
AC or DC / 24 to 48	On-delay	1 to 30 1		LA2KT2E	32.80
AC / 110 to 240	On-delay	1 10 30	'	LA2KT2U	32.00

Note: For other electronic timers see Type RE7 and 9050 Type JCK, pages 23-28 and 23-30.

### Table 23.90: Accessories (supplied separately)

		Description	Sold in lots of	Catalog No.	\$ Price ea.
Marker holder□	Clips on front of	relay	LA9D90	0.06	
Clip-on	4 maximum per	Strip of 10 identical numbers, 0 to 9	0.5	AB1R•□	0.70
markers□	device	Strip of 10 identical capital letters A to Z	25	AB1G•□	0.70
		For AC and DC voltages 12 to 24 V (varistor)		LA4KE1B★	
	Clips onto front of relay with	For AC and DC voltages 32 to 48 V (varistor)		LA4KE1E★	9.80
Suppressor		For AC and DC voltages 50 to 129 V (varistor)		LA4KE1FC★	
modules with incorporated	locating device. No tools	For AC and DC voltages 130 to 250 V (varistor)	5	LA4KE1UG ★	
LED indicator	required for	For DC voltages 12 to 24 V (diode + Zener diode)		LA4KC1B▼	
	connection.	For DC voltages 32 to 48 V (diode + Zener diode)		LA4KC1E▼	
		For AC voltages 220 to 250 V (RC)		LA4KA1U∆	

- Protection by the limitation of the transient voltage to 2 Uc maximum. Maximum reduction of the transient voltage peaks. Slight time delay on drop-out (1.1 to 1.5 times normal).
- No overvoltage or oscillation frequency. Polarized component. Slight time delay on drop-out (1.1 to 1.5 times normal).
- Protection by limitation of the transient voltage to 3 Uc max. and limitation of the oscillation frequency. Slight time delay on drop-out (1.2 times to twice normal).

  See "Clip-in Marker Strips" in Catalog 8501CT0101 for information on completing the catalog number.

### Table 23 91: Environment

Table 23.91. Environment									
Conforming	IEC 947, NF C 63-140, VDE 0660, BS 5424, CE								
Appre	UL, CSA, DEMKO, NEMKO, SEMKO, FI								
Protective treatment	Conforming to IEC 68 (DIN 50016)	"TC" (Climateproof)							
Degree of protection	Conforming to VDE 0106	Protection against direct finger contact							
Ambient air temperature	Storage	-58 to 176 °F (-50 to 80°C)							
Ambient an temperature	Operation	-13 to 122 °F (-25 to 50°C)							
Maximum operating altitude	Without derating	6562 ft (2000 m)							







CA2SK11G7



LA1SK11

### TeSys™ SK IEC Style Relays

Table 23.92: IEC Style Industrial Control Relays

- Miniature size saves space.
- Mounts on 35 mm DIN 3 track
- Up to 4 poles

	Control Circuit Supply	Consumption	Type of Termination	Contact Co	onfiguration	Catalog Number	\$ Price	
	Control Circuit Supply	Consumption	Type of Termination	N.O.	N.C.	Catalog Number	\$ Price	
	AC	4.2 VA	0	1	1	CA2SK11•• ▲	43.70	
	AC	4.2 VA		2	0	CA2SK20 • • ▲	43.70	
	DC	2.2 W	Screw clamp	1	1	CA3SK11 •• ▲	51.00	
				2	0	CA3SK20 •• ▲	51.00	

Use the appropriate voltage code to complete the catalog number (for example: CA2SK11G7)

### Table 23.93: Contact Adder Decks (for CA2SK20 only)

Type of Termination	Contact Co	nfiguration	Catalan Numban	¢ Dvice	
Type of Termination	N.O.	N.C.	Catalog Number	\$ Price	
	2	0	LA1SK20		
Screw clamp	1	1	LA1SK11	16.90	
	0	2	LA1SK02		

### **Transient Suppressor Module**

Dampens the voltage spike that may occur when the relay coil is de-energized. The spike may adversely affect solid state equipment near the relay. The transient suppressor module snaps into a cavity located in the side of the relay. These modules can be used with CA2SK and CA3SK relays.

Table 23.94: Transient Suppressor Module

Control Circuit Voltage	Catalog Number	\$ Price
24-48 Vac 50/60 Hz, 24-48 Vdc	LA4SKEIE	21.80
110-250 Vac 50/60 Hz, 110-250 Vdc	LA4SKEIU	21.00

### Table 23.95: Coil Voltage Codes for Control Relays

Voltage	12	24	36	48	72	110	120	220	230	240	380	400	480
50/60 Hz	_	B7 ■	_	E7 ■	_	F7	G7 ■	M7 ■	P7	U7 ■	Q7	V7	T7 ■
DC	JD	BD	CD	ED	SD	_	_	_	_	_	_	_	

Alternating relays CA2SKE available in these voltages only. No other voltages are available.

### Alternating Relays, CA2SKE

### Refer to Catalog 8501CT9701

These alternating relays are used to alternate the use of 2 motor circuits. When the coil is energized the first time, one contact closes and will open when the coil is de-energized. When the coil is energized again, the other contact will close and will open when the coil is de-energized. The contacts from these alternators are to be used in the control circuit of the starters that are controlling pump or compressor motors.

Approvals: UL File: E164353 CCN: NKCR; CSA File: LR43364 Class: 3211 03.

### Table 23.96: Alternating Relays

Coil Voltage (Voltage-Hz)	Туре	\$ Price
24–50/60	CA2SKE20••▲	120.00
 		0 1 11 11 11 11 11 11 11 11

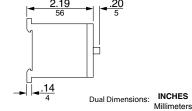
Use the appropriate voltage code to complete the catalog number (for example, CAZSK11G7). Only available with voltages indicated above.

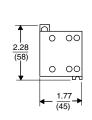
### Table 23.97: Contact Ratings for CA2SK, CA3SK, AND CA2SKE20 Relays

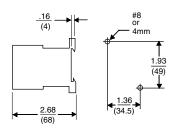
						AC		DC		
	Inductive 35% PF Resistive 75% PF									
Volts	NEMA Rating	Make		Break		Continuous	Make, Break and Continuos Amperes	Volts	Continuous Amperes	
		Α	VA	Α	VA	Amperes	Continuos Amperes			
120		60		6		20 10	10	24	3	
240	A600	30	7200	3				60	2	
480	A000	15	7200	1.5	120	10	10	110	0.8	
600		12		1.2				240	0.2	

## **Approximate Dimensions for CA2SKE Relay**













CA2SKE20





Type XMO40

Control Relay

Type XMO40

Master Relay

Type XO40XTE1 Timing Relay

Type XO40XL Latching Relay

### **AC Control Relays** Straight-through wiring

- Plug-in contact cartridges for easy contact conversion and
- Contact conversion without removing terminal screws or wires
- Self-lifting pressure wire connectors
- Replaceable coil

### Table 23.98: AC Control Relays

Normally Open Convertible	Control Relay ▲				
Instantaneous Contacts	Type♦	\$ Price			
0 2 3 4 6 8 10 12	XO00 XO20 XO30 XO40 XO60 XO80 XO1000 XO1200	98.00 144.00 169.00 192.00 242.00 288.00 336.00 385.00			
A maximum of 9 N C contacts is allowed on 0, 12 note relay					

A maximum of 8 N.C. contacts is allowed on 9-12 pole relays

### AC Master Relays

- 20 ampere contact rating due to use of master contact cartridges. ★
- Provisions for standard cartridges to be used in contact cavities not occupied by master cartridges in 2-8 pole AC

### Table 23.99: AC Master Relays

Number of N.O. 20 Ampere	Open Type ■		
Convertible Contacts	Type♦	\$ Price	
2 4 6	XMO20 XMO40 XMO60	204.00 336.00 457.00	

Attachments not permitted on this relay.

### **AC Timing Relays**

- Easily convertible On Delay or Off Delay
- Two adjustable timing ranges
- Repeat accuracy well above ±10%
- Convertible 1 N.O. and 1 N.C. timed contacts
- Large knob for easy adjustment of time delay
- Off Delay mode times out even after loss of power.

### Table 23.100: AC Timing Relays

	N.O.	Timed Convertible					
Timing Mode	Convertible Instantaneous		ertible tacts	0.2–60 s	5–180 s	\$ Price	
	Contacts	N.O.	N.C.	Type ♦	Type ♦		
On Delay	0 2 4	1 1 1	1 1 1	XO00XTE1 XO20XTE1 XO40XTE1	XO00XTE2 XO20XTE2 XO40XTE2	432.00 480.00 529.00	
Off Delay	0 2 4	1 1 1	1 1 1	XO00XTD1 XO20XTD1 XO40XTD1	XO00XTD2 XO20XTD2 XO40XTD2	432.00 480.00 529.00	

### **AC Latching Relays**

- Mechanical latch holds all contacts switched even after removal of power from replaceable latching coil.
- Provides sequence memory in the event of power loss. Ideal for press control, process control and punch presses.
- Replaceable unlatch coil to switch contacts back to original

### Table 23.101: AC Latching Relays

N.O. Convertible Instantaneous Contacts	Latching Relay			
	Type ♦	\$ Price		
2 3 4 6 8	XO20XL XO30XL XO40XL XO60XL XO80XL	313.00 336.00 360.00 408.00 457.00		

Voltage Code must be specified to order these products. Refer to Table 23.104 and insert the code as shown in Table 23.107: How to Order.

### Approvals:





File



### Table 23.102: AC Contact Ratings

(for DC ratings, see page 23-23)

Type of		Inductive 35% Power Factor				Resistive 75% Power Factor		
Cartridge	V	V NEMA		Make		eak	Continuous	Make, Break and
		Rating	A	VA	A	VA	Amperes	Continuous Amperes
Standard or Overlapping	120 240 480 600	A600	60 30 15 12	7200	6 3 1.5 1.2	720	10	10
		Same as standard cartridge above except						

substitute 20 A for the continuous ampere rating 150 Vac, 150 mA, 8 W Maximum Logic Reed

Maximum of six 8501 Type XC4 Master Cartridges may be used on only 7 and 8 pole AC Devices

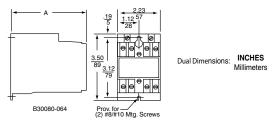
### Table 23.103: Average Operating Time (ms)

Device	Pick-Up	Drop-Out
AC Relay	15	16
AC Latching Relay	15	13

### Table 23.104: Voltage Codes

AC Voltages - Hz	Code
12-60	V11
24-60	V01
24–50	V12
48-60	V18
48-50	V16
120-60/110-50	V02
208–60	V08
240-60/220-50	V03
277–60	V04
480-60/440-50	V06
600-60/550-50	V07

### **AC Control Relays and AC Master Relays**



### Table 23.105: Dimensions and Weight

No. of Poles	Dim. A		Shipping Weight, Ib
No. of Foles	in.	mm	Shipping Weight, ib
0–4	3.95	100	2.0
6–8	5.16	131	2.3
10-12	6.36	162	2.7

### **AC Latching Relay Dimensions**

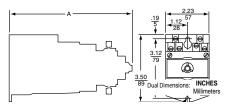


Table 23.106: Dimensions and Weight

No. ofPoles	Dir	n. A	Shipping Weight, Ib
No. diroles	in.	mm	Shipping Weight, ib
2-4	6.54	166	2.8
6–8	7.74	197	3.1

For replacement coils, see page 23-24.

### Table 23.107: How to Order

	To Order Specify:	C	atalog Numl	ber
•	Class Number Type Number	Class	Туре	Voltage Code
•	Voltage Code	8501	XO40	V02



RELAYS AND TIMERS



### **Industrial Relays** Square D™ NEMA Style

### **DC Control Relays**



Type XDO40 Control Relay

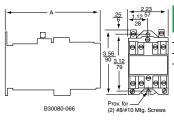
- Replaceable, highly reliable pure DC power plant: no economizing resistors, overlapping contacts or dualwound coil
- Utilizes the same Type XB adder decks and attachments as the AC version.
- Offers all the features of the AC relay.
- Available in up to 8 poles.
- All contact poles are usable since no overlapping contacts are needed.

### Table 23.108: DC Control Relays

Normally Open Convertible	Control Relay		
Instantaneous Contacts	Туре	\$ Price	
0 2 4 6 8	XDO00 ▼ XDO20 ▼ XDO40 ▼ XDO60 ▼ XDO80 ▼	216.00 264.00 313.00 360.00 408.00	

### DC Control Relay Utility Auxiliary Relay

### Table 23.109: Dimensions



No. of Poles			Snipping weight	
140. 011 0103	in.	mm	lb.	
0–4	5.17	131	3.1	
6–8	6.37	162	3.4	
10–12	7.60	193	3.8	

### DC Timing Relays

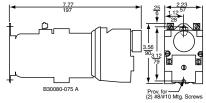


- Easily convertible On Delay or Off Delay.
- Two adjustable timing ranges.
- Repeat accuracy well above ±10%.
- Convertible 1 N.O. and 1 N.C. timed contacts.
- Large knob for easy adjustment of time delay.
- Off Delay mode times out even after loss of power.

Type XDO40XTE2 Timing Relay

### Table 23.110: DC Timing Relays

	Normally	Timed Convertible		Timing		
Timing Mode	Open Convertible Instantaneous	Conve		0.2–60 s	5–180 s	\$ Price
	Contacts	N.O.	N.C.	Туре	Туре	
On Delay	0 2 4	1 1 1	1 1 1	XDO00XTE1 ▼ XDO20XTE1 ▼ XDO40XTE1 ▼	XDO00XTE2 ▼ XDO20XTE2 ▼ XDO40XTE2 ▼	522.00 601.00 648.00
Off Delay	0 2 4	1 1 1	1 1 1	XDO00XTD1 ▼ XDO20XTD1 ▼ XDO40XTD1 ▼	XDO00XTD2 ▼ XDO20XTD2 ▼ XDO40XTD2 ▼	522.00 601.00 648.00



### Table 23.111: DC Contact Ratings (for AC ratings, see page 23-22)

			DC	Ratings			
Type of			Inductive		Resistive		
Cartridge	Volts	NEMA Rating	Make and Break Amperes 138 VA Max.	Continuous Amperes	Make and Break Amperes	Continuous Amperes	
Standard	125 250	P600	1.1 0.55	5 5	4 0.8	5 5	
Overlapping	125	P150	1.1	5	4	5	
Logic Reed	_	_	30 Vdc, 60 ma				

Note: Do not use any 8501 Type XC4 Master Cartridges on any DC-operated device.

### **DC Latching Relays**



Type XDO40XDI

Latching Relay

- Ideal for sequencing applications such as press
- Provides sequence memory in the event of power

Mechanical latch holds all contacts switched even

after removal of power from replaceable latching coil.

- control, process control and punch presses.
- Replaceable unlatch coil to switch contacts back to original state.

### Table 23.112: DC Latching Relays

Normally Open Convertible	Latching Relay		
Instantaneous Contacts	Туре	\$ Price	
2 4 6 8	XDO20XDL ▼ XDO40XDL ▼ XDO60XDL ▼ XDO80XDL ▼	485.00 534.00 582.00 629.00	

Unlatch coil is rated for intermittent duty and should be connected through a N.O. contact of the relay if the input signal is maintained. Order one more N.O. contact than the application requires to use as a coil clearing contact.

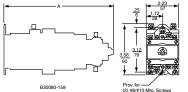


Table 23.113: Dimensions

No. of	Din	n. A	Shipping Weight, lb.
Poles	in.	mm	Weight, lb.
2–4	7.76	197	3.9
6–8	8.98	228	4.2

### **DC Utility Relays**



Type XUDO40 Utility Relay

- Ideal for utility plant applications where reliable performance and a pure DC power plant is required. In addition to the Type XDO relay features, the Type XUDO provides:
- Up to 12 poles N.O. or N.C.
- Nominal 125 Vdc coil, capable of handling 140 Vdc continuously and picking up at 105 Vdc after having been operated at 140 Vdc continuously. Other voltages with comparable operating characteristics are
- Enclosed device capable of operating in 145°F ambient.

### Table 23.114: DC Utility Relays

Number of Conv	vertible Contacts	Open Type		
N.O.	N.C.	Туре	\$ Price	
4	0	XUDO40 ▼	390.00	
0	4	XUDO04 ▼		
8	0	XUDO80 ▼	510.00	
0	8	XUDO88 ▼		
12	0	XUDO1200 ▼	629.00	
0	12	XUDO0012 ▼		

### Table 23.115: Average Operating Times (in ms)

3 1, 1,					
Device	Pick-Up	Drop-Out			
DC Relay	37	21			
DC Latching Relay	37	45			

### Table 23.116: Voltage Codes—8501 XUDO and XDO Relays

DC Voltages for 8501 XUDO Relays ONLY	Code	DC Voltages for 8501 XDO Relays	Code
6 12 24 48 125 250	V50 V51 V53 V56 V63 V67	6 12 24 32 48 72 90 115/125 230/250	V50 V51 V53 V54 V56 V58 V59 V62 V66

Voltage code must be specified to order these products. Refer to Table 23.116 and insert the appropriate code as shown in Table 23.117: How to Order.

### Table 23.117: How to Order

	To Order Specify:		Catalog Nu	ımber
•	Class Number	Class	Type	Voltage Code
	Type Number Voltage Code	8501	XDO40	V53

For Replacement coils, see page 23-24 For UL and CSA approvals, see page 23-22

Table 23.118:	Type X'" Reia
100	68
	Me Me

Table 25.110. Type A	telays					
<b>1</b> 11	<b>Description</b>	Type	\$ Price			
0	Mechanical Latch Attachment—Mounts on any 2 through 8-pole relay (except XMO master relay). The Type XL and XDL latch attachments are identical in size and mounting provisions. The Type XLAC latch attachment has a continuous-duty-rated coil which is replaceable). The Type XDLDC latch attachment has an intermittent—rated coil (replaceable) and should be connected through a N.O. contact of the basic relay if the input signal is maintained to the unlatch coil.  AC Latch Attachment DC Latch Attachment	XL▲ XDL▲	169.00 222.00			
4	Pneumatic Timer Attachment—Mounts only on any 0 through 4-pole AC or DC relays (except XMO master relay). It provides 1 N.O. and 1 N.C. convertible timed contacts, which are the same Type XC1 cartridges used on the basic relay. Two timing ranges are available, and conversion from On Delay to Off Delay or vice versa is easy.	7.02				
3	Off Delay 0.2–60 seconds 5–180 seconds On Delay	XTD1 XTD2	336.00 336.00			
	0.2-60 seconds 5-180 seconds	XTE1 XTE2	336.00 336.00			
Q.	Timer Lockout Cover—Fits over the time delay adjustment knob of any Type XT timing attachment. The Lockout Cover is designed to protect the time setting against accidental adjustment. It mounts directly to the timing attachment with two included screws.	XJ1	9.00			
	Adder Decks—Adder decks are used to expand the number of poles on a relay. The basic 4-pole relay can be easily converted to an 8-pole or 12-pole relay by installing one or two adder decks. The Class 8501 Type XB20 comes with 2 convertible contact cartridges and will accept 2 additional convertible contact cartridges. The Class 8501 Type XB40 comes with 4 convertible contact cartridges. The same Type XB adder deck is used for both the middle and upper decks of the AC or DC relay.					
3333	With 2 N.O. contact cartridges With 4 N.O. contact cartridges	XB20 XB40	48.00 98.00			
	Contact Cartridges—The Type X relay offers 4 Types of contact cartridges. All are color—coded for visual identification of each Type.					
	Standard Cartridge—The standard cartridge, used for most applications, has a black case.	XC1	24.20			
	Overlapping Cartridge—Same NEMA Type A600 AC rating as standard cartridge and a NEMA Type P150 DC rating. When it is used in the N.O. mode it will close early and when used in the N.C. mode it will open late. If two or more are used together, the N.O. contacts will close before the N.C. contacts open as the relay picks up. Overlap also occurs during dropout. Overlapping cartridge has a red case.	XC2	24.20			
C	May be ordered factory installed:  Substitute 1 N.O. and 1 N.C. overlapping cartridges for 2 standard cartridges.  Substitute 2 N.O. and 2 N.C. overlapping cartridges for 4 standard cartridges.  Substitute 3 N.O. and 3 N.C. overlapping cartridges for 6 standard cartridges.  Substitute 4 N.O. and 4 N.C. overlapping cartridges for 8 standard cartridges.	Form Y1591 Y1592 Y1593 Y1594	Add 24.20 Add 24.20 Add 24.20 Add 24.20			
	Master Cartridge—Features the same contact ratings as the Type XC1 standard cartridge except it has a 20 ampere continuous current rating instead of 10 amperes. It can be used in circuits where a master relay is required. Master cartridge has a blue case. Maximum of 6 master cartridges may be used on any 7 and 8-pole AC relays. Do not use any master cartridges on 9-12-pole AC or any DC-operated devices. Note: If master cartridges are added to a standard relay, attachments (latch mechanism, timers, etc.) cannot be used.	XC4	60.00			
	Logic Reed Cartridge—See logic reed adder deck above.					
	Mounting Track—The mounting track has pre-punched mounting holes to simplify mounting the track on the control panel. The relay mounting screws are factory installed on the track so that the relays can be hung prior to tightening the screws.  9 in. long for 4 relays 18 in. long for 8 relays 27 in. long for 12 relays 36 in. long for 16 relays	XM4 XM8 XM12 XM16	19.70 29.80 36.40 42.90			
	Manual Test Tool—Provides a means of manually switching the contacts of a basic relay or timing relay and holding all contacts in their switched state until the tool is removed. This simplifies the checking of control circuits without power on the coil or contacts.	XA1	6.10			
	<b>Transient Suppressor</b> —Consists of an R-C circuit designed to suppress coil generated transients to approximately 200 percent of peak voltage. It is particularly useful when switching the Type X relay near solid state equipment. It is designed for use on coils up to 120 Vac.	XS1	48.00			
	NEMA 1 Enclosure—Formed from sheet steel to provide strength and rigidity. Two conduit knockouts are located in both the top and bottom of the enclosure. The enclosure is furnished with self tapping screws for mounting the relay inside the enclosure. Accommodates a single 4 or 8-pole AC or DC relay, 12-pole AC relay, 4-pole AC latching relay, and 4-pole AC timing relay. Note: The 4-pole DC latching relay, 4-pole DC timing relay, 8-pole AC and DC latching relays and 12-pole utility auxiliary relay will not fit.	Class 9991 Type UE7	29.60			

See Mechanical Latch Attachment Voltage Codes table below:

### Table 23.119: Mechanical Latch Attachment Voltage Codes

			•
AC Voltage	Code	DC Voltage	Code
24–60 24–50 120–60/110–50 208–60 240–60/220–50 277–60 480–60/440–50 600–60/550–50	V01 V12 V02 V08 V03 V04 V06 V07	6 12 18 24 48 72 90 115/125 230/250	V50 V51 V99 V53 V56 V58 V59 V62 V66

### Table 23.120: How to Order

	To Order Specify:		Catalog Number	
•	Class Number	Class	Type	
:	<ul> <li>Type Number</li> <li>Voltage Code for mechanical latch attachment</li> </ul>		XTE1	
•	Form for factory installed overlapping contacts	8501		

### Table 23.121: Relay Coil Selection and Pricing

Device	Equipment To	Be Serviced	Coil Prefix, or Class	Hz		(The co	omplete o	oil numb	oer consi		UFFIX refix or	the Clas	ss and 1	ype, fo	llowed by	suffix.)		Coil Burden	\$ Price
Туре	Class	Туре	and Type		6 V	12 V	18 V	24 V	32 V	48 V	64 V	72 V	90 V	110 V	115/125 V	220 V	230/250 V	Watts	
		XD	9998 XD	<b> </b>	19	28	34	37	40	46	49	52	55	_	58	_	67	18	168.00
DC	8501	XDL	9998 XDL	_	19	28	34B	37B	40B	46B	49B	52B	55B	_	58B	_	67B	50	216.00
		XUD	9998 XUD	_	19	28	_	37	_	46	_	_	_	_	58★	_	67♦	16	168.00
Device	Equipment To	o Be Serviced	Coil Prefix														Coil Volt	-Amperes	\$ Price
Туре	Class	Туре	or Class and Type	_	24 V	110-115 V	120 V	208 V	220 V	240 V	277 V	380 V	440 V	480 V	550 V	600 V	In-rush	Sealed	\$ FIICE
AC	8501	XO,	9998 X ■	60	23	_	44	51	52	53	55	_	_	62	_	65	148	23	69.00
AC	0301	XMO	3330 ∧ ■	50	24	44	_	52	53	_	_	_	62	_	65	_	143	25	09.00

- To order an unlatch coil add the letter "L" to the type number and the letter "B" to the suffix number. Example: for a 120 V 60 Hz unlatch coil order a Class 9998 Type XL44B. Not dual rated—250 Vdc only 125 Vdc only







SSRPCDS25A1



SSRDCDS10A1



SSRDCDS45A1



SSRAH1



SSRAT1

### **Schneider Electric Solid State Relays**

Solid state relays do not have any moving parts to wear out. Combined with vibration resistance, arc-less switching and the lack of acoustical noise, you have the ideal product for switching applications that demand reliable execution. For added reliability the Zelio™ SSRP and SSRD solid state relays utilize Direct Copper Bonding (DCB) technology to decrease internal temperatures and improve the overall quality of the product.

### Key features include:

- Input voltage range 3 to 32 Vdc, 90 to 280 Vac
- Breaking capacities up to 125 A
- Zero voltage turn on, low EMI / RFI
- No moving parts
- Shock and Vibration resistant
- No acoustical noise
- Fast response
- Arc-less switching
- Long life (>10<sup>9</sup> operations)

### Table 23.122: Solid State Relays

	Voltage	e Range	Load Current		\$ Price ea.
Switching	Input	Output	Range	Catalog Number	
	V	V	Α	Number	
anel Mounted					· ·
			10	SSRPCDS10A1	40.
	3•••32 DC	24•••280 AC	25	SSRPCDS25A1	41.
			50	SSRPCDS50A1	59.
		48•••530 AC	75	SSRPCDS75A2	100.
	4•••32 DC	48•••660 AC	90	SSRPCDS90A3	114.
SCR Output		48************************************	125	SSRPCDS125A3	144.
Zero voltage switching			10	SSRPP8S10A1	43.
		24•••280 AC	25	SSRPP8S25A1	45.
	90•••280 AC		50	SSRPP8S50A1	53.
	90•••280 AC	48•••530 AC	75	SSRPP8S75A2	114.
		48•••660 AC	90	SSRPP8S90A3	117.
		48***000 AC	125	SSRPP8S125A3	134.
MOSEET Output			12	SSRPCDM12D5	66.
•	3.5•••32 DC	0•••100 DC	25	SSRPCDM25D5	82.
instant switching			40	SSRPCDM40D5	114.
N Rail Mounted					
			10	SSRDCDS10A1	58.
	4•••32 DC	24•••280 AC	20	SSRDCDS20A1	81.
			30	SSRDCDS30A1	85
SCR Output	3•••32 DC	24•••280 AC	45	SSRDCDS45A1	100
Zero voltage switching			10	SSRDP8S10A1	61
-	90 •• 280 AC	24•••280 AC	20	SSRDP8S20A1	70
			30	SSRDP8S30A1	78
SCR Output Zero voltage switching  MOSFET Output Instant switching I Rail Mounted  SCR Output	90•••140 AC	24•••280 AC	45	SSRDF8S45A1	106

### Table 23.123: Accessories For Panel Mount Solid State Relays

Description	For Use With Relays	Load Current Range	Catalog Number	\$ Price ea.
Heat Sink	SSRPP8S••••	to FO A	CCDALIA	26.00
neat Sink	SSRPCDS••••	up to 50 A	Catalog Number SSRAH1 SSRAT1	26.00
Pre-Cut Thermal Transfer Pad	SSRPP8S••••	up to 125 A	SSDAT1	2.30
(sold in pack sof 10)	SSRPCDS••••	up to 125 A	SSNALL	2.30

### Zelio ™ IEC Style—17.9 mm wide

### Table 23.124: RE11 Modular Timers—17.9 mm wide (Multi-range timers offering 7 selectable ranges)



RE11RLMU

RE11LHBM

Output 1 C/O contact				
Functions	Supply Voltages	Rated Current	Catalog Number	\$ Price
On delay	24 Vdc, 24-240 Vac	8A	RE11RAMU	42.90
Interval	24 Vdc, 24-240 Vac	8A	RE11RHMU	42.90
Asymmetrical repeat cycle	24 Vdc, 24-240 Vac	8A	RE11RLMU	53.00
Asymmetrical repeat cycle	12 Vac/Vdc	8A	RE11RLJU	75.00
One shot	24 Vdc, 24–240 Vac	8A	RE11RBMU	52.00
Off delay with control start	24 Vdc, 24-240 Vac	8A	RE11RCMU	52.00
Multi-function ▲	24 Vdc, 24-240 Vac	8A	RE11RMMU	62.00
Multi-function ▲	12-240 Vac/Vdc	8A	RE11RMMW	75.00
Multi-function ▲	12-240 Vac/Vdc	8A	RE11RMMWS	75.00
Multi-function ▲	12 Vac/Vdc	8A	RE11RMJU	75.00
Multi-function ■	24 Vdc, 24-240 Vac	8A	RE11RMEMU	75.00
Multi-function ▲	24 Vdc, 24-240 Vac	8A	RE11RMXMU	75.00

Timing ranges: 0.1-1 s, 1-10 s, 0.1-10 min, 1-10 min, 0.1-1 hr, 1-10 hr, 10-100 hr

•	Timing ranges: 0.1-1 s,	1-10 s, 0.1-10 min,	1-10 min, 0.1-1 hr, 1-10 hr
---	-------------------------	---------------------	-----------------------------

			IEC 61812-1, EN 50081-1/2, EN 50082-1/2, LV directives (73/23/EEC + 93/68/EEC (CE marking) + EMC directive (89/336/EEC + IEC 60669-2-3)
			cULus File: E173076 CNN: NRNT
			File: E173076 CNN: NRNT7
Approvals			CSA File: 217698 Class 3211 07
			CE
			GL except RE11 RMX MU and RE11 RME MU
Ambient air temperature around the	Storage	°F (°C)	-22 to +140 (-30 to +60)
device	Operation	°F (°C)	-4 to +140 (-20 to +60)

### Table 23.125: RE11 Modular Timers—17.9 mm wide (Multi-function, dual function or single function)

Functions Supply Voltages		Rated Current	Catalog Number	\$ Price
Solid state output				
On delay	24-240 Vac/Vdc	0.7A	RE11LAMW	45.40
Interval	24–240 Vac	0.7A	RE11LHBM	42.90
Off delay with control contact	24–240 Vac	0.7A	RE11LCBM	52.00
Asymmetrical repeat cycle	24–240 Vac	0.7A	RE11LLBM	75.00
Multi-function	24-240 Vac	0.7A	RE11LMBM	62.00
Timing ranges: 0.1-1 s, 1-10 s, 0.1-10 m	nin, 1–10 min, 0.1–1 hr, 1–10 hr, 10–100 hr			

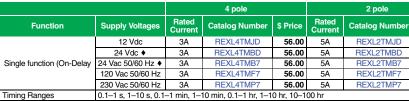
		,		
Conforming to standards				81-1/2, EN 50082-1/2, LV directives (73/23/EEC + 93/68/EEC (CE marking) + 6/EEC + IEC 60669-2-3)
Approvals			cULus	File: E173076 CNN: NRNT File: E173076 CNN: NRNT7
Аррготаіз	Approvais			File: 217698 Class: 3211 07
			CE	
Ambient air temperature around the	Storage	°F (°C)	-22 to 140 (-30 to +6	0
device	Operation	°F (°C)	-4 to 140 (-20 to +60	

### Table 23.126: RE48 Panel Mount Timers (For required socket, refer to the catalog section)

Functions	Supply Voltages	Rated Current	Catalog Number	\$ Price
Single function: on delay, two relay outputs	24-240 Vac/Vdc	2 x 5 A	RE48ATM12MW	73.00
Repeat cycle: two relay outputs	24-240 Vac/Vdc	2 x 5 A	RE48ACV12MW	88.00
Multi-function: on delay, one shot, off delay, repeat cycle	24-240 Vac/Vdc	2 x 5 A	RE48AML12MW	86.00
Multi-function: on delay and interval, two relay outputs, of which one selectable and instantaneous	24-240 Vac/Vdc	2 x 5A	RE48AMH13MW	86.00

Conforming to standards		IEC 61812-1, EN 50081-1/2, EM 50082-1/2, LV directives (73/23/EEC + 93/68/EEC (CE marking) + ENC directive (89/336/EEC + IEC 60669-2-3)				
		cURus	File: E173076 CNN: NRNT2			
		COTTUS	File: E173076 CNN: NRNT8			
Approvals		CSA	File: 217698 Class: 3211 070			
		CE, C-Tick, GL				
		RoHS compliant as	s of date code 0625			
Ambient air temperature around the device	Storage °F (°C)	-40 to 158 (-40 to +70)				
Ambient all temperature around the device	Operation oF (oC)	-4 to 122 (-20 to +50)				

### Table 23.127: REXL Miniature Plug-in Timers (For required socket, refer to the catalog section)



For 48 Vac supply, additional resistor 390 ohm 4 W / 24 V

For 48 Vac supply, additional resistor 560 ohm 2 W / 24 V



REXL2TMJD

RE48A TM12MW

Approvals:











IEC 61812-1

53.00

53.00

53.00

53.00

53.00

RoHS Compliant







RE7ML

RE7T

RE7M

### Zelio ™ IEC Style—22.5 mm

**Timers** 

These timers offer multi range timing from 0.05 to 300 hours, in 10 timing ranges.

### Table 23.128: RE7M 6 Function and 8 Function Timers

Function	Supply Voltages	Relay Output	Catalog Number	\$ Price
6 Function Timer				
On-Delay Timer Off-Delay Timer Interval Timer  start on energization  start on opening of remote control contact  Repeat Cycle Timer with start during the OFF period.  Repeat Cycle Timer with start during the ON period  External control possible for:  start of time delay  partial stop of time delay  adjustment of time delay	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O, SPDT	RE7ML11BU	226.00
8 Function Timer				
Same as 6 Function Timer ▲ plus Timer for star-delta starting	24 Vdc or Vac 110–240 Vac	2 C/O, DPDT	RE7MY13BU	252.00
<ul> <li>with double On-Delay timing</li> <li>with changeover contact to star connection</li> </ul>	24–240 Vdc or Vac	2 C/O, DPDT	RE7MY13MW	277.00

<sup>▲</sup> Except control of partial stop of time delay for RE7MY13BU.

### Table 23.129: RE7T On-Delay Timers

Table 2011201 11211 On Dolay Timore									
Functions	Supply Voltages	Relay Output	Catalog Number	\$ Price					
On-Delay Timer	24 Vdc or Vac 110–240 Vac	1 C/O, SPDT	RE7TL11BU	138.00					
On-Delay Timer External control possible for:  • start of time delay  • partial stop of time delay  • adjustment of time delay  ■	24 Vdc or Vac 42–48 Vdc or Vac 110-240 Vac	1 C/O, SPDT	RE7TM11BU	177.00					
On-Delay Timer Remote control possible for: adjustment of time delay ■	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O♦, DPDT	RE7TP13BU	189.00					

### Table 23.130: RE7M Symmetrical and Asymmetrical Timers

Functions	Supply Voltages	Relay Output	Catalog Number	\$ Price
Symmetrical Timers: On and Off delay times are	e equal.			
On-Delay and Off-Delay Timer External control possible for:  partial stop of time delay  adjustment of time delay  Start control via external contact only	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O, SPDT	RE7MA11BU	194.00
On-Delay and Off-Delay Timer Start control via external contact only	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O ◆, DPDT	RE7MA13BU	208.00
Asymmetrical Timers: On and Off delay times a	re adjusted separately.			
On-Delay and Off-Delay Timer External control possible for:  • partial stop of time delay  • adjustment of time delay  Start control via external contact only	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O, SPDT	RE7MV11BU	214.00

By external potentiometer, to be ordered separately (see page 3 of Catalog 9050C10001 for specifications). If external potentiometer is used, the internal potentiometer is automatically disconnected.

### ♦ A switch on the front face of the timer allows the second contact to be used in instantaneous mode.

### Table 23.131: Output Circuit Specifications for RE7

Current Limit, Ith		8 A		
Rated Operational Lim	24 V	115 V	250 V	
Conforming to IEC60947-5-1/1991 and	AC-15 N.C. contact	3 A	3 A	3 A
	AC-15 N.O. contact	5 A	5 A	5 A
VDE 060	DC-13 N.O. contact	2 A	0.2 A	0.1A
<b>UL and CSA Current</b>	Resistive Rating	5A		
NEMA / UL B300	Inductive Rating	3600 VA Make, 360 VA E 5 A Carry		'A Break,

### Table 23.132: Output Circuit Specifications for RE8

Maximum Switching Voltage		250 Vac/Vdc		
Current Limit Ith	8 A			
Rated Operational Limits at 15	24 V	115 V	250 V	
Conforming to IEC 60947-5-	AC-15	3 A	3 A	3 A
1/1991 and VDE 0660	DC-13	2 A	0.2 A	0.1 A
UL and CSA Current Ratings (		5 A		
NEMA / UL B300 Ratings (Indu	3600 VA Make, 360 VA Break. 5 A Carry			

## RE7, RE8, and RE9 Timers comply to the following:

Conforming to Standards		IEC 61812-1, EN 61812-1		
Product Approvals		CUL US File E164353 NKCR File 089150 Class 3211-07 C E	61812-1	
CE Marking		RE7, RE8, and RE9 Timers conform to European regulations relating to CE Marking		
Ambient Air Temperature	Storage	-40°F to +185°F (-40°C to +85°C)		
Ambient Air Temperature	Operation	-4°F to +140°F (-20°C to +60°C)		





### Zelio ™ IEC Style—22.5 mm

### Table 23.133: RE7R Timers Off-Delay Timers



RE7R



RE7P



RE7C

Functions	Supply Voltages	Relay Output	Catalog Number	\$ Price
On De-energization, Adjustable from 0.05 s to 10 min, i	n 7 Ranges			
Off-Delay Timer (Times without power)	24-240 Vdc or Vac	1 C/O SPDT	RE7RB11MW▲	189.00
Off-Delay Timer Remote control possible for:  • adjustment of time delay ■	24-240 Vdc or Vac	2 C/O	RE7RB13MW▲	214.00
On Opening of External Control Contact, Adjustable from	om 0.05 s to 300 h, in 10	Ranges		
Off-Delay Timer External control possible for:  • partial stop of time delay • adjustment of time delay ■	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O SPDT	RE7RA11BU	164.00
On opening of Low Level External Control Contact, Adj	justable from 0.05 s to 3	00 h, in 10 Ranges		
Off-Delay Timer External control possible for:  • partial stop of time delay  • adjustment of time delay ■	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O SPDT	RE7RM11BU	177.00
Off-Delay Timer	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O♦, DPDT	RE7RL13BU	189.00

<sup>▲</sup> If the device has been stored de-energized for more than a month, it must be energized for about 15 seconds to activate it. Subsequently, a time of > 1 s is enough to activate the time delay.

Note: If this time is not complied with, the relay will remain energized indefinitely.

### Table 23.134: RE7P Interval Timers

Functions	Supply Voltages	Relay Output	Catalog Number	\$ Price
Start on Energization				
Interval Timer	24 Vdc or Vac 110–240 Vac	1 C/O SPDT	RE7PE11BU	151.00
Interval Timer External control possible for:  • adjustment of time delay ■	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O ♦	RE7PP13BU	189.00
Start on Opening of External Control Conta	act			
Interval Timer External control possible for:  • partial stop of time delay  • adjustment of time delay ■	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	1 C/O SPDT	RE7PM11BU	151.00
Interval Timer	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O •	RE7PD13BU	189.00

### Table 23.135: RE7C Timers Symmetrical and Asymmetrical Relays

Table 20:105: TIE70 Timers Gymin	ionioai ana 710 yiiiii cuioai			
Functions	Supply Voltages	Relay Output	Catalog Number	\$ Price
Symmetrical Relays with Start during Off Pe	riod			
Repeat Cycle Timer	24 Vdc or Vac 110–240 Vac	1 C/O SPDT	RE7CL11BU	164.00
Repeat Cycle Timer External control possible for:  adjustment of time delay	24 Vdc or Vac 42–48 Vdc or Vac 110–240 Vac	2 C/O ♦ مبر DPDT	RE7CP13BU	202.00
Asymmetrical, with Separate Adjustment of	On-Delay and Off-Delay			
Repeat Cycle Timer External control possible for:	24 Vdc or Vac	1 C/O		
<ul> <li>start period</li> <li>adjustment of time delays ■</li> <li>partial stop</li> </ul>	42–48 Vdc or Vac 110–240 Vac	SPDT	RE7CV11BU	214.00

By external potentiometer, to be ordered separately (see page 3 of Catalog 9050CT0001 for specifications). If external potentiometer is used, the internal potentiometer is automatically disconnected.

For conformance to standards, see page 23-32

RoHS Compliant as of date code 0626

A switch on the front face of the timer allows the second contact to be used in instantaneous mode.



### Zelio™ IEC Style—22.5 mm

**Timers** 

### Table 23.136: On-Delay (timing starts on energization), TDE

Relay Output	Supply Voltages	Timing Range ▲	Catalog Number	Standard Pack Quantity ■	\$ Price
1 C/O	24 Vdc or Vac 110–240 Vac	0.1–3 s	RE8TA61BUTQ	10	75.00
1 0/0		0.1-10 s	RE8TA11BUTQ ★	10	75.00
		0.3–30 s	RE8TA31BUTQ ★	10	75.00
ODDT.		3–300 s	RE8TA21BUTQ ★	10	75.00
SPDT		20 s-30 min	RE8TA41BUTQ	10	75.00

Table 23.137: Off-Delay (timing starts on de-energization), TDD

Control Contact					
		0.1-10 s	RE8RA11BTQ ★	10	95.0
1 C/O	O 24 Vdc or Vac	0.3–30 s	RE8RA31BTQ	10	95.0
10/0		3–300 s	RE8RA21BTQ ★	10	95.0
		0.1-10 s	RE8RA11FUTQ ★	10	95.0
	110–240 Vac	0.3–30 s	RE8RA31FUTQ	10	95.0
SPDT 110–240	110-240 Vac	3–300 s	RE8RA21FUTQ ★	10	95.0
		20 s-30 min	RE8RA41FUTQ	10	95.0
elf-Powered (Times v	vithout power)				
1 C/O		0.05-0.5 s	RE8RB51BUTQ	10	105.0
	24 Vdc or Vac 110–240 Vac SPDT	0.1–10 s	RE8RB11BUTQ	10	105.00
SPDT		0.3–30 s	RE8RB31BUTQ	10	105.0

<sup>★</sup> Also available in pack of one; delete TQ from the end of the catalog number. Example: RE8TA11BU.

### Table 23.138: Repeat Cycle Timer

Relay Output	Supply Voltages	Timing Range ▲	Catalog Number	Standard Pack Quantity ■	\$ Price
1 C/O					
SPDT	24 Vdc or Vac 110–240 Vac	0.1–10 s	RE8CL11BUTQ	10	105.00

### Table 23.139: Interval Timer

On Energization					
1 C/O		0.1-10 s	RE8PE11BUTQ	10	87.00
4.0	24 Vdc or Vac	0.3–30 s	RE8PE31BUTQ	10	87.00
SPDT	110-240 Vac	3–300 s	RE8PE21BUTQ	10	87.00
By Control Contact					
	24 Vdc or Vac	0.1-10 s	RE8PD11BTQ	10	101.00
1 C/O		0.3–30 s	RE8PD31BTQ	10	101.00
~		3–300 s	RE8PD21BTQ	10	101.00
<b>√.</b>		0.1–10 s	RE8PD11FUTQ	10	101.00
SPDT	110-240 Vac	0.3–30 s	RE8PD31FUTQ	10	101.00
		3–300 s	RE8PD21FUTQ	10	101.00
On De-Energization					
1 C/O					
SPDT	24 Vdc or Vac 110–240 Vac	0.05–1 s	RE8PT01BUTQ	10	107.00

- For easier adjustment, it is preferable to set the time delay between the maximum value in the range and one tenth of this value. Example: RE8TA11BUTQ timing range 0.1–10 s, recommended use 1–10 s.
- Orders must specify standard pack quantity or multiples of that quantity.

For technical information, refer to ...... page 23-32.

### Table 23.140: On-Delay Timer (Solid State Output)

Power Supply Circuit	Function	Timing Range ♦	Catalog Number	\$ Price
24–240 Vac or Vdc		0.1–10 s	RE9TA11MW	87.00
	On-Delay	0.3–30 s	RE9TA31MW	87.00
		3–300 s	RE9TA21MW	87.00
		40 s-60 min	RE9TA51MW	87.00

### Table 23.141: Off-Delay Timer (Solid State Output)

		0.1–10 s	RE9RA11MW7	126.00
24–240 Vac	Off Delevi	0.3–30 s	RE9RA31MW7	126.00
	Off-Delay	3–300 s	RE9RA21MW7	126.00
		40 s-60 min	RE9RA51MW7	126.00

For easier adjustment, it is preferable to set the time delay between the maximum value in the range and one tenth of this value. Example: RE9TA11MW timing range 0.1-10 s, recommended use 1-10 s.

RoHS Compliant as of date code 0626

For technical information, refer to catalog 9050CT0001.



RE8TA

RE8PE



## Class 9050 / Refer to Catalog 9050CT9601



### Square D™ General Purpose Plug-In



9050JCK timing relays are designed to provide low-cost timing in a plug-in housing. The Types JCK11 thru 59 provide ±1% repeat accuracy. The Types JCK60 and 70 offer ±0.1% repeat accuracy. These timers are directly interchangeable with many other 8 and 11 pin tube base timers.

- Up to ±0.1% repeat accuracy
- Timing from 0.05 seconds to 999 hours
- Available in 5 timing modes
- DPDT contacts (2 N.O. and 2 N.C.)
- 10 A contact rating
- Transient protected
- Hold down spring available
- Variable or fixed time delay
- Horsepower rated
- RoHS compliant

### Table 23.142: Variable Time Delay

Knob Adjustable Timing Range	On Delay	\$ Price	Off Delay■	\$ Price	Off Delay Power Trigger	\$ Price	Interval	\$ Price	One Shot■	\$ Price	One Shot Power Trigger	\$ Price	Repeat Cycle▲	\$ Price
0.1-10 seconds	JCK11△	78.00	JCK21△	98.00	JCK21PT△	98.00	JCK31△	78.00	JCK41△	98.00	JCK41PT△	98.00	JCK51△	140.00
0.3-30 seconds	JCK12△	78.00	JCK22△	98.00	JCK22PT△	98.00	JCK32△	78.00	JCK42△	98.00	JCK42PT△	98.00	JCK52△	140.00
0.6-60 seconds	JCK13△	78.00	JCK23△	98.00	JCK23PT△	98.00	JCK33△	78.00	JCK43△	98.00	JCK43PT△	98.00	JCK53△	140.00
1.2-120 seconds	JCK14△	78.00	JCK24△	98.00	JCK24PT△	98.00	JCK34△	78.00	JCK44△	98.00	JCK44PT△	98.00	JCK54△	140.00
1.8-180 seconds	JCK15△	78.00	JCK25△	98.00	JCK25PT△	98.00	JCK35△	78.00	JCK45△	98.00	JCK45PT△	98.00	JCK55△	140.00
0.1-10 minutes	JCK16△	87.00	JCK26△	107.00	JCK26PT△	107.00	JCK36△	87.00	JCK46△	107.00	JCK46PT△	107.00	JCK56△	147.00
0.3–30 minutes	JCK17△	87.00	JCK27△	107.00	JCK27PT△	107.00	JCK37△	87.00	JCK47△	107.00	JCK47PT△	107.00	JCK57△	98.00
0.6-60 minutes	JCK18△	87.00	JCK28△	107.00	JCK28PT△	107.00	JCK38△	87.00	JCK48△	107.00	JCK48PT△	107.00	JCK58△	98.00
1.2–120 minutes	JCK19△	87.00	JCK29△	107.00	JCK29PT△	107.00	JCK39△	87.00	JCK49△	107.00	JCK49PT△	107.00	JCK59△	98.00

- Two dials are provided for independently adjustable repeat cycle timing ranges.
- Initiating contact can be up to 50 feet from the timer.

### Table 23.143: Fixed Time Delay

Timing Mode	Туре	Timing Range (seconds)	\$ Price
On Delay	JCK1F(XXXX)♦△	0.1 to 180	78.00
On Delay	JUNIF(XXXX)♥△	181 to 3600	87.00
Off Delay ▼	JCK2F(XXXX)♦△	0.1 to 180	98.00
On Delay ¥	JCKZI (XXXX)¥Z	181 to 3600	107.00
Off Delay with	JCK2F(XXXX)PT♦△	0.1 to 180	98.00
Power Trigger	JCKZI (XXXX)FT VA	181 to 3600	107.00
Interval	JCK3F(XXXX) ♦ △	0.1 to 180	78.00
Interval	JUN3F(XXXX)♥△	181 to 3600	87.00
One Shot▼	JCK4F(XXXX)♦△	0.1 to 180	98.00
One Shot	JCR41 (XXXX) ♥ △	181 to 3600	107.00
One Shot with	JCK4F(XXXX)PT♦△	0.1 to 180	98.00
Power Trigger	JCK4F(XXXX)F1♥△	181 to 3600	107.00
Repeat Cycle	JCK5F(XXXX)◆★△	0.1 to 180	140.00
	JCK9F(XXXX)♥¥△	181 to 3600	147.00

- (XXXX) denotes the timing period in seconds. Example: Class 9050 Type JCK1F60 is an On Delay timer fixed at 60 seconds. Fixed repeat cycle timers can be supplied with the same or different On-Time and Off-Time.
- Initiating contact can be up to 50 feet from the timer.
- Voltage code must be specified to order this product. Refer to standard voltage codes listed below and insert as shown in How To Order.

### Class 8501 Sockets

For sockets, see page 23-14 For DIN rail, see page 24-16

### For all 9050JCK timers:

With appropriate 8501NR Socket:





214768 3211 07



**RoHS** IEC Compliant as of date code

9050JCK1-5 = 0627

### Table 23.144: Voltage Codes

Voltage	Code			
12 Vdc	V36			
24 Vac/Vdc	V14			
48 Vac/Vdc	V17			
120 Vac/110 Vdc	V20			
240-50/60 Vac	V24			

### Table 23.145: Contact Ratings

		AC An	nperes				DC Amperes			
	Indu	ctive 35%	6 P.F.				Indu	ctive	ak us	
AC Volts	Make	Break	Continuous	Res. 75% P.F. Make Break an Continuous	hp	DC Volts	Make	Break	Res. Make Break and Continuous	
120	30	3	10	10	1/3	28	3	3	10	
240	15	1.5	10	10	1/2	2	)	)	10	

### AC15 / B300 (NO/NC) DC13 / R300 (NO)

### Type JCK60

This On Delay timer uses a 5 position rotary switch to select the timing range. The three pushbutton thumbwheels are used to select the time

### Table 23.146: Selection and Pricing

Timing Modes	Timin	g Ranges	Туре	\$ Price
On Delay	.01s 0.1s S 0.1m M 0.1h	0.05–9.99 seconds 00.1–99.9 seconds 001–999 seconds 00.1–99.9 minutes 001–99.9 hours 001–99.9 hours	JCK60△	152.00

### Type JCK70

Two 5 position rotary switches are used to select the timing mode and timing range. The three pushbutton thumbwheels are used to select the

### Table 23.147: Selection and Pricing

Timing Modes	Timing Range	Туре	\$ Price
On Delay Off Delay Interval One Shot Repeat Cycle	Same as JCK60	JCK70△	173.00

on-time and off-time.

### Table 23.148: Class 8501 Hold Down Spring

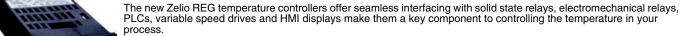
For use on Class 9050 Type JCK Timers	Class	Туре	\$ Price ea.
Hold down spring holds timer in socket during heavy vibration. (See 9050JCK with 8501NH7 photo at the top of this page.)	8501	NH7	8.30

### Table 23.149: How to Order

Table 23.149. 110W	Table 23.149. How to Order									
To Order Specify:	Ca	atalog Num	ber							
<ul><li>Class Number</li><li>Type Number</li></ul>	Class	Туре	Voltage Code							
<ul> <li>Voltage Code</li> </ul>	9050	JCK11	V20							



REG24PTP1RHU



**Relays** 

Offer includes 3 versions:

**Control and Measurement** 

- A 24x48 mm (1/32 DIN) cost effective solution for basic temperature control needs.
- A 48x48 mm (1/16 DIN) balanced version for optimal price and functionality.
- A 96x48 mm (1/8 DIN) full-featured version for complete performance and function.

### Key features include:

- Modbus communication for easy data exchange with other automation products
- Simple parameter settings
- IP66 certification enables dust resistance
- Flash memory (saves configurations)
- Compatible with a wide range of sensors

**Zelio™ Temperature Controllers** 

- Advanced Functions (standard): PID, fuzzy logic, auto-tuning, soft start
- Optimized programming
  - Common software for all products in the temperature relay range (freely downloadable from www.schneider-electric.us).
  - A single cable enables connection to both a computer and PLCs.
  - Simple adjustment of parameters.
  - Saving of configurations.

### Table 23.150: Zelio Temperature Controllers



REG48PUN1RHU

REG96PUN1RHU

Input Type	Supply Voltage	Number and Type of Outputs	Alarms	Communication on Modbus	Catalog Number	\$ Price
28 x 48 Size —	1/32 DIN Standard					
Thermocouple PT100 Probe	100/240 Vac	1 electromechanical relay 1 electromechanical relay 1 solid state relay 1 solid state relay 1 analog interface (4–20 mA)	No 1 No 1 No	Yes Yes Yes No Yes	REG24PTP1RHU REG24PTP1ARHU REG24PTP1LHU REG24PTP1ALHU REG24PTP1JHU	209.00 186.00 216.00 192.00 219.00
	24 Vac/Vdc	1 electromechanical relay 1 solid state relay 1 analog interface (4–20 mA)	No No No	Yes Yes Yes	REG24PTP1RLU REG24PTP1LLU REG24PTP1JLU	209.00 216.00 219.00
Voltage/current	100/240 Vac	1 electromechanical relay 1 solid state relay	No No	Yes Yes	REG24PUJ1RHU REG24PUJ1LHU	209.00 216.00
	24 Vac/Vdc	1 electromechanical relay 1 solid state relay	No No	Yes Yes	REG24PUJ1RLU REG24PUJ1LLU	219.00 216.00
48 x 48 Size —	1/16 DIN Standard					
		1 electromechanical relay	2	Yes No	REG48PUN1RHU REG48PUNL1RHU	252.00 226.00
		2 electromechanical relays	2	Yes	REG48PUN2RHU	292.00
	100/240 Vac	1 solid state relay	2	Yes No	REG48PUN1LHU REG48PUNL1LHU	258.00 234.00
Universal		1 solid state relay + 1 electromechanical relay 1 analog interface (4–20 mA) 1 solid state relay + 1 analog interface (4–20 mA)	2 2 2	Yes Yes Yes	REG48PUN2LRHU REG48PUN1JHU REG48PUN2LJHU	295.00 260.00 298.00
	24 Vac/Vdc	1 electromechanical relay     2 electromechanical relays     1 solid state relay     1 solid state relay     1 analog interface (4–20 mA)     1 solid state relay + 1 analog interface (4–20 mA)	2 2 2 2 2 2	Yes Yes Yes Yes Yes Yes	REG48PUN1RLU REG48PUN2RLU REG48PUN1LLU REG48PUN2LRLU REG48PUN1JLU REG48PUN2LJLU	252.00 292.00 258.00 295.00 260.00 298.00
98 x 48 Size —	1/8 DIN Standard			l.		
		1 electromechanical relay	3	Yes No	REG96PUN1RHU REG96PUNL1RHU	336.00 311.00
		2 electromechanical relays	3	Yes	REG96PUN2RHU	381.00
	100/240 Vac	1 solid state relay	3	Yes No	REG96PUN1LHU REG96PUNL1LHU	343.00 317.00
Universal		1 solid state relay + 1 electromechanical relay 1 analog interface (4–20 mA) 1 solid state relay + 1 analog interface (4–20 mA)	3 3 3	Yes Yes Yes	REG96PUN2LRHU REG96PUN1JHU REG96PUN2LJHU	383.00 345.00 385.00
	24 Vac/Vdc	1 electromechanical relay     2 electromechanical relays     1 solid state relay     1 solid state relay + 1 electromechanical relay     1 analog interface (4–20 mA)     1 solid state relay + 1 analog interface (4–20 mA)	3 3 3 3 3	Yes Yes Yes Yes Yes	REG96PUN1RLU REG96PUN2RLU REG96PUN1LLU REG96PUN2LRLU REG96PUN1JLU REG96PUN2LJLU	336.00 381.00 343.00 384.00 345.00 385.00

Table 23.151: Temperature Controller Accessories

Description	For Use With Relays	Sold In Lots Of	Catalog Number	\$ Price
Bracket for mounting on DIN rail	24 x 48 mm (1/32 DIN)	4	REG24PSOC	21.90
Terminal block cover	48 x 48 mm (1/16 DIN) 96 x 48 mm (1/8 DIN)	2 2	REG48PCOV REG96COV	30.30 37.10





RM17JC00MW

A1 A2 E3 E2 E1 M

### Zelio™ Current Measurement Relays

Zelio Current Measurement Relays are designed to measure under and overcurrent, without external sensors. Current measurement relays enable continuous monitoring of the operation of electrical and mechanical loads such as motors and resistors. They are DIN rail mountable and the control status is indicated by an LED.

### **RM17JC Current Control Relay**

- Monitors a.c. currents
- Designed to monitor overcurrent
- Equipped with an integrated current transfmormer

### **RM35JA Current Control Relays**

- Selection between overcurrent or undercurrent
- Automatic d.c. or a.c. recognition
- Selectable memory function

### Table 23.152:

Measurem	Measurement Range		Width		Catalog Number	\$ Price		
Range▲	Terminals	5Amps	Inches	mm	- Catalog Number	\$ FIICE		
2–20 A	N/A	1 C/O	0.69	17.50	RM17JC00MW	130.00		
2–20 mA	E1-M				BM35.IA31MW			
10–100 mA	E2-M							1 11110007 10 111111
50–500 mA	E3-M	2.00	1.00	25.00				
0.15–1.5 A	E1-M	20/0	20/0	1.30	35.00	BM35.IA32MW		
0.5–5 A	E2-M				1 1110007 10211111	177.00		
1.5–15 A	E3-M							
	Range ▲ 2-20 A 2-20 mA 10-100 mA 50-500 mA 0.15-1.5 A 0.5-5 A	2-20 A N/A 2-20 mA E1-M 10-100 mA E2-M 50-500 mA E3-M 0.15-1.5 A E1-M 0.5-5 A E2-M	Range ▲         Terminals         5Amps           2-20 A         N/A         1 C/O           2-20 mA         E1-M           10-100 mA         E2-M           50-500 mA         E3-M           0.15-1.5 A         E1-M           0.5-5 A         E2-M	Range ▲         Terminals         5Amps         Inches           2-20 A         N/A         1 C/O         0.69           2-20 mA         E1-M         10-100 mA         E2-M           50-500 mA         E3-M         2 C/O         1.38           0.15-1.5 A         E1-M         2 C/O         1.38	Range ▲         Terminals         5Amps         Inches         mm           2-20 A         N/A         1 C/O         0.69         17.50           2-20 mA         E1-M         10-100 mA         E2-M           50-500 mA         E3-M         2 C/O         1.38         35.00           0.15-1.5 A         E1-M         0.5-5 A         E2-M         2 C/O         1.38         35.00	Range ▲         Terminals         5Amps         Inches         mm         Catalog Number           2-20 A         N/A         1 C/O         0.69         17.50         RM17JC00MW           2-20 mA         E1-M         F1-M         FM35JA31MW         RM35JA31MW           10-100 mA         E2-M         2 C/O         1.38         35.00         RM35JA32MW           0.15-1.5 A         E1-M         FM35JA32MW         RM35JA32MW         RM35JA32MW		

<sup>▲</sup> Above 15A, a current transformer can be connected (for RM35JA3•MW). See page 57 of the catalog for suggested wiring.

### Table 23.153: Output Characteristics and Measurement Circuit Characteristics

Type of Relay		RM17JC00MW	RM35JA31MW	RM35JA32MW		
Setting accuracy		Plus or minus 10% of the full scale value				
Repeat accuracy (with constant param	eters)		Plus or minus 0.5%			
Hysteresis		15% of the threshold setting, fixed	5 to 50% of the threshold setting, adjustable			
Time delay accuracy (with constant pa	rameters)	N/A plus or minus 2%				
Time delay on pick-up		500ms	300	Oms		
Conforming to standards			NF EN 60255-6			
Ambient air temperature around the	Storage	-40 to 158 degrees F (-40 to +70°C)				
device	Operational	-4 to 122 degrees F (-20 to +50°C)				

# A1 A2 E3 E2 E1 M

RM35JA31MW

### Approvals:





217698 3211 07



CE: 73/23/EEC and EMC 89/336/EEC

GL, C-Tick, GOST, RoHS

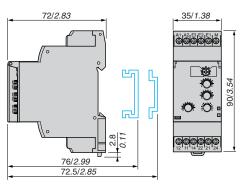


**RELAYS AND TIMERS** 

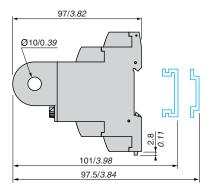
### RM35JA32MW

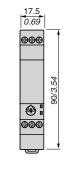


## **Approximate Dimensions** RM35JA3•MW



### RM17JC00MW





Dual Dimensions: INCHES Millimeters



RM17TG•0

RM17TA00

RM17TE00

### Zelio™ Phase Measurement Relays

**Control and Measurement** 

**Relays** 

Zelio Phase Measurement Relays monitor their own power supply. Relay status is indicated by an LED and they are DIN rail mountable.

RM17TG•0 measurement and control relays are for monitoring of 3-phase supplies for the correct sequencing of phases L1, L2, and L3, as well as the total loss of one or more phases.

Table 23.154: 3-Phase supply control relays

Supply			Wi	dth	Catalog Number	S Price
Voltage	Threshold	5 Amps	inches	mm	Catalog Number	\$ FILE
208-480 Vac	<100 Vac	1 C/O	0.69	17.50	RM17TG00	114.00
208-440 Vac	<100 vac	2 C/O	0.09	17.50	RM17TG20	125.00

### Table 23.155: Multifunction 3-phase supply control relays

Supply	Voltage	Output	Wi	dth	Catalog	\$ Price
Voltage	Range	5 Amps	inch	mm	Number	\$ FIICE
	Selectable voltages: 208–480 Vac Selectable voltages: 208, 220, 380, 400, 415, 440, 480				RM17TT00	136.00
208–480 Vac			0.69	17.50	RM17TA00	177.00
200 400 100			0.00	17.00	RM17TU00	131.00
					RM17TE00	217.00

Table 23.156: RM17TT, RM17TA, RM17TU, and RM17TE multifunction control relays monitor the following on 3-phase supplies:

Function	RM17TT	RM17TA	RM17TU	RM17TE
Sequence of phases L1, L2 and L3	Yes	Yes	Yes	Yes
Phase failure with regeneration (0.7 x selected voltage range)	Yes	Yes	Yes	Yes
Asymmetry (phase imbalance)	No	Yes	No	Yes
Undervoltage	No	No	Yes	No
Overvoltage and undervoltage	No	No	No	Yes

Table 23.157: 3-phase supply and motor temperature control relays

Supply	Measurement	Output	Width		Catalog	\$ Price
Voltage	Voltage Range 5 Amps	inch	mm	Number	ψ1 Hoc	
220–480 Vac	208–480 Vac	2 N.O.	1.38	35.00	RM35TM50MW	221.00
220-400 Vac	200-400 Vac	2 IN.O.	1.00	33.00	RM35TM250MW	231.00

Table 23.158: RM35TM control relays monitor the following on 3-phase supplies:

Function	RM35TM50MW	RM35TM250MW
Sequence of phases L1, L2 and L3	Yes	Yes
Phase failure	Yes	Yes
Motor temperature via PTC probe	Yes	Yes
Selection (with or without memory)	No	Yes
Test-reset button	No	Yes

RM35TF30 measurement and control relay is for monitoring of phase sequence, phase failure, asymmetry, undervoltage and overvoltage in window mode.

Table 23.159: Multifunction 3-phase supply control relays

Supply	Measurement	Output	Width Catalog		\$ Price	
Voltage	Range	5 Amps	inch	mm	Number	ψTHOC
220-480 Vac	194-528 Vac	2 C/O	1.38	35.00	RM35TF30	273.00
	111 120 140			22.00		

## Approvals:



E173076



217698 File



CE: 73/23/EEC and

GL. C-Tick. GOST. RoHS

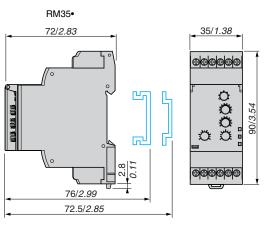


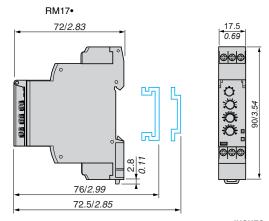
RM35TM••MW

RM35TF30



**Approximate Dimensions** 



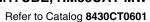


Dual Dimensions:

INCHES Millimeters RM17UB310

RM35UB3•••

RM17UAS•



### Zelio™ Voltage Measurement Relays

Zelio Voltage Measurement Relays are DIN rail mountable and relay status is indicated by an LED. Single phase and d.c. voltage measurement and control relays RM17UAS and RM17UBE monitor:

- Overvoltage
- Undervoltage
- Overvoltage and undervoltage (window mode)
- Nominal voltages

Table 23.160: Single-phase and d.c. voltage control relays

Supply Voltage	Ranges Controlled	Output 5 A	Wi	Width		\$ Price	
Supply Voltage	nanges controlled	Output 3 A	in.	mm	Catalog Number	\$ FILE	
12 Vdc	9–15 Vdc				RM17UAS14▲	138.00	
24-48 Vac/Vdc	20-80 Vac/Vdc				RM17UAS16▲	138.00	
110-240 Vac/Vdc	65-260 Vac/Vdc	1 C/O	0.69	17.50	RM17UAS15▲	138.00	
24-48 Vac/Vdc	20-80 Vac/Vdc				RM17UBE16■	146.00	
110-240 Vac/Vdc	65-260 Vac/Vdc				RM17UBE15■	146.00	
A Browides ever	oltaga ar undan altaga	protection	•				

- Provides overvoltage and undervoltage protection in window mode.

Multifunction voltage control relays RM35UA1•MW monitor both a.c. and d.c. voltages.

- Automatic Vdc or Vac recognition
- Selection between overvoltage and undervoltage

### Table 23.161: Multifunction voltage control relays

Supply Voltage	Measurem	ent Range	Output Wid		dth	Catalog	\$ Price
Supply voltage	Range★	Terminals	5 Å	in.	mm	Number	\$ Price
	0.05-0.5 V	E1-M				RM35UA11MW	
	0.3–3 V	E2-M					157.00
	0.5–5	E3-M		1.38	35.00		
	1–10	E1-M				RM35UA12MW	
24-240 Vac/Vdc	5–50	E2-M	2 C/O				157.00
	10–100	E3-M					
-	15–150	E1-M				RM35UA13MW	
	30–300	E2-M					157.00
	60–600	E3-M					

3-phase voltage control relays monitor:

- Failure of one or more phases
- Voltage between phases
- Absence of neutral
- Voltage between phases and neutral
- Overvoltage and undervoltage

### Table 23.162: Three-phase voltage control relays

Rated 3-Phase	Measurement Range	Output	Wi	dth	Catalog	\$ Price
Supply Voltage Vac	weasurement hange	5 A	in.	mm	Number	\$ FILE
220–480 phase-phase	195–528 Vac	1 C/O + 1 C/O 1 per threshold	1.38	35.00	RM35UB330 ♦	229.00
120–277 phase-neutral	183–528 Vac	1 C/O	0.69	17.50	RM17UB310◆	189.00
120-277 phase-neutral	114–329 Vac	1 C/O + 1 C/O 1 per threshold	1.38	35.00	RM35UB3N30★	254.00

- Provides overvoltage and undervoltage protection between phases.

  Provides overvoltage and undervoltage protection between phases and neutral and absence of neutral.

### Approvals:



E173076 NRNT

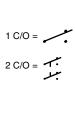


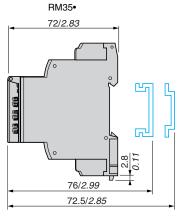


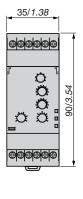
CE: 73/23/EEC and EMC 89/336/EEC

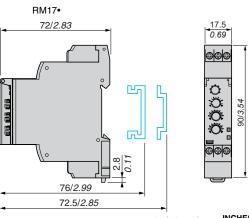
GL, C-Tick, GOST, RoHS

### **Approximate Dimensions**









**Dual Dimensions:** 

INCHES Millimeters

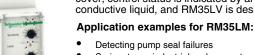
RELAYS AND TIMERS



### Control and **Measurement Relays**

## Zelio™ Level Control Relays and Zelio™ Pump Control Relays

Zelio level control relays control one or two levels with fill or empty function. The settings are protected by a sealable cover, control status is indicated by an LED, and they are DIN rail mountable. RM35LM is designed to control levels of conductive liquid, and RM35LV is designed to control levels of other materials.



RM35LM33MW

RM35LV14MW

RM79696043

### Detecting pump seal failures

- Spring, town, industrial and sea water
- Metallic salt, acid or base solutions
- Liquid fertilizers
- Non-concentrated alcohol (<40%)

- Liquids in the food-processing industry: milk, beer, coffee, etc. Application examples for RM35LV:
- Chemically pure water
- Fuels, liquid gasses (inflammable)
- Oil, concentrated alcohol (>40%)
- Ethylene, glycol, paraffin, varnish and paints



Time Delay on Crossing the Threshold	Function	Output Relay	Supply Voltage 50/60 Hz	Measurement Ranges	Catalog Number	\$ Price
0.1–5 seconds,	Detection by resistive	2 C/O, 5A		250 Ω –5 kΩ 5 kΩ –100 kΩ	RM35LM33MW	115.00
0.1–5 seconds, 0 + 10%	probes	ŕ	24-240 Vac/Vdc	50 kΩ−1 MΩ		
	Detection by discrete sensors	1 C/O, 5A		_	RM35LV14MW	146.00

Table 23.164: Probes

Application	No. of	Operating t	emperature	Maximum	Catalog	\$ Price	
Application	probes	°F	°C	pressure kg/cm <sup>2</sup>	Number	3 FIICE	
Recommended for drink vending machines and where installation space is limited (stainless steel)▲	3	176	80	2	RM79696044	78.00	
Suitable for boilers, pressure vessels, and under high temperature conditions (1) (304 stainless steel)▲	1	392	25	200	RM79696014	95.00	

<sup>3/8&</sup>quot; BSP mounting thread with hexagonal head. Use a 24mm spanner for tightening.

### Table 23.165: Probes

Description	Catalog Number	\$ Price
Protected probe for mounting by suspension, protective shell PUC (S7) Electrode: stainless steel	RM79696043	57.00
Liquid level control probe, suspended by cable, maximum operating temperature 212°F/100°C■	LA9RM201	83.00

<sup>3/8&</sup>quot; BSP mounting head

### Table 23.166: Electrode Holders

Description	Material	Catalog Number	\$ Price
Electrode for use up to 662°F (350°C)	Stainless steel isolated by ceramic	RM79696006	62.00

Pump control relay RM35BA10 can operate on a single-phase or 3-phase supply. It incorporates three functions in a signal unit:

Over and under current measurement

Phase presence control

Single or three phase

It has two operating modes which are designed to control a pump via two external signal inputs (Y1 Y2). These two signals are controlled by volt-free contacts. Control inputs Y1 and Y2 can be connected to:

- Level sensor
- Level relay
- Pressure sensor
- Push button

Table 23.167: Pump Control Relay

Description	Current Range Controlled	Supply Voltage	Output	Catalog Number	\$ Price
Pump Control Relav	1–10 A	208-480 Vac, 3 phase	1 C/O 5 A	RM35BA10	284.00
- unp control rielay	1-10 A	230, single-phase	10/034		204.00







GL, C-Tick, GOST,

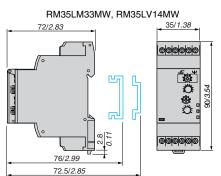


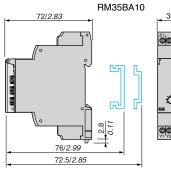
LA9RM201

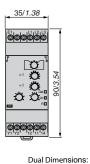


RM35BA10 1 C/O =

### **Approximate Dimensions**







Millimeters



RM35S0MW

RM35HZ21FM

### Zelio™ Speed Control Relays, Zelio™ Frequency Control Relays, and Zelio™ Temperature Control Relays

Zelio speed control relay RM35SOMW monitors underspeed and overspeed, with or without memory, with inhibition by an external contact. It operates with either N.O. or N.C. sensors. Adjustable time between impulses is 0.05s to 10m. Power-on inhibition time is adjustable from 0.6 to 60s. Inhibition is controlled by an external contact. Settings are protected by a sealable cover, control status is indicated by an LED, and it is DIN rail mountable.

Table 23.168: Speed Control Relay

Fun	nction	Time Delay	Measurement Input	Supply	Output	Catalog Number	\$ Price
Unde	erspeed	0.05s-10min	3-wire PNP or NPN proximity sensor	24-240 Vac/Vdc	1 C/O	RM35S0MW	217.00
Ove	rspeed	0.003-1011111	Namur proximity sensor 0–30 V voltage Volt-free contact	24 240 Vac/ Vac	5A		217.00

Zelio frequency control relay RM35HZ monitors its own supply voltage. Settings are protected by a sealable cover, control status is indicated by an LED, and it is DIN rail mountable.

Table 23.169: Frequency Control Relay

Function	Controlled	Supply Voltage	Output	Catalog Number	\$ Price
Over frequency and under frequency (50 or 60 Hz)	40–60 Hz (50 Hz) / 50–70 Hz (60 Hz)	120–277 Vac	1 C/O + 1 C/O 5A	RM35HZ21FM	222.00

Zelio temperature control relays are designed for monitoring the temperature in elevator (lift) pully rooms, in compliance with directive EN81. For use with PT100 input (customer supplied). Features adjustable control, control status is indicated by an LED, and it is DIN rail mountable.

Table 23.170: Temperature Control Relays

Function	Supply Voltage	Vac	Output	Catalog Number	\$ Price
Over temperature 93 to 114°F (34 to 46°C)		_	1 C/O 5A	RM35ATL0MW	141.00
Under temperature 30 to 51°F (-1 to 11°C)	24-240 Vac/Vdc	_	2 N.O. 5A	RM35ATR5MW	151.00
Over temperature 93 to 114 °F (34 to 46°C)		208–480 Vac	2 N.O. 5A	RM35ATW5MW	
Under temperature 30 to 51°F (-1 to 11°C)		200-400 Vac	2 N.O. 3A	HIVIOSAI VVSIVIVV	237.00
Phase sequence					237.00
Phase failure					

## Approvals:





217698 3211 07

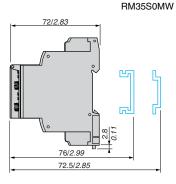


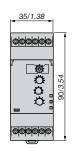


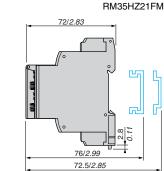


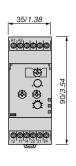
RM35AT•0MW

### Approximate Dimensions

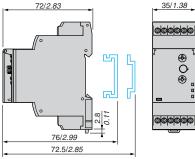








RM35AT••MW



INCHES Dual Dimensions:



### Phaseo™ DC Power Supply

Phaseo switch mode power supplies are totally electronic and their output voltage is regulated. They offer:

- Compact size
- High degree of output voltage stability

For use with Universal power supplies, see optional function modules in catalog 8440CT0601/08, which offer a set of solutions to meet the needs for continuity of service such as:

- Immunity to microbreaks
- Voltage holding during power outages
- Voltage holding during power supply equipment failure

### Table 23.171: Modular, Single Phase

Meets all the needs of simple automation systems with power ratings from 7 to 60 W and an output voltage of 5 Vdc, 12 Vdc, or 24 Vdc.

Input Voltage (Vac)	Output Voltage (Vdc)	Nominal Current (I)	Protection Reset	Catalog Number	\$ Price
	5	4		ABL8MEM05040	128.
	12	2		ABL8MEM12020	132.
100–240		0.3	Auto	ABL8MEM24003	71.
100–240	24	0.6	Auto	ABL8MEM24006	105.
		1.2		ABL8MEM24012	141.
		2.5		ABL7RM24025	180.



### Table 23.172: Optimum, Single Phase

The low-cost solution for applications supplied at 12 Vdc, 24 Vdc, or 48 Vdc and requiring currents between 3 and 5 A.

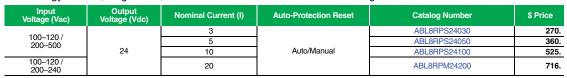
Input Voltage (Vac)	Output Voltage (Vdc)	Nominal Current (I)	Protection Reset	Catalog Number	\$ Price
	12	5		ABL7RP1205	360.
100–240	24	3	Auto	ABL8REM24030	195.
100–240	24	5	Auto	ABL8REM24050	300.
	48	3		ABL7RP4803	225.



ABL8REM24030

### Table 23.173: Universal, Single Phase

Adapts to the majority of power distribution systems with power ratings from 72 to 480 W at 24 Vdc. The same power supply can be connected phase-to-neutral (N-L1) or phase-to-phase (L1-L2) for line supplies ranging from 100 to 500 Vac. Energy reserve, diagnostics, and choice of manual or auto reset are integrated into these units.





ABL8RPS24100

### Table 23.174: Universal, Three Phase

This three-phase, 480 to 960 W, 24 Vdc output offering is particularly suited for complex machines and processes. Energy reserve, diagnostics and choice of manual or auto reset are integrated into these units.

Input Voltage (Vac)	Output Voltage (Vdc)	Nominal Current (I)	Auto-Protection Reset	Catalog Number	\$ Price
380–500	24	20	Auto/Manual	ABL8WPS24200	735.
		40		ABL8WPS24400	1173.



ABL8WPS24200

### Table 23.175: Dedicated, Single Phase

Designed for integration into repetitive equipment with power ratings from 60 to 240 W and an output voltage of 12 Vdc or 24 Vdc.

Input Voltage (Vac)	Output Voltage (Vdc)	Nominal Current (I)	Protection Reset	Catalog Number	\$ Price
	12	5		ABL1REM12050	113.
100–240▲	24	2.5		ABL1REM24025	93.
	24	4.2	Auto	ABL1REM24042	132.
100–120 / 200–240■	24	6.2		ABL1REM24062	143.
100-120 / 200-240■	24	10		ABL1REM24100	206.
100–240▲	12	8.3		ABL1RPM12083	150.
100-240-	24	4.2	Auto	ABL1RPM24042	158.
100–120 / 200–240■	24	6.2	Auto	ABL1RPM24062	173.
100-1207 200-240	24	10		ABL1RPM24100	270.



ABL1RPM24042

- Compatible input voltage 120-370 Vdc not indicated on the product.
- Compatible input voltage 180-370 Vdc not indicated on the product.



ABL1RPM24100

### Approvals:







F164867







See www.Schneider-Electric.us for UL and CSA compliances. For additional information, refer to Catalog #8440CT0601R1/08.



### Tielei to Oa



RMTJ40BD



RMTK90BD



RMPT70BD



RMPT13BD



RMCN22BD

### Zelio™ Analog Interface Modules

The Zelio Analog range of converters is designed to convert signals emitted by sensors or electrical measurement devices, into standard electrical signals that are compatible with automation platforms and controllers. They also allow the connection distance between a sensor and a measurement device to be increased, for example, between a thermocouple and a programmable controller

Table 23.176: Converters for Type J and K type thermocouples—supply voltage 24 Vdc ± 20%, non-isolated

	Туре	Temperati	ure Range	- Switchable Output Signals	Catalog Number	\$ Price
	туре	°F	°C	Switchable Output Signals	Catalog Number	\$ FIICE
		32-302	0-150	0-10 V, 0-20 mA, 4-20 mA	RMTJ40BD	141.00
Ty	/pe J	32-572	0-300	0-10 V, 0-20 mA, 4-20 mA	RMTJ60BD	141.00
		32-1112	0–600	0-10 V, 0-20 mA, 4-20 mA	RMTJ80BD	141.00
	pe K	32-1112	0-600	0-10 V, 0-20 mA, 4-20 mA	RMTK80BD	141.00
13	/pe K	32-2192	0-1200	0-10 V, 0-20 mA, 4-20 mA	RMTK90BD	141.00

Table 23.177: Converters for Universal Pt100 probes—supply voltage 24 Vdc ± 20%, non-isolated

Type	Temperature Range		Switchable Output Signals	Catalog Number	S Price
Туре	°F	°C	Switchable Output Signals	Catalog Number	3 Frice
	- 40–104	- 40–40	0-10 V, 0-20 mA, 4-20 mA	RMPT10BD	141.00
Pt100	- 148–212	- 100–100	0-10 V, 0-20 mA, 4-20 mA	RMPT20BD	141.00
2-wire, 3-wire, and	32-212	0-100	0-10 V, 0-20 mA, 4-20 mA	RMPT30BD	141.00
4-wire	32-482	0-250	0-10 V, 0-20 mA, 4-20 mA	RMPT50BD	141.00
	32-932	0-500	0-10 V, 0-20 mA, 4-20 mA	RMPT70BD	141.00

Table 23.178: Converters for Optimum Pt100 probes ▲—supply voltage 24 Vdc ± 20%, non-isolated

Type	Temperati	ure Range	Cuitabable Output Cienale	Catalan Number	\$ Price	
Туре	°F	°C	Switchable Output Signals	Catalog Number		
	- 40–104	- 40–40	0-10 V or 4-20 mA	RMPT13BD	113.00	
Pt100	- 148–212	- 100–100	0-10 V or 4-20 mA	RMPT23BD	113.00	
2-wire, 3-wire, and	32-212	0-100	0-10 V or 4-20 mA	RMPT33BD	113.00	
4-wire	32-482	0-250	0-10 V or 4-20 mA	RMPT53BD	113.00	
	32-932	0-500	0-10 V or 4-20 mA	RMPT73BD	113.00	

<sup>▲</sup> Converters dedicated to Zelio Logic smart relays.

### Table 23.179: Universal Voltage/Current Converters

Туре	Input signal	Output signal	Catalog Number	\$ Price
Supply voltage 24 Vdc ± 20%, non-isolated	0–10 V or 4–20 mA	0–10 V or 4–20 mA	RMCN22BD	95.00
	0–10 V, ± 10 V, 0–20 mA, 4–20 mA	Switchable: 0–10 V, ± 10 V, 0–20 mA, 4–20 mA	RMCL55BD	141.00
Supply voltage 24 Vdc ± 20%, isolated	0–50 V, 0–300 V, 0–500 V DC or AC, 50/60 Hz	Switchable: 0–10 V, 0–20 mA, 4–20 mA	RMCV60BD	154.00
	0-1.5 A, 0-5 A, 0-15 A DC or AC, 50/60 Hz	0–10 V, 0 <del>–</del> 20 mA, 4–20 mA	RMCA61BD	154.00

### Approvals:



File E16435 CCN NKCF



File 089150\_S\_000 Class 3211 07



IEC 60947-1

RoHS Compliant

Tahla	23	120.	How	to	Orda

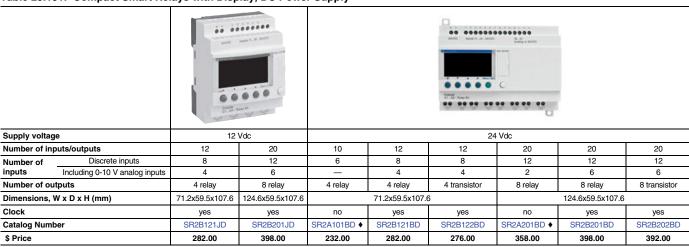
	To Order Specify:	Catalog Number
•	Catalog Number	RMCN22BD



### Zelio™ Logic 2 Smart Relays

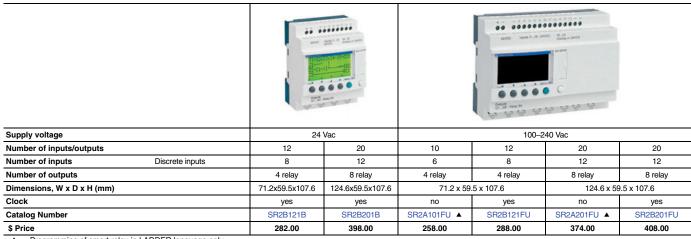
Zelio Logic 2 smart relays meet the demands of applications that require more flexibility than a simple relay, timer, or counter, but are too small or simple for the smallest Nano PLC. The Zelio Logic SR2 range is an exact replacement for the obsolete SR1 range, but with an expanded feature set. Designed to accept control outputs just like a relay, Zelio Logic 2 features dual language capability, using either Function Block Diagramming (FBD) or Ladder Logic Programming (LL), and can be programmed easily by using either the front panel or by using ZelioSoft software.

Table 23.181: Compact Smart Relays with Display, DC Power Supply



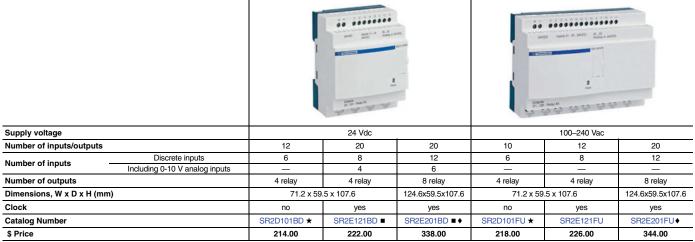
Programming of smart relay in LADDER language only.

### Table 23.182: Compact Smart Relays with Display, AC Power Supply



Programming of smart relay in LADDER language only.

Table 23.183: Compact Smart Relays without Display and without Buttons, DC and AC Power Supply



- ★ Programming of smart relay in LADDER language only
- To order a smart relay for a 24 Vac supply (no analog inputs), delete the letter D from the end of the catalog number (SR2E121B and SR2E201B)
- To order a smart relay without a clock, replace the letter E with the letter D (Example: SR2D201BD and SR2D201FU (these units can only be programmed in LADDER language.

Please consult Schneider Electric representative for list prices.

Refer to Catalog DIA3ED2051002EN-US



### Zelio™ Logic 2 Smart Relays

### Table 23.184: Modular Smart Relays ▲ with Display, DC and AC Power Supply



Supply voltage		12 Vdc	24	Vdc	24	Vac	ac 100-240 Vac	
Number of inputs/outputs		26	10	26	10	26	10	26
Number of inputs	Discrete inputs	16	6	16	6	16	6	16
Number of inputs	Including 0-10 V analog inputs	6	4	6	_	_	_	_
Number of outputs		10 relay	4 relay	10 relay	4 relay	10 relay	4 relay	10 relay
Dimensions, W x D x H	(mm)	124.6x59.5x107.6	71.2x59.5x107.6	24.6x59.5x107.6	71.2x59.5x107.6	124.6x59.5x107.6	71.2x59.5x107.6	124.6x59.5x107.6
Clock		yes	yes	yes	yes	yes	yes	yes
Catalog Number		SR3B261JD	SR3B10pBD ■◆	SR3B26pBD ■◆	SR3B101B	SR3B261B	SR3B101FU	SR3B261FU
\$ Price		380.00	_	_	282.00	476.00	292.00	486.00

- The modular base can be fitted with one I/O extension module. The 24 Vdc modular base can be fitted with one communication module and/or one I/O extension module.
- Replace the p by the number 1 to order a smart relay with relay output or by 2 for a smart relay with transistor output (Example: SR3B101BD). Please consult local Schneider Electric representative for list prices.

### Table 23.185: Extension Modules for Zelio Logic 2 SR3B·····▲









		Communicat	ion			Discrete Inputs/0	Outputs			Analog Inputs/Outputs	
Application		MODBUS net	vork			_				_	
Number of inputs/o	utputs	_		6 10		14		4			
Number of inputs Discrete inputs		_		4		6		8		_	
Number of inputs	Analog (0-10 V, 0-20 mA, PT100)	=		_		_		_		2■	
Number of outputs	Relay	_		2relay		4 relay		6 relay		_	
Number of outputs	Analog (0-10 V)	_		_		_		_		2	
Dimensions, W x D	x H (mm)	35.5x59.5x107.6		35.5x59.5x107.6		72x59.5x107.6		72x59.5x107.6		35.5x59.5x1	07.6
		Cat. No.	\$ Price		\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
	12 Vdc	_	_	SR3XT61JD	80.00	SR3XT101JD	100.00	SR3XT141JD	140.00	_	
Voltage	24 Vdc	SR3MBU01BD	200.00	SR3XT61BD	106.00	SR3XT101BD	126.00	SR3XT141BD	164.00	SR3XT43BD	220.00
	24 Vac	_	-	SR3XT61B	106.00	SR3XT101B	126.00	SR3XT141B	164.00		
	100-240 Vac		_	SR3XT61FU	106.00	SR3XT101FU	126.00	SR3XT141FU	164.00	_	

The power supply of the extension modules is provided via the Zelio Logic 2 modular relays. max. 1 PT 100 input

### Table 23.186: Zelio Soft Software and Memory for SR2/SR3

Multilingual Programming Software Connecting Cables						Back-up Memory					
	0-ROM , 2000, XP, ME) ▲	PC Serial to	Relay	PC USB to SF	R2CBL01	PC USB to	Relay		ROM Soft software nware)		ROM Soft software nware)
Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
SR2SFT01	74.00	SR2CBL01	136.00	SR2CBL06	156.00	SR2USB01	160.00	SR2MEM01	38.00	SR2MEM02	30.00

CD-ROM includes Zelio Soft software, application library, self-training manual, installation instructions and user's manual

### Table 23.187: Communication interface for SR2/SR3

Interface, Zelio Logic 2 Alarm Software	Communication Interface ▲	Alarm Management Software	Zelio Logic GSM Modem
Supply voltage	12-24 Vdc	_	24 Vdc
Description	_	PC CD-ROM (Windows 98, NT, 2000, XP)	GSM modem
Dimensions, W x D x H	72x59.5x107.6 mm	_	
Catalog Number	SR2COM01	SR2SFT02	SR2MOD02
\$ Price	230.00	60.00	545.00

### ▲ Modems to be supplied by user.

### Approvals:



E164866 NRAQ







23-41





ABS2EA01EM

ABS2SA01MB

### **Solid State Interface Modules**

ABS solid state relay interface modules are for discrete digital input or output control signals exchanged in automated equipment. Features include:

- High operating rate
- 5 separate character places for marking
- Silent operation
- LED indication of the control signal state 35 mm DIN 3 or 32 mm DIN 1 track mountable

### Table 23.188: Solid State Interface Input Modules

		Input	Module Catalog N	umber		\$ Price ea.		
Input Module Catalog No.	ABS2EC01EA	ABS2EC01EB	ABS2EC01EE	ABS2EA02EF	ABS2EA02EM	70.00		
Dimensions (WxDxH)▲	Inches: 0.37 x 2.	.78 x 2.91	•	mm: 9.5 x 70.5 x	74			
Control Circuit Characteristics								
Rated Voltage US	5 Vdc	24 Vdc	48 Vdc	120/127 60Hz	230/240 60Hz			
Maximum Voltage	6 (TTL)	28.8 Vdc	57.6 Vdc	140 Vac	264 Vac			
Maximum Current at Us	13.6 mA	12 mA	10.5 mA	17 mA	15 mA			
Internal Protection Against Reverse Polarity	Yes	Yes	Yes	N/A	N/A			
Output Circuit Characteristics								
Rated Operational Voltage Ve	5 to 48 Vdc	5 to 48 Vdc	5 to 48 Vdc	5 to 48 Vdc	5 to 48 Vdc			
Min./Max. Voltage	2/60 Vdc	2/60 Vdc	2/60 Vdc	2/60 Vdc	2/60 Vdc			
Min./Max. Switching Current	1/50 mA	1/50 mA	1/50 mA	1/50 mA	1/50 mA			
Rated Insulation Voltage	Conforming to IEC 60947-1: 300 V Conforming to IEC 0110: 250 V group C							
Approvals	UL E164353, CS	A 081630, IEC 609	47-1	•		,		

### Table 23.189: Solid State Interface Output Modules

		Output Modu	le Catalog No.		\$ Price
	ABS2SC01EB	ABS2SC02EB	ABS2SA01MB	ABS2SA02MB	80.00 80.00 90.00 101.00
Dimensions (W x D x H) ▲	Inches: 0.69 x 2.78 x 2	.91	mm: 17.5 x 70.5 x 74		
Control Circuit Characteristics					
Rated Voltage Us	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Maximum Voltage	28.8 Vdc	28.8 Vdc	28.8 Vdc	28.8 Vdc	1
Maximum Current at Us	12 mA	12 mA	13.6 mA	13.6 mA	
Internal Protection against reverse polarity	Yes	Yes	Yes	Yes	
Output Circuit Characteristics					
Rated Operational Voltage Ve	5 to 48 Vdc	5 to 48 Vdc	24 to 240 Vac	24 to 240 Vac	
Maximum Voltage	57.6 Vdc	57.6 Vdc	264 Vac	264 Vac	1
Internal Protection against reverse polarity	Yes	Yes	Yes	Yes	
External Protection			s for 1k, 1k (Ac) and <100 very high breaking capaci		
Rated insulation voltage			g to IEC 60947-1: 300 V VDE 0110: 250 V group	С	
Approvals		UL E164353,	CSA 081630, IEC 60947-	-1	·

Dimensions mounted on DIN 3 (7.5 mm high) track.

For Mounting Track, see page 24-16.

### Table 23.190: How to Order

	To Order Specify:	Catalog Number
•	Catalog Number	ABS2EC01EA

23-42

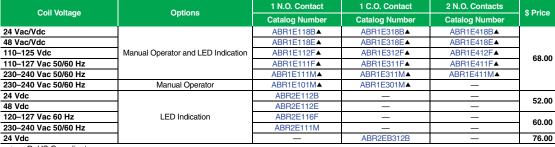


### **Electromechanical Interface Modules**

ABR electromechanical relay modules are for discrete digital input or output control signals exchanged in automated equipment. Features include:

- High contact reliability
- LED indication of the control signal state
- 5 separate character places for marking
- 35 mm DIN 3 or 32 mm DIN 1 track mountable

### Table 23.191: Input Modules



<sup>▲</sup> RoHS Compliant

### Table 23.192: Output Modules

Ontions	1 N.O. Contact	1 C.O. Contact	2 N.O. Contacts	1 N.C. & 1 N.O. Contact	\$ Price
Options	Catalog Number	Catalog Number	Catalog Number	Catalog Number	\$ FIICE
Manual Operator	ABR1S102B■	ABR1S302B■	ABR1S402B■	ABR1S602B■	52.00
	ABR1S118B■	ABR1S318B■	ABR1S418B■	ABR1S618B■	
	ABR1S118E■	ABR1S318E■	ABR1S418E■	ABR1S618E■	70.00
LLD Indication	ABR1S111F■	ABR1S311F■	ABR1S411F■	ABR1S611F■	
I ED Indication	ABR2S112B	_	_	_	40.10
LLD IIIdiCation		ABR2SB312B	_	_	80.00
_	ABR2S102B			_	26.00
		Options  Catalog Number  Manual Operator  Manual Operator and LED Indication  LED Indication  Catalog Number  ABR15102B■  ABR151118B■  ABR1S1118■  ABR2S112B  ABR2S112B	Options         Catalog Number         Catalog Number           Manual Operator         ABR1S102B■         ABR1S302B■           Manual Operator and LED Indication         ABR1S118B■         ABR1S318B■           ABR1S111E■         ABR1S318E■         ABR1S318E■           ABR1S111F■         ABR1S311F■         ABR1S311F■           ABR2S112B         —         ABR2SB312B	Options         Catalog Number         Catalog Number         Catalog Number           Manual Operator         ABR1S102B■         ABR1S302B■         ABR1S402B■           Manual Operator and LED Indication         ABR1S118B■         ABR1S318B■         ABR1S418B■           ABR1S111E■         ABR1S311E■         ABR1S418E■           ABR1S111F■         ABR1S311F■         ABR1S411F■           ABR2S112B         —         —           ABR2SB312B         —	Options         Catalog Number         Catalog Numbe

<sup>■</sup> RoHS Compliant

### Table 23.193: Coil Data

Relay		ABR1E			ABR2E ABR			ABR2EB	ABR1S			ABR2S		ABR2SB				
Coil Voltage Ue	٧	24 Vac/Vdc	48 Vac/Vdc	127 Vdc	127 Vac	240 Vac	24 Vdc	48 Vdc	127 Vac	240 Vac	24 Vdc	24 Vdc	24 Vdc	48 Vac/Vdc	127 Vac	24	24	24
Maximum Voltage	٧	30	53	137	140	255	28.8	56	140	264	28.8	30	30	53	140	28.8	28.8	28.8
Pick-up Voltage	٧	17	38	97	93	195	16.9	37.3	97	186	16.9	17	17	38	83	16.9	16.9	16.9
Minimum Sealed Current	mA	5.2	5.4	1.5	2.4	2	2	2	2.5	2.5	2	6.6	6.2	5.4	2.4	2	2	2
Maximum Sealed Current	mA	62	36	15	8	7	19.5	11	16	15	29	62	62	36	8	28	17	29

### Table 23.194: Contact Ratings

Relay		ABR1E	ABR2E	ABR2EB	ABR1S	ABR2S	ABR2SB
Rated Voltage Ue	Vac	250	115	48	250	230	48
Rated Voltage Ue	Vdc	125	100	48	125	120	48
Thermal Current Ith	Α	2	1	0.05	5	5	0.05
Break Rating (AC14)	Α	1	0.5	1	1	1	_
Break Rating (DC13)	Α	1	1	1	1	1.5	_

Table 23.195: Dimensions

Modules	Approximate Dimensions (WxDxH)◆					
Modules	In.	mm				
ABR1E, ABR2EB, ABR2SB	0.69 x 2.91 x 2.78	17.5 x 74 x 70.5				
ABR2E	0.37 x 2.91 x 2.78	9.5 x 74 x 70.5				
ABR2S1	0.47 x 2.91 x 2.78	12 x 74 x 70.5				

<sup>♦</sup> Dimensions mounted on DIN 3 track (7.5 mm high).

### Table 23.196: Approvals

Table 20.100. Applovals	
ABR1E, ABR2E	UL E164353, CSA 081630, IEC 60947-1
ABR1S, ABR2S	UL E164353, CSA 081630, IEC 60947-1

ABR1 relays are RoHS compliant as of date code 0610.

For Mounting Track, see page 24-16



ABR2E112E

ABR1E411F

ABR1S111F



ABR2S102B

## **Section 24**

**Terminal Blocks** 

24-2

24-18

24-8







**AB1RRN**, p. 24-3







**AB1VV**, p. 24-5





GB2, p. 24-17

9080GCB, p. 24-17





9080LB, p. 24-18

9080GF6, p. 24-14



**9080FB**, p. 24-19



## **Product Panorama** Terminal Blocks

Track-Mounting Termin	nal Blocks and Prewired Co	nnectors
Advantys TELEFAST™ 2	ABE7 Connection Systems	24-22
NEMA Style	Class 9080 Type G	24-13
IEC Style	AB1	24-3
<b>Direct-Mounting Termi</b>	nal Blocks	
NEMA Style	Class 9080 Type GK	24-13

### **Circuit Protectors**

Class 9080 Type GCB	24-17
GB2	24-17

### **Power Distribution Blocks (Splitter Blocks)**

Fuseholders		
Panel Mounting	Class 9080 Type FB	24-19
NEMA Style	Class 9080 Type GF6	24-14

Class 9080 Type LB

IEC Style	AB1FU, AB1SF	24-8
	AB1AASF	24-10
	AB1RRNSF	24-4

## **Cable Ends (Ferrules, Wire Markers)**

DF

	DZ5	24-20
	AZ5	24-20
	AR1	24-21
	AT1	24-21
Mounting Track		

### Mounting Track

9080GH (Square D)	24-16
9080MH (DIN)	24-12



# www.schneider-electric.us









Product Family		AB1RRN	AB1VV	AB1AA	9080G
Type of product		IEC spring technology	IEC screw technology	IEC insulation displacement technology	NEMA screw technology
Mounting		DIN 3	DIN 1 and DIN 3	DIN 3	DIN 3 and Square D track ▲
Maximum rated voltage (V)		600	600	600	600 ■
Maximum rated current per UL (A)	)	115	375	22	255
Ambient air temperature			-40 to +257 °F (-40 to 125 °C)		
Annyoyolo A	(ĴL)	UL File 164359 CCN XCFR2	UL File 164359 CCN XCFR2	UL File 164359 CCN XCFR2	UL File E60616 CCN XCFR2
Iaximum rated voltage (V)   600					
Color		Blué Green/Yellow Black	Blue Green/Yellow Orange Red Green White	Green/Yellow	Black Blue Green Gray Orange Red Yellow

<sup>9080</sup>GK6 can be mounted directly to a panel or on Square D track.
9080GT6 is 120 V.
Refer to catalogs 9080CT9901R7/07 and 9080CT9601 for a complete list of certifications.



### **IEC Style Terminal Blocks**

	Description				Block				End Barrier	<b>&gt;</b>	
De	escription	Maximum Voltage	Current	Color	Catalog Number	\$ Price ea.	Std. Pack▲	Color	Catalog Number	\$ Price ea.	Std. Pack▲
D. O.	Spring-Clip Style Block Two Terminals	600 V	20 A	Gray	AB1RRN235U2GR	1.40	100	Gray	AB1RRNAC242GR	0.60	10
5 mm (0.20 in.) wide	Solid or Stranded Copper Wire 22–12 AWG	000 V	20 A	Blue	AB1RRN235U2BL	1.40	100	Blue	AB1RRNAC242BL	0.60	10
. Day	Spring-Clip Style Block Three Terminals	600 V	20 A	Gray	AB1RRN235U3GR	1.80	100		AB1RRNAC243GR	0.68	10
5 mm (0.20 in.) wide	Solid or Stranded Copper Wire 22–12 AWG		·	Blue	AB1RRN235U3BL	1.80	100	Blue	AB1RRNAC243BL	0.68	10
	Spring-Clip Style Block Four Terminals	600 V	20 A	Gray	AB1RRN235U4GR	2.30	100	Gray	AB1RRNAC244GR	0.75	10
5 mm (0.20 in.) wide	Solid or Stranded Copper Wire 22–12 AWG			Blue	AB1RRN235U4BL	2.30	100	Blue	AB1RRNAC244BL	0.75	10
0_6	Spring-Clip Style Block Two Terminals	600 V	30 A	Gray	AB1RRN435U2GR	1.50	100	Gray	AB1RRNAC442GR	0.60	10
6 mm (0.24 in.) wide	Solid or Stranded Copper Wire 24–10 AWG	333 1	5071	Blue	AB1RRN435U2BL	1.50	100	Blue	AB1RRNAC442BL	0.60	10
D.D.Ed.	Spring-Clip Style Block Three Terminals	600 V	30 A	Gray	AB1RRN435U3GR	2.30	100	Gray	AB1RRNAC443GR	0.60	10
6 mm (0.24 in.) wide	Solid or Stranded Copper Wire 24–10 AWG	000 V	30 A	Blue	AB1RRN435U3BL	2.30	100	Blue	AB1RRNAC443BL	0.60	10
D.D. Hold	Spring-Clip Style Block Four Terminals	600.1/	30.4	Gray	AB1RRN435U4GR	2.90	100	Gray	AB1RRNAC444GR	0.90	10
6 mm (0.24 in.) wide	Solid or Stranded Copper Wire 24–10 AWG	600 V	30 A	Blue	AB1RRN435U4BL	2.90	100	Blue	AB1RRNAC444BL	0.90	10
TO ECO	Spring Clip Style Block Two Terminals			Gray	AB1RRN635U2GR	2.10	50	Gray	AB1RRNAC642GR	0.83	10
	Solid or Stranded Copper Wire	600 V	50 A								

△ Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

These provinces control values occurred the use of insulated copper conductors with 75°C to

Solid or Stranded Copper Wire 24–8 AWG

Solid or Stranded Copper Wire

Solid or Stranded Copper Wire 16–4 AWG

Solid or Stranded Copper Wire 14–2 AWG

Spring Clip Style Block Two Terminals

Spring Clip Style Block Two Terminals

Spring Clip Style Block Two Terminals

16-6 AWG

AB1RRN635U2BL

AB1RRN1035U2GR

AB1BBN1035U2BI

AB1RRN1635U2GF

AB1RRN1635U2BL

AB1RRN3535U2GR

AB1RRN3535U2BL

2.10

2.70

2.70

4.40

4.40

22.50

22.50

50

50

50

50

50

10

10

Blue

Grav

Blue

Gray

Blue

Blue

Grav

Blue

Gray

Blue

Gray

Blue

One end-barrier is required for each assembly of like blocks.



File CCN

8 mm (0.31 in.) wide

10 mm (0.39 in.) wide

12 mm (0.47 in.) wide

16 mm (0.63 in.) wide

E164359 XCFR2 SP.

File 702070 Class 6228 01



RoHS Compliant

600 V

600 V

600 V

60 A

115 A

For track and accessories, see pages 24-11 and 24-12.

AB1RRNAC642BL

AB1RRNAC1042GR

AB1RRNAC1042BI

AB1RRNAC1642GR

AB1RRNAC1642BL

None Required

0.83

0.90

0.90

1.20

1.20

10

10

10

10

10

These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.

Refer to Catalog 9080CT9901

### Table 24.1: Spring-Clip, AB1RRN (continued)

			Maximum		Block			End Barrier ♦					
	Description	Maximum Voltage	Current	Color	Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack		
5 mm (0.20 in.) wide	Spring-Clip Style Grounding Block Two Terminals Solid or Stranded Copper Wire 22–12 AWG	600 V	20 A	Green / Yellow	AB1RRNTP235U2	5.10	100	Green	AB1RRNTPAC242	0.60	10		
5 mm (0.20 in.) wide	Spring-Clip Style Grounding Block Four Terminals Solid or Stranded Copper Wire 22–12 AWG	600 V	20 A	Green / Yellow	AB1RRNTP235U4	7.50	100	Green	AB1RRNTPAC244	0.75	10		
6 mm (0.24 in.) wide	Spring-Clip Style Grounding Block Two Terminals Solid or Stranded Copper Wire 22–10 AWG	600 V	30 A	Green / Yellow	AB1RRNTP435U2	6.20	100	Green	AB1RRNTPAC442	0.60	10		
8mm (0.31 in.) wide	Spring-Clip Style Grounding Block Two Terminals Solid or Stranded Copper Wire 24–8 AWG	600 V	50 A	Green / Yellow	AB1RRNTP635U2	6.90	50	Green	AB1RRNTPAC642	0.83	10		
10 mm (0.39 in.) wide	Spring-Clip Style Grounding Block Two Terminals Solid or Stranded Copper Wire 16–6 AWG	600 V	60 A	Green / Yellow	AB1RRNTP1035U2	7.80	50	Green	AB1RRNTPAC1042	0.90	10		
12 mm (0.47 in.) wide	Spring-Clip Style Grounding Block Two Terminals Solid or Stranded Copper Wire 22–10 AWG	600 V	85 A	Green / Yellow	AB1RRNTP1635U2	9.30	50	Green	AB1RRNTPAC1642	1.20	10		
	Spring-Clip Style Diode/Fuseholder Block Solid or Stranded Copper Wire 22–10 AWG	300 V	10 A	Gray	AB1RRNSF435UGR	4.10	100	Gray	AB1RRNAC442GR	0.60	10		
6 mm (0.24 in.) wide	Fuseholder 5x20 (Fuse not included) Fuseholder 5x20 + 24 V LED Fuseholder 5x20 + 220 V LED Holder for Diode (Diode not included) Holder with1N4007-1 Diode	Depends diode	on fuse or e used	Gray	AB1SF520 AB1SF520B AB1SF520M AB1SV1 AB1SV2	6.50 20.30 20.30 6.20 15.60	100 100 100 100 100	Not applicable					

### Table 24.2: Miniature, AB1VV and AB1TP

TADIC 24.2. WIII	lature, ADIVV and ADIII										
5 mm (0.20 in.) wide	Miniature Block with Box Lug			Gray	AB1VV215	1.50	100	Gray			
	Solid or Stranded Copper Wire 22–14 AWG Mounts on 15 mm DIN 2 track	150 V	10 A	Blue	AB1VV215BL	1.50	100	Blue	AB1AC2	0.62	10
5 mm (0.20 in.) wide	Miniature Block with Box Lug Solid or Stranded Copper Wire 22–10 AWG Mounts on 15 mm DIN 2 track	150 V	10 A	Gray	AB1VV415	1.70	100	Gray	AB1AC2	0.62	10
6 mm (0.24 in.) wide	Miniature Grounding Block with Box Lug Solid or Stranded Copper Wire 22–14 AWG Mounts on 15 mm DIN 2 track	150 V	10 A	Green / Yellow	AB1TP215	4.40	100	Gray	AB1CT215	0.62	50

Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation, class and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.

One end-barrier is required for each assembly of like blocks.



**TERMINAL BLOCKS** 















For track and accessories, see pages 24-11 and 24-12.



### **IEC Style Terminal Blocks**

Box Lug, AB1VV Table 24.3:

		Maximum	Maximum		Block				End Barrier ♦			
	Description	Voltage	Current	Color	Catalog Number	\$ Price ea.	Std. Pack ▲	Color	Catalog Number	\$ Price ea.	Std. Pack ▲	
2 2	Based on Otala Plants			Gray	AB1VV235U	1.40	100	Gray	AB1AC24	0.62	50	
1979	Box-Lug Style Block Solid or Stranded Copper Wire 22–12 AWG	600 V	20 A	Blue	AB1VV235UBL	1.40	100	Blue	AB1AC24BL	0.62	50	
5 mm (0.20 in.) wide	22 127 110			Orange	AB1VV235UGE	1.40	100	Orange	AB1AC24GE	0.62	50	
				Gray	AB1VV435U	1.50	100	Gray	AB1AC24	0.62	50	
				Blue	AB1VV435UBL	1.50	100	Blue	AB1AC24BL	0.62	50	
2 2	Box-Lug Style Block			Orange	AB1VV435UGE	1.50	100	Orange	AB1AC24GE	0.62	50	
AN THE	Solid or Stranded Copper Wire	600 V	30 A	Black	AB1VV435UNO	1.50	100	Gray	AB1AC24	0.62	50	
P	22–10 AWG			Red	AB1VV435URO	1.50	100	Gray	AB1AC24	0.62	50	
6 mm (0.24 in.) wide				Green	AB1VV435UVE	1.50	100	Gray	AB1AC24	0.62	50	
				White	AB1VV435UBLA	1.50	100	Gray	AB1AC24	0.62	50	
(m /m)				Gray	AB1VV635U	2.10	100	Gray	AB1AC6	0.62	50	
。唐山曾、	Box-Lug Style Block Solid or Stranded Copper Wire 22-8 AWG	600 V	50 A	Blue	AB1VV635UBL	2.10	100	Blue	AB1AC6BL	0.62	50	
8 mm (0.31 in.) wide	22-0 AVG			Orange	AB1VV635UGE	2.10	100	Orange	AB1AC6GE	0.62	50	
	Box-Lug Style Block	600 V	65 A	Gray	AB1VVN1035U	2.70	50	Gray	AB1ACN10	0.78	10	
10 mm (0.39 in.) wide	Solid or Stranded Copper Wire 16–6 AWG			Blue	AB1VVN1035UBL	2.70	50	Blue	AB1ACN10BL	0.78	10	
	Box-Lug Style Block	600 V	85 A	Gray	AB1VVN1635U	5.40	50	Gray	AB1ACN16	0.93	10	
12 mm (0.47 in.) wide	Solid or Stranded Copper Wire 12–4 AWG			Blue	AB1VVN1635UBL	5.40	50	Blue	AB1ACN16BL	0.93	10	
	Box-Lug Style Block	600 V	95 A	Gray	AB1VVN3535U	7.70	20		Not required for the	ese blocks.		
16 mm (0.63 in.) wide	Solid or Stranded Copper Wire 10–2 AWG			Blue	AB1VVN3535UBL	7.70	20		7			
	Box-Lug Style Block	600 V	175 A	Gray	AB1VVN7035U	27.90	20	Not required for those blocks				
24 mm (0.94 in.) wide	Solid of Shallbed Copper Wile 6–2/0 AWG Blue AB1VVN7035UBL 27.90 20		. sectoquired for the	Not required for these blocks.								
	Box-Lug Style Block	600 V	335 ∆	Gray	AB1VVN15035U	65.00			ese blocke			
28 mm (1.10 in.) wide	Solid or Stranded Copper Wire 2/0–350 kcmil	000 V	335 A -	Blue	AB1VVN15035UBL	65.00	10		Not required for these blocks.			



E164359 XCFR2



File Class





RoHS

For track and accessories, see pages 24-11 and 24-12.

Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL rating are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.

One end-barrier is required for each assembly of like blocks.



Table 24.4: **Grounding, AB1TP** 

		Maximum		Block		End Barrier ♦					
Desc	ription	Voltage	Color	Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack	
5.1 mm (0.20 in.) wide	Grounding Block Solid or Stranded Copper Wire 22–10 AWG	600 V	Green/Yellow	AB1TP235U	5.30	100	Green	AB1AC25	0.83	10	
6 mm (0.24 in.) wide	Grounding Block Solid or Stranded Copper Wire 22–10 AWG	600 V	Green/Yellow	AB1TP435U	6.20	100	Not required for this block.				
8 mm (0.31 in.) wide	Grounding Block Solid or Stranded Copper Wire 22–8 AWG	600 V	Green/Yellow	AB1TP635U	6.90	100	Not required for this block.				
10 mm (0.39 in.) wide	Grounding Block Solid or Stranded Copper Wire 16–6 AWG	600 V	Green/Yellow	AB1TP1035U	7.80	50	Not required for this block.				
12 mm (0.47 in.) wide	Grounding Block Solid or Stranded Copper Wire 12–4 AWG	600 V	Green/Yellow	AB1TP1635U	9.30	50	Not required for this block.				
16 mm (0.63 in.) wide	Grounding Block Solid or Stranded Copper Wire 10–2 AWG	600 V	Green/Yellow	AB1TP3535U	13.20	20		Not required	for this block.		

Table 24.5: Two Tier, AB1ET

Description			Block	End Barrier ◆						
		Color	Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack	
ET 11 TO	Standard two tier block	Gray	AB1ET435U	4.10	100					
	Standard two tier block + upper-lower link	Black	AB1ET435U2	6.20	100					
	Standard two tier block + grounding	Green/Yellow	AB1ET435UTP	18.60	100					
	Standard two tier block + red 24 V LED	Red	AB1ET435UBRO	17.10	100		AB1TE	1.10		
LI-8.19	Standard two tier block + green 24 V LED	Red	AB1ET435UBVE	17.10	100	Gray			50	
6 mm (0.24 in.) wide	Standard two tier block + head to tail diodes (red)	Orange	AB1ET435UBGE	17.10	100					
Two Tier Blocks Solid or Stranded Copper Wire 22–10 AWG 300 V 20 A ■	Standard two tier block + diode upper-lower	Red	AB1ET435UHBRO	10.80	100					
	Standard two tier block + diode lower-upper	Orange	AB1ET435UBHGE	10.80	100					
	Standard two tier block + 2 diodes	Red	AB1ET435U2DRO	19.20	100					

- Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

  These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.
- One end-barrier is required for each assembly of like blocks.



File CCN

E164359 XCFR2



RoHS Compliant

For track and accessories, see pages 24-11 and 24-12



### **IEC Style Terminal Blocks**

**NOTE:** The blocks in Table 24.6 and Table 24.7 are used for proximity sensors.

Three Tier, AB1DD and AB1ET

		Maximum	Maximum		Block			End Barrier ♦								
	Description	Voltage	Current ■	Color	Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack					
1	Three Tier Block Solid or Stranded Copper Wire 22–12 AWG Three Tier Block				AB1DDP235U	5.40	100									
	with 24 V LED (+) Solid or Stranded Copper Wire 22–12 AWG			Gray	AB1DDP235ULP	10.10	100									
6 mm (0.24 in.) wide	Three Tier Block with 24 V LED (-) Solid or Stranded Copper Wire 22–12 AWG				AB1DDP235ULM	10.10	100									
· · · · /	Three Tier Block with ground Solid or Stranded Copper Wire 22–12 AWG				AB1DDP235T	8.60	100									
	Three Tier Block with 24 V LED (+) and ground Solid or Stranded Copper Wire 22–12 AWG		25 A	Gray with Green/Yellow	AB1DDP235TLP	13.20	100		Not rea	uired for						
6 mm (0.24 in.) wide	Three Tier Block with 24 V LED (-) and ground Solid or Stranded Copper Wire 22–12 AWG	- 300 V		23.4	2071		AB1DDP235TLM	13.20	100			blocks.				
	Three Tier Block Solid or Stranded Copper Wire 22–12 AWG							ļ				Gray	AB1ET3235U	8.60	100	
	Three Tier Block with 24 V LED (+) and ground Solid or Stranded Copper Wire 22–12 AWG				AB1ET3235UTLP	27.80	100									
6 mm (0.24 in.) wide	Three Tier Block with 24 V LED (-) and ground Solid or Stranded Copper Wire 22–12 AWG			Gray with Green/Yellow	AB1ET3235UTLM	27.80	100									
	Three Tier Block with ground Solid or Stranded Copper Wire 22–12 AWG				AB1ET3235UT	12.60	100									

### Table 24.7: Two Tier, AB1ETN

			Maximum		Block		End Barrier ◆				
Description		Maximum Voltage	Current ■	Color	Catalog Number	\$ Price ea.	Std. Pack ▲	Color	Catalog Number	\$ Price ea.	Std. Pack
	Two Tier Block (one terminal in and two out) Solid or Stranded Copper Wire 22–10 AWG			Gray	AB1ETN335U	3.60	100	Gray	AB1TEN3	1.10	10
	Two Tier Block (two terminals in and two out) Solid or Stranded Copper Wire 22–10 AWG	300 V	30 A	Gray	AB1ETN435U	5.10	100	Gray	AB1TEN4	1.20	10
6 mm (0.24 in.) wide AB1ETN335U	Grounding Block (two terminals in and two out) Solid or Stranded Copper Wire 22–10 AWG			Green/ Yellow	AB1ETNTP435U	12.20	100		Not required	for this block	<u>.</u>

- Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

  These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.

  One end-barrier is required for each assembly of like blocks.



E164359 XCFR2

702070 6228 01

RoHS Compliant

For track and accessories, see pages 24-11 and 24-12.



Table 24.8: Fuse Block, AB1★

				Block			End Barrier ◆					
	Description		Color	Catalog Number	\$ Price ea.	Std. Pack ▲	Color	Catalog Number	\$ Price ea.	Std. Pack ▲		
	Fuse Block For 5x20 or 5x25 mm fuse	Without indicator lamp	Gray	AB1FUSE435U5X	7.80	100						
	Solid or Stranded Copper Wire	With 5–12 V LED indicator	Gray	AB1FUSE435U5XJ	16.10	50	N	ot required for t	basa blask			
5.79	22–10 AWG	With 12-24 V LED indicator	Gray	AB1FUSE435U5XB	16.10	50	IN	ot required for t	Hese Diock	5.		
8 mm (0.31 in.) wide	Maximum Voltage—600 V Maximum Current—15 A ■	With 110–250 V neon indicator	Gray	AB1FUSE435U5XM	16.10	50						
6 II III	Fuse Block For 1/4 x 1-1/4 in. fuse	Without indicator lamp	Gray	AB1FUSE435U6X	14.40	100						
	Solid or Stranded Copper Wire	With 5–12 V LED indicator	Gray	AB1FUSE435U6XJ	18.60	50	Not required for these blocks.					
10 mm (0.39 in.) wide	22–10 AWG	With 12-24 V LED indicator	Gray	AB1FUSE435U6XB	18.60	50						
	Maximum Voltage—600 V Maximum Current—15 A ■	With 110–250 V neon indicator	Gray	AB1FUSE435U6XM	18.60	50						
an film	Fuse Block For 5 x 20 mm fuse	Without indicator lamp	Gray	AB1FU10135U	10.80	50						
	Solid or Stranded Copper Wire 22–6 AWG	With 28 V yellow LED indicator	Gray	AB1FU10135UB	26.40	50	Gray	AB1TF	1.40	50		
	Maximum Voltage—600 V Maximum Current—15 A ■	With 250 V yellow LED indicator	Gray	AB1FU10135UU	26.40	50						
12 mm (0.47 in.) wide	Fuse Block For 5 x 25 mm fuse											
	Solid or Stranded Copper Wire 22–6 AWG	Without indicator lamp	Gray	AB1FU10235U	14.00	50	Gray	AB1TF	1.40	50		
	Maximum Voltage—600 V Maximum Current—15 A ■											
	Fuse Block For 5 x 30 mm fuse											
	Solid or Stranded Copper Wire 22–6 AWG	Without indicator lamp	Gray	AB1FU10335U	15.60	50	Gray	AB1TF	1.40	50		
	Maximum Voltage—600 V Maximum Current—15 A ■											
	Fuse Block For 1/4 x 1-1/4 in. fuse	Without indicator lamp	Gray	AB1FU10435U	15.60	50						
	Solid or Stranded Copper Wire 22–6 AWG	With 28 V yellow LED indicator	Gray	AB1FU10435UB	26.40	50	Gray	AB1TF	1.40	50		
	Maximum Voltage—600 V Maximum Current—15 A ■	With 110–500 V red neon indicator	Gray	AB1FU10435UFS	26.40	50						
		Fuse / Diode block	Gray	AB1SF435U	3.90	100	Gray	AB1PS4	0.86	10		
ARTON		Removable fuse holder for 5x20 mm fuse	Gray	AB1SF520	6.50	100						
(h. (b)	Fuse / Diode Block Solid or Stranded Copper Wire	Removable fuse holder for 5x20 mm fuse with 24 V red LED indicator	Gray	AB1SF520B	20.30	100						
4	22–10 AWG Maximum Voltage—300 V	Removable fuse holder for 5x20 mm fuse with 220 V red LED indicator	Gray	AB1SF520M	20.30	100		N/A				
6 mm (0.24 in.) wide	Maximum Current—10 A ■	Removable diode or resistor holder	Gray	AB1SV1	6.20	100						
5 11111 (0.27 III.) WILLE		Removable holder	Gray	AB1SV2	15.60	100						





E164359 XCFR2











- Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

  These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.
- One end-barrier is required for each assembly of like blocks. For additional information, refer to Catalog **9080CT9901**

Table 24.9: Modular Fuse Holders, DF▼

	Rated Thermal Current	Type of Fuse	Composition	Standard Pack Quantity	Catalog Number	\$ Price ea.
			1 Pole	12	DFCC1	18.00
000			2 Poles	6	DFCC2	36.00
		Class CC	3 Poles	4	DFCC3	54.00
	30 A		1 Pole △	12	DFCC1V	22.50
DFCC1V DFCC3V			2 Poles △	6	DFCC2V	45.00
			3 Poles △	4	DFCC3V	68.00

For additional blocks and information, refer to Catalog 9080CT0801.

**TERMINAL BLOCKS** 

CNN

E310269

IZLT

With blown-fuse indicator.

**IEC Style Terminal Blocks** 

Table 24.10: Other Blocks, AB1

				Block		End Ba	rrier♦			
	Description			Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack
12 mm (0.47 in.) wide	Block for Diodes (Diodes not included) Solid or Stranded Copper Wire 22–14 AWG	0-0-0-0	Gray	AB1D11435U	12.50	50		Not required fo	or this block	
	Circuit Isolation Block Solid or Stranded Copper Wire 22–10 AWG	With no test sockets	Gray	AB1SC435U	7.10	50	Crow	AD4DC4	0.86	10
6 mm (0.24 in.) wide	Maximum Voltage—600 V Maximum Current—20 A ■	With two test sockets	Gray	AB1SC435U2PT	7.10	50	Gray	AB1PS4	0.86	10
Parel.	Box Lug / Slip-on Block Solid or Stranded Copper Wire	Box lug on one side. Slip-on access from top and side	Gray	AB1FV135U	3.00	100	Gray	AB1TC01	1.40	50
1170	22–12 AWG	Box lug on one side. Slip-on access from top	Gray	AB1FC335U	3.90	100	Gray	AB1TC3	1.40	50
6 mm (0.24 in.) wide	Maximum Voltage—300 V Maximum Current—10 A■	Slip-on connectors on both sides	Gray	AB1FF235U	2.10	100		Not required for	or this block	

Table 24.11: Lug/Lug and Lug/Clamp, AB1

				Block				Partiti	ion	
	Description	Color	Catalog Number	\$ Price ea.	Std. Pack	Color	Catalog Number	\$ Price ea.	Std. Pack	
32 mm (1.26 in.) wide	Lug/Lug Block Solid or Stranded Copper Wire 0 AWG–350 kcmil	M10 bolt Maximum Voltage—600 V Maximum Current—230 A■	Gray	AB1BB9535	21.30	10	Gray	AB1CT1	2.40	50
42 mm (1.65 in.) wide	Lug/Lug Block Solid or Stranded Copper Wire 0 AWG–400 kcmil	M12 bolt Maximum Voltage—600 V Maximum Current—375 A■	Gray	AB1BB18535	27.30	10	Gray	AB1CT2	2.70	50
42 mm (1.65 in.) wide	Lug/Lug Block Solid or Stranded Copper Wire 0 AWG–500 kcmil	M12 bolt Maximum Voltage—600 V Maximum Current—375 A■	Gray	AB1BB24035	45.00	10	Gray	AB1CT2	2.70	50
32 mm (1.26 in.) wide	Lug/Clamp Block Solid or Stranded Copper Wire 0 AWG–350 kcmil	M10 bolt Maximum Voltage—600 V Maximum Current—230 A■	Gray	AB1BC9535	31.10	10	Gray	AB1CT1	2.40	50
42 mm (1.65 in.) wide	Lug/Clamp Block Solid or Stranded Copper Wire 0 AWG–400 kcmil	M12 bolt Maximum Voltage—600 V Maximum Current—325 A■	Gray	AB1BC15035	62.00	10	Gray	AB1CT2	2.70	50
42 mm (1.65 in.) wide	Lug/Clamp Block Solid or Stranded Copper Wire 0 AWG-500 kcmil	M12 bolt Maximum Voltage—600 V Maximum Current—375 A ■	Gray	AB1BC24035	86.00	10	Gray	AB1CT2	2.70	50

- Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.
- These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used. The UL ratings are shown. The CSA rating may be higher or lower. Refer to the catalog for CSA ratings.

  One end-barrier is required for each assembly of like blocks.



File CCN

E164359 XCFR2



File Class

702070 6228 01



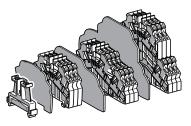
RoHS

For track and accessories, see pages 24-11 and 24-12.

Discount Schedule



#### **Insulation Displacement Style Terminal Blocks and Accessories**





5 mm (0.20 in.) wide AB1AA135U4●●

Insert wires without stripping

- Available for wire sizes 30-14 AWG
- DIN 3 rail mounting
- Finger safe connections

#### Table 24.12: Insulation Displacement, AB1AA

	Manadana	Mandana				Block			End Barrier ♦					
Description	Maximum Voltage	Maximum Current■	Wire Size	No. of Poles	Color	Catalog Number	\$ Price ea.	Std. Pack▲	Color	Catalog Number	\$ Price ea.	Std. Pack▲		
Insulation Displacement	600 V	13 A	30–18 AWG	2	Gray	AB1AA135U2GR	1.80	100	Gray	AB1AAAC122GR	.62	10		
Connector: Passithrough Block Solid or Stranded Copper Wire	000 V	10 A	50-10 AWG		Blue	AB1AA135U2BL	1.80	100	Blue	AB1AAAC122BL	.62	10		
Cond of Characta Copper Vine	600 V	13 A	18–14 AWG	2	Gray	AB1AA235U2GR	2.00	100	Gray	AB1AAAC122GR	.62	10		
Acres Services					Blue	AB1AA235U2BL	2.00	100	Blue	AB1AAAC122BL	.62	10		
	600 V	10 A	30-18 AWG	3	Gray	AB1AA135U3GR	2.90	50	Gray	AB1AAAC123GR	.78	10		
Watte Co					Blue	AB1AA135U3BL	2.90	50	Blue	AB1AAAC123BL	.78	10		
	600 V	10 A	18-14 AWG	3	Gray Blue	AB1AA235U3GR AB1AA235U3BL	3.00	50 50	Gray Blue	AB1AAAC123GR AB1AAAC123BL	.78 .78	10		
					Gray	AB1AA235U3BL AB1AA135U4GR	5.90	50	Grav	AB1AAAC123BL AB1AAAC124GR	.78	10		
. \	600 V	10 A	30-18 AWG	4	Blue	AB1AA135U4BL	5.90	50	Blue	AB1AAAC124GK AB1AAAC124BL	.93	10		
					Gray	AB1AA235U4GR	6.00	100	Gray	AB1AAAC124GR	.93	10		
5 mm (0.20 in.) wide AB1AA135U2 ● ●	600 V	10 A	18–14 AWG	4	Blue	AB1AA235U4BL	6.00	100	Blue	AB1AAAC124BL	.93	10		
Insulation Displacement Connector: Grounding Block	600 V	13 A	30–18 AWG	2	Green/ Yellow	AB1AATP135U2	5.90	100	Green/ Yellow	AB1AAAC122VE	.62	10 10		
Annel lean	600 V	13 A	18–14 AWG	2	Green/ Yellow	AB1AATP235U2	6.20	100	Green/ Yellow	AB1AAAC122VE	.62	10 10		
THE ASSESSMENT OF THE PARTY OF	600 V	13 A	30–18 AWG	2	Green/ Yellow	AB1AATP135U3	8.10	100	Green/ Yellow	AB1AAAC123VE	.78	10		
	600 V	10 A	18–14 AWG	3	Green/ Yellow	AB1AATP235U3	8.10	50	Green/ Yellow	AB1AAAC123VE	.78	10		
	600 V	10 A	30–18 AWG	4	Green/ Yellow	AB1AATP135U4	13.70	50	Green/ Yellow	AB1AAAC124VE	.93	10		
5 mm (0.20 in.) wide AB1AATP135U3	600 V	10 A	18–14 AWG	4	Green/ Yellow	AB1AATP235U4	14.00	50	Green/ Yellow	AB1AAAC124VE	.93	10		
Two Tier Block	600 V	13 A	30–18 AWG	2	Gray	AB1AAET135UGR	4.80	50	Gray	AB1AAAC124GR	.93	10		
45,44				2/2	Gray	AB1AAET235UGR	5.10	50	Gray	AB1AAAC124GR	.93	10		
				2/2	Red	AB1AAET235URO	5.10	50	Red	AB1AAAC124GR	.93	10		
	600 V	22 A	18–14 AWG	2/2	Orange	AB1AAET235UGE	5.10	50	Orange	AB1AAAC124GR	.93	10		
6 mm (0.24 in.) wide				4	Red	AB1AAET235UBRO	15.60	50	Red	AB1AAAC124GR	.93	10		
AB1AAET235 ● ●				4	Orange	AB1AAET235UBGE	15.60	50	Orange	AB1AAAC124GR	.93	10		
Fuse Block	600 V	6.3 A	30–18 AWG	2	Gray	AB1AASF135UGR	5.00	50	Gray	AB1AAAC123GR	.78	10		
6 mm (0.24 in.) wide AB1AASF135U ● ●	600 V	6.3 A	18–14 AWG	2	Gray	AB1AASF235UGR	5.30	50	Gray	AB1AAAC123GR	.78	10		
Disconnect Block	600 V	10 A	18–14 AWG	2	Gray Blue	AB1AASC235UGR AB1AASC235UBL	6.00 6.00	50 50	Gray Blue	AB1AAAC123GR AB1AAAC123BL	.78 .78	10 10		



E164359 XCFR2



702070 6228 01



RoHS Compliant

For track and accessories, see pages 24-11 and 24-12.

Dilde ABTAASC23SUBL 5.00 Bilde ABTAASC23BL .78 10

Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

These maximum current values assume the use of insulated copper conductors with 75°C temperature rating and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of the wire which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the size, insulation class, and other characteristics of the wire used.

One end-barrier is required for each assembly of like blocks.





Table 24.13: Markers, AB1

	Marking	Catalog	\$ Price	Std.
	IVIAI KIIIY	Number	ea.	Pack ▲
	Blank	AB1BV5		
	1–10	AB1B510		
	11–20	AB1B520		
	21-30	AB1B530		
AB1B510	31-40	AB1B540		
THE OWNER OF THE PARTY OF THE P	41–50	AB1B550	0.78	25
AB1B510	51–60	AB1B560		
B	61–70	AB1B570		
Black number on white background	71–80	AB1B580		
5 mm (0.20 in.) wide	81–90	AB1B590		
, ,	91–100	AB1B5100		
	Blank	AB1BV6		
	1–10	AB1B610		
	11-20	AB1B620		
	21-30	AB1B630		
	31-40	AB1B640		
_	41-50	AB1B650	1	
	51-60	AB1B660	1	
AB1B610	61-70	AB1B670		05
ADADO	71–80	AB1B680	0.78	25
AB1B610	81–90	AB1B690		
Dischause beneau	91–100	AB1B6100		
Black number on white background	L1	AB1B6L1	1	
6 mm (0.24 in.) wide	L2	AB1B6L2	1	
, ,	L3	AB1B6L3	1	
	+ (Red)	AB1BV6RP	1	
	- (Blue)	AB1BV6BM	1	
	Blank	AB1BV8		
	1–10	AB1B810	1	
_	11–20	AB1B820	1	
	21–30	AB1B830	1	
AB1B810	31–40	AB1B840	1	
	41–50	AB1B850	0.78	25
АВ1В810	51–60	AB1B860	1	
	61–70	AB1B870	1	
Black number on	71–80	AB1B880	1	
white background	81–90	AB1B890	1	
8 mm (0.31 in.) wide	91–100	AB1B8100	1	
	Blank	AB1RV		
	1	AB1R1	1	
	2	AB1R2	1	
	3	AB1R3	1	
- 8	4	AB1R4	1	
ABIB2	5	AB1R5	1	
	6	AB1R5 AB1R6	1	
A DA DO	7	AB1R7	0.78	25
AB1R2	8		1	
		AB1R8	1	
Black number or symbol	9	AB1R9 AB1R0	1	
on white background	,		-	
Ç ·	0–9	AB1R11	-	
	+	AB1R12	4	
	_	AB1R13		

Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

	Marking	Catalog Number	\$ Price ea.	Std. Pack ▲
	А	AB1GA	ea.	rack =
	B	AB1GB		
	С	AB1GC		
	D	AB1GD		
	E	AB1GE		
	F	AB1GE		
	G	AB1GG		
	H	AB1GH		
	- ''	AB1GI		
	J	AB1GJ		
	K	AB1GK		
	L	AB1GL		
	M	AB1GM		
AB1GA			0.78	25
ARIGA	N	AB1GN		
ABIGA	0	AB1GO		
	P	AB1GP		
Black capital letters on	Q	AB1GQ		
white background	R	AB1GR		
	S	AB1GS		
	T	AB1GT		
	U	AB1GU		
	V	AB1GV		
	W	AB1GW		
	Χ	AB1GX		
	Υ	AB1GY		
	Z	AB1GZ		
CHAR		AB1SR6	0.78	200
िचि		AB1SA1	0.18	500
		AB1SA2	0.39	500
<b>VIII</b>		AB1SA3	0.78	500
िन		AB1RT	0.78	500
0		AR1SB2	1.50	100
		AR1SB3	1.35	50

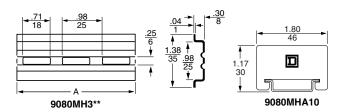
RoHS Compliant

Table 24.14: DIN 3 Track - Various Lengths

Description	on	Length m (in.)	Class 9080 Type	\$ Price ea.	Std. ▲ Pack	
		0.08 (3)	MH203	3.20		
		0.10 (4)	MH204	3.60		
		0.13 (5)	MH205	4.10		
		0.15 (6)	MH206	4.70		
		0.18 (7)	MH207	5.10		
		0.20 (8)	MH208	5.60		
		0.23 (9)	MH209	6.20		
		0.25 (10)	MH210	6.80		
	Galvanized steel.	0.28 (11)	MH211	7.20		
	no mounting	0.30 (12)	MH212	7.80		
	holes	0.33 (13)	MH213	8.30		
		0.36 (14)	MH214	8.70		
		0.38 (15)	MH215	9.30		
		0.41 (16)	MH216	9.80		
		0.42 (17)	MH217	10.20		
		0.46 (18)	MH218	10.80		
0			0.50 (19.68)	MH220	11.60	
Symmetrical rail 35 x 7.5 mm		1 (39.37)	MH239	19.70		
(1.38 in. x 0.295 in.)		2 (78.74)	MH279	29.60	10	
in compliance with		0.08 (3)	MH303	3.50	10	
EN 50022 standard (DIN 46277-3).			0.10 (4)	MH304	3.90	
(2.11 10277 0).			0.13 (5 in.	MH305	4.70	
		0.15 (6)	MH306	5.10		
		0.18 (7)	MH307	5.70		
		0.20 (8)	MH308	6.20		
		0.23 (9)	MH309	6.90		
		0.25 (10)	MH310	7.40		
	Galvanized	0.28 (11)	MH311	8.10		
	steel,	0.30 (12)	MH312	8.60		
	prepunched	0.33 (13)	MH313	9.20		
		0.36 (14)	MH314	9.60		
		0.38 (15)	MH315	10.20		
		0.41 (16)	MH316	10.80		
		0.42 (17)	MH317	11.60		
		0.46 (18)	MH318	12.00		
		0.50 (19.68)	MH320	13.10		
		1 (39.37)	MH339	23.00		
		2 (78.74)	MH379	32.70		
High rise track	Aluminum	1 (39.37)	MH439	27.90	2	

Orders must specify the standard package quantity (Std. Pack) or multiples of that quantity.

#### Dimensions



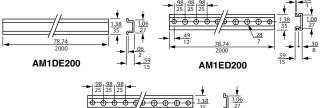
Angle bracket kit		Catalog Number	\$ Price ea.	Std. ▲ Pack
For mounting 9080GH or MH track to a panel at 45° angle. Includes 2 brackets and hardware for mounting the track to the brackets.		9080MH82◆	7.20	1
End Clamps				
Plastic end clamp for 35 mm DIN 3 track, 8 mm (0.31 in.) wide	1	AB1AB8P35	1.50	100
Metal end clamp for 35 mm DIN 3 track, 8 mm (0.31 in.) wide		AB1AB8M35	2.40	100
Polycarbonate end clamp for 35 mm DIN 3 track, 8 mm (0.31 in.) wide	F III	9080MHA10	2.40	50

Not RoHS Compliant

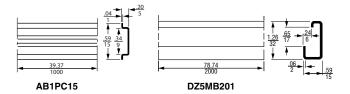
Table 24.15: Mounting Track 1 or 2 meter length

Description	Length m (in.)	Catalog Number	\$ Price ea.	Std. ▲ Pack
DIN 3				
15 mm depth, 1 mm steel, zinc chromated	2 (78.74)	AM1ED200	14.70	10
15 mm depth, 1.5 mm steel, zinc chromated	2 (78.74)	AM1DE200	21.80	10
7.5 mm depth, 1 mm steel, zinc chromated EN 50022 & NF C63-015	2 (78.74)	AM1DP200	7.80	10
DIN 1				
Asymmetrical 32 mm track EN 50035 & NF C63-018	2 (78.74)	DZ5MB201	23.20	10
DIN 2				
Symmetrical 15 mm track EN 50045	1 (39.37)	AB1PC15	7.50	10

#### Dimensions



#### AM1DP200



End Clamps		Catalog Number	\$ Price ea.	Std. ▲ Pack
Plastic end clamp for 32 mm DIN 1 track, 7.5 mm (0.30 in.) wide		AB1AB7P32	2.60	100
Metal end clamp for 32 mm DIN 1 track, 7.5 mm (0.30 in.) wide	1	AB1AB10M32	2.60	100
Plastic end clamp for 15 mm DIN 2 track, 7.5 mm (0.30 in.) wide		AB1AB715	1.50	100

RoHS Compliant

Discount Schedule

Table 24.16: Selection Guide

		Maximum	Maximum		Blo	cks		Er	nd Barriers	•	Blocks	Max. Combi	Wire nations
Description		Voltage	Current■	Color	Туре	\$ Price ea.	Std. Pack ▲	Туре	\$ Price ea.	Std. Pack ▲	per ft	Сорре	er Wire d or solid)
	Solderless Box Lug for #22 to #8 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track. Fingersafe per DIN 57470.	600 V	60 A	Natural Black Blue Green Gray Orange Red Yellow Brown	GR6 GRB6 GRL6 GRG6 GRE6 GRS6 GRR6 GRY6	2.40	50	GM6B GMB6B GML6B GMG6B GME6B GMS6B GMR6B GMY6B	0.78	10	34	1 #8 1 #10 1–3 <b>#12</b>	1–4 #16 1–5 #18 1–8 #20
H	Similar to a 9080GR6 except with a 9080GH91 banana test plug adapter installed. Fingersafe per DIN 57470.	600 V	60 A	Natural	GR6T	2.90	50	GM6B	0.78	10		1-4 #14	1–10 <b>#22</b>
	Solderless Box Lug for #22 to #10 AWG wire. Can be mounted directly to a panel or can be mounted on 9080GH track.	600 V	40 A	Natural Black Blue Green Gray Orange Red Yellow	GK6 GKB6 GKL6 GKG6 GKE6 GKS6 GKR6	2.40	50	GK6B	0.93	50	34	1–4 #16 1 #10 1–2 #12 1–2 #14	1–4 # <b>16</b> 1–5 # <b>18</b> 1–8 # <b>20</b> 1–10 # <b>22</b>
	High Density Solderless Box Lug for #22 to #10 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track. Fingersafe per DIN 57470.	600 V	30 A	Natural Black Blue Green Gray Orange Red Yellow Brown	GM6 GMB6 GML6 GMG6 GME6 GMS6 GMR6 GMY6	1.80	50	GM6B GMB6B GML6B GMG6B GME6B GMS6B GMR6B GMY6B GMN6B	0.78	10	51	1 #10 1 #12 1 #14 1–2 #16	1–2 # <b>18</b> 1–5 # <b>20</b> 1–8 # <b>22</b> 1–2 # <b>16</b>
	Solderless Box Lug for #18 to #4 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	85 A	Natural	GC6	5.00	50	GC6B	1.30	10	28	1 # <b>4</b> 1 # <b>6</b> 1–2 # <b>8</b> 1–4 # <b>10</b>	1–5 # <b>12</b> 1–6 # <b>14</b> 1–6 # <b>16</b> 1–8 # <b>18</b>
	Solderless Box Lug for #12 to #1/0 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	170 A	Natural	GD6	10.10	10	GD6B	1.70	10	17	1 1/0 1 #1 1 #2 1–2 #4	1–3 # <b>6</b> 1–5 # <b>8</b> 1–6 # <b>10</b> 1–7 # <b>12</b>
200	Solderless Box Lug for #6 AWG to 250 kcmil wire. ★ Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	255 A	Natural	GE6	27.00	10	No	one Require	ed	10	1 250 l 1 4/0 1 3/0 1 2/0 1 1/0	xcmil★ 1 #1 1 #2 1 #4 1 #6

- Orders must specify standard package quantity or multiples of that quantity.

  These maximum current values assume the use of insulated copper conductors with 75°C temperature rating, and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of that wire or combination of wires (as listed in the above table) which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the number, size, insulation class, and other characteristics of the wires used. The lower of the UL and CSA ratings are shown.
- One end-barrier is required for each assembly of like blocks.

  Terminals are tin plated, making them suitable for use with either copper or aluminum wire.



E60616 XCFR2

025490 3211 07

**BoHS** 

For Standard or Custom Assemblies . . . . . . . . page 24-15 For Mounting Track and Accessories page 24-16
For DIN 3 track and end clamps page 24-12

		Maximum	Maximum		Blocks		1	End Barriers	•	Blocks	Max. Combir	Wire nations
De	scription	Voltage	Current ■	Туре	\$ Price ea.	Std. Pack ▲	Туре	\$ Price ea.	Std. Pack ▲	per ft	Coppe (stranded	r Wire or solid)
W W	Self-Lifting Pressure Wire Connector for #18 to #12 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	40 A	GP6	2.60	50	GP6B	1.00	10	32	1 or 2 1 or 2 1 or 2 1 or 2	#12 #14 #16 #18
Chemin	Flat Terminal Connector for											
(a) (b)	#22 to #12 AWG wire. Screws are #6-32 x 5/16 in. for ring or spade lugs, 5/16 in. wide maximum. Mounts on standard 9080GH track or 35 mm DIN 3 track. Fingersafe per DIN 57470.	600 V	40 A	GA6	1.80	50	GP6B	1.00	10	32	1 or 2 Co Per S # <b>12</b> -	crew
	Circuit Isolating Switch★											
	with self-lifting pressure connectors for #18 to #10 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	30 A	GG6	18.00	10	GF6B	4.80	10	16	1 1 1 1–4 1–4	#10 #12 #14 #16 #18
	Slip-on Connectors for #22 to											
	#12 AWG wire. Tabs accept 0.250 x 0.032 in. slip-on connectors Mounts on standard 9080GH track or 35 mm DIN 3 track.	600 V	20 A	GS6	4.80	10	GF6B	4.80	10	16	1–2 1–2 1–2 1–2 1–2 1–2	#12 #14 #16 #18 #20 #22
	Transient Voltage Suppressors △ with box lug connectors for #18 to #10 AWG wire. Mounts on standard 9080GH track or 35 mm DIN 3 track.	120 V	_	GT6	20.70	5	GT6B	1.70	10	24	1 1 1 1-2 1-4	#10 #12 #14 #16 #18
	Fuse Block for 13/32 in. Dia. x 1-12 in. ferrule fuse with self-lifting pressure connectors. Fuse puller is included as standard. Fuses are not included. Mounts on standard 9080GH track or 35 mm DIN 3 track. Fingersafe per DIN 57470.	600 V	30 A	GF6	11.70	10	GF6B	4.80	10	16	1 1 1 1-4 1-4	#10 #12 #14 #16 #18
	Fuse Puller▼	_	_	GH63	2.40	50	N/A		N/A	N/	A	
	Blown Fuse Indicator/ Pullers are neon pilot lights which plug on to the	120–240 V	_	GLP3 11.90 10			N/A		N/A	N/	A	
4.	fuse in a standard Type GF6 fuse block.	277–600 V	_	GLP6	11.90	10		N/A				

Orders must specify the standard package quantity or multiples of that quantity.

GF6 fuse block.

- quantity or multiples of that quantity. These maximum current values assume the use of insulated copper conductors with 75°C temperature rating, and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of that wire or combination of wires (as listed in the above table) which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the number, size, insulation class, and other characteristics of the wires used. The lower of the UL and CSA ratings are shown below. One end-barrier is required for each assembly of like sections.

  Not intended to make or break a live circuit.
- Power must be disconnected from the circuit before operation of the switch.
- Fuse puller is supplied as standard with Class 9080 Type GF6 fuse block. The 9080GH63 is a replacement fuse puller.

Modules have RC circuitry for suppressing transient voltage, generated when opening a coil circuit, to approximately 200% of the peak line voltage, when used with 120 V coils. Type GT6 is suitable for use with Square D class 8501 Type X, K, R and C relays or Square D Type S starters and contactors, Sizes 00-2.

#### Terminal Blocks E60616 XCFR2 File CCN 025490 3211 07 File Class

RoHS Compliant

Blown Fuse Indicator								
ÛL	File CCN	E63698 JDV5						
(SP.	File Class	025490 3211 07						

RoHS Compliant

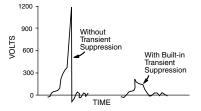


Table 24.18: How to Order

	To Order Specify	Catalog	Number
•	Class Number	Class	Type
•	Type Number	9080	GP6

For Standard or Custom Assemblies page 24-15 For Mounting Track and Accessories page 24-16 For DIN 3 track and end clamps page 24-12



## www.schneider-electric.us

#### Standard Terminal Block Assemblies

**NEMA Style** 

**Terminal Blocks** 

The assemblies listed in the table below consist of 6 ft (two 3 ft lengths packaged together) of terminal blocks. The terminal blocks are mounted on snap-off mounting track, which can be easily broken every 5/16 in. Every tenth terminal block is marked to aid in counting off the proper number of terminal blocks. After adding the proper end barrier and a slip-in end clamp to the blocks that were broken off, the custom assembly is ready for installation.

Table 24.19: Standard Terminal Block Assemblies

Description	Туре	\$ Price
Assembly of 188 Type GA6	GA6188BC	530.00
Assembly of 204 Type GR6	GR6204BC	674.00
Assembly of 94 Type GF6	GF694BC	1311.00
Assembly of 296 Type GM6	GM6296BC	830.00
Assembly of 188 Type GP6	GP6188BC	653.00



#### **Custom Terminal Block Assemblies**

Order an assembly built as required for the application. As standard, custom assemblies use 9080GH mounting track with screw on end clamps. Other options are available from the table below.

One terminal block type: The number of blocks in the assembly is added to the end of the catalog number of the desired block. Example: an assembly of **25** 9080GR6 blocks would be 9080GR625.

More than one terminal block type in an assembly:  $\ensuremath{\mathsf{A}}$ detailed drawing or sketch of the desired assembly must accompany the order.

Table 24.20: Custom Assembly Pricing

Block Type	\$ Price Per Block/Terminal	Block Type	\$ Price Per Block/Terminal
GA6	2.80	GK6 channel mounted	3.30
GC6	6.10	GK6 direct mounted	2.70
GCB01-15	68.00	GM6	2.90
GCB20-150	84.00	GP6	3.50
GD6	12.20	GR6	3.30
GE6	31.80	GR6T	3.80
GF6	14.00	GS6	3.80
GG6	14.60	Blank vinyl marking strip	0.05
ddo	14.00	Pre-numbered (1-25 only)	0.24

Table 24.21: Custom Terminal Block Assemblies

Option	Suffix	Example
Substitute slip-in end clamps	С	9080GR625C
Substitute snap-off channel	В	9080GR625BC ▲
For direct mount assembly of 9080GK6 blocks	D	9080GK67D
Add a blank vinyl marking strip	M	9080GR625M
Add pre-marked (1–25 only) marking strip	MPO	9080GR625MPO
Mount on 35 mm DIN 3 track instead of 9080GH track	T	9080GR625T

The 9080GH10 screw-on end clamp is **not** recommended for use with snap-off channel. It is recommended that the 9080GH11 slip-in end clamp be used. Therefore, when the suffix **B** is used, it should be followed by the suffix **C**.

Subtotal (multiply # of blocks by price of blocks) Initial Charge for factory assemblies All except 9080GK6 direct mount (\$7.00) OR for 9080GK6 direct mount (\$3.60) Vinyl Marking Strips Adder for Suffix M-\$0.05 per block OR adder for Suffix MPO-\$0.24 per block Deduct for Suffix C-\$2.40 Total everything from Subtotal down Apply the following rounding rules to the total obtained: \$1.00 through \$50.00

Table 24.22: How to Order

over \$50.00

Price per block from Table 24.20 Number of blocks in the assembly x

	To Order Specify	Catalog	Catalog Number		
•	Class Number	Class	Type		
•	Type Number	9080	GA612		

Round to the nearest dime Round to the nearest dollar

#### Table 24.23: 3/4 in. Mounting Track

		Style	Length (in.)	Туре	\$ Price ea.	Std. Pack ▲
		3	GH103	2.40	5	
		4	GH104	2.40	5	
		5	GH105	2.60	5	
		6	GH106	2.60	5	
		7	GH107	2.60	5	
		8	GH108	3.00	5	
		9	GH109	3.00	5	
		10	GH110	3.30	5	
	Standard Track	11	GH111	3.30	5	
		12	GH112	3.50	5	
		13	GH113	3.50	5	
Snap-Off			14	GH114	3.80	5
Track			15	GH115	3.90	5
rradic			16	GH116	4.20	5
			17	GH117	4.40	5
	-		18	GH118	4.80	5
- 15			36	GH136	11.70	5
	1		48	GH148	15.20	5
134	-		72	GH172	22.70	5
		C=== O#	36	GH236	11.70	20
	High Rise	Snap-Off Track	48	GH248	15.20	20
		aon	72	GH272	22.70	20
		High Rise	36	GH336	29.00	2

Note: For additional track and appropriate end clamps, see page 24-12.

Table 24.24: Accessories

1 abit 24.24. A	0003301103			
De	scription	Туре	\$ Price ea.	Std. Pack ▲
End Clamps				
9 0	Screw-on End Clamp (Not recommended for use on snap-off mounting track)	GH10	2.40	50
	Slip-in End Clamp (Not for use with 9080 GE6, GK6 blocks)	GH11	.63	50
Jumpers				
	2-pole jumper for GM6	GH700	.59	20
177	6-pole jumper for GM6	GH710	1.20	10
12.01	2-pole jumper for GK6, GR6	GH72	.62	20
	6-pole jumper for GK6, GR6	GH73	1.80	10
5	2-pole jumper for GC6	GH74	2.30	10
	6-pole jumper for GC6	GH75	4.30	10
000000	2-pole jumper for GD6	GH76	3.20	10
5.5	6-pole jumper for GD6	GH77	8.70	10
1	2-pole jumper for GA6, GP6	GH78	1.20	10
Marie Contraction of the Contrac	6-pole jumper for GA6, GP6	GH79	2.00	10
Fanning Strip				
THE REAL PROPERTY OF THE PARTY	Snap-together fanning strip section for GA6 blocks	GH51	3.00	10
	Snap-together fanning strip section for GK6, GR6 blocks	GH52	3.30	10

Orders must specify the standard package quantity or multiples of that quantity.

Table 24.25: Marking and Additional Accessories

		-	\$ Price	Std.
Descr	iption	Туре	ea.	Pack ▲
0	25 ft blank vinyl marking strip	GH220	11.90	1
	For GK6, GR6	GH21	4.40	5
************	For GA6, GP6	GH22	4.40	5
Vinyl marking strip numbered 1-25	For GM6	GH230	4.40	5
	Blank pin-feed marking tabs—6 x 20 (total 120) marking tabs for GD6, GR6, and GT6 blocks	GH200	1.70	20
	Pre-marked 01 to 50 (2 sets) plus 20 Various marking tabs (total 120 marking tabs) for GD6, GR6, and GT6 blocks	GH210	13.10	5
	Marking pen with permanent, fine line black ink	GH40	8.00	12
	Marking strip end plug for GK6, GR6, GM6, GA6, GP6, GC6, GD6, GE6, and GT6 blocks	GH60	.39	50
	Transition barrier between GK6 and all other G or K blocks	GH61	.98	50
TT	Cover for GR6 or GR6T blocks	GH62	.98	50
	Banana test plug for GR6T block	GH90	7.40	10
	Test plug adapter for GR6T block (included as standard with GR6T)	GH91	1.20	50
	Angle bracket kit—for mounting 9080GH or MH track to panel at 45° angle. Includes 2 brackets and hardware for mounting the track to the brackets	MH82	7.20	1
Wall of	Polycarbonate end clamp for 35 mm DIN 3 track, 8 mm (0.31 in.) wide	MHA10	2.40	50

#### Table 24.26: How to Order

To Order Specify	er Specify Catalog Number		
Class Number	Class	Type	
Type Number	9080	GH10	

Discount Schedule

www.schneider-electric.us

#### Table 24.27: 9080GCB Thermal-Magnetic Circuit Protectors

Internal Resistance

CASS AND THE STATE OF THE STATE
GCB100

\$ Price Maximum Current (A) **Maximum Voltage** Catalog Number▲ 0.1 133 GCB01 0.5 6.6 GCB05 0.8 GCB08 2.55 66.00 1.0 1.97 GCB10 GCB12 1.2 1.22 250 Vac 65 Vdc 1.5 0.86 GCB15 20 0.49 GCB20 2.5 0.31 GCB25 3.0 0.20 GCB30 40 0.10 GCR40 72.00 5.0 0.08 GCB50 GCB70 0.03 10.0 <0.02 GCB100 125 Vac 65 Vdc 15.0 <0.02 GCB150

#### Selection

To properly select a Class 9080 Type GCB circuit protector, follow these steps:

- Determine the inrush correction factor from Table 24.28.
- 2. Determine the temperature correction factor from Table 24.29.
- 3. Determine the sealed current of the load that is being protected.
- Multiply the sealed current by the two correction factors and choose the closest circuit protector.

Choosing a circuit protector with a value lower than the calculated value might cause nuisance tripping, while choosing the larger might provide a protector that will not properly protect the load.



E152841 QVNU2 (UL1077)



025490 3211 07 File Class

 $\epsilon$ 

**Example:** Solenoid with sealed current of 0.75 A, an inrush ratio of 1:6, and in an ambient temperature of  $85^{\circ}F$ :  $0.75 \times 1.5 \times 1.05 = 1.18$  Choose the 1.2 A

Tripping Time: Tripping time of the circuit protector is determined from Table 24.30. Divide the circuit protector value by the temperature correction factor from Table 24.29 to determine actual rated current referenced in Table 24.30.

#### Table 24.28: Table A—Inrush Ratio Correction Table

Note: For resistive loads, use inrush correction factor of 1.0.

CP5 Discount Schedule

Description

3/L2 (13)

4/T2 (14)

Two pole Thermal Magnetic Circuit Protector

Inrush Ratio	1:1 to 1:4	1:5	1:6	1:7	1:8
Factor	1.3	1.4	1.5	1.6	1.7

#### Table 24.29: Table B—Ambient Temperature Correction Table

Ambient Temperature	70°F	100°F	120°F	140°F	160°F	180°F	200°F
remperature	(21.1°C)	(37.8°C)	(48.9°C)	(60°C)	(71.1°C)	(82.2°C)	(93.3°C)
Factor	1.0	1.1	1.2	1.3	1.4	1.5	1.6

#### Table 24.30: Table C—Tripping Times in Seconds at 70°F (21.1°C)

Percent rated current	100%	200%	300%	400%	500%	600%	1000%	2000% and greater
Tripping Time (s)	no trip	10–40	38	1.5–9	0.8–6	0.003-4	0.003–2	Max. 0.02

When several protectors are channel mounted adjacent to each other, the "no trip" current will be 80% of rated current at 70°F.

Thermal Rating

0.5 A

1 A 2 A

3 A

4 A

5 A

6 A

8 A

10 A

12 A

GB2CD05 GB2CD06

GB2CD07

GB2CD08

GB2CD09

GB2CD10

GB2CD12

GB2CD14

GB2CD16

GB2CD20

Maximum

300 Vac



www.schneider-electric.us

#### **Thermal-Magnetic Circuit Protectors**

#### Type GB2

www.schneider-electric.us

#### Table 24.31: GB2 Thermal-Magnetic Circuit Protectors+



GB2CB06



GB2CD

Description	Maximum Voltage	Thermal Rating	Catalog Number	\$ Price ea.★
One pole Thermal Magnetic Circuit		0.5 A	GB2CB05	
Protector		1 A	GB2CB06	
1/L1	300 Vac	2 A	GB2CB07	
-		3 A	GB2CB08	43.60
)		4 A	GB2CB09	
Ь		5 A	GB2CB10	
		6 A	GB2CB12	
I>		8 A	GB2CB14	
2/11/		10 A	GB2CB16	
<u> </u>		12 A	GB2CB20	

Discount schedule I. Must order in multiples of 6

For markers, use AB1()R and AB1()G markers from page 24-16

081630 3215 30

 $\epsilon$ 



**TERMINAL BLOCKS** 

\$ Price ea.★

52.00

These maximum current values assume the use of insulated copper conductors with 75°C temperature rating, and are calculated based on NEC Article 310, Table 310-16. In most cases this value is the maximum ampacity of that wire or combination of wires (as listed in the above table) which has the greatest current carrying capacity. The actual allowable current for a particular application depends on the number, size, insulation class, and other characteristics of the wires used.

Discount schedule CP5.





Lug W	ire Range ▲	Aluminum ■						
Main	Main Branch		One Pole		le	Three Pole		
Main	Branch	Туре	\$ Price	Туре	\$ Price	Туре	\$ Price	
(1) #14-2/0	(1) #14–2/0	LBA162101	10.40	LBA262101	22.10	LBA362101	25.70	
(1) #6-350 kcmil	(1) #6-350 kcmil	LBA163101	53.00	LBA263101	81.00	LBA363101	107.00	
(1) #4-600 kcmil	(1) #4-600 kcmil	LBA164101	95.00	N/A	_	LBA364101	183.00	
(2) #4-350 kcmil	(2) #4-350 kcmil	LBA165202	98.00	LBA265202	147.00	LBA365202	189.00	
(2) #6-500 kcmil	(2) #4-500 kcmil	LBA1652021	135.00	LBA2652021	206.00	LBA3652021	243.00	
(1) #14-2/0	(4) #14-4	LBA162104	30.50	LBA262104	45.80	LBA362104	68.00	
(1) #14-2/0	(6) #14-4	N/A	_	N/A	_	LBA362106	131.00	
(1) #6-400 kcmil	(4) #14–2	LBA163104	56.00	LBA263104	84.00	LBA363104	113.00	
(1) #6-400 kcmil	(6) #14–2	LBA163106	59.00	LBA263106	89.00	LBA363106	122.00	
(1) #6-400 kcmil	(8) #14–2	LBA164108	77.00	LBA264108	116.00	LBA364108	161.00	
(1) #4-500 kcmil	(6) #14–2/0	LBA165106	126.00	LBA265106	189.00	LBA365106	233.00	
(1) #4-500 kcmil	(12) #14–2	LBA165112	134.00	LBA265112	201.00	LBA365112	261.00	
(2) #14–2/0	(6) #14-4	LBA163206	60.00	LBA263206	90.00	LBA363206	122.00	
(2) #6-500 kcmil	(8) #14-2/0	LBA165208	126.00	LBA265208	189.00	LBA365208	251.00	
(2) #6-500 kcmil	(12) #14-4	LBA165212	135.00	LBA265212	206.00	LBA365212	261.00	

Class 9080 / Refer to Catalog 9080CT9603

Table 24.33: Miniature Power Distribution Blocks Lug Wire Range ▲



One Pole Two Pole Three Pole Main Branch \$ Price \$ Price Type Type \$ Price 13.40 (1) #14-2 LBA161101 (1) #14-2 N/A LBA361101 (1) #14–2 (4) #18-10 LBA161104 26.40 LBA261104 30.60 LBA361104

Table 24.34: Copper Power Distribution Blocks



LBC165212

Lug W	ire Range ▲		Copper <b>♦</b>						
Main	Dronoh	One Po	One Pole		Two Pole		Three Pole		
wain	Main Branch		\$ Price	Туре	\$ Price	Туре	\$ Price		
(1) #18–1/0	(1) #18–1/0	LBC162101	99.00	N/A	_	LBC362101	201.00		
(1) #6-250 kcmil	(1) #6-250 kcmil	LBC163101	125.00	N/A	_	LBC363101	233.00		
(1) #14-2/0	(4) #14-4	LBC162104	99.00	LBC262104	147.00	LBC362104	248.00		
(1) #4-500 kcmil	(6) #14–2	LBC163106	153.00	LBC263106	228.00	LBC363106	354.00		
(2) #14-2/0	(6) #14-4	LBC163206	134.00	LBC263206	201.00	LBC363206	269.00		
(2) #4-500 kcmil	(8) #14-2/0	LBC165208	297.00	N/A	<u> </u>	LBC365208	593.00		
(2) #6-500 kcmil	(12) #14–2	LBC165212	284.00	N/A	_	LBC365212	567.00		

- Lugs suitable for use with 75°C conductors. (#) indicates number of conductors.
- Aluminum blocks will accept either Al or Cu conductors.
- Cu blocks will accept copper conductors only.

Refer to catalog for dimensions.

#### Certifications



E60616 File Guide



File 70361 Class 6228-01

Aluminum ■

RoHS Compliant



23.40

58.00

#### Table 24.35: Clear Plastic Covers (0.045 in. thick)

Note: There are no covers for miniature blocks

For LBA Type	Туре	\$ Price ea. ★	Dim. A	Dim. B
LBA162, LBC162	LB21	11.30	1.062	2.750
LBA262, LBC262	LB22	13.50	1.875	2.750
LBA362, LBC362 ▼	LB23	15.80	2.688	2.750
LBA163, LBC163	LB31	12.50	1.782	3.813
LBA263, LBC263	LB32	14.70	3.313	3.813
LBA363 LBC363	LB33	17.00	4.844	3.813
LBA164	LB41	13.50	2.125	4.563
LBA264	LB42	15.80	4.000	4.563
LBA364	LB43	18.00	5.875	4.563
LBA165, LBC165	LB51	14.70	2.719	5.313
LBA265, LBC265	LB52	17.00	5.656	5.313
LBA365, LBC365	LB53	19.20	8.375	5.313

#### **Application Data**

Voltage Rating-Class B & C-600 V

Blocks are rated based on NEC Table 310-16 using 75°C wire.

Aluminum blocks are tin plated high conductive aluminum. Copper blocks are tin plated high conductive copper.

Housing material:

- Miniature Blocks are made from high impact thermoplastic rated at 125°C. max. & -40°C. min.
- Full Size Blocks are made from general purpose phenolic rated at 150°C. max. & -40°C. min. All blocks have a flammability rating of UL 94V-0.

Most blocks have a short circuit current rating for UL508A up to 200 kA for branch circuit applications. For the actual ratings, see catalog **9080CT9603R9/08**.

- These covers must be ordered in multiples of 5. Each cover comes with two self-tapping screws. Will not work on a 9080LBA362106 block.



#### Table 24.36: 250 V—Classes H and R

Rating	No. of	of Class H		Class R★		Lug	
(A) △	Poles	Туре	\$ Price	Туре	\$ Price	Wire Range	
	1	FB1211	12.90	FB1211R	19.20		
30▲	2	FB2211	21.90	FB2211R	28.40	#14–10 Cu	
	3	FB3211	31.10	FB3211R	37.20	Ou	
	1			FB1221R	28.40	"44.0	
60▲	2	FB2221	39.20	FB2221R	45.80	#14–2 Cu or Al	
	3	FB3221	55.00	FB3221R	61.00	Ou or Ar	

#### Table 24.37: 600 V—Classes H and R

Rating	No. of	o. of Class H Cla		Class R★		Lug	
(A) △	Poles	Туре	\$ Price	Туре	\$ Price	Wire Range	
	1	FB1611	24.30	FB1611R	30.60	"11 10	
30■	2	FB2611	42.60	FB2611R	48.50	#14–10 Cu	
	3	FB3611	54.00	FB3611R	60.00	Ou	
	1			FB1621R▼	37.20	"44.0	
60■	2	FB2621	51.00			#14–2 Cu or Al	
	3	FB3621	54.00	FB3621R	78.00	00 0171	
100■	3	FB3631	147.00	FB3631R	158.00	#6–2/0 Cu or Al	

#### Table 24.38: 600 V Series-Miniature Fuse Dimension (13/32 x 1-1/2 in.)

			Type M	Class CC★			Lug Wire Range	
(A) △		Poles	Туре	\$ Price	Туре	\$ Price		
ľ		1	FB1611M	13.50	FB1611CC	13.50		
30▲	30▲	2	FB2611M	19.80	FB2611CC	22.10	#14–10 Cu	
		3	FB3611M	24.30	FB3611CC	24.80	Ju	

#### **Application Information:**

#### Base material:

- Base is high impact thermoplastic—maximum operating temperature 125°C
- Base is general purpose phenolic— maximum operating temperature 150°C Base is high impact polyester— maximum operating temperature 130°C

#### Clip material:

- All 30 and 60 A fuse clips are copper alloy tin plated.
- All 100 and 200 A fuse clips are one piece aluminum with copper spring tin plated.
- All Class H, R and J fuses are standard with reinforced fuse clips.

#### Lug termination:

- All 30 A blocks have pressure wire connectors.
- All 60, 100 and 200 A blocks have box lug connectors.

- The Type M fuseholders are UL component recognized (File E40747 CCN IZLT2).
- The Type H, R, J and CC are UL Listed (File E40747 CCN IZLT).
- All fuseholders are CSA certified (File 70360 Class 6225-01).

Flammability rating of all FB fuse blocks is UL 94V-0.

#### RoHS Compliant





FB3221R

Table 24.39: 600 V—Class H Only (Copper Only)

	Rating	No. of	Class H		Lug	
	(A) △	Poles	Туре	\$ Price Wire Range		
		1	FB1611	24.30		
	30■	2	FB2611	42.60	#14–10 Cu	
_		3	FB3611	54.00	Ou	
	100■	3	FB3631C	158.00	#6–2/0 Cu	

Table 24.40: 600 V—Class J

Ratin	g	No. of			Lug
<b>(A)</b> △		Poles	Туре	\$ Price	Wire Range
	30■	2	FB2611J	45.50	#2-14 AWG
	30■	3	FB3611J	63.00	Cu—Al
	en=	2	FB2621J▼	54.00	#2-14
60■		3	FB3621J	75.00	Cu—Al

#### Table 24.41: Track Adapter

Description		Туре	\$ Price ea.	Std. Pack ♦
	35 mm DIN 3 Track Adapter For 9080 FB*211, FB*211R, FB*611M, and FB*611CC Fuseholders	FBDIN3 ▼	4.10	100

#### Table 24.42: Fuse Sizes—(Diameter x Length)

	Class of Fuse	ass of Fuse						
A	Class H/R— 300 V	Class H/R— 600 V	Class M/CC— 600 V	Class J— 600 V				
30	9/16 x 2 in.	13/16 x 5 in.	13/32 x 1-1/2 in.	13/16 x 2-1/4 in.				
60	13/16 x 3 in.	1-1/16 x 5-1/2 in.	N/A	1-1/16 x 2-3/8 in.				
100	1 x 7-7/8 in.	1 x 7-7/8 in.	N/A	N/A				
200	1-1/2 x 7-1/8 in.	1-3/4 x 9-5/8 in.	N/A	N/A				

- Class R and CC fuseholders accept current limiting Class R & CC
- olass H and Colliseriolders accept current limiting class H at Colliser only.

  Not in stock. Order point—Raleigh, NC.
  Specified wire ranges are based on 75°C wire. Wires with temperature ratings other than 75°C are approved while observing NEC. Article 310 wire tables for allowable ampacities of insulated Class R, J and CC fuse blocks are tested and approved for 200,000 AIC in accordance with UL 512.
- Can be mounted directly to a panel or on 35 mm DIN 3 track.
- Orders must specify the standard package quantity or multiples of that quantity.

#### Table 24.43: How to Order

To Order Specify	Catalog Number
Class Number	9080
Type Number	FB1211

Conform to NF C 63-023 Standard Mark and terminate wires simultaneously

Strip the wire, insert it into the cable end and crimp it. Up to 7 markers can be used.

DZ5CE063

0.66

#### Table 24.44: Without Marking Flag

				•	•					
	Wire	Size	Sleeve		Dimensi	ons (mm)		Catalog Number	o Dulas as	Std. Pack
ı	AWG	mm <sup>2</sup>	color	Α	В	С	D	**	\$ Price ea.	*
	00	0.05	Valla	11	6.2			DZ5CE002L6		
	26	0.25	Yellow	13	8.2	1.0	0.0	DZ5CE002	0.16  0.18  0.26  0.18  0.28  0.22  0.42  0.24  0.44  0.42  0.62	
	0.4	0.04	0	11	6.2	1.2	2.2	DZ5CE003L6		
	24	0.34	Green	13	8.2	1		DZ5CE003		
				11	6.2			DZ5CE005L6■	0.40	
	22	0.50	White	13	8.2	1.4	3	DZ5CE005■	0.18	
				16.8	12			DZ5CE005L12	0.26	
		0.75	Dive	11	6.2	4.0	0.4	DZ5CE007L6■		
	20	0.75	Blue	13	8.2	1.6	3.1	DZ5CE007■		
			Red	11.5	6.2	1.8	3.4	DZ5CE010L6■		4000
	18	1.00		13.5	8.2			DZ5CE010■		1000
				16.8	12			DZ5CE010L12	0.28	
				11.5	6.2			DZ5CE015L6■	0.00	
	16	1.50	Black	13.5	8.2	2.1	4	DZ5CE015■	0.22	
				22.8	17.7			DZ5CE0153■	0.42	
	14	2.00	Yellow	14.5	8.2	2.35	4.2	DZ5CE020	0.04	
	1.1	0.50	Cravi	14.5	8.2	2.7	4.6	DZ5CE025■	0.24	
	14	2.50	Gray	24 17.7		2.7	4.6	DZ5CE0253■	0.44	
	10	4.00	0	17.3	9.8	3.3	5.5	DZ5CE042■	0.42	
	12	4.00	Orange	25.5	17.5	3.3	5.5	DZ5CE043■	0.62	
	10	0.00	C	20	11.5	0.05	7	DZ5CE062	0.48	100
		6.00	Green	26	17.5	3.95	/	D75CE062	0.66	100

#### Table 24.45: With Marking Flag

26	0.25	Yellow				2.2	DZ5CA002	0.26		
24	0.34	Green	13		1.2	2.2	DZ5CA003	0.20		
22	0.50	White	13	13		1.4	3	DZ5CA005■		
20	0.75	Blue			8.2	1.6	3.1	DZ5CA007■		1000
18	1.00	Red	13.5		1.8	3.4	DZ5CA010■	0.32		
16	1.50	Black			2.1	4	DZ5CA015■			
14	2.50	Gray	14.5		2.7	4.6	DZ5CA025■			

17.5

#### Table 24.46: Marking Flag Optional ▼

	12	4.00	Orange	19.5	11.5	3.3	5.5	DZ5CA042■	0.38	1000		
	12	4.00	Orange	25.5	17.5	3.3	5.5	DZ5CA043■	0.46	1000		
	10	6.00	Green	20	11.5	3.95	7	DZ5CA062	0.62			
	10	6.00	Green	26	17.5	3.95	7	DZ5CA063	0.64	İ		
	8	3 10.00 Brown	Dunium	21.5	12	4.95	8.4	DZ5CA102	0.72	İ		
			brown	27	17.5	4.95	8.4	DZ5CA103	0.78	100		
	6	16.00	White	23.5	12	6.35	9.8	DZ5CA162	0.86	İ		
	ь		vvriite	29	17.5	6.35	9.8	DZ5CA163	0.96	ı		
	4	25.00	Black	30	17.5	8.15	12	DZ5CA253	1.10	İ		
	2	35.00	Red	30	16	9	13.5	DZ5CA352	1.30			
	2	35.00	35.00	35.00	neu	39	25	9	13.5	DZ5CA353	1.50	00
	0	50.00	50.00	50.00	Blue	36	20	11	15.7	DZ5CA502	1.50	20
	U	50.00	Diue	41	25	11	15.7	DZ5CA503	1.70	i		

#### Table 24.47: Dual Wire Cable Ends

			Α	В	С	D	Е				
22	0.50	White	10	1.4	2.5	4.7	AZ5DE005				
20	0.75	Blue	13	13 8	1.6	2.8	5.0	AZ5DE007	0.24	500	
18	1.00	Red	13.5		1.8	3.4	5.4	AZ5DE010		500	
16	1.50	Black		13.5	13.5		2.1	3.6	6.6	AZ5DE015	0.26
14	2.50	Gray	24	10	2.7	4.2	7.8	AZ5DE025	0.32	250	

- Bold faced catalog numbers are stocked in the United States.

  These catalog numbers are UL Component Recognized (File E164872 CCN ZMMT2) provided the AT1PA crimping tool is used to crimp the cable end.

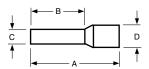
  CE Marked.
- Order must specify the standard pack quantities or multiples of that quantity. Will accept an AR1SC03 cable marker from page 24-22.

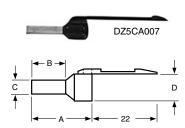
Discount Schedule

RoHS Compliant

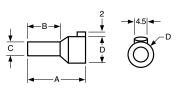




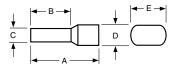




















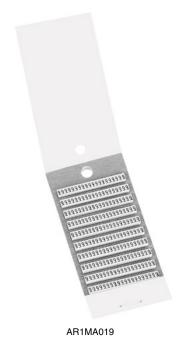


Table 24.48: Cable End Markers & Accessories

Style	Catalog Number	\$ Price ea.	Std. Pack ▲
Adjustable collar type marker holder for #14 to #2 wire	AR1SC01	0.42	
Clip-on marker holder for #18 to #16 wire (7 markers max.)	AR1SC02	0.42	100
Cable end marker tags for DZ5CA042 to DZ5CA253	AR1SC03	0.12	
Card of 200 yellow markers with black numeral 0 thru 9	AR1MA01■	136.00	
Card of 200 yellow markers with black letters A thru Z	AR1MB01 ■	300.00	
Card of 200 black markers with a white 0 marked on them	AR1MC010	13.60	
Card of 200 brown markers with a white 1 marked on them	AR1MC011	13.60	
Card of 200 red markers with a black 2 marked on them	AR1MC012	13.60	
Card of 200 orange markers with a black 3 marked on them	AR1MC013	13.60	
Card of 200 yellow markers with a black 4 marked on them	AR1MC014	13.60	
Card of 200 green markers with a black 5 marked on them	AR1MC015	13.60	
Card of 200 blue markers with a black 6 marked on them	AR1MC016	13.60	
Card of 200 violet markers with a black 7 marked on them	AR1MC017	13.60	1
Card of 200 gray markers with a black 8 marked on them	AR1MC018	13.60	-
Card of 200 white markers with a black 9 marked on them	AR1MC019	13.60	
Card of 200 blank yellow markers	AR1MA0196	12.20	
Card of 200 blank green markers	AR1MA0197	12.20	
Card of 200 yellow markers with a black + marked on them	AR1MA0198	12.20	
Card of 200 yellow markers with a black—marked on them	AR1MA0199	12.20	
Complete set of numeral markers 0 thru 9, plus one card each of the "+" ".", yellow blanks, and green blanks/one AT1PA1 positioning tool. Each kit has 200 of each item.	AR1MA01	136.00	
Complete set of letter markers A thru Z, plus one card each of the "+" "-", yellow blanks, and green blanks/one AT1PA1 positioning tool. Each kit has 200 of each item.	AR1MB01	300.00	

Table 24.49: Cable End Tools

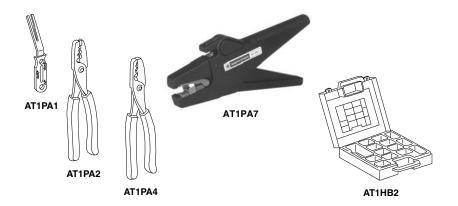
Description	Catalog Number	\$ Price
Cable end marker positioning tool	AT1PA1	30.20
Automatic stripping and cutting tool for 0.8 mm to 4 mm cable, adjustable stripping length	AT1PA7	506.00
Crimping tool for cable ends 0.5 mm <sup>2</sup> to 16 mm <sup>2</sup>	AT1PA2	246.00
Crimping tool for cable ends 10 mm <sup>2</sup> to 35 mm <sup>2</sup>	AT1PA4	268.00
Organizing case for cable ends—holds stripping tool and cable ends (not supplied)	AT1HB2	116.00

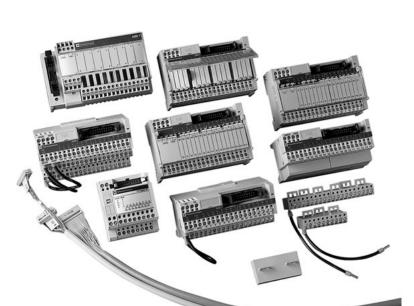
- Order must specify the standard pack quantities or multiples of that quantity.

  Complete the catalog number by adding the number or letter desired.

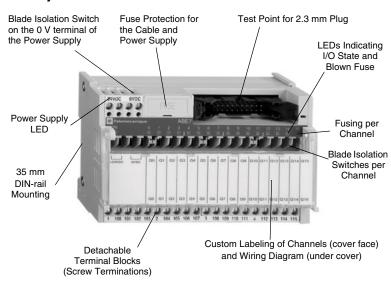
  Examples: AR1 MA015 is a card of 200 yellow markers with a black 5 marked on them.

  R1 MB01T is a card of 200 yellow markers with a black T marked on them.





#### **Advantys TELEFAST 2 Product Features**



NOTE: Not all features available on all modules.



The TELEFAST 2 system is a set of products for the rapid connection of I/O modules (24 Vdc discrete, analog and counters) to Various control circuit components. These components act as a substitute for screw terminal blocks, remotely locating and partly eliminating the single wire connections. The system connects only to channels with HE10 and SUB-D connectors, or to standard terminal blocks with a cabled connector.

Variations within the listing of modules include those with and without relays (electromechanical and solid state), analog and counter modules, and special function modules.

Pre-wired cables available allow you to connect directly to:

- Schneider Electric (Modicon<sup>™</sup> family)
  - TSX Premium™
  - TSX Micro
  - TSX Series 7
  - Twido
  - Quantum™
  - Compact
  - April S5000/7000
  - NUM1020/1060
- Siemens
  - S7 200/300/400
  - S5 95U to 155U
- Allen-Bradley
  - SLC500

In addition, other accessories include:

- I/O simulators
- Continuity blocks
- Label marking software
- Splitter bases (16, 23, and 32 channels)
- Mounting kits
- Detachable terminal strips
- Wiring pass-through connectors
- Fuses

25-4

25-4

25-5

25-6

25-7

25-7

25-8

25-8

### Section 25

### Back to Product Index **Section Listing**

### **Machine Safety Products**



**XPS Safety** Relay (p. 25-4)



**XPSMC Safety** Controller (p. 25-4)



**XPSMF Safety** PLC (p. 25-5)



AS-Interface Safety at Work (p. 25-5)



**XUSL Light Curtain** (p. 25-6)

XCSDM Non-Contact Safety Interlock Switches(p. 25-7)



XY2 Cable Pull Switches (p. 25-8)

### Safety Relays

XPS safety relays for controlling individual safety functions of the

#### **Safety Controller**

XPSMC safety controllers for use where multiple safety relays and multiple safety functions are required, or where there is a greater interaction between the various safety functions required on the machine.

#### Safety PLC

XPSMF Safety PLC for use in safety systems where multiple 25-5 functions are required, or where the interaction between the various components of the safety system is more complicated.

#### **AS-Interface Safety at Work**

AS-Interface for use where multiple safety functions and their interaction need to be monitored. All safety information is transmitted using a safety communication bus.

#### **Light Curtains**

XUSL light curtains for use in point of operation guarding and perimeter guarding. Available in 14 mm (finger) or 30 mm (hand) minimum object sensitivity (MOS) as well as perimeter or body detection, all with a wide range of protected heights.

#### Safety Interlock Switches

XCS safety interlock switches for mechanical interlocking of gates and guards. Locking and non-locking versions are available.

#### Non-Contact Safety Interlock Switches

XCSDM non-contact safety interlock switches for interlocking of gates and guards, where no contact is desired between switch and

#### **Safety Limit Switches**

XCS safety limit switches for a wide variety of safety related functions, including end of travel notification, over-travel indication, safety related positioning of machinery/tooling or component parts, as well as gates and guards.

#### **Cable Pull Switches**

XY2 cable pull switches for Emergency Stop control around conveyors, assembly lines, and large machines.

#### **Palm Operators**

9001 Type P palm operators for applications such as power operated presses, and two hand control applications.

See catalog MKTED208051EN-US



Class 9007 / Refer to Catalog MKTED208051EN-US

Safety-related systems are comprised of many components, and no single safety component will ensure the safety of the system. The design of the complete safety-related system and level of safety desired must be considered before choosing products. The whole safetyrelated system needs to be integrated as part of the initial design, not added on after the machine is built. Schneider Electric can provide a wide range of products for the protection of personnel for machine guarding applications and safety-related system architectures.

#### Safety PLCs—XPSMF

Safety PLCs are used where the safety-related solution is complicated, or where there are a greater number of safety inputs or outputs required. They are also used where safety inputs and outputs need to be distributed around the machine or production area.

#### Safety Controllers—XPSMC

Safety controllers are used in applications where multiple safety relays would be required to control the safetyrelated system, or where the interaction between the individual safety relays would require significant interwiring. The simple-to-use software allows the user to easily develop the safety-related control system, providing a cost effective solution.

#### Safety Relays—XPS

To tie the whole safety system together, XPS safety relays are used to monitor the safety inputs, outputs, and feedback from the system to determine when the system is safe to start and when the system should be shut down.

#### AS-Interface Safety at Work—AS-i

AS-Interface provides the safety solution of multiple safety relays on a communication bus that can transmit both standard and safety relevant data. The safety solution is simply configured with the easy to use configuration

#### Light Curtains—XUSL

Some machine operations may not allow gates or guards to be used, and other applications require high visibility of the process or easy accessibility. For these applications, XUSL light curtains may be the best choice and are available in many protected heights, minimum object sensitivities, and configurations.

#### Safety Interlock Switches—XCS

To protect operators, maintenance, and other personnel, safety systems may require the interlocking of mechanical gates or guards. We provide both locking and non-locking mechanical XCS safety interlock switches in many body styles and contact arrangements.

#### Non-Contact Safety Interlock Switches—XCSDM

Sometimes no contact between the safety interlock switch and its actuating key is desired, such as in food and

beverage applications, so we provide several different types of XCSDM non-contact safety interlock switches.

#### Safety Limit Switches—XCS

In some applications, the position of components is important to the safety of the machine, and devices such as safety interlocks or light curtains are impractical. These applications are ideal for safety limit switches. They can also be used on gates and guards to verify a closed position or a fully open or overtravel position.

#### Cable Pull Switches—XY2

In most applications, emergency stopping is required to shut the machine down in case an emergency or problem arises. Where an individual emergency stop is required, the XB4/XB5 emergency stop push buttons are available in various types, sizes, and nameplates. On large machines or conveyors a high number of emergency stop operators may need to be installed. As more individual e-stop buttons are required, using an XY2 cable pull switch becomes a more economical solution based on ease of use, installation time, and cost effectiveness.

#### Palm Buttons—9001 P

Press applications demand two hand control units for operator protection that are large and easy to operate while wearing gloves. Other press applications, such as stop and inch, also need large buttons for operators wearing gloves. The 9001 P palm buttons offer a variety of operators to meet these needs.

#### Other products for use in safety systems

We offer many other products that are suitable for use in safety-related circuits, such as:

- XB4/XB5 emergency stop push buttons— See Section 19
- XV indicating banks—See Section19
- TeSys contactors and relays—See Section 18
- Limit switches with positive/direct opening N.C. contacts—See Section 21

All of the machine safety products discussed in this section are designed to work together to allow you to meet your various safety requirements. When properly applied, these products will allow you to meet SIL 3 per IEC 61508, Category 4 per EN 954-1 and ISO 13849-1, and performance level "e" per ISO 13849-1, and help you meet domestic and international safety requirements, standards, and codes.

The next few pages give an overview of our wide offering of machine safety products. Catalog **MKTED208051EN-US** gives a detailed description of our offering, including safety PLCs, safety controllers, safety relays, AS-Interface, safety interlocks, light curtains, safety interlocks, non contact safety interlocks, cable pull switches, and palm buttons. This catalog also provides additional information on domestic and international safety standards and codes, and much more information to help you develop safety





XPS Safety Relays

# the safety related solution. Various architectures may have inherent benefits such as simple selection or increased levels of diagnostics, but their cost effectiveness can depend on the size and complexity of the safety related system and the features and functions required. Some of the features and benefits of these various architectures are: XPS Safety Relays

Architectures for Safety Related Solutions

- Local diagnostics (LEDs)
- Remote diagnostics (solid-state outputs)
- Plug-in connectors simplify maintenance
- Select only the safety functions needed
- Simple installation
- Simple replacement
- Proven electromechanical reliability
- No software to learn or use



XPSMC Safety Controller

#### **XPSMC Safety Controllers**

- Simplicity and flexibility
  - 16 or 32 inputs and 10 safety outputs
  - A wide library of predefined and certified safety functions
  - User-friendly software configuration
  - Reduced wiring
  - Only one product to install and implement
- Local and remote diagnostics via serial link to PC or PLC
  - Reduced implementation time and downtime
  - Reduced troubleshooting time

#### **XPSMF Safety PLCs**

- Increased productivity because of:
  - Reduced machine down time
  - Reduced overall engineering costs incurred during installation and maintenance
  - Reduced system complexity by having a single network solution instead of many
- XPS-MF will simplify the entire system by:
  - Saving space
  - Reducing wiring
  - Increasing overall system flexibility by use of programming and device placement (network capability)

safety relays to safety PLCs. The architecture can determine what SIL level or performance level can be achieved with

- Providing complex diagnostics (network capability)
- Saving time and money due to reduced maintenance
- SafeEthernet protocol

#### **AS-Interface Safety at Work**

- Enables safety related solutions to be integrated into the distributed architecture
- Reduces wiring requirements and speeds implementation
- Allows quick and flexible connection of safety interfaces via vampire connector
- Provides simple software configuration
  - Drag and Drop
  - On-line diagnostics
- Provides diagnostics without additional wiring
- Lowers costs from design to operation

All of our machine safety products—such as safety interlocks, light curtains, and cable pull switches—can be used with any of the safety devices listed above. The final safety related control system could meet the safety levels indicated in Table 25.1, depending upon how the circuit is designed.



XPSMF Safety PLC

AS-Interface

#### Table 25.1: Maximum Levels of the Architectures for Safety Related Solutions

		•
	Category 4 per EN 954-1 and Performance Level "e" per ISO 13849-1	SIL 3 Per IEC 61508
XPS Safety Relays	Yes	No
XPSMC Safety Controllers	Yes	Yes
XPSMF Safety PLCs	Yes	Yes
AS-Interface Safety at Work	Yes	Yes

MACHINE SAFETY PRODUCTS

#### XPS Safety Relays



XPS Safety Relay

XPS safety relays monitor various safety inputs, start sequences, and feedback from starters and relays to allow machinery operation only when all safety controls are in their appropriate state and are functioning properly. Inputs can be from emergency stop push buttons, cable pull switches, limit switches, light curtains, safety interlock switches, or two hand control stations.

XPS safety relays give users increased functionality and flexibility when designing equipment to meet safety requirements and standards in the U.S., for the European Safety Directive, IEC safety requirements and meet Category 4 of EN 954-1 and EN/ISO 13849-1. Most devices can be configured for single or dual channel inputs, and for either monitored start, non-monitored start, or automatic start. Removable wiring terminals or non-removable wiring terminals are available on most module types.

The XPS product family complements our broad safety product offering with modules for many specific safety functions and applications, as well as devices for use in general types of applications. There are even devices whose safety functions can be configured at the time of installation.

### Preventa XPS Includes the Following Types of Safety Relay Modules:

- Specific purpose modules such as limit switch monitoring, zero speed, timing, two-hand control, press control, and others
- Multifunctional configurable devices with multiple sets of inputs whose functions can be configured from 15 pre-defined functions, allowing greater flexibility and functionality
- Broad range of devices for emergency stop applications
- Expansion modules to increase the number of safety outputs
- Many devices compatible with light curtains

#### **Features and Benefits**

- LEDs are provided to indicate power, input, output, and feedback loop status.
- Solid state outputs provide compatibility with system controllers for diagnostics, troubleshooting, and correct system operation.
- Most devices are available with either removable or non-removable terminals.
- Most devices are available with a monitored start function to detect welded contacts or incorrect status in the start function and also to detect tampering with the start circuit.
- Dual voltage devices are available for use with either 120 V or 24 V power to reduce your inventory and increase flexibility.

#### **XPSMC Safety Controllers**



XPSMC Safety Controller

The XPSMC safety controllers can be used for monitoring all of the different safety tasks for your applications in one safety controller. All of the functions of the various safety relays are built into the hardware and software. The XPSMC safety controllers meet SIL 3 per IEC 61508, Category 4 per EN 954-1 and ISO 13849-1, and performance level "e" per ISO 13849-1. The associated configuration software makes development of the safety solution simple, using drag and drop techniques to configure the safety system. Detailed diagnostics provide an in depth overview of the status of the inputs and outputs.

#### **Features and Benefits**

- Safety inputs
  - 16 or 32 safety inputs
- Safety outputs
  - Six safety semiconductor outputs
  - Two safety relay outputs, with two relay contacts each (for a total of four relay outputs)
  - One output for muting indicators
- Control outputs
  - Eight control outputs are used to supply the safety inputs in order to detect incorrect wiring or short circuits in the wiring.

#### **Configuration Software**

- The wide device library of certified safety related functions simplifies the development of safety applications.
- Using the simple to use XPSMCWIN software, the configuration can be developed without special training.

#### **Diagnostics with PC and Software**

- Using the diagnostics mode, the XPSMCWIN software provides an exhaustive overview about the status of the safety functions.
- The status of the inputs, the safety devices and the outputs are indicated by various colored indicators.

#### Diagnostics with LEDs in the Front Cover

- 6 LEDs indicate the status of the controller.
- 8 LEDs indicate the status of the safety outputs.
- 16 or 32 LEDs indicate the status of the safety inputs.
- Input/output errors are indicated by blinking of the corresponding LED.



#### Preventa™ XPS Safety PLCs and AS-i Safety at Work

Class 9007 / Refer to Catalog MKTED208051EN-US

For Monitoring Safety Functions

#### **XPSMF Safety PLCs**



XPSMF PLC

The XPSMF Safety PLCs are programmable logic controllers that can be interfaced with the machine control system to meet US, EN, and IEC safety requirements. All XPSMF Safety PLCs meet the requirements of SIL 3 per IEC 61508, Category 4 per EN 954-1 and ISO 13849-1, and performance level "e" per ISO 13849-1. The XPSMF can perform all of the various safety functions required in today's machinery. These functions can be programmed by using one or more pre-defined and certified function blocks (CFB) or by creating your own configuration and function blocks.

#### **Features and Benefits**

- Increased productivity because of:
  - Reduced machine down time
  - Reduced overall engineering costs incurred during installation and maintenance
  - Reduced system complexity by having a single network solution instead of many
- Saving space, reducing complexity
  - Reducing wiring
  - Increasing overall system flexibility by use of programming and device placement (network capability)
  - Providing complex diagnostics (network capability)
  - Saving time and money due to reduced engineering and maintenance

#### Hardware

- Certified to SIL 3 per IEC 61508, Category 4 per EN 954-1 and ISO 13849-1, and performance level "e" per ISO 13849 -1, UL/CSA
  Each Safety PLC contains two processors
- (redundancy)
- SafeEthernet protocol
- Standard bus communication using Ethernet
- 2 or 4 RJ45 connection points (depending on version)
- Connect hardware in any orientation
- LED diagnostics on PLC housing
- Removable terminals
- Compact range contain DIN rail attachment simplifying installation

#### **AS-Interface Safety at Work**



ASISAFEMON1B Monitor

AS-Interface, the recognized cabling system for sensors and actuators, has been enhanced. Standard process information and information relating to safety can now be transmitted over the same yellow cable. Certified to SIL 3 per IEC 61508, Category 4 per EN 954-1 and ISO 13849-1, and performance level "e" per ISO 13849-1, the AS-Interface "Safety at work" system meets the needs of the most common safety applications, such as:

- Monitoring of emergency stops with instantaneous break contacts (stop category 0)
- Monitoring of emergency stops with delayed break contacts (stop category 1)
- Monitoring of safety interlocks and limit switches with and without interlocking
- Monitoring of light curtains

#### **Features and Benefits**

- Simplicity
  - Just add the required safety devices to the standard AS-Interface network.
- Integration
  - Standard data and safety relevant data is transmitted over the same communication bus—no need for a separate safety network.
- Flexibility
  - Monitor multiple devices and control multiple safety sectors.
- Diagnose
  - From one screen, see the status of the safety interfaces and the system.
- - Category 4 per EN 954-1 and ISO 13849-1
  - Performance level "e" per EN/ISO 13849-1
- SIL 3 per IEC 61508
- Multifunctional
  - Monitor up to 31 safety interfaces.
  - Available with 1 or 2 independent output groups.
- Segmentation of safety sectors
  - Multiple safety monitors can be connected to the same AS-Interface network.
  - Monitors can be configured to monitor different groups of safety interfaces.
- 45 mm wide housing

#### **ASISWIN2 Configuration Software**

- Drag and drop methodology
- Predefined, certified safety functions for user selection
- On-line diagnostics of AS-Interface Safety System
- Password protection



XUSL Type 4 light curtains provide point of operation protection for large areas without the need for gates or guards. They allow excellent visibility of the machine or process and free access to the machine while providing protection for personnel. Light curtains are made up of an array of infrared light beams to form a protected area. Whenever one or more of the light beams is broken, the light curtain sends a stop signal to the machine safety control circuit.

XUSLB and XUSLD light curtains for point of operation safeguarding are available in either single or multiple segment configurations. Choose the one that best meets your application requirements. These versions are available in either 14 mm or 30 mm minimum object sensitivity (MOS). Fixed and floating blanking is standard on the XUSLD.

XPSLP perimeter guard light curtains detect the presence of a body as it enters a protected area. They are available in single or multiple beam systems.

#### Features and Benefits of All XUSL Light Curtains

- Slim and rugged design results in an esthetically pleasing small mounting footprint suitable for aggressive environments.
- Broken Beam Indicators for EVERY beam on ALL devices (patented).
  - Makes alignment easier, reducing installation time and cost.
  - Identifies which beams are broken.
  - Identifies exact channel (fixed blanking) select beams.
  - Simplifies troubleshooting and re-adjustment, reducing downtime.

#### **XUSLB and XUSLD 2-Box Light Curtain**

Two box light curtains are ideal for installations where it is desirable to mount and wire only two components, transmitter and receiver. These devices are self-contained and the receiver provides the safety outputs.

#### Features and Benefits

- 14 and 30 mm minimum object sensitivity (MOS)
- 14 mm MOS protection heights: 280 1360 mm (11.0 53.5 in.)
- 14 mm MOS sensing range: 7.0 m (22.9 ft.)
- 30 mm MOS protection heights: 320 2120 mm (12.6 83.5 in.)
- 30 mm MOS sensing range: 8 m or 20 m (26.2 or 65.6 ft.)
- 38 x 50 mm housing size (1.5 x 1.97 in.)
- 24 Vdc supply voltage
- Broken beam Indicators for EVERY beam on ALL devices
- Female connector cables sold separately (5 m, 10 m, 15 m, and 30 m)
- Configurable by hand held programming and diagnostic module (PDM)
- Cascadable devices available in the XUSLD versions up to 4 segments

#### **XUSLP Perimeter Guard for Body Detection**

Perimeter guarding light curtains are used around work cells and for guarding around the perimeter of machinery. They are also used in place of gates or doors. These two box systems simplify installation, since no inter-wiring is required between the emitter and receiver. Installation is further simplified with the passive receiver version, which only needs to have the emitter wired. No wiring is required for the receiver.

#### **Features and Benefits**

- 1 to 6 beams
- Sensing distance up to 70 m (230 ft.) depending upon configuration
- Height: 750 mm (29 in.) to 1800 mm (68 in.)
- Minimum object sensitivities: 300, 400, 500, or 600 mm (11.8, 15.75, 19.69, or 23.62 in.) and single beam
- Visible, red broken beam Indicators
- Short circuit protected
- Display for diagnosis and working mode
- No need of shielded wire up to 120 m (394 ft.)
- Restart and start interlock
- External device monitoring /machine primary control element monitoring (EDM/MPCE)
- Machine test signal (MTS)
- 3 types of coding (A, B, C) by internal switches



XUSLP Light Curtain





#### **XCS Safety Interlock Switches** For Gate or Guard Interlocking







**XCSMP** 

XCS safety interlock switches verify that the doors, gates, or guards are closed before a process which could be harmful to personnel can start up. The hazards to personnel can be mechanical, electrical, hydraulic, pneumatic, chemical, or thermal. The various sizes and shapes of safety interlock switches are designed for a wide variety of applications. These mechanical devices have two components: a switch and an actuating key. When the gate or guard is closed, the actuating key. When the gate or guard is inserted into the switch, closing the safety contacts, allowing the machine to be started. When the gate or guard is opened, the actuating key is removed from the switch, and the safety interlock switch contacts open.

XCS safety interlock switches are designed to meet demanding requirements in the US and Europe, as well as the rest of the world. The flexibility of the XCS line allows one XCS device to perform the same functions as several competitor's devices. This means that fewer XCS devices may be required to cover your needs.

Specifically designed for the protection of machine operators, maintenance and other personnel, the XCS switches can be used in a wide range of applications where a gate, door or guard is a part of the safety related system.

#### **Features and Benefits**

- Simple, rapid installation saves time and labor
- Device flexibility reduces stock requirements
- Wide variety of body styles, contact arrangement, and operators meet a variety of application requirements
- Bodies available in metal or plastic
- Switches are interchangeable between new and older devices, as well as with competitor's devices
- A variety of actuating keys are suitable for all applications
- Pre-wired devices and many connector options available to make wiring and installation easier

#### The Following Types of Safety Interlocks are Available:

- Non-locking
- Locking with push button or key release
- Locking by electrical solenoid
- Rotary shaft operation, for use on hinges of doors
- Rotary lever for hinged guards
- Pre-wired compact body

#### **XCSDM Non-Contact Safety Interlock Switches** For Non-Contact Gate or Guard Interlocking

Class 9007 / Refer to Catalog MKTED208051EN-US





XCSDM non-contact safety interlock switches are designed for the same functions as mechanical safety interlock switches. The difference is that the non-contact safety interlock switches are magnetically coded devices and require no contact between the switch and coded magnet. This is a benefit where door or guard misalignment is an issue, or where the machine designer does not want to use a mechanical device.

#### **Benefits of Non-contact Devices:**

- Food, beverage and pharmaceutical applications require that no contaminants be trapped in or around devices.
- Non-contact devices have no inherent operating force and are well-suited for applications such as lightweight or plexiglass doors, where cracking or breakage is prevalent with standard mechanical safety interlock switches.
- Wash down applications where a standard mechanical safety interlock switch would be more difficult to clean, especially in the actuating key receptacle.
- Where small size is critical or a slim profile is desired

#### Features and Benefits of XCSDMC, XCSDMP, and **XCSDMR**

- Tolerates gate or guard alignment problems
- Wider temperature range for a plastic bodied device than any competitor's products
- Multiple coded-magnet approach directions allow for maximum flexibility of mounting options
- Suitable for Category 4 safety circuits when used with a safety relay or safety controller.
- Available with or without LEDs
- Connector and cabled versions available

#### Features and Benefits of XCSDM3 and XCSDM4

- Meets SIL 2 and 3 per IEC 61508, Category 3 and 4 per EN 954-1 and EN/ISO 13849-1 and performance level "e" per EN/ISO 13849-1 without the need for a safety relay or safety controller
- Connector and cabled versions available
- Multicolor LEDs for diagnostics and status
- Multiple coded-magnet approach directions allow for maximum flexibility of mounting options

#### **Safety Limit Switches**



XCS Safety Limit Switch

#### **XCS Safety Limit Switches**

Preventa XCS safety limit switches are used in machine safety systems for a wide variety of safety related functions, including end of travel notification, overtravel indication, safety related positioning of machinery/tooling or component parts, as well as interlocking gates and guards. They are often used in conjunction with safety interlock switches for mechanical and electrical redundancy on doors and guards.

#### **Features and Benefits**

- Meet US and European safety standards requiring that switches used in safety related applications have positive opening contacts
- Tamper resistant covers over mounting screw and head adjustment to reduce potential for tampering
- Red color allows easy visibility and identification of safety related limit switches
- Two body styles available:
  - Compact, pre-wired with cable
  - Compact, with conduit entry

#### **XCSP/XCSD Safety Limit Switches**

The XCSP (plastic body) and XCSD (metal body) safety limit switches are identical in size and features. The only difference is the enclosure and conduit entry. XCSP and XCSD safety limit switches are for use in safety related applications including end of travel notification, overtravel indication, safety related positioning of machinery/tooling or component parts, as well as interlocking gates and guards.

#### **Features and Benefits**

- Positive opening contacts standard in all devices
- Snap acting contacts
- Slow make/slow break contacts
- Several head types available
- Metal and Plastic body styles available
- Several conduit types available
- Tamper resistant cover

#### **XCSM Safety Limit Switches**

The XCSM safety limit switches come pre-wired in multiple lengths of electrical cable for simplified installation. The XCSM safety limit switches are for use in safety related applications including end of travel notification, overtravel indication, safety related positioning of machinery/tooling or component parts, as well as interlocking gates and guards.

#### **Features and Benefits**

- Positive opening contacts standard in all devices
- Snap acting contacts
- Slow make/slow break contacts
- Several head types available
- Plastic body
- Pre-wired in various cable lengths
- Tamper resistant cover

### Cable Pull Switches For Emergency Stop Operation



XY2 Cable Pulls

#### XY2 Cable Pull Switches

XY2 cable pull switches provide emergency stop signaling at any point along a cable up to 165 feet in length. This is preferable to installing many individual emergency stop push button stations along a conveyor or around the machine, providing a more cost effective solution. Typical applications include conveyor systems, packaging, textiles, transfer machines, presses, woodworking equipment and paint lines.

Operation is based on the taut cable principle. The cable must be tight and have appropriate tension applied to set or reset the switch. Once cable tension has been set, the device will open the N.C. control contacts if either the cable is pulled or if it becomes slack due to stretching or breakage of the cable.

Normal stop versions are used where a momentary, nonemergency signal is required at any point along a cable.

#### **Features and Benefits**

- Cable lengths: XY2CE 165 ft. and XY2CH 50 ft.
- Emergency stop versions (available in XY2CE and XY2CH)
  - The N.C. contact opens the control circuit and mechanically latches, and will remain latched in the open position until an operator manually resets it
  - Emergency stop versions have positive/direct opening contacts as standard
  - Device will not reset if out of adjustment
- Normal stop versions (available in XY2CE and XY2CH)
  - Normal stop versions are used where a momentary, non-emergency signal is required
  - Normal stop versions do not latch contacts open or include positive opening contacts
  - Normal stop versions are provided with snap action contacts for momentary stop

#### XY2CE

- 165 ft. maximum cable length
- Adjustable tripping force
- Available with 2 N.O. and 2 N.C. contacts

#### XY2CH

- 50 ft. maximum cable length
- Two viewing windows to aid in adjusting the switch
- Manual tripping force adjustment
- Adjustment indicator
- Traction force indicator

# Back to Product Index Section Listing

### Section 26

#### **AC Drives and Soft Starts**





Altivar<sup>TM</sup> 212 (26-6)

Altivar<sup>TM</sup> 312 (p. 26-7)



Altivar<sup>TM</sup> 61 (26-10)



**Altivar<sup>TM</sup> 71** (p. 26-13)







Altistart<sup>™</sup> 48 Soft Starts (p. 26-17)

#### **AC Drives Overview**

Panel Mounted Open AC Drive Solutions	26-2
Soft Start Solutions	26-4

#### **AC Drives**

New! Altivar™ 212	26-6
Altivar™ 312	26-7
Altivar™ 61	26-10
Altivar™ 71	26-12
Altivar™ 61 and 71 Options	26-14

#### **Enclosed Drives**

Newl	S–Flex™ 212 Enclosed Drive Controller	26-16
IVEVV:	5 1 10X 2 12 211010000 21110 00111101101	

#### **Soft Starts**

Altistart™ 48	26-17
Altistart™ 22	26-18

#### **AC Drives**

Support, Training, and Documentation	26-20
--------------------------------------	-------

For detailed information on the complete range of open and enclosed drives and soft starts, please refer to AC Drives and Soft Starts Price Guide: 8800PL9701R08/11



#### Panel Mounted / Open AC Drive Solutions

Type of Motor Control		Simple	Machines	Complex Machines
Key Application/Market Segment		Conveyors     Mixers     Gate control     Machine movement	Small pumps and fans     Positive displacement pumps     Material handling	Material working     Material handling     Packaging     Capping, Palletizing     Forming, Embossing     Hoisting
Drives		Altivar 12	Altivar 312	Altivar 32
		AL RAIN AND AND AND AND AND AND AND AND AND AN	Segment To Segment To	
Distribution voltage ranges for 50/60 Hz line supply		Single-phase 100 V to 120 V Single-phase 200 V to 240 V Three-phase 200 V to 230 V	Single-phase 200 V to 240 V Three-phase 200 V to 240 V Three-phase 380 V to 500 V Three-phase 525 V to 600 V	Single-phase 200 V to 240 V Three-phase 380 V to 500 V
Horsepower ratings for three-phase motors		1/4 hp to 1 hp, 115 V/230 V single-phase input 1/4 hp to 3 hp, 208 V/230 V single-phase input 1/4 hp to 5hp, 208V/230 V	1/4 hp to 3 hp, 208 V/230 V single-phase input 1/4 hp to 20 hp, 208 V/230 V 1/2 hp to 20 hp, 400 V/480 V 1 hp to 20 hp, 525 V/600 V	1/4 hp to 3 hp, 200 V/240 V 1/2 hp to 20 hp, 380 V/500 V
Drives	Output frequency	0.5 Hz to 400 Hz	0.5 Hz to 500 Hz	0.1 Hz to 599 Hz
	Type of Control:			
	Asynchronous motor	Sensorless flux vector control Kn2 quadratic ratio for pump and fan	Sensorless flux vector control, volts per hertz, Energy saving ratio	Sensorless flux vector without speed feedback, volts/hertz (2 or 5 point or quadration
	Synchronous motor	_	_	Permanent magnet motor control without speed feedback
	Transient overtorque	150% to 170% of nominal motor torque	170% to 200% of the nominal motor torque	150% nominal for 60 seconds, 200% nominal for 2 seconds
Functions Number of Functions		40	5	>150 + ATV Logic
Number of I/O	Analog inputs	1	3	3
	Analog outputs	1	1	1
	Logic inputs	4	6	6 + Safe Torque Off input
	Logic/Relay outputs	1 L.O., 1 N.O./1 N.C. relay contacts	2: 1 N.O./1 N.C. + 1 N.O. relay contacts	1 L.O., 1 N.O./1 N.C., 1 N.O.
Communication	Integrated	Modbus™	Modbus™ and CANOpen	Modbus™ and CANOpen
	Available as an option	_	DeviceNet     Profibus DP     CANOpen Daisy Chain     Ethernet TCP/IP	CANOpen Daisy Chain     DeviceNet     Profibus DP V1     Ethernet TCP/IP
Other Option Cards		_	-	_
Enclosure Rating		IP20	IP20, Type 1 with optional kit Type 12 available with ATV31C	IP20
Standards and Certifications		EC/EN 61800-5-1, IEC/EN 61800-3 (Environments 1 and 2, categories C1 and C3) CE, UL, CSA, C-Tick, NOM, GOST	EN 50178, EN 61800-3, EN 55011 - EN 55002: class A, class B with option, C-TICK, UL, N998, CE, CSA	IEC/EN 61800-5-1, IEC 61800-3 (1 and 2, category C2) IEC/EN 61508 SIL 1 UL508C, CSA, C-Tick, NOM, GOST, CE



**Open AC Drives** 

www.schneider-electric.us

Complex, High-power Machines	Centrifugal Pu	imps and Fans
Material handling     High performance movement and regulation     Lifts, cranes, hoists     Extruders, shredders     Presses	Pumps     Fans	
Altivar 71	Altivar 212	Altivar 61
Tage of the second seco	EMAZO  PARAMENTO  PARA	Schrieder  Adverti
Single-phase 230 V to 240 V Three-phase 200 V to 240 V Three-phase 380 V to 480 V Three-phase 500 V to 690 V	Three-phase 200 V to 240 V Three-phase 380 V to 480 V	Single-phase 230 V to 240 V Three-phase 200 V to 240 V Three-phase 380 V to 480 V
1 hp to 30 hp, 208 V/230 B single-phase input 1/2 hp to 100 hp, 200 V/230 V 1 hp to 1800 hp, 400 V/480 V 2 hp to 2100 hp, 575 V/690 V	1 hp to 40 hp, 208 V/230 V 1 hp to 100 hp, 400 V/480 V	1 hp to 30 hp, 208 V/230 V single-phase input 1 hp to 125 hp, 208 V/230 V 2 hp to 2500 hp, 575 V/690 V
0.5 Hz to 599 Hz up to 50 hp 0.5 Hz to 500 Hz from 50 hp to 700 hp	0 Hz to 200 Hz	0.5 Hz to 1000 Hz up to 50 hp 0.5 Hz to 500 Hz from 50 hp to 900 hp
Sensorless flux vector control (with or without sensor), volts per	Volts per hertz or sensorless flux vector control	Volts per hertz ratio (2 or 5 points) or sensorless flux vector
hertz ratio (2 or 5 points), ENA system, synchronous motor vector control with or without speed feedback	voils per nertz or sensoriess ilux vector control	control, energy-saving ratio
Vector control with or without speed feedback	_	_
220% of the nominal motor torque for 2 seconds 170% for 60 seconds	Transient overload: 110% of the nominal drive current for 60 seconds	Transient overload: 110% of the nominal drive current for 60 seconds
> 150	50	> 100
2-4	2	2-4
_	1	_
6-20	3	6-20
2-4	2: 1 N.O./1 N.C. and 1 N.O. relay contacts	2-4
Modbus™ and CANopen	Modbus™, Apogee P1, BACnet, Metasys® N2	Modbus™ and CANopen
DeviceNet     Modbus/Uni-Telway     Modbus TCP/IP     Profibus DP [V1]     Ethernet IP      Modbus/Uni-Telway     Modbus/Plus     Interbus S	• LonWorks	Apogee FLN ( P1)     BACnet     Modbus/Uni-Telway     LonWorks     Modbus TCP/IP     Ethernet IP      Modbus Plus     Interbus S     DeviceNet     Profibus DP [V1]     Metasys N2
Encoder interface cards, I/O extension cards, Controller Inside programmable card	_	I/O extension cards, Controller Inside programmable card, multi-pump cards
IP20, Type 1 with optional kit, Type 12 @ 460 Vac	IP20, Type 1 with optional kit, Type 12 @460 Vac	IP20, Type 1 with optional kit, Type 12 @460 Vac
IEC/EN 61800-5-1, IEC/EN 61800-3 (environments 1 and 2, C1 to C3), EN 55011, EN 55022, IEC/EN 61000-4-2/4-3/4-4/4-5/4-6/4-11,CE, UL, CSA, DNV, C-TICK, NOM 117, GOST, ABS	EN 50178, IEC/EN 61800-3, EN 55011, 55022: class A, class B with option, CE, UL, C-TICK, N998, UL 1995 Plenum-rated	IEC/EN 61800-5-1, IEC/EN 61800-3 (environments 1 and 2, C1 to C3), EN 55011, EN 55022, UL 1995 Plenum-rated, IEC/EN 61000-4-2/4-3/4-4/4-5/4-6/4-11, CE, UL, CSA, DNV, C-TICK, NOM 117, GOST, ABS



Type of Mo	tor Control	Simple Machines	Light-duty Machines	Heavy-duty Machines
Key Application/Market Segment		Conveyors Mixers Gate control Machine movement Small pumps and fans Positive displacement pumps	Pumps     Fans     Turbines     Compressors     Conveyor belts     Lifting screws     Escalators	Pumps     Fans     Punch presses     Band saws     Crushers     Centrifuges     Conveyors (high inertia loads)
Soft Starts		Altistart 01	Altistart 22	Altistart 48
		O TO TO TO TO TO TO TO TO TO TO TO TO TO	Solgredor and state of the stat	
Distribution voltage ra	inges for 50/60 Hz line	Single-phase 110 V to 480 V Three-phase 110 V to 690 V	Three-phase 208 to 600 Vac	Three-phase 230 V to 415 V Three-phase 208 V to 690 V
Horsepower ratings fo	or three-phase motors	1/4 hp to 2 hp 115 V/230 V 1/2 hp to 30 hp, 208 V/230 V 1/2 hp to 60 hp, 400 V/480 V 30 hp to 75 hp, 575 V/600 V	3 hp to 500 hp	3 hp to 1200 hp
Drives	Output frequency	Equals input frequency	-	Equals input frequency
	Type of Control:			
	Asynchronous motor	Reduced voltage start	Controlled starting and stopping, via voltage and torque	Reduced voltage start Reduced voltage start and torque control stop
	Synchronous motor	_	_	_
	Typical starts per hour rating	_	6	10
Functions Number of Functions	· ·	1	29	36
Number of I/O	Analog inputs	_	1 PTC probe	1 PTC probe
	Logic inputs	3	3	4
	Relay outputs	1	2 (N.O./N.C)	1
Communication	Integrated	_	Embedded Modbus	Modbus
	Available as an option	Combined with TeSys™ U-Line self-protected starter	_	DeviceNet     Ethernet TCP/IP     Fipio     Profibus DP V1
Other Option Cards		_	_	_
Enclosure Rating		IP20	IP00, IP20	IP20
Standards and Certifications		EC/EN 60947-4/2, C-Tick, CSA, UL, CE, CCC	UL, CSA, CE, GOST, C-TICK, CCC, and RoHS directive	EC/EN 60947-4/2, EMC class A and B, DNV, C-Tick, GOST, CCIB, NOM, UL, CE, CCC, CSA

# Schneider Enclosed AC Drives

www.schneider-electric.us

Type of Motor Control	Adjustable Speed Drives Commercial HVAC & Retrofits	Soft Starts Commercial
Key Application/Market Segment	Pumps     Fans	Pumps Fans Conveyors Centrifuges
Packaged Products	S-Flex (Altivar 212)	Enclosed 22
Distribution voltage ranges for 50/60 Hz line supply	208 Vac, 240 Vac, 480 Vac	208 Vac, 230 Vac, 460 Vac, 575 Vac
Horsepower ratings for three-phase motors	Variable torque 1 hp to 40 hp, 200 V/230 V 1 hp to 100 hp, 460 V	Type 1 and Type 12 3 hp to 150 hp, 208 V 5 hp to 200 hp, 230 V 10 to 400 hp, 460 V 15 to 500 hp, 575 V  Type 3R or 50 °C Rated: 3 hp to 150 hp, 230 V 5 hp to 150 hp, 230 V 10 to 400 hp, 460 V
Configurable options	Configurable product Drive with isolation/bypass Non-bypass Drive input disconnect switch Line contactor  Communication options	Basic shunt tip Full featured shunt trip non-reversing isolation Reversion isolation Integral Full Voltage Bypass
Enclosure ratings	Type 1 general purpose	Type 1 general purpose Type 12 industrial use (Dust-Tight/Drip-Tight) Type 3R outdoor use
Communication	Modbus RJ45 (included as standard)     BACnet (embedded)     LonWorks (option card)     Metasys N2 (embedded)     APOGEE FLN (P1) (embedded)	Modbus (embedded)
Standards and Certifications	UL 508C, Seismic qualification ICC ES AC156 acceptance test protocol	Service Entrance Rating, UL Listed per UL 508 under category NKJH, Conforms to applicable NEMA ICS, NFPA, and IEC standards, Manufactured under ISO9001 standards, Factory modification E10 provides Canadian cUL certification pe C22.2, No.14, Seismic qualification



ATV212W075N4



ATV212HU30M3X



ATV212HD37N4



VW3A1101



VW3A1101 VW3A1102 VW3A1103 VW3A1104R10



VW3A8121



LonWorks Option Card VW3A21212

The Altivar 212 drive is for use with three-phase asynchronous motors for variable torque pump and fan applications. Select the Altivar 212 drive using the motor nameplate voltage, the full load ampere rating = and the table below. The Altivar 212 drive includes 3 logic inputs, 2 analog inputs, 1 analog output, and 2 relay outputs (with 1 NO and 1 NO/NC contacts). The Altivar 212 drive includes an integrated 4 digit, 7 segment LED display with a 7 button keypad and includes an RJ45 Modbus port plus a four-screw terminal block for BACnet, Modbus, Metasys N2 and Apogee P1 communication protocols. LonWorks™ is available in an option card.

Altivar™ 212 Selection and Pricing

			Continuous			Enclosure Ra	ating		
AC Input Line Voltage		Three-Phase otor Power▲  Output Current		IP 20■ Open Style Product		Type 1 Conduit Kit Purchase ATV212 and Conduit Kit for Type 1 Installation		Type 12 / IP54 ◆ ★	
	HP	kW	AA	Catalog Number	\$ Price	Catalog Number	\$ Price	Catalog Number	\$ Price
	1 2 3 4 5	0.75 1.5 2.2 3 4	4.6 7.5 10.6 13.7 18.7	ATV212H075M3X ATV212HU15M3X ATV212HU22M3X ATV212HU30M3X ATV212HU40M3X	309. 400. 454. 555. 618.	VW3A31814 VW3A31814 VW3A31814 VW3A31815 VW3A31815	45. 45. 45. 45. 45.	= = =	_ _ _ _
200/240 Vac -15%, +10% Three-Phase	7.5 10 15 20 25	5.5 7.5 11 15 18.5	24.2 32 46.2 61 74.8	ATV212HU55M3X ATV212HU75M3X ATV212HD11M3X ATV212HD15M3X ATV212HD18M3X	799. 963. 1225. 1532. 1795.	VW3A31816 VW3A31816 VW3A31817 VW3A31817 VW3A31817	45. 45. 45. 45. 45.	= = =	
	30 40	22 30	88 117	ATV212HD22M3X ATV212HD30M3X	2188. 2806.	VW3A9206 VW3A9208	65. 135.	_	_
	1 2 3 4 5	0.75 1.5 2.2 3 4	2.2 3.7 5.1 7.2 9.1	ATV212H075N4 ATV212HU15N4 ATV212HU22N4 ATV212HU30N4 ATV212HU40N4	400. 472. 545. 618. 654.	VW3A31814 VW3A31814 VW3A31814 VW3A31815 VW3A31815	45. 45. 45. 45. 45.	ATV212W075N4 ATV212WU15N4 ATV212WU22N4 ATV212WU30N4 ATV212WU40N4	500. 590. 681. 772. 817.
380/480 Vac -15%, +10% Three-Phase	7.5 10 15 20 25	5.5 7.5 11 15 18.5	12 16 22.5 30.5 37	ATV212HU55N4 ATV212HU75N4 ATV212HD11N4 ATV212HD15N4 ATV212HD18N4	798. 946. 1145. 1425. 1705.	VW3A31815 VW3A31816 VW3A31816 VW3A31817 VW3A31817	45. 45. 45. 45. 45.	ATV212WU55N4 ATV212WU75N4 ATV212WD11N4 ATV212WD15N4 ATV212WD18N4	998. 1183. 1489. 1853. 2131.
	30 30 40 50 60 75 100	22 22 30 37 45 55 75	43.5 43.5 58.5 79 94 116 160	ATV212HD22N4S★ ATV212HD22N4 ATV212HD30N4 ATV212HD30N4 ATV212HD37N4 ATV212HD45N4 ATV212HD55N4 ATV212HD75N4	1780. 1856. 2284. 2686. 3372. 3883. 4433.	VW3A31817 VW3A9206 VW3A9206 VW3A9207 VW3A9207 VW3A9208 VW3A9208	45. 65. 65. 65. 135.	ATV212WD22N4 ATV212WD30N4 ATV212WD37N4 ATV212WD45N4 ATV212WD55N4 ATV212WD75N4	2412. 2855. 3358. 4215. 4853. 5541.

UL File E116875, CSA 2278406, Plenum rated per UL 508C for UL 1995 installations. NOM, CE

- These horsepower, wattage and continuous ampere ratings apply to the default switching frequency and maximum 40 °C ambient. Refer to the installation manual for derating curves as a function of switching frequency, ambient temperature, and mounting conditions. IP20 Altivar 212 drives can be installed as UL Type 1 with an optional conduit box by following the instructions in the Installation Manual.
- For ATV212W... drives with Class B EMC filter, add the letter "C" to the end of the standard catalog number and multiply \$ Price by 1.3.
- Late 3Q 2011 availability.

Table 26.2: **Altivar 212 Options and Accessories** 

	Description	For Use on Drives	Catalog Number	\$ Price
User Interface Op	otions			
Remote LCD Display Keypad	8 line, 24 characters per line, plain text, 8 keys, rotary wheel, 60 °C IP54 rated	Altivar 212, 312, 32 Altivar 61 & 71	VW3A1101■	115.
Remote I CD	IP54 rated kit for remote mounting LCD keypad on enclosure door. Clear plastic door for use with VW3A1102 for IP65 rating and tamper resistant. Female / Female right angle RJ45 adaptor, to connect cable and keypad.▲	VW3A1191 VW3A1102 VW3A1101	VW3A1102■ VW3A1103■ VW3A1105■	55. 35. 35.
Keypad Mounting Accessories	Remote LCD Keypad Mounting Cables —Equipped with two RJ45 connectors 1 meter length 3 meter length 5 meter length 10 meter length	VW3A1101 VW3A1101 VW3A1101 VW3A1101	VW3A1104R10 ♦ VW3A1104R30 ♦ VW3A1104R50 ♦ VW3A1104R100 ♦	35. 35. 35. 35.
Multi-loader	Use to copy configurations between like drives, PC Soft, or SoMove PC Software	Altivar 12, 212, 312 32, 61, 71, & Altistart 22	VW3A8121	350.
Potentiometer	Operator, mounting collar, 2.5 kilohm, ½ watt potentiometer	Altivar 212	ATVPOT25K	69.
Software				
	PC software configuring, monitoring and trouble shooting Altivar 212 drives. Requires one of two cables (noted below) to connect a PC to the RJ45 Modbus port on the drive	Altivar 212	Download at www.schneider-electric.	us/drives
PCSoft	USB/RS485 cable: equipped with USB connector and RJ45 connector	Altivar & Altistart	TCSMCNAM3M002P◆	52.
	RS 232-RS485 converter with SUB-D $\&$ RJ45 port, cable with two RJ45 connectors	Altivar 212	VW3A8106■	75.
SoMobile™	Software for compatible moble phones provides wireless interface similar to the LCD display. Requires Modbus™ to Bluetooth® adaptor to connect phone and Altivar 212 drive. Modbus	Altivar 212	Download at www.schneider-electric.	us/drives
Bluetooth Adaptor	Connects to RJ45 Modbus port on the drive.	Altivar 12, 212, 312, 61, 71	VW3A8114	85.
Communication (	Option			
LonWorks Communication Card Option	Provides a four-screw terminal block for connecton to LonWorks network. Install in place of standard control board that comes mounted in the Altivar 212 drive. The I/O count is reduced to 3LI, 1 AI and 1 NO/NC relay	Altivar 212	VW3A21212	375.
Mounting Kit				
DIN Rail Mounting Kit	For installation on 35 mm wide DIN rail	Altivar 212H075M3XU22M3X Altivar 212H075N4U22N4	VW3A31852	375.

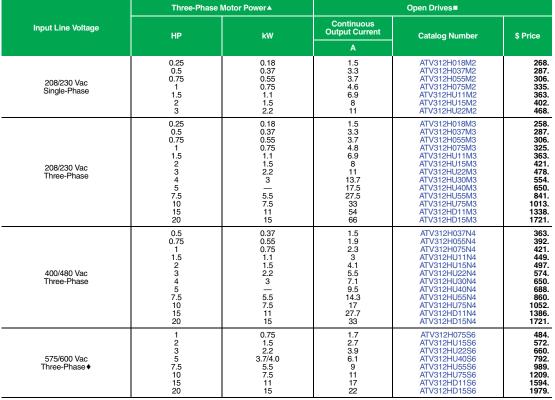
Not required if using VW3A1102.

1979



Altivar™ 312 Selection and Pricing Table 26.3:



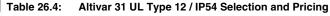




- These horsepower, wattage, and continuous ampere ratings apply to 4 kHz switching frequency and maximum 50 °C ambient. Refer to the installation manual for derating curves as a function of switching frequency, ambient temperature, and mounting conditions.
- Open type Altivar 312 Drives can be installed as UL Type 1 with optional conduit box when following instructions in the installation manual.

15

A minimum 3% line reactor is required on all 575 V drive installations.



20



ATV31C IP54 / UL Type 12

Input Line	Three-Phase Motor Power▲		Open Drives■	IP54 / UL Type 12 Enclosed	
Voltage	kW	HP	A▲	Catalog Number	Standard \$ Price
208/230 Vac Single-Phase	0.18 0.37 0.55 0.75 1.1 1.5 2.2	0.25 0.5 0.75 1 1.5 2	1.5 3.3 3.7 4.6 6.9 8 11	ATV31C018M2 ATV31C037M2 ATV31C055M2 ATV31C075M2 ATV31CU11M2 ATV31CU11M2 ATV31CU15M2 ATV31CU22M2	362. 387. 413. 452. 490. 543. 632.
400/480 Vac Three-Phase	0.37 0.55 0.75 1.1 1.5 2.2 3 — 5.5 7.5 11 15	0.5 0.75 1 1.5 2 3 4 5 7.5 10	1.5 1.9 2.3 3 4.1 5.5 7.1 9.5 14.3 17 27.7 33	ATV31C037N4 ATV31C055N4 ATV31C075N4 ATV31CU11N4 ATV31CU15N4 ATV31CU22N4 ATV31CU20N4 ATV31CU40N4 ATV31CU40N4 ATV31CU55N4 ATV31CU75N4 ATV31CD15N4	490. 529. 568. 606. 671. 774. 878. 929. 1162. 1420. 1733. 2151.

These horsepower, wattage, and continuous ampere ratings apply to 4 kHz switching frequency and maximum 50 °C ambient. Refer to the installation manual for derating curves as a function of switching frequency, ambient temperature, and mounting conditions.

Table 26.5: Altivar™ 312 Options and Accessories

	Description	For Use on Drives	Catalog Number	\$ Price
Software				
SoMove™ Lite This software enables the uthe integrated display terminal menus. It ca	ser to configure, set, debug and organize maintenance task for the ATV n be used with a direct connection or a Bluetooth $^{\textcircled{m}}$ wireless connection.	312 soft starter. It can a Free download www.sc	lso be used to cus chneider-electric.	stomize .us
Powersuite™ Test and Commissioning Software Kit	Software on CD-ROM. For use with Microsoft Windows™ 95, 98, NT, and XP operating systems for PCs	ATV312 all ranges	VW3A8104	150.
User Interface Kits				
USB to RJ45 Adaptor Kit	For use in connecting to a PC with a USB port	Advantys™ OTB, Altistart™ motor starters, Altivar series incl. HMI, Altivar controller	TCSMCNAM3M 002P	52.
Remote Keypad Options and Accessories	Remote Keypad Display Remote Keypad Display Remote Keypad Display and Mounting Kit Remote Keypad Display	ATV12 (IP54) ATV12 (IP65) ATV312 ATV312, ATV61, ATV71	— VW3A31101 VW3A1101 ▲	 175. 115.
Cable for remote mounting LCD graphic keypad. RJ-45 connector on each end.	5 meters	Any ATV61, Any ATV71 Any ATV61, Any ATV71 Any ATV61, Any ATV71 Any ATV61, Any ATV71	VW3A1104R30 VW3A1104R50	35. 35. 35. 45.
Communication Options	Profibus CANopen Daisy Chain DeviceNet	ATV312 ATV312 ATV312	VW3A31207 VW3A31208 VW3A31209	185. 185. 185.
Potentiometer	Operator, mounting collar, 2.5 kilohm, ½ watt potentiometer	Altivar 312	ATVPOT25K	69.

<sup>▲</sup> Refer to page 26-14 for remote mounting kit and IP65 option for this keypad.

**NOTE:** Refer to Catalog MKTED211041EN-US for communication cables.

Table 26.6: Configuration Tools

Description	Part Number	For Use on Drives	\$ Price
Bluetooth® Dongle: to establish connection between Altivar drives and PC enabled with Bluetooth	VW3A8114	All	85.
Simple Loader: to transfer configuration between like drives. For use with the Altivar product line.	VW3A8120	ATV12, ATV312, ATV32, ATV61 and ATV71	175.
Multi-loader: to copy a configuration from a drive or from SoMove via an SD card, and transferring to another drive or to a PC $$	VW3A8121	ATV12, ATV312, ATV212, ATV32, ATV61, ATV71 and ATS22	350.

Table 26.7: Options—Field Installed Kits

	Description	For Use on Drives	Catalog Number	\$ Price
		ATV312H018M2, ATV312H037M2, ATV312H055M2, ATV312H075M2, ATV312H018M3, ATV312H037M3, ATV312H055M3, ATV312H075M3	VW3A9804	72.
DIN Rail Mount Kit	DIN Rail Mounting Plate for 35 mm wide DIN rail	ATV312HU11M2, ATV312HU15M2, ATV312HU11M3, ATV312HU15M3, ATV312HU22M3, ATV312H037N4, ATV312H055N4, ATV312H075N4, ATV312HU11N4, ATV312HU15N4, ATV312HU55S6, ATV312HU15S6	VW3A9805	72.
		ATV312H018M2, ATV312H037M2, ATV312H055M2, ATV312H075M2	VW3A31812	45.
		ATV312H018M3, ATV312H037M3, ATV312H055M3, ATV312H075M3	VW3A31811	45.
		ATV312HU11M3, ATV312HU15M3	VW3A31813	45.
Conduit Entrance	Multiple knockout sizes Installation of conduit entrance kit and retention of vent cover on	ATV312HU11M2, ATV312HU15M2, ATV312HU22M3, ATV312H037N4, ATV312H055N4, ATV312H075N4, ATV312HU11N4, ATV312HU15N4, ATV312HU11N4, ATV312HU15N6	VW3A31814	45.
Kit	top of drive controller provides the ATV31 with UL Type 1 rating.	ATV312HU22M2, ATV312HU30M3, ATV312HU40M3, ATV312HU22PM4, ATV312HU30N4, ATV312HU40N4, ATV312HU22S6, ATV312HU40S6	VW3A31815	45.
		ATV312HU55M3, ATV312HU75M3, ATV312HU55N4, ATV312HU75N4, ATV312HU55S6, ATV312HU75S6	VW3A31816	45.
		ATV312HD11M3, ATV312HD15M3, ATV312HD11N4, ATV312HD15N4, ATV312HD11S6, ATV312HD15S6	VW3A31817	45.
	This kit contains brackets that adapt the spacing of the ATV312	ATV312H018M2, ATV312H037M2, ATV312H055M2, ATV312H075M2 ATV312H018M3, ATV312H037M3, ATV312H055M3, ATV312H075M3	VW3A31821	25.
ATV28 Replacement Kit	mounting holes to be equivalent to that of an ATV28 with the same rating. This will permit the ATV312 to be secured to the panel holes and mounting hardware already in place for the ATV28.	ATV312HU11M2, ATV312HU15M2, ATV312HU11M3, ATV312HU15M3, ATV312HU22M3, ATV312H075S6, ATV312HU15S6	VW3A31822	25.
		ATV312HU55M3, ATV312HU75M3, ATV312HU55N4, ATV312HU75N4, ATV312HU55S6, ATV312HU75S6	VW3A31823	25.
		ATV312H018M2-037M2 ATV312H018M3-037M3 ATV312H037N4-U40N4	VW3A66711	422.
Dynamic Braking	DB resistors are provided in a Type 1 enclosure and are thermally protected.	ATV312H055M2-U22M2 ATV312H055M3-U22M3 ATV312HU55N4-U75N4	VW3A66712	633.
Resistor Kit	, , , , , , , , , , , , , , , , , , , ,	ATV312HU30M3-U40M3 ATV312HD11N4-D15N4	VW3A66713	950.
		ATV312HU55M3-U75M3	VW3A66714	1266.
		ATV312HD11M3-D15M3	VW3A66715	1846.



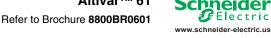
**AC Drives** 

Table 26.7: Options—Field Installed Kits (Continued)

	Description		For Use on Drives	Catalog Number	\$ Price
	230/460 V		See Price Guide 8800PL9701.		
			ATV312H075S6	RL00202	158.
			ATV312HU15S6 ATV312HU22S6	RL00403	163.
Line Reactors		Open Style	ATV312HU40S6 ATV312HU55S6 ATV312HU75S6 ATV312HD11S6 ATV312HD11S6	RL00803 RL00802 RL01202 RL01802 RL02502	245 179 200 253 291
	575 V		ATV312H075S6	RL00212	289
			ATV312HU15S6 ATV312HU22S6	RL00413	294.
		Enclosed (Type 1)	ATV312HU40S6 ATV312HU55S6 ATV312HU75S6 ATV312HD11S6 ATV312HD15S6	RL00813 RL00812 RL01212 RL01812 RL02512	379. 310. 332. 388. 507.
	For compliance with European (CE) conducted emissions standard 55022 Class B (Class A filter built into 230/460 V ATV31 drives)	Single-phase supply voltage: 200–240 V 50/60 Hz	ATV312H037M2 ATV312H055M2 ATV312H075M2	VW3A31401	58.
			ATV312HU11M2 ATV312HU15M2	VW3A31403	79
			ATV312HU22M2	VW3A31405	108
		3 phase supply voltage: 200–240 V 50/60 Hz	ATV312H018M3 ATV312H037M3 ATV312H055M3 ATV312H075M3	VW3A31402	72
			ATV312HU11M3 ATV312HU15M3 ATV312HU22M3	VW3A31404	90
			ATV312HU30M3 ATV312HU40M3	VW3A31406	133
RFI Input Filter			ATV312HU55M3 ATV312HU75M3	VW3A31407	189
			ATV312HD11M3 ATV312HD15M3	VW3A31408	297
	,		ATV312HD11N4 ATV312HD15N4	VW3A31409	243
			ATV312H037N4 ATV312H055N4 ATV312H075N4 ATV312HU11N4 ATV312HU15N4	VW3A31404	90
		3 phase supply voltage: 380–500 V 50/60 Hz	ATV312HU22N4 ATV312HU30N4 ATV312HU40N4	VW3A31406	133
			ATV312HU55N4 ATV312HU75N4	VW3A31407	189
			ATV312HD11N4 ATV312HD15N4	VW3A31409	243
	Installation of the fan kit enables	the drive to operate in higher	ATV61/71HD18M3XHD22M3X, ATV61/71HD22N4	VW3A9404	135.00
an Kit	ambient temperatures. The fan mounts of		ATV61/71HD30N4HD37N4	VW3A9405	145.00
	product catalog for more information		ATV61/71HD30M3XHD45M3X	VW3A9406	165.00
			ATV61/71HD45N4HD75N4	VW3A9407	195.00



#### **Altivar 61 Three-Phase Drives** Table 26 8: Selection and Pricing





26

AC DRIVES







	Variable Torque'					Catalog Number to have ATV61 and Type 1			
Input Line Voltage	Three-Phase Motor Power		Continuous Output Current	Catalog Number with LCD Keypad (Stocked)∆	\$ Price	to have ATV61 and Type 1 conduit \entry kit shipped as one line item. Field installation required (Packaged as kit at	\$ Price	Catalog Number with LED Keypad (Non-stocked)	\$ Price
	HP	kW	Α			warehouse).			
				Page 1					
208/240 Vac Three Phase	1 2 3 4 5 7.5 10 15 20 25 30 40 50 60 75 100 125	0.75 1.5 2.2 3 4 5.5 7.5 11 15 18 22 30 37 45 55 75 90	4.8 8 11 13.7 17.5 27.5 33 54 66 75 88 120 144 176 221 285 359	ATV61H075M3▲★ ATV61HU15M3▲★ ATV61HU20M3▲★ ATV61HU40M3▲★ ATV61HU40M3▲★ ATV61HU45M3▲★ ATV61HU75M3▲★ ATV61HD15M3X▲■★ ATV61HD15M3X▲■★ ATV61HD15M3X▲■★ ATV61HD2M3X▲■★ ATV61HD2M3X▲■★ ATV61HD2M3X▲■★ ATV61HD30M3X▲■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★ ATV61HD35M3X■★	639. 663. 764. 925. 1035. 1292. 1586. 2011. 2525. 2943. 3586. 4599. 5342. 6326. 7806. 9379.	ATV61H075M3T1★ ATV61HU15M3T1★ ATV61HU22M3T1★ ATV61HU40M3T1★ ATV61HU40M3T1★ ATV61HU55M3T1★ ATV61HU75M3T1★ ATV61HD15M3XT1■★ ATV61HD15M3XT1■★ ATV61HD22M3XT1■★ ATV61HD2M3XT1■★ ATV61HD37M3XT1■★ ATV61HD37M3XT1■★ ATV61HD37M3XT1■★ ATV61HD55M3XT1■★ ATV61HD55M3XT1■★ ATV61HD75M3XT1■★	684. 708. 809. 970. 1080. 1337. 1631. 2056. 2570. 3008. 3651. 4684. 5427. 6411. 8266. 9839.	ATV61H075M3Z ATV61HU15M3Z ATV61HU22M3Z ATV61HU30M3Z ATV61HU40M3Z ATV61HU55M3Z ATV61HU75M3Z ATV61HD11M3Z ATV61HD11M3Z ATV61HD11M3Z ATV61HD11M3Z	544. 568. 669. 830. 940. 1197. 1491. 1916. 2430.
400/480 Vac Three Phase	1 2 3 4 5 7.5 10 15 20 25 30 40 50 60 75 150 250 350 400 500 600 700 900	0.75 1.5 2.2 3 4 5.5 7.5 11 15 18 22 30 37 45 55 75 90 110 130 120 220 250 315 400 630	2.3 4.1 5.8 7.8 10.5 14.3 17.6 27.7 33 41 48 66 79 94 116 160 179 215 259 314 427 481 616 759 941 1188	ATV61H075N4 ▲ ★ ATV61HU15N4 ▲ ★ ATV61HU30N4 ▲ ★ ATV61HU30N4 ▲ ★ ATV61HU30N4 ▲ ★ ATV61HU35N4 ▲ ★ ATV61HU5N4 ▲ ★ ATV61HD15N4 ▲ ★ ATV61HD15N4 ▲ ★ ATV61HD15N4 ▲ ★ ATV61HD15N4 ▲ ★ ATV61HD2N4 ▲ ★ ATV61HD3N4 ▲ ★ ATV61HD3N4 ▲ ★ ATV61HD3N4 ▲ ★ ATV61HD5N4 ▲ ★ ATV61HD5N4 ▲ ★ ATV61HD5N4 ▲ ★ ATV61HD5N4 ▲ ★ ATV61HC13N4 ◆ ★ ATV61HC13N4 ◆ ★ ATV61HC13N4 ◆ ★ ATV61HC2N4 ◆ ★ ATV61HC2N4 ◆ ★ ATV61HC3N4 ◆ ▼ ATV61HC3N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC4N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼ ATV61HC6N4 ◆ ▼	754. 857. 999. 1125. 1158. 1299. 1578. 1868. 2322. 2795. 3042. 3744. 4403. 5528. 6365. 7267. 7988. 9022. 10366. 11711. 13993. 16475. 23734. 31783.	ATV61H075N4T1 *	799. 902. 1044. 1170. 1203. 1344. 1623. 1913. 2367. 2840. 3107. 3809. 4468. 5563. 6500. 7402. 8448. 9575. 10939. 12299. 14581. 17079.	ATV61H075N4Z ATV61HU15N4Z ATV61HU2N4Z ATV61HU30N4Z ATV61HU40N4Z ATV61HU55N4Z ATV61HU55N4Z ATV61HD11N4Z ATV61HD11N4Z ATV61HD15N4Z ATV61HD15N4Z ATV61HD28N4Z ATV61HD28N4Z ATV61HD30N4Z ATV61HD37N4Z ATV61HD37N4Z ATV61HD55N4Z	659. 762. 904. 1030. 1063. 1204. 1483. 1773. 2700. 2947. 3649. 4308. 5433. 6270. 7172

- Option to have product treated for increased protection for dusty and corrosive environments. This product is not stocked. On 1 hp to 10 hp at 230 Vac 3 phase and up to 100 hp at 460 V, add "\$337" to the end of the catalog number. On 15 hp to 60 hp at 230 Vac 3 phase, add "337" to the end of the catalog number. In both cases multiply price by 1.2 to obtain new price. With this option, exposed copper is tinned, circuit boards are conformal coated in critical areas and plastics are treated to better withstand the corrosive nature of certain oils. This option is standard on 55 kW/75 hp @ 230 Vac 3 phase and higher and 90 kW/125 hp @ 460 Vac and higher.

- Product does not contain an EMC filter.

  Product does not contain an EMC filter.

  Product ships with a DC choke that must be field mounted. A 5% line reactor may be purchased and installed in place of the DC choke. Add "D" to the end of the catalog number to receive just the AC drive and multiply the listed price by .96 to obtain new price.

  These products can be ordered with LonWorks® or BACnet communication option card shipped as one line item. Field installation required. Add "LW" to the end of the part number to receive a LonWorks option card. Add \$2550 to the price. Add "BN" to the end of the part number to receive a BACnet option card. Add \$225 to the price.
- These products do not contain a dynamic braking transistor. A separate transistor must be added for applications requiring dynamic braking. When ordering replacements for Square D™ brand E-Flex™, MCC and M-Flex™ enclosed drive controllers containing the Altivar 61 drive, identify the replacement catalog number by referring to the applicable instruction manual, the side nameplate on power converter, or using the graphic keypad (menu 1.11 identification).



**AC Drives** 



Table 26.8: Altivar 61 Selection and Pricing (continued)

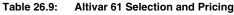
		Varia	ble Torque			
Input Line Voltage	Three-Phase	Motor Power	Continuous Output Current	Catalog Number with LCD Keypad (Stocked)	\$ Price	
	HP	kW	Α	ì í		
				Napote management		
575/690 Vac Three Phase	3 4 5 7.5 10 15 20 25 30 40 50 60 75 100 125 150 — 200 250 350 450 450 550 700 800	3 4 5.5 7.5 11 15 18.5 22 30 37 45 55 75 90 110 132 160 200 250 315 400 630 800	3.9 5.8 6.1 9 111 17 222 27 32 41 52 62 77 99 125 150 180 220 290 355 420 543 675 840	ATV61HU30Y▲ ATV61HU40Y▲ ATV61HU55Y▲ ATV61HU55Y↓ ATV61HD11Y↓ ATV61HD11Y↓ ATV61HD18Y↓ ATV61HD18Y↓ ATV61HD22Y↓ ATV61HD30Y↓ ATV61HD37Y↓ ATV61HD55Y↓ ATV61HD55Y↓ ATV61HD75Y↓ ATV61HC11Y↓■ ATV61HC11Y↓■ ATV61HC13Y↓■ ATV61HC25Y↓■ ATV61HC25Y↓■↓ ATV61HC25Y↓■↓ ATV61HC3Y↓■↓ ATV61HC3Y↓■↓ ATV61HC3Y↓■↓ ATV61HC3Y↓■↓ ATV61HC3Y↓■↓ ATV61HC3Y↓■↓ ATV61HC30Y↓■↓ ATV61HC30Y↓■↓ ATV61HC63Y↓■↓	1889. 1990. 2099. 2380. 2799. 3380. 3979. 4790. 5780. 6999. 8579. 10379. 12199. 14399. 16899. 19179. 20795. 24290. 28950. 35950. 46750. 59590. 78490.	

- Conformal coating is standard.
- An AC 5% line reactor is mandatory.
- These products do not contain a dynamic braking transistor. A separate transistor must be added for applications requiring dynamic braking.

#### Altivar™ 61 Single-Phase Drives

In an application where it is necessary to use a 240 V single-phase input for a 3-phase motor, the drive must be derated; therefore, the power listed on the drive nameplate will be higher than the power rating on the motor nameplate.

For more information on wire and line reactor sizing, refer to *Altivar 61 and 71 Supplementary Ratings* (30072-451-38) and Price Guide 8800PL9701 for line reactor selection and pricing.





Input Line Voltage	With A 3% Line Reactor			Without A 3% Line Reactor					Catalog Number for ATV61 drive and Type 1 conduit entry		Catalan Number	
	Motor Power		Continuous Output Current	Motor Power		Continuous Output Current	Catalog Number with LCD Keypad	List Price \$	kit shipped as one line item. Field installation required	List Price \$	Catalog Number with LED Keypad (Non-stocked)	List Price \$
	HP	kW	Α	HP	kW	Α			(packaged as kit at warehouse).			
							Vagente				Name of the State	
,	_	_	_	0.5	0.37	3	ATV61H075M3▲■	639.00	ATV61H075M3T1■	684.00	ATV61H075M3Z▲	544.00
	_	_	_	1	0.75	4.8	ATV61HU15M3▲■	663.00	ATV61HU15M3T1■	708.00	ATV61HU15M3Z▲	568.00
	_	_	_	2	1.5	8	ATV61HU22M3▲■	764.00	ATV61HU22M3T1■	809.00	ATV61HU22M3Z▲	669.00
	_	_	_	3	2.2	11	ATV61HU30M3▲■	925.00	ATV61HU30M3T1■	970.00	ATV61HU30M3Z▲	830.00
	_	3	13.7	_	_	_	ATV61HU40M3▲■	1035.00	ATV61HU40M3T1■	1080.00	ATV61HU40M3Z▲	940.00
208/	5	4	17.5	_	_	_	ATV61HU55M3▲■	1292.00	ATV61HU55M3T1■	1337.00	ATV61HU55M3Z▲	1197.00
240 Vac Single	7.5	5.5	27.5	5	4	17.5	ATV61HU75M3▲■	1586.00	ATV61HU75M3T1▲■	1631.00	ATV61HU75M3Z▲	1491.00
Phase	10	7.5	33	7.5	5.5	27.5	ATV61HD15M3X▲■	2525.00	ATV61HD15M3XT1■	2570.00	ATV61HD15M3XZ▲	2430.00
	_	_	_	10	7.5	33	ATV61HD18M3X▲■	2943.00	ATV61HD18M3XT1■	3008.00	_	
	15	11	54	-	_	_	ATV61HD22M3X▲■	3586.00	ATV61HD22M3XT1■	3651.00	_	_
	20	15	66	15	11	54	ATV61HD30M3X▲■	4599.00	ATV61HD30M3XT1■	4684.00	_	
	25	18	75	20	15	66	ATV61HD37M3X▲■	5342.00	ATV61HD37M3XT1■	5427.00	_	
	30	22	88	25	18	75	ATV61HD45M3X▲■	6326.00	ATV61HD45M3XT1■	6411.00	_	

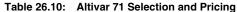
Option to have product treated for increased protection for dusty and corrosive environments. This product is not stocked. On 0.5 hp to 5 hp at 230 Vac single phase, add "\$337" to the end of the catalog number. On 7.5 hp to 25 hp at 230 Vac single phase, add "\$337" to the end of the catalog number. In both cases multiply price by 1.2 to obtain the new price. With this option, exposed copper is tinned, circuit boards are conformal coated in critical areas and plastics are treated to better withstand the corrosive nature of certain oils.

Product does not contain an EMC filter.

#### Altivar 71 Single-Phase

In an application where it is necessary to use a 240 V single-phase input for a 3-phase motor, the drive must be derated; therefore, the power listed on the drive nameplate will be higher than the power rating on the motor nameplate.

For more information on wire and line reactor sizing, refer to Altivar 61 and 71 Supplementary Ratings (30072-451-38).





	With A 3% Line Reactor			Without A 3% Line Reactor					Catalog Number to have ATV71 and Type 1 conduit entry		Catalog Number	
Input Line Voltage	Motor		Continuous Output Current	Motor		Continuous Output Current	Catalog Number with LCD Keypad■	Price \$	kit shipped as one line item. Field installation required	Price \$	with LED  Keypad  (Non-stocked)	Price \$
	HP	kW	A	HP	kW	Α			(Packaged as kit at warehouse).			
							* James 1982				**************************************	
	_	-	1	0.5	0.37	3	ATV71H075M3▲	652.	ATV71H075M3T1	697.	ATV71H075M3Z▲	557.
	_	_	_	1	0.75	4.8	ATV71HU15M3▲	694.	ATV71HU15M3T1	729.	ATV71HU15M3Z▲	589.
	_	_	_	2	1.5	8	ATV71HU22M3▲	796.	ATV71HU22M3T1	841.	ATV71HU22M3Z▲	701.
	_	_	_	3	2.2	11	ATV71HU30M3▲	984.	ATV71HU30M3T1	1029.	ATV71HU30M3Z▲	889.
	_	3	13.7	_	_	_	ATV71HU40M3▲	1150.	ATV71HU40M3T1	1195.	ATV71HU40M3Z▲	1055.
208/	5	4	17.5	_	_	_	ATV71HU55M3▲	1458.	ATV71HU55M3T1	1503.	ATV71HU55M3Z▲	1363.
240 Vac Single	7.5	5.5	27.5	5	4	17.5	ATV71HU75M3▲	1790.	ATV71HU75M3T1	1835.	ATV71HU75M3Z▲	1695.
Phase	10	7.5	33	7.5	5.5	27.5	ATV71HD15M3X▲◆	2850.	ATV71HD15M3XT1♦	2895.	ATV71HD15M3XZ▲	2755.
	_	_	_	10	7.5	33	ATV71HD18M3X▲◆	3422.	ATV71HD18M3XT1 ♦	3487.	_	_
	15	11	54			_	ATV71HD22M3X▲◆	4170.	ATV71HD22M3XT1 ♦	4253.	_	_
	20	15	66	15	11	54	ATV71HD30M3X▲◆	5348.	ATV71HD30M3XT1♦	5433.	_	_
	25	18	75	20	15	66	ATV71HD37M3X▲◆	6212.	ATV71HD37M3XT1 ♦	6297.	_	_
	30	22	88	25	18	75	ATV71HD45M3X▲◆	7356.	ATV71HD45M3XT1 ♦	7491.	_	_

- Option to have product treated for increased protection for dusty and corrosive environments. This product is not stocked. On 0.5 hp to 5 hp at 230 Vac single-phase, add "S337" to the end of the catalog number. On 7.5 hp to 25 hp at 230 Vac single-phase, add "S37" to the end of the catalog number. In both cases multiply price by 1.2 to obtain new price. With this option, exposed copper is tinned, circuit boards are conformal coated in critical areas and plastics are treated to better withstand the corrosive nature of certain oils.

  These products can be ordered with LonWorks® or BACnet communication option card shipped as one line item. Field installation required. Add "LW" to the end of the part number to receive a LonWorks option card. Add \$550 to the price. Add "BN" to the end of the partnumber to receive a BACnet option card. Add \$225 to the price.
- Product does not contain an EMC filter.

#### Altivar 71 Three-Phase

Table 26.11: Altivar 71 Selection and Pricing



LCD Keypad



LED Keypad

	(	Constant	Torque						
Input Line Voltage	Three-Phase Motor Power		Continuous Output Current	*	\$ Price	Catalog Number ATV71 drive and Type 1 conduit entry kit	\$ Price	Catalog Number with LED Keypad (Non-stocked)	\$ Price
	HP	kW	A					( )	
				*PITE					
	0.5	0.37	3	ATV71H037M3▲	616.	ATV71H037M3T1	661.	ATV71H037M3Z	521.
	1	0.75	4.8	ATV71H075M3▲	652.	ATV71H075M3T1	697.	ATV71H075M3Z	557.
	2	1.5	8	ATV71HU15M3▲	684.	ATV71HU15M3T1	729.	ATV71HU15M3Z	589.
	3	2.2	11	ATV71HU22M3▲	796.	ATV71HU22M3T1	841.	ATV71HU22M3Z	701.
	4	3	13.7	ATV71HU30M3▲	984.	ATV71HU30M3T1	1029.	ATV71HU30M3Z	889.
	5	4	17.5	ATV71HU40M3▲	1150.	ATV71HU40M3T1	1195.	ATV71HU40M3Z	1055.
	7.5	5.5	27.5	ATV71HU55M3▲	1458.	ATV71HU55M3T1	1503.	ATV71HU55M3Z	1363.
208/240 Vac	10	7.5	33	ATV71HU75M3▲	1790.	ATV71HU75M3T1	1835.	ATV71HU75M3Z	1695.
Three	15	11	54	ATV71HD11M3X▲■	2270.	ATV71HD11M3XT1■	2315.	ATV71HD11M3XZ■	2175.
Phase	20	15	66	ATV71HD15M3X▲■	2850.	ATV71HD15M3XT1■	2895.	ATV71HD15M3XZ■	2755.
	25	18	75	ATV71HD18M3X▲■	3422.	ATV71HD18M3XT1■	3487.	_	_
	30	22	88	ATV71HD22M3X▲■	4170.	ATV71HD22M3XT1■	4235.	_	_
	40	30	120	ATV71HD30M3X▲■	5348.	ATV71HD30M3XT1■	5433.	_	_
	50	37	144	ATV71HD37M3X▲■	6212.	ATV71HD37M3XT1■	6297.	_	_
	60	45	176	ATV71HD45M3X▲■	7356.	ATV71HD45M3XT1■	7491.	_	-
	75	55	221	ATV71HD55M3X■◆▼	8870.	ATV71HD55M3XT1■	9330.	_	-
	100	75	285	ATV71HD75M3X■◆▼	10658.	ATV71HD75M3XT1■	11211.	_	-

- Option to have product treated for increased protection for dusty and corrosive environments. This product is not stocked. On 0.5 hp to 10 hp at 230 Vac 3 phase and up to 100 hp at 460 V, add "5337" to the end of the catalog number. On 15 hp to 60 hp at 230 Vac 3 phase, add "337" to the end of the catalog number. In both cases multiply price by 1.2 to obtain new price. With this option, exposed copper is tinned, circuit boards are conformal coated in critical areas and plastics are treated to better withstand the corrosive nature of certain oils. This option is standard on 55 kW/75 hp @ 230 Vac 3 phase and higher & 90 kW/125 hp @ 460 Vac and higher.

  Product does not contain an EMC filter.
- Product ships with a DC choke that must be field mounted. A 5% line reactor may be purchased and installed in place of the DC choke. Add "D" to the end of the catalog number to receive just the AC drive and multiply the listed price by .96 to obtain new price.

  Also possible for use with a synchronous motor. Add "383" to the end of the catalog number and multiply the listed price by 1.2 to obtain new price.

Conformal coating is standard.



#### Table 26.13: Altivar™ 71 Selection and Pricing (continued)

**Constant Torque** 



ATV71HC28N4

Input Line Voltage		-Phase r Power			\$ Price	Type 1 conduit entry kit shipped as one line item. Field installation required	\$ Price	Catalog Number with LED Keypad (Non-stocked)	\$ PriceW
	HP	kW	Α			(Packaged as kit at warehouse).			
				Tagain and State of S				1	
	1	0.75	2.3	ATV71H075N4▲◆	794.	ATV71H075N4T1	839.	ATV71H075N4Z	699.
	2	1.5	4.1	ATV71HU15N4▲◆	912.	ATV71HU15N4T1	957.	ATV71HU15N4Z	817.
	3	2.2	5.8	ATV71HU22N4▲◆	1110.	ATV71HU22N4T1	1155.	ATV71HU22N4Z	1015.
	4 5	3 4	7.8 10.5	ATV71HU30N4▲◆ ATV71HU40N4▲◆	1250. 1316.	ATV71HU30N4T1 ATV71HU40N4T1	1295. 1361.	ATV71HU30N4Z ATV71HU40N4Z	1155. 1221.
	7.5	5.5	14.3	ATV71HU55N4▲◆	1516.	ATV71HU55N4T1	1629.	ATV71HU55N4Z	1489.
	10	7.5	17.6	ATV71HU75N4▲◆	1924.	ATV71HU75N4T1	1969.	ATV71HU75N4Z	1829.
	15	11	27.7	ATV71HD11N4▲◆	2278.	ATV71HD11N4T1	2323.	ATV71HD11N4Z	2183.
	20	15	33	ATV71HD15N4▲◆	2832.	ATV71HD15N4T1	2877.	ATV71HD15N4Z	2737.
	25	18	41	ATV71HD18N4▲◆	3408.	ATV71HD18N4T1	3453.	ATV71HD18N4Z	3313.
	30	22	48	ATV71HD22N4▲◆	3710.	ATV71HD22N4T1	3775.	ATV71HD22N4Z	3615.
400/400 \/a-a	40	30	66	ATV71HD30N4▲◆	4566.	ATV71HD30N4T1	4631.	ATV71HD30N4Z	4471.
400/480 Vac Three	50	37	79	ATV71HD37N4▲◆	5370.	ATV71HD37N4T1	5435.	ATV71HD37N4Z	5275.
Phase	60	45	94	ATV71HD45N4▲◆	6742.	ATV71HD45N4T1	6877.	ATV71HD45N4Z	6647.
	75	55	116	ATV71HD55N4▲◆	7762. 8862.	ATV71HD55N4T1	7897. 8997.	ATV71HD55N4Z	7667.
	100 125	75 90	160 179	ATV71HD75N4▲ ♦ ATV71HD90N4■ ♦	9742.	ATV71HD71N4T1 ATV71HD90N4T1	10202.	ATV71HD75N4Z	8767.
	150	110	215	ATV71HC11N4■◆	11002.	ATV/THD90N4TT	10202.	_	
	200	130	259	ATV71HC13N4■◆	12642.	_	_	_	_
	250	160	314	ATV71HC16N4■◆	14282.	_	_	_	_
	300	200	387	ATV71HC20N4■♦△	16462.	_	_	_	_
	400	250	481	ATV71HC25N4■♦△	19382.	_	_	_	_
	450	280	550	ATV71HC28N4■♦△	23002.	_	_	_	_
	500	310	616	ATV71HC31N4■♦△	27922.	_	_	_	_
	600	400	759	ATV71HC40N4■♦△	37392.	_	_	_	_
	700	500	941	ATV71HC50N4■♦△	52041.	_		_	_
	2	2.2	2.7	ATV71HU22Y★	1889.	_	_	_	_
	3	3	3.9	ATV71HU30Y★	1990.	_	_	_	_
	4 5	4	5.8	ATV71HU40Y★	2009. 2380.	_	_	_	_
	7.5	5.5 7.5	6.1 9	ATV71HU55Y★ ATV71HU75Y★	2380. 2799.	_		_	
	10	11	11	ATV71HD11Y★	3380.				
	15	15	17	ATV71HD15Y★	3979.	_		_	
	20	18.5	22	ATV71HD18Y★	4790.	_	_	_	_
	25	22	27	ATV71HD22Y★	5780.	_	_	_	_
	30	30	32	ATV71HD30Y★	6999.	_	_	_	_
575 (000 ) <i>(</i>	40	37	41	ATV71HD37Y★	8579.	_	_	_	_
575/690 Vac Three	50	45	52	ATV71HD45Y★	10379.	_	_	_	_
Phase	60	55	62	ATV71HD55Y★	12199.	_	_	_	_
	75	75	77	ATV71HD75Y★	14399.	_	_	_	_
	100	90	99	ATV71HD90Y★	16899.	_	_	_	_
	125	110	125	ATV71HC11Y★▼ ATV71HC13Y★▼	19179.	_	_	_	_
	150 175	132 160	150 180	ATV71HC13Y★▼ ATV71HC16Y★▼	23795. 24290.		_	_	I _
	200	200	220	ATV71HC20Y★▼△	24290. 28950.	_		_	
	250	250	290	ATV71HC25Y★▼△	35950.	_	_	_	
	350	315	355	ATV71HC31Y★▼△	46750.	_	_	_	_
	450	400	420	ATV71HC40Y★▼△	59590.	_	_	_	l –
	550	500	543	ATV71HC50Y★▼△	78490.	_	_	_	_
	700	630	675	ATV71HC63Y★▼△	103390.	_		_	<u> </u>

Catalog Number to have ATV71 drive and

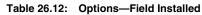
ATV71HC31Y

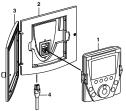
Option to have product treated for increased protection for dusty and corrosive environments. This product is not stocked. Up to 100 hp at 460 V, add "S337" to the end of the catalog number and multiply price by 1.2 to obtain new price. With this option, exposed copper is tinned, circuit boards are conformal coated in critical areas and plastics are treated to better withstand the corrosive nature of certain oils. This option, system is standard on 90 kW/125 hp @ 460 Vac and higher.

Product ships with a DC choke that must be field mounted. A 5% line reactor may be purchased and installed in place of the DC choke. Add "D" to the end of the catalog number to receive just the AC drive and

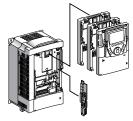
- multiply the listed price by.96 to obtain new price.
- Also possible for use with a synchronous motor. Add "383" to the end of the catalog number and multiply the listed price by 1.2 to obtain new
- price.
  Conformal coating is standard.
- An AC 5% line reactor is mandatory.
- These products do not contain a dynamic braking transistor. A separate transistor must be added for applications requiring dynamic braking.



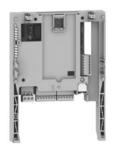




LCD Keypad Mounting Kits



Option Card Assembly



I/O Option Card



Communication Option Card



Incremental Encoder Interface Option Card

	Description		For Use on Drives	Catalog No.	\$ Price
	LCD graphic keypad: IP54 rating			VW3A1101	115.
Operator	Remote mounting kit: includes bezel and m	ounting hardware		VW3A1102	55.
	Door for use with remote mount kit for IP65	rating		VW3A1103	45.
		1 meter		VW3A1104R10	35.
	Cable for remote mounting LCD graphic	3 meters	any ATV61 any ATV71	VW3A1104R30	35.
Interface	keypad RJ-45 connector on each end	5 meters	u., y 7.1. 7.7.1	VW3A1104R50	35.
	Tio 40 conficción di Caon cha	10 meters		VW3A1104R100	45.
	RJ-45 female—female adaptor to connect L required if using VW3A1102.			VW3A1105	35.
	Operator, mounting collar, 2.5 kilohm, 1, wa	att potentiometer	Altivar 61	ATVPOT25K	69.
PowerSuite™	PowerSuite software on CD for PC		Altivar AC drives	VW3A8104	150.
Software Options	USB/RS485 cord set (equipped with RJ45 s	socket)	Altistart™ 48 TeSys™ U-line	TCSMCNAM3M002P	52.
For Wireless Connection	Modbus™ to Bluetooth® Gateway and RS-		any ATV61 any ATV71	VW3A8114	85.
I/O Adaptor	115 Vac logic input adaptor adapts 7 logic in	nputs for use with	any ATV61	VW3A3101	195.
• • •	user supplied 115 Vac signals	a autouta di Farra Cirale:	any ATV71		
I/O Extension Option Cards	Basic I/O option card—4 logic inputs, 2 logic output, an input for PTC motor probes, a 24 output	c outputs, 1 Form C relay Vdc output, and a 10 Vdc	any ATV61 any ATV71	VW3A3201	165.
	Extended I/O option card—contains all the I/plus 2 analog inputs, 2 analog outputs, 1 pu	O on the Basic I/O option card lse input	<b>,</b>	VW3A3202	195.
CANopen Adapter	This adaptor connects to the RJ-45 port and SUB-D connector conforming to the CANo (CIA DRP 303-1)	d provides a 9–pin male pen standard	any ATV61 any ATV71	VW3CANA71	45.
CANopen Connector	9-pin female SUB-D with line terminator (ca outlet CAN-H, CAN-L, CAN-GND connect		any ATV61 any ATV71	VW3CANKCDF180T	45.
	with RS-422 outputs, 5 Vdc			VW3A3401	85.
	with RS-422 outputs, 15 Vdc			VW3A3402	85.
	with open collector outputs, 12 Vdc			VW3A3403	85.
	with open collector outputs, 15 Vdc			VW3A3404	85.
Incremental Encoder	with push-pull outputs, 12 Vdc		AT) (T)	VW3A3405	85.
Interface Option Cards	with push-pull outputs, 15 Vdc		any ATV71	VW3A3406	85.
Option Carus	with push-pull outputs, 24 Vdc			VW3A3407	85.
	Resolver			VW3A3408▲	85.
	Universal with SinCos, SinCos Hiperface®,	SinCos EnDat <sup>®</sup> or SSI output		VW3A3409▲	85.
	Incremental with RS422 outputs and encod	er emulation		VW3A3411▲	85.
	Modbus™ Plus card			VW3A3302	550.
	Modbus / Uni-Telway™ card			VW3A3303	225.
	Modbus TCP/IP daisy chain			VW3A3310D	275.
	Interbus <sup>®</sup> S card		any ATV61	VW3A3304	550.
	Profibus DP card		any ATV71	VW3A3307	550.
Communication	Profibus DPv1 card			VW3A3307S371	550.
Option Cards	DeviceNet™ card			VW3A3309	225.
	Ethernet/IP™ card			VW3A3316	275.
	LonWorks <sup>®</sup> card			VW3A3312	550.
	Metasys <sup>®</sup> N2 card		om: AT /04	VW3A3313	225.
	Apogee® FLN P1 card		any ATV61	VW3A3314	225.
	BACnet card			VW3A3315	225.
IMC Option Card	ATV IMC drive controller card ◆			VW3A3521S0	755.
Controller Inside Option Card	Programmable option card, conforms with I standard.	EC61131–3 programming	any ATV61 any ATV71	VW3A3501■	550.
Water Solutions Control Card	This option card contains a variety of pre-pr features to manage multi–pump installations	ogrammed functions and s.	any ATV61 any ATV71	VW3A3503■	650.
Simple Loader	Using RJ45 port connections, the configura downloaded then uploaded to compatible d	tions of a drive can be	ATV31, ATV61, and ATV71	VW3A8120	175.

- For use with the ATV71H...383 drive ONLY.
  The drive cannot support the VW3A3503 water solutions card and the VW3A3501 controller inside option card simultaneously.
  SoMachine is required to use this product.



www.schneider-electric.us
Table 26.14: Options—Field Installed (continued)

Table 26.	.14:	Options—F	ield Installe	d (continued)						
				Description		For Use	on Drives		Catalog No.	\$ Price
					ATV61/71H037				VW3A9501	255.
3 0	1)				/71H075N4HU22N4 /71HU22M3HU40M3					
			ATV61/71HU3				VW3A9502	279.		
					ATV61/71HU5				\/\\/2\0E02	325.
0	~ <b>~</b>	4			ATV61/71HU5	- ,			VW3A9503	325.
	A STATE OF THE PARTY OF THE PAR	2			ATV61/71HU75				VW3A9504	358.
		<b>3</b>			ATV61/71HD1	1M3XHD15M3X	<i></i>			<del>                                     </del>
2	1				ATV61/71HD1		`		VW3A9505	419.
(	6					BM3XHD22M3			VW3A9506	438.
						2N4, ATV61/71H	U30YHD30Y			
				Kit includes:	ATV61/71HD30	0M3XHD45M3)	(		VW3A9507 VW3A9508	469. 469.
2330	(5			a metal frame, seals, mounting hardware, and a bracket to mount the fan kit so the fan can be		5N4HD75N4, A		HD90Y	VW3A9509	477.
	-		Flange Kit	accessed from the front of the drive template.		3XHD75M3X				
( D) ( D) ( D)				Kit used to mount the heatsink of the drive outside of an enclosure.	ATV71HD55M	3X, ATV71HD90	N4		VW3A9510	500.
	Flange			outside of all eliciosure.		3X, ATV61HC13			10101010	
`	VW3A9	19506				3X, ATV71HC11			VW3A9511	667.
					ATV61HC16N4 ATV71HC13N4	1, ATV61HC20Y,	ATV61/71HC11\	/HC16Y,	VW3A9512	1053.
						1, ATV71HC16N	1		VW3A9513	1053.
					ATV61HC25N4	1HC31N4				1
					ATV61HC40Y ATV61/71HC2				VW3A9514	1053.
					ATV71HC20N4 ATV71HC20Y	1HC28N4				
					ATV61HC25N4	1HC31N4 with	VW3A7101 brak	ing transistor		-
					ATV61HC40Y ATV61/71HC2	5Y. HC31Y			VW3A9515	1062.
					ATV71HC20N4	1HC28N4 with	VW3A7101 brak	ing transistor		
					ATV71HC20Y ATV61/71H037M3HU15M3				+	<del>                                     </del>
					ATV61/71H075N4HU22N4				VW3A9201	45.
					2M3HU40M3			VW3A9202	45.	
				ATV61/71HU30N4HU40N4 ATV61/71HU55M3						
					ATV61/71HU5				VW3A9203	45.
					ATV61/71HU7				VW3A9204	45
					ATV61/71HD1				VW3A9204	45.
						1M3XHD15M3)	(		VW3A9205	45.
					ATV61/71HD15N4, HD18N4 ATV61/71HD18M3XHD22M3X					+
					ATV61/71HD22N4				VW3A9206	65.
					ATV61/71HU30					
					ATV61/71HD30N4, HD37N4 ATV61/71HD30M3XHD45M3X				VW3A9207 VW3A9217	65.
					ATV61/711D30M3X1D45M3X ATV61/71HD45N4HD75N4					85.
				Kit includes:	ATV61/71HD37YHD90Y				VW3A9208	135.
			Type 1 Conduit Kit	a metal box with conduit knockouts. The kit provides conduit landing when wall	ATV61HD55M3XHD75M3X ATV61HD90N4HC11N4				\ #4/0 A 0000	400
				mounting the drive.	ATV71HD55M3X, ATV71HD90N4, ATV61HC11N4				VW3A9209	460.
					ATV61HD90M3X, ATV61HC13N4				VW3A9210	553.
					ATV71HD75M3X, ATV71HC11N4				VW3A9210	555.
					ATV61HC16N4, ATV71HC13N4				VW3A9211	573.
					ATV61/71HC11YHC16Y ATV61HC20Y				V VV 3A9211	3/3.
					ATV61HC22N4, ATV71HC16N4				VW3A9212	588.
					ATV61HC25N4 ATV71HC20N4	1ATV61HC31N 1 HC28N4	4			
					ATV71HC20IV	T1 1020114			VW3A9213	604.
					ATV61/71HC2	5Y, HC31Y				
					ATV61HC40Y	1 1100:111: ::	MAIO 4710::			<b></b>
					ATV71HC25N4	4HC31N4 with 4HC28N4 with	v vv3A/101 brak VW3A7101 brak	ing transistor ing transistor		
					ATV71HC20Y				VW3A9214	604.
					ATV61/71HC2	5Y, HC31Y			4	
					ATV61HC40Y	controllers	480 V Driv	e controllers		<del>                                     </del>
					ATV61H ◆	ATV71H****	ATV61H••••	ATV71H••••		<del>                                     </del>
					075M3	037M3	075N4	075N4		<del> </del>
					U15M3	037M3	U15N4	U15N4	VW3A9201PF	101.
						U15M3	U22N4	U22N4		<u> </u>
			Profibus Option Card	Type 1 cover for Profibus Option Card	U22M3	U22M3	U30N4	U30N4	\/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	400
			Cover		U30M3 U40M3	U30M3 U40M3	U40N4 —	U40N4 —	VW3A9292PF	102.
					U55M3	U55M3	U55N4	U55N4	\A\(\a\(\c\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	100
					_	_	U75N4	U75N4	VW3A9203PF	104.
					U75M3	U75M3	D11N4	D11N4	VW3A9204PF	107.
					D11M3X D15M3X	D11M3X D15M3X	D15N4 D18N4	D15N4 D18N4	VW3A9205PF	112.
					D TOWION	I D TOINION	D 10147	D 10147		

<sup>▲</sup> The symbol "•" indicates the part of the number that varies with controller size or rating.

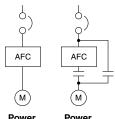
## Variable Torque AC Drive-208 V, 230 V, and 460 V Ratings

Table 26.13: S-Flex™ 212 Enclosed Drive Controller Selection and Pricing



S-Flex 212 Enclosed Drive Controller Type 1 Rated +14 to +104 °F (-10 to +40 °C)

AC DRIVES



Power Power Circuit W Circuit Y

Table 20.13.	3-1 lex 2			iei Selection an			Options	
Input Line Voltage	HP	kW	Output Current	utput Current Catalog Number		Without Bypass	Disc Switch	Line Contactor
			A		\$ Price	MOD W Price \$▲	MOD A07 Price \$■	MOD B07 Price \$■
	1 2 3 5	0.75 1.5 2.2 4	4.8 7.8 11 17.5	SFD212CG2Y SFD212DG2Y SFD212EG2Y SFD212FG2Y	1402. 1501. 1593. 1789.	1048. 1123. 1193. 1342.	1584. 1689. 1784. 1992.	1480. 1585. 1682. 1889.
208 Vac Three-phase	7.5 10 15 20 25 30 40	5.5 7.5 11 15 18.5 22 30	25.3 32.2 48.3 62.1 78.2 92 120	SFD212GG2Y SFD212HG2Y SFD212JG2Y SFD212KG2Y SFD212LG2Y SFD212LG2Y SFD212MG2Y SFD212NG2Y	1957. 2253. 2758. 3169. 3865. 4705. 5920.	1468. 1700. 2089. 2389. 2910. 3542. 4911.	2177. 2478. 3023. 3476. 4240. 5171. 6370.	2066. 2378. 2886. 3316. 4044. 4950. 6294.
	1 2 3 5	0.75 1.5 2.2 4	4.2 6.8 9.6 15.2	SFD212CG3Y SFD212DG3Y SFD212EG3Y SFD212FG3Y	1402. 1501. 1593. 1789.	1048. 1123. 1193. 1342.	1584. 1689. 1784. 1992.	1480. 1585. 1682. 1889.
230 Vac Three-phase	7.5 10 15 20 25 30 40	5.5 7.5 11 15 18.5 22 30	22 28 42 54 68 80 104	SFD212GG3Y SFD212HG3Y SFD212JG3Y SFD212KG3Y SFD212LG3Y SFD212LG3Y SFD212MG3Y SFD212NG3Y	1957. 2253. 2758. 3169. 3865. 4705. 5920.	1468. 1700. 2089. 2389. 2910. 3542. 4911.	2177. 2478. 3023. 3476. 4240. 5171. 6370.	2066. 2378. 2886. 3316. 4044. 4950. 6294.
	1 2 3 5	0.75 1.5 2.2 4	2.1 3.4 4.8 7.6	SFD212CG4Y SFD212DG4Y SFD212EG4Y SFD212FG4Y	1250. 1317. 1419. 1554.	880. 928. 1000. 1095.	1314. 1384. 1491. 1633.	1289. 1358. 1463. 1602.
460 Vac Three-phase	7.5 10 15 20 25 30 40	5.5 7.5 11 15 18.5 22 30	11 14 21 27 34 40 52	SFD212GG4Y SFD212HG4Y SFD212JG4Y SFD212KG4Y SFD212LG4Y SFD212LG4Y SFD212MG4Y	1690. 1892. 2227. 2709. 3229. 3749. 4359.	1190. 1333. 1624. 2060. 2455. 3037. 3641.	1776. 1988. 2361. 2909. 3467. 3956. 4600.	1742. 1950. 2296. 2864. 3409. 3903. 4538.
	50 60 75 100	37 45 55 75	65 77 96 124	SFD212PG4Y SFD212QG4Y SFD212RG4Y SFD212SG4Y	5347. 6257. 7102. 8097.	4545. 5444. 6392. 7293.	5643. 6603. 7527. 8581.	5567. 6514. 7379. 8413.

- When ordering a unit without bypass, insert a "W" in place of the "Y" in the Catalog Number.

  Options A07 Disconnect Switch and B07 Line Contactor are available only when a full voltage bypass standard "Y" product is selected. Options A07 and B07 are mutually exclusive.

Miscellaneous Options★		
Description	Option Number	\$ Price
BACnet Factory Set Up	A06	50.
LonWorks <sup>®</sup> Communication Card	B06	375.
Metasys® N2 Factory Set Up	C06	50.
Apogee® FLN P1 Factory Set Up	D06	50.
LCD Text Keypad	D07	250.
Modbus™ Monitoring (by Default)	N06	N/C
Seismic Qualification	S07	215.

*	Miscellaneous Options A06, B06, C06, and D06 are mutually exclusive. Add Misc. Option number to 5-Flex 212 Catalog Number when ordering communications card factors installed.

For Modbus control, see the Instruction Manual. NOTE: See the Instruction Bulletin for set up instructions.

Accessories		
Description	Catalog Number	\$ Price
Altivar 212 PCSoft Test and Commissioning Software. For use with Microsoft Windows™ 95, 98, NT, XP, and Vista operating systems for PCs only. (Cable not included.)	VW3A2104◆	N/C
PC Cable for Test and Commissioning Software Includes 3-meter (9.8 ft.) cable, RS-485/RS-232C adaptor, and connectors	VW3A8106	75.
USB to RJ45 Adaptor Kit For use in connecting to a PC with a USB port	TCSMCNAM3M0 02P	52.
EZ-M Mounting Channel, 72 in. length	EZM72MC	42.

Can be downloaded from the internet at www.Schneider-Electric.com

#### All S-Flex 212 Enclosed Drives are supplied with:

- Altivar™ 212 power converter
- Square  $\mathsf{D}^{\mathsf{TM}}$  circuit breaker disconnect (Power Fuses for 460 V version only)
- UL 508C coordinated short circuit rating for 100,000 A
- Adjustable Frequency Controller-Off-Bypass selector switch
- Local/Remote configurable on controller
- Power On red LED
- Bypass Run green LED
- Fire/Freezestat interlock for Adjustable Frequency Drive and Bypass mode
- Form C Adjustable Frequency Controller fault auxiliary contact
- Modbus RJ-45 communication port
- Smoke Purge Function
- Bypass Run Auxiliary Contact
- Drive Run Auxiliary Contact
- Full Voltage Bypass Power Circuit with overload relay
- 120 Vac fused control power transformer





#### Altistart™ 48 Soft Starts

**AC Soft Starts** 

The Altistart 48 soft start combines ease of selection with simple installation and high motor control performance. With its exclusive motor Torque Control System, the Altistart 48 helps eliminate uncontrolled motor acceleration and deceleration, a problem inherent with standard voltage-ramp soft starts. The Altistart 48 includes features to help with motor and machine protection and is available for motors ranging from 208 to 575 volts. In addition to a built-in display and programming terminal, a remote keypad option and programming software is available to ease integration and commissioning. The Altistart 48 has a built–in Modbus™ port and is offered with serial communication gateways to such popular networks as Ethernet and DeviceNet™.

#### Open Style Soft Starts 50-60 Hz, Three-Phase, 690 V Maximum—AC3 Duty

The Altistart 48 soft start must be selected using the table below, based on nameplate full load ampere rating of the motor. The horsepower ratings shown in table are for reference only.

Table 26.14: Altistart 48 Selection and Pricing▲

Si	tandard Duty (Low	Inertia Loads)■ M	Altistart Soft Starts				
208 V	230 V	400 kW	460 V	575 V	Rated A	Catalog Number	\$ Price
3 5 7.5 10 — 15 20 25 30 40 50 60 75 100 125 150 — 250 250 350 400	5 7.5 10 — 15 20 25 30 40 50 60 75 100 125 150 — 200 250 300 350	5.5 7.5 11 15 18.5 22 30 37 45 55 75 90 110 132 160 220 250 315 355 400	10 15 20 25 30 40 50 60 75 100 125 150 200 250 300 350 400 500 600 800	15 20 25 30 40 50 60 75 100 250 250 300 350 400 500 600 800 1200	17 22 32 38 47 62 75 88 110 140 170 210 250 320 410 480 590 660 790 1000	ATS48D17Y ATS48D22Y ATS48D32Y ATS48D38Y ATS48D47Y ATS48D62Y ATS48D62Y ATS48D75Y ATS48D75Y ATS48C11Y ATS48C11Y ATS48C17Y ATS48C21Y ATS48C25Y ATS48C25Y ATS48C41Y ATS48C48Y ATS48C48Y ATS48C79Y ATS48C79Y ATS48C66Y ATS48C69Y ATS48M10Y ATS48M10Y	780. 810. 840. 900. 950. 1200. 1280. 1700. 2100. 2300. 2900. 3300. 3900. 4700. 5400. 7200. 8600. 16000.

- Motor full load amperage (FLA) must not exceed the ampere rating of the soft start.
- Low Inertia—Connected motor load inertia equal or less than 10 times motor rotor inertia. High Inertia—Connected motor load inertia greater than 10 times motor rotor inertia.

NOTE: For severe duty or high inertia loads, derate by 1 hp size.

Table 26.15: Altistart 48 Options

Description	Catalog Number	\$ Price
Remote Keypad Display Mounting Kit, including: Keypad with 3-character 7-segment display IP65 cover and seal, mounting screws, and 3 meter cable to connect keypad display to Altistart 48	VW3G48101	165.
Cover for power terminals—Set of 6 for ATS48C14Y and ATS48C17Y	LA9F702★	61.
Cover for power terminals—Set of 6 for ATS48C21Y, ATS48C25Y, and ATS48C32Y	LA9F703★	82
Modbus Ethernet Gateway	TSXETG100▼	1027
DeviceNet Gateway	LUFP9∆	495.
Profibus DP Gateway	LUFP7∆	495.
FIPIO™ Gateway	LUFP1∆	495.
1/3 meter connection cable (RJ–45 to RJ–45)	VW3A8306R03	20.
1 meter connection cable (RJ–45 to RJ–45)	VW3A8306R10	25.
3 meter connection cable (RJ–45 to RJ–45)	VW3A8306R30	30.
1/3 meter splitter cable (For RJ—45 daisy chain connection)	VW3A8306TF03	75.
1 meter splitter cable (For RJ–45 daisy chain connection)	VW3A8306TF10	85
RJ45 terminator (2 per package)	VW3A8306RC	6.
Modbus hub (Eight RJ–45 ports)	LU9GC3∆	208.
Powersuite™ commissioning software on CD♦	VW3A8104□	150
PowerSuite upgrade CD from most recent to new version ♦	VW3A8105□	98.
PC connection kit. To connect PC to Altistart 48 soft start ◆	VW3A8106□	75
USB to RJ45 Adaptor Kit For use in connecting to a PC with a USB port	TCSMCNAM3M002P	52.
Size M10 Bolt Kit	W808780210111	8
Size M12 Bolt Kit	W808780220111	10.

- For more information, see Data Bulletin 8806DB0001.
- Use discount schedule I12
- Use discount schedule PC41
- discount schedule I11 discount schedule CP4C

For additional information on Altistart 48, refer to Catalog 8636CT0201.









#### Altistart™ 22 Open Style Softstarter

The Altistart 22 unit uses both voltage and torque control to provide a softstart and soft stop for three-phase asynchronous motors between 17 and 590 amps.

#### Table 27: **ATS22 Selection and Pricing**

Select the Altistart 22 softstart using the nameplate full-load ampere rating of the motor and the table below. The horsepower ratings are for reference only.

208 V	230 V	400 kW	460 V	575 V	Rated	Softstart Reference				Frame	\$ Price
206 V	230 V	400 KW	460 V	5/5 V	Α	■ or +	w	н	D	Size	\$ FIICE
3	5	5.5	10	15	17	ATS22D17S6,S6U	5.1	9.8	6.6	Α	613.00
7.5	10	11	20	25	32	ATS22D32S6,S6U	5.1	9.8	6.6	Α	654.00
	15	18.5	30	40	47	ATS22D47S6,S6U	5.1	9.8	6.6	Α	786.00
15	20	22	40	50	63	ATS22D62S6,S6U	5.7	10.9	8.1	В	945.00
20	25	30	50	60	75	ATS22D75S6,S6U	5.7	10.9	8.1	В	1083.00
25	30	37	60	75	88	ATS22D88S6,S6U	5.7	10.9	8.1	В	1266.00
30	40	45	75	100	110	ATS22C11S6,S6U	5.9	13	9	С	1468.00
40	50	55	100	125	140	ATS22C14S6,S6U	5.9	13	9	C	1792.00
50	60	75	125	150	170	ATS22C17S6,S6U	5.9	13	9	С	2056.00
60	75	90	150	200	210	ATS22C21S6,S6U	8.1	15.6	11.8	D	2383.00
75	100	110	200	250	250	ATS22C25S6,S6U	8.1	15.6	11.8	D	2714.00
100	125	132	250	300	320	ATS22C32S6,S6U	8.1	15.6	11.8	D	3083.00
125	150	160	300	350	410	ATS22C41S6,S6U	8.1	15.6	11.8	D	3573.00
150	_	220	350	400	480	ATS22C48S6,S6U	11.9	16.8	13.4	Е	4263.00
_	200	250	400	500	590	ATS22C59S6,S6U	11.9	16.8	13.4	E	4862.00

- Value not indicated when there is no corresponding standardized motor. S6 = 208–600 line voltage, 220 V control voltage S6U = 208–600 line voltage, 110 V control voltage







#### Enclosed AltisStart™ 22 Motor Controllers

Enclosed Altistart 22 (ATS22) solid-state combination motor controllers are a pre-engineered, integrated solution for reduced voltage starting and soft stopping of standard three-phase asynchronous induction (squirrel cage) motors. The Enclosed 22 controllers consist of a disconnect means and an ATS22 softstarter in a standalone enclosure. Enclosed 22 controllers integrate the ATS22 softstart technology into a combination package for application requirements up to 125 hp at 480 V.

- 3-50 hp, 208 V
- 5-60 hp, 230 V
- 10-125 hp, 460 V

**Catalog Number Description** Table 28:

Field	Digit	Characteristic	Description
		Controller	8638 = Fused Disconnect◆
		Class	8639 = Circuit Breaker Disconnect
01	1–3	Controller Style	22F = Altistart 22 with Class J Fuse Clips and Molded Case Switch ◆ 22T = Altistart 22 with PowerPact Motor Circuit Protector 22U = Altistart 22 with PowerPact Thermal-
02	4	Horsepower	A = 3 hp B = 5 hp C = 7.5 hp D = 10 hp E = 15 hp F = 20 hp G = 25 hp H = 30 hp J = 40 hp K = 50 hp L = 60 hp M = 75 hp N = 100 hp P = 125 hp Q = 150 hp
03	5	Enclosure Type	G = UL Type 1 General Purpose A = UL Type 12K Industrial Use, Dust-Tight/Drip- Tight H = UL Type 3R Outdoor Use
04	6	Voltage	2 = 208 Vac 3 = 230 Vac 4 = 460 Vac 5 = 575 Vac
05	7	Power Circuit	B = Basic Shunt Trip S = Full-Featured Shunt Trip N = Non-Reversing Isolation R = Reversing Isolation Y = Integral Full-Voltage Bypass
06	8–10	Control Options★▼	A06 = Start-Stop Pushbuttons B06 = Forward-Off-Reverse C06 = Hand-Off-Auto (HOA) Selector Switch D06 = Stop-Run Selector Switch E06 = Hand-Auto Selector Switch/Start-Stop Pushbuttons
07	11–13	Pilot Device Options★▼	A07 = Run Light (Red), Off Light (Green) B07 = Push-to-Test Run Light (Red), Push-to-Test Off Light (Green) C07 = Run Light (Red), Off Light (Green), Tripped Light/Reset (Yellow) D07 = PTT Run Light (Red), PTT Off Light (Green), Tripped Light/Reset (Yellow)
80	14–16	Metering Options	B08 = Elapsed Run Time Meter▼
09	17–19	Miscellaneous Options	A10 = Floor Mounting Kit∆ B10 = Additional 150 VA□ C10 = Power-Up On Delay Relay◊ D10 = Emergency Stop Pushbutton□ E10 = cUL Label▲ F10 = Auxiliary Run Mode Contacts G10 = Auxiliary Run Mode Contacts H10 = Auxiliary F15 Bypass Contacts★ H10 = Auxiliary Trip Indication Contacts J10 = Auxiliary Trip Indication Contacts L10 = ID Engraved Nameplate□ M10 = 10 Spare Terminal Blocks□ P10 = Permanent Wire Markers□ R10 = MOV-Surge Arrestor□ U10 = Omit Door-Mounted Keypad Display■ X10 = 50 °C Operation Z10 = Service Entrance Rating▲ ♀ 910 = American Recovery and Reinvestment Act
			(ARRA) Option

- Options E10 and Z10 cannot be used together.
- Options E to a find 2 to carriot be used together. If you select option U10, you must separately order the remote keypad (VW3G22101) and cable (VW3A1104R30) to commission the softstarter. Refer to the ATS22 User Manual, BBV51330, for serial communication programming and control capabilities.
- This option is not selectable with power circuit option B05.
- Select only one option.
- To omit, do not include a selection in the catalog number.
- This option is available only for enclosure size D.

- This option is available only for enclosure size D.

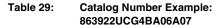
  This option is not selectable with power circuit option B05.

  This option is not selectable with power circuit option B05. This option is valid only with the following control options: C06, D06, or E06.

  This option is not selectable with power circuit option B05. The contacts are available only when power circuit option Y05 is selected.

  The contacts are not available when power circuit option R05 is selected.

  This option is valid only with the following control options: C06, D06, or E06.
- Options E10 and Z10 cannot be ordered together.



			Field				
_	1	2	3	4	5	6	7
8639	22U	С	G	4	В	A06	A07
Controller Class	PowerPact™ Thermal- Magnetic Circuit Breaker	7.5 hp	Type 1 General Purpose	460 Vac	Basic Shunt Trip	Start-Stop Pushbutton	Run Light (Red), Off Light (Green

#### **Control Options (pick one)**

	. u ,	
Mod	Start/Stop push buttons	\$ Price
A06	Provides black start and red stop push buttons (3-wire control scheme).	132.00
		<u>_</u>
Mod	Forward-Off-Reverse selector switch	\$ Price
B06	Provides three-position selector switch to select between forward, off and reverse. Uses 2-wire control.	240.00
Mod	Hand-Off-Auto selector switch	\$ Price
C06	Provides a three-position selector switch, 2-wire control scheme.	132.00
Mod	Stop-Run selector switch	\$ Price
D06	Provides a two-position selector switch.	132.00
Mod	Hand-Auto selector switch and Start/Stop push buttons	\$ Price
E06	Provides a two-position selector switch and start/stop push buttons (3-wire control).	264.00

#### Pilot Light Cluster Options (pick one)

	Pilot light cluster #1	\$ Price				
Mod A07	Consists of red "RUN" and green "OFF" pilot lights. Provides standard red "RUN (ON)" and green "OFF" pilot lights for status annunciation.	180.00				
	Pilot light cluster #2	\$ Price				
Mod B07	Consists of red "RUN" (push-to-test) and green "OFF" (push-to-test) pilot lights. Provides push-to-test type red "RUN (ON)" and standard green "OFF" pilot lights for status annunciation.					
	Pilot light cluster #3					
Mod C07	Consists of red "RUN", green "OFF" and yellow "FAULT" pilot lights. Provides standard red "RUN (ON)" green "OFF" and yellow "FAULT" pilot lights for status annunciation.	270.00				
	Pilot light cluster #4	\$ Price				
Mod D07	Consists of red "RUN (ON)" (push-to-test), green "OFF" (push-to-test) and yellow "FAULT" (push-to-reset) pilot lights. Provides push-to-test type red "RUN (ON)" standard green "OFF", and push-to-reset type yellow "FAULT" for status annunciation.	540.00				

#### Meter Display Options (pick one)

Mod	Elapsed time meter	\$ Price
BO8	Provides a seven-digit analog, non-resettable elapsed run time meter. Not available on Type 3R Enclosures	348.00

### **Miscellaneous Options** (multiple compatible options may be selected)

Mod	Floor mounting kit	\$ Price
A10	Only available for size D enclosures.	105.00
Rules	Available for power options S05, N05, R05, Y05.	
Mod	150 VA additional control power capacity	\$ Price





#### Information and Selection

For information and selection, contact your nearest Schneider Electric sales office or visit our website: www.schneider-electric.ussp

#### **Technical Support**

#### **Drive Product Support Group**

For support and assistance, contact the Drive Product Support Group. The Drive Product Support Group is staffed from 8:00 am until 6:00 pm Eastern time to assist with product selection, start-up, and diagnosis of product or application problems.

EMERGENCY Technical phone support is available 24 hours a day, 365 days a year.

Toll Free: 888-778-2733

E-mail: drive.products.support@schneider-electric.com

Fax: 919-217-6508

#### Services (On-Site)

Square D Services is your single source of service expertise for all major brands of electrical equipment. With our national network of service locations and qualified experts, Square D Services is capable of providing customer–based solutions anywhere in the United States. Services responds to your requests, seven day a week, 24 hours a day.

Toll Free: (888-778-2733)

#### **Customer Training**

Schneider Electric offers a variety of instructor-led, skill enhancing and technical product training programs for customers. For a complete list of drives/soft start training with dates, locations, and pricing, please call:

Phone: 978-975-9306 Fax: 978-975-2821

#### **Packaged Product Documentation**

#### **Standard Documentation**

Each adjustable frequency drive or soft start shipped includes one set of instruction bulletins. Each set of instruction bulletins includes installation, start—up, troubleshooting and wiring diagram information. Separate Approval and/or Record Drawings are not included.

#### **Approval and Record Drawings**

All factory orders for enclosed drives and soft starts come with factory supplied user drawings and are identified by a factory order number. The factory supplied drawing set typically includes:

- Enclosure outline drawing
- Power elementary drawing
- Control elementary drawing
- Interconnection drawing

These drawings are also available in DWG, DXF, IGS, Microcad and PDF formats upon customer request.

#### **Product Literature**

To view or download product literature, visit the Schneider Electric web site: www.schneider-electric.us



# **Section 27**

## **Automation Products**



Modicon M340 (p. 27-2)



Modicon Premium (p. 27-2)



Modicon Quantum (p. 27-2)



Magelis XBTGT (p.27-3)



Twido Nano (p. 27-10)

Programmable Logic Controllers	
Modicon™ TSX Micro PLC	27-2
Modicon M340™ PAC	27-2
Modicon Premium™ PLC	27-2
Modicon Quantum™ PLC	27-2
Unity™ Pro Application Software	27-2
Unity Application Generator	27-2
Concept <sup>™</sup> and PL7 <sup>™</sup> Application Software	27-2
ProWORX™ 32 Application Software	27-2
НМІ	
Magelis™ Small Panels Products (STO/STU, XBT N/R, XBT RT)	27-3
Magelis Advanced Panels Products (XBTGT, XBT GK, XBT GH, XBT GTW)	27-3
Magelis Smart+ iPC	27-4
Magelis Smart iPC	27-4
Magelis Compact iPC	27-4
"BOX + Display" Solutions	27-4
Vijeo™ Designer™	27-4
SCADA	
Vijeo™ Citect™	27-4
Vijeo™ Historian™	27-4
Distributed I/O	
Advantys™ OTB	27-5
Modicon TM5 Expansion Module	27-5
Modicon STB	27-5
Advantys Telefast™ ABE7 Sub-bases, IP20	27-5
Advantys Telefast ABE9 Passive Splitter Boxes, IP67	27-5
Modicon TM7 I/O Blocks, IP67	27-5
Modicon Momentum™ Distributed I/O and PLC	27-5
Networking Products and Systems	
ConneXium™ Ethernet Products	27-6
ConneXview™Industrial Ethernet Diagnostic Software	27-6
Transparent Ready™ Solutions	27-6
CANopen™ Products	27-6
Ethernet TCP/IP Products	27-7
Actuator Sensor Interface (AS-i) Bus Products	27-7
OEM Solutions	
Modicon M168 Programmable Logic Controller	27-8
Modicon M238 Logic Controller	27-8
Modicon M258 Logic Controller	27-8
Modicon LMC058 Motion Controller	27-9
Altivar™ IMC Integrated Controller Card	27-9
Magelis XBT GC HMI Controller	27-9
SoMachine™ Software Suite	27-10
Twido™ Nano™	27-10
Modicon Zelio™ Logic Controller	27-10

For more detailed information, please refer to the catalogs referenced with each product, or you can also visit our website at www.schneider-electric.com.



## Schneider Electric

#### Modicon™ PLC Products

#### Modicon™ TSX Micro™ PLC



Compact and cost-efficient, this midrange PLC boasts the power and flexibility OEMs find most desirable. Optional integrated safety relays, half-size I/O and web-enabled modules provide seamless connection to supervisory maintenance

systems plus minimize real estate. PCMCIA memory cards preserve your investment when expanding. Communication options include Ethernet and ASi for global access using Open standards. More details are available at www.schneider-electric.com.

#### Modicon M340™ PAC



Our latest midrange PAC is the most integrated ever! Highly requested by industrial OEMs and end users, the all-power-inside concept boasts high-performance processing and small size to create a system that provides flexibility beyond any before. With up to 3 built-in CPU

communication ports, large memory options, 64 channel high-density modules, and embedded web-servers, the Modicon M340 is a powerful solution for industrial OEMs and end users demanding more productivity in their PACs. The Modicon M340 PAC supports advanced communications such as enhanced EtherNet/IP which support both EtherNet/IP, Modbus TCP/IP and daisy chain loop communications on the same 4-port, rack mounted switch module. It will also support DNP3.0 in serial or Ethernet in a rack-mounted RTU module. The Modicon M340 PAC is programmed with Unity Pro software, which allows users to dramatically reduce setup time and effort with features like drag 'n drop CANopen bus setup and standard IEC 61131-3 language selection. Designers gain fast, easy and efficient startups. More details are found on our website or in the latest Modicon M340 catalogs and brochures. More details are available at www.schneider-electric.com, or in catalog DIA6ED2081007EN-US.

#### Modicon Premium™ PLC



Ideally suited for discrete manufacturing, complex OEM applications as well as municipality and infrastructure applications, this cost-effective PLC line features integrated functions such as weighing, interpolated motion control, and process loops. Using the built-in Ethernet port, user-

customized web page capabilities, and a range of popular Openstandard fieldbus connections the Modicon Premium enables seamless communication with enterprise systems providing low-cost remote maintenance diagnostics. More details are available at www.schneider-electric.com, or in catalog MKTED208054EN-US.

## Modicon Quantum™ PLC



The Modicon Quantum PLC is our high-end, full function PLC designed for high I/O count industrial applications that require high performance such as Pharmaceutical, Petrochemical, Food & Beverage, Automotive, and others. Quantum also offers true bumpless hot standby. Quantum processors

can be programmed with Unity Pro. It will also support legacy 984 ladder logic programs in the LL984 Unity Pro editor by simply importing the legacy application program. Concept<sup>™</sup> application software and ProWORX<sup>™</sup> 32 application software are also supported on the Quantum platform. The Unity Quantum's onboard memory can exceed 3 Mbytes. The Unity Quantums can have more than 7 Mbytes of extended memory on a PCMCIA card for data and application storage combined. They can have over 8 Mbytes of just data storage. The Quantum PLC also offers Safety PLC versions certified for use in up to SIL3 applications. This includes both standard and hot standby capability as well as redundant I/O. It programs with Unity Pro XLS. The SIL3 offer stresses both high reliability as well as high availability. More details are available at www.schneider-electric.com, or in catalog MKTED208011EN-US.

Information about the SIL3 Quantum is available in brochure 8000BR0808R03/10.

#### Unity™ Pro Application Software



Unity Pro is a new generation software platform for application development. Unity Pro is compatible with all Industrial End User midrange and highend controllers including Modicon M340, Premium and Quantum PLCs. Unity provides a collaborative automation environment that enables individuals and teams to work together more effectively, reducing the cost of developing and

managing automation solutions. Unity Pro XLS software is used to program the SIL3 Quantum as well as all Unity-based, standard Quantums, Unity-based Premiums and M340s. Since one software package can program all the platforms, it greatly simplifies development and support issues. It integrates commercial IT technologies like Ethernet, VBA, XML and hyperlinks within the traditional control framework to enable customers to reduce the cost of automating both discrete and batch control applications. More details are available at www.schneider-electric.com, or in brochure 8000BR0935R02/10.

#### Unity Application Generator



Unity Application Generator is an advanced design and generation software tool that integrates multiple PLCs and HMI/SCADA systems to provide an automation solution rivaling a Distributed Control System (DCS). UAG supports structured project design by providing a software tool to bridge from the process engineer to the control/automation designer (from the P&ID to the

automation system). UAG will capture and re-use the Customer's best practices within application-specific libraries that reduce the dependency on experts and enable standardization and increases software robustness. Single database entry avoids duplicate effort and resulting errors. Automatic Application Generation including the automatic configuration of networks in multi device systems increases efficiency, improves software quality, speeds commissioning while simultaneously reducing project risk. Integrated change tracking and automatic documentation generation reduces engineering effort and enables system validation. UAG integrates Unity PLCs (M340/Premium/Quantum), Vijeo Citect, Connectors for leading HM/SCADA systems, Modbus TCP/IP communication and OFS/OPC. Additional information can be found at www.schneider-electric.com.

#### Concept<sup>™</sup> and PL7<sup>™</sup> Application Software





Concept and PL7 comply with the IEC 61131 standard for programming software.
Concept and PL7 can be programmed in four IEC languages including two text-based editors (Structured Text and Instruction List), and two graphic-based editors (Sequential Function Chart and Ladder Diagram). In addition, Concept can be programmed

using the IEC compliant graphic editor for Derived Function Blocks. The Concept and PL7 software both promote productivity by using structured programming, which increases reusability while reducing maintenance costs. Concept can be used to program the Quantum, and Momentum PLCs while PL7 can be used to program the Micro and Premium. More information is available at www.schneider-electric.com.

#### ProWORX™ 32 Application Software



ProWORX 32 is the simple programming solution to program your Modicon PLCs using 984 ladder logic programming. Compatible with

584, 984, Modicon Micro, Momentum, Compact, and Quantum. Schneider Electric Automation Services maintains the tools necessary to upgrade your ProWORX 32 application to a Unity Pro application with ladder logic that is designed to mirror the 984LL application. More information can be found at www.schneider-electric.com.



## Magelis™ Small Panels HMI Products

The Magelis STO/STU, XBT N, XBT R, and XBT RT Small Panels have been specifically designed to satisfy the requirement for panels that are compact and easy to use. These terminals are easy to configure and work seamlessly with other Schneider Electric equipment to provide a complete automation solution, dedicated to simple or compact machines.

#### Magelis STO/STU

The new Magelis STO and STU panels enhance the Magelis small panels range by offering more flexibility, more communication



capability, and a quick and easy revolutionary mounting system. Powered by Vijeo Designer software, these panels bring a cost-effective solution to all machine builders. The new Magelis STO & STU terminals adapt to your needs by integrating the latest technological innovations to enhance machine productivity. More information is available at www.schneider-electric.com.

#### Magelis XBT N/R

The Magelis XBT N and R matrix screen text display units accommodate up to four lines of large font (20 mm high) text for easy viewing. Rated for IEC 60529, NEMA 4X outdoor use, Class I Div II and UL508, the





sturdy Magelis XBT N and R displays feature an ergonomically designed keyboard with up to 20 keys and ports to handle either point-to-point or multipoint communications. A truly global solution, the XBT N and R displays provide low-cost connectivity to all Schneider Electric PLCs using Modbus<sup>TM</sup> and Uni-Telway<sup>TM</sup> protocols, support Latin, Cyrillic, Katakana, Greek and Chinese fonts, and six languages. More information is available at www.schneider-electric.com.

#### Magelis XBT RT

The Magelis XBT RT semi-graphic touch screens accommodate up to ten lines of 33 characters of text. Rated for NEMA 4X, Class I Div II and UL508, the sturdy Magelis XBT RT displays semi-graphic objects, bar graphs, curves,





buttons, and bitmaps and has ports to handle either point-to-point or multipoint communications. With the ability to choose between touch screen and keypad combination or keypad only operation, the XBT RT, is adaptable. Like the other Magelis small panels, the XBT RT displays provide low-cost connectivity to all Schneider Electric PLCs using Modbus and Uni-Telway protocols and several major third party protocols and supports multiple languages, including Japanese, Cyrillic, Greek and Chinese. More information is available at www.schneider-electric.com.

#### **Magelis Advanced Panels HMI Products**

The Magelis XBT GT, GK, GH and GTW graphic terminals offer numerous connectivity options from Ethernet to USB. With their exceptional image quality and choice of touch screen and/or keypad interface, they are flexible enough for a large range of applications. When combined with Vijeo Designer configuration software, application designs are unlimited.

#### Magelis XBT GT

Available in six sizes (3.8, 5.7, 7.4, 10.4, 12.1 and 15 inches) and 4 function levels, the Magelis XBT GT graphical touch screen terminals are designed to fit all your HMI application needs. Some offer: multimedia capability with a large processing capacity; openness with



unequalled connectivity via numerous communication ports and multilink communication for simultaneous equipment control; ease-of-use with simple installation and simple configuration with Vijeo Designer software. The entire product range is RoHS compliant. More information is available at www.schneider-electric.com.

#### Magelis XBT GK

With three models to choose from and two sizes screen sizes, 5.7 and 10.4 inches, the Magelis XBT GK offers a lot of flexibility. The XBT GK uses the same technology of the popular XBT GT but adds a keypad and industrial mouse pointer for extra







control and data input that can be configured to operate simultaneously with or without the touchscreen. In a dusty or dirty environment, the keypad enables the use of the terminal, even while wearing gloves. There is an extra added safety feature where two keys can be simultaneously pressed to ensure command order security and the keys can be locked during delicate phases of an operation. Vijeo Designer, the single software package for the entire Magelis Advanced Panel range, ties the solution together. More information is available at www.schneider-electric.com.

#### Magelis XBT GH

Powered by Vijeo Designer software and based on the same technology as XBT GT, the XBT GH hand-held panel combines intuitive operation, quality, durability, mobility and safety





with rugged corded mobile design and integrated safety features. More information is available at www.schneider-electric.com.

#### **Magelis XBT GTW**

Available in two color touch screens sizes, 8.4 and 15 inches, the Magelis XBT GTW terminals offer a Windows environment open to the Web (local and remote diagnostic and maintenance functions) and multimedia applications (streaming video on IP, Webcam management, sound



and an integrated video output). With this open platform, the XBT GTW allows you to enhance your HMI applications with Vijeo Designer, while providing total access to Microsoft Office software (Excel, Word, PowerPoint, etc.) and data editing with Office Viewer or Acrobat Reader, two pre-installed applications.

The front panel USB port provides connectivity for peripherals. Numerous communication interfaces such as dual-Ethernet, multiple USB ports and slots provided for PCMCIA (15") and Compact Flash slots are available. More information is available at www.schneider-electric.com.

## **SCADA Products**

#### Magelis™ HMI Products

#### Magelis Industrial PCs

The Magelis Industrial PC (iPC) range offers "All-In-One" or "BOX + Display" industrial PC for autonomous or distributed applications. The Magelis iPC provides the openness and ergonomics of a Windows environment in a rugged PC that is ready for tough industrial environments. With the Magelis iPC range, you will be sure to find the PC that corresponds exactly to your specifications.

#### "All-In-One" Solutions:

#### Magelis Smart+ iPC



The new Magelis Smart+ iPC is the first industrial PC with Windows XP Pro operating system that requires no maintenance and contains no rotating parts (no hard disk or fan). The Smart+ iPC also offers all of the openness associated with Windows XP Pro. The IP65 touch screen shares the same 15" dimensions as the rest of the Magelis range. With its Intel® Celeron® M 1 GHz

processor, 1 GB of RAM, and two Ethernet ports, Magelis Smart+ iPC offers great performance, and features a solid state drive (SSD) with Windows XP Pro operating system. The industrially rugged Smart+ iPC has been certified to the most demanding standards, including UL 508 for automation equipment, UL and ATEX for hazardous locations, and marine.Magelis Smart+ iPC supports Vijeo™ Designer™ HMI applications (demonstration version can be expanded to unlimited version) and is the first maintenance-free Magelis iPC to fully support the Vijeo Citect SCADA supervisor.

#### Magelis Smart iPC



An extension of dedicated terminals and the industrial PC, Magelis Smart is open to the Web. It meets the demands of predefined operator dialog, display and remote diagnostics and is available in 8.4, 12, or 15 inches. Practical and reliable, the Smart has simplified connections, including: 2 Ethernet ports, one with gigabit support, 4 or 5 USB ports, 2 serial ports and a

PCMCIA slot. Its also more resistant to noise and vibration with data storage on static disk (compact Flash) and no fan. The WEB Edition is ready to use as a web client or connected to the FactoryCast Web servers for remote diagnostics via the integrated Web browser. The HMI Edition (with Vijeo Designer runtime) transforms the iPC into an operator terminal.

#### Magelis Compact iPC



Available in 8.4, 12, or 15", the Magelis Compact iPC provides data storage adapted to industrial needs, Industrial HDD disk or 8 or 16 GB Flash disk (15") only. This panel PC has several extension options, including: 1 PCI slot, dual-Ethernet ports, one with gigabit support, 4 or 5 USB ports, 2 serial ports and a PCMCIA slot. Vijeo Designer HMI software transforms the iPC

into an operator terminal with the advantages of Windows® openness (HMI Edition).

More information is available at www.schneider-electric.com.

#### "BOX + Display" Solutions:



From the simple preconfigured Magelis Smart BOX or the Compact PC BOX to the Flex PC BOX with its advanced features, these BOX + Display solutions have in common a high level of design guaranteeing the best reliability possible.

#### Magelis Smart BOX

The Magelis Smart BOX is preconfigured with MS Windows® and offers the same features as the "All-In-One" version.

#### Magelis Compact PC BOX

The Magelis Compact PC BOX offers 1 PCI slot and the same features as the Compact IPC

#### Magelis Flex PC BOX

The Magelis Flex PC BOX features:

- 2 or 4 PCI slots
- Industrial HDD 24/7 and/or 8 or 16 GB disk
- Intel® Celeron® M 440 with 1.86 GHz or Pentium Core Duo with 2 GHz 100-240 Vac or 24 Vdc power supply

#### PC BOX COMPONENTS







To complete the configuration:

- To convert the Flex PC BOX into an "All-In-One" PC, add a 15" or 19" Front Panel in touch version or 12 or 15" Front Panel in touch/keyboard version
- To connect a remote screen to the PC BOX (Smart, Compact, or Flex), add a 15 or 19" iDisplay in touch version or 15" iDisplay in touch /keyboard version.

More information is available at www.schneider-electric.com.

#### Vijeo™ Designer



Vijeo Designer configuration software can be used to create HMI applications designed for controlling automation systems for the Magelis HMISTO/STÚ/GTW/P/XBTGT/XBTGK/XBTGTW/iPC. It's the ideal design tool for the simplest control application right up to the most complex HMI installations. It offers advanced script functions, recipe

management, data management, remote access via PC web browser, e-mail and multi-protocol connectivity. More information is available at www.schneider-electric.com.

#### **SCADA Products**

#### Vijeo Citect



The flexibility of Vijeo Citect supervisory control and data acquisition (SCADA) software enables users to achieve the solution that best suits their supervision requirements for installations. Vijeo Citect offers all the functions of a modern supervisor. Its distributed clientserver architecture is applicable to a multitude of applications in the most varied domains:

- Energy and infrastructures: airports, roads and tunnels, water wastewater, oil and gas, etc.
- Industries: food and beverage, mining, metals, minerals, system integrator, etc.

This development tool enables the development of any supervision application, from small stand-alone systems to large distributed redundant systems. More information is available at www.schneider-electric.com.

#### Vijeo Historian



Vijeo Historian, a data logging and reporting software, collects, compares, and records the entire flow of data on a common platform. By establishing the communication between the supervisory systems (SCADA) and database systems, such as Oracle and SQL, Vijeo Historian enables collection and management of the production data and its availability

for a vast range of client processing applications. More information is available at www.schneider-electric.com.



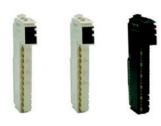
## www.schneider-electric.us Advantvs<sup>TM</sup> OTB

The open and modular new Advantys OTB distributed I/O system offers an ideal solution for IP20 distributed input/output requirements. Users can create I/O islands managed by a master controller, via a fieldbus or communication network. It includes three communication bases for the various types of



fieldbus: CANopen™, Éthernet TCP/IP, or Modbus™ RS 485 serial. Discrete or analog I/O are available. More information is available in catalog **DIA3ED2040801EN-US**.

#### Modicon™ TM5 Expansion Module



The Modicon TM5 digital I/O module offer consists of input, mixed I/O and output electronic modules (sensor and preactuator 24 V == power supply). They complement the embedded I/O in the various M258 controllers and LMC058 motion controllers. They are used to adapt to the application requirements as closely as possible to reduce the installation and wiring costs, and

they can be used with the CANopen communications head and with multiple controllers. These modules offer the following advantages: a removable terminal, spring terminals which can be used for quick, tool-free connection of the sensors and preactuators (and can help eliminate the need for periodic retightening), and hot swapping. More information is available at www.schneider-electric.com, or in catalog MKTED211041EN.

#### **Modicon STB**



The Modicon STB is a highly modular distributed I/O platform, integrated wiring solution, and power management system that delivers effective and targeted control. With an open network adaptable to most major field buses, a flexible "island" I/O structure, and simple

configuration via the STBSUP1000 software, Modicon STB is the right choice. The Modicon STB distributed I/O can also be configured directly from Unity™ Pro application software. More information is available in catalog **MKTED208053EN-US**.

### Advantys Telefast™ ABE7 Sub-bases, IP20



The Advantys Telefast ABE7 pre-wired system enables connection and adaptation of control signals of industrial PLC cards that are fitted with HE10 connectors. It rationalizes cabling by replacing PLC terminals and traditional terminal

blocks—thus improving simplicity and economy. More information is available at **www.schneider-electric.com**.

## Advantys Telefast ABE9 Passive splitter boxes, IP67

Advantys Telefast ABE9 splitter boxes eliminate long and difficult cable runs by avoiding the use of intermediate junction boxes. Due to their modularity and size, they are perfect for the requirements of your varying applications. More information is available at www.schneider-electric.com.



#### Modicon TM7 I/O Blocks, IP67



Compact and flexible, the TM7 IP67 I/O Blocks allow connection of sensors and actuators at the heart of processes or machines in severe environments. The wide range of modules provides solutions to match your exact needs. It includes connectivity to CANopen. More information is available at www.schneiderelectric.com, or in catalog MKTED211041EN.

#### Modicon Momentum™ Distributed I/O and PLC



The small footprint and open architecture of the Momentum PLC product line make it extremely versatile for a variety of automation applications. The Momentum PLC is ideal for PC-based control, distributed control, distributed I/O, and traditional, standalone PLC control. Momentum PLC options and accessories include: I/O bases, processor adapters, option adapters and communication adapters that are interchangeable and snap

together to deliver optimal flexibility throughout the control system lifecycle.

Using Ethernet as its communications backbone, the Modicon Momentum M1E Processor delivers all the performance benefits of real-time control. The open architecture of the M1E processor makes it a universal controller for distributed I/O, compatible with many of the major fieldbus and control network environments.

An integral Ethernet port in the M1E allows users to perform a wide range of functions over Ethernet, including data acquisition, peer-to-peer communications, and I/O scanning. Five embedded web pages enable the use of a standard web browser to read status and diagnostic information from the processor.

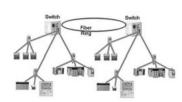
The most recent addition to the Momentum product offer is the Momentum M1E ConneXium switch. This model combines the power and functionality of the M1E processor with the communication versatility of four Modbus Ethernet TCP/IP ports.

The award winning M1E not only seamlessly connects I/O and other control devices via open standards; it delivers the performance of a full function, real-time controller for stand-alone and distributed system configurations in one money-saving unit. Additional information can be found at www.schneider-electric.com or in catalog MKTED205061EN.

## Schneider Electric

#### ConneXium™ Products

#### ConneXium™ Ethernet Products



The ConneXium line of networking products offers a complete range of Ethernet switches (managed and unmanaged), hubs, transceivers, gateways, cabling, and diagnostic monitoring software for demanding industrial environments. With fiber and redundant capabilities, along with

advanced filtering and security features, ConneXium products improve the performance and security of the network. More details can be found at www.schneider-electric.com.

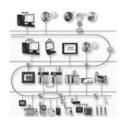
#### ConneXview™ Industrial Ethernet Diagnostic Software

ConneXview Industrial Ethernet diagnostic software combines the power of IT-based network management programs with Schneider Electric's Transparent Ready Ethernet expertise to provide a tool specifically designed for the automation environment. ConneXview offers automatic device discovery plus Ethernet (SNMP) and controlnetwork device (Modbus/TCP) mapping. In addition, the software has an easy-to-use graphical interface including convenient task panels for device status, settings and alarms, and topological visual graphics. Other benefits include:

- · Increased overall productivity with easy-to-use diagnostics
- Expanded functionality offered with the Device Type Editor, including adding third-party devices to the library and adding unique device names for increased recognition
- An intuitive and ergonomic design that minimizes end-user training and decreases maintenance costs

#### Transparent Ready™ Products

## Transparent Ready™ Solutions



Transparent Ready products cover solutions in Industrial automation to electrical Distribution, and are based on universal Ethernet TCP/IP and Web technologies. They provide seamless communication between plant floor devices, like PLCs, drives, and MCCs, with corporate business systems. Use of the open Modbus TCP/IP and EtherNet/IP protocols that are the leading industrial Ethernet protocols, broadens the scope of dedicated machine diagnostics to remote

management. Choosing Transparent Ready means opting for flexible, open automation architectures. More details can be found at www.schneider-electric.com.

## Network Products CANopen Products



CANopen is an open network that is supported by over 400 companies world wide and promoted by CAN in Automation. CANopen is standardized in the EN50325-4 and in ISO15745-2 for its device description.

The main reason for using a network is the performance and the flexibility to adapt the network exactly to the requirements of the application. CANopen provides a unique feature for the adaptation of the data transmission. Based on the producer/consumer model, CANopen allows for a data transmission broadcast, peer-to-peer, change-of-state and cyclic

communication. This means it transmits data only when required or on a specified time base. Process data objects can be individually configured. Parameters can be changed at runtime.

CANopen combines ease of installation with inexpensive devices. CANopen provides an integrated equipotential bounding in the cable. Therefore, an additional cable or stranded copper ribbon to achieve the same potential on all network devices is not necessary. Installation costs are heavily reduced.

More information on CANopen and CANopen Products is available in catalog **MKTED208054EN-US**.



## Ethernet TCP/IP Products



The recognition of Ethernet TCP/IP, both in organizations and on the internet, has made it the communication standard of today. Its wide use is leading to a reduction in connection costs, increased performance and the addition of new functions, which all combine to ensure its durability.

Ethernet TCP/IP meets the connection requirements of every application:

- Twisted pair copper cables for simplicity and low costs
- Optical fiber for immunity to interference and for long distances
- Communication redundancy, inherent in the IP (internet protocol)
- Remote point-to-point access via the telephone network or the Internet for the cost of a local call

Ethernet TCP/IP, a truly open technology, supports all type of communication:

Web pages

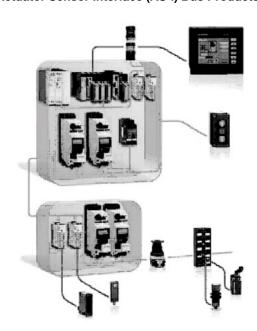
File transfer

Industrial messaging

With its high speed, the network no longer limits the performance of the application. The architecture can evolve without any difficulty. The products or devices remain compatible, ensuring the long-term durability of the system.

More information on Ethernet and Ethernet Products is available in catalog **MKTED208054EN-US**.

#### Actuator Sensor Interface (AS-i) Bus Products



AS-Interface (AS-i) is a versatile, low-cost, easy to-install cabling solution dedicated to distributed machines and installations as a replacement for traditional parallel wiring. AS-i technology is compatible with virtually any fieldbus or device network. AS-i is used as a quick and upgradeable industrial network—a single cable with a quick, openended wire system connects all the components in the automation system. It contributes significantly to improve the reliability and availability by reducing cabling errors and offering high-level electromagnetic interference immunity (EMC).

AS-i is an open network standardized in IEC 62026-2 and promoted by AS-International Association.

AS-International has over 260 members worldwide.

More information on AS-International and AS-i Products is available in catalog **MKTED208054EN-US**.

## Schneider Electric

#### Modicon™ M168 Programmable Logic Controller



Modicon M168 programmable logic controllers have been developed for the buildings market – offering HVAC and pump solutions for Building Management System communication networks (BACNet). Four different Modicon M168 logic controllers are available, all of which can be programmed with

SoHVAC software, providing customized applications designed to control:

- Water chiller
- Heat pumps
- Compact air/air roof-top unit
- Air handling system, twin-flow enclosure
- Precision air conditioners
- Refrigerated display windows
- Compressor racks
- Pumping stations
- Booster stations
- Circulators
- Condensate/boiler feed pumps
- Cooling tower pumps

More information is available at www.schneider-electric.com or in catalog DIA6ED2110101EN-US.

#### Modicon M238 Logic Controller

The Modicon M238 logic controller is a compact, high-performance and fully expandable PLC. It forms a part of Flexible Machine Control approach, a key component of MachineStruxure™, which brings you maximum flexibility and ensures the most optimized control solution. Modicon M238 compact logic controllers offer an "all-in-one" solution in a compact



unit (157 x 118 x 86 mm excluding expansion modules). Four models are available, with different embedded communications and supply voltages. The number of I/O can be expanded on all four models by adding up to 7 expansion modules (1) of the following type on the right-hand side of the base unit:

- Digital TM2 DDI/DDO/DMM/DRA
- Analog TM2 AMI/ALM/ARI/AMO/AVO/AMM
- Up to 3 High-speed counter TM200 HSC206DT/DF
- Up to 2 AS-Interface master module TWD NOI 10M3.

Modems or communication gateways can be connected to the serial links in order to expand the connectivity capability to include Ethernet Modbus/TCP, Profibus DP, and DeviceNet.

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.

#### **Modicon M258 Logic Controller**



The Modicon M258 logic controller is a compact, high-performance and fully expandable PLC. It forms a part of Flexible Machine Control approach, a key component of MachineStruxure, which brings you maximum flexibility and ensures the most optimized control solution. This PLC is

designed for machine manufacturers (OEMs) focusing on applications such as packaging, conveying and storage, textiles and woodworking, etc. It offers high-performance solutions for speed control, counting, axis control and communication functions. The Modicon M258 logic controller's dual-core processor provides extremely high performance. Core 1 is dedicated exclusively to managing program tasks and offers the maximum resources for real-time execution of the application code. Core 2 is dedicated to executing communication tasks, which have no impact on the application performance.

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.



#### www.schneider-electric.us

#### Modicon™ LMC058 Motion Controller

The Modicon LMC058 motion controller is the optimum solution for axis control and positioning, including automation functions. It forms a part of Flexible Machine Control approach, a key component of MachineStruxure™, which brings you maximum flexibility and ensures the most optimized control solution The Modicon



LMC058 motion controller meets the needs of a wide range of applications in all business sectors. This motion controller is designed for machine manufacturers (OEMs) who require synchronized axes, focusing on applications such as packaging, conveying and storage machines, metal and wood working machines, etc. and offers highperformance solutions for velocity control, counting, axis control and communication functions. To this end, the LMC058 master motion controller includes as standard a CANopen™ master and a CANmotion master dedicated to control of up to 8 synchronized axes, with a performance of 2 ms for 4 axes. With the Modicon LMC058 motion controllers, Lexium 32 and Lexium SD3 drives, and BSH and BDH servo motors, Schneider Electric offers a complete, high performance and cost-effective solution.

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.

## Altivar™ IMC Integrated Controller Card for Altivar 61 and Altivar 71 Variable Speed Drives



The Altivar IMC integrated controller card forms a part of Flexible Machine Control approach, a key component of MachineStruxure, which brings you maximum flexibility and ensures the most optimized control solution. The Altivar IMC integrated controller card VW3 A3521S0 is a compact optimized solution developed for Altivar 61 and 71 variable speed drives. When equipped with the ATV IMC card, Altivar 61 and 71 drives become controllers capable of meeting the needs of machine manufacturers (OEMs) in applications such as textiles, hoisting, pumping or woodworking, etc. The Altivar IMC integrated controller card VW3

A3521S0 is configured and programmed using SoMachine software (see page 27-10). The expansion capability of the Altivar IMC card is based on Schneider Electric's "Flexible Machine Control" concept. The Altivar IMC card boosts the expansion capability of machines and allows us to meet the OEM market's requirements in terms of performance, simplicity of use and openness.

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.

#### Magelis™ XBT GC HMI Controller





The Magelis XBT GC HMI Controller offer forms a part of Flexible Machine Control approach, a key component of MachineStruxure, which brings you maximum flexibility and ensures the most optimized control solution. The Magelis HMI Controller offer brings together HMI and control functions within in a single product. This reduces the amount of equipment required and the associated costs throughout the life cycle of the machine. The XBT GC range is comprised of 6 touch screen terminals, with the following, depending on the model:

- 3.8" monochrome screen, 12 integrated inputs/6 integrated outputs (sink or source)
- 5.7" monochrome or color screen, 16 integrated inputs/16 integrated outputs (sink or source)
- A wide choice of communication interfaces: USB, serial link, CANopen and Ethernet

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.

## Schneider & Electric

#### SoMachine™ Software Suite



SoMachine is the OEM solution software for developing, configuring and commissioning the entire machine in a single software environment, including logic, motion control, HMI and related network automation functions. SoMachine allows you to program and commission all the elements in Schneider Electric's Flexible and Scalable Control

platform, the comprehensive solution-oriented offer for OEMs, which helps you achieve the most optimized control solution for each machine's requirements. Flexible and Scalable Control platforms include:

#### Controllers:

- HMI controllers: XBT GC, XBT GT/GK CANopen
- Logic controllers: Modicon M238, Modicon M258
- Motion Controller Modicon LMC 058
- Integrated Controller Card Altivar IMC
- TM2. TM5 and TM7 offers

#### нмі:

HMI Magelis graphic panels: XBT GT, XBT GK

SoMachine is a professional, efficient, and open software solution integrating Vijeo <sup>™</sup> Designer. It integrates also the configuring and commissioning tool for motion control devices. It features all six IEC 61131-3 languages, integrated field bus configurators, expert diagnostics and debugging, as well as outstanding capabilities for maintenance and visualization.

More information is available at www.schneider-electric.com or in catalog MKTED211041EN-US.

#### Twido™ Nano™



The Twido Nano PLC is a feature-rich ultra-compact controller designed especially for small control systems. Flexible, affordable, and adaptable, Twido makes it easy to build just the right control solution for your customer's application. Offering software with graphical

development, the Twido Nano PLC makes it easy to create, configure, and manage applications. Communication options include CANopen, Ethernet TCP/IP, Modbus, and ASi. More information is available in catalog **DIA3ED2090202EN**.

#### Modicon™ Zelio™ Logic Controller

To meet the demand for applications that require more flexibility than a simple relay, timer or counter, but are too small or simple for the smallest Nano PLC, the new generation of Zelio Logic smart relays are now available. Designed to accept and control outputs just like a relay, Zelio Logic features dual language capability, using either Function Block Diagram (FBD) or Ladder Logic Programming (LL), and can easily be programmed by using either the front panel or by utilizing ZelioSoft software. This new generation



of Zelio Logic smart relays provides customers with considerable gains from the design stage to the monitoring of their applications, due to its simplicity and flexibility.

More information is available at www.schneider-electric.com or in catalog DIA3ED2051002EN-US.

## Section 28

## **Universal Enclosures**



Spacial Steel Enclosures (p. 28-4)



Thalassa Polyester Enclosures (p. 28-7)



ClimaSys Thermal Management System (p. 28-8)

,	
Spacial™ Steel Enclosures	28-2
Thalassa <sup>™</sup> Polyester Enclosures	28-2
ClimaSys™ Thermal Management System	28-3
Our Software Suite	28-3
NEMA and UL Enclosure Ratings	28-3
New Spacial Steel Enclosures	
Floor-Standing and Wall-Mounting Options	28-4
New Thalassa Polyester Enclosures	
Floor-Standing and Wall-Mounting Options	28-7
New ClimaSys Thermal Management System	
Ventilation Systems with Filters	28-8
Cooling Units	28-8
Thermal Control	28-8



**Product Summary** 





#### New!) Spacial<sup>TM</sup>

#### Metal enclosures and boxes

From our small boxes to large modular floor-standing enclosures, with the Spacial range you can find the optimal fit for your applications. Our extensive range of easy-to-use accessories helps you save time during your projects.

Select between steel or stainless steel to better suit the installation environment. In our stainless-steel offer you can find the optimal solution where cleanliness or protection in highly corrosive environments are required.

#### Steel: Indoor non-clean industrial environment

The environment in industrial plants can subject electric and electronic components to dust. splashing oil, and impacts. Such environments require a range of enclosures that are suited to harsh conditions yet are easy to install.

- Universal range, for industry.
- EMC (electromagnetic compatibility) range, against electromagnetic disturbances (treated

#### 304L - 316L stainless steel: Demanding industrial environment

Food and beverage, pharmaceutical, petrochemical, and infrastructure industries have particularly demanding hygiene and corrosion resistance requirements. Our Spacial range is available in two grades of stainless steel:

- 304L stainless steel, for resistance to corrosion and ease of cleaning (often used in food production environments).
- 316L stainless steel, also known as "marine stainless steel," for very high resistance to corrosion (used in saline or chlorinated environments).
- Range of ATEX enclosures, for potentially explosive atmospheres.

#### New product family names:

Spacial S44 - S57 - S24: Steel industrial boxes Spacial SDB: Steel junction boxes IP55 Spacial S3DC: Steel wall-mounting enclosures Spacial SM: Compact metal enclosures Spacial SF: Modular metal enclosures

Spacial S3X: Stainless-steel wall-mounting enclosures

Spacial SMX: Stainless-steel monobloc floor-standing enclosures

Spacial SFX: Stainless-steel modular enclosures



### New!) Thalassa<sup>TM</sup>

#### Insulated enclosures and boxes

Without the right protection, harsh environments can expose your installation to chemicals or other substances.

Developed to help protect your equipment in outdoor applications or harsh conditions, our Thalassa offer ranges from boxes to floor-standing enclosures made from fiberglass reinforced polyester.

Our Thalassa industrial boxes in ABS or polycarbonate are strong, easy to install, and designed to be used in highly demanding environments.

#### Insulating polyester and plastic materials (ABS, polycarbonate): Outdoor infrastructures and severe industrial environments

Outdoor infrastructures and electrical installations are exposed to direct sunlight, rain, saline mist, extreme temperatures, oil splashes, chemical and corrosive agents, and are in contact with the public.

- Universal range, for industry.
- Range of ATEX enclosures, for potentially explosive atmospheres.

#### New product family names:

Thalassa TBS: Insulating industrial boxes Thalassa TBP: Insulating industrial boxes Thalassa PLS: Insulating modular boxes IP65 Thalassa PLM: Polyester wall-mounting enclosures Thalassa PLA: Polyester floor-standing enclosures







#### Thermal management

Preserving and keeping the right temperature inside your enclosure is vital for maximizing the average service life of your installed devices. With our ClimaSys offer you can find the right solution, be it ventilation, cooling or heating, including control units for temperature, humidity and much more.

#### New product family names:

ClimaSys CV: Ventilation systems ClimaSys CU: Cooling unit

ClimaSys CR: Insulated resistance heaters

ClimaSys CC: Thermal control



## New!) Our software suite

#### Spacial.pro

Spacial.pro allows you to make switchboard proposals based on the standard Spacial™ offer. A full project with several sets of switchboards is quoted in minutes, with automatic creation of the bill of material and 2D drawings for front and side views.

#### **ProClima**

Calculate the right choice for your thermal management requirements, according to the environment and the electrical/electronic devices installed inside the enclosure.

#### Spacial.ref and Thalassa.ref

These digital rules assist you in selecting the appropriate components for your application from our extensive product range. The tool automates product and accessory selection to help save you time and money.

Table 28.1: NEMA and UL Enclosure and Component Ratings

Enclosures							Туре	of protec	ction •					
Eficiosures		1	2	3	3R	38	4	4X	5	6	6P	12	12K	13
Ctast well may inting analogues	S3DC	•	•	•4	•4		•4	••				•=	•=	•=
Steel wall-mounting enclosures	CRN	•	•4	•4	•4		••		••			•		•
Stainless-steel wall-mounting enclosures	S3X	•	•4	•4	•4		•4	•4	•4			•	•=	•4
Steel floor-standing enclosures	SM	•	•4	•4	•4		•4		•4			•	•	•4
Steel modular enclosures	SF	•										•	•	
Stainless-steel floor-standing enclosures	SMX	•	•4	•4	•4		•4	•4	•4			•	•	•4
Stainless-steel modular enclosures	SFX	•										•	•	
Thermoplastic boxes	TBS - TBP	•		•		•	•	•						
Polyester modular boxes	PLS	•	•	•	•	•	•	•				•		•
Polyester wall-mounting enclosures	PLM	•	•	•	•	•	•	•				•		•
Polyester floor-standing enclosures	PLA	•	•	•4	•4		•4	•4	•4			•		•

<sup>▲ 1</sup> door ■ 2 doors

Commonanto							Туре	of protec	tion •					
Components		1	2	3	3R	38	4	4X	5	6	6P	12	12K	13
Ventilation system	CV											•	•	
Thermal regulation system	CC											•	•	

In some ranges the classification depends on the model and version. The detailed protection types are indicated in the UL certifications.



Table 28.2: **Spacial Steel Floor-Standing Enclosures** 











					4					
				NSYSM Welded	NSYSFI	Modular		Accessories, Floor-S	Standing Enclosure	s
Height: mm (in)	Width: mm (in)	Depth: mm (in)	# Doors	Without	Without	2 Cido nomele	Mountinguist	Cable-gland plate,	Plinth height 1	00 mm (3.9 in)
(,	(,	()		mounting plate	mounting plate	2 Side panels	Mounting plate	1 entry	Front/back	Sides
1200 (47.2)	600 (23.6)	400 (15.7)	1	_	NSYSF12640	NSY2SP124	NSYMP126	NSYEC641	NSYSPF6100	NSYSPS4100
1200 (47.2)	600 (23.6)	600 (23.6)	1	_	NSYSF12660	NSY2SP126	NSYMP126	NSYEC661	NSYSPF6100	NSYSPS6100
1200 (47.2)	800 (31.5)	300 (11.8)	1	NSYSM12830	_	_	NSYMP128	_	NSYSPF8100	NSYSPS3100
1200 (47.2)	800 (31.5)	400 (15.7)	1	_	NSYSF12840	NSY2SP124	NSYMP128	NSYEC841	NSYSPF8100	NSYSPS4100
1200 (47.2)	800 (31.5)	600 (23.6)	1	_	NSYSF12860	NSY2SP126	NSYMP128	NSYEC861	NSYSPF8100	NSYSPS6100
1200 (47.2)	1000 (39.4)	300 (11.8)	2	NSYSM1210302D	_	_	NSYMP1210	_	NSYSPF10100	NSYSPS3100
1200 (47.2)	1200 (47.2)	400 (15.7)	2	NSYSM1212402D	_	_	NSYMP1212	_	NSYSPF12100	NSYSPS4100
1400 (55.1)	600 (23.6)	300 (11.8)	1	NSYSM14630	_	_	NSYMP146	_	NSYSPF6100	NSYSPS3100
1400 (55.1)	600 (23.6)	400 (15.7)	1	NSYSM14640	NSYSF14640	NSY2SP144	NSYMP146	NSYEC641	NSYSPF6100	NSYSPS4100
1400 (55.1)	800 (31.5)	300 (11.8)	1	NSYSM14830	_	_	NSYMP148	_	NSYSPF8100	NSYSPS3100
1400 (55.1)	800 (31.5)	400 (15.7)	1	NSYSM14840	NSYSF14840	NSY2SP144	NSYMP148	NSYEC841	NSYSPF8100	NSYSPS4100
1400 (55.1)	1000 (39.4)	400 (15.7)	2	NSYSM1410402D	_	_	NSYMP1410	_	NSYSPF10100	NSYSPS4100
1400 (55.1)	1200 (47.2)	400 (15.7)	2	NSYSM1412402D	_	_	NSYMP1412	_	NSYSPF12100	NSYSPS4100
1600 (63.0)	600 (23.6)	300 (11.8)	1	NSYSM16630	_	_	NSYMP166	_	NSYSPF6100	NSYSPS3100
1600 (63.0)	600 (23.6)	400 (15.7)	1	NSYSM16640	_	_	NSYMP166	_	NSYSPF6100	NSYSPS4100
1600 (63.0)	600 (23.6)	600 (23.6)	1	_	NSYSF16660	NSY2SP166	NSYMP166	NSYEC661	NSYSPF6100	NSYSPS6100
1600 (63.0)	600 (23.6)	800 (31.5)	1	_	NSYSF16680	NSY2SP168	NSYMP166	NSYEC681	NSYSPF6100	NSYSPS8100
1600 (63.0)	800 (31.5)	300 (11.8)	1	NSYSM16830	_		NSYMP168	_	NSYSPF8100	NSYSPS3100
1600 (63.0)	800 (31.5)	400 (15.7)	1	NSYSM16840	_	_	NSYMP168	_	NSYSPF8100	NSYSPS4100
1600 (63.0)	800 (31.5)	600 (23.6)	1	_	NSYSF16860	NSY2SP166	NSYMP168	NSYEC861	NSYSPF8100	NSYSPS6100
1600 (63.0)	800 (31.5)	800 (31.5)	1	_	NSYSF16880	NSY2SP168	NSYMP168	NSYEC881	NSYSPF8100	NSYSPS8100
1600 (63.0)	1000 (39.4)	300 (11.8)	2	NSYSM1610302D	_	_	NSYMP1610	_	NSYSPF10100	NSYSPS3100
1600 (63.0)	1000 (39.4)	400 (15.7)	2	NSYSM1610402D	_	_	NSYMP1610	_	NSYSPF10100	NSYSPS4100
1600 (63.0)	1200 (47.2)	300 (11.8)	2	NSYSM1612302D	_	_	NSYMP1612	_	NSYSPF12100	NSYSPS3100
1600 (63.0)	1200 (47.2)	400 (15.7)	2	NSYSM1612402D	_	_	NSYMP1612	_	NSYSPF12100	NSYSPS4100
1800 (70.9)	400 (15.7)	400 (15.7)	1	_	NSYSF18440	NSY2SP184	_	NSYEC441	NSYSPF4100	NSYSPS4100
1800 (70.9)	400 (15.7)	500 (19.7)	1	_	NSYSF18450	NSY2SP185	_	NSYEC451	NSYSPF4100	NSYSPS5100
1800 (70.9)	400 (15.7)	600 (23.6)	1	_	NSYSF18460	NSY2SP186	_	NSYEC461	NSYSPF4100	NSYSPS6100
1800 (70.9)	600 (23.6)	300 (11.8)	1	NSYSM18630	_		NSYMP186	_	NSYSPF6100	NSYSPS3100
1800 (70.9)	600 (23.6)	400 (15.7)	1	NSYSM18640	NSYSF18640	NSY2SP184	NSYMP186	NSYEC641	NSYSPF6100	NSYSPS4100
1800 (70.9)	600 (23.6)	500 (19.7)	1	NSYSM18650	NSYSF18650	NSY2SP185	NSYMP186	NSYEC651	NSYSPF6100	NSYSPS5100
1800 (70.9)	600 (23.6)	600 (23.6)	1	_	NSYSF18660	NSY2SP186	NSYMP186	NSYEC661	NSYSPF6100	NSYSPS6100
1800 (70.9)	600 (23.6)	800 (31.5)	1	_	_	NSY2SP188	NSYMP186	NSYEC681	NSYSPF6100	NSYSPS8100
1800 (70.9)	800 (31.5)	300 (11.8)	1	NSYSM18830	_	_	NSYMP188	_	NSYSPF8100	NSYSPS3100
1800 (70.9)	800 (31.5)	400 (15.7)	1	NSYSM18840	NSYSF18840	NSY2SP184	NSYMP188	NSYEC841	NSYSPF8100	NSYSPS4100
1800 (70.9)	800 (31.5)	500 (19.7)	1	NSYSM18850	NSYSF18850	NSY2SP185	NSYMP188	NSYEC851	NSYSPF8100	NSYSPS5100
1800 (70.9)	800 (31.5)	600 (23.6)	1	NSYSM18860	NSYSF18860	NSY2SP186	NSYMP188	NSYEC861	NSYSPF8100	NSYSPS6100
1800 (70.9)	800 (31.5)	600 (23.6)	2	_	NSYSF188602D	NSY2SP186	NSYMP188	NSYEC861	NSYSPF8100	NSYSPS6100
1800 (70.9)	1000 (39.4)	400 (15.7)	1	NSYSM181040	NSYSF181040	NSY2SP184	NSYMP1810	NSYEC1041	NSYSPF10100	NSYSPS4100
1800 (70.9)	1000 (39.4)	400 (15.7)	2	NSYSM1810402D	NSYSF1810402D	NSY2SP184	NSYMP1810	NSYEC1041	NSYSPF10100	NSYSPS4100
1800 (70.9)	1000 (39.4)	500 (19.7)	1	_	NSYSF181050	NSY2SP185	NSYMP1810	NSYEC1051	NSYSPF10100	NSYSPS5100
1800 (70.9)	1000 (39.4)	500 (19.7)	2	NSYSM1810502D	_		NSYMP1810		NSYSPF10100	NSYSPS5100
1800 (70.9)	1000 (39.4)	600 (23.6)	1	_	NSYSF181060	NSY2SP186	NSYMP1810	NSYEC1061	NSYSPF10100	NSYSPS6100
1800 (70.9)	1000 (39.4)	600 (23.6)	2	_	NSYSF1810602D	NSY2SP186	NSYMP1810	NSYEC1061	NSYSPF10100	NSYSPS6100
1800 (70.9)	1200 (47.2)	400 (15.7)	2	NSYSM1812402D	NSYSF1812402D	NSY2SP184	NSYMP1812	NSYEC1241	NSYSPF12100	NSYSPS4100
1800 (70.9)	1200 (47.2)	500 (19.7)	2	NSYSM1812502D	NSYSF1812502D	NSY2SP185	NSYMP1812	NSYEC1251	NSYSPF12100	NSYSPS5100
1800 (70.9)	1200 (47.2)	600 (23.6)	2		NSYSF1812602D	NSY2SP186	NSYMP1812	NSYEC1261	NSYSPF12100	NSYSPS6100
1800 (70.9)	1600 (63.0)	400 (15.7)	2	NSYSM1816402D		_	NSYMP1816	- NOTEO1201	NSYSPF16100	NSYSPS4100
1800 (70.9)	1600 (63.0)	500 (19.7)	2	NSYSM1816502D	_		NSYMP1816	_	NSYSPF16100	NSYSPS5100
2000 (78.7)	300 (11.8)	500 (19.7)	1		NSYSF20350	NSY2SP205		NSYEC351	NSYSPF3100	NSYSPS5100
2000 (78.7)	300 (11.8)	600 (23.6)	1		NSYSF20360	NSY2SP206		NSYEC361	NSYSPF3100	NSYSPS6100
2000 (78.7)	400 (15.7)	400 (23.6)	1		NSYSF20360 NSYSF20440	NSY2SP206 NSY2SP204	-	NSYEC441	NSYSPF4100	NSYSPS6100 NSYSPS4100
					NSYSF20440 NSYSF20450	NSY2SP204 NSY2SP205	_	ł	NSYSPF4100 NSYSPF4100	NSYSPS5100
2000 (78.7)	400 (15.7)	500 (19.7)	1				_ 	NSYEC451		
2000 (78.7)	400 (15.7)	600 (23.6) 800 (31.5)	1		NSYSF20460 NSYSF20480	NSY2SP206 NSY2SP208	-	NSYEC461 NSYEC481	NSYSPF4100 NSYSPF4100	NSYSPS6100 NSYSPS8100
	400 (15.7)	800 (31.5)		NICVCMANCOCO	110 10020480	1101207208	NSVMP206	NOTEU481		
2000 (78.7)	600 (23.6)	300 (11.8)	1	NSYSM20630	NOVOE00040	Nevocess4	NSYMP206	Neveocia	NSYSPF6100	NSYSPS3100
2000 (78.7)	600 (23.6)	400 (15.7)	1	NSYSM20640	NSYSF20640	NSY2SP204	NSYMP206	NSYEC641	NSYSPF6100	NSYSPS4100

www.schneider-electric.us

Table 28.2: Spacial Steel Floor-Standing Enclosures (continued)

**Universal Enclosures** 

Refer to Catalog 9993CT0901

				NSYSM Welded	NSYSF	Modular		Accessories, Floor-S	Standing Enclosure	s
Height: mm (in)	Width: mm (in)	Depth: mm (in)	# Doors	Without	Without			Cable-gland plate.	Plinth height 1	00 mm (3.9 in)
		(,		mounting plate	Without mounting plate	2 Side panels	Mounting plate	Cable-gland plate, 1 entry	Front/back	Sides
2000 (78.7)	600 (23.6)	500 (19.7)	1	NSYSM20650	NSYSF20650	NSY2SP205	NSYMP206	NSYEC651	NSYSPF6100	NSYSPS5100
2000 (78.7)	600 (23.6)	600 (23.6)	1	_	NSYSF20660	NSY2SP206	NSYMP206	NSYEC661	NSYSPF6100	NSYSPS6100
2000 (78.7)	600 (23.6)	800 (31.5)	1	_	NSYSF20680	NSY2SP208	NSYMP206	NSYEC681	NSYSPF6100	NSYSPS8100
2000 (78.7)	800 (31.5)	300 (11.8)	1	NSYSM20830	_	_	NSYMP208	_	NSYSPF8100	NSYSPS3100
2000 (78.7)	800 (31.5)	400 (15.7)	1	NSYSM20840	NSYSF20840	NSY2SP204	NSYMP208	NSYEC841	NSYSPF8100	NSYSPS4100
2000 (78.7)	800 (31.5)	500 (19.7)	1	NSYSM20850	NSYSF20850	NSY2SP205	NSYMP208	NSYEC851	NSYSPF8100	NSYSPS5100
2000 (78.7)	800 (31.5)	600 (23.6)	1	NSYSM20860	NSYSF20860	NSY2SP206	NSYMP208	NSYEC861	NSYSPF8100	NSYSPS6100
2000 (78.7)	800 (31.5)	600 (23.6)	2	_	NSYSF208602D	NSY2SP206	NSYMP208	NSYEC861	NSYSPF8100	NSYSPS6100
2000 (78.7)	800 (31.5)	800 (31.5)	1	_	NSYSF20880	NSY2SP208	NSYMP208	NSYEC881	NSYSPF8100	NSYSPS8100
2000 (78.7)	1000 (39.4)	400 (15.7)	1	_	NSYSF201040	NSY2SP204	NSYMP2010	NSYEC1041	NSYSPF10100	NSYSPS4100
2000 (78.7)	1000 (39.4)	400 (15.7)	2	NSYSM2010402D	NSYSF2010402D	NSY2SP204	NSYMP2010	NSYEC1041	NSYSPF10100	NSYSPS4100
2000 (78.7)	1000 (39.4)	500 (19.7)	1	_	NSYSF201050	NSY2SP205	NSYMP2010	NSYEC1051	NSYSPF10100	NSYSPS5100
2000 (78.7)	1000 (39.4)	500 (19.7)	2	NSYSM2010502D	NSYSF2010502D	NSY2SP205	NSYMP2010	NSYEC1051	NSYSPF10100	NSYSPS5100
2000 (78.7)	1000 (39.4)	600 (23.6)	1	_	NSYSF201060	NSY2SP206	NSYMP2010	NSYEC1061	NSYSPF10100	NSYSPS6100
2000 (78.7)	1000 (39.4)	600 (23.6)	2	_	NSYSF2010602D	NSY2SP206	NSYMP2010	NSYEC1061	NSYSPF10100	NSYSPS6100
2000 (78.7)	1000 (39.4)	800 (31.5)	1	_	NSYSF201080	NSY2SP208	NSYMP2010	NSYEC1081	NSYSPF10100	NSYSPS8100
2000 (78.7)	1200 (47.2)	400 (15.7)	2	NSYSM2012402D	NSYSF2012402D	NSY2SP204	NSYMP2012	NSYEC1241	NSYSPF12100	NSYSPS4100
2000 (78.7)	1200 (47.2)	500 (19.7)	2	NSYSM2012502D	NSYSF2012502D	NSY2SP205	NSYMP2012	NSYEC1251	NSYSPF12100	NSYSPS5100
2000 (78.7)	1200 (47.2)	600 (23.6)	2	NSYSM2012602D	NSYSF2012602D	NSY2SP206	NSYMP2012	NSYEC1261	NSYSPF12100	NSYSPS6100
2000 (78.7)	1200 (47.2)	800 (31.5)	2	_	NSYSF2012802D	NSY2SP208	NSYMP2012	NSYEC1281	NSYSPF12100	NSYSPS8100
2000 (78.7)	1600 (63.0)	400 (15.7)	2	NSYSM2016402D	NSYSF206402D	NSY2SP204	NSYMP2016	NSYEC1641	NSYSPF16100	NSYSPS4100
2000 (78.7)	1600 (63.0)	500 (19.7)	2	NSYSM2016502D	NSYSF2016502D	NSY2SP205	NSYMP2016	NSYEC1651	NSYSPF16100	NSYSPS5100
2000 (78.7)	1600 (63.0)	600 (23.6)	2	NSYSM2016602D	NSYSF2016602D	NSY2SP206	NSYMP2016	NSYEC1661	NSYSPF16100	NSYSPS6100
2200 (86.6)	400 (15.7)	600 (23.6)	1	_	NSYSF22460	NSY2SP226	_	NSYEC461	NSYSPF4100	NSYSPS6100
2200 (86.6)	600 (23.6)	600 (23.6)	1	_	NSYSF22660	NSY2SP226	NSYMP226	NSYEC661	NSYSPF6100	NSYSPS6100
2200 (86.6)	600 (23.6)	800 (31.5)	1		NSYSF22680	NSY2SP228	NSYMP226	NSYEC681	NSYSPF6100	NSYSPS8100
2200 (86.6)	800 (31.5)	600 (23.6)	1	_	NSYSF22860	NSY2SP226	NSYMP228	NSYEC861	NSYSPF8100	NSYSPS6100
2200 (86.6)	800 (31.5)	800 (31.5)	1	_	NSYSF22880	NSY2SP228	NSYMP228	NSYEC881	NSYSPF8100	NSYSPS8100
2200 (86.6)	1000 (39.4)	600 (23.6)	1		NSYSF221060	NSY2SP226	NSYMP2210	NSYEC1061	NSYSPF10100	NSYSPS6100
2200 (86.6)	1200 (47.2)	600 (23.6)	2	_	NSYSF2212602D	NSY2SP226	NSYMP2212	NSYEC1261	NSYSPF12100	NSYSPS6100
2200 (86.6)	1200 (47.2)	800 (31.5)	2		NSYSF2212802D	NSY2SP228	NSYMP2212	NSYEC1281	NSYSPF12100	NSYSPS8100

Table 28.3: **Spacial Stainless Steel Floor-Standing Enclosures** 











				NSYSMX	NSYSFX	Modular	Ac	cessories, Stainless S	teel
Height: mm (in)	Width: mm (in)	Depth: mm (in)	# Doors	Without	Without	0.0145		Plinth height 1	00 mm (3.9 in)
	()	()		mounting plate	mounting plate	2 Side panels	Mounting plate	Front/back	Sides
1400 (55.1)	1000 (39.4)	300 (11.8)	2	NSYSMX141030	_	_	NSYMP1410	NSYSPXF10100H	NSYSPXS3100H
1600 (63.0)	800 (31.5)	400 (15.7)	1	NSYSMX16840	_	_	NSYMP168	NSYSPXF8100H	NSYSPXS4100H
1800 (70.9)	600 (23.6)	400 (15.7)	1	NSYSMX18640	NSYSFX18640	NSY2SPX184	NSYMP186	NSYSPXF6100H	NSYSPXS4100H
1800 (70.9)	800 (31.5)	400 (15.7)	1	NSYSMX18840	NSYSFX18840	NSY2SPX184	NSYMP188	NSYSPXF8100H	NSYSPXS4100H
1800 (70.9)	1200 (47.2)	400 (15.7)	2	NSYSMX181240	NSYSFX181240	NSY2SPX184	NSYMP1812	NSYSPXF12100H	NSYSPXS4100H
1800 (70.9)	1600 (63.0)	400 (15.7)	2	NSYSMX181640	_	_	NSYMP1813	NSYSPXF16100H	NSYSPXS4100H
2000 (78.7)	600 (23.6)	500 (19.7)	1	_	NSYSFX20650	NSY2SPX205	NSYMP206	_	_
2000 (78.7)	800 (31.5)	400 (15.7)	1	_	NSYSFX20840	NSY2SPX204	NSYMP208	_	_
2000 (78.7)	800 (31.5)	500 (19.7)	1	NSYSMX20850	_	_	NSYMP208	NSYSPXF8100H	NSYSPXS5100H
2000 (78.7)	800 (31.5)	600 (23.6)	1	_	NSYSFX20860	NSY2SPX206	NSYMP208	_	_
2000 (78.7)	1000 (39.4)	400 (15.7)	2	NSYSMX201040	_	_	NSYMP2010	NSYSPXF10100H	NSYSPXS4100H
2000 (78.7)	1000 (39.4)	600 (23.6)	2	=	NSYSFX201060	NSY2SPX206	NSYMP2010	_	
2000 (78.7)	1200 (47.2)	500 (19.7)	2	NSYSMX201250	_	_	NSYMP2012	NSYSPXF12100H	NSYSPXS5100H
2000 (78.7)	1200 (47.2)	600 (23.6)	2	=	NSYSFX201260	NSY2SPX206	NSYMP2012	_	_
2000 (78.7)	1600 (63.0)	600 (23.6)	2	NSYSMX201660	_	_	NSYMP2016	NSYSPXF16100H	NSYSPXS6100H

Schneider Electric www.schneider-electric.us

Table 28.4: Spacial Steel Wall-Mounting Enclosures



CRN/CRNG





S3X Stainless Steel



Mounting Plate

Table 28.4:	Spacial Stee	l Wall-Mounti	ng Encl	osures			
				Spacial S	teel Wall-Mounting Er	nclosures	
Height: mm (in)	Width: mm (in)	Depth: mm (in)	# Doors▲	CRN/CRNG	S3DC	S3X Stainless steel	Mounting Plate
200 (7.9)	200 (7.9)	150 (5.9)	1	NSYCRN22150■	_	_	NSYMM22
200 (7.9)	300 (11.8)	150 (5.9)	1	NSYCRN23150■	_	_	NSYMM32
250 (9.8)	200 (7.9)	150 (5.9)	1	NSYCRN252150	_	_	NSYMM2520
300 (11.8)	200 (7.9)	150 (5.9)	1	_	NSYS3DC3215	NSYS3X3215	NSYMM32
300 (11.8)	250 (9.8)	150 (5.9)	1	NSYCRN325150	_	NSYS3X302515	NSYMM3025
300 (11.8)	250 (9.8)	200 (7.9)	1	NSYCRN325200	_	_	NSYMM3025
300 (11.8)	300 (11.8)	150 (5.9)	1	NSYCRN33150	NSYS3DC3315	NSYS3X3315	NSYMM33
300 (11.8)	300 (11.8)	200 (7.9)	1	NSYCRN33200	NSYS3DC3320	_	NSYMM33
300 (11.8)	400 (15.7)	200 (7.9)	1	NSYCRN34200	_	_	NSYMM43
300 (11.8)	450 (17.7)	150 (5.9)	1	NSYCRN345150■	_	_	NSYMM3045
400 (15.7)	300 (11.8)	150 (5.9)	1	NSYCRN43150	NSYS3DC4315	NSYS3X4315	NSYMM43
400 (15.7)	300 (11.8)	200 (7.9)	1	NSYCRN43200	NSYS3DC4320	NSYS3X4320	NSYMM43
400 (15.7)	400 (15.7)	200 (7.9)	1	NSYCRN44200	NSYS3DC4420	NSYS3X4420	NSYMM44
400 (15.7)	600 (23.6)	200 (7.9)		_	_	NSYS3X4620	NSYMM46
400 (15.7)	600 (23.6)	250 (9.8)	1	NSYCRN46250	_	_	NSYMM64
400 (15.7)	600 (23.6)	300 (11.8)	1	NSYCRN46300	_	_	NSYMM64
500 (19.7)	400 (15.7)	150 (5.9)	1	NSYCRN54150	_	_	NSYMM54
500 (19.7)	400 (15.7)	200 (7.9)	1	NSYCRN54200	NSYS3DC5420	NSYS3X5420	NSYMM54
500 (19.7)	400 (15.7)	250 (9.8)	1	NSYCRN54250	NSYS3DC5425	_	NSYMM54
500 (19.7)	500 (19.7)	200 (7.9)	1	_	NSYS3DC5520	_	NSYMM55
500 (19.7)	500 (19.7)	250 (9.8)	1	NSYCRN55250	NSYS3DC5525	_	NSYMM55
600 (23.6)	400 (15.7)	150 (5.9)	1	NSYCRN64150	_	_	NSYMM64
600 (23.6)	400 (15.7)	200 (7.9)	1	NSYCRN64200	NSYS3DC6420	NSYS3X6420	NSYMM64
600 (23.6)	400 (15.7)	250 (9.8)	1	NSYCRN64250	NSYS3DC6425	_	NSYMM64
600 (23.6)	500 (19.7)	150 (5.9)	1	NSYCRN65150	_	_	NSYMM65
600 (23.6)	500 (19.7)	200 (7.9)	1	NSYCRN65200	_	_	NSYMM65
600 (23.6)	500 (19.7)	250 (9.8)	1	NSYCRN65250	_	_	NSYMM65
600 (23.6)	600 (23.6)	200 (7.9)	1	NSYCRN66200	NSYS3DC6620	_	NSYMM66
600 (23.6)	600 (23.6)	250 (9.8)	1	NSYCRN66250	NSYS3DC6625	NSYS3X6625	NSYMM66
600 (23.6)	600 (23.6)	300 (11.8)	1	NSYCRN66300	NSYS3DC6630		NSYMM66
600 (23.6)	800 (31.5)	300 (11.8)	1	NSYCRN68300	_		NSYMM86
700 (27.6)	500 (19.7)	200 (7.9)	1	NSYCRN75200	_	_	NSYMM75
700 (27.6)	500 (19.7)	250 (9.8)	1	NSYCRN75250	NSYS3DC7525	NSYS3X7525	NSYMM75
800 (31.5)	600 (23.6)	200 (7.9)	1	NSYCRN86200	NSYS3DC8620		NSYMM86
800 (31.5)	600 (23.6)	250 (9.8)	1	NSYCRN86250	NSYS3DC8625	NSYS3X8625	NSYMM86
800 (31.5)	600 (23.6)	300 (11.8)	1	NSYCRN86300	NSYS3DC8630	_	NSYMM86
800 (31.5)	600 (23.6)	400 (15.7)	1	NSYCRNG86400	NSYS3DC8640	_	NSYMM86
800 (31.5)	800 (31.5)	200 (7.9)	1	NSYCRN88200		_	NSYMM88
800 (31.5)	800 (31.5)	250 (9.8)	1	_	NSYS3DC8825	_	NSYMM88
800 (31.5)	800 (31.5)	300 (11.8)	1	NSYCRN88300	NSYS3DC8830	NSYS3X8830	NSYMM86
800 (31.5)	1000 (39.4)	300 (11.8)	2	NSYCRNG810300D		_	NSYMM108
800 (31.5)	1200 (47.2)	300 (11.8)	2	NSYCRNG812300D		_	NSYMM128
1000 (39.4)	600 (23.6)	250 (9.8)	1	NSYCRN106250	NSYS3DC10625	_	NSYMM106
1000 (39.4)	600 (23.6)	300 (11.8)	1	NSYCRN106300		_	NSYMM106
1000 (39.4)	600 (23.6)	400 (15.7)	1	NSYCRNG106400		_	NSYMM106
1000 (39.4)	800 (31.5)	250 (9.8)	1	NSYCRN108250	NSYS3DC10825	_	NSYMM108
1000 (39.4)	800 (31.5)	300 (11.8)	1	NSYCRN108300	NSYS3DC10830	NSYS3X10830	NSYMM108
1000 (39.4)	800 (31.5)	400 (15.7)	1	NSYCRNG108400	NSYS3DC10840	_	NSYMM108
1000 (39.4)	1000 (39.4)	300 (11.8)	2	NSYCRNG1010300D	NSYS3DC101030	NSYS3X101030	NSYMM1010
1000 (39.4)	1200 (47.2)	300 (11.8)	2	NSYCRNG1012300D		_	NSYMM1210
1000 (39.4)	1200 (47.2)	400 (15.7)	2	NSYCRNG1012400D		_	NSYMM1210
1200 (47.2)	600 (23.6)	300 (11.8)	1	NSYCRNG126300			NSYMM126
1200 (47.2)	600 (23.6)	400 (15.7)	1	NSYCRNG126400			NSYMM126
1200 (47.2)	800 (31.5)	300 (11.8)	1	NSYCRNG128300	NSYS3DC12830	NSYS3X12830	NSYMM128
1200 (47.2)	800 (31.5)	400 (15.7)	1	NSYCRNG128400	NSYS3DC12840		NSYMM128
1200 (47.2)	1000 (39.4)	300 (11.8)	2	NSYCRNG1210300D	NSYS3DC121030	NSYS3X121030	NSYMM1210
1200 (47.2)	1000 (39.4)	400 (15.7)	2	NSYCRNG1210400D			NSYMM1210
1200 (47.2)	1200 (47.2)	300 (11.8)	2	NSYCRNG1212300D			NSYMM1212
1200 (47.2)	1200 (47.2)	400 (15.7)	2	NSYCRNG1212400D	_	_	NSYMM1212
1400 (55.1)	1000 (39.4)	300 (11.8)	2	NSYCRNG1410300D	_	_	NSYMM1410

<sup>▲</sup> IP66 with one door, IP55 with two doors.

Two cable gland plates, one on top and one on bottom.





ABS/PC Wall-Mounting Enclosure IP66—Plain Door

### Table 28.5: Thalassa Polyester Wall-Mounting Enclosures

Height:	Width:	Depth:		all-Mounting ures IP66	Polye	ester Wall-Mount	ing Enclosure	s IP66	Polyester Wall-	Manustina
mm (in)	mm (in)	mm (in)	Plain door	Transparent door	Plain door	Transparent door	Plain door 3-point closure	Transparent door 3-point closure	Mounting ATEX Enclosures	Mounting Plate
310 (12.2)	215 (8.5)	160 (6.3)	NSYPLM32	NSYPLM32T	_	_	_	_	_	NSYMM32
308 (12.1)	255 (10 0)	160 (6.3)	_	_	NSYPLM3025	NSYPLM3025T	_		NSYPLMEX3025	NSYMM3025
430 (16.9)	330 (13.0)	200 (7.9)	_		NSYPLM43	NSYPLM43T	NSYPLM43V	NSYPLM43TV	NSYPLMEX43	NSYMM43
530 (20 9)	430 (16.9)	200 (7.9)	_		NSYPLM54	NSYPLM54T	NSYPLM54V	NSYPLM54TV	NSYPLMEX54	NSYMM54
647 (25.5)	436 (17.2)	250 (9.8)	_	_	NSYPLM64	NSYPLM64T	NSYPLM64V	NSYPLM64TV	NSYPLMEX64	NSYMM64
747 (29.4)	536 (21.1)	300 (11.8)	_		NSYPLM75	NSYPLM75T	NSYPLM75V	NSYPLM75TV	NSYPLMEX75	NSYMM75
847 (33.3)	636 (25.0)	300 (11.8)	_		NSYPLM86	NSYPLM86T	NSYPLM86V	NSYPLM86TV	NSYPLMEX86	NSYMM86
1056 (41.6)	852 (33.5)	350 (13.8)	_	_	NSYPLM108	NSYPLM108T	_	_	NSYPLMEX108	NSYMM108

Table 28.6: Thalassa Polyester Floor-Standing Enclosures



Sealed Enclosure IP65— Plain Door



Sealed Enclosure IP65— Transparent Door

	THE PARTY
ш	1143
ш	

Enclosure with Open Bottom IP54—Plain Door

Height: mm (in)	Width: mm (in)	Depth: mm (in)	# Doors	Sealed En	closure, IP65	Enclosures with Oper Bottom, IP54	
	()	, , ,		Plain door	Transparent door	Plain door	
500 (19.7)	500 (19.7)	320 (12.6)	1	NSYPLA553	NSYPLA553T	NSYPLAZ553	
500 (19.7)	500 (19.7)	420 (16.5)	1	NSYPLA554	NSYPLA554T	NSYPLAZ554	
500 (19.7)	750 (29.5)	320 (12.6)	1	NSYPLA573	NSYPLA573T	NSYPLAZ573	
500 (19.7)	750 (29.5)	420 (16.5)	1	NSYPLA574	NSYPLA574T	NSYPLAZ574	
500 (19.7)	1000 (39.4)	320 (12.6)	2	NSYPLA5103	NSYPLA5103T	NSYPLAZ5103	
500 (19.7)	1000 (39.4)	420 (16.5)	2	NSYPLA5104	NSYPLA5104T	NSYPLAZ5104	
500 (19.7)	1250 (49.2)	320 (12.6)	2	NSYPLA5123	NSYPLA5123T	NSYPLAZ5123	
500 (19.7)	1250 (49.2)	420 (16.5)	2	NSYPLA5124	NSYPLA5124T	NSYPLAZ5124	
750 (29.5)	500 (19.7)	320 (12.6)	1	NSYPLA753	NSYPLA753T	NSYPLAZ753	
750 (29.5)	500 (19.7)	420 (16.5)	1	NSYPLA754	NSYPLA754T	NSYPLAZ754	
750 (29.5)	750 (29.5)	320 (12.6)	1	NSYPLA773	NSYPLA773T	NSYPLAZ773	
750 (29.5)	750 (29.5)	420 (16.5)	1	NSYPLA774	NSYPLA774T	NSYPLAZ774	
750 (29.5)	1000 (39.4)	320 (12.6)	2	NSYPLA7103	NSYPLA7103T	NSYPLAZ7103	
750 (29.5)	1000 (39.4)	420 (16.5)	2	NSYPLA7104	NSYPLA7104T	NSYPLAZ7104	
750 (29.5)	1250 (49.2)	320 (12.6)	2	NSYPLA7123	NSYPLA7123T	NSYPLAZ7123	
750 (29.5)	1250 (49.2)	420 (16.5)	2	NSYPLA7124	NSYPLA7124T	NSYPLAZ7124	
1000 (39.4)	500 (19.7)	320 (12.6)	1	NSYPLA1053	NSYPLA1053T	NSYPLAZ1053	
1000 (39.4)	500 (19.7)	420 (16.5)	1	NSYPLA1054	NSYPLA1054T	NSYPLAZ1054	
1000 (39.4)	750 (29.5)	320 (12.6)	1	NSYPLA1073	NSYPLA1073T	NSYPLAZ1073	
1000 (39.4)	750 (29.5)	420 (16.5)	1	NSYPLA1074	NSYPLA1074T	NSYPLAZ1074	
1000 (39.4)	1000 (39.4)	320 (12.6)	2	NSYPLA10103	NSYPLA10103T	NSYPLAZ10103	
1000 (39.4)	1000 (39.4)	420 (16.5)	2	NSYPLA10104	NSYPLA10104T	NSYPLAZ10104	
1000 (39.4)	1250 (49.2)	320 (12.6)	2	NSYPLA10123	NSYPLA10123T	NSYPLAZ10123	
1000 (39.4)	1250 (49.2)	420 (16.5)	2	NSYPLA10124	NSYPLA10124T	NSYPLAZ10124	
1250 (49.2)	500 (19.7)	320 (12.6)	1	NSYPLA1253	NSYPLA1253T	NSYPLAZ1253	
1250 (49.2)	500 (19.7)	420 (16.5)	1	NSYPLA1254	NSYPLA1254T	NSYPLAZ1254	
1250 (49.2)	750 (29.5)	320 (12.6)	1	NSYPLA1273	NSYPLA1273T	NSYPLAZ1273	
1250 (49.2)	750 (29.5)	420 (16.5)	1	NSYPLA1274	NSYPLA1274T	NSYPLAZ1274	
1250 (49.2)	1000 (39.4)	320 (12.6)	2	NSYPLA12103	NSYPLA12103T	NSYPLAZ12103	
1250 (49.2)	1000 (39.4)	420 (16.5)	2	NSYPLA12104	NSYPLA12104T	NSYPLAZ12104	
1250 (49.2)	1250 (49.2)	320 (12.6)	2	NSYPLA12123	NSYPLA12123T	NSYPLAZ12123	
1250 (49.2)	1250 (49.2)	420 (16.5)	2	NSYPLA12124	NSYPLA12124T	NSYPLAZ12124	
1500 (59.1)	500 (19.7)	320 (12.6)	1	NSYPLA1553	NSYPLA1553T	NSYPLAZ1553	
1500 (59.1)	500 (19.7)	420 (16.5)	1	NSYPLA1554	NSYPLA1554T	NSYPLAZ1554	
1500 (59.1)	750 (29.5)	320 (12.6)	1	NSYPLA1573	NSYPLA1573T	NSYPLAZ1573	
1500 (59.1)	750 (29.5)	420 (16.5)	1	NSYPLA1574	NSYPLA1574T	NSYPLAZ1574	
1500 (59.1)	1000 (39.4)	320 (12.6)	2	NSYPLA15103	NSYPLA15103T	NSYPLAZ15103	
1500 (59.1)	1000 (39.4)	420 (16.5)	2	NSYPLA15104	NSYPLA15104T	NSYPLAZ15104	
1500 (59.1)	1250 (49.2)	320 (12.6)	2	NSYPLA15123	NSYPLA15123T	NSYPLAZ15123	
1500 (59.1)	1250 (49.2)	420 (16.5)	2	NSYPLA15124	NSYPLA15124T	NSYPLAZ15124	



#### New! Ventilation systems with filters

Specially recommended for installations in which the ambient temperature is lower than the desired temperature inside the enclosure, a high protection rating is required: IP54 or IP55, and the surrounding environment is relatively clean, allowing air to enter the enclosure.

- 38 to 850 m<sup>3</sup>/h
- 5 input voltages: AC: 400/440 V, 230 V, 115 V (50/60 Hz), DC: 48 V and 24 V.
- Broad range of accessories (filters, IP55 and EMC covers, anti-vandalism kit).



### New! Cooling units

Cooling units control the temperature inside the enclosure to help ensure the correct operation of the components, regardless of the outside temperature, by separating the internal and external air circuits and reducing the humidity of the enclosure.

- Cooling power from 1100 W to 2700 W.
- According to the input voltage: 230 V (50/60 Hz); 3 X 400/440 V (50/60 Hz); 115 V (50/60 Hz).
- RAL 7035 gray and stainless steel.
- A minimum height of 1800 mm (70.9 in) and door width of 800 mm (31.5 in) or side panel width of 600 mm (23.6 in) is required to install a SLIM cooling unit in a Spacial enclosure.



#### New!) Thermal control

Thermostats control the temperature inside the enclosure and send a signal when maximum or minimum temperature values have been reached.

- Temperature control: adjustable thermostats; single or double.
- Relative humidity control: adjustable humidistat.
- Temperature and relative humidity control: adjustable hygrotherm.



## Section 29

## **Advanced Products**



#### New EVIInk™ Electric Vehicle Charging Solutions EVlink™ Electric Vehicle Charging Stations—Overview 29-2 **Indoor Charging Stations (Residential Applications)** 29-3 **Outdoor Charging Stations** 29-4 **RFID Accessories** 29-4 **Dimensions** 29-5 New! Wiser™ Energy Efficiency Solutions **Energy Efficiency Solutions Overview** 29-6 In-Home Display (IHD) 29-6 **Programmable Communicating Thermostats (PCT)** 29-6 **Smart Plug** 29-7 **Load Control Relays** 29-7 **Large Load Control** 29-7 **Ethernet Gateway** 29-8 **Accessories** 29-8 New! Residential Solar Power Solutions Conext<sup>™</sup> Series Grid Tie Inverters 29-9 **Specifications** 29-10

#### Wiser™ Energy Efficiency Solutions



#### Residential Solar Power Solutions





#### EVlink™ Electric Vehicle Charging Stations

Our Electric Vehicle Supply Equipment (EVSE) provides power to recharge the on-board vehicle batteries in Electric Vehicles (EV) and Plug-in Hybrid Electric Vehicles (PHEV). The EVSE units are Level 2 type which can charge the vehicle batteries in as little as 3-6 hours, depending on the vehicle type and level of battery charge. The EVSE will typically be fed from a 208 V or 240 V source, two-pole 40 A circuit breaker or disconnect and will be able to provide 30 A of current to the vehicle's on-board charger. All units meet or exceed SAE J1772 ▲ and UL standards for electric vehicle supply equipment.

#### Schneider Electric EVSE features include:

- Integral Ground Fault Protection at 5 mA
- User friendly interface to indicate power on/off, charging, system detected faults etc.
- Heavy duty cord and connector which meet SAE J1772 standards
- Automatic reset and restart after ground fault or main power loss
- Radio Frequency Identification (RFID) authentication available for outdoor units
- Available in indoor/outdoor, wall and pedestal mount, single and dual charger models
- Optional advanced metering functionality available to collect and monitor energy and demand profile data ♦

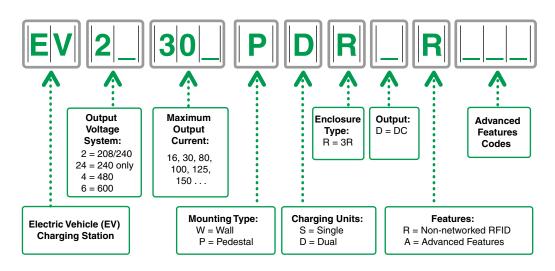




#### Coming in 2012:

- · Charging Station with advanced communications and networking
- DC fast charging station which can charge 80% of EV in less than 30 minutes

Please stay tuned at www.schneider-electric.us/ go/evlink



- SAE J1772—standard for Electric Vehicles that defines common connectors and interfaces at various power levels for PHEV and EV established by Society of Automotive Engineers for North America.

  RFID—localized RFID in which the programming for the addition or removal of subscribers is done at the EVSE
- Energy monitoring and metering options are available and can be added to provide networking and communication through an optional power meter enclosure. Please consult your local Schneider Electric sales representative for selection information or call 1-888-778-2733.

### **Indoor Charging Stations (Residential Applications)**

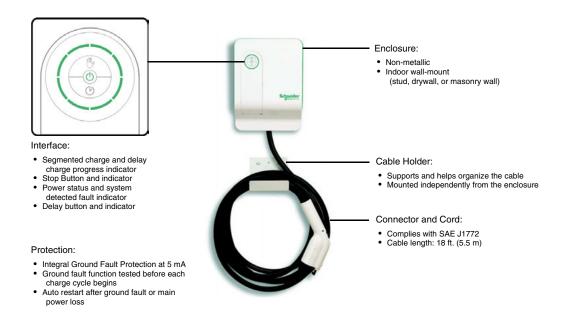
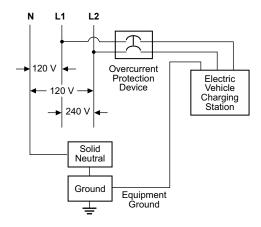


Table 29.1: Indoor Charging Station—Wall-mounted

Output Voltage System	Output Current	Mounting	Enclosure Type	Number of Charging Units	Catalog Number	\$ Price
240 Vac only	30 A	Wall	1	1	EV2430WS	1200.00

#### 120/240 Vac Only





Outdoor Dual Unit

Pedestal-mount

#### **Outdoor Charging Stations**

#### Protection: Authentication: Integral Ground Fault Protection at 5 mA Ground fault function tested before each charge cycle begins · Localized RFID solution (optional) Auto restart after ground fault or main power loss Interface: · Power status Charge indicator Enclosure: System detected fault indicator Metallic enclosure Wall-mount Cable and Connector Holders: Supports and helps organize the cable Connector storage Integral with the enclosure **Cables and Connectors:** Complies with SAE J1772 Cable length: 18 ft. (5.5 m) Cable Holder: Supports and helps organize the cable Connector storage Mounted independently Enclosure: from the enclosure Metallic enclosure Pedestal-mount Indoor / Outdoor Wall-mount Mounting: Metallic pedestal

Table 29.2: **Outdoor Charging Stations** 

Output Voltage System	Application	Output Current	Mounting	Enclosure Type	Number of Charging Units	Catalog Number	\$ Price
208-240 Vac	Indoor/Outdoor	30 A	Wall	3R	Single	EV230WSR	1800.00
208–240 Vac	Outdoor	30 A	Pedestal	3R	Single	EV230PSR	2400.00
208–240 Vac	Outdoor	30 A	Pedestal	3R	Dual▲	EV230PDR	4000.00

Outdoor Single Unit

Pedestal-mount

Output current per charge unit

#### Table 29.3: **Outdoor Charging Stations with RFID Access**

Output Voltage System	Application	Output Current	Mounting	Enclosure Type	Number of Charging Units	Catalog Number	\$ Price
208-240 Vac	Indoor/Outdoor	30 A	Wall	3R	Single	EV230WSRR	2400.00
208–240 Vac	Outdoor	30 A	Pedestal	3R	Single	EV230PSRR	3000.00
208–240 Vac	Outdoor	30 A	Pedestal	3R	Dual■	EV230PDRR	4600.00

Output current per charge unit

#### Table 29.4: RFID Accessories ♦

Description	Catalog Number	\$ Price
RFID Handheld Programmer	EVRFIDHP	240.00
RFID Authentication Cards (Quantity of 10)	EVRFIDKF10	110.00

Required for charging stations with RFID Access

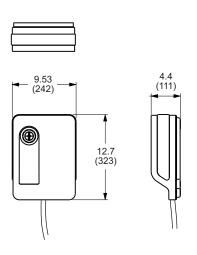




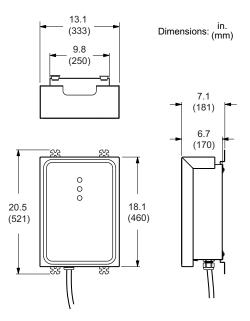
**EVRFIDKF10** 

## Schneider Blectric

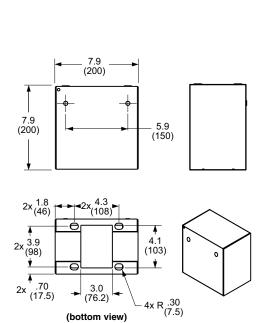
#### **Dimensions**



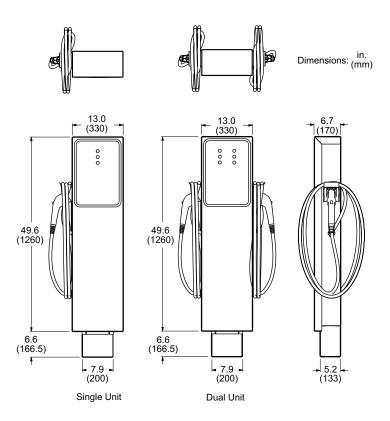




Indoor/Outdoor Wall-mount



Pedestal Base



**Pedestal Mounted Charging Stations** 

## Schneider Electric

### **Energy Efficiency Solutions Overview**

Our Wiser Energy Efficiency products can give you information about your home's energy consumption and provide ways to conveniently automate energy use. Information displays can be conveniently located and easily integrated with Smart Grid energy programs. In addition, these devices provide useful information displays such as time and temperature.

HVAC thermostats, an in-home display, and load controls are designed to integrate into a seamless energy control system, allowing you to easily **Make the Most of Your Energy**<sup>SM</sup>.

#### **Schneider Electric Energy Efficiency Products:**

- Use industry standard radio interfaces. Products are certified to the ZigBee<sup>®</sup> Smart Energy protocol
- Provide easy to use, conveniently located controls
- Signal energy with vivid color display screens
- Are designed to be integrated into Smart Grid energy efficiency programs
- Are certified to UL916, and UL489 (as applicable)
- Incorporate convenience features, such as remote thermostat control, time-of-day display, remote load control, and load scheduling
- Load controls are available in outdoor configurations









Color Based Energy Signaling

### Wiser In-Home Display (IHD)

- Internal rechargable battery for power outages and convenience
- Integrates with remote measurement devices, and graphically displays energy use and signals based on demand
- Schedules Wiser components, such as load controls, load relays, and smart plugs
- Controls Wiser thermostats from remote locations
- Automatically sets time from the network
- Displays time
- Displays outdoor temperature (optional components required)

#### Table 29.5: Wiser In-Home Display (IHD)

Model	Industry Specifications	Power	\$ Price
EER20100	UL Standard 916 Canadian Standard CAN/CSA C22.2, No. 205 ZigBee® Smart Energy	100–240 Vac 50–60 Hz	550.00

## Wiser Programmable Communicating Thermostats (PCT)

- Offers four programmable temperature changes per day for up to seven days
- Supports demand response through ZigBee<sup>®</sup> Smart Energy Profile
- Integrates with remote measurement devices, and graphically displays energy use and signals based on demand
- Schedules Wiser components, such as load controls, load relays, and smart plugs
- Automatically sets time from the network
- Displays outdoor temperature (optional components required)
- No batteries required, operates in four wire installations

#### Table 29.6: Wiser Programmable Communicating Thermostats (PCT)

Mod	del	Industry Specifications	Power	\$ Price
EER5	6000	UL Standard 916 Canadian Standard CAN/CSA C22.2, No. 205-M1983 ZigBee® Smart Energy Single stage conventional heat/cool Heat pump (two stage heat / single stage cool) Dual fuel heat pump (two stage heat / single stage cool)	100–240 Vac 50–60 Hz	550.00
EER5	6100	UL Standard 916 Canadian Standard CAN/CSA C22.2, No. 205-M1983 ZigBee® Smart Energy Single stage conventional heat/cool Two stage conventional (two stage heat / two stage cool) Heat pump and geothermal heat pump (two stage heat / single stage cool) Two-speed heat pump and two-speed geothermal heat pump (three stage heat / two stage cool) Ulal fuel heat pump and geothermal dual fuel heat pump Humidifier and dehumidifier control	100-240 Vac 50-60 Hz	720.00



EER20100



EER56000 EER56100

## Schneider Electric

## Wiser™ Energy Efficiency Solutions



EER40200



EER42200 EER42300



EER260LLCR



EER260LLCCT1 EER260LLCCT2

#### **Wiser Smart Plug**

- Supports demand response through ZigBee<sup>®</sup> Smart Energy Profile
- Plugs into 120 V electrical outlets
- Measures power used by electrical outlet loads
- Provides scheduling and remote control when used with the EER20100 Wiser In-Home Display or the EER56000/EER56100 Wiser Programmable Communicating Thermostats

#### Table 29.7: Wiser Smart Plug

Model	Industry Specifications	Power	\$ Price
EER40200	<ul> <li>UL Standard 508 and UL 244A</li> <li>Canadian Standard CAN/CSA C22.2, No. 14-05</li> <li>ZigBee<sup>®</sup> Smart Energy</li> </ul>	100-240 Vac 50-60 Hz	340.00

#### **Wiser Load Control Relays**

- Supports demand response through ZigBee<sup>®</sup> Smart Energy Profile
- Low voltage 120 and 240 V relays
- Measures power used by electrical outlet loads
- Provides scheduling and remote control when used with the EER20100 Wiser In-Home Display or the EER56000/EER56100 Wiser Programmable Communicating Thermostats
- EER42300 provides isolated contact outputs

#### Table 29.8: Wiser Load Control Relays

N	/lodel	Industry Specifications	Power	\$ Price
EE	R42200	UL Standard 916 Canadian Standard CAN/CSA C22.2, No. 205-M1983 ZigBee® Smart Energy Supply voltage: 100–250 Vac, 50/60 Hz	30 A, 240 Vac 30 A, 28 Vdc 2 hp, 240 Vac 1 hp, 120 Vac	405.00
EE	R42300	UL Standard 916 Canadian Standard CAN/CSA C22.2, No. 205-M1983 ZigBee® Smart Energy Supply voltage: 100–250 Vac, 50/60 Hz	5 A, 240 Vac 5 A, 28 Vdc 240 VA, 240 Vac	375.00

#### **Wiser Large Load Control**

- Supports demand response through ZigBee<sup>®</sup> Smart Energy Profile
- Used with Square D<sup>™</sup> QOPL-ILC circuit breaker devices, ordered separately
- Measures branch circuit loading (current transformer required, ordered separately)
- Provides remote control when used with the EER20100 In-Home Display or the EER56000/EER56100 Wiser Programmable Communicating Thermostats
- Provides remote disconnect switch functions

#### Table 29.9: Wiser Large Load Control

Model	Industry Specifications	Load Contacts	\$ Price
EER260LLCR	<ul> <li>UL489</li> <li>ZigBee<sup>®</sup> Smart Energy</li> <li>120 / 240 Vac, 1P/2P, 50/60 Hz</li> </ul>	QOPL-ILC circuit breaker (see Table 29.10)	405.00
EER260LLCCT1	1P 60 A current transformer	_	50.00
EER260LLCCT2	2P 60 A current transformer	_	100.00

#### Table 29.10: QOPL-ILC Circuit Breakers

Catalog Number	Rating (A)	No. of Poles	AIC Rating (kA)
QO115PLILC	15	1	10
QO120PLILC	20	1	10
QO230PLILC	30	2	10
QO240PLILC	40	2	10
QO250PLILC	50	2	10
QO260PLILC	60	2	10

# www.schneider-electric.us



EER21200



EER57000



EER57100



EER57200

#### **Wiser Ethernet Gateway**

- Allows for software monitoring, programming, and control of Wiser Energy Efficiency products via the internet
- Used with the Wiser Head End Server system

#### Table 29.11: Wiser Ethernet Gateway

Model	Industry Specifications	\$ Price
EER21100	ZigBee® Router type device     UL power adapter     ZigBee® Smart Energy     Supply voltage: 100–240 Vac, 50/60 Hz	395.00
EER21200	ZigBee® Coordinator type device     UL power adapter     ZigBee® Smart Energy     Supply voltage: 100–240 Vac, 50/60 Hz	395.00

#### **Wiser Accessories**

- $\label{thm:conceal} \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and paint lines from $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes and $ \mbox{Trim ring can be used to conceal mounting imperfections, such as holes are conceal mounting imperfections.} \label{fig:trim ring can be used to conceal mounting can be used to conceal mounting imperfections.} \label{fig:trim ring can be used to conceal mounting can be used to conceal mounting imperfections.} \label{fig:trim ring can be used to conceal mounting can be used to co$ previous installations
- External temperature sensor provides temperature measurements when used with Wiser thermostats
- Auxiliary power supply permits Wiser thermostats to be used in specialized four wire installations

#### Table 29.12: Wiser Accessories

Model	Name	Industry Specifications	\$ Price
EER57000	Trim Ring	_	50.00
EER57100	Auxiliary Power Supply	<ul> <li>UL Standard 916</li> <li>Canadian Standard CAN/CSA C22.2, No. 205-M1983</li> </ul>	75.00
EER57200	External Temperature Sensor	_	90.00







**Solar Inverters** 

Conext™ Series Grid Tie Inverter

## Conext<sup>™</sup> Series Grid Tie Inverters

The Conext™ Grid Tie Solar Inverter (Conext Series) converts photovoltaic (PV) electricity produced by solar modules into utility grade power that can be used by the home or sold to a local electrical utility. Offering high performance, clean aesthetics, innovative features, and easy installation, the Conext Series provides great value in a compact high-frequency design. The Conext Series may be installed as a single inverter for a single PV array or in a multiple inverter configuration for large PV systems or three-phase applications.

#### **Features**

- An NEC compliant, integrated Square D™ DC/AC disconnect eliminates the need for external DC (PV) disconnects and in some jurisdictions, AC disconnects
- Large heatsink offers excellent heat dispersion without the need for a cooling fan
- Liquid Crystal display provides instantaneous information—power level, daily and lifetime energy production, PV array voltage and current, utility voltage and frequency, time online "selling", system troubleshooting messages, and installer-customized screens
- User-enabled Fast Sweep™ Maximum Power Point Tracking (MPPT) increases energy harvest in shaded installations
- LCD vibration sensor allows the tap of a finger to turn backlight on and easily cycle through display
- FCC Class B compliance

#### Installation

- Flexible Module selection due to wide PV input MPPT tracking voltage range
- Lightweight and versatile mounting bracket
- Easy access DC (PV) and AC (Utility) terminal blocks simplify wiring
- Rugged NEMA 3R inverter enclosure allows reliable indoor and outdoor installations
- Simple communications set-up for daisy-chained single phase and three-phase installation

#### Servicability

- Sealed inverter enclosure can be quickly separated from the wiring box allowing DC/AC connections to remain intact during a service event
- Ten-year standard warranty

#### Table 29.13: Conext™ Inverters

Product	Description	Part Number	\$ Price
Conext TX 2800 NA	2.8 kW inverter 208/240 V	RNW-878-2801	2040.00
Conext TX 3300 NA	3.3 kW inverter 208/240 V	RNW-878-3301	2410.00
Conext TX 3800 NA	3.8 kW inverter 208/240 V	RNW-878-3801	2575.00
Conext TX 5000 NA	5.0 kW inverter 208/240 V	RNW-878-5001	3250.00

#### Table 29.14: Residential Grid-Tie Solar Package

System Voltage	Kilowatts	Amps	DC Disconnect	Inverter	AC Disconnect	Suggested Load Center ▲
250 Vdc	2.8	30	HU361RB	878-2801	D221NRB	QO130M200
250 Vdc	3.3	60	HU362RB	878-3301	D222NRB	QO140M225
250 Vdc	3.3	100	HU363RB	878-3301	D223NRB	QONQ42MS400
600 Vdc	3.8	30	HU361RB	878-3801	D221NRB	QO130M200
600 Vdc	5.0	60	HU362RB	878-5001	D222NRB	QO140M225
600 Vdc	5.0	100	HU363RB	878-5001	D223NRB	QONQ42MS400

Consult Digest Section 1 for other load center options, covers, accessories, and circuit breakers.

NOTE: See Digest Section 3 for additional PV switch offerings including the new UL98B 1000 Vdc PV disconnect.

29



#### Table 29.15: Specifications

•					
Electrical Specifications (Output)					
Product Model	Conext TX 2800 NA	Conext TX 3300 NA	Conext TX 3800 NA	Conext TX 5000 NA	
Nominal output power	2800 W / 2650 W	3300 W / 3100 W	3800 W / 3500 W	5000 W / 4500 W	
AC output voltage (nominal)	240/208 Vac	240/208 Vac	240/208 Vac	240/208 Vac	
AC output voltage range	-	Auto detect 24	0 to 208 Vac		
AC frequency (nominal)		60 H	<del>l</del> z		
AC frequency range		59.3 to 6	0.5 Hz		
Max. continuous output current	11.8/13.0 A rms	14.0/15.2 A rms	16.0/16.8 A rms	21/22 A rms	
Max. output over-current protection	15 A rms	20 A rms	25 A rms	30 A rms	
Max. utility back-feed current		0 <i>F</i>	1		
Total harmonic distortion (THD)		THD <	: 3%		
Power factor		>0.99 (at rated power), >	0.95 (full power range)		
Utility monitoring, islanding protection		UL 1741-2010. E	d.2 / IEEE1547		
Output characteristics		Current S	Source		
Output current waveform	True Sine Wave				
Electrical Specifications (Input)					
Max. Array open-circuit voltage		600 \	/dc		
MPPT voltage range (CEC & CSA)	195-550 Vdc	195-550 Vdc	195-550 Vdc	240-550 Vdc	
Max. input current	15.5 Adc / 14.9 Adc	18 Adc / 17.5 Adc	20.8 Adc / 19.5 Adc	22 Adc / 20 Adc	
Max. array short-circuit current	24 Adc				
Reverse-polarity protection		Short-circu	uit diode		
Ground-fault protection		GF detection	ı, I <sub>DIF</sub> > 1A		
Max. Peak efficiency	95.2% / 95.2%	95.6% / 95.3%	96.3% / 96%	96.7% / 96.4%	
CEC Efficiency	94.5% / 94.5%	95% / 94.5%	95.5% / 95.5%	96.0% / 95.5%	
Night-time power consumption		1 V	V		
General Specifications					
Mounting		Wall mount (mounting	g bracket included)		
Input and output terminal		AC and DC terminals accept	wires sizes #14 to #6 AWG		
PV / Utility disconnect	Eli	minates need for external PV (DC) disco	nnect. Complies with NEC requirement	S.	
Cooling		Convection cooled	, fan not required		
Display	Backlit, two-line, 16-character liquid crystal display provides instantaneous power, daily and lifetime energy production, PV array voltage and current, utility voltage and frequency, time online "selling", faults messages, and installer-customizable screens				
Communications		Integrated RS232 and Xanbus <sup>T</sup>	™ RJ45 communication ports		
Wiring box	PV, utility, gro	ound, and communications connections.	The inverter can be separated from the	wiring box.	
Warranty		Ten-year s	standard		
Part number (negative ground)	878-2801	878-3301	878-3801	878-5001	
Environmental Specifications					
Operating Temperature Range		-13°F to 149°F (-	-25°C to 65°C)		
Enclosure Type		NEMA 3R (Ou	tdoor Rated)		
Inverter Weight	31.8 kg (70.1 lbs)	32.2 kg (71 lbs)	36.5 kg (80.5 lbs)	38.9 kg (85.8 lbs)	
Inverter dimensions (H x W x D)	89.3 x 40.3 x 18.5 cm 35.2 x 15.9 x 7.3 in.	89.3 x 40.3 x 18.5 cm 35.2 x 15.9 x 7.3 in.	98.8 x 40.3 x 18.5 cm 38.9 x16 x 7.3 in.	98.8 x 40.3 x 18.5 cm 38.9 x 16 x 7.3 in.	
Shipping dimensions (H x W x D)	107.0 x 57.7 x 26.0 cm 42.1 x 22.7 x 10.2 in.	107.0 x 57.7 x 26.0 cm 42.1 x 22.7 x 10.2 in.	116.5 x 57.7 x 26.0 cm 45.8 x 22.7 x 10.2 in.	116.5 x 57.7 x 26.0 cm 45.8 x 22.7 x 10.2 in.	
Regulatory Approvals					

#### Regulatory Approvals

CSA Certified to UL 1741-2010 Ed.2 (Include IEEE 1547)—inverters, converters, controllers and interconnection system equipment for use with distributed energy resources; and CSA C22.2 No 107.1 FCC Class B general use power supplies.





www.scillelder-electric.us	and the second of the second o
Numerics	cabling, TeSys D 18-9 C-Bus 5-4
	contactors 16-109
1000 Vdc photovoltaic heavy duty disconnect switches 3-22	contactors, <b>TeSys</b> D 18-8–18-11, 18-14
14-inch-wide NQ panelboards 9-8	contactors, <b>TeSys</b> F 18-8, 18-11–18-13, 18-15
<b>16 mm push buttons</b> 19-12- 19-22	disconnect switches, flange mounted and cable operated 8-16
20-inch-wide NF panelboards 9-13	double throw safety switches 3-15, 3-18
<b>20-inch-wide NQ panelboards</b> 9-6-9-7, 9-9	energy meter 4-15
	float switches 22-28 high density meter system 4-14
<b>22 mm push buttons</b> 19-8, 19-23–19-55, 19-57–19-65	I-Line merchandised panelboards 9-23
2-Pole single phase full voltage starters 16-20-16-21	insulation displacement style terminal blocks 24-10
<b>30 mm push buttons</b> 19-9, 19-67–19-69, 19-73–19-79,	Lk4 nonfusible and GS2 fusible 8-10
19-83- 19-93	machine tool pressure switches 22-18
4-Pole, 2-phase full voltage starters 16-20-16-21	manual starters and protectors, GV 18-34
800 A-5000 A pricing instructions	mechanical interlocks 16-114
I-Line II 12-6	meter centers 2-15 meter sockets 2-3
<b>8M, 36M, 60M enclosures</b> 5-18	Mini-Vario and Vario motor disconnect switches 8-6
9012G pressure switches	NF merchandised panelboards 9-14
differential 22-15	NQ merchandised panelboards 9-9
dual stage 22-15	operating mechanisms, disconnect switches
industrial 22-13	and circuit breakers 8-24
machine tool 22-14	PowerPact circuit breakers 7-39
9013F commercial pressure switches 22-21	proximity sensors 20-9 QO and Homeline load centers 1-12
9013G commercial pressure switches 22-22	QO and QOB miniature circuit breakers 7-12
9016GAW vacuum switches 22-19	QO load centers 1-12
9016GVG vacuum switches 22-19	QO miniture circuit breaker 1-4
9036D float switches 22-23	QOU 7-15
9036FG float switches 22-24	safety switches 3-3
9036G float switches 22-23	series 800 4-10 series 4000 4-11
9037E float switches 22-24	solid neutral 16-113
9037H closed tank float switches 22-25	starters 16-109
	TeSys AK5 panel busbar system 18-39
9038A mechanical alternators 22-26	TeSys contactors 18-38
9038C mechanical alternators 22-26	TeSys D 18-8- 18-11, 18-14 TeSys F 18-8, 18-11- 18-13, 18-15
9038D mechanical alternators 22-27	TeSys GV 18-36
	TeSys K 18-27
A	<b>TeSys</b> U 18-28–18-31
	transformers 14-10, 14-17
AB1	transient suppression module 16-112 trench duct 13-6
markers 24-11 other blocks 24-9	trench duct 13-6 Type K and SK 19-89–19-90
other blocks 24-9 <b>AB1AA</b> insulation displacement blocks 24-10	XB6 19-20
•	accessories and modification kits,
AB1DD, AB1ET three tier 24-7	manual starters and switches 16-9, 16-11
AB1ET two tier blocks 24-6	AccuSine AHF
AB1ETN two tier blocks 24-7	dynamic VAR compensation 4-34-4-36
AB1FU and AB1SF/SV fuseholders 24-8	actuator sensor interface (AS-i) bus products 27-7
AB1RR	adapter, I-Line to I-Line II 12-7
spring clip blocks 24-2– 24-3	Advantys OTB 27-5
spring clip terminals 24-4	Advantys TeleFast 2
AB1TP grounding blocks 24-6	prewired connection system 24-22
AB1VV and AB1TP miniature blocks 24-4	Advantys Telefast ABE7 sub-bases 27-5
AB1VV box lug blocks 24-5	Advantys Telefast ABE9 passive splitter boxes 27-5
ABR electromechanical interface modules 23-42	ADVC controller 11-20
ABS solid state interface modules 23-41	alternating relays
AC drives	TeSys SKE IEC style 23-21
Altivar 12 26-2	Altistart 22 26-18
Altivar 212 26-3, 26-5—26-6	Altistart 22 (enclosed) 26-19
Altivar 31 26-7 Altivar 312 26-2, 26-7 26-9	(1.1.1.1)
Altivar 312 26-2, 26-7– 26-9 Altivar 32 26-2	Altistart 48 26-17
Altivar 61 26-3, 26-10-26-11, 26-14-26-15	Altistart drive 18-32
Altivar 71 26-3, 26-12– 26-15	Altistart U01 soft starters
documentation 26-20	dimensions 18-51
S-Flex (Altivar 212) 26-16	Altivar 12 26-2
support 26-20 training 26-20	<b>Altivar 32</b> 26-2
training 26-20 accessories	<b>Altivar 212</b> 26-3, 26-5–26-6
C60 UL489 mounting base 7-13	<b>Altivar 31</b> 26-7

Alphabetical Listing			www.schneider-electric.us
Altivar 312	26-2, 26-7-26-9	auxiliary contacts	
Altivar 61 26-3, 26	6-10-26-11, 26-15	manual and magnetic contactors and starters	16-110
*	26-3, 26-12-26-15	TeSys D and F	18-8
Altivar IMC integrated controller card	27-9	auxiliary input unit	5-12
analysis and consulting	4-20	auxillary gutter, QO load centers	1-10
Appleton Powertite receptacle safety switches	3-9		
application	0.0	В	
fuseholders	24-19	backup power solutions	1-9
application data		biometric switches, XB5S	19-65— 19-66
double throw safety switches	3-20 21-4	blank doors Model 6 MCC	17-6
limit switches power distribution blocks	21-4 24-18	bodies, limit switches	21-17
AR1 and AT1 cable ends	24-21	bolt-on remotely operated circuit breakers	5-24
arc extinguishing system, Arc Terminator	11-16	box lug blocks AB1VV	24-5
arc flash analysis	4-20	_	14-11
arc flash protection and mitigation system	4-26	brackets, transformers	14-11
Arc Terminator, arc extinguishing system	11-16	branch circuit breakers  NQ factory assembled panelboards	9-11
architectures for safety related solutions	25-3	Qwik-Gard	9-11
area lighting panels	5-18	branch circuit power meter,	4-16
AS-i safety at work	25-3, 25-5	branch devices, meter centers	2-11, 2-13
-	23-3, 23-3	branch feeder units, Model 6 MCC	17-6
assemblies, terminal blocks ATEX enclosures	28-2	branch switches,	
	26-2 18-32	QMB fusible	9-35
ATSU01 Altistart drive		branch units, meter centers	2-8
automatic circuit recloser	11-20	buck and boost, transformers	14-8
automation power system	4-21	bus couplers, C-Bus	5-13
automation products	s 27-7	busbar	
Actuator Sensor interface (AS-i) bus products Advantys	5 21-1	configuration code	12-3
ОТВ	27-5	busbar accessories,TeSys contactors	18-38- 18-39
Telefast ABE7 sub-bases	27-5	busbar configurations	
Telefast ABE9 passive splitter boxes	27-5	busway	12-2
Altivar IMC integrated controller card	27-9 27-6	busway	
CANopen network products  ConneXium ethernet products	27-6 27-6	elbows	12-6 12-6
ethernet TCP/IP products	27-7	hangers I-Line	12-13- 12-14
Magelis advanced panels		I-Line II	12-5- 12-6, 12-11
XBT GH	27-3	Surgelogic SPD units	6-5
XBT GK XBT GT	27-3 27-3	tee terminating	12-6
XBT GTW	27-3	accessories	12-18
Magelis HMI products	•	transition section meter centers	2-15
Compact iPC	27-4	I-Line	12-4
Compact PC BOX	27-4	busway	
Flex PC BOX	27-4	"footage and fittings" pricing method 800 A–5000 A busway	12-4 12-5
Smart BOX	27-4	800 A–5000 A busway 800 A–5000 A pricing instructions	12-5
Smart iPC Smart+ iPC	27-4 27-4	accessories	12-8
Magelis small panels	21-4	additions	12-8
STO/STU	27-3	busbar configuration code	12-3 12-2
XBT N/R	27-3	busbar configurations bussed transformer connection	12-7
XBT RT	27-3	circuit breaker cubicle	12-7
Magelis XBT GC HMI controller	27-9	connection to competitive busway	12-7
Modicon LMC058 motion controller	27-9	construction options	12-17 12-8
M168 PLC	27-8	electrical data expansion fittings	12-7
M238 PLC	27-8	feeder	12-6
M258 PLC	27-8	finger protection to IP2X	12-7
M340 PAC	27-2	fused	12-7
Momentum distributed I/O and PLC	27-5	hangers high short circuit bracing	12-17 12-6
Premium PLC	27-2	I-Line	12-4
Quantum PLC	27-2	I-Line II	12-5
STB	27-5 27-5	I-Line II, PowerPact plug-in units	40.44 40.40
TM5 expansion module TM7 I/O blocks	27-5 27-5	H-frame	12-11 12-12
TSX Micro PLC	27-5 27-2	J-frame M-frame	12-11 12-12 12-12
Zelio Logic controller	27-10	P-frame	12-12
Transparent Ready solutions	27-6	R-frame	12-14
Twido Nano controller	27-10		
: 0	and the Control Delate		© 2012 Cohnaider Floatrie



## Electric www.schneider-electric.us			Alphabetical Listing
	12-10	dimensions and chinning weights	7-54— 7-55
I-Line II, surge protective device plug-in units indoor drip resistant	12-10	dimensions and shipping weights door-mounted operating mechanisms	8-19- 8-20
indoor tap boxes	12-7	emergency lighting	5-24
non-segregated bus	12-15	enclosed	7-57
outdoor construction	12-6	enclosures	7-56
plug-in units	12-9- 12-10	F-frame	9-24- 9-25
Powerbus	12-2	flange mounted and variable depth operating	
Power-Zone	12-15	flexible cable mechanisms	8-21-8-22
riser service heads	12-6 12-7	H-frame thermal-magnetic	9-26 24– 9-25, 9-27– 9-30
space heaters	12-7 12-17	I-Line panelboards 9-2 J-frame thermal-magnetic	24- 9-25, 9-27- 9-30 9-26
SPD plug-in units	12-17	K-frame thermal-magnetic	9-27
standard components	12-4	LA mission critical	9-28
standard straight lengths	12-6	L-frame	9-29
supports	12-17	Masterpact	11-6
thermostat	12-17	motor operators	7-40
transformer taps	12-7	motor protector	7-31
unfused reducer	12-7	NF factory assembled panelboards NF merchandised panelboards	9-16
		NQ factory assembled panelboards	9-15 9-11
C		PowerPact D-frame mission critical	9-24
		PowerPact J-frame	7-23
C60N Multi 9 miniature circuit breakers	7-16— 7-17	PowerPact L-frame	7-25
cable ends		PowerPact M-frame	7-26, 9-29
AR1 and AT1	24-21	PowerPact P-frame	9-30
DZ5 and AZ5	24-20	PowerPact Q-frame	7-24, 9-25
cable pull switches		PowerPact R-frame	7-28, 9-30
XY2	25-8	QO enclosures QO plug-on	1-25 1-2
cables, Powerlink	5-24	QOB bolt-on	9-10
cabling accessories		QO-EPD	7-11
TeSys D	18-9	QO-HM, high magnetic trip	7-11
calculation of trip current rating		QO-K, key operated	7-11
thermal unit selection	16-119	QOPL-ILC for intelligent load centers	29-7
cam-lock tap box	10-4	QO-SWN	7-11
CANopen network products	27-6	QOT tandem  Qwik-Gard	7-10 9-10— 9-11
caps		replacement tandem	7-10
16 mm push buttons	19-21	shunt trip	9-38
22 mm push buttons 19-39—19-41, 19-6	-	telecommunications applications	7-17
•	74, 19-79 <sup>°</sup> , 19-83	Tenant	2-6
compact pilot lights	19-11	Type EOX vacuum substation	11-19
Cassia energy management system	5-30	Type FVR vacuum substation	11-19
catalog numbering system		Type VOX vacuum substation UL Listed 500 Vdc	11-19 7-35– 7-36
combination starters	17-2	without overload trip	7-35-7-36 9-38
C-Bus		circuit meter	4-16
Decorator wall plates	5-7		4-11
device power supply	5-25	circuit monitor, PowerLogic	4-11
device router	5-25	circuit protectors	04.47
dimmers DLT keypads	5-15 5-5– 5-6	thermal-magnetic	24-17
enclosures	5-18	ClimaSys	00.0.00.0
input sensors	5-13	cooling units thermostats	28-3, 28-8 28-3, 28-8
multi room audio	5-9, 5-10	ventilation systems	28-3, 28-8
Neo Decorator keypads	5-6	clock/timer	15-5
Neo keypads	5-4	closed tank float switches	22-24- 22-25
relays	5-13	9038C mechanical alternators with bushing	22-26
Saturn Decorator keypads Saturn keypads	5-6 5-5	9038D mechanical alternators	22-27
sensors	5-12	coil replacement, definite purpose contactors	
software	5-19	coil suppressor, TeSys D	18-9
thermostats	5-11	• • • • • • • • • • • • • • • • • • • •	10-3
touch screens	5-7	coil voltage codes	10.0 10.6
ceiling mount occupancy sensors	5-21	TeSys D TeSys F	18-2, 18-6 18-3
changeover relay	5-13	column width panelboards	9-18- 9-19
circuit breaker enclosures		-	
accessories	7-58	combination lighting contactors	16-61
dimensions	7-58	combination service entrance devices	
enclosed walking beam mechanical interlock	7-57	accessories	1-22
insulated groundable neutral assembly	7-58	all-in-ones, rainproof	1-20, 1-24
service ground kits	7-58	circuit breakers  Homeline	1-22
circuit breakers		dimensions	1-23
bolt-on remotely operated	5-24	hubs	1-22
DC	7-35	meter mains, rainproof	1-19
		•	

		www.	schneider-electric.us
solar ready CSED	1-24	TeSys K	18-24- 18-27
surge protection devices	1-12	non-reversing mini-contactors	18-24
combination starters		reversing mini-contactors	18-25
catalog numbering system	17-2	contactors and starters	
Compac 6 fusible switch disconnects  Model 6 MCC	17-5 17-3	NEMA, magnetic AC catalog numbering system	16-13
NEMA style	16-31	control and measurement relays	00.00
accessories	16-41	Zelio RM17JC current measurement relay Zelio RM17T phase measurement relay	23-32 23-33
application data	16-40	Zelio RM17UAS voltage measurement relay	23-34
control transformers	16-41	Zelio RM17UB voltage measurement relay	23-34
dimensions	16-42	Zelio RM17UBE voltage measurement relay	23-34
fusible	10.01	Zelio RM35AT temperature control relay	23-36
disconnect switch type	16-31	Zelio RM35BA10 pump control relay Zelio RM35HZ frequency control relay	23-35 23-36
disconnect switch type with class R interlocks	fuse clips 16-33 16-41	Zelio RM35JA current measurement relay	23-32
MCP circuit breaker	16-35- 16-36	Zelio RM35L level control relay	23-35
non-fusible	10 00 10 00	Zelio RM35S speed control relay	23-36
disconnect switch type	16-32	Zelio RM35UA1 voltage measurement relay	23-34
thermal magnetic circuit breaker	16-38 16-39	Zelio RM35UB voltage measurement relay Zelio Type REG	23-34 23-31
NEMA style oversized enclosure MCP circuit	breaker 16-37	control circuit fuse holder	2001
commercial pressure switches	22-21-22-22	contactors	16-112
communications, TeSys contactors	18-38	starters	16-112
Compac 6		control relays	
combination starters	17-5	NEMA style Type X	23-22-23-24
motor circuit protector Disconnects	17-5	NEMA style, utility auxiliary	23-23
Model 6 MCC	17-5	control stations	
compact general duty limit switches	21-22	enclosures 19-70—19-72, 19-80—19-82,	
compact height switches MiniBreak	11-7	control unit, TeSys U	18-28- 18-30
compact pilot lights	19-10— 19-11	copper wound transformers	14-4
complete devices		corrosion resistant	10.70 10.01
XB4	19-23	multifunction operators non-illuminated operators	19-78, 19-84 19-77
XB5	19-42 21-14	pilot lights	19-83
complete switches, limit switches	21-14	cover viewing window for safety switches	3-12
components	10.6	cover-mounted control units	
trench duct Concept application software	13-6 27-2	contactors	16-109
Conext series grid tie solar inverters	29-9- 29-10	starters	16-109
connection components, limit switches	29-9-29-10	crosses	
connection modules, TeSys contactors	18-38	trench duct	13-6
· •	27-6	Crouse-Hinds Arktite receptacle safety switches	3-9
ConneXium ethernet products		Crouse-Hinds Style 2 Hubbellock receptacle	3-9
ConneXview industrial ethernet diagnostic so	oftware 27-6	CT, split-core	4-15
construction options	12-17	current measurement relays	
busway consulting, analysis	4-20	Zelio RM17JC	23-32 23-32
contact assemblies, limit switches	21-17	Zelio RM35JA current ratings	23-32
contact assembles, limit switches	21-17	limit switches	21-5
TeSys D and F	18-8	current-limiting fuses DIN-style	11-11
XAC pendant station	19-118	custom terminal blocks assemblies	24-15
contact units for melting alloy type overload			
replacement parts kits	16-108	D	
contactors		D	
accessories	16-109	DALI gateway	5-15
control circuit fuse holder	16-112	DC circuit breakers	7-35
cover-mounted control units definite purpose	16-109 16-70	DC telecommunication applications circuit breaker	
power pole adders	16-112	decorator face plates	5-6
replacement parts kits	16-107	Decorator, Saturn	
TeSys D	18-2	keypads	5-6
accessories	18-8- 18-11, 18-14	decorator style	2 3
non-reversing	18-4 18-17— 18-19	cover plates, Neo	5-7
repair parts reversing	18-6	definite purpose	
TeSys F	18-3	contactors	16-70
•	18-11- 18-13, 18-15	reversing hoist	16-81
non-reversing	18-5	device power supply	
repair parts	18-18, 18-20	Powerlink	5-25
reversing	18-7	device routers, Powerlink	5-25



www.schneider-electric.us			
differential pressure switches	22-15	electric vehicle charging stations	29-2
dimensions		electrical components	
Altistart U01 soft starters	18-51	Type K, SK and KX	19-86
definite purpose		XB4	19-34
contactors	16-72, 16-74	XB5	19-55
disconnect switches, flange mounted	0.17 0.10	XB6	19-15
and cable operated disconnect switches, IEC style	8-17— 8-18 8-11— 8-14	electrical data	10.0
	3-17, 3-19, 3-21	I-Line II busway	12-8
duplex motor controllers	16-80	electrical interlock kits	0.0 0.10
enclosures	16-96, 16-99	safety switches	3-3, 3-10
EV charging stations, EVlink	29-5	electrical ratings	00.10
flange mounted and variable depth operating med		pressure switches, 9012 and 9016	22-16
lighting contactors	16-66- 16-69	electronic alarms, XVS	19-116
meter centers meter sockets	2-16 2-4	electronic pressure switches	
pressure switches	2-4	XMLF	22-8- 22-9
9012G	22-17	electronic timers	
XML international	22-12	TeSys D	18-10
XMLG electronic	22-5	electronic trip units, Micrologic	7-46— 7-47
XMLK electronic	22-7	EMA (external modular assembly) SPDs	6-2
QO and Homeline dimensions	1-17	replacement modules	6-4
safety switches	3-3, 3-13	emergency lighting circuit breakers	5-24
TeSys D 18-40— 18-41, 18-4		emergency stop operation	
TeSys F	18-42, 18-47	cable pull switches	25-8
TeSys GV manual starters and protectors TeSys K	18-52 18-56 18-49	emergency stop operators	
TeSys U	18-50- 18-51	XB4	19-28
Well-Guard	10 00 10 01	XB5	19-48
pump panels	16-77	enclosed drives	
dimensions and shipping weights		Altistart 22	26-5, 26-19
miniature and molded case circuit breakers	7-54	Altivar 212 S-Flex (Altivar 212)	26-5 26-16
molded case circuit breakers	7-55	enclosed soft starts	20-10
dimensions, disconnect switches	3-22	Altistart 22	26-19
dimmer unit, four channel	5-14	enclosed starters, TeSys D	18-21- 18-23
disconnect switches		enclosure	10-21 10-20
acceptation flance mounted and achie anaroted	0.16	enciosure	
accessories, flange mounted and cable operated	8-16	ON 10M 04M 26MC 26M 60M	E 10
accessories, LK4 nonfusible and GS2 fusible	8-10	8M, 12M, 24M, 36MS, 36M, 60M	5-18
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated	8-10 8-17– 8-18	enclosures	
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated	8-10 8-17— 8-18 8-15	enclosures 304L stainless steel	28-2
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible	8-10 8-17 8-18 8-15 8-8 8-9	enclosures	
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2	enclosures 304L stainless steel 316L stainless steel	28-2 28-2
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18	enclosures 304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5	enclosures 304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads	8-10 8-17— 8-18 8-15 8-8-9 8-2 14-18 27-5 5-5— 5-6	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives	8-10 8-17- 8-18 8-15 8-8- 8-9 8-2 14-18 27-5 5-5- 5-6 26-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7 16-94
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25 8-27	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7 16-94 28-2
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8	8-10 8-17— 8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25 8-27 8-26, 8-28	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-2 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25 8-27 8-26, 8-28 3-15— 3-16	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4-28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25 8-27 8-26, 8-28 3-15— 3-16 7-45	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7 16-94 28-2 28-2 28-2 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories	8-10 8-17— 8-18 8-15 8-8— 8-9 8-2 14-18 27-5 5-5— 5-6 26-20 8-25 8-27 8-26, 8-28 3-15— 3-16 7-45	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications	28-2 28-2 28-2 7-56 9-82, 19-100- 19-104 16-96, 16-99 28-4- 28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 1 selection table NEMA 1 ratings	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7 28-7 28-7 28-9 16-94 16-95
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 1 2/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-7 28-1 6-94 16-94 16-93 16-95
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-7 28-94 16-94 16-95 28-3 16-94 16-93 16-95 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-94 16-95 28-3 16-94 16-95 28-3 16-94 16-95 28-3 16-94
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers  DVCAS switchgear	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-2 28-7 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-94 16-95 28-3 16-94 16-95 28-3 16-94 16-95 28-3 16-94
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers DVCAS switchgear DZ5 and AZ5 cable ends	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-94 16-95 28-3 16-94 16-95 28-3 16-94 16-95 28-3 16-94
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection  disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers  DVCAS switchgear	8-10 8-17—8-18 8-15 8-8—8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70– 19-72, 19-80– 19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa	28-2 28-2 28-2 28-2 7-56 9-82, 19-100—19-104 16-96, 16-99 28-4—28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-94 16-93 16-93 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers DVCAS switchgear DZ5 and AZ5 cable ends	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70– 19-72, 19-80– 19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-3 16-94 16-93 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers DVCAS switchgear DZ5 and AZ5 cable ends  E EBA (external brick assembly) SPDs	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70– 19-72, 19-80– 19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-3 16-94 16-93 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products  DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers  DVCAS switchgear DZ5 and AZ5 cable ends  E  EBA (external brick assembly) SPDs replacement modules	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers UL ratings	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex motor controllers DVCAS switchgear DZ5 and AZ5 cable ends  E EBA (external brick assembly) SPDs replacement modules EE medium voltage, dry type transformers	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers UL ratings wall-mounting	28-2 28-2 28-2 7-56 9-82, 19-100—19-104 16-96, 16-99 28-4—28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-94 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms    single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex    motor controllers DVCAS switchgear DZ5 and AZ5 cable ends  E EBA (external brick assembly) SPDs    replacement modules EE medium voltage, dry type transformers EE NL transformers	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers UL ratings wall-mounting XAC	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-94 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms    single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex    motor controllers DVCAS switchgear DZ5 and AZ5 cable ends  E EBA (external brick assembly) SPDs    replacement modules EE medium voltage, dry type transformers elbows	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA type 3R, 4, 4X, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers UL ratings wall-mounting XAC end clamps	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7
accessories, LK4 nonfusible and GS2 fusible dimensions, flange mounted and cable operated flange mounted and cable operated LK4 nonfusible and GS2 fusible selection disconnects, transformers distributed I/O products DLT keypads documentation, AC drives door closing mechanisms    single and multi-door enclosures types M5, M6, M1, and M8 double throw safety switches drawout cradle and accessories drive, Altistart ATSU01 dry type transformers dual stage pressure switches duplex    motor controllers DVCAS switchgear DZ5 and AZ5 cable ends  E EBA (external brick assembly) SPDs    replacement modules EE medium voltage, dry type transformers EE NL transformers	8-10 8-17—8-18 8-15 8-8-8-9 8-2 14-18 27-5 5-5—5-6 26-20 8-25 8-27 8-26, 8-28 3-15—3-16 7-45 18-32 14-20 22-15 16-78—16-79 11-15 24-20	enclosures  304L stainless steel 316L stainless steel ATEX circuit breaker control stations 19-70—19-72, 19-80—19 dimensions floor-standing flush mounting selection table for explosive atmospheres insulated IP54 IP65 IP66 metal NEMA 1 selection table NEMA 12/3R outdoor applications NEMA ratings NEMA type 1 and flush mounting NEMA type 3R, 4, 4X, and 12 NEMA types 1, 4, and oversize open bottom polyester Spacial stainless steel steel Thalassa thermal management systems transformers UL ratings wall-mounting XAC	28-2 28-2 28-2 7-56 9-82, 19-100— 19-104 16-96, 16-99 28-4— 28-5, 28-7 16-94 28-2 28-7 28-7 28-7 28-7 28-7 28-3 16-94 16-95 28-3 16-94 16-95 28-7 28-7 28-7 28-7 28-7 28-7 28-7 28-7

Alphabetical Listing



r ipriazonou zioling		w	www.schneider-electric.us
energy efficient		float switches	22-1
1201-15,000 Volts	14-20	accessories	22-28
energy efficient transformers	14-4	renewal parts	22-28
energy meters	4-15	floor-standing enclosures	28-4-28-5, 28-7
energy profiler online service	4-18	foot switches	19-124— 19-125
engineering service, PowerLogic	4-20- 4-21	four channel dimmer unit	5-14
equipment grounding kits for safety switches	3-11	fractional horsepower	
ethernet gateway, Wiser	29-8	manual starters	16-4
ethernet TCP/IP products	27-7	frequency control relays	00.00
Ethernet-Modbus/TCP networks	4-19	Zelio RM35HZ full voltage contactors	23-36
EV charging stations, EVlink		NEMA style	
dimensions	29-5	general information	16-14
indoor charging	29-3	NEMA style	
outdoor charging outdoor charging with RFID access	29-4 29-4	3-pole polyphase	16-14
RFID accessories	29-4 29-4	solid state overload relay protection, Motor	
EVlink electric vehicle charging solutions	29-1- 29-5	full voltage contactors & starters and solid state	•
export model		factory modifications (forms)	16-102
transformers	14-8	full voltage contactors and starters	10 100
external brick assembly (EBA) SPDs	6-3	factory modifications (forms) NEMA style	16-100
external modular assembly (EMA) SPDs	6-2	application data for selection	16-23
external modular L-L enhanced SPDs	6-3	dimensions	16-24- 16-27
external reset mechanisms	16-92	full voltage reversing contactors and starters	
externally mounted surge protective devices (SPE	<b>o</b> ) 6-2	NEMA style	16-44
extra capacity single phase starters	,	dimensions	16-48- 16-49
full voltage starters	16-22	solid state overload relay protection, Motor	<b>Logic</b> 16-46
EZ Meter-Pak		full voltage reversing vacuum contactors	10.50
meter center dimensions	2-16	NEMA style approximate dimensions full voltage starters	16-50 16-18— 16-19
meter centers	2-8	2-Pole single phase	16-20- 16-21
meter centers and accessories  EZM main devices, meter centers	2-15 2-14	4-Pole, 2-Phase	16-20- 16-21
LZW mam devices, meter centers	2-14		10.00
		extra capacity single phase starters	16-22
_		NEMA style	16-18- 16-19
F		NEMA style 2-pole single phase	16-18- 16-19 16-22
		NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals	16-18- 16-19
face plates decorator	5-6	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors	16-18— 16-19 16-22 16-22
face plates	5-6 4-22	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information	16-18- 16-19 16-22 16-22 16-28- 16-29
face plates decorator		NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30
face plates decorator factory assembled enclosures, PowerLogic		NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications	4-22 9-31– 9-34 9-38	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF	4-22 9-31– 9-34 9-38 9-16– 9-17	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ	4-22 9-31– 9-34 9-38	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF	4-22 9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width)	4-22 9-31— 9-34 9-38 9-16— 9-17 9-11— 9-12 9-12	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible	4-22 9-31— 9-34 9-38 9-16— 9-17 9-11— 9-12 9-12 9-12	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications	4-22 9-31— 9-34 9-38 9-16— 9-17 9-11— 9-12 9-12 9-12 9-19 9-36— 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders	16-18- 16-19 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3 11-14 11-17
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches	9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV	16-18- 16-19 16-22 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3 11-14 11-17 24-8
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches	4-22 9-31— 9-34 9-38 9-16— 9-17 9-11— 9-12 9-12 9-12 9-19 9-36— 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information	16-18- 16-19 16-22 16-22 16-29 16-30 16-115 3-10 3-3 11-14 11-14 11-17 24-8 24-19
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms)	9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV	16-18- 16-19 16-22 16-22 16-22 16-28- 16-29 16-30 16-115 3-10 3-3 11-14 11-17 24-8
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches	9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays	9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1  panel mounting	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories	9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37 21-36 22-18 16-100	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1  panel mounting  Type FB	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers	4-22  9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-19 9-36- 9-37  21-36 22-18  16-100 16-102 7-39	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1  panel mounting  Type FB  Fuselogic	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 11-8, 11-11
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers	4-22  9-31-9-34 9-38 9-16-9-17 9-11-9-12 9-12 9-19 9-36-9-37  21-36 22-18  16-100  16-102  7-39 7-12	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1  panel mounting  Type FB  Fuselogic  fusible and non-fusible safety switches	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 11-8, 11-11
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units	4-22  9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-19 9-36- 9-37  21-36 22-18  16-100 16-102 7-39	NEMA style  2-pole single phase  Types SB–SD with auxiliary load terminals  full voltage vacuum contactors  general information  full voltage vacuum starters  fuse block, replacement parts kits  fuse kits safety switches, class R  fuse puller kits, safety switches  fuse selection tables  boric acid fuses, HVL  DIN/E HVL  fused HVL/cc  load interrupter switch  fuseholders  AB1FU and AB1SF/SV  application information  LS1  panel mounting  Type FB  Fuselogic  fusible and non-fusible safety switches	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19 11-8, 11-11 3-15
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units feed-through lugs	4-22  9-31-9-34 9-38 9-16-9-17 9-11-9-12 9-12 9-19 9-36-9-37  21-36 22-18  16-100  16-102  7-39 7-12	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders  AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19 11-8, 11-11 3-15
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units	4-22  9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37  21-36 22-18  16-100  16-102  7-39 7-12 17-2	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders  AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink gateway, DALI	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19 11-8, 11-11 3-15
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units feed-through lugs NQ factory assembled panelboards	4-22  9-31- 9-34 9-38 9-16- 9-17 9-11- 9-12 9-12 9-12 9-19 9-36- 9-37  21-36 22-18  16-100 16-102  7-39 7-12 17-2	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink gateway, DALI Gen 3 products, lighting control systems	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19 11-8, 11-11 3-15
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units feed-through lugs NQ factory assembled panelboards F-frame circuit breakers Fingersafe contact blocks	4-22  9-31-9-34 9-38 9-16-9-17 9-11-9-12 9-12 9-12 9-19 9-36-9-37  21-36 22-18  16-100  16-102  7-39 7-12 17-2  9-12 9-24-9-25	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders  AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink gateway, DALI Gen 3 products, lighting control systems general duty	16-18- 16-19
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units feed-through lugs NQ factory assembled panelboards F-frame circuit breakers Fingersafe contact blocks covers 7-15, 14-8, 14	9-31— 9-34 9-38 9-16— 9-17 9-11— 9-12 9-12 9-12 9-19 9-36— 9-37 21-36 22-18 16-100 16-102 7-39 7-12 17-2 9-12 9-24— 9-25	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders  AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink gateway, DALI Gen 3 products, lighting control systems general duty safety switches	16-18- 16-19 16-22 16-22 16-22 16-30 16-115 3-10 3-3 11-14 11-17 24-8 24-19 18-36 24-19 24-19 11-8, 11-11 3-15
face plates decorator factory assembled enclosures, PowerLogic factory assembled panelboards I-Line modifications NF NQ feed-through lugs sub-feed lugs NQ/NF single row (column width) QMB fusible factory modifications limit switches machine tool pressure switches factory modifications (forms) full voltage contactors & starters full voltage contactors & starters and solid state overload relays factory-installed accessories PowerPact circuit breakers QO and QOB miniature circuit breakers features, merchandised units feed-through lugs NQ factory assembled panelboards F-frame circuit breakers Fingersafe contact blocks	4-22  9-31-9-34 9-38 9-16-9-17 9-11-9-12 9-12 9-12 9-19 9-36-9-37  21-36 22-18  16-100  16-102  7-39 7-12 17-2  9-12 9-24-9-25	NEMA style 2-pole single phase Types SB–SD with auxiliary load terminals full voltage vacuum contactors general information full voltage vacuum starters fuse block, replacement parts kits fuse kits safety switches, class R fuse puller kits, safety switches fuse selection tables boric acid fuses, HVL DIN/E HVL fused HVL/cc load interrupter switch fuseholders  AB1FU and AB1SF/SV application information LS1 panel mounting Type FB Fuselogic fusible and non-fusible safety switches  G G3 systems, Powerlink gateway, DALI Gen 3 products, lighting control systems general duty	16-18- 16-19



www.schneider-electric.us		7p
general purpose (NEMA Type 1)		HVL/cc
wireway	13-2	medium voltage metal-enclosed 11-8, 11-10
general purpose dry type transformers	14-2	metal-enclosed load interrupter switchgear 11-8
general purpose relays	23-2-23-15	switchgear 11-9 switchgear quick ship program 11-9
general thermal unit selection	16-116	hybrid VAR compensator (HVC) 4-36
GFI, QO circuit breakers	7-11	Tybrid VAIT compensator (TVO)
GFP ground fault protectors, Multi 9	7-18	
GJL circuit breakers, single motor circuit protection	7-32	
ground-fault protection	7-51	IEC 24-10
GC-200 ground-fault relay system	7-51	IEC style
module enclosure selection	7-53	Square D JCK timing relay 23-30
sensors	7-51	terminal blocks 24-2-24-9, 24-11-24-12
ground-fault relay system		TeSys Type D relay 23-16-23-18
GC-200 Vigirex	7-51 7-52	<b>TeSys</b> Type K relay 23-19—23-20
grounding blocks AB1TP	7-52 24-6	TeSys Type SK relay 23-21 TeSys Type SKE alternating relay 23-21
grounding blocks ABTTI	24-0	Zelio RE11 timer 23-26
		Zelio RE48 timer 23-26
Н		<b>Zelio</b> RE7 timer 23-27—23-28
hangers		Zelio RE8 timer 23-29
busway	12-6, 12-17	Zelio RE9 timer 23-29 Zelio REXL timer 23-26
Power-Zone busway	12-17	IEC style disconnect switches
HCR-U	11-18	accessories, LK4 nonfusible and GS2 fusible 8-10
heavy duty		dimensions, LK4 Nonfusible and GS2 fusible 8-11-8-14
limit switches	21-32	LK4 nonfusible and GS2 fusible 8-8-9
heavy duty safety switches	3-4	IEC terminal blocks 24-10
H-frame thermal-magnetic circuit breakers	9-26	I-Line
H-frame, PowerPact		busway 12-4, 12-13— 12-14
circuit breaker accessories	7-40	plug-in units 12-9 PowerPact P-frame plug-in unit 12-13
circuit breakers	7-23	PowerPact R-frame plug-in unit 12-14
molded case switches	7-34	standard components 12-4
termination options switches	7-23 7-34	I-Line
HID QO circuit breaker	7-11	molded case circuit breakers 11-18
high ampere QOU circuit breakers	7-14	Surgelogic SPD units 6-5
high density meter enclosures	4-11	I-Line distribution 11-17
high magnetic withstand MC circuit breakers	7-37	I-Line distribution bus
HMI products	27-3 <del>-</del> 27-4	I-Line distribution section 11-5
HMI—human machine interface	16-85	I-Line II
		800 A–5000 A busway 12-5 800 A–5000 A pricing instructions 12-6
holders, legend	19-37, 19-58	busway 12-5, 12-6, 12-11
Homeline HOM-AFI circuit breaker	1-14	electrical data 12-8
HOM-EPD circuit breaker	1-14	surge protective device plug-in units 12-10
HOM-GFI circuit breaker	1-14	I-Line panelboards
HOM-HM circuit breaker	1-14	accessories 9-23
HOMT, quad tandem circuit breaker	1-14	circuit breakers 9-24- 9-25, 9-27- 9-30 factory assembled 9-31- 9-34
surge protective devices (SPD)	6-8	merchandised 9-21 9-22
Homeline load centers convertable field-installable kits	1 16	pricing procedure 9-20
indoor, main circuit breaker	1-16 1-15	series ratings 9-3—9-4
indoor, main lugs	1-15	terminal data 9-40
manufactured housing load centers	1-10	I-Line to I-Line II adapter
plug-on circuit breakers	1-14	illuminated beacons
rainproof main circuit breakers	1-16	indicating banks 19-107—19-115
rainproof, main lugs horizontal ganged meter sockets	1-16 2-3	illuminated operators 19-53
horsepower and voltage thermal unit selection	16-120	16 mm push buttons 19-16 22 mm push buttons 19-32— 19-33, 19-53— 19-54
HP ratings of motors, MCP selection		30 mm push buttons 19-32 19-33, 19-33 19-34
	7-29	indoor dimensions 1-17
Hubbellock receptacle safety switches	3-9	indoor EV charging stations, EVlink 29-3
HVL medium voltage metal-enclosed	11-11	indoor meter centers 2-8, 2-10, 2-12
HVL metal-enclosed load interrupter switchgear	11-11	indoor, 1Ø main circuit breaker, QO load centers 1-6
HVL switches, Power-Dry,		indoor, main lug, QO load centers 1-5
Power-Cast transformer connections	11-12	indoor, main lugs, Homeline load centers 1-15
HVL switchgear quick ship program	11-11	industrial control transformers 14-14- 14-17

, apriaconous Elemig			www.schneider-electric.us
industrial energy efficiency	4-21	termination options	7-23
industrial format limit switches	21-24- 21-25	thermal-magnetic circuit breakers	9-26
industrial limit switches	21-32		
industrial pressure switches	22-13	K	
Industrial Relays	23-16-23-24	K2 custom and K30-K150	
industrial snap switches	21-6	power switching	19-126 19-128
input units, C-Bus	5-13	key interlock systems for safety switches	3-12
inserts		keypads	
legend	19-38, 19-59	C-Bus	5-4- 5-8
Insta-Kits accessories for enclosed combination	n starter 18-23	Decorator, Saturn	5-6
insulated case circuit breakers selection inform	nation 7-7	DLT	5-5- 5-6
insulation displacement blocks, AB1AA	24-10	Neo style Saturn	5-4 5-5
integral horsepower		K-frame thermal-magnetic circuit breakers	9-27
manual starters	16-8 16-9	it maine thermal magnetic en out products	0 21
integrated equipment sample lineups	10-6		
integrated power and control solutions		L	
IPaCS equipment	10-2	LA mission critical circuit breakers	9-28
Integrated Power Center	10-3	LAL circuit breakers, single motor circuit p	rotection 7-32
IPC	10-2- 10-3	large load controls, Wiser	29-7
layout lead time	10-3 10-3	latching relays	25-1
pricing	10-3	NEMA style Type X	23-22- 23-23
shipping	10-3	legend plates	20 22 20 20
Submetering	10-4	16 mm push buttons	19-20, 19-22
Integrated Power Center 2		30 mm push buttons	19-89- 19-90, 19-98
IPC2	10-2, 10-4-10-5	compact pilot lights	19-11
layout lead time	10-4 10-4	pendant stations	19-120
pricing	10-4	legends	10.07, 10.50
shipping	10-4	holders inserts	19-37, 19-58 19-38, 19-59
interface modules		level control relays	10 00, 10 00
ABR electromechanical	23-42	Zelio RM35L	23-35
solid state TeSys D	23-41 18-10	lever arms	
Zelio RM analog	23-38	limit switches	21-9, 21-34
interface relays		L-frame circuit breakers	9-29
Zelio RSL	23-2	L-frame, PowerPact	
Zelio RSB	23-3	circuit breaker	7-25
internal barrier kits for safety switches	3-10	circuit breaker accessories	7-40
international pressure switches, XML	22-10- 22-11	switches life safety, medical products	7-34 15-2
ION EEM enterprise energy management softw	<b>are</b> 4-6	•	10-2
ION enterprise operations software, PowerLogi	c 4-4	light curtain, 2-box XUSLB	25-6
ION enterprise software ordering information	4-4	XUSLD	25-6
ION power and energy meter, PowerLogic	4-7- 4-8	light curtains	25-6
IP54 enclosures	28-7	light level sensor	5-12
IP65 enclosures	28-7	lighting contactors	16-59- 16-60
IP66 enclosures	28-7	combination	16-61
IPaCS equipment		dimensions	16-66- 16-69
integrated power and control solutions	10-2	mechanically held ASCO Type 920	9-38
IPC integrated power center	10-2- 10-3	modifications multipole lighting	16-63— 16-65 16-59
IPC2		Square D brand PB	9-38
Integrated Power Center 2	10-2, 10-4-10-5	limit switches	
transformer combo	10-2	application data	21-4
Iso-Gard	4- 4	bodies	21-17
line isolation monitor (LIM)	15-4	compact general duty	21-22 21-14
isolated alarm contacts	16-113	complete switches connection components	21-14
melting alloy overload relays isolated power panels medical products	15-2- 15-3	contact assemblies	21-17
iodiated power pariets medical products	10-2- 10-0	factory modifications	21-36
		heads for miniature and compact bodies	21-16
J		heavy duty industrial	21-26, 21-32–21-33 21-32
J-frame, PowerPact		industrial format	21-24- 21-25
automatic molded case switches	7-34	industrial snap	21-6
circuit breaker accessories	7-40	lever arms	21-9, 21-34
circuit breakers	7-23	levers for miniature and compact bodies mill and foundry	21-16 21-37– 21-40
molded case switches	7-34 7-34	miniature	21-8-21-11
switches	7-34		3 11



modular	21-10-21-13	manual and magnetic contactors and starters	
oiltight	21-37-21-38	auxiliary contacts	16-110
selection	21-8	manual starters	16-4
severe duty	21-37-21-40	accessories and modification kits	16-9
specifications	21-8	fractional horsepower	16-4
standard, classic without enclosures	21-20– 21-21 21-6	melting alloy type thermal overload relay	16-4
XCK	21-12- 21-13	general purpose enclosure (flush mount)	
XCKJ		dimensions	16-6
bodies and options	21-27	general purpose enclosure (surface mount)	40.0
operating heads	21-28	dimensions	16-6
operating heads, replacement parts, and leve	rs 21-29	integral horsepower dimensions	16-8— 16-9 16-10
precision switches with direct acting contacts	21-26	open type	10-10
XCKL		dimensions	16-6
complete switches	21-22	reversing and two speed	16-9
XCKL, XCKM	21-20-21-21	watertight die cast zinc enclosure	
XCMD	21-10-21-11	dimensions	16-6
line isolation monitor	15-4	manual starters and switches	
Iso-Gard	15-4	accessories and modifications	16-11
load break switch/sectionalizer	11-20	manual switches	
load centers value pack, QO and Homeline load co		general purpose enclosure (flush mount)	
load control relays, Wiser	29-7	dimensions	16-6
load interrupter switch		general purpose enclosure (surface mount)	
fused, HVL/cc	11-17	dimensions	16-6
load interrupter switchgear	11-11	non-reversing	16-5
locked-rotor indicating codes	7-32	open type dimensions	16-6 16-5
lock-on provisions for safety switches	3-12	reversing two speed	16-5
low voltage standard automatic capacitor bank	4-31	watertight die cast zinc enclosure	10 3
low voltage switchgear		dimensions	16-6
Power-Zone	11-6	manufactured housing load centers	1-10
low voltage transient free reactive compensation	11.0	markers, AB1 terminal blocks	24-11
capacitor banks	4-32	master relays	
LS1 fuseholders	18-36	NEMA style Type X	23-22
		Masterclad	20 22
LTMCU compact display	16-85	medium voltage <b>Metalclad</b> switchgear	11-16
LTME expansion module	16-85	Metalclad Arc Terminator	11 10
LTMR controller	16-85	Metalclad Arc Resistant	11-16
lug-lug tap box	10-4	MasterPact	
lugs		NT circuit breaker	7-49
safety switches	3-3, 3-12-3-13	MasterPact	
transformers	14-11	circuit breaker, switchboard/switchgear	11-6
		NT circuit breaker ratings	7-49- 7-50
M		NT/NW circuit breakers	7-50
		NW and NT circuit breakers NW circuit breaker ratings	11-6 7-50
machine safety products	25-2		49– 7-50, 11-3,  11-6
machine tool pressure switches	22-14, 22-18		47, 7-50, 11-3, 11-6
Magelis		universal power circuit breakers	7-50
Compact iPC	27-4	MCP selection	
Compact PC BOX	27-4	GJ-, LA-, and MA-frame	7-32
Display	16-85	HP ratings of motors	7-29
Flex PC BOX Smart BOX	27-4 27-4	mechanical alternators	22-26- 22-27
Smart iPC	27-4	mechanical interlock accessories	16-114
Smart+ iPC	27-4	medical products	15-1
STO/STU small panels	27-3	isolated power panels	15-2- 15-3
XBT GC HMI controller	27-9	life safety	15-2
XBT GH advanced panels	27-3	medium voltage capacitors	4-33
XBT GK advanced panels XBT GT advanced panels	27-3 27-3	medium voltage metal-enclosed	
XBT GT advanced panels  XBT GTW advanced panels	27-3 27-3	DVCAS	11-15
XBT N/R small panels	27-3	HVL	11-11
XBT RT small panels	27-3	HVL/cc	11-8, 11-10
Mag-Gard circuit breakers	7-31	medium voltage motor controllers	
Mag-Gard combo starter	16-35	Motorpact	11-19
magnetic coils	16-105	medium voltage transformers	14-20
main circuit breaker kits, QO load centers	1-5	melting alloy overload relay jumper strap kits	16-108
	2-12	melting alloy overload relays	
main devices, meter centers		isolated alarm contacts	16-113
MAL circuit breakers, single motor circuit protect	i <b>on</b> 7-32	merchandise configurations transformer com	<b>bo</b> 10-6

merchandised panelboards		Model 6 MCC	
I-Line	9-21-9-22	blank doors	17-6
NF	9-13	branch feeder units	17-6
NQ	9-6- 9-9	catalog numbering system	17-6
NQ/NF single row (column width) merchandised service selection	9-18 11-5	combination starters	17-3 17-4
	_	fusible switch disconnects	17-4 17-3
merchandised units Model 6 MCC	17-2	motor circuit protector disconnects  Compac 6	17-5 17-5
Metalclad switchgear	11-16	merchandised units	17-3
meter centers		motor control centers	17-2
accessories	2-15	Modicon	
branch device dimensions branch devices	2-16 2-11, 2-13	LMC058 motion controller	27-9
branch devices branch devices, NEMA 3R construction	2-11, 2-13	M168 PLC	27-8
branch units	2-8	M238 PLC	27-8
busway transition section	2-15	M258 PLC M340 PAC	27-8 27-2
dimensions	2-16	Momentum distributed I/O and PLC	27-5
EZ Meter-Pak EZM main Busway tap	2-8 2-14	Premium PLC	27-2
EZM main devices	2-14	Quantum PLC	27-2
indoor	2-8, 2-10, 2-12	STB	27-5
indoor Busway mains	2-14	TM5 expansion module TM7 I/O blocks	27-5 27-5
main devices	2-12	TSX Micro PLC	27-3 27-2
MP Meter-Pak	2-5 2-8, 2-10	Zelio Logic controller	27-10
NEMA 3R construction rainproof	2-8, 2-10 2-8, 2-10, 2-12	modifications	
ring and ringless devices	2-5	lighting contactors	16-63- 16-65
selection information	2-9	modifications for factory assembled panelboards	9-38
tenant circuit breaker accessories	2-6	modular panelboard system	10-3
tenant circuit breakers	2-6	MPS	10-2- 10-3
meter comparison chart	4-9	molded case switches	
meter door selection	11-5	PowerPact H-frame	9-27
meter mains, test block bypass, EUSERC	2-3	PowerPact L frame	9-27
meter sockets		PowerPact L-frame Mono-Flat Front, riser panels	9-27 1-11
accessories	2-3	•	
dimensions horizontal ganged	2-4 2-3	motor control centers Model 6	17-1
ring and ringless type, individual meter sockets	2-3 2-2	structure features	17-2
test block bypass sockets	2-3	unit features	17-2
metering	4-7	Model 6 MCC	17-2
M-frame, PowerPact		Surgelogic SPD units	6-5
circuit breaker	7-26	motor controller	
Micrologic electronic trip units		Altistart 22 (Enclosed)	26-19
accessories	7-48- 7-49	motor controllers	
adjustable rating plugs	7-48	duplex	16-78- 16-79
electronic trip units	7-46— 7-47 7-47	motor disconnect switches	0.7
long-time pickup settings neutral current transformers	7-47 7-48	MD motor disconnect switches	8-7
options	7-46 7-47	Mini-Vario and Vario accessories Mini-Vario and Vario assembled and	8-6
rating plugs	7-48	enclosed switches	8-3-8-4
special options	7-47	Mini-Vario and Vario switches	8-5
trip units	11-6	Motor Logic and Motor Logic Plus	
mill and foundry limit switches	21-37- 21-40	solid state overload relay accessories	16-111
Mini Power-Zone transformers	14-12	motor operators, circuit breaker	7-40
miniature blocks		motor protection selection tables	7-33
AB1VV and AB1TP	24-4	motor protective devices	7-29
miniature circuit breakers	- 4-	motor protector circuit breakers	7-31
C60N dimensions and shipping weights	7-17 7-54	motor starters	
Multi 9	7-34 7-17	PowerSuite software	18-31
QO	7-10	TeSys U	18-28- 18-32
QO and QOU	7-12, 7-14	TeSys U-Line power bases	16-12
QOU	7-14	Motorpact	44.46
QOU low ampere QOU-HM	7-14 7-14	medium voltage motor controllers	11-19
selection information	7-14 7-2	mounting bases	7 40
miniature limit switches	21-8-21-9	Multi 9 QO	7-13 7-13
MiniBreak	- · - · - · ·	mounting track	7-13 24-12
compact height switches	11-7	MP Meter-Pak	22
MiniBreak compact height	,	meter centers	2-5
switch enclosure	11-7	meter centers dimensions	2-7
		meter centers knockouts	2-7



MPS, modular panelboard system	10-2 10-3
Multi 9	
C60 accessories	7-20
C60N supplementary protectors	7-19
GFP ground fault protectors	7-18
miniature circuit breakers	7-17
mounting bases	7-13
mounting bases, UL489 C60, 240 Vac max.	7-13
NC100 miniature circuit breakers ground fault protectors	7-18
multi circuit energy meter	4-14
multipole lighting contactor	16-59
MV controllers	11-19

feed-through lugs	9-12
3 3	
merchandised	9-6- 9-9
pricing procedure	9-5
QOB bolt-on circuit breakers	9-10
series ratings	9-2
sub-feed lugs	9-12
terminal data	9-39
NQ/NF panelboards	
factory assembled single row (column width)	9-19
merchandised single row (column width)	9-18
NQOB application data	9-18 9-19
NQOD distribution bus	11-4
nurses' station indicator	15-5

N	
NEMA 3R construction, meter centers	2-8, 2-10
NEMA 7 and 9 safety switches	3-7
NEMA enclosure ratings	28-3
NEMA Premium	14-3, 14-7
NEMA style	,
combination starters	16-31
full voltage reversing contactors	16-44
full voltage starters	16-18
full voltage vacuum contactors  Square D Type X relays	16-28 23-22- 23-24
terminal blocks	24-13, 24-15
NEMA Type 1 and flush mounting	
enclosures	16-94
NEMA Type 3R, 4, 4X, and 12	
enclosures	16-93
NEMA Type 4, 4X, 5, 7, 9 and 12 safety switches	3-14
NEMA Types 1, 4, and oversize	10.05
enclosures	16-95 5-7
Neo Decorator style cover plates Neo style decorator keypads	5-7 5-6
network accessories, Powerlink	5-0 5-25
•	5-25 5-15
network bridge, C-Bus	
network components, Web-enabled	4-19 27-6– 27-7
network products and systems	
neutral assemblies for safety switches	3-11
NF panelboards	0.10
20-inch-wide factory assembled	9-13 9-16— 9-17
circuit breakers	9-16
merchandised	9-13
accessories	9-14
circuit breakers	9-15
pricing procedure series ratings	9-5 9-3
terminal data	9-39
Night-Master combination lighting contactors	16-62
NLP series transformers	14-6
non-automatic miniature switches	7-11
non-automatic miniature switches, QO, plug-on	1-3
non-linear loads	14-6
non-reversing manual switches	16-5
non-segregated bus	
busway	12-15
NQ panelboards	
14-inch-wide	9-8
20-inch-wide	9-6-9-7, 9-9
accessories factory assembled	9-9 9-11– 9-12
branch circuit breakers	9-11

0	
occupancy sensors	5-20- 5-22
auxiliary relay	5-21
ceiling mount	5-21
fixture mount	5-22
power pack	5-21
occupancy sensors, C-Bus	5-12
OEM solutions	27-8, 27-10
OEM systems	27-9
oiltight	
limit switches	21-37-21-38
oiltight (NEMA Type 12)	
wireway	13-3
open drives	
Altivar 12	26-2
Altivar 212	26-3, 26-6
Altivar 312	26-2, 26-7—26-8
Altivar 32	26-2
Altivar 61	26-3, 26-10-26-11
Altivar 71	26-3, 26-12-26-13
open tank float switches	22-23- 22-24
9038A mechanical alternators	22-26
operating mechanisms	
accessories, disconnect switches and	
door mounted for circuit breakers	8-19— 8-20
flange mounted and variable depth for flexible cable for circuit breakers	circuit breakers 8-23 8-21—8-22
selection	8-2 8-2
operators	0-2
accessories, XAC standard duty	19-120
common	
Type K, SK	19-9
XB4 - XB5	19-8
emergency stop	19-48
heavy duty specialty	19-75
XB4 Specialty	19-30
XB5 specialty	19-50
options	
Altistart 22	26-18
Altistart 48	26-17
Altivar 61	26-14
Altivar 212	26-6

Altivar 61

Altivar 71

Ativar 312

surge protective devices (SPDs) EBA (external brick assembly)

Osisense photoelectric sensors

Osisense proximity sensors

EMA (external modular assembly)

external modular L-L enhanced

Osisense RFID, radio frequency identification

26-11, 26-15

26-14-26-15

26-8

6-3

6-2

6-3

20-2

20-7

20-5-20-6

	ec	UT	C
 	 	-41-	

			www.schneider-electric.us
other blocks, AB1	24-9	plug-in relays	
other products		Square D 8501KA, alternating	23-11
ABR electromechanical interface modules	23-42	Square D JCK timing	23-30
ABS solid state interface modules	23-41	Square D Type K	23-10
Phaseo ABL1	23-37	Square D Type R, minature	23-12
Phaseo ABL7	23-37	Square D Type R, miniature	23-13
Phaseo ABL8	23-37	Zelio RPM	23-6- 23-7
Zelio SR3 modular smart relays	23-40	Zelio RUM	23-8- 23-9
Zelio Logic 2 smart relays	23-39	Zelio RXM	23-4- 23-5
outdoor	1-9, 1-20	plug-in units	
outdoor EV charging stations, EVlink	29-4	accessories	12-3
	23-4	busway	12-3, 12-9
overload relays		factory assembled units	12-3
accessories, TeSys D	18-16	field installed kit	12-3
enclosed combination starters	18-23	locking devices	12-3
jumper strap kits, melting alloy	16-108	non-locking devices	12-3
TeSys D	18-4	polyester enclosures	28-7
TeSys F	18-5	power base, TeSys U	18-28- 18-29
		power distribution blocks application data	24-18
P			4-7- 4-8
		power meters energy meters	
panel mounting fuseholders	24-19	power meters, PowerLogic	4-10
panelboards		power pole adders	
I-Line merchandised	9-21 9-22	contactors	16-112
accessories	9-23	starters	16-112
NF		power relays	
20-inch-wide	9-13	Square D Type C	23-15
merchandised	9-13	power supplies	
NQ		Phaseo ABL1	23-37
14-inch-wide	9-8	Phaseo ABL7	23-37
20-inch-wide	9-6-9-7, 9-9	Phaseo ABL8	23-37
factory assembled	9-11 9-12	power switching	
factory assembled feed-through lugs	9-12	K2 custom and K30–K150	19-126 19-128
factory assembled sub-feed lugs	9-12	power system automation	4-21
merchandised	9-6 9-9	Powerbus	
NQ/NF	9-0- 9-9	busbar configurations	12-2
factory assembled single row (column width)	9-19	busway, 100 Ampere—600 Volt maximum	12-2
merchandised single row (column width)	9-19	busway, 225 Ampere—240 Volt maximum	12-2
	9-18-9-19	configuration code, busbar	12-3
NQOB application data		plug-in units, accessories	12-3
panelboards, I-Line distribution	11-17	plug-in units, factory assembled units	12-3
PC Interface (PCI), C-Bus	5-16	plug-in units, field installed kit	12-3
pendant stations	19-117 19-123	plug-in units, locking devices	12-3
perimeter guard		plug-in units, non-locking devices	12-3
XUSLP	25-6	Powerlink	
P-frame, PowerPact		breakers	5-24
circuit breaker	7-27	cables	5-24
circuit breaker accessories	7-40	control bus	5-24
automatic molded case switches	7-34	controller	5-24
termination options	7-27	misc. hardware	5-24
phase measurement relays		power supply	5-24
Zelio RM17T	23-33	remote source controller	5-24
Phaseo	20 00	Powerlink energy management	5-27
ABL1 DC power supply	23-37	PowerLogic	4-2
ABL7 DC power supply ABL7 DC power supply	23-37	circuit monitor	4-11
ABL8 DC power supply	23-37	circuit monitors	11-1
photoelectric sensors	20-2	E5600 socket meter	4-13
Osisense	20-2	Enercept Meter	4-15
XUB tubular	20-2	engineering services	4-20- 4-21
XUM miniature, XUK and XUX compact	20-4	Ethernet Gateways	4-19
photovoltaic heavy duty disconnect switch, 1000		factory assembled enclosures high density meter enclosures	4-22 4-11
	29-9	industrial energy efficiency	4-21
photovoltaic inverters		ION Enterprise software	4-4
pilot lights	19-10— 19-11	ION power and energy meters	4-6-4-7
compact	19-10	Multi circuit energy meter	4-14
corrosion resistant	19-83	power meter	4-10
Type K heavy duty	19-74	powerview software	4-5
XB4	19-31	Remote Energy Management	4-4
XB5	19-51	scada software	4-5
PL7 application software	27-2	system integration	4-21
plastic push buttons, XB5R	19-63	Tenant metering software	4-13
		total energy control	4-21



#### v.schneider-electric.us PowerPact molded case switches H-frame 9-27 9-27 J-frame L-frame 9-27 **PowerPact circuit breakers** 7-39-7-40accessories common catalog numbering system 7-21 compression lugs 7-43 D-frame mission critical 9-24 H-frame 7-22-7-23 circuit breaker frame 7-23 7-29 motor circuit protectors motor circuit protectors (MCP) 7-30 termination options 7-22 thermal-magnetic circuit breakers 7-22 installation accessories 7-41 interlocking locks 7-41 7-22-7-23 J-frame circuit breaker frame 7-23 motor circuit protectors 7-29 motor circuit protectors (MCP) 7-30 termination options 7-22 thermal-magnetic circuit breakers 7-22 L-frame 7-25 locks 7-41 mechanical lugs 7-42 M-frame 7-26, 9-29 molded case circuit breakers 11-17 P-frame 7-27, 9-30 phase barriers 7-44 7-45 plug-in and drawout mountings power distribution connectors (PDC) 7-43 Q-frame 7-24. 9-25 Q-frame thermal-magnetic circuit breaker 7-24 rear connections 7-41 R-frame 7-28, 9-30 terminal nuts, terminal pads, terminal shields 7-44 termination options 7-38, 7-45 PowerPact H-frame plug-in units 12-12 busway PowerPact J-frame plug-in units 12-11-12-12 busway **PowerPact L-frame** 7-34 PowerPact M-frame plug-in units busway 12-12 **Powerpact P circuit breakers** 11-18 PowerPact P-frame plug-in unit buswav 12-13 I-Line busway 12-13 11-18 **Powerpact R circuit breakers** PowerPact R-frame plug-in unit busway 12-14 I-Line busway 12-14 **PowerPact** switches 7-34 **Power-Style** commercial multi-metering switchboards 11-3 QED-2 switchboard 11-2 QED-6 commercial multi-metering 11-3 switchboard 11-3

Powersub Type FVR vacuum substation circuit breakers

PowerSuite software for motor starters

package unit substations

low voltage switchgear

distribution section

unit substations

Power-Zone busway		12-17
hangers non-segregated bus		12-17
space heaters		12-17
supports		12-17
terminating accessories thermostat		12-18 12-17
Premium 30		14-3
pressure sensors		
XMLG electronic		22-4
XMLK electronic		22-6
pressure switches		22-1
commercial		22-21-22-22
differential pressure dimensions		22-15
9012G		22-17
XML international		22-12
XMLF		22-9
XMLG electronic		22-5
XMLK electronic dual stage		22-7 22-15
industrial		22-13
machine tool		22-14, 22-18
Pumptrol		22-22
renewal parts XML international		22-28 22-10- 22-11
XMLF electronic		22-8- 22-9
XMLG electronic		22-4
XMLK electronic pressure transmitters, XMLG ele	aatrania	22-6 22-4
Preventa machine safety produ		25-4 25-2
Preventa safety controllers	CIS	25-2 25-4
Preventa safety relays		25-4 25-4
prewired connection system		25-4
Advantys TeleFast 2		24-22
pricing		
Integrated Power Center		10-3
pricing procedure		
I-Line panelboards		9-20
NF panelboards NQ panelboards		9-5 9-5
QMB panelboards		9-20
ProClima software		28-3
professional dimmer, C-Bus		5-15
programmable logic controllers		27-2
<b>ProWORX</b> application software		27-2
proximity sensors		20-5
accessories		20-9
XS basic series XS plastic rectangular		20-8 20-5
XS plastic tubular		20-6
pump control relays		
Zelio RM35BA10		23-35
pump panels Well-Guard		16-75 16-76
Pumptrol		
compressor pressure switches	S	22-20
pressure switches	_	22-22 22-21
water pump pressure switches push buttons 16 mm	5	19-12- 19-22
push buttons 22 mm	19-8, 19-23- 19-55,	
push buttons 30 mm	19-9, 19-67—19-69,	
	,	19-83- 19-99
PV inverters		29-9
0		
<b>u</b>		

11-19

18-31

11-6

11-18

11-17

11-17

**Power-Zone** 

Model III

, 3		www.schn	eider-electric.us
QED-6 rear-connected switchboards	11-3	QO plug-on	
QED-6 switchboards	11-3	arc-fault circuit breaker	1-3
QED-S Power-Style		circuit breakers	1-2
switchboards	11-2	EPD, overload, short circuit	4.0
Q-frame		class B ground fault protection circuit breaker	1-3
circuit breaker enclosures	1-25	GFI, Qwik-Gard class A ground fault protection circuit breaker	1-3
QO and Homeline dimensions	1-17	HID, high intensity discharge lighting circuit breaker	1-3
Q-frame, PowerPact		HM, high magnetic trip circuit breaker	1-3
circuit breaker	7-24	K, key operated circuit breaker	1-3
QMB		SWN, switch neutral common trip circuit breaker	1-3
Surgelogic SPD units	6-5	QOB bolt-on circuit breakers	9-10
QMB branch switches		for NQ panelboards	9-10
terminal data	9-40	QOU miniature circuit breakers	7-12, 7-14
QMB fusible branch switches	9-35	accessories	7-15
QMB panelboards		plug-on miniature circuit breakers	7-10 7-14
	6-9-37	non-automatic switches	7-14
pricing procedure	9-20	solid neutral assemblies	7-13
QO	4.0	wire sizes	7-10
plug-on non-automatic miniature switches surge protective devices (SPD)	1-3 6-8	QOU-HM miniature circuit breakers	7-14
QO and Homeline load center panelboards-style covers ris		quick-connect terminals, QOUQ	7-15
panels	1-11	Qwik-Gard	
•	1-11	branch circuit breakers	9-11
QO and Homeline load centers	4.40	ground fault circuit interrupter	9-10
accessories indoor load centers	1-12	Qwik-Open	1-2
dimensions	1-17	QYU	
knockouts	1-17	supplementary protectors	7-14
rainproof dimensions	1-18	UL1077 recognized	7.44
rainproof knockouts	1-18	supplementary protectors	7-14
rainproof, bolt-on hubs	1-18		
load centers value pack	1-11	R	
riser panels	1-11		
surge protection devices	1-12 1-12	radio frequency identification	
voltage testers  QO and QOB miniture circuit breaker accessories	1-12	Osisense RFID	20-7
	1-4	•	2-10, 2-12
QO load centers accessories	1-12	raintight (NEMA Type 3R)	40.0
auxillary gutter	1-12	wireway	13-3
back up power solutions	1-9	raintight trough (NEMA Type 3R)	10.0
convertable main lugs kits	1-6	wireway	13-3 3-6
indoor, 1Ø main circuit breaker	1-6	ratings, safety switches ReactiVar	3-0
indoor, main lugs	1-5		4.00.4.00
main circuit breaker kits main lugs, main circuit breaker	1-5 1-8	low voltage fixed capacitors	4-28, 4-29 3-9
rainproof, main lugs, main circuit breaker	1-7	receptacle, Crouse-Hinds Style 2 Hubbellock	
rainproof, metallic enclosure	1-7	receptacle switches, safety switches	3-9
rainproof, non-metallic enclosure	1-7	receptacle Wiser smart plug	29-7
service upgrade panels	1-10	relay panels	5-28
special applications	1-10	relay sockets	
tap kit  QO miniature circuit breakers	1-10	snapmount	23-14
	2 7 1 4	Square D Type N	23-14
miniature circuit breakers 7-10, 7-12 accessories	2, 7-14 7-12	relays	
arc fault	7-11	10 Amp 20 Amp	5-14 5-14
arc-fault circuit breaker	7-11	8-Channel Low Voltage	5-14 5-14
EPD	7-11	changeover	5-13
factory-installed accessories	7-12	Sepam series digital protective	4-24
GFI	7-11	remote alarm indicator	15-4
HID	7-11	remote controls, C-Bus	5-11
HM, high magnetic trip	7-11	remote modem support, Powerlink	5-25
K, key operated	7-11	remote monitor option, surge protective devices (SPD)	
mounting bases	7-13	remote source controller, Powerlink	5-24
non-automatic switches	7-11	renewal parts	0 24
plug-on	7-10	pressure, vacuum, and float switches	22-28
solid neutral assemblies	7-13	replacement modules, surge protective devices (SPD)	6-4
SWN	7-11 7-10	EBA (external brick assembly) SPDs	6-4
Wire sizes		EMA (external modular assembly) SPDs	6-4
QO OEM mounting bases, UL Listed and CSA approved	7-13	L-L enhanced (L-L) SPDs	6-4
		L-L enhanced MA (L-N, L-G) SPDs	6-4



www.schneider-electric.us			
replacement parts		electrical interlock kits	3-3, 3-10
22 mm push buttons	19-40, 19-61	equipment grounding kits	<sup>2</sup> 3-11
30 mm enclosures	19-103- 19-104	fuse puller kits	3-3
30 mm push buttons	19-76, 19-93	fusible and non-fusible	3-15
lamps	19-10	general duty	3-2
pendant stations	19-117, 19-120	heavy duty	3-4
replacement parts kits	10 117, 10 120	316 grade stainless steel, NEMA	3, 3R, 4, 4X, 5, 12 3-7
· · · · · · · · · · · · · · · · · · ·	10 100	applications	3-7
contact units for melting alloy type overload relays		fiberglass reinforced polyester en	
contactors	16-107	Hubbellock receptacle	3-9
fuse block	16-115	internal barrier kits	3-9 3-10
relays	16-107		3-10
starter accessories	16-108	key interlock systems	3-12
starters	16-107	Krydon enclosures, NEMA 4X	3-7 3-12
replacement tandem circuit breakers	7-10	lock-on provisions	
residential solar power solutions	29-1	lug data	3-3, 3-13 3-12
residential surge protective devices (SPD)	6-8	lug kits NEMA 7 and 9	3-12
for QO, NQ, and Homeline loadcenters	6-8		3-7 3-14
whole house	6-8	NEMA Type 4, 4X, 5, 7, 9 and 12	
	0-0	neutral assemblies	3-11 3-6
reversing and two speed		ratings	3-9
manual starters	16-9	receptacle switches single throw non-fusible	3- <del>9</del> 3-6
reversing combination starters		•	
NEMA style		sample lineups, integrated equipment	10-6
coil voltage codes	16-55	Saturn keypads	5-5
dimensions	16-57- 16-58	SB/SF switchboards	11-4
fusible disconnect switch type	16-51	SCADA products	27-4
Mag-Gard circuit breaker	16-53- 16-54	•	
MCP circuit breaker	16-53	SCCR short circuit current rating	7-29
		sealed	
non-fusible and fusible disconnect switch type	16-52	Mini Power-Zone transformers	14-12
thermal magnetic circuit breaker	16-55— 16-56	transformers	14-8
reversing manual switches	16-5	selection	
R-frame, PowerPact		limit switches	21-8
automatic molded case switches	7-34		21-0
electronic trip circuit breaker	7-28	selection information	
ring and ringless devices meter centers	2-5	insulated case circuit breakers	7-7
		meter centers	2-9
ringless meter sockets	2-2	miniature circuit breakers	7-2
riser panels, QO load centers	1-11	molded-case circuit breakers	7-4, 7-8
rotary handles	7-40	selection tables	
-		motor protection	7-33
rotating lights	40.407	Sepam series	4-25
XVR	19-107	selector switches	
		16 mm push buttons	19-14, 19-17—19-19
S		22 mm push buttons 19-24, 19-29,	
•		30 mm push buttons 19-70-	19-73, 19-80- 19-82, 19-95
safety at work		pendant stations	19-119
AS-i	25-3, 25-5	sensor plugs	7-48
safety controllers	20 0, 20 0	sensors	
-	05.0.05.4		7.54
XPSMC	25-3- 25-4	ground-fault protection	7-51
safety interlock switches		photoelectric	20-2
XCS	25-7	proximity	20-5
safety interlock switches, non-contact		ultrasonic	20-11
XCSDM	25-7	Vigirex ground-fault relays	7-52
safety limit switches	25-8	Sepam series	
XCS	25-8	digital protective relay	4-24
XCSM	25-8	selection table	4-25
XCSP/XCSD	25-8	separate enclosures	16-93
	25-0	series ratings	
safety PLCs		I-Line panelboards	9-3-9-4
XPSMF	25-3, 25-5	NF panelboards	
safety relays		•	9-3
XPS	25-3-25-4	NQ panelboards	9-2
safety switches	25-8	Servicepak power outlet	
accessories	3-3	panels	
Appleton Powertite receptacle	3-9	construction sites	1-26
class H, R, J, L fuse provisions	3-5	recreational vehicle parks	1-26
class R fuse kits	3-10	severe duty	
cover viewing window	J-10		01.07.01.40
	2₋10	limit switches	21-37-31-711
	3-12 3-9	limit switches	21-37-21-40
Crouse-Hinds Arktite receptacle	3-9	S-Flex Altivar 212	26-5, 26-16
Crouse-Hinds Arktite receptacle dimension	3-9 3-3	S-Flex Altivar 212 shipping	
Crouse-Hinds Arktite receptacle dimension dimensions	3-9 3-3 3-13	S-Flex Altivar 212 shipping Integrated Power Center	26-5, 26-16 10-3
Crouse-Hinds Arktite receptacle dimension	3-9 3-3	S-Flex Altivar 212 shipping	26-5, 26-16

short circuit current rating, SCCR

11-4-- 11-5

snort circuit current rating, SCCR	7-29	Speed-D switchboards 11-4-11-5
shunt trip circuit breakers	9-38	splitter boxes, TeSys contactors 18-38
sine wave tracking module (SWT) for SPD	6-2-6-3	SPQ
single and multi-door enclosures	0_ 00	cam-lock tap box 10-4
door closing mechanisms	8-27	lug-lug tap box 10-4
single row (column width) panelboards	9-18 9-19	spring clip blocks, AB1RR 24-2-24-3
single throw non-fusible safety switches	3-6	spring clip terminals, AB1RR 24-4
,		spring-charging motors
sirens, XVS	19-116	P-frame circuit breakers 7-40
slow trip, thermal unit selection	16-116	Square D
smart relays		8501KA alternating plug-in relay 23-11
Zelio Logic 2	23-39- 23-40	JCK timing relay 23-30
SMS ordering information		Type C power relay 23-15
Socket meter, E5600, PowerLogic	4-13	Type K plug-in relay 23-10
soft starters, TeSys U	18-32	Type N sockets 23-14
soft starts		Type R minature plug-in relay 23-12
Altistart 22	26-4, 26-18	Type R miniature plug-in relay 23-13 Type X relays 23-22-23-24
Altistart 22 (Enclosed)	26-19	stainless steel enclosures 28-5
Altistart 48	26-4, 26-17	304L 28-2
software	07.0	316L 28-2
Concept ConneXview	27-2 27-6	standby power connection solutions 10-4
PL7	27-0 27-2	starter accessories
ProClima	28-3	replacement parts kits 16-108
ProWORX	27-2	starters
SoMachine	27-10	accessories 16-109
Spacial.pro	28-3	accessories, GV 18-34
Spacial.ref Thalassa.ref	28-3 28-3	control circuit fuse holder 16-112
Unity Application Generator	20-3 27-2	cover-mounted control units 16-109
Unity Pro	27-2	GV manual starters and protectors 18-33
Vijeo Citect	27-4	power pole adders 16-112 replacement parts kits 16-107
Vijeo Designer	27-4	universal baseplate 16-108
Vijeo Historian	27-4	steel enclosures 28-4–28-6
C-Bus	5-19	sub-feed circuit breaker 5-26
solar inverters	29-9-29-10	cabinet data 5-26
solar ready CSED	1-24	sub-feed lugs
solid neutral accessories	16-113	NQ factory assembled panelboards 9-12
solid state relays		submetering 4-13
ZelioType SSR	23-25	submetering integrated power center 10-4
solutions		substation circuit breakers 11-19
Conext residential solar power inverters	29-1 29-1	sump application float switches 22-23-22-24
electric vehicle charging energy efficiency	29-1 29-6	supplementary protectors QYU 7-14
EVIInk EV charging	29-1	2 kg - 2
utilities	4-17	support, AC drives 26-20
Wiser energy efficiency	29-1	supports
SoMachine software suite	27-10	busway 12-17
sound levels	14-3	Power-Zone busway 12-17 surge protection device plug-in units
space heaters		busway 12-10
busway	12-17	surge protection devices 1-12, 11-17
Power-Zone busway	12-17	• •
Spacial enclosures	28-2, 28-4-28-6	surge protective devices (SPD)
accessories	28-4- 28-6	EBA (external brick assembly) 6-3 EMA (external modular assembly) 6-2
Spacial.pro software	28-3	external modular, L-L enhanced 6-3
Spacial.ref software	28-3	externally mounted 6-2
SPD	11-17	flush mount kits 6-2, 6-7
OFM/seeses letter 12te	6-6	internally mounted, new construction and retrofit 6-5
OEM/assembler kits	0 0	
replacement modules	6-4	remote monitor option 6-2
		replacement modules 6-4
replacement modules		replacement modules 6-4 residential whole house 6-8
replacement modules special applications	6-4 1-10	replacement modules 6-4
replacement modules special applications QO load center specifications Conext grid tie solar inverters	6-4 1-10 29-10	replacement modules 6-4 residential whole house 6-8 SDSA1175 nipple-mounted 6-7
replacement modules  special applications  QO load center  specifications  Conext grid tie solar inverters limit switches	6-4 1-10	replacement modules 6-4 residential whole house 6-8 SDSA1175 nipple-mounted 6-7 SDSA3650 nipple-mounted 6-6 sine wave tracking module (SWT) for SPD 6-2 Surgelogic HWA SPDs 6-7
replacement modules  special applications  QO load center  specifications  Conext grid tie solar inverters limit switches  speed control relays	6-4 1-10 29-10 21-8	replacement modules residential whole house SDSA1175 nipple-mounted 6-7 SDSA3650 nipple-mounted 6-6 sine wave tracking module (SWT) for SPD 6-2 Surgelogic HWA SPDs XR nipple-mounted 6-8
replacement modules  special applications  QO load center  specifications  Conext grid tie solar inverters limit switches  speed control relays Zelio RM35S	6-4 1-10 29-10	replacement modules residential whole house SDSA1175 nipple-mounted SDSA3650 nipple-mounted sine wave tracking module (SWT) for SPD Surgelogic HWA SPDs XR nipple-mounted Surgelogic surge protective devices (SPD) 6-6, 9-12, 9-17, 9-34
replacement modules  special applications  QO load center  specifications  Conext grid tie solar inverters limit switches  speed control relays	6-4 1-10 29-10 21-8	replacement modules residential whole house SDSA1175 nipple-mounted 6-7 SDSA3650 nipple-mounted 6-6 sine wave tracking module (SWT) for SPD 6-2 Surgelogic HWA SPDs XR nipple-mounted 6-8

7-29

**Speed-D** switchboards

SB/SF switchboards

11-4



www.schneider-electric.us			Alphabetical Listing
		ToCyc D	
switchboards	11-1	TeSys D	100 1011 1011
Power-Style QED-2	11-2 11-2	accessories	18-8-18-11, 18-14
Power-Style	11-2	auxiliary contacts cabling accessories	18-8 18-9
switches	7-34	coil suppressors	18-9
foot	19-124— 19-125	contactors, non-reversing	18-2, 18-4
industrial snap	21-6	contactors, reversing	18-2, 18-6, 18-14
PowerPact H-frame	7-34	control modules	18-10
PowerPact J-frame	7-34		1, 18-44— 18-46, 18-48
switchgear	11-1	electronic timers	18-10
low voltage metal-enclosed drawout	11-6	interface modules	18-10
medium voltage metal-enclosed		TeSys F	0 10 11 10 10 10 15
DVCAS	11-15		8, 18-11–18-12, 18-15
HVL	11-12- 11-14	auxiliary contacts contactors, non-reversing	18-8 18-3, 18-5
HVL/cc	11-9	contactors, reversing	18-3, 18-7
MiniBreak	11-7	dimensions	18-42, 18-47
wind farm applications	11-15	overload relay accessories	<sup>^</sup> 18-16
SWT (sine wave tracking) module for ex	xternal SPDs 6-2	TeSys GV manual starters and protectors	
system integration, PowerLogic	4-21	accessories	18-34- 18-37
system units and enclosures	5-17	dimensions	18-52— 18-56
•		TeSys K	
<del>-</del>		contactors and accessories	18-27
T		dimensions	18-49
tables 1-148, thermal unit selection	16-121- 16-138	non-reversing mini-contactors	18-24
	10-121 10-100	reversing mini-contactors	18-25
tap box	10.4	TeSys T	40.04
cam-lock lug-lug	10-4 10-4	motor management system configuration with PowerSuite	16-84
tap kit, QO load centers	1-10	3	16-86 16-85
	4-23	LTMCU compact display LTME expansion module	16-85
technical support		LTMR controller	16-85
tee, busway	12-6	Magelis display	16-85
tees		TeSys T and SMS, PowerLogic	16-86
trench duct	13-6	motor management systems	10-00
temperature control relays		HMI—human machine interface	16-85
Zelio RM35AT	23-36	TeSys U	
temperature controllers		dimensions	18-50- 18-51
Zelio Type REG	23-31	motor starters	18-28- 18-31
tenant circuit breakers		soft starters	18-32
meter center accessories	2-6	Thalassa enclosures	28-2, 28-7
meter centers	2-6	accessories	28-7
tenant metering software (TMS)	4-13	Thalassa.ref software	28-3
terminal block kits		thermal overload relays	
transformers	14-11	NEMA style	
terminal block, tie point	16-113	bimetallic	16-89
terminal blocks		dimensions	16-90- 16-92
assemblies	24-15	melting alloy	16-82
IEC style	24-2-24-9, 24-11-24-12	solid state overload relay	16-83
NEMA style	24-13, 24-15	thermal unit selection	16-116
terminal data		calculation of rip current rating	16-119
I-Line panelboards	9-40	general	16-116
NF panelboards	9-39	horsepower and voltage	16-120
NQ panelboards	9-39	slow trip	16-116
QMB branch switches	9-40	tables 1–148	16-121- 16-138
termination options	7.00	thermal units, mounting	16-120
H- and J-frame	7-23	thermal-magnetic circuit breakers	

panel busbar system

**TeSys AK5** 

Tesys

P-frame

**TeSys** relays

Type D relay

Type K relay

Type SK relay

D-line and F-line

Type SKE alternating relay

test block bypass sockets, meter sockets

Power-Zone busway

thermal-magnetic circuit protectors

H-frame

J-frame

K-frame

thermostats

busway

7-27

23-21

23-21

7-29

18-39

23-16-23-18

23-19-23-20

2-3

7-22, 9-26

7-22, 9-26

9-27

24-17

12-17

12-17

29-6

24-7

16-113

			www.schneider-electric.us
timers		two-speed	
Zelio JCK	23-30	manual switches	16-5
Zelio RE11 Zelio RE48	23-26 23-26	Type 1 surge protective devices (SPD)	6-2
Zelio RE7	23-27- 23-28	Type EOX vacuum substation circuit breakers	11-19
Zelio RE8	23-29	Type FB fuseholders	24-19
Zelio RE9	23-29	Type FVR vacuum substation circuit breakers	11-19
Zelio REXL	23-26	Type K heavy duty pilot lights	19-74
timing relays		Type K, SK	
NEMA style Type X	23-22- 23-23	accessories	19-89- 19-90
touch screens, C-Bus	5-7- 5-8	common operators, contact blocks	19-9
tower lights and beacons	19-107— 19-116	Type K, SK and KX electrical components	19-86
training, AC drives	26-20	Type KX square multifunction operators	19-94— 19-96,
transformer combo		19-98— 19-99	
IPC2	10-2	Type VOX vacuum substation circuit breakers	11-19
merchandise configurations transformer enclosures	10-6 14-9	Type W non-reversing vacuum starters	16-30
transformers	14-1		
1201–15,000 volts	14-1	Ū	
single-phase indoor	14-20		
three-phase indoor	14-20	UL enclosure ratings	28-3
accessories	14-10, 14-17	UL Listed 500 Vdc circuit breakers	7-35- 7-36
brackets	<sup>′</sup> 14-11	ultrasonic sensors	20-11
buck and boost	14-8	XUV and XXV	20-10
copper wound	14-4	Uni-Cast	
core and coil disconnects	14-3 14-18	transformer connections	11-12
drive isolation	14-16	transformers	11-12
dry type	14-20	unit substation	
EE medium voltage, dry type	14-20	distribution section	11-18
EE NL	14-6	transformer section	11-18
enclosures	14-10, 14-18	Unity application generator software	27-2
energy efficient, single-phase export model	14-5 14-8	Unity pro application software	27-2
general purpose dry type	14-6	universal baseplate starters	16-108
high harmonic loads	14-3, 14-7	universal power circuit breakers, Masterpact	7-50
DIT	14-3	university, power management	4-23
industrial control	14-14- 14-17	utilities, solutions	4-17
lug	14-11	utility relays	
Mini Power-Zone	14-12	NEMA style Type X	23-23
motor starting auto NEMA Premium	14-3 14-3		
NLP series	14-6	V	
non-ventilated	14-9	V	
open core and coil	14-9	vacancy sensors	
Power-Cast	11-12	residential wall switch	5-20
sealed sealed, Mini Power-Zone	14-8 14-12	vacuum circuit breaker	11-16
stainless steel enclosed	14-12	vacuum substation circuit breakers	11-19
terminal block kits	14-11	Type EOX	11-19
Uni-Cast	11-12	Type FVR	11-19
Watchdog	14-4— 14-5	Type VOX	11-19
transient suppression module accessories	16-112	vacuum switches	22-1, 22-19
Transparent Ready	11-1	renewal parts	22-28
Transparent Ready solutions	27-6	value packs	1-11
trench duct		vamp 221	4-26
accessories	13-6	VAR compensator (HVC) hybrid	4-36
components	13-6	Vario assembled and enclosed switches	8-3-8-4
crosses	13-6	Vario manual motor control switches	8-5
elbows	13-6	Vigirex ground-fault relay system	7-52
fittings tees	13-6 13-6	Vijeo Citect software	27-4
wire management	13-5	Vijeo Designer configuration software	27-4
trip unit suitable for reverse connections	7-22	Vijeo Historian software	27-4
trip units	_		27-4
Micrologic	11-6	voltage measurement relays Zelio RM17UAS	23-34
Twido Nano controller	27-10	Zelio RM17UAS Zelio RM17UB	23-34 23-34
two tier blocks	,	Zelio RM17UBE	23-34
AB1ET	24-6	Zelio RM35UA1	23-34
AB1ETN	24-7	Zelio RM35UB	23-34



100		XB6	
W		accessories	19-20
wall duct		characteristics and complete devices	19-12
accessories	13-4 13-5	electrical components	19-15
Class 5250	13-4	illuminated operators keyed selector switches	19-16 19-19
components	13-4	non-illuminated	10-10
wire management	13-4 13-5	operators	19-17
wall-mounting enclosures	28-6- 28-7	selector switches	19-18
web-enabled		XCK limit switches	21-12-21-13
ethernet communication devices	11-1	XCKJ industrial format EN 50041	21-24-21-25
web-enabled network components	4-19	XCKJ precision switches with direct acting contac	ts
WebPageGenerator	4-19	limit switches	21-26
Well-Guard pump panels	16-75— 16-76	XCKL	
wind farm applications	11-15	exploded view	21-20-21-21
wire management		XCKL components	21-23
trench duct	13-5	XCKM limit switches	21-20- 21-21
wall duct wireway	13-4– 13-5 13-2	XCKS	21-19
wireless, batteryless push buttons, XB4R	19-63	XCMD limit switches	21-10-21-11
wireway		XCS safety interlock switches	25-7
general purpose (NEMA Type 1)	13-2	XCS safety limit switches	25-8
oiltight (NEMA Type 12)	13-3	XCSDM non-contact safety interlock switches	25-7
raintight (NEMA Type 3R)	13-3	XCSM safety limit switches	25-8
raintight trough (NEMA Type 3R)	13-3	XCSP/XCSD	
wiring, TeSys contactors	18-38	safety limit switches	25-8
Wiser energy efficiency solutions	29-1, 29-6–29-8	XML international pressure switches	22-10-22-12
Wiser energy efficiency solutions		XMLF electronic pressure switches	22-8- 22-9
accessories	29-8	XMLG electronic pressure transmitters and switch	es 22-4
ethernet gateway in-home display IHD	29-8 29-6	XMLK electronic pressure transmitters	22-6
large load control	29-7	XPS safety relays	25-3-25-4
load control relays	29-7	XPSMC safety controllers	25-3- 25-4
programmable communicating thermostats (PC		XPSMF safety PLCs	25-3, 25-5
smart plug	29-7	XS basic series proximity sensors	20-8
		XS plastic rectangular proximity sensors	20-5
X		XS plastic tubular proximity sensors	20-6
XAL 22 mm control stations	19-100	XUB tubular photoelectric sensors	20-2
XB4		XUM miniature, XUK and XUX compact	
accessories	19-39	photoelectric sensors	20-4
common operators, complete with contact block		XUSLB 2-box light curtain	25-6
complete devices	19-23	XUSLD 2-box light curtain	25-6
electrical components	19-34	XUSLP perimeter guard	25-6
illuminated operators pilot lights	19-32 19-31	XUV and XXV ultrasonic sensors	20-10
selector switches	19-29		19-110- 19-112
specialty operators	19-30	•	19-108 19-109
XB4R		XVE tower light components	19-113
wireless, batteryless push buttons	19-63	XVP 50 mm illuminated indicating banks	10 110
XB5		accessories	19-115
accessories	19-60 s 19-8	XVP tower light components	19-114
common operators, complete with contact block complete devices	19-42	XVR rotating lights	19-107
components	19-63- 19-64	XVS	.0 .0.
electrical components	19-55	electronic alarms	19-116
pilot lights	19-51	sirens	19-116
selector switches specialty	19-49	XY2 cable pull switches	25-8
operators	19-50		
XB5 20 mm		7	
components	19-66	-	
XB5R		ZCKD01	21-19
plastic push buttons	19-63	ZCKD02	21-19
XB5S		ZCKD31	21-19
biometric switches	19-65	ZCKD39	21-19
		ZCKD41	21-19
		ZCKD49	21-19

RM analog interface module

RM17JC current measurement relay

RM17UAS voltage measurement relay

RM17UB voltage measurement relay

RM17T phase measurement relay

Alphabetical Listing

REXL timer



23-3

23-26

23-2

23-25

23-8-23-9

23-4-23-5

v.schneider-electric.us ZCKD59 21-19 RM17UBE voltage measurement relay 23-34 RM35AT temperature control relay 23-36 ZCKS 21-19 RM35BA10 pump control relay 23-35 Zelio RM35HZ frequency control relay 23-36 Logic 2 smart relays 23-39-23-40 RM35JA current measurement relay 23-32 RE48 timer 23-26 RM35L level control relay 23-35 RE7 timer 23-27-23-28 RM35S speed control relay 23-36 RE8 timer 23-29 RM35UA1 voltage measurement relay 23-34 23-29 RE9 timer RM35UB voltage measurement relay 23-34 REG temperataure controller 23-31 RPM plug-in relay 23-6-23-7

RSB interface relay

RUM plug-in relay

SSR solid state relay

RSL slim interface relay

RXM miniature plug-in relay

RSE11 timer

23-26

23-38

23-32

23-33

23-34

23-34





w.schneider-electric.us 00 thru A400L	1-22. 2-3	AM1ED200	24
5]	,	AO	21
\		AP2308G10ST thru AP2540G10ST	
\P		AP30210 thru AP506LT()	
3		APJ3485 thru APJ10487	
11AA135U2BL thru AB1AATP235U4		APP2D1 thru APP2R4H4	1.9
1AB10M32 thru AB1AB8P35		AR	
1AC2		AR1MA01 thru AR1MC019	
1AC24 thru AB1ACN16BL		AR1SB2 thru AR1SB3	
1B510 thru AB1B890		AR1SC01 thru AR1SC03	
1BB18535 thru AB1BC9535	24-9	ARP00026	1-22, 2-3, 2
1BV5 thru AB1BV8	24-11	ARP00118 thru ARP00427	
1CT1 thru AB1CT2		ASILUFC51	
1CT215		AT1HB2	
1D11435U		AT1PA1 thru AT1PA7	
1DDP235T thru AB1ET3235UTLP		ATS22C11S6S6U thru ATS22D88S6S6U	
1ET435U thru AB1ET435UTP		ATS48C11Y thru ATS48M12Y	
1ETN335U thru AB1ETNTP435U		ATSU01N206LT thru ATSU01N232LT	
1FC335U thru AB1FF235U	24-9	ATV212H075M3X thru ATV212WU75N4	
1FU10135U thru AB1FUSE435U6XM		ATV312H018M2 thru ATV31CU75N4	
1FV135U		ATV61H075M3 thru ATV61HU75Y	
		ATV71H037M3 thru ATV71HU75Y	
1G()			
1GA thru AB1GZ		ATVPOT25K	
IPC15		AZ5DE005 thru AZ5DE025	
1PS4	24-8, 24-9	B075 thru B400	
1R()	23-20	BCAP	
1RÖ thru AB1R13		BCH thru BCHB	
1RRN1035U2BL thru AB1RRNAC642GR		BCPMA042D thru BCPMSCCT2	
1RRNSF435UGR thru AB1RRNTPAC642		BH20512 thru BH2096	
			,
1RT thru AB1SA3		BMK2Q400	
1SC435U thru AB1SC435U2PT		C125RB thru C4L200S	
1SF435U	24-8	CA2KN22 thru CA2KN407	23
1SF520 thru AB1SF520M	24-4. 24-8	CA2SK11 thru CA2SKE20	
1SR6	, -	CA3KN22 thru CA3KN407	
1SV1 thru AB1SV2		CA3SK11 thru CA3SK20	
1TC01 thru AB1TC3		CA4KN22 thru CA4KN407	
1TE		CAB4 thru CAB30	
1TEN3 thru AB1TEN4		CAD32 thru CAD506	
1TF		CF2308G10ST thru CF2550GLFM21	
1TP1035U thru AB1TP635U	24-4, 24-6	CL0306F	3-12, 3-14, 8
1VV215 thru AB1VVN7035UBL	24-4. 24-5	CL10F thru CL60F	3-12. 3-14. 8
L1REM12050 thru ABL1RPM24100		CM200S	
L7RM24025 thru ABL7RP4803		CM4000T	
L8MEM05040 thru ABL8WPS24400		CM4250	
R1E101M thru ABR2SB312B		CMB363 thru CMB381	
S2EA02EF thru ABS2SC02EB		CMDLC thru CMDVF	
F13EC thru ACF88WF	12-5	CMELK4	
P	1-22, 2-3	CP2308G10ST thru CP2550G10ST	
P1034CD thru ACP6034BC	3-9	CP30210 thru CP506LT()	-
		CT1000CC +bru CTEC! 500050	
P2EC thru ACP4WF		CT1000SC thru CTFCL500058	
PA thru ACPLA		CU100FD	
2308G10ST thru AF2540GLFM22		CU1200P24K thru CU1200R53K	
thru AK		CU12L400CB thru CU12L400FN	
5JB1410 thru AK5PE27	18-39	CU150HD thru CU800M23K4	
0306F		CU816D400CB thru CU816D400CN	
00FA		CUM400CB	
00FD	= ==	CVM42 thru CVMT	
10F		CYA060HD thru CYA800P7	
200P24K thru AL1200R53K		D211N thru D326NTR	
150HD		DA1TT090 thru DA1TT170	
1650 thru AL16501	21-40	DASKGS100 thru DASKP600	14
75JD	7-42	DE9RA1012	
802		DFCC1 thru DFCC3V	
0DTF		DJA32150W thru DJA32600W	
	_		
2500RK		DJL32150W thru DJL32600W	
250JD		DL1BDB1 thru DL1BLM	
2820		DL1CB006 thru DL1CF220	
80FD	9-15	DL1CJ0241 thru DL1CJ0246	19-
100L61K3 thru AL400L61K4		DL1CJUS0063 thru DL1CJUS1205	
100LA		DL1EDGS	
600LF52K3 thru AL800P7K4		DR2SC0039 thru DR2SC4700	-
800SN		DR5TE4S thru DR5TF4V	
900MA		DRK30 thru DRK600	
		DS200EK2D thru DT600NKD	3-16, 3-18, 3
1DE200	23-20, 24-12	DTU222 thru DTU663AWK	
	,	DU221RB thru DU324RB	
1DL201	18-39	1)U// 186 INTU 1)U3/486	



			www.schneider-electric.us
DX1AP25 thru DX1AP26	18-16	Fl36020 thru Fl36100	9-25
DZ2FF1 thru DZ2FX6	18-12	FI3IMA12C() thru FI9IMA18C()	6-5
DZ5CA002 thru DZ5CE063	24-20	FJA14015() thru FJA14070()	9-24
DZ5MB201		FK400	1-22
E5600020SQD thru E5600450SQD		FPK03 thru FPK0610	3-3, 3-10
ECB14015G3 thru ECB34020G3	5-24	FY14015() thru FY14030()	9-24
ECC21		G1414 thru G19103	
FOTO7505000 #h FOT0000000	4-11		
ECT075050SC thru ECT300800SC		GB2CB05 thru GB2CD20	
EDB14015 thru EDB34125	9-15	GC200C thru GC2DSP	7-51
EDB14015EPD thru EDB14050EPD	9-15	GFI2PA	1-4, 7-12
EDPA thru EDPAF		GFM150HD thru GFM25CT	7 52
	9-14		
EE1000T151HCT thru EE1000T79H		GK2AF01	
EE100S3534H thru EE750T79H	14-4. 14-6	GS1AD10	8-9
EE15S3534H thru EE75T6H		GS1AU203 thru GS1AU803	8-9
EER20100 thru EER57200			
		GS1AW306 thru GS1AW903	
EGB14015 thru EGB34125		GS1DDU3 thru GS1DU3	
EGB14015EPD thru EGB14050EPD	9-15	GS2AE2 thru GS2AE81	8-8. 8-9
EGB2HT thru EGB3HT		GS2AH110 thru GS2AH120F	
EIK031 thru EIK032		GS2AH130 thru GS2AP73	
EINUST UITU EINUSZ	3-3, 3-10		
EIK1 thru EIK2		GS2GU3N thru GS2TU3	
EIK40601 thru EIK40602	3-10	GT1218 thru GT930	7-51
EJB14015 thru EJB34125		GTK03 thru GTK0610C	2_2 2_11
EJB14015EPD thru EJB14050EPD		GV1F03 thru GV1L3	40.07
		GV 1703 IIIU GV 1L3	
EK400DTU2		GV2AF01 thru GV2APN04	
ELM150HD thru ELM250JD	7-53	GV2E01	18-37
EMB1010 thru EMB3164		GV2G05	
EMBK3 thru EMCB		GV2G245 thru GV2G554	
EMCT010 thru EMCT164		GV2GH7	
EME1010 thru EME3164	4-15	GV2K011 thru GV2K04	
EMFP1 thru EMFP3		GV2MC01 thru GV2MC02	
EMT1225CB thru EMT3225CB		GV2ME01 thru GV2ME32	
EP112T3HFISCUNP thru EP75T3HNISCUNP		GV2MP01 thru GV2MP04	
EV230PDR thru EV230WSRR	29-4	GV2P01 thru GV2P32	18-33
EV2430WS		GV2SN13 thru GV2SN37	18-37
EVRFIDHP thru EVRFIDKF10		GV2V01	
EZM11000CB thru EZM11200TBU		GV2V03	
EZM112225 thru EZM115225CU	2-11	GV3APN01 thru GV3APN04	18-34
EZM11600GCBC thru EZM11600TB		GV3G264 thru GV3G66	
EZM116125 thru EZM116125CUX		GV3P13 thru GV3P65	10-04
EZIVI 10125 (IIIU EZIVI 10125CUX	2-11	GV3P13 tillu GV3P65	
EZM12000CB thru EZM1225TB		GV7AB11	
EZM125QOA	2-6, 2-15	GV7AC01 thru GV7AC07	18-35
EZM1400CB thru EZM1600FSU	2-10	GV7AD111 thru GV7AD112	18-35
		GV7AE11	
EZM1600FTLK3			
EZM1600TB thru EZM1800TBU	2-10	GV7AP01 thru GV7AP05	
EZM1CORNER thru EZM1TRANR	2-15	GV7AS055 thru GV7AU525	18-35
EZM31000CB thru EZM31200TBU		GV7RE20 thru GV7RE150	18-33
EZM31000CBNBBTL thru EZM31200JBNFBTR		GV7RS20 thru GV7RS150	10 00
EZM312225 thru EZM315225CU	2-13	GV7V01	
EZM31600GCBC thru EZM31600TB	2-12	GVA()025 thru GVA()505	18-34
EZM316125 thru EZM316125CUX		GVAD0101 thru GVAD1010	
EZM32000CB thru EZM3400CB		GVARDE 4	
EZM3400CBNBBTL thru EZM3800FSNFBTR		GVAPB54	
EZM3400CBU thru EZM3800TBU	2-12	GVAPH02	18-37
EZM3BUSLB thru EZM600FTLK3		GVAPH03	
EZM72MC			
		GVAPK11	
EZMH112225 thru EZMH116125CUX		GVAPK12	
EZMH312225 thru EZMH316125CUX		GVAPR54 thru GVAPR65	18-35
EZMK111400 thru EZMK112400		H()A26015 thru H()A36150	
EZMK311400 thru EZMK332400		H()A36060U31X thru H()A36150U54X	0.06
EZML111225 thru EZML114225D		H()L26015(C) thru H()L36150(C)	
EZML311400 thru EZML334225D	2-13. 2-14	H()L36030M38X thru H()L36100M38X	
EZMPCP	,	H()L36060(C)U31X thru H()L36150(C)U54X	7-93
		LOEO their L1000D	0.40 0.40
EZMR112225 thru EZMR116125CUX		HÖ50 thru H100CP	
EZMR312225 thru EZMR334225CU		H100XFA	3-7, 3-14
EZMSK2	2-15	H100XFA1212	3-7
EZMT111225 thru EZMT113225		H1200SNE4	
EZMT311225 thru EZMT333225		H125 thru H125CP	
FA100A thru FA100S	7-56, 7-58	H12LKE2	
FA14035() thru FA24100()	9-24	H150 thru H200CP	3-10. 3-18
FA26015() thru FA26100()		H2212AWK thru H2212AWK	
	Q_25		
FA32015 thru FA34100			
	9-24	H221A thru H224NRB	
FA36015 thru FA36100	9-24 9-25		
	9-24 9-25	H221A thru H224NRB H225 thru H225R	3-4
FH16015() thru FH26100()	9-24 9-25 9-25	H221A thru H224NRB H225 thru H225R H225XJG	3-4 3-7, 3-14
FH16015() thru FH26100() FH36015 thru FH36100	9-24 9-25 9-25 9-25	H221A thru H224NRB H225 thru H225R H225XJG H225XJGAA	3-4 3-7, 3-14 3-7
FH16015() thru FH26100() FH36015 thru FH36100 FI1IMA12C() thru FI1IMA24C()	9-24 9-25 9-25 9-25 6-5	H221A thru H224NRBH225 thru H225RH225XJGH225XJGAAH226 thru H228R	3-4 3-7, 3-14 3-7
FH16015() thru FH26100() FH36015 thru FH36100 FI1IMA12C() thru FI1IMA24C() FI26100()	9-24 9-25 9-25 9-25 6-5 9-25	H221A thru H224NRB H225 thru H225R H225XJG H225XJGAA	3-4 3-7, 3-14 3-7
FH16015() thru FH26100() FH36015 thru FH36100 FI1IMA12C() thru FI1IMA24C()	9-24 9-25 9-25 9-25 6-5 9-25	H221A thru H224NRBH225 thru H225RH225XJGH225XJGAAH226 thru H228R	3-4 3-7, 3-14 3-7 3-4 3-10, 3-18



www.schneider-electric.us			
H265AWK thru H268AWK		HM112T208HNCUEP thru HM75T259HNCUEP.	
H265DS thru H266DS	3-5	HM112T208NCU thru HM75T259NCU	
H265R thru H268R		HNM1BL thru HNM4BL	
H300		HOM115 thru HOM290	
H321A thru H324NRB	3-4, 3-13, 3-14	HOM115CAFI thru HOM120CAFI	
H325 thru H328R	3-4	HOM115EPD thru HOM250EPD	1-14
H350		HOM115GFI thru HOM250GFI	
H361 thru H368		HOM115HM thru HOM120HM	
H3612 thru H3612RB		HOM1224L125RB thru HOM24M125RB	1-16
H361A thru H364A		HOM1224L125TC thru HOM24M125C	
H361AWA thru H363AWC		HOM1HT	
H361AWK thru H368AWK		HOM1PA	
H361DF thru H364DF		HOM1RK	
H361DS thru H366DS		HOM2100 thru HOM2125	
H361DSWA thru H363DSWC		HOM2150BB thru HOM2200BB	1-14, 1-22
H361DX thru H363DX	3-7, 3-14	HOM2175SB	1-12, 6-8
H361N thru H368N	3-5	HOM24L125TC thru HOM24M125C	1-15
H361NRB thru H364NRB	3-5	HOM24L70RB thru HOM24M125RB	
H361RB thru H364RB	3-5	HOM2HBD	1-14
H361SS thru H366SS	3-7. 3-14	HOM2PAHA thru HOM2PAVHA	
H361WA thru H363WC		HOM3040L200RB thru HOM48L125GRB	
H364NA		HOM3040L200TC thru HOM48L125GC	
H364NAWK thru H368NAWK		HOM4RK2HA thru HOM4RK2LA	
H364NDS thru H366NDS		HOM5RK	
H365NR thru H368NR		HOM612L100RB	
H365R thru H368R		HOM816L125C thru HOM816M100TC	
H400		HOM816L125RB thru HOM816U200FTRB	
H461 thru H466		HOMCGK2 thru HOMCRBGK1	
H461AWK thru H664AWK		HOME250SPA	
H461DS thru H664DS		HOMEP	
H600SN thru H600SNC		HOML2125 thru HOML2225	
H60XFA		HOMQPA	
	- , -		
H60XFA1212		HOMRBGK2	
H800SNE4		HOMT1515 thru HOMT3020	
H82254 thru H82455		HOMT1515215 thru HOMT2020250	
H8LKE2		HOMVP1 thru HOMVP9	
HC2609DEXF thru HC2609EXS		HOMVP12 thru HOMVP16	1-11
HC2652B thru HC2692B		HOMVPL1 thru HOMVPL2	1-11
HC2652WP thru HC2886WP		HOMVPRB1	
HC2SN	9-23	HP2F thru HP5SH	
HC3209EXF thru HC3209EXS		HPAFD thru HPAFD	5-24, 9-15
HC3248B thru HC3291B		HQO206AB thru HQO206BC	
HC3248WP thru HC3291WP		HQO306	
HC4212DEXF thru HC4412DEXS	9-23	HRA36000S15	9-27
HC4250DB thru HC4486DB		HRK1020	
HC4250WP thru HC4486WP		HRK30	
HC4SNHCW4SN thru HC8SNHCW8SN		HRK4060	
HCM14482N thru HCM36918MP	9-21	HRL36000S15	
HCM400VCA thru HCN600VCA		HRL36030M38X thru HRL36150M38X	
HCM41914M thru HCN92T()D		HU265 thru HU466	
HCP145012N thru HCP50868	9-22	HU661AWK thru HU664DS	3-6, 3-14
HCP54868SU	9-21	HVDSA3 thru HVDSA15	11_12
LICECHICANIII LICECHICA			11-13
HCPSU8SN thru HCPSU8SNCT	9-23	HVL305BG thru HVL317BW	11-11
HCR12SNCT	9-23 9-23	HVL405BGL thru HVL415DEWR2H	11-11 11-12
HCR12SNCTHCR548612U	9-23 9-23 9-22	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2H	11-11 11-12 11-12
HCR12SNCTHCR548612UHCR86T() thru HCW86T()D	9-23 9-23 9-22 9-22, 9-23	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2	11-11 11-12 11-13
HCR12SNCTHCR548612UHCR86T() thru HCW86T()D	9-23 9-23 9-22 9-22, 9-23	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14315NHVLCA14315N.	
HCR12SNCTHCR548612U	9-23 9-23 9-22 9-22 9-22, 9-23 9-23	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGR	11-11 11-12 11-13 11-9 11-10
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA14A	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGR	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA14AHVLCCA20305D thru HVLCCA20315NHVLCCA20405DGL thru HVLCCA20515DGR	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA14AHVLCCA20305D thru HVLCCA20315NHVLCCA20405DGL thru HVLCCA20515DGRHVLCCA20405DGL thru HVLCCA20515DGR	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-22, 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA20305D thru HVLCCA20315NHVLCCA20405DGL thru HVLCCA20515DGRHVLCCA20AHVLCCB14305D thru HVLCCB14315NHVLCCB14405DGL thru HVLCCB14515DGRHVLCCB14405DGL thru HVLCCB14515DGRHVLCCB14AHVLCCB20305D thru HVLCCB20315NHVLCCB20405DGL thru HVLCCB20515DGR	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA14405DGL thru HVLCCA20315NHVLCCA20405DGL thru HVLCCA20515DGRHVLCCA20AHVLCCB14305D thru HVLCCB14315NHVLCCB14405DGL thru HVLCCB14515DGRHVLCCB14405DGL thru HVLCCB14515DGRHVLCCB14AHVLCCB20305D thru HVLCCB20315NHVLCCB20405DGL thru HVLCCB20315NHVLCCB20405DGL thru HVLCCB20515DGRHVLCCB20405DGL thru HVLCCB20515DGRHVLCCB20A	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48	HVL405BGL thru HVL415DEWR2HHVL505BGL thru HVL515DEWR2HHVLC thru HVLC2HVLCCA14305D thru HVLCCA14315NHVLCCA14405DGL thru HVLCCA14515DGRHVLCCA20305D thru HVLCCA20315NHVLCCA20405DGL thru HVLCCA20515DGRHVLCCA20AHVLCCB14305D thru HVLCCB14315NHVLCCB14405DGL thru HVLCCB14515DGRHVLCCB144AHVLCCB14AHVLCCB14AHVLCCB20305D thru HVLCCB20315NHVLCCB20405DGL thru HVLCCB20515DGRHVLCCB20405DGL thru HVLCCB20515DGRHVLCCB20AHVLCCB20AHVLCCDSA10 thru HVLCCDSA18	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 4-15 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27 7-34	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27 7-34 7-34	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27 7-34 7-31 7-29	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-23 9-22, 9-23 9-22, 9-23 7-56 9-27 4-14 4-14 4-14 4-15 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27 7-34 7-31 7-29 9-23	HVL405BGL thru HVL415DEWR2H	
HCR12SNCT	9-23 9-23 9-23 9-22 9-22, 9-23 9-23 7-56 9-27 4-14 4-14 4-14 6-8 12-5 12-5 7-31 9-5 7-29 7-48 6-5 9-27 7-34 7-34 7-31 7-29 9-23	HVL405BGL thru HVL415DEWR2H	



IK250DS	7-56, 7-58	LA9FL970 thru LA9FL982	18-7, 18-15
IOC44	4-11	LA9K0969 thru LA9K0970	
IONE60REPCD thru IONESQL2005CPU	4-4	LA9RM201	
IOX thru IOX2411	4-11	LA9TFD15 thru LA9TFD80	18-23
J()A26150 thru J()A36250		LAD21 thru LAD22	23-18
J()A36250U31X thru J()A36250U54X	9-26	LAD31 thru LAD32	18-38
J()L26150(C) thru J()L36250(C)	7-22	LAD311 thru LAD351	
J()L36250(C)U31X thru J()L36250(C)U54X J225X thru J250S	7-23	LAD3BLAD4BBVULAD4BB thru LAD4BBVU	
JD250S		LAD4CM	
JGL36250M38X		LAD4D3U thru LAD4VU	18-9 23-17
JGL37100D81 thru JGL37250D82		LAD6K10	
JJL36250M38X		LAD703 thru LAD7C2	
JJL36250M75		LAD7X3	
JLA26000S17 thru JLA36000S25		LAD8N02	
JLL26000S17 thru JLL36000S25		LAD8N11 thru LAD8N20	
JLL36250M38X		LAD90	
JLL36250M75		LAD92560 thru LAD96560	18-11
JRA36000S17 thru JRA36000S25 JRL36000S17 thru JRL36000S25		LAD96570LAD9ET1	
JRL36250M38X		LAD9P3 thru LAD9P33	10-10 ما -دے 11۔11
KA250RWB thru KA250SWB		LAD9R3	
KAC1BZ thru KDF3PZ	8-3 8-5	LADC22 thru LADN403	18-7 18-8 23-16
KFP		LADR0 thru LADT43	
KI26200() thru KI26250()		LAL34200MC thru LAL34400MC	
Kl36110 thru Kl36250		LAL36000S40X thru LAL36000S60X	
KZ13 thru KZ103		LAL3640022M thru LAL3640036M	7-31, 7-32
L()A36250U31X thru L()A36600U54X	9-29	LC1D09 thru LC1D80008	
L()L36250(C)U31X thru L()L36400(C)U54X		LC1D50 thru LC1D95	
L()L36400M38X thru L()L36600M38X	7-32	LC1DT20 thru LC1DT80A	
L()L36600U31X thru L()L36600U54X		LC1F115 thru LC1F800	
L()L46250(C)U31X thru L()L46400(C)U54X L()L46600U31X thru L()L46600U54X	7-25	LC1K0601 thru LC1K1210 LC1K09004 thru LC1K12004	
L100WDR2M4 thru L100WS2M3		LC26300() thru LC26600()	
L111N thru L221N		LC2D09 thru LC2DT40	18-6
L300WDR2M4 thru L525WDR2M59		LC2K0610 thru LC2K1210	
LA1DX02 thru LA1DZ40		LC36300 thru LC36600	
LA1KN02 thru LA1KN40		LCSADVANCED thru LCSB	5-24
LA1KN023 thru LA1KN407		LDB101 thru LDB8TF	
LA1SK02 thru LA1SK20		LDRB410M thru LDRB8WH	
LA26125() thru LA26400()		LE1D093A62 thru LE2D803A72	
LA2KT2E thru LA2KT2ULA34200MC thru LA34400MC		LGA36000S40X thru LGA36000S60X LGL36000S40X thru LGL36000S60X	
LA34200MC Inru LA34400MC	9-28	LGL36000S40X thru LGL36000S60X LGL36400M37X thru LGL36600M38X	
LA400AWK thru LA400S	9-20 7-56 7-58	LGL46000S40X thru LGL46000S60X	
LA4DA2E thru LA4DE3U		LH26125() thru LH26400()	9-28
LA4DFB thru LA4DLE		LH34200MC thru LH34400MC	9-28
LA4DMK thru LA4DT4U		LH36125 thru LH36400	9-28
LA4DWB		LHL34200MC thru LHL34400MC	
LA4KA1U thru LA4KE1UG	18-27, 23-20	LHL3625025DC thru LHL3640030DC	
LA4SKEIE thru LA4SKEIU		LI26300() thru LI26600()	
LA5D115450 thru LA5D150803		LI36300 thru LI36600	
LA5F115450 thru LA5FH441		LJB12606 thru LJB8X	
LA6DK10LA6DK20		LJL36400M37X thru LJL36600M38X LK100AN thru LK225AN	
LA7D03 thru LA7F902		LK4AD10N thru LK4AP83N	
LA7K0064		LK4DU3CN thru LK4WU3N	
LA8D324	_	LK70AN	
LA9CA06DT thru LA9CA16WT		LKN4AEAH12C	
LA9D09966 thru LA9D09981	18-11, 18-12	LLL36000S40X thru LLL46000S60X	7-34
LA9D11502 thru LA9D80978		LP1K0601 thru LP5K12004	
LA9D90		LP5K1210	
LA9D901		LR2D3522 thru LR2D3563	
LA9D92 thru LA9D93		LR2K0301 thru LR2K0321	
LA9E01 thru LA9E02LA9F103		LR3D01 thru LR3D365 LR9D5367 thru LR9F7581	
LA9F15076 thru LA9F15082		LRA36000S40X thru LRA36000S60X	
LA9F701 thru LA9F709		LRD01 thru LRD4369	
LA9FF601 thru LA9FF602		LRL36000S40X thru LRL36000S60X	
LA9FF970 thru LA9FF982		LRL36400M37X thru LRL36600M38X	
LA9FG601 thru LA9FG602		LRL46000S40X thru LRL46000S60X	
LA9FG970 thru LA9FH4G		LS1D30 thru LS1D323	18-36
LA9FH601 thru LA9FH602		LSDL	
LA9FH976 thru LA9FK4J	•	LT6CT1001 thru LT6CT8001	
LA9FK601 thru LA9FK602		LTM9CE180T	
LA9FK976 thru LA9FK976 LA9FL601 thru LA9FL602		LTM9KCU	
LAST LOUT HIM LASTLOUZ	18-11	LTMCC004	16-87



LTMCU	16-8	25
LTMEV40BD thru LTMEV40FM	10-0	70
LIMEV40BD UITU LIMEV40FM	10-6	50
LTMR08CBD thru LTMR27PFM	16-8	35
LU9GC3	26-1	7
LU9R03 thru LU9R10	16-8	37
LUA1C11 thru LUA1C20	3-12 18-2	ρΩ
LUA4F11 thru LUA4F12	10-2	
LUA4FII IIIIU LUA4FIZ	10-3	)
LUALF1	18-3	30
LUB12 thru LUB32	18-3	32
LUB32NR	16-1	2
LUC05BL thru LUC32BL	10-3	20
LUCA05 thru LUCD1X16-12, 18	10-0	2
LUCAU5 (ITIU LUCD IX16-12, 18	3-28, 18-3	30
LUCD32 thru LUCDX6	16-1	2
LUCM05BL thru LUCM1XBL		
LUFN02 thru LUFN2016	3-12 18-2	8
LUFP1 thru LUFP9	26-1	7
LUEVO # LUEVA 4.0	20-1	. /
LUFV2 thru LUFW10	18-3	SU
LULC07 thru LULC15		
LV429226	7-4	14
LX1D2B5 thru LX1D2Z7	18-1	7
LX1D6B5 thru LX1D8W7	10 1	6
LX 1D6B5 tilru LX 1D6W7	18-1	ø
LX1FF thru LX1FX	18-1	8
LX4D2BD thru LX4D8UD	18-1	9
LX4F8 thru LX4FX	18-2	'n
LX600AWK		10
LX9FF thru LX9FL		
LXD1B7 thru LXD1Z7	18-1	7
LXD3B7 thru LXD3YC7	18-1	R
M800AWK thru M800S	7 56 7 5	0
M800AVVK triru M8005	. 7-56, 7-5	o
M9PAF		
MA1200S	7-5	56
MA1IBA12 thru MA9IMA18	6.	-4
MC3604X		÷
MOOOIMA 40 II - MOOOIMA 04		-/
MCC2IMA12 thru MCC8IMA24	6·	-5
MCM8364	4-1	6
MD3304X	8	-7
		-/
MDS30P	8	_
MDSAN11 thru MDSAN20	8-7, 8-	-8
MDSAN11 thru MDSAN20MFTSECT802000	8-7, 8- 4-1	-8  4
MDSAN11 thru MDSAN20 METSECT802000 MFTSEDM6200 thru MFTSEPM1200	8-7, 8 4-1 4-1	8
MDSAN11 thru MDSAN20 METSECT802000 MFTSEDM6200 thru MFTSEPM1200	8-7, 8 4-1 4-1	8
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016	8-7, 8 4-1 4-1	-8  4  0  4
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 4-1	-8  4  0  4  20
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2	8 4 0 4 20 9
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1	8 4 0 4 20 9 20
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1	8 4 0 4 20 9 20
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2	-8  4  0  4  9  9
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2 9-2	-8  4  0  4  0  9  9  9  9
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2 9-2	8 4 0 9 9 9 9 9 6
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2 9-2 9-2	8 4 0 4 0 9 9 9 9 6 0
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2 9-2 9-2	8 4 0 4 0 9 9 9 9 6 0
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-1 7-2 9-2 9-2 7-2 7-2	8 4 10 19 19 29 29 20 17
MDSAN11 thru MDSAN20	8-7, 8- 4-1 4-1 7-2 7-2 9-2 7-2 7-2 7-2	8 4 0 9 9 9 9 9 7 8
MDSAN11 thru MDSAN20	8-7, 8- 4-1 7-2 7-1 7-2 9-2 9-2 7-1 7-1 7-1 7-1	8404099960783
MDSAN11 thru MDSAN20	8-7, 8- 4-1 7-2 7-1 7-2 9-2 9-2 7-1 7-1 7-1 7-1 7-3	84040999607835
MDSAN11 thru MDSAN20	8-7, 8- 4-1 7-2 7-2 9-2 9-2 7-2 7-1 7-1 7-3	840409996078354
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-27-27-27-27-27-27-17-3	84040999960783548
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-27-27-27-27-27-27-17-3	84040999960783548
MDSAN11 thru MDSAN20	8-7, 8- 4-1 7-2 7-2 7-2 9-2 7-2 7-2 7-1 7-1 7-3 7-4 9-2	84040999607835489
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-29-27-27-17-37-37-47-47-2	840409996078354899
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-29-27-27-17-37-37-47-47-27-47-37-27-47-47-27-27-27-3	84040909960783548996
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-29-27-27-17-37-37-47-47-27-47-37-27-47-47-27-27-27-3	84040909960783548996
MDSAN11 thru MDSAN20	8-7, 84-14-17-27-19-27-27-17-17-27-17-17-27-27-27-27-27-27-27-27-27-27-27-27-2	840409099607835489966
MDSAN11 thru MDSAN20	8-7, 8-4-14-17-29-27-17-27-17-27-17-27-17-27-27-27-17-2	8404090996078354899665
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJA26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL25MB MM200MB MM200MB	8-7, 84-17-29-27-17-27-17-37-17-47-27-17-27-27-27-27-27-27-27-2	8404099960783548996655
MDSAN11 thru MDSAN20  METSECT802000  METSEDM6200 thru METSEPM1200  METSQEM480516 thru METSQEM488016  MG10285 thru MG10287  MG17402 thru MG24562  MG26925 thru MG27150  MGA26300() thru MGA26800()  MGA36300 thru MGA36800  MGL26300 thru MGN26381  MGN1500 thru MGN61431  MGN61500 thru MGN61537  MH26 thru MH86WP  MH26 thru MH86WP  MH26100040DC thru MHL3690039DCH  MHT2DH20  MICROTUSEAL  MJA26300() thru MJA26800()  MJA36300 thru MJA26800()  MJA36300 thru MJA36800  MML26300 thru MJA36800  MML26300 thru MJA36800  MML26300 thru MJA36800  MM125MB  MM200MB  MMBLC  MMHB	8-7, 84-17-29-27-17-17-37-17-27-17-27-27-17-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-2	84040999607835489966555
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJA26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL25MB MM200MB MM200MB	8-7, 84-17-29-27-17-17-37-17-27-17-27-27-17-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-2	84040999607835489966555
MDSAN11 thru MDSAN20  METSECT802000  METSEDM6200 thru METSEPM1200  METSQEM480516 thru METSQEM488016  MG10285 thru MG10287  MG17402 thru MG24562  MG26925 thru MG27150  MGA26300() thru MGA26800()  MGA36300 thru MGA36800  MGL26300 thru MGN26381  MGN61500 thru MGN61431  MGN61500 thru MGN61537  MH26 thru MH86WP  MH26 thru MH86WP  MH26100040DC thru MHL3690039DCH  MHT2DH20  MICROTUSEAL  MJA26300() thru MJA26800()  MJA36300 thru MJA36800  MJL26300 thru MJA36800  MJL26300 thru MJA36800  MM125MB  MM200MB  MMBLC  MMHB  MMBLC  MMHB  MMBLC  MMHB  MMLK250 thru MMLK600	8-7, 84-14-17-29-27-17-17-27-17-27-17-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-27-2	8404090996078354899665555
MDSAN11 thru MDSAN20	8-7, 84-14-17-29-27-17-17-27-17-27-27-17-2	84040909960783548996655555
MDSAN11 thru MDSAN20	8-7, 84-14-17-29-27-17-27-17-27-27-37-27-27-27-27-27-27-27-29-12-6, 2-12-6, 2-12-6, 2-12-6, 2-1	840409099607835489966555555
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGL36800 MGN26380 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MM125MB MM200MB MM200MB MMBLC MMHB  1-22 MMLK250 thru MMLK600 MMLRK MMSAMK MMSK2 thru MMSK4	8-7, 84-17-27-17-27-17-17-27-17-27-17-27-17-27-17-27-17-29-	840409099607835489966555556
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MM125MB MM200MB MM200MB MMBLC MMHB  1-22 MMLK250 thru MMLK600 MMLRK MMSAMK MMSK2 thru MMSK4 MM12NIPEDEXT thru MP43X8PED	8-7, 84-17-27-17-27-17-37-17-27-17-27-17-2	8404090996078354899665555566
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MM125MB MM200MB MM8LC MMHB  MM200MB MMBLC MMHB  MM254 thru MMLK600 MMLK250 thru MMLK600 MMLK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4	8-7, 84-14-17-29-27-17-37-17-27-17-27-17-27-17-27-27-27-27-27-22-6, 2-12-6, 2-12-6, 2-12-2, 2-12-12-1	-8 4 0 4 0 9 0 9 9 9 6 0 7 8 3 3 5 4 8 9 9 9 6 6 5 5 5 5 5 5 6 6 6 5
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MJL26300 thru MJA36800 MM125MB MM200MB MM8LC MMHB  MM200MB MMBLC MMHB  MM254 thru MMLK600 MMLK250 thru MMLK600 MMLK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4	8-7, 84-14-17-29-27-17-37-17-27-17-27-17-27-17-27-27-27-27-27-22-6, 2-12-6, 2-12-6, 2-12-2, 2-12-12-1	-8 4 0 4 0 9 0 9 9 9 6 0 7 8 3 3 5 4 8 9 9 9 6 6 5 5 5 5 5 5 6 6 6 5
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MJL26300 thru MJA36800 MM125MB MM200MB MMBLC MMHB  MMBLC MMHB  MMSAMK MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MP86200 MPH22125 thru MP86200 MPH22125 thru MP866200	8-7, 84-14-17-27-17-27-17-37-17-17-17-27-17-27-17-27-17-2	-8 4 0 0 4 0 0 9 9 9 9 9 9 9 9 9 9 9 9 9 9
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN1500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MH26100040DC thru MHL3690039DCH MH72DH20 MICROTUSEAL MJA26300() thru MJA26800() MJA36300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJL36800 MMM125MB MM200MB MMBLC MMHB MM20MB MMBLC MMHB MM2015 thru MMLK600 MMLRK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAMK MMSAE thru MMSK4 MP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPH22125 thru MPR86200 MPH22125 thru MPR86200	8-7, 84-14-17-29-27-17-17-27-17-17-27-17-27-17-27-27-27-27-22-6, 2-12-6, 2-12-6, 2-12-6, 2-12-6, 2-12-6, 2-12-7	-8 4 0 0 4 0 0 9 9 9 9 9 9 9 9 9 9 9 9 9 9
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN1500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MH26100040DC thru MHL3690039DCH MH72DH20 MICROTUSEAL MJA26300() thru MJA26800() MJA36300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML26300 thru MJA36800 MML25MB MM200MB MMBLC MMHB MM20MB MMBLC MMHB MM20T MMLK600 MMLRK MMSAMK MMSK2 thru MMKK4 MMSAMK MMSK2 thru MMSK4 MMSAMK MMSK2 thru MMSK4 MP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPH2512 thru MPSF26	8-7, 84-14-17-29-27-17-17-27-17-27-17-27-17-27-27-27-22-6, 2-1	-84040909996078335489996-655555-6-6-5-5-11-6
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGL36800 MGN26380 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MH26 thru MH86WP  MHZ6300() thru MJA26800() MJA26300() thru MJA26800() MJA26300() thru MJA26800() MJA26300 thru MJA26800() MJA26300 thru MJA26800() MJA26300 thru MJA26800 MM125MB MM200MB MMBLC MMHB  MM20MB MMBLC MMHRK MMSK2 thru MMSK4 MMSK2 thru MP86200 MPPAF MSF12 thru MPSF26 MPX81542	8-7, 84-14-17-27-17-27-17-37-17-27-17-27-17-27-17-2	-840409099660783354899966555556665551168
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGL36800 MGN26380 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MH26 thru MH86WP  MHZ6300() thru MJA26800() MJA26300() thru MJA26800() MJA26300() thru MJA26800() MJA26300 thru MJA26800() MJA26300 thru MJA26800() MJA26300 thru MJA26800 MM125MB MM200MB MMBLC MMHB  MM20MB MMBLC MMHRK MMSK2 thru MMSK4 MMSK2 thru MP86200 MPPAF MSF12 thru MPSF26 MPX81542	8-7, 84-14-17-27-17-27-17-37-17-27-17-27-17-27-17-2	-840409099660783354899966555556665551168
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA36800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MH26 thru MH86WP MH26400() thru MJA26800() MJA36300 thru MJA26800() MJA26300() thru MJA26800() MJA26300() thru MJA26800() MJA26300 thru MJA26800() MJA36300 thru MJA36800 MML25MB MM200MB MMBLC MMHB MM20MB MMBLC MMHB MM2125 thru MMK600 MMLRK MMSAMK MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPRPAF MPSF12 thru MPSF26 MPX81542 MPZ10S40F thru MPZB7S40FSS	8-7, 84-14-17-29-27-17-17-27-17-27-17-2	-8 4 0 0 4 00 9 00 99 96 00 7 18 3 3 5 4 18 99 9 6 6 6 5 5 5 5 5 6 6 6 6 5 5 5 1 6 6 6 5 5 5 5
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGL36800 MGN26380 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP 9-6 MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJA36300 thru MJA36800 MJ126300 thru MJA36800 MM125MB MM200MB MMBLC MMHB 1-22 MMLK250 thru MMLK600 MMLRK MMSK2 thru MMSK4 MMSK2 thru MMSK4 MP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPPAF MPSF12 thru MP8F26 MPX81542 MPZ10S40F thru MPZB7S40FSS 14 MTX836 thru MTX866	8-7, 84-17-27-17-27-17-17-27-17-27-17-27-17-2	-8 4 0 0 4 00 9 00 99 96 00 7 8 3 3 5 4 8 9 99 96 6 5 5 5 5 5 5 6 6 6 5 5 5 1 6 6 6 5 5 5 5
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MM125MB MM200MB MMBLC MMHB  MM200MB MMBLC MMHB  MM200MB MMBLC MMHB MM2015 thru MMK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSAMK MMSK2 thru MMSK4 MMSAMK MMSAMK MMSK2 thru MMSK4 MMSAMK MMSK2 thru MMSK4 MP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPH22125 thru MP86200 MPRAF MPSF12 thru MPSF26 MPX81542 MPZ10S40F thru MPZB7S40FSS  12 MTX836 thru MTX866 N100MFI	8-7, 84-14-17-27-17-27-17-27-17-27-17-27-17-29-22-6, 2-12-6, 2-12-6, 2-12-6, 2-1	-8 4 0 0 4 00 9 00 9 9 9 6 00 7 8 3 3 5 4 8 9 9 9 6 6 5 5 5 5 5 5 6 6 6 5 5 5 1 6 8 3 8 3
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MH26100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MJL26300 thru MJA36800 MML26300 thru MJA36800 MML25MB MM200MB MMBLC MMHB MM25MB MM8LC MMHB MMSK2 thru MMLK600 MMLK250 thru MMLK600 MMLK4550 thru MMLK600 MMLK4550 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK4 MMSK4 MMSK4 MMSK5 thru MMSK4 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MPSF5 MP21125 thru MPSF5 MP2115 thru MPSF5 MP2115 thru MPSF5 MPSF12 thru MPSF5 MPSF12 thru MPSF5 MPSF15 thru MPSF5 MPSF15 thru MPSF5 MPSF15 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF17 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF17 thru MPSF5 MPSF17 thru MPSF5 MPSF18 thru MPSF5 MPSF1	8-7, 84-14-17-27-17-27-17-37-17-27-17-27-17-17-17-27-27-27-27-27-27-27-17-17-27-27-27-27-27-27-27-27-27-27-27-27-27-29-19-19-19-19-5, 9-1	-8 4 0 4 0 9 0 9 9 6 0 7 8 3 3 5 4 8 9 9 9 6 6 5 5 5 5 5 6 6 6 5 5 1 6 6 8 3 8 3 3 3
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN26381 MGN61500 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP  MHL36100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MM125MB MM200MB MMBLC MMHB  MM200MB MMBLC MMHB  MM200MB MMBLC MMHB MM2015 thru MMK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSAMK MMSK2 thru MMSK4 MMSAMK MMSAMK MMSK2 thru MMSK4 MMSAMK MMSK2 thru MMSK4 MP12X11PEDEXT thru MP43X8PED MP22125 thru MP86200 MPH22125 thru MP86200 MPH22125 thru MP86200 MPRAF MPSF12 thru MPSF26 MPX81542 MPZ10S40F thru MPZB7S40FSS  12 MTX836 thru MTX866 N100MFI	8-7, 84-14-17-27-17-27-17-37-17-27-17-27-17-17-17-27-27-27-27-27-27-27-17-17-27-27-27-27-27-27-27-27-27-27-27-27-27-29-19-19-19-19-5, 9-1	-8 4 0 4 0 9 0 9 9 6 0 7 8 3 3 5 4 8 9 9 9 6 6 5 5 5 5 5 6 6 6 5 5 1 6 6 8 3 8 3 3 3
MDSAN11 thru MDSAN20 METSECT802000 METSEDM6200 thru METSEPM1200 METSQEM480516 thru METSQEM488016 MG10285 thru MG10287 MG17402 thru MG24562 MG26925 thru MG27150 MGA26300() thru MGA26800() MGA36300 thru MGA36800 MGL26300 thru MGN26381 MGN61300 thru MGN61431 MGN61500 thru MGN61537 MH26 thru MH86WP MH26100040DC thru MHL3690039DCH MHT2DH20 MICROTUSEAL MJA26300() thru MJA26800() MJJ26300 thru MJA36800 MJL26300 thru MJA36800 MML26300 thru MJA36800 MML25MB MM200MB MMBLC MMHB MM25MB MM8LC MMHB MMSK2 thru MMLK600 MMLK250 thru MMLK600 MMLK4550 thru MMLK600 MMLK4550 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK2 thru MMSK4 MMSK4 MMSK4 MMSK4 MMSK5 thru MMSK4 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MMSK5 MMSK5 thru MPSF5 MP21125 thru MPSF5 MP2115 thru MPSF5 MP2115 thru MPSF5 MPSF12 thru MPSF5 MPSF12 thru MPSF5 MPSF15 thru MPSF5 MPSF15 thru MPSF5 MPSF15 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF17 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF16 thru MPSF5 MPSF17 thru MPSF5 MPSF17 thru MPSF5 MPSF18 thru MPSF5 MPSF1	8-7, 84-14-17-27-17-27-17-27-17-27-17-27-17-27-17-29-19-19-19-19-5, 9-19-5, 9-1	8404090999607833548999665555566655116838333

Aipha-Numenc Listin	_
NC26() thru NC86V()HR9-6, 9-7, 9-1	3
NC59TS thru NC85TS	
NCTWIRING	8
NF1000G3 tillu NF1000G3N2	4
NF120PSG3 thru NF120PSG3L 5-2	24
NF125FTL thru NF125SFL9-1	4
NF12RDE9-1	4
NF12SBLG3 thru NF12SBRG35-2	4:
NF18RDE	4
NF2000G3	.4 ) <u>/</u>
NF204OE thru NF204S	4
NF21SBLG3 thru NF21SBRG35-2	24
NF240PSG3 thru NF240PSG3L5-2	<u>'</u> 4
NF250FTL thru NF250SFL	4
NF277PSG3 thru NF277PSG3L 5-2 NF2HG3 5-2	:4
NF3000G3 thru NF3000G3C	:4 )/
NF400FTL thru NF400SFL 9-1	4
NF418L1 thru NF484L6C9-1	3
NF500G3	4
NF600SFBH thru NF600SFBJ9-1	4
NF6RDE	4
NFADAPTERG35-2	o N
NFALV1 thru NFALV69-1	4
NFASBKG35-2	24
NFCUM1 thru NFCUM69-1	4
NFCUV1 thru NFCUV6	4
NFDP1120G3C thru NFDR277G3C5-2	.5
NFFP15 9-1 NFFPCG3 5-2	4
NFN1CU thru NFN6CU 9-1	4
NFNL1 thru NFNL4 9-1	4
NFSELG35-2	24
NFSN06 thru NFSN505-2	:4
NJPAF	.1
NQ1020E thru NQ10259- NQ12RDE9-	.y .a
NQ18L1 thru NQ18L1C	-7
NQ18L1C149-	-8
NQ18RDE	.9
NQ2040E thru NQ204S9-	
NQ24RDE	.9
NQ30L1C14 thru NQ464L6C	. / . 8
NQ6RDE 9-	
NQ72L2 thru NQ84L6C9-6, 9-	·7
NQB532 thru NQB5509-	-8
NQC20FWG thru NQC30FWG1-1	1
NQC32 thru NQC449-	
NQC550	
NQFTL2H thru NQFTL4L 9-	.9
NQMB2HJ thru NQMB4LA9-7, 9-	-8
NQN1CU thru NQNL49-	.9
NQSFB2Q thru NQSFB4Q9-	.9
NQSFL1 thru NQSFL4	.9
NSY2SP204 thru NSY2SP228	·4 .5
NSYCRN106250 thru NSYCRNG86400	-6
NSYEC1041 thru NSYEC1661 28-4, 28-	-5
NSYEC351 thru NSYEC881	-5
NSYMM1010 thru NSYMM304528-6, 28-	.7
NSYMM106 thru NSYMM128	.7
NSYMM22 thru NSYMM88	.5
NSYMP126 thru NSYMP228	-5
NSYPLA10103 thru NSYPLM86V28-	-7
NSYPLMEX108 thru NSYPLMEX8628-	-7
NSYS3DC101030 thru NSYS3X883028-	-6
NSYSF12640 thru NSYSF188602D	.4
NSYSF201040 thru NSYSF2016602D	.5 ./
NSYSF206402D thru NSYSF22880	<del>4</del> 5
NSYSM1210302D thru NSYSM18860	.4
	•

Alpha-Numeric Index



NSYSM2010402D thru NSYSM2016502D ......28-5 NSYSM20630 thru NSYSM20860.....28-4, 28-5 NSYSPF10100 thru NSYSPS8100 ......28-4, 28-5 PK15GTA6......1-5 NTMPRRT......7-50 NTX836 thru NTX866 9-18 NW08H1 thru NW60L1......11-6 NW08HDC thru NW40NDC......7-36 PK2SCPV ...... 1-22 NWMPRRT thru NWNTMPRRT......7-50 PK3GTA1......1-5, 1-7, 3-3 OCK400......1-22 PK3MB......1-12 OHBL thru OHBS ......1-22 OHBL IIIIU OHBS 1-22
OPTICALPROBEUSB 4-13
P()A36025(C)U31A thru P()A36120U74AE1 9-30
P()L36025(C)U31A thru P()L36120(C)U74AE1 7-27
P1200AWK thru P1200S 7-56, 7-58
PAF361200DC thru PAF362000DC 7-35 PK4GTA thru PK27GTA ...... 1-6, 1-11 PK4MB2HA thru PK4MB2LA 1-12 PK5RK 1-12 PAK1004CGFI thru PAK76CGFI......1-26 PK6FL thru PK8FL...... 1-13 PB100EC thru PB225WF.......12-2 PKGTAB ...... 1-13, 5-18, 9-8 PBCF3A100CR thru PBCF5A225TB ...... 12-2 PBCP3A100ST048 thru PBCP5A225ST120......12-2 PBFO100FA thru PBP54100QO ......12-3 PKOGTA2......3-3, 3-11, 7-58 PBPFA3A100 thru PBPFA5A100A100 ...... 12-3 PKOGTA4.......7-58 PBPIOCVR......12-2 PBPQO3A100 thru PBPQO5A100......12-3 PBPQOR3A100 thru PBPQOR5A100M420B ......12-3 PBPTB3A100 thru PBPTB5A100.......12-3 PBQ3640G thru PBQ4660G ......12-9 PLL34080M68 thru PLL34120M70 ...... 7-31 PM210......4-14 PBRFLKIT ...... 12-3 PBTB306G thru PBTB506G......12-4 PM710 thru PM8RDA ...... 4-10 PS080 ...... 4-11 PCS050D5CE30 thru PCS050D5N12.......4-34 PS24 4-15 PS3220G thru PS4620G 12-9 PCS078D6CE30 thru PCS078D6N12......4-35 PSDS ...... 1-12, 1-13 PCS100D5CE30 thru PCS100D5N12......4-34 PCS101 ...... 5-24 PCS235D6CE30 thru PCS235D6N12.......4-35 PTPG36040G()U31A thru PTPG36120GN()U44A ...... 12-13 PTPG36040G()U31A thru PTPG36120GN()U44A 12-13
PTPJ36040G()U31A thru PTPJ36120GN()U44A 12-13
PTQ36100G() thru PTQ4680G() 12-9
PTRG36080G()U31A thru PTRG36160GN()U44A 12-14
PTRJ36080G()U31A thru PTRJ36160GN()U44A 12-14
PTRL36080G()U31A thru PTRL36160GN()U44A 12-14
PTT23WG thru PTT44WG 12-14 PFA32015G thru PFA36100G.......12-9 PFCD1002 thru PFCD2100......4-29 PFCD4006 thru PFCD6175......4-30 PFH360100GN thru PFH36100G......12-9 PFI34020G thru PFI34100GN...... 12-10 PHD36015G thru PHD36060GN......12-11 PHD36060GNU31X thru PHD36060GU44X......12-12 PHD36070G thru PHD36100GN......12-11 PHD36100GNU31X thru PHD36100GU44X...... 12-12 PHD36125G thru PHD36150GN......12-11 PHD36150GNU31X thru PHD36150GU44X.......12-12 PHG36015G thru PHG36060GN ...... 12-11 PHG36060GNU31X thru PHG36060GU44X ...... 12-12 QBL32070 thru QBL32250 ...... 1-25, 7-24 QBMIK 7-41
QBP22070TM thru QBP32070TM 2-6, 2-15
QBP32080TM thru QBP32225TM 2-15 QBPA thru QBPAF......7-41 QC816F100CH thru QC816F150SL 1-19 QC816F150SLS thru QC816F150SS 1-24 QC816F200CH thru QC816F200SL 1-19 QC816F200SLS thru QC816F200SS 1-24 PHJ36125G thru PHJ36150GN ...... 12-11 PHJ36150GNU31X thru PHJ36150GU44X ...... 12-12 PHL36015G thru PHL36060GN ...... 12-11 QCGK3 ...... 1-22 QDA22070() thru QDA32225() 9-25 QDL22070 thru QDL22250 1-22, 1-25, 7-24 PHL36060GNU31X thru PHL36060GU44X ...... 12-12 PHL36070G thru PHL36100GN ...... 12-11 PHL36100GNU31X thru PHL36100GU44X ...... 12-12 PIU2IMA16 thru PIU8IMA24 ......6-5, 12-10 PJA26000S10() thru PJA36000S80.......9-29 PJD36175G thru PJD36250GN ...... 12-11 PJD36250GNU31X thru PJD36250GNU31X...... 12-12 QH115 thru QH330 ...... 1-2, 7-10 PJJ36175G thru PJJ36250GN ...... 12-11 QHB115 thru QHB330 ...... 9-10 PJJ36250GNU31X thru PJJ36250GU44X ...... 12-12 PJL26000S10 thru PJL36000S80.......7-34



0.11.0000000000000000000000000000000000		
QJL32070 thru QJL322501-8,	1-25, 7-24	4
QJP22070TM thru QJP22225TM	2-6 2-14	5
O IDOOGTOTALL O IDOOGGETM	2 0, 2 10	_
QJP32070TM thru QJP32225TM	2-1	c
QMB100B	9-3!	5
QMB1IMA12 thru QMB1IMA24		=
QIVID TIIVIA 12 LITIU QIVID TIIVIA24		2
QMB200EK1 thru QMB264W	9-3	5
QMB2IMA12 thru QMB2IMA24	6-4	5
QMB300EK1 thru QMB300EK2		_
QIVIB300EKT INTU QIVIB300EKZ	9-3:	)
QMB30R	12-9	9
QMB321HW thru QMB367W	0-31	=
QIVID32111VV IIII QIVID307VV	9-0	_
QMB36R	. 9-35, 12-9	9
QMB3IMA12 thru QMB3IMA24	6-4	5
QMB4060R	0.05.10.0	~
QIVID4U0UN	.9-35, 12-8	9
QMB4IMA12 thru QMB4IMA24	6-{	5
QMB60R	9-35 12-0	a
OMBOOD CHARGOD	. 3-00, 12-0	_
QMB60RQMB36R	9-3:	2
QMB610EK1 thru QMB610EK2	9-3!	5
QMB8IMA12 thru QMB8IMA24	6 1	=
QIVIDOTIVIA 12 LITTU QIVIDOTIVIA24	0-3	)
QMJ361T thru QMJ366	13028	3
QO110 thru QO1701-2,	1-22 7-10	ኅ
QO 110 tillu QO 170	1-22, 7-10	•
QO110K thru QO130K	1-3, 7-1	1
QO11220M100C	1-1(	)
QO11224L125G	4 /	=
QU11224L123G	1-3	)
QO11224L125GC	1-10	C
QO11224L125GRB	1.1	7
001122411230110		'.
QO11224L125WG		
QO112L125G	1-4	5
001121200		ζ
QO112L125GC	1-10	J
QO112L125GRB	1-7	7
QO112L200G	1 1	=
QO112L200GRB	1-7	7
QO112M100	1-6	ጓ
QO112M100C		
QO112M100RB		
QO11428MX150FTRB thru QO11428UX200FTRB	1_0	2
QOTT420WAT30FTND IIIU QOTT4200A200FTND		
QO115CAFI thru QO120CAFI	1-3, 7-1 <sup>-</sup>	1
0011		
OO115EPD thru OO130EPD	1-3 7-11	1
Q0115EPD thru Q0130EPD	1-3, 7-1	1
QQ115GFI thru QQ130GFI	1-3. 7-1	1
QO115GFI thru QO130GFI	1-3, 7-1	1
QO115GFI thru QO130GFI	1-3, 7-1	1
QO115GFI thru QO130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1	1
QO115GFI thru QO130GFIQO115HID thru QO150HIDQO115HM thru QO120HMQO115PLILC.	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-1	1 1 1 7
QO115GFI thru QO130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7	1 1 7 7
QO115GFI thru QO130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7	1 1 7 7
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7 1-22, 7-1( 1-3, 7-1	1 1 7 7 1
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7 1-22, 7-10 1-3, 7-1	1 1 7 7 1 1
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7 1-22, 7-10 1-3, 7-1	1 1 7 7 1 1
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-7 1-22, 7-10 1-3, 7-1	1 1 7 7 1 1
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29-1 1-22, 7-10 1-3, 7-1 1-3, 7-1 1-1	111701157
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29- 1-22, 7-10 1-3, 7-1 1-3, 7-1 1-1	1117011575
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29- 1-22, 7-10 1-3, 7-1 1-3, 7-1 1-1	1117011575
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29- 1-22, 7-1 1-3, 7-1 1-3, 7-1 1-5	11170115756
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29- 1-22, 7-1 1-3, 7-1 1-3, 7-1 1-1 1-1	111701157560
Q0115GFI thru Q0130GFI	1-3, 7-1 1-3, 7-1 1-3, 7-1 29- 1-22, 7-1 1-3, 7-1 1-3, 7-1 1-1 1-1	111701157560
Q0115GFI thru Q0130GFI	1-3, 7-1:1-3, 7-1:1-3, 7-1:29-; 1-22, 7-1(1-3, 7-1:1-3, 7-1:1-4;1-6:1-6:1-6:1-6:1-1	1117011575607
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-; 1-22, 7-1(1-3, 7-11-3, 7-11-11-11-11-1	11170115756075
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-; 1-22, 7-1(1-3, 7-11-3, 7-11-11-11-11-1	11170115756075
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-3, 7-11-11-61-1	111701157560751
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-1	1117011575607515
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-1	11170115756075156
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-1	11170115756075156
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-11-1	111701157560751560
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-11-11-11-11-11-11-11-11-11-11-1	1117011575607515607
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-11-1	11170115756075156076
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-11-11-11-11-11-11-11-11-1	11170115756075156076
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-11-61-11-11-11-11-11-11-11-1	111701157560751560760
Q0115GFI thru Q0130GFI Q0115HID thru Q0150HID Q0115HM thru Q0120HM Q0115PLILC Q0115VH thru Q0130VH Q0115VHGFI thru Q0120VHCAFI Q0115VHGFI thru Q0130VHGFI Q011624L125G Q011624L125GRB Q011624L125GRB Q0116M100 Q0116M100C Q0116M100RB Q012030L125VG Q012030L15OG Q012030M150 Q012030M150C Q012030M150C Q012040M200C Q012040M200C Q012040M200C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-3, 7-11-1	1117011575607515607607
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100RB QO12030L125G QO12030L15OG QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200RB QO12040M200C QO12040M200RB	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-1	11170115756075156076075
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100RB QO12030L125G QO12030L15OG QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200RB QO12040M200C QO12040M200RB	1-3, 7-11-3, 7-11-3, 7-129- 1-22, 7-101-3, 7-11-3, 7-11-1	11170115756075156076075
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-1	111701157560751560760750
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129 1-22, 7-101-3, 7-11-3, 7-11-11-61-1	1117011575607515607607506
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129 1-22, 7-101-3, 7-11-3, 7-11-11-61-1	1117011575607515607607506
Q0115GFI thru Q0130GFI Q0115HID thru Q0150HID Q0115HM thru Q0120HM Q0115PLILC Q0115VH thru Q0130VH Q0115VHGFI thru Q0120VHCAFI Q0115VHGFI thru Q0130VHGFI Q011624L125G Q011624L125GRB Q0116L125G Q0116M100 Q0116M100C Q0116M100RB Q012024L125G Q012030L125WG Q012030L15VG Q012030M150C Q012030M150RB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012030M15ORB Q012040M200C Q012040M200RB Q01201205GC Q0120M100	1-3, 7-11-3, 7-11-3, 7-129-7 1-22, 7-101-3, 7-11-3, 7-11-11-61-1	11170115756075156076075060
Q0115GFI thru Q0130GFI	1-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-3, 7-11-1	111701157560751560760750607
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO11624L125GRB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO1205CC QO1205CC QO1205CC QO1205M100C QO1205M100C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200RB QO120125GC QO120M100C QO120M100C QO120M100C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-1	1117011575607515607607506077
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO11624L125GRB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO1205CC QO1205CC QO1205CC QO1205M100C QO1205M100C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200RB QO120125GC QO120M100C QO120M100C QO120M100C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-1	1117011575607515607607506077
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GBB QO11624L125GBB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO1205M100C QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-3, 7-11-1	11170115756075156076075
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO11624L125GRB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150C QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO1203M10O QO12040M200C QO12040M100C QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120M100RB QO120PLILC QO12436M200TFT	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-3, 7-11-1	111701157560751560750607756
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GBB QO11624L125GBB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO1205M100C QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-3, 7-11-1	111701157560751560750607756
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GBB QO116L125G QO116M100C QO116M100C QO116M100RB QO12030L125WG QO12030L15OG QO12030M150C QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO12040M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO12436L200TFT QO12436M200TFT	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-1 .	11170115756075156076077565
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115VH thru QO130VH QO115VHCAFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L125WG QO12030L150G QO12030M150C QO12030M150C QO12030M150RB QO12040M200 QO12040M200C QO12040M200C QO12040M200RB QO120125GC QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C QO120M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO1204M100C QO12436L200TFT QO12436M200TFT QO12436M200TFT QO12436M200TFT	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-1 .	11170115756075156076075060775657
Q0115GFI thru Q0130GFI Q0115HID thru Q0150HID Q0115HM thru Q0120HM Q0115PLILC Q0115VH thru Q0130VH Q0115VHGFI thru Q0120VHCAFI Q0115VHGFI thru Q0130VHGFI Q011624L125G Q011624L125GRB Q011624L125GRB Q0116M100 Q0116M100C Q0116M100RB Q012024L125G Q012030L125WG Q012030L150G Q012030M150C Q012030M150RB Q012030M150RB Q012040M200 Q012040M200C Q012040M200C Q012040M200RB Q0120125GC Q01201125GC Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100RB Q01204M200TFT Q012436L200TFT Q0124436M200TFT Q0124125GRB Q0124L125G	1-3, 7-11-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-1	111701157560751560760750607756575
Q0115GFI thru Q0130GFI Q0115HID thru Q0150HID Q0115HM thru Q0120HM Q0115PLILC Q0115VH thru Q0130VH Q0115VHGFI thru Q0120VHCAFI Q0115VHGFI thru Q0130VHGFI Q011624L125G Q011624L125GRB Q011624L125GRB Q0116M100 Q0116M100C Q0116M100RB Q012024L125G Q012030L125WG Q012030L150G Q012030M150C Q012030M150RB Q012030M150RB Q012040M200 Q012040M200C Q012040M200C Q012040M200RB Q0120125GC Q01201125GC Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100C Q0120M100RB Q01204M200TFT Q012436L200TFT Q0124436M200TFT Q0124125GRB Q0124L125G	1-3, 7-11-3, 7-11-3, 7-11-3, 7-129-1 1-22, 7-101-3, 7-11-1	111701157560751560760750607756575
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100 QO116M100C QO116M100RB QO12024L125G QO12030L125WG QO12030L150G QO12030M150C QO12030M150RB QO12040M200 QO12040M200C QO12040M200C QO12040M200RB QO120L125G QO120L125G QO120L125G QO120L125G QO120H100C QO120M100C QO120M100C QO120M100RB QO120H10C QO120M10ORB QO1204M10OC QO120M10ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M100C QO120M100RB QO120H125GC QO120M100RB QO120H10C QO12436M200TFT QO12436M200TFT QO12436M200TFT QO124L125GRB QO124L125GRB QO124L150G	1-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-1	1117011575607515607607506077565756
Q0115GFI thru Q0130GFI Q0115HID thru Q0150HID Q0115HM thru Q0120HM Q0115VHLC Q0115VH thru Q0130VH Q0115VHGFI thru Q0120VHCAFI Q0115VHGFI thru Q0130VHGFI Q011624L125G Q011624L125GRB Q0116H100 Q0116M100 Q0116M100C Q0116M100C Q0116M100RB Q012030L125WG Q012030L125WG Q012030L150G Q012030M150C Q012030M150RB Q012030M150RB Q012040M200C Q012040M200C Q012040M200C Q0120L125GC Q0120M100C Q0120M100C Q0120H10C Q0120M10C	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-1, 7-11-1	11170115756075156075060775657566
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100 QO116M100C QO116M100RB QO12024L125G QO12030L125WG QO12030L150G QO12030M150C QO12030M150RB QO12040M200 QO12040M200C QO12040M200C QO12040M200RB QO120L125G QO120L125G QO120L125G QO120L125G QO120H100C QO120M100C QO120M100C QO120M100RB QO120H10C QO120M10ORB QO1204M10OC QO120M10ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M20ORB QO1204M100C QO120M100RB QO120H125GC QO120M100RB QO120H10C QO12436M200TFT QO12436M200TFT QO12436M200TFT QO124L125GRB QO124L125GRB QO124L150G	1-3, 7-11-3, 7-11-3, 7-11-3, 7-1 1-22, 7-101-3, 7-11-1, 7-11-1	11170115756075156075060775657566
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO11624L125GRB QO116M100 QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12030M10C QO12040M200RB QO1201125GC QO120M100C QO120M100C QO120M100RB QO1204M100C QO120M100C QO120M100C QO120M100RB QO1204H125GC QO120M100RB QO1204H100 QO124436L200TFT QO12436M200TFT QO124436M200TFT QO1244M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M125GRB QO124H150G QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M100 QO124M125RB	1-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-	11170115756075156076075060775667
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150C QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO1204M100RB QO1202H125GC QO1203M10ORB QO1204UNEONC QO1204M10ORB QO1204UNEONC QO1204M10OC QO1204M10ORB QO1204UNEONC QO1204M10ORB QO1204M10ORB QO1204M10OC QO120M10ORB QO1204M10ORB QO1204M10ORB QO1204H125GC QO124H125GR QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124M10O QO124M125 QO124M10O QO124M125 QO124M10O QO124M125 QO124M125RB	1-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-3, 7-11-1	111701157560751560760750607756676676
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100RB QO12030L125WG QO12030L15OG QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO120BIDEC QO120M100 QO120HIC QO120M100 QO120HIC QO120M100C QO124M125GR QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124M125BB QO124M125RB QO124M125RB	1-3, 7-11-3, 7-11-3, 7-11-3, 7-129-7 1-22, 7-101-3, 7-11-1, 7-11-1	11170115756075156075060775657566766
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100C QO116M100RB QO12030L125WG QO12030L150G QO12030M150 QO12030M150C QO12030M150RB QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO1204M100RB QO1202H125GC QO1203M10ORB QO1204UNEONC QO1204M10ORB QO1204UNEONC QO1204M10OC QO1204M10ORB QO1204UNEONC QO1204M10ORB QO1204M10ORB QO1204M10OC QO120M10ORB QO1204M10ORB QO1204M10ORB QO1204H125GC QO124H125GR QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124M10O QO124M125 QO124M10O QO124M125 QO124M10O QO124M125 QO124M125RB	1-3, 7-11-3, 7-11-3, 7-11-3, 7-129-7 1-22, 7-101-3, 7-11-1, 7-11-1	11170115756075156075060775657566766
QO115GFI thru QO130GFI QO115HID thru QO150HID QO115HM thru QO120HM QO115PLILC QO115VH thru QO130VH QO115VHGFI thru QO120VHCAFI QO115VHGFI thru QO130VHGFI QO11624L125G QO11624L125GRB QO116L125G QO116M100C QO116M100RB QO12030L125WG QO12030L15OG QO12030M150 QO12030M150C QO12030M150C QO12040M200C QO12040M200C QO12040M200C QO12040M200C QO120BIDEC QO120M100 QO120HIC QO120M100 QO120HIC QO120M100C QO124M125GR QO124L125GRB QO124L125GRB QO124L125GRB QO124L125GRB QO124M125BB QO124M125RB QO124M125RB	1-3, 7-11-3, 7-11-3, 7-11-3, 7-129 1-22, 7-101-3, 7-11-3, 7-11-11-61-11-61-1	111701157560751560760750607756575667661

Alpha-Numeric Listing
QO13040L200GC 1-10
QO13040L200GRB
QO13040L200WG1-11
QO13040M2001-6
QO13040M200C1-10
QO13040M200GRB
Q0130L150G
Q0130L150GRB
QO130L150TC
QO130L200GRB
QO130M150
QO130M150C1-10
QO130M150RB
QO130M200
QO130M200C
QO132L125G
QO132M100
QO132M1251-6
QO132M125C1-10
Q0132M150
QO13842MX150 thru QO13842UX225
QO14060L200GRB
QO14060M200
QO14060M200RB1-7
QO140L200G1-5
Q0140L200GRB
QO140M200C 1-16
QO140M200C
QO140M225
QO14252L200G1-5
QO14252L200GRB1-7
QO14252M200
Q014252M200RB
QO142L225G
QO142M200
QO142M200RB1-7
QO142M2251-6
QO142M225RB
QO1515 thru QO1520
QO1612M125FTRB 1-7
QO1816M150FTRB thru QO1816M200FTRB1-7
QO1DM10020TRBR thru QO1DM10050TRBR
QO1HPL
Q01PAF
Q01SE
QO200 thru QO290
QO2000 thru QO22001-2, 1-22, 7-10
QO2000NRB thru QO200TRNM
QO2100VH thru QO2200VH1-2, 1-22, 7-10
QO210SWN thru QO250SWN
QO2125BNRB1-25
QO2125SL
Q0215EPD thru Q0260EPD
QO215GFI thru QO260GFI
QO215HID thru QO250HID
QO215VH thru QO290VH1-2, 7-10
QO2175SB1-12, 6-8
QO2225SL
QO230PLILC
QO240PLILC
QO24L60NRNM
QO24L70RB
QO24L70TS1-10
Q0250PLILC
QO260NATR thru QO260NATS
QO2DTI thru QO2DTIM



QO2L30S	1-5	QOU110 thru QOU3100	7-14
QO2L30TTS	1-10	QOU115HM thru QOU120HM	
QO2L40RB	1-7	QOU115VH thru QOU330VH	7-14
QO2PAF	1-4, 7-12, 9-9	QOU14100BAFB thru QOU14100JBAF	7-15
Q02TR	1-25	QOU16150BAFB thru QOU16150JBAF	
QO300	1-2, 7-11	QOU1CMSB thru QOU1PL	7-15
QO3000 thru QO3100	1-2. 7-10	QOU200 thru QOU30001	7-14
QO3100BNRB		QOU215H thru QOU230H	7-14
QO3100VH		QOU2DTILA thru QOU2PAFLA	
QO310SWN thru QO350SWN	1-3 7-11	QOUCP2 thru QOUCP6B	7-15
QO3125SL	1-4 7-19	QOUEC thru QOUECB	
QO312L125G thru QO312L125GRB	1-4, 7-12	QOUFR thru QOUFRB	
QO315EPD thru QO350EPD		QOUHFSC1 thru QOUHFSC1B	
Q0315EPD tillu Q0350EPD	1-3, 7-11, 9-10		
QO315EPE thru QO350EPE		QOULFSC1 thru QOULFSC1B	
QO315GFI thru QO350GFI		QOUMF1 thru QOUMFS1B	
QO315HID thru QO330HID	1-3, /-11	QOURT thru QOURTB	
QO315VH thru QO390VH		QOVP1 thru QOVP10	1-11
QO318L200G thru QO318L200GRB		QU12L400CL thru QU12L400SL	
QO320L125G thru QO320L125GRB		QU816D400CK thru QU816D400SL	
QO324L125G		QUM400CK thru QUM400CL	1-21
QO327M100 thru QO327M100RB		QYU110 thru QYU130	7-14
QO330L200G thru QO330MQ200RB		R()A36100CU31A thru R()A36120CU74AE1	9-30
QO342L225G thru QO342MQ225RB	1-8	R()F36060(C)U31A thru Ř()F36300(C)U74AE1	7-28
QO3HT	7-12, 9-8, 9-9	R400L	1-22
QO403L60NRB	1-8	R417A thru R826A	
QO48M30DSGP thru QO48M60DSGP	1-9	RC12L200S	
QO60SL		RC1624M100S thru RC1624M125S	
Q0612L100RB thru Q0816L100RBCU	1.7	RC200S	
QO70AN	Q_Q_Q_1/	RC2040M125CH thru RC2040M200SH	1-1∂ ∩α_1
QOB110 thru QOB3100	0 10	RC2M200S thru RC2M200SL	
QOB110 tillu QOB3100QOB110K thru QOB130K		RC3040M150SL thru RC3040M200SL	
QOB115CAFI thru QOB120CAFI		RC816D200CH thru RC816F150SL	1-20
QOB115EPD thru QOB260EPD		RC816F150SLS thru RC816F150SS	
QOB115GFI thru QOB260GFI	9-10	RC816F200C thru RC816F200SH	
QOB115HID thru QOB330HID		RC816F200SHS	
QOB115HM thru QOB120HM		RC816F200SL	
QOB115VH thru QOB3150VH		RC816F200SLS thru RC816F200SS	
QOB115VHCAFI thru QOB120VHCAFI		RC8L125S	1-19
QOB115VHGFI thru QOB130VHGFI		RCGK2	1-22
QOB210SWN thru QOB350SWN	9-10	RCM200SL	1-19
QOB2125SL	9-9	RCP0624 thru RCP3024	13-5
QOB215H thru QOB2100H		RDB41 thru RDB126	13-3
QOB3125SL		RE11LAMW thru RE11RMXMU	
QOC12UF thru QOC12US	1-6	RE48ACV12MW thru RE48ATM12MW	23-26
QOC16UF thru QOC16US		RE7CL11BU thru RE7TP13BU	
QOC20U100F thru QOC20U100S		RESCL11BUTQ thru RE9TA51MW	23-20
QOC20UFWG thru QOC30UFWG		REC06 thru REC30	
QOC24UF thru QOC32UF	151610	REG24PSOC thru REG96PUNL1RHU	
QOC342MQF thru QOC342MQS	1-5, 1-6, 1-6	REHU393IP thru REHU494IP	۱ د-دے دی۔ مور م
		REXL2TMB7 thru REXL4TMP7	
	1-9		
QOC40UF thru QOC42US		RFK03 thru RFK10	. 3-18, 8-16, 16-115
QOCGK2 thru QOCRBGK1	,	RFK03H thru RFK06H	
QOE250GFINM		RG50	
QOFP		RHV062100009 thru RHV302100033	
QOGFI1PAF thru QOGFI2PAF	, ,	RKF26000S12 thru RKF36000S30	
QOGL20		RL00202 thru RL02512	
QOH2100 thru QOH2125	1-2, 2-6, 7-10	RL3TB thru RL3TB4	7-44
QOH240 thru QOH290		RLF26000S12 thru RLF36000S30	
QOHPL	1-4, 7-12	RLTB thru RLTB4	7-44
QOL125 thru QOL225	1-6, 1-16	RM17TA00 thru RM17TU00	23-33
QOL3125 thru QOL3225	1-8	RM17UAS14 thru RM17UBE16	23-34
QOM100VH thru QOM125VH	1-5. 1-16. 1-22	RM35ATL0MW thru RM35ATW5MW	23-36
QOM1FP	1-13	RM35JA32MW	
QOM1PA		RM35LM33MW thru RM35LV14MW	
QOM2100MM thru QOM2200MVH		RM35S0MW	
QOM2100VH thru QOM2225VH	1-5 1-16 1-22	RM35TF30	
QOM2FP	1 10	RM35TM50MW thru RM35TM250MW	
QOM2PA	1-13	RM35UA11MW thru RM35UB3N30	
QOM50VH thru QOM90VH		RM79696006 thru RM79696044	23-35
QOMB1 thru QOMB3		RMC1000G3120 thru RMC500G3277	
QON11224L125I thru QON816L100		RMCA61BD thru RMTK90BD	
QONQ30LS400 thru QONQ42LS400		RNW8782801 thru RNW8785001	
QONQ42MS300 thru QONQ42MS400		RPF2AB7 thru RPF2BP7	
QORBGK2	,	RPM11B7 thru RPM43P7	
QOSAMK		RPZ1DA thru RPZ4FA	23-7
QOT1515 thru QOT2020		RPZF1 thru RPZF4	23-6, 23-7
QOTHPA thru QOTHT	1-4, 7-12	RPZR235	23-7



www.schneider-electric.us		, <b>.</b>	g
RRC06 thru RRC30		S64201 thru S64273	
RRV182100012LR thru RRV182100012RR		S7300A0B0B0A0A0A thru S7350A0B0B0E0A0A	
RSB06 thru RSB18		S7550A0C0B6A0A0A thru S8650C1C0E6A0B0A	
RSB1A120B7 thru RSB1A160U7	23-3	SA7PL thru SA26PSR	
RSB24		SAIF200	
RSB2A080B7 thru RSB2A080U7		SAM	4-11
RSB30		SASFBH100L thru SASFBJ225R	
RSC16G3120 thru RSC16G3277		SB124IR thru SB348WS	11-4
RSG4		SBA15D13MS thru SBA30D15MS	
RSL1AB4BD thru RSL1AB4ND		SBAD800 thru SBSAD800R	
RSL1PRBU thru RSL1PRPU		SC12L200F thru SC12L200S	
RSL1PVBU thru RSL1PVPU		SC1624M100F thru SC1624M125S	
RSLZ2 thru RSLZ5		SC200F	
RSLZRA1 thru RSLZRA4		SC2040M125F thru SC40M200S	
RSLZVA1 thru RSLZVA4		SC816D150C thru SC816F200S	1-19
RSV062100120 thru RSV302100120		SC8L125F thru SC8L125S	
RSV122ET thru RSV182ST		SCBRLLOCK	
RSZE1S35M thru RSZE1S48M		SD12781	
RSZL300 thru RSZR215		SDAG26	
RTV062100011 thru RTV302100035		SDGT30020 thru SDGT300C300C SDSA1175	
		5D5A1175	1-12, 6-7, 16-64
RUC60RUMC2		SDSA1175TSDSA2V	
RUMC2AB1B7 thru RUMF3AB3P7		SDSA3650	
RUW101MW thru RUW242P723-7		SDSA3650D	
RUZ420 thru RUZSF3M23-		SDSA4P	
RVE06 thru RVE30		SDSB1175C thru SDSB1175RB	
RWT06ACP thru RWT18XES		SERP16HS thru SERPWSMB	
RWTBG100 thru RWTRC		SF124FR thru SF348WS	
RXM021BN thru RXM4GB3P723-4		SFCF12	
RXV062100012 thru RXV302100036		SFD212CG2Y thru SFD212SG4Y	26-16
RXZ400 thru RXZS2	10 0 5 23-7	SK9795 thru SK9948BW	
RZ1011 thru RZ535		SKR16H2 thru SKR16H13	
RZD60		SL100 thru SL800	
RZM021BN thru RZM041FU7		SLC12MSG thru SLC36SC	5-18
S131A thru S174A		SLC4CSF8	
S29272 thru S29287		SLC5000CT2FSS thru SLC5000CTL2SS	
S29305 thru S32478		SLC5000SDHG104 thru SLC5000SDSPU4	5-19
S32514 thru S32534		SLC5030URC	
S32558 thru S330387-40	_	SLC5031PE thru SLC5031PEWP	
S33091 thru S33095	-,	SLC5031RDTSL	
S33098 thru S33099	7-45	SLC5050CT2F thru SLC5050CTL2	
S33100 thru S33101	7-48	SLC5050IS() thru SLC5054NRP()	5-4, 5-7
S33166 thru S33171	7-45	SLC5055DLBK thru SLC5055DLWE	5-6
S33575 thru S33595	7-48	SLC5058NLCM thru SLC5058NRP()	5-4
S33646	7-44	SLC5070THBBK thru SLC5070THPWE	5-11
S33658 thru S337187-39	9, 7-41	SLC5080CTCF thru SLC5080CTL2	5-8
S33763 thru S33859	7-45	SLC5080LC8 thru SLC5084NLM()	5-5, 5-7
S33801	7-39	SLC5084TX	
S33857	7-41	SLC5085DLBK thru SLC5085DLWE	
S33875	7-40	SLC5086F30 thru SLC5086NLFSS	
S33890	7-41	SLC5088TX	
S33928	7-44	SLC5100BCS thru SLC5100TUS	5-17
S33929 thru S33997		SLC5101TD20 thru SLC5500DMX	
S33930 thru S33931		SLC5500HPS thru SLC5500TPS	
S33932 thru S33935		SLC5502DAL thru SLC5512TRVFP	
S33937 thru S33984	-	SLC560011 thru SLC5608842E	
\$33998		SLC5750WPL thru SLC5753PEIRL	
S34036	_	SLC5850BP() thru SLC5880BPPG()	
S36965 thru S36967		SLC60MFG thru SLC60MSG	
\$37420	-	SLC8M	
\$37422		SLCBB5000CTCL2 thru SLCBS5000CTCL2	
S37423 thru S37424		SLCE5504TGI	
S37425 thru S37430		SLCLE5504AUX	
S37432 thru S37440		SLCLE5504HAMP thru SLCLE5504TAMP	
S37442 thru S37443	_	SLCU5100TB	5-15
S37444 thru S37450		SLCZ00004DT thru SLCZ082000TP	
S41940 thru S432575		SLSBCB thru SLSBCW	
S432639 thru S432652	-	SLSCDS2000 thru SLSCUS800	
S434201 thru S434508	_	SLSDWD1277UB thru SLSDWS1277UW	
S47052 thru S47067		SLSEDC120 thru SLSERC1277	
S47100 thru S47105	-	SLSFPS1347 thru SLSFPS1480SLSPCW001	
S47390 thru S47398		SLSPIP210 thru SLSPIPBRACKET	
S48182 thru S48981	-	SLSPP1277 thru SLSPSP102	-
S48899 thru S48933	-	SLSPWD1277UB thru SLSPWD1277UW	
S6200A0A0B0A0B0R thru S6200T1A0B0A0B0R		SLSPWS120VI thru SLSPWS1277UW	
			5 20



SLSSP24	5-21	TVS3EMA12A() thru TVS3EMA48A()	6-2
SLSSP24347		TVS3HWA10X thru TVS3HWA80X	
SLSUWD1277UB thru SLSUWS1277UW		TVS3IMA12O() thru TVS3IMA24O()	6-6
SLSWDS1500	5-21	TVS4EBA12A() thru TVS4EBA24S()	6-3
SLSWP2DBB thru SLSWP2DTW		TVS4EMA12A() thru TVS4EMA48S()	6-2
SLSWPS1500		TVS4HEMA12Å() thru TVS4HEMA4ŠS()	6-2
SLSWUS1500	5-21	TVS4HIMA12O() thru TVS4HIMA24O()	
SM900A100000 thru SM956A890000		TVS4HWA10X thru TVS4HWA80X	
SMD thru SMDOPN		TVS4IMA12O() thru TVS4IMA24O()	6-6
SN03 thru SN03C		TVS4MEMA12A() thru TVS4MEMA36S()	6-3
SN0310 thru SN0310C		TVS5EMA12A() thru TVS5EMA48S()	
SN0610 thru SN0610CSN1000MA		TVS5HWA10X thru TVS5HWA80XTVS5IMA12O() thru TVS5IMA24O()	
SN100FA		TVS6EMA12A() thru TVS6EMA48S()	0-0
SN1200		TVS6HWA10X thru TVS6HWA80X	
SN12125 thru SN12200		TVS6IMA12O() thru TVS6IMA24O()	
SN20 thru SN42		TVS8EBA12A() thru TVS8EBA24S()	 6-३
SN20A thru SN20C		TVS8EMA12A() thru TVS8EMA48S()	6-2
SN225KA		TVS8HEMA12A() thru TVS8HEMA32S()	6-2
SN400LA		TVS8HIMA12O() thru TVS8HIMA12O()	6-6
SNC400LX thru SNC800LX	7-58	TVS8HWA10X thru TVS8HWA80X	
SO1020M100S thru SO2040M200S	1-20	TVS8IMA12O() thru TVS8IMA24O()	
SPL28G thru SPL29G		TVS9EMA12A() thru TVS9EMA32S()	6-2
SR2A101BD thru SR2B202BD	23-39	TVS9HWA10X thru TVS9HWA80X	
SR2CBL01 thru SR2CBL06		TVS9IMA12O() thru TVS9IMA18O()	
SR2COM01		TVSHWAFMK	
SR2D101BD thru SR2D101FU	23-39	TVSXRFMK	
SR2E121BD thru SR2E201FU		U92197CCCPL	2-2
SR2MEM01 thru SR2MOD02		UAK7T	2-2
SR2SFT01 thru SR2SFT02		UATRS101B thru UATRS213B	2-2
SR2USB01	23-40	UBHMRS212B	2-2
SR3B101B thru SR3B26BD	23-40	UFTL	9-9
SR3MBU01BD	23-40	UGHTRS101L thru UGHTRS111C	2-2
SR3XT101B thru SR3XT61JD	23-40	UHTRS101B thru UHTRS223A	
SRCTV12	7-45	UK7T	2-2
SS03 thru SS20		URS101BCPL thru URS212ADQ	
SS0306SK		URTRS101B thru URTRS213B	
SS10SK	3-10, 8-16	US11220018 thru US36020018	
SS212AB thru SS212AC		USMBLK thru USMBTC	7-13
SS2PL		UT2R1121B thru UT6R2392TU	
SS312		UTH4203T thru UTH7300T	
SSRAH1 thru SSRAT1		UTRS101B thru UTRS213B	
SSRDCDS10A1 thru SSRPP8S90A3		UTZRS101A	
STRMSTRV00011	4-11	V0 thru V6	
STRV00121 thru STRV00211STRV00910 thru STRV00911		VBD0 thru VBD2VBDN12 thru VBDN20	
STS3000		VBF0 thru VBF6	
SU2040M200C		VCCD0 thru VCCDN20	
SU2X6TRIM		VCCDN12 thru VCCDN20	<del>0-4</del>
SU3040D300CB thru SU3040D400FN			8-3 8-4
SU3040M200R thru SU3040M225R	· · · · · · · · · · · · · · · · · · ·	VCD0 thru VCD2	
SU816D150C thru SU816D200C		VCDN12 thru VCDN20	_
SVW3A8114		VCEL02114S1 thru VCEL07512H1	
T2A thru T9A		VCELSK1 thru VCELSK4	
T327N thru T327NR		VCF0 thru VCF6	
TCSEAV0100		VCFN12GE thru VCFN20GE	8-3
TCSMCNAM3M002P		VM18CD0000 thru VM1VI3000Q	
TIKFD		VN12 thru VN20	
TMSCE		VVD0 thru VVD4	
TRV00128 thru TRV00917	7-48, 7-49	VVE0 thru VVE4	8-4
TSXCANCA50 thru TSXCANCA300	16-87	VW3A1101 thru VW3A1103	26-6, 26-14
TSXCANKCDF90T thru TSXCANKCDF180T		VW3A1104R10 thru VW3A1104R100	7-51, 16-87, 26-6
TSXCUSB485	16-86	VW3A1105	26-6, 26-14
TSXETG100		VW3A2104	
TSXPBSCA100 thru TSXPBSCA400		VW3A21212	26-6
TVS120XR50S thru TVS120XR80S		VW3A3101	
TVS12FMK thru TVS20FMK		VW3A31101 thru VW3A31209	
TVS1EBA12A() thru TVS1EBA24S()		VW3A31401 thru VW3A31409	
TVS1EMA12A() thru TVS1EMA48S()		VW3A31811 thru VW3A31852	
TVS1HWA10X thru TVS1HWA80X		VW3A3201 thru VW3A3521S0	
TVS1IMA12O() thru TVS1IMA24O()		VW3A66711 thru VW3A66715	
TVS2EBA12A() thru TVS2EBA24S()		VW3A8104	
TVS2EMA12A() thru TVS2EMA48S()		VW3A8105	
TVS2HWA10X thru TVS2HWA80X		VW3A8106	
TVS2IMA12O() thru TVS2IMA24O()		VW3A8111	
TVS2MEMA12A() thru TVS2MEMA36S()	6-3	VW3A8114	
I V O O E DA I Z A ( ) II II U I V O O E DA Z 4 O ( )	ხ-პ	VW3A8120	∠6-8, ∠6-14



VW3A8121	26-6, 26-8	XB5AV31 thru XB5AV65	19-44
VW3A8306R	16-87	XB5AVB1 thru XB5AVB6	
VW3A8306R03 thru VW3A8306R30	16-87, 26-17	XB5AVG1 thru XB5AVG6	
VW3A8306RC	26-17	XB5AW11B5 thru XB5AW36G5	
VW3A8306TF03 thru VW3A8306TF10VW3A9201 thru VW3A9217	16-87, 26-17	XB5AW73731B5 thru XB5AW73731M5	19-42
VW3A9201 thru VW3A9217VW3A9201PF thru VW3A9292PF		XB5DSB thru XB5KSMXB6AA11B thru XB6AA65B	19-50
VW3A9201FF tillu VW3A9292FFVW3A9404 thru VW3A9407		XB6AD221B thru XB6AD235B	
VW3A9501 thru VW3A9515		XB6AE1B1B thru XB6AF6G5B	
VW3A9804 thru VW3A9805		XB6AGB5B thru XB6AGH5B	
VW3CANA71 thru VW3CANKCDF180T		XB6AS8342B thru XB6AS9345B	
VW3G4104		XB6AV1BB thru XB6AV6GB	
VW3G48101		XB6AW1B1B thru XB6AW6G5B	
VZ0 thru VZ9		XB6CA11B thru XB6CA65B	
VZ01 thru VZ02		XB6CD221B thru XB6CD235B	
VZ10 thru VZ18VZ20 thru VZ31		XB6CE1B1B thru XB6CF6G5BXB6CGB5B thru XB6CGH5B	
VZN05 thru VZN30		XB6CV1BB thru XB6CV6GB	
W808780210111 thru W808780220111	26-17	XB6CW1B1B thru XB6CW6G5B	
WHC5918		XB6DA11B thru XB6DA65B	
WMB361362 thru WMB363364		XB6DD221B thru XB6DD235B	
WS363 thru WS384		XB6DE1B1B thru XB6DF6G5B	
XACA009		XB6DGB5B thru XB6DGH5B	
XACA02H7 thru XACA12H7		XB6DV1BB thru XB6DV6GB	
XACA201 thru XACA207		XB6DW1B1B thru XB6DW6G5B	
XACA9411 thru XACA9419XACA971 thru XACA983	19-119	XBFX13XBTN410	
XACB961XACB963		XBTZ938	
XACD21A0101 thru XACD21A1241	19-120	XBY2U	
XACS101 thru XACS105		XCDR2110N12 thru XCDR2527N12	
XALD01H7 thru XALD05H7		XCKD2106N12 thru XCKD25H0N12	
XALD101H29H7 thru XALD341H29H7	19-100	XCKJ10511H7 thru XCKJ20541H7	21-26
XALK01H7		XCKL10011H7 thru XCKL50041H7	21-22
XALK174H7 thru XALK194H7		XCKL102H7 thru XCKL510H7	
XALZ09		XCKN2102P20 thru XCKN2949P20	21-18
XAPA1100 thru XAPA4100XAPE302 thru XAPE905		XCKP2106N12 thru XCKP25H0N12XCKS101 thru XCKS559	
XAPG19100 thru XAPG59505		XCKT2102N12 thru XCKT2118N12	
XAPZ100 thru XAPZ316		XCMD2102L1 thru XCMD25F2L1	21-14
XB4BA21 thru XB4BA65		XCMN2110L1	
XB4BA3311 thru XB4BA4322		XCNR2102P20 thru XCNR2927P20	21-18
XB4BA711237 thru XB4BA731327	19-23	XCPR2110N12 thru XCPR2527N12	
XB4BA821 thru XB4BA962		XD4PA12 thru XD4PA24	
XB4BC21		XD5PA12 thru XD5PA24	
XB4BD21 thru XB4BD53XB4BG03 thru XB4BG61		XE2NP2151 thru XE2SP2158XENG1191 thru XENG3791	21-29
XB4BJ21 thru XB4BJ53		XENP2151	
XB4BL42 thru XB4BP61	19-23	XENT1192	
XB4BL73415		XESP2021 thru XESP2031	21-29
XB4BS142 thru XB4BS542		XESP2151 thru XESP2158	21-23
XB4BS84441		XMLA001S2S13 thru XMLDM02V1S13	
XB4BS8445 thru XB4BS9445		XMLF010D2026 thru XMLFM01D2026	
XB4BT42		XMLG001D23 thru XMLGM01D73	
XB4BT845XB4BV65		XMLGZ001	
XB4BVB1 thru XB4BVB6XB4BVB1 thru XB4BVB6		XMLK006B2C21 thru XMLK300P2P73XMLZL001 thru XMLZL011	
XB4BVG1 thru XB4BVG6		XS108B3NAL2 thru XS130B3PBM12	
XB4BW11B5 thru XB4BW36G5		XS506B1NAL2 thru XS530B1PBM12	20-7
XB4BW73731B5 thru XB4BW73731M5		XS608B1NAL2 thru XS608B1PBM12	20-6
XB5AA21 thru XB5AA65		XS612B1MAL2 thru XS612B1MBU20	20-9
XB5AA3311 thru XB5AA4322		XS612B1NAL2 thru XS612B1PBM12	
XB5AA711237 thru XB5AA731327		XS618B1MAL01B thru XS618B1MBL01G	
XB5AA831 thru XB5AA862		XS618B1MAL2 thru XS618B1MBL2	
XB5AA84101 thru XB5AA86202		XS618B1NAL01B thru XS630B1PBM12	
XB5AC21XB5AD21 thru XB5AD53		XS7C40DA210H7 thru XS8C40PC449H7XSZB108 thru XSZB165	
XB5AG03 thru XB5AG61		XSZCD101Y thru XSZCD103Y	
XB5AJ21 thru XB5AJ53		XT112S1NAL2 thru XT130B1PCM12	
XB5AL42		XU2M18MA230 thru XU9M18MB230K	
XB5AL45		XUB1APANL2 thru XUB9BPBNM12	20-2
XB5AL73415		XUK1APANL2 thru XUM9APCNM8	20-4
XB5AL84101 thru XB5AL84201		XUVA0505PANM8 thru XUVA1515PANM8	
XB5AP21 thru XB5AP61		XUVR0303PANL2 thru XUVR1218PBNM8	
XB5AS142 thru XB5AS542XB5AS8444 thru XB5AS9445		XUVU06M3KCNL2 thru XUVU06M3KCNM8 XUX0AKSAM12T thru XUX0ARCTT16T	20-10
XB5AT42		XUX1APANM121 thru XUX1ARCNT161XUX1APANM12 thru XUX1ARCNT16	
XB5AT845	19-43	XUX2APANM12R thru XUX2ARCNT16R	

Alpha-Numeric Index



XUX5APANM12 thru XUX9APBNT16......20-4 ZA2BB2 thru ZA2BG5...... 19-119 XUX9ARCNT16......20-4 XUZA118 thru XUZA218 ......20-2, 20-10 XUZC24 thru XUZC80......20-2, 20-10 ZA2BS834 thru ZA2BS944 ...... 19-119 XVBC00 thru XVBC040......19-112 ZALVB1 thru ZALVM6 ...... 19-101 7B2BF101 thru 7B2BF102 19-119 XVBC33 thru XVBC38......19-111 XVBC4B3 thru XVBC4B8.......19-111 XVBC4M3 thru XVBC4M8......19-111 XVBC8B3 thru XVBC8B8......19-111 XVBC8G3 thru XVBC8G8......19-111 ZB4BA0 thru ZB4BA9 ...... 19-26 XVBC9B thru XVBC9M ...... 19-111 XVBL4B3 thru XVBL4B8......19-110 XVBL4M3 thru XVBL4M8......19-110 ZB4BA7120 thru ZB4BA7341 ...... 19-27 XVBL8B3 thru XVBL8B8......19-110 ZB4BA791......19-27 XVBZ02 thru XVBZ04A ......19-113 XVC1B1K thru XVC1B5K......19-108 XVC1B1SK thru XVC1B5SK......19-108 XVC1M1K thru XVC1M5K......19-108 XVC1M1SK thru XVC1M5SK.......19-108 XVC4B1 thru XVC4B5......19-108 ZB4BG0 ...... 19-29 ZB4BG01 thru ZB4BG09 ...... 19-29 XVC4B15S thru XVC4B55S......19-108 XVC4B1K thru XVC4B5K......19-108 ZB4BH01 thru ZB4BH06.......19-27 XVC4M15S thru XVC4M55S......19-108 XVC6B15S thru XVC6B55S......19-109 ZB4BH13 thru ZB4BH63.......19-32 ZB4BJ2 thru ZB4BJ8 ...... 19-29 XVC6M1 thru XVC6M5 ......19-109 XVCZ01......19-108 XVCZ02......19-109 ZB4BP1S thru ZB4BP6S ...... 19-26 XVCZ11......19-108 ZB4BR2 thru ZB4BR6...... 19-28 XVCZ13 thru XVCZ23......19-107, 19-108 XVDC02 ...... 19-113 XVEC21 thru XVEC37.......19-113 ZB4BV01 thru ZB4BV07.......19-31 ZB4BV013 thru ZB4BV063 19-31 ZB4BV013S thru ZB4BV063S 19-31 XVEC21P ...... 19-113 ZB4BV3 thru ZB4BV9 ...... 19-31 XVEZ13......19-113 XVLA123 thru XVLA335.......19-10 XVLX08 thru XVLX12......19-10 ZB4BVB1 thru ZB4BVB6 ...... 19-31 XVPC02 thru XVPC04W ......19-115 XVPC09B thru XVPC09MW......19-114 ZB4BVG1 thru ZB4BVG6 ...... 19-31 XVPC12 thru XVPC12W ...... 19-115 ZB4BVJ1 thru ZB4BVJ6 ...... 19-31 XVPC21 thru XVPC6G8W ...... 19-114 ZB4BW031 thru ZB4BW085 ...... 19-34 ZB4BW0B11 thru ZB4BW0B65 ...... 19-34 ZB4BW0G11 thru ZB4BW0G65 ...... 19-34 XVR08B03 thru XVR13J05 ...... 19-107 XVRZ081 thru XVRZ082......19-107 XVRZR1 thru XVRZR3......19-107 XVS14BMW ...... 19-116 XVS72BMBN thru XVS72BMWP ...... 19-116 XX2V3A1NFM12 thru XX9V3A1H3M12......20-12 XXV18B1NAL2 thru XXV18B1PBM12 ......20-10 XXZPB100......20-10 ZB4BZ009.......19-35, 19-36 XZCP0566L2 thru XZCP0666L2......20-6 ZB4BZ101 thru ZB4BZ105 ...... 19-34 XZCP0941L2 thru XZCP1041L2......20-2, 20-10 ZB4BZ1015 thru ZB4BZ1055 ...... 19-36 XZCP1141L10......21-27, 22-9 ZB4BZ106 thru ZB4BZ107 ...... 19-35, 19-56 XZCP1141L2......20-2, 21-27, 22-9 XZCP1141L5......21-27, 22-9 ZB4BZ1905 thru ZB4BZ2105 ...... 19-40, 19-61 XZCP1241L10.......22-9 ZB4BZ62 thru ZB4BZ64 ...... 19-40, 19-61 XZCP1241L2 thru XZCP1241L5......20-2, 20-6, 22-9 ZB5AA131 thru ZB5AA435...... 19-46 ZB5AA14 thru ZB5AA68 ...... 19-45, 19-53 YA060HD thru YA2500R7......7-43 ZB5AA7120 thru ZB5AA7341 ...... 19-47



2B5AA79	www.schneider-electric.us			Alpha-Numeric Listing
285A2791	ZB5AA79	19-47	ZB6Y001 thru ZB6Y019	19-22
2BBAC2 thu ZBSAD44				
285AD2 Phu ZBSAD98	ZB5AC2 thru ZB5AC64	19-46	ZB6Y7001 thru ZB6Y7330	
285A01 bru ZBSA092	ZB5AD2 thru ZB5AD48	19-49. 19-50		
285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-41 285AG1 thru ZBSAG09.  19-42 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-47 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-49 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-40 285AG1 thru ZBSAG09.  19-41 285AG1 thru ZBSAG09.  19-41 285AG1 thru ZBSAG09.  19-41 285AG1 thru ZBSAG09.  19-54 28	ZB5AD912 thru ZB5AD922	19-50		
ZBSAH1 thru ZBSAH63			ZB6YA100 thru ZB6YA626	19-21
ZBSAH1 thu ZBSAH63  19-53  ZBSAL1 thu ZBSAH63  19-49  ZBSAL2 thu Z	ZB5AG1 thru ZB5AG9	19-49	ZB6YB028 thru ZB6YJ012	19-22
285A1 thru ZBSA16  19-47  285A12 thru ZBSA18  19-49  285A12 thru ZBSA18  19-49  285A12 thru ZBSA18  19-49  285A12 thru ZBSA18  19-51  285A11 thru ZBSA18  19-52  285A11 thru ZBSA17  285A17  2	ZB5AH01 thru ZB5AH06	19-47	ZB6YC100 thru ZB6YC626	19-21
285A/12 Pinu ZBSA/18   19-49   ZBSZ18 Hnu ZBSZ58.   19-15   ZBSA/11 Pinu ZBSA/18   19-54   ZBSZ18 Hnu ZBSA/18   19-54   ZBSZ18 Hnu ZBSA/18   19-55   ZBSZ18 Hnu ZBSA/18   19-55   ZBSZ18 Hnu ZBSA/18   19-60   ZBSA/18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSA/18   19-65   ZBSZ18 Hnu ZBSZ28   19-65   ZBSZ18 Hnu ZBSZ28   29-65   ZBSZ18 Hnu ZBSZ28   29-65   ZBSZ18 Hnu ZBSZ28   29-65   ZBSZ18 Hnu ZBSZ28   29-65   ZBSZ18 Hnu ZBSZ28   29-65   ZBSZ	ZB5AH013 thru ZB5AH63	19-53	ZB6YD100 thru ZB6YD626	19-21
ZBSAK123 thru ZBSAK183         19-54         ZBSEZ11B thru ZBSAL95         19-31         19-30 19-90           ZBSAL1232 thru ZBSAL435         19-46         ZBA11 thru ZBA39         19-30 19-90           ZBSAL7340 thru ZBSAL7441         19-47         ZBA17 thru ZBA39         19-30 19-90           ZBSAP781 thru ZBSAS         19-46         ZBA77 thru ZBA34         19-41 19-62           ZBSAP 1 thru ZBSAS6         19-46         ZBA77 thru ZBA348         19-41 19-62           ZBSAS12 thru ZBSAS64         19-48         ZBCW0113 thru ZBCW083         19-62           ZBSAS12 thru ZBSAS74         19-48         ZBCW0113 thru ZBCW9363         19-62           ZBSAV10 thru ZBSAV063         19-51         ZBDW0113 thru ZBCW9363         19-62           ZBSAV10 thru ZBSAV063         19-51         ZBDW0113 thru ZBCW9365         19-52           ZBSAV10 thru ZBSAV063         19-51         ZBDW0114 thru ZBCW07         19-53         19-56           ZBSAV10 thru ZBSAV065         19-52         ZBED15 thru ZBCW07         19-51         19-51         19-51         19-52         19-52         19-54         19-52         2BSAW011 thru ZBSAW086         19-52         2BSAW011 thru ZBCW07         19-51         19-52         2BSAW011 thru ZBCW07         19-53         19-56         19-53         19-56 <t< td=""><td>ZB5AH1 thru ZB5AH6</td><td> 19-47</td><td>ZB6YD20 thru ZB6YD22</td><td>19-20, 19-22</td></t<>	ZB5AH1 thru ZB5AH6	19-47	ZB6YD20 thru ZB6YD22	19-20, 19-22
285AL 1 thru ZB6AL6	ZB5AJ2 thru ZB5AJ8	19-49	ZB6Z1B thru ZB6Z5B	19-15
ZBSAL239 thru ZBSAL435	ZB5AK123 thru ZB5AK183	19-54	ZB6ZB11B thru ZB6ZH05B	19-15
2B5AP1 thru ZB5AP68	ZB5AL1 thru ZB5AL6	19-45		
ZBSAP1 thru ZBSAP68	ZB5AL232 thru ZB5AL435	19-46	ZBA131 thru ZBA639	19-39, 19-60
285AP1 thru ZB5AP68	ZB5AL7340 thru ZB5AL7341	19-47		
ZBSAP15 thru ZBSAP6S. 19-45 ZBA7131 thru ZBA7432 19-40, 19-61 ZBSAR6 thru ZBSAR6 thru ZBSAR6 thru ZBSAR74 19-48 ZBCV09113 thru ZBCV09363. 19-62 ZBSA8324 thru ZBSAS74 19-48 ZBCV1010 19-60 ZBSAR8434 thru ZBSAS74 19-48 ZBCV1010 19-60 ZBSAR8434 thru ZBSAS74 19-48 ZBCV1010 19-60 ZBSAR8434 thru ZBSAV0968. 19-51 ZBE1016 thru ZBE005. 19-51 ZBE1016 thru ZBSAV0968. 19-52 ZBDD2 19-52 ZBDD2 19-52 ZBDD2 19-52 ZBSAV1866 19-52 ZBSAV1866 19-52 ZBCV201 thru ZBSAV096 19-50 ZBSAV1861 thru ZBSAV086 19-52 ZBCV201 thru ZBG4V01 19-30, 19-50 ZBSAV1861 thru ZBSAV086 19-52 ZBCV201 thru ZBG4V01 19-30, 19-50 ZBSAV1864 19-52 ZBCV201 thru ZBG4V01 19-30, 19-50 ZBSAV1864 19-52 ZBV01 thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-53 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-53 ZBV01 Thru ZBSAV086 19-53 ZBV01 Thru ZBSAV086 19-52 ZBV01 Thru ZBSAV086 19-53 ZBV01 Thru ZBSAV086 19-54 ZBV01 Thru ZBSAV086 19-54 ZBV01 Thru ZBSAV086 19-54 ZBV01 Thru ZBSAV086 19-54 ZBV01 Thru ZBS	ZB5AP1 thru ZB5AP68	19-45	ZBA71 thru ZBA79	19-40, 19-61
ZBSAR2 thm ZBSAR6	ZB5AP1S thru ZB5AP6S	19-45	ZBA7131 thru ZBA7432	
ZB5AS12 thru ZB5AS74         19-48         ZBCW9113 thru ZBCW9363         19-62           ZB5AS8384 thru ZB5AS964         19-54         ZBDDQ         19-41         19-62           ZB5AS936 thru ZB5AV063         19-51         ZBEI01 thru ZBE205         19-31         19-62           ZB5AV01 S thru ZB5AV063         19-51         ZBEI01 thru ZBE4066         19-52         ZBE101 thru ZB5AV166         19-53         19-51           ZB5AV1 BB1 thru ZB5AV166         19-52         ZBE101 thru ZB5AV166         19-52         ZBE101 thru ZB5AV169         19-91         19-91         19-91         19-91         19-91         19-91         19-91         19-91         19-91         19-91         19-92         2BSAV81 thru ZB5AV166         19-52         ZBP1 thru ZB5AV166         19-52         ZBVB thru ZB5AV166         19-52         ZBVB thru ZBV017         19-91         19-91         19-91         19-92         2BVB thru ZBV066         19-52         ZBVB thru ZBV066         19-52         ZBVB thru ZBV066         19-52         ZBVB thru ZBV066         19-52         ZBVB thru ZBV066         19-53         19-56         ZBVB thru ZBV066         19-52         ZBVB thru ZBV066         19-53         19-56         ZBVB thru ZBV066         19-53         19-56         ZBVB thru ZBV066         19-53         19-57         ZBVB thru	ZB5AR2 thru ZB5AR6	19-46		
2B5AS8934 thru ZB5AS964 19-54 ZBCV1101 9-60 ZB5AT043M 19-54 ZBCV1101 19-62 ZB5AV01 thru ZB5AV063S 19-51 ZBE101 thru ZBE205 19-53, 19-56 ZB5AV018 thru ZB5AV063S 19-51 ZBE101 thru ZBE206P 19-35, 19-56 ZB5AV18H 1 thru ZB5AV18G6 19-52 ZBG2201 thru ZB61026P 19-30, 19-50 ZB5AV18H 1 thru ZB5AV18G6 19-52 ZBG2201 thru ZB63C0P 19-41 19-62 ZB5AV18H 1 thru ZB5AV8G6 19-52 ZBC3AV18H 2 SBAV18H 2 SBAV8				
ZBSAV0 Intu ZBSAV063				
ZBSAVIO Ithru ZBSAVIOSS         19-51         ZBE101 thru ZBE1026S         19-55         19-51         ZBE1015 thru ZBE1026P         19-55         19-56         ZBG201 thru ZBC4401         19-30         19-50         ZBG2V1 thru ZBG4V401         19-30         19-50         ZBG31314 thru ZBG502P         19-41         19-82         ZBG31314 thru ZBG502P         19-41         19-82         ZBSAV64         19-52         ZBEN ZBG4W64         19-52         ZBEN DB TRAIN ZBSAVB6         19-52         ZBEN DB TRAIN ZBSAVB6         19-52         ZBV6 thru ZBV017         19-41         19-62         ZBSAVB64         19-52         ZBV6 thru ZBV017         19-41         19-62         ZBSAVB64         19-52         ZBV6 thru ZBV017         19-41         19-62         ZBV6 thru ZBV017         19-41         19-62         ZBV6 thru ZBV017         19-41         19-62         ZBV6 thru ZBV066         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52         ZBV8 thru ZBV866         19-52				
ZBSAVOIS thru ZBSAVO63S.         19-51         ZBE1015 thru ZBE402P         19-35, 19-56           ZBSAV18B1 thru ZBSAV9         19-52         ZBG2201 thru ZBG520P         19-41, 19-62           ZBSAV8120         19-52         ZBG31314 thru ZBG520P         19-41, 19-62           ZBSAV624         19-52         ZBH Irbu ZBD.         19-39, 19-60           ZBSAVB61 thru ZBSAVB66         19-52         ZBPO thru ZBV017         19-41, 19-62           ZBSAWG1 thru ZBSAVG6         19-52         ZBVB Irbu ZBV017         19-41, 19-62           ZBSAWG1 thru ZBSAVG66         19-52         ZBVB Irbu ZBV86         19-53, 19-56           ZBSAWG1 thru ZBSAWG66         19-52         ZBVB Irbu ZBV86         19-53, 19-56           ZBSAWG1 thru ZBSAWG68         19-52         ZBVB Irbu ZBV66         19-53, 19-56           ZBSAW031 thru ZBSAWG65         19-55         ZBVG1 thru ZBV66         19-36, 19-57           ZBSAW103 thru ZBSAWG65         19-55         ZBVG1 thru ZBV66         19-36, 19-57           ZBSAW11 thru ZBSAWG65         19-55         ZBVG1 thru ZBV66         19-36, 19-57           ZBSAW11 thru ZBSAWG65         19-55         ZBVG1 thru ZBV66         19-36, 19-57           ZBSAW11 thru ZBSAWG63         19-55         ZBVG1 thru ZBV66         19-36, 19-57           ZBSAW1				
ZBSAV18B1 Ihru ZBSAV196.6         19-52         ZBG2201 Ihru ZBG4V01         19-90.19-10				
ZBSANS thruz ZBSAV9         19-52         ZBLI thru ZBL9         19-31, 19-60           ZBSAV620         19-52         ZBLI thru ZBL9         19-39, 19-60           ZBSAV81 thru ZBSAVB6         19-52         ZEV6         19-35, 19-56           ZBSAVBG1 thru ZBSAVB6         19-52         ZEV8         19-35, 19-56           ZBSAVG1 thru ZBSAVG6         19-52         ZBV91 thru ZBVB65         19-36, 19-57           ZBSAVQ1 thru ZBSAV085         19-52         ZBV91 thru ZBVB66         19-36, 19-57           ZBSAW01 thru ZBSAW085         19-55         ZBVG1 thru ZBVB66         19-35, 19-56           ZBSAW01 thru ZBSAW085         19-55         ZBVG1 thru ZBVB66         19-35, 19-56           ZBSAW01 thru ZBSAW065         19-55         ZBVG1 thru ZBVG66         19-57           ZBSAW01 thru ZBSAW065         19-55         ZBVG1 thru ZBVG66         19-57           ZBSAW11 thru ZBSAW065         19-55         ZBVG1 thru ZBVG66         19-57           ZBSAW11 thru ZBSAW053         19-51         ZBVM1 thru ZBVG66         19-57           ZBSAW11 thru ZBSAW053         19-52         ZBVM1 thru ZBVG66         19-57           ZBSAW171 thru ZBSAW743         19-54         ZBW1 thru ZBVG66         19-57           ZBSAW715 thru ZBSAW743         19-54         ZBWM1 t				
ZBSAM06120.         19-52         ZBD thru ZBSU017         19-94,11,19-62           ZBSAMVB1 thru ZBSAWB6.         19-52         ZBPO thru ZBV017         19-41, 19-62           ZBSAMVB1 thru ZBSAWG6         19-52         ZBVB1 thru ZBVB6         19-35, 19-56           ZBSAVG1 thru ZBSAWG6         19-52         ZBVB1 thru ZBVB65         19-36, 19-56           ZBSAVI thru ZBSAWG6         19-52         ZBVB61 thru ZBVB66         19-35, 19-56           ZBSAW031 thru ZBSAW065         19-55         ZBVG1 thru ZBVG6         19-35, 19-56           ZBSAW031 thru ZBSAW0665         19-55         ZBVG1 thru ZBVG6         19-36, 19-57           ZBSAW11 thru ZBSAW0665         19-55         ZBVG1 thru ZBVG6         19-36, 19-57           ZBSAW11 thru ZBSAW737         19-53         ZBVJ1 thru ZBVG6         19-36, 19-57           ZBSAW13 thru ZBSAW768         19-53         ZBVJ1 thru ZBVM6         19-36, 19-57           ZBSAW13 thru ZBSAW763         19-54         ZBWM1 thru ZBVM66         19-54, 19-56           ZBSAW175 thru ZBSAW763         19-54         ZBW911 thru ZBW393         19-41, 19-62           ZBSAW175 thru ZBSAW763         19-54         ZBW911 thru ZBW3937         19-41, 19-62           ZBSAW16 thru ZBSAW66         19-54         ZBW910 thru ZBW3939         19-41, 19-62 <tr< td=""><td></td><td></td><td></td><td></td></tr<>				
ZBSANSCEAL         19-52         ZEPO thru ZBSO17         19-41, 19-62           ZBSANG I thru ZBSAVBG         19-52         ZEV6         19-35, 19-56           ZBSAVG I thru ZBSAVGG         19-52         ZEVB1 I thru ZBVBGS         19-36, 19-57           ZBSAVG I thru ZBSAVUB         19-52         ZEVB1 I thru ZBVBGG         19-36, 19-57           ZBSAWO31 thru ZBSAW085         19-55         ZEVBG1 I thru ZBVGG         19-35, 19-56           ZBSAW0811 thru ZBSAW0865         19-55         ZEVG1 I thru ZBVGG         19-35, 19-56           ZBSAW0811 thru ZBSAW0865         19-55         ZEVG1 I thru ZBVGG         19-35, 19-56           ZBSAW11 thru ZBSAW37         19-55         ZEVG15 I thru ZBVGG         19-35, 19-56           ZBSAW11 thru ZBSAW763         19-55         ZEVJ15 thru ZBVJG         19-36, 19-57           ZBSAW1713 thru ZBSAW763         19-53         ZEVJ15 thru ZBVJG         19-36, 19-57           ZBSAW713 thru ZBSAW763         19-54         ZBWM15 thru ZBVM6         19-57, 19-51           ZBSAW713 thru ZBSAW743741         19-54         ZBW911 thru ZBW939         19-46           ZBSAW713 thru ZBSAW713740         19-54         ZBW911 thru ZBW939         19-46           ZBSAW209         19-57         ZBW200 thru ZBV3930         19-81, 19-59				
ZBSANB1 thru ZBSAVB6         19-52         ZBVB II thru ZBSAVB6         19-35, 19-56           ZBSAVG1 thru ZBSAVG6         19-52         ZBVB1 thru ZBSAVG6         19-35, 19-56           ZBSAV1 thru ZBSAVG6         19-52         ZBVB1 thru ZBVBG6         19-35, 19-56           ZBSAW031 thru ZBSAW085         19-55         ZBVBG1 thru ZBVG6         19-35, 19-56           ZBSAW0B1 thru ZBSAW0865         19-55         ZBVG1 thru ZBVG6         19-36, 19-57           ZBSAW11 thru ZBSAW0865         19-55         ZBVG1 thru ZBVG6         19-36, 19-57           ZBSAW11 thru ZBSAW0863         19-55         ZBVJ1 thru ZBVG6         19-35, 19-56           ZBSAW13 thru ZBSAW363         19-53         ZBVJ15 thru ZBVG6         19-36, 19-57           ZBSAW13 thru ZBSAW363         19-53         ZBVJ15 thru ZBVG6         19-36, 19-56           ZBSAW13 thru ZBSAW363         19-53         ZBVM15 thru ZBVG6         19-36, 19-57           ZBSAW13 thru ZBSAW363         19-54         ZBVM15 thru ZBVG6         19-36, 19-57           ZBSAW13 thru ZBSAW363         19-54         ZBVM15 thru ZBW66         19-36, 19-57           ZBSAW174 Thru ZBSAW363         19-54         ZBVM15 thru ZBW66         19-36, 19-57           ZBSAW174 bru ZBSAW364         19-54         ZBVM15 thru ZBW66         19-36, 19-57 <td></td> <td></td> <td></td> <td></td>				
ZBSAVBG1 thru ZBSAVG6         19-52         ZEVB1 thru ZBVB65         19-56         19-56           ZBSAVG1 thru ZBSAVG6         19-52         ZEVB15 thru ZBVG6         19-35         19-56           ZBSAW01 thru ZBSAW085         19-55         ZEVBG1 thru ZBVG6         19-35         19-56           ZBSAW0B11 thru ZBSAW0B65         19-55         ZEVG1 thru ZBVG66         19-35         19-56           ZBSAW0B11 thru ZBSAW0G65         19-55         ZEVG1 thru ZBVG66         19-36         19-57           ZBSAW11 thru ZBSAW37         19-53         ZEVJ1 thru ZBVJ66         19-36         19-57           ZBSAW11 thru ZBSAW363         19-54         ZEVJ1 thru ZBVJ65         19-36         19-57           ZBSAW173 thru ZBSAW763         19-54         ZEWN1 thru ZBVM65         19-36         19-57           ZBSAW7715 thru ZBSAW7A3741         19-54         ZEW911 thru ZBW37         19-41         19-56           ZBSAW789 thru ZBSAW7A3744         19-54         ZEW910 thru ZBY910         19-38         19-59           ZBSAZ1009         19-56, 19-57         ZBY2002 thru ZBY910         19-37         19-58           ZBSAZ101 thru ZBSAZ141         19-55         ZBY4001 thru ZBY910         19-37         19-58           ZBSAZ101 thru ZBSAZ1905         19-61				
ZBSAVC1 thru ZBSAVI6         19-52         ZBVB15 thru ZBVB66         19-36, 19-57           ZBSAVI thru ZBSAW085         19-55         ZBVBG1 thru ZBVG6         19-35, 19-56           ZBSAW081 thru ZBSAW0865         19-55         ZBVG1 thru ZBVG6         19-35, 19-56           ZBSAW011 thru ZBSAW077         19-55         ZBVG1 thru ZBVJ6         19-36, 19-57           ZBSAW11 thru ZBSAW377         19-53         ZBVJ15 thru ZBVJ6         19-36, 19-57           ZBSAW113 thru ZBSAW763         19-53         ZBVJ15 thru ZBVJ6         19-36, 19-57           ZBSAW174 bru ZBSAW763         19-54         ZBVM15 thru ZBVM6         19-35, 19-56           ZBSAW715 thru ZBSAW763         19-54         ZBVM15 thru ZBVM6         19-36, 19-57           ZBSAW7A1715 thru ZBSAW7A3741         19-54         ZBVM15 thru ZBVM6         19-37, 19-60           ZBSAW20 thru ZBSAW7A3744         19-48         ZBV1010 thru ZBV3037         19-41, 19-62           ZBSAZ101 thru ZBSAZ141         19-56         ZBY2010 thru ZBV3031         19-36           ZBSAZ101 thru ZBSAZ141         19-55         ZBY2020 thru ZBV3031         19-37, 19-88           ZBSAZ101 thru ZBSAZ141         19-56         ZBY21010 thru ZBV3010         19-37, 19-88           ZBSAZ101 thru ZBSAZ142         19-47         ZBY302 thru ZBV304         19-37				,
ZBSAW01 thru ZBSAW065         19-52         ZBVBG1 thru ZBVG6         19-35, 19-56           ZBSAW0811 thru ZBSAW065         19-55         ZBVG1 thru ZBVG6         19-36, 19-56           ZBSAW0B11 thru ZBSAW076         19-55         ZBVG1 thru ZBVG6         19-36, 19-56           ZBSAW11 thru ZBSAW77         19-53         ZBVJ1 thru ZBVJ65         19-36, 19-56           ZBSAW11 thru ZBSAW768         19-53         ZBVJ1 thru ZBVJ66         19-36, 19-56           ZBSAW713 thru ZBSAW768         19-54         ZBWM1 thru ZBWM65         19-36, 19-57           ZBSAW713 thru ZBSAW768         19-54         ZBWM1 thru ZBWM65         19-36, 19-57           ZBSAW79 thru ZBSAW743740         19-54         ZBW1101 thru ZBW937         19-48           ZBSAX2009         19-56, 19-57         ZBY2002 thru ZBV2931         19-38, 19-59           ZBSAZ0101 thru ZBSAZ141         19-55         ZBY2H011 thru ZBV1912         19-39, 19-58           ZBSAZ1015 thru ZBSAZ1055         19-57         ZBY2002 thru ZBV2931         19-37, 19-58           ZBSAZ101 thru ZBSAZ141         19-55         ZBY4H01 thru ZBV6102         19-38, 19-59           ZBSAZ101 thru ZBSAZ905         19-61, 19-101         ZBY361 thru ZBV3610         19-38, 19-59           ZBSAZ01 thru ZBSCAG6         19-61, 19-101         ZBY3610 thru ZBSCAG6				
ZBSAW031 thru ZBSAW085 19-55 ZBVG1 thru ZBVG6 19-35, 19-56 ZBSAW0B11 thru ZBSAW0865 19-36, 19-57 ZBSAW0G11 thru ZBSAW0G65 19-36 19-55 ZBVJ11 thru ZBVJ6 19-35, 19-56 ZBSAW113 thru ZBSAW563 19-35 ZBVJ15 thru ZBVJ6 19-36, 19-57 ZBSAW113 thru ZBSAW563 19-53 ZBVJ15 thru ZBVJ6 19-36, 19-57 ZBSAW113 thru ZBSAW563 19-53 ZBVJ15 thru ZBVJ65 19-36, 19-57 ZBSAW713 thru ZBSAW563 19-53 ZBVJ15 thru ZBVJ65 19-36, 19-57 ZBSAW7A1715 thru ZBSAW763 19-54 ZBWJ15 thru ZBVJ65 19-36, 19-57 ZBSAW7A1715 thru ZBSAW7A3741 19-54 ZBWJ15 thru ZBW937 19-41, 19-62 ZBSAW7A9 thru ZBSAW7A3741 19-54 ZBW9101 thru ZBW937 19-41, 19-62 ZBSAW7A9 thru ZBSAW7A3741 19-54 ZBW9101 thru ZBW937 19-41, 19-62 ZBSAW7A9 thru ZBSAW7A1713 thru ZBSAW4 19-48 ZBY1101 thru ZBW1912 19-39, 19-60 ZBSAZ090 19-56, 19-57 ZBY2002 thru ZBV2931 19-37, 19-58 ZBSAZ101 thru ZBSAZ141 19-56, 19-57 ZBY2002 thru ZBV2931 19-37, 19-58 ZBSAZ101 thru ZBSAZ141 19-55 ZBY24101 thru ZBV61101 19-37, 19-58 ZBSAZ101 thru ZBSAZ105 19-61 19-55 ZBY24101 thru ZBW61101 19-37, 19-58 ZBSAZ101 thru ZBSAZ105 19-61 19-61 ZBY5101 thru ZBW6102 19-38, 19-59 ZBSAZ905 19-61 19-61 ZBY5101 thru ZBW6102 19-38, 19-59 ZBSAZ905 19-61 19-61 ZBY5101 thru ZBW6102 19-38, 19-59 ZBSAZ101 thru ZBSCA66 19-45 ZBY9300 19-28, 19-48 ZBSCA31 thru ZBSCA66 19-45 ZBY9300 19-28, 19-48 ZBSCA31 thru ZBSCA432 19-46 ZBSCA31 thru ZBSCA432 19-46 ZBSCA31 thru ZBSCA432 19-46 ZBSCA31 thru ZBSCA432 19-46 ZBSCA31 thru ZBSCA432 19-46 ZBSCA31 thru ZBSCA434 19-46 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA34 19-47 ZBSCA3				
ZBSAW0B11 thru ZBSAW0B65			ZBVG1 thru ZBVG6	19-35 19-56
ZBSAW0G11 thru ZBSAW0G65         19-55         ZBSAW11 thru ZBSAW37         19-53         ZBVJ1 thru ZBSAW56         19-36, 19-57           ZBSAW113 thru ZBSAW683         19-53         ZBWJ1 thru ZBVM6         19-36, 19-57           ZBSAW713 thru ZBSAW7483         19-54         ZBWM1 thru ZBVM6         19-36, 19-57           ZBSAW7A9 thru ZBSAW7A3741         19-54         ZBW911 thru ZBW937         19-41, 19-62           ZBSAW7A9 thru ZBSAW44         19-46         ZBV1010 thru ZBV95005         19-38, 19-59           ZBSAZ009         19-56, 19-57         ZBY2002 thru ZBV2931         19-37, 19-58           ZBSAZ101 thru ZBSAZ141         19-55         ZBY2002 thru ZBV2931         19-37, 19-58           ZBSAZ1015 thru ZBSAZ1055         19-57         ZBY4001 thru ZBV4101         19-37, 19-58           ZBSAZ101 thru ZBSAZ066         19-61, 19-101         ZBY3101 thru ZBV9101         19-38, 19-59           ZBSAZ01 thru ZBSAZ066         19-45         ZBY3101 thru ZBV9101         19-28, 19-48           ZBSCA1 thru ZBSCA66         19-45         ZBY93101 thru ZBV9101         19-28, 19-48           ZBSCA1 thru ZBSCA66         19-45         ZBY9301 thru ZBSCA90         19-8, 19-28, 19-48           ZBSCA1 thru ZBSCA66         19-45         ZBY301 thru ZBSCA90         19-8, 19-28, 19-49           ZBSCA1 thru Z				
ZBSAW11 thru ZBSAW363         19-53         ZBMW15 thru ZBVM66         19-36, 19-56           ZBSAW113 thru ZBSAW763         19-54         ZBWM15 thru ZBVM66         19-36, 19-56           ZBSAW743 thru ZBSAW743741         19-54         ZBWM15 thru ZBWM65         19-36, 19-57           ZBSAW749 thru ZBSAW7L3740         19-54         ZBW01001 thru ZBV37         19-41, 19-62           ZBSAW749 thru ZBSAW7L3740         19-54         ZBW01001 thru ZBV37         19-41, 19-62           ZBSAZ101 thru ZBSAW4         19-48         ZBW10101 thru ZBV1912         19-39, 19-60           ZBSAZ101 thru ZBSAZ441         19-48         ZBW1011 thru ZBV1912         19-39, 19-60           ZBSAZ101 thru ZBSAZ141         19-55         ZBW2002 thru ZBY2931         19-37, 19-58           ZBSAZ101 thru ZBSAZ905         19-57         ZBY4001 thru ZBY4101         19-37, 19-58           ZBSAZ301 thru ZBSAZ905         19-61, 19-101         ZBY3101 thru ZBY6102         19-38, 19-59           ZBSAZ1 thru ZBSCA66         19-45         ZBY3010 thru ZBY6101         19-38, 19-59           ZBSCA1 thru ZBSCA66         19-45         ZBY3030         19-81, 19-61           ZBSCH1 thru ZBSCA66         19-45         ZBY3330         19-81, 19-61           ZBSCH21 thru ZBSCA69         19-46         ZBX2600 thru ZBX365         19-				
ZBSAW113 thru ZBSAW063         19-53         ZBWM1 thru ZBSW065         19-36, 19-57           ZBSAW713 thru ZBSAW7A3741         19-54         ZBWM11 thru ZBW937         19-41, 19-62           ZBSAW7A9 thru ZBSAW7A3741         19-54         ZBW911 thru ZBW937         19-41, 19-62           ZBSAW7A9 thru ZBSAW7A3744         19-48         ZBY01001 thru ZBY0912         19-38, 19-59           ZBSAZ009         19-56, 19-57         ZBY2002 thru ZBY2931         19-39, 19-60           ZBSAZ101 thru ZBSAZ141         19-55         ZBY2002 thru ZBY2931         19-37, 19-58           ZBSAZ1015 thru ZBSAZ1055         19-57         ZBY2000 thru ZBY4101         19-37, 19-58           ZBSAZ301 thru ZBSAZ905         19-61         ZBY4001 thru ZBY4101         19-37, 19-58           ZBSAZ301 thru ZBSAZ905         19-61         ZBY4001 thru ZBY9101         19-38, 19-59           ZBSAC31 thru ZBSCA66         19-45         ZBY9101 thru ZBY9101         19-28, 19-48           ZBSCA16 thru ZBSCA66         19-45         ZBY9101 thru ZBY93307         19-40, 19-61           ZBSCA16 thru ZBSCA66         19-45         ZBY9101 thru ZBY93307         19-40, 19-61           ZBSCL1 thru ZBSCL66         19-45         ZBY9101 thru ZBY93307         19-40, 19-61           ZBSCA16 thru ZBSCA422         19-46         ZBY1011 thru ZBY93				
ZBSAW713 thru ZBSAW763         19-54         ZBWM15 thru ZBW937         19-41, 19-52           ZBSAW7A9 thru ZBSAW7L3740         19-54         ZBW01001 thru ZBV05005         19-38, 19-59           ZBSAW7A9 thru ZBSAX4         19-44         2BW01001 thru ZBY05005         19-38, 19-59           ZBSA2009         19-56, 19-57         ZBY2002 thru ZBY2931         19-39, 19-50           ZBSA2101 thru ZBSAZ141         19-55         2BY21001 thru ZBY6H102         19-37, 19-58           ZBSA2101 thru ZBSAZ1655         19-57         ZBY4001 thru ZBY4101         19-37, 19-58           ZBSA231         19-61         ZBY5101 thru ZBY6102         19-38, 19-59           ZBSA2301 thru ZBSCA66         19-61, 19-101         ZBY5101 thru ZBY9101         19-38, 19-59           ZBSCA1 thru ZBSCA66         19-45         ZBY9101 thru ZBY9101         19-28, 19-40           ZBSCA1 thru ZBSCA66         19-45         ZBY9101 thru ZBY9330         19-8, 19-28, 19-40           ZBSCA31 thru ZBSCA66         19-45         ZBY9330         19-8, 19-28, 19-40           ZBSCA31 thru ZBSCA66         19-46         ZBZ1600 thru ZBY305         19-40, 19-61           ZBSCA1 thru ZBSCA66         19-47         ZBZ28         19-40, 19-61           ZBSCA1 thru ZBSCA083         19-31, 19-58         ZBZ328         19-40, 19-61				
ZBSAW7A1715 thru ZBSAW7A3741         19-54         ZBW011 thru ZBW05005         19-31 19-62           ZBSAW7A9 thru ZBSAW4         19-48         ZBY1001 thru ZBV50005         19-38 19-52           ZBSA2009         19-56, 19-57         ZBY2002 thru ZBSA2031         19-37, 19-58           ZBSA2101 thru ZBSA2141         19-55         ZBY2002 thru ZBY2031         19-37, 19-58           ZBSA21015 thru ZBSA21055         19-57         ZBY4001 thru ZBY6102         19-37, 19-58           ZBSA231 thru ZBSA2905         19-61         ZBY5101 thru ZBY6102         19-38, 19-59           ZBSA2301 thru ZBSA2905         19-61, 19-101         ZBY8101 thru ZBY6102         19-38, 19-58           ZBSCA16 thru ZBSCA66         19-45         ZBY9101 thru ZBY9101         19-28, 19-48           ZBSCA16 thru ZBSCA66         19-45         ZBY9101 thru ZBY9330T         19-49, 19-61           ZBSCA18 thru ZBSCA66         19-45         ZBY9030         19-8, 19-28         19-48           ZBSCO11 thru ZBSCA66         19-45         ZBY9030         19-8, 19-28         19-48           ZBSCO11 thru ZBSCA66         19-45         ZBY3030         19-8, 19-28         19-48           ZBSCO13 thru ZBSCA66         19-47         ZBZ28         19-40         19-61           ZBSCO13 thru ZBSCA66         19-45				
ZBSAWTAB thru ZBSAWT.3740         19-54         ZBV01001 thru ZBY05005         19-38, 19-59           ZBSAX2 bru ZBSAX2         19-48         ZBV1101 thru ZBY2911         19-39, 19-60           ZB5AZ009         19-56, 19-57         ZBV2002 thru ZBY2931         19-37, 19-58           ZB5AZ101 thru ZBSAZ1055         19-57         ZBV2401 thru ZBY6H102         19-37, 19-58           ZBSAZ31         19-61         ZBY4001 thru ZBY6H01         19-37, 19-58           ZBSAZ301 thru ZB5AZ905         19-61, 19-61         ZBY8101 thru ZBY9101         19-83, 19-59           ZBSCA21 thru ZB5CA6         19-45         ZBY9301 thru ZBY9330T         19-49, 19-41           ZBSCA1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28, 19-48           ZBSCA31 thru ZBSCA66         19-45         ZBY9330         19-81, 19-28, 19-48           ZBSCA1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28, 19-48           ZBSCA31 thru ZBSCA632         19-46         ZBZ1600 thru ZB2505         19-40, 19-61           ZBSCL1 thru ZB5CL6         19-47         ZBZ28         19-41, 19-62           ZBSCV013 thru ZBSCV663         19-51         ZBZ41         19-40, 19-61           ZBSCX011 sthru ZB5CW363         19-51         ZBZ41         19-40, 19-61           ZBSCX011 sthru			7RW011 thru 7RW037	10-41 10-62
ZBSAX2 thru ZBSAX4         19-48         ZBV1101 thru ZBV1912         19-39, 19-60           ZBSAZ090         19-56, 19-57         ZBV2002 thru ZBV2931         19-37, 19-58           ZBSAZ1015 thru ZBSAZ141         19-55         ZBY2H101 thru ZBY4101         19-37, 19-58           ZBSAZ1015 thru ZBSAZ1055         19-61         ZBY5010 thru ZBY4101         19-37, 19-58           ZBSAZ31         19-61         ZBY5010 thru ZBY6102         19-38, 19-59           ZBSAZ301 thru ZBSAZ905         19-61, 19-101         ZBY8101 thru ZBY9101         19-28, 19-48           ZBSCA16 thru ZBSCA66         19-45         ZBY91017 thru ZBY9330T         19-40, 19-61           ZBSCA18 thru ZBSCA66         19-45         ZBY91017 thru ZBY9330T         19-40, 19-61           ZBSCA18 thru ZBSCA622         19-46         ZBY9330         19-8, 19-28, 19-48           ZBSCO013 thru ZBSCA432         19-46         ZBY9330         19-8, 19-28, 19-48           ZBSCO013 thru ZBSCV663         19-47         ZBZ28         19-40, 19-61           ZBSCA18 thru ZBSCV663         19-47         ZBZ288         19-41, 19-62           ZBSCV213 thru ZBSCV663         19-51         ZBZ41         19-40, 19-61           ZBSCW113 thru ZBSCW363         19-53         ZBZ48 thru ZBSCS         19-41, 19-62           Z				
ZB5AZ009         19-56, 19-57         ZBV2002 thru ZBY2931         19-37, 19-58           ZB5AZ101 thru ZB5AZ141         19-55         ZBV2H101 thru ZBY6H102         19-37, 19-58           ZB5AZ101 thru ZB5AZ1055         19-67         ZBY4001 thru ZBY4101         19-37, 19-58           ZB5AZ31         19-61         ZBY5101 thru ZBY6102         19-38, 19-59           ZB5AZ901 thru ZB5CA6         19-61         ZBY5101 thru ZBY9101         19-28, 19-48           ZB5CA1 thru ZB5CA66         19-45         ZBY9101T thru ZBY9330         19-48, 19-48           ZB5CA31 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28           ZB5CH 1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28           ZB5CH 1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28           ZB5CH 1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-28           ZB5CH 1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-81, 19-48           ZB5CA1 thru ZB5CA66         19-45         ZBY9330         19-81, 19-49, 19-61           ZB5CH 1 thru ZB5CA62         19-47         ZBZ28         19-40, 19-61           ZB5CH 1 thru ZB5CA63         19-18         ZBZ28         19-41, 19-62           ZB5CA1 thru ZB5CA63         19-15         <				
ZB5AZ101 thru ZB5AZ141         19-55         ZBY2H101 thru ZBY4101         19-37, 19-58           ZB5AZ1015 thru ZB5AZ1055         19-61         ZBY4001 thru ZBY6102         19-38, 19-59           ZB5AZ31         19-61         ZBY5101 thru ZBY6102         19-38, 19-59           ZB5AZ901 thru ZB5AZ905         19-61, 19-101         ZBY5101 thru ZBY6101         19-28, 19-48           ZB5CA1 thru ZB5CA6         19-45         ZBY91017 thru ZBY93007         19-40, 19-61           ZB5CA16 thru ZB5CA66         19-45         ZBY91017 thru ZBY93007         19-40, 19-61           ZB5CA131 thru ZB5CA66         19-45         ZBY93030         19-8, 19-28, 19-40, 19-61           ZB5CA16 thru ZB5CH06         19-47         ZB228         19-40, 19-61           ZB5CH1 thru ZB5CH06         19-47         ZB228         19-41, 19-62           ZB5CV113 thru ZB5CV063         19-51         ZBZ41         19-40, 19-61           ZB5CS23         19-40, 19-61, 19-101         ZBZ41         19-40, 19-61           ZB5SZ3         19-40, 19-61, 19-101         ZBZ8         19-41, 19-62           ZB5SZ3         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZB5SZ3         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZB6AX1 thru ZB6AA9         19-17 <td></td> <td></td> <td></td> <td></td>				
ZB5AZ1015 thru ZB5AZ1055         19-67         ZBV4001 thru ZBV6102         19-37, 19-58           ZB5AZ301         19-61         ZBV5101 thru ZBV6102         19-38, 19-59           ZB5AZ901 thru ZB5CA66         19-45         ZBV5101 thru ZBY330T         19-49, 19-48           ZB5CA1 thru ZB5CA66         19-45         ZBV91017 thru ZBY330T         19-49, 19-48           ZB5CA31 thru ZB5CA432         19-46         ZBV99330         19-81, 19-81           ZB5CL1 thru ZB5CL66         19-47         ZB28         19-41, 19-62           ZB5CL1 thru ZB5CV663         19-47         ZB228         19-41, 19-62           ZB5CL1 thru ZB5CV63         19-45         ZB232 thru ZB235         19-37, 19-58           ZB5CV013 thru ZB5CV063         19-51         ZBZ41         19-40, 19-61           ZB5CW113 thru ZB5CV663         19-53         ZB248 thru ZB258         19-40, 19-61           ZB5SZ3         19-40, 19-61, 19-101         ZB28         19-40, 19-61           ZB5SZ5         19-41         19-61         ZCD21 thru ZCD39         21-17           ZB6AA1 thru ZB6AA9         19-17         ZCDEF1z thru ZCDEP20         21-18           ZB6A21 thru ZB6A99         19-18         ZCKD01 thru ZCKD00         21-19           ZB6A31 thru ZB6A99         19-16 <td< td=""><td></td><td> /</td><td>7RV2H101 thru 7RV6H102</td><td>19-37 19-58</td></td<>		/	7RV2H101 thru 7RV6H102	19-37 19-58
ZB5AZ31         19-61         ZB5AZ901 thru ZB5AZ905         19-61, 19-101         ZBY8101 thru ZBY6102         19-38, 19-59           ZB5AZ901 thru ZB5CA66         19-45         ZBY9101 Thru ZBY9330T         19-40, 19-61           ZB5CA16 thru ZB5CA66         19-45         ZBY9101 Thru ZBY9330T         19-40, 19-61           ZB5CA31 thru ZB5CA432         19-46         ZB21600 thru ZB23605         19-41, 19-61           ZB5CL01 thru ZB5CH06         19-47         ZB228         19-41, 19-62           ZB5CL1 thru ZB5CV63         19-45         ZB232 thru ZBZ35         19-37, 19-58           ZB5CV13 thru ZB5CW363         19-51         ZBZ41         19-40, 19-61           ZB5SZ3         19-40, 19-61, 19-101         ZB28         19-41, 19-62           ZB5SZ3         19-40, 19-61, 19-101         ZB28         19-40, 19-61           ZB6AA1 thru ZB6A9         19-17         ZCD21 thru ZCD29         21-17           ZB6AD2 thru ZB6A69         19-17         ZCDE71 thru ZCDEP20         21-17           ZB6ABC3 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AC3 thru ZB6AC9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AC3 thru ZB6AC9         19-17         ZCKD01 thru ZCKD109         21-29           ZB6AC3			7RV4001 thru 7RV4101	19-37 19-58
ZB5AZ901 thru ZB5AZ905         19-61, 19-101         ZB8N101 thru ZBY9101         19-48         ZB9CA1 thru ZBSCA66         19-45         ZBY9101T thru ZBY9330T         19-48         19-48         ZBY9101T thru ZBSCA66         19-49         19-40         19-40         19-41         19-40         19-41         19-40         19-41         19-40         19-41         19-41         19-42         19-4				
ZBSCA1 thru ZBSCA6   19-45			7RV8101 thru 7RV9101	19-28 19-48
ZBSCA16 thru ZBSCA66         19-45         ZBY9330         19-8, 19-28, 19-48           ZBSCA331 thru ZBSCA432         19-46         ZBZ1600 thru ZBZ605         19-40, 19-61           ZBSCL1 thru ZBSCL6         19-47         ZBZ28         19-41, 19-62           ZBSCL1 thru ZBSCC63         19-41         ZBZ22 thru ZBZ35         19-37, 19-58           ZBSCW113 thru ZBSCW663         19-51         ZBZ41         19-40, 19-61           ZBSCW113 thru ZBSCW663         19-40, 19-61         2BZ48         19-40, 19-61           ZBSSC3         19-40, 19-61, 19-101         ZBZ8         19-40, 19-62           ZBSSZ5         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSA25         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSSZ5         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSA25         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSA25         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSA25         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSA26         19-101         ZCDE1 thru ZCD39         21-17           ZB6AA1 thru ZB6A49         19-17         ZCDEF12 thru ZCD29         21-17				
ZBSCA331 thru ZBSCA432				
ZB5CH01 thru ZB5CH06         19-47         ZB228         19-41, 19-62           ZB5CL1 thru ZB5CL6         19-45         ZB232 thru ZB235         19-37, 19-58           ZB5CW113 thru ZB5CW63         19-51         ZB232 thru ZB258         19-40, 19-61           ZB5SZ3         19-40, 19-61, 19-101         ZB28         19-41, 19-62           ZB5SZ3         19-40, 19-61         ZCD21 thru ZCD39         21-17           ZB6AA1 thru ZB6AA9         19-17         ZCDEF12 thru ZCDEP20         21-17           ZB6A21 thru ZB6AP9         19-17         ZCDEF12 thru ZCDEP20         21-17           ZB6A61 thru ZB6AP9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AGA1 thru ZB6AF9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AGA1 thru ZB6AF9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AGA1 thru ZB6AS934         19-17         ZCKE05 thru ZCKD59         21-19           ZB6AS34 thru ZB6AS934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AW9         19-16         ZCKC05 thru ZCKE676         21-29           ZB6CA1 thru ZB6CW9         19-16         ZCKL05 thru ZCKL947         21-29           ZB6CA1 thru ZB6CW9         19-17         ZCKL17H7 thru ZCKL94H7				
ZBSCL1 thru ZBSCL6         19-45         ZBZ32 thru ZBZ35         19-51         ZBZ41         19-40, 19-61           ZBSCV013 thru ZBSCV063         19-53         ZBZ48 thru ZBZ58         19-41, 19-62         2BSSZ3         19-40, 19-61, 19-101         ZBZ48 thru ZBZ58         19-41, 19-62         2BSSZ5         19-61         ZCD21 thru ZCD299         21-17         2B6AA1 thru ZB6AA9         19-17         ZCD21 thru ZCDEP20         21-17         2BCAA1 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCDEP20         21-17         2BCABA1 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCDEP20         21-17         2BCABA1 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCDEP20         21-17         2BCABA1 thru ZB6AE9         19-16         ZCKD01 thru ZCH20         21-19         2BCABA1 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-19         2BCABA1 thru ZB6AF9         19-16         ZCKD01 thru ZCKD109         21-29         2BCABA1 thru ZB6AF9         19-16         ZCKD01 thru ZCKD109         21-29         2BCABA1 thru ZB6AS934         19-17         2CKE051 thru ZCKD59         21-19         2DCABA1 thru ZB6AS934         19-17         2CKE055 thru ZCKE667         21-29         2BCABA1 thru ZB6AV9         19-16         2CKC055 thru ZCKE667         21-29         2BCABA1 thru ZB6AV9         19-16         2CKC055 thru ZCKE667         21-23         2BCABA1 thru ZB				
ZBSCV013 thru ZBSCW363         19-51         ZBZ41         19-40, 19-61           ZBSSZ3         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZBSSZ5         19-40, 19-61, 19-101         ZBZ8         19-40, 19-61           ZB6AA1 thru ZB6AA9         19-61         ZCD21 thru ZCD39         21-17           ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCED20         21-17           ZB6AE1 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-18           ZB6AG1 thru ZB6AF9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AG4 thru ZB6AGT         19-17         ZCKD02 thru ZCKD09         21-23           ZB6AG4 thru ZB6AG934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE05 thru ZCKE676         21-29           ZB6CD22 thru ZB6CA9         19-17         ZCKE05 thru ZCKJ04H7         21-23           ZB6CD22 thru ZB6CP9         19-16         ZCKJ019H7 thru ZCKJ28H7         21-27           ZB6CB1 thru ZB6CV9         19-16         ZCKJ11H7 thru ZCKJ28H7         21-27           ZB6CQ1 thru ZB6CV9         19-16         ZCKJ11H7 thru ZCKJ4140H7				
ZB5CW113 thru ZB5CW363         19-40, 19-61, 19-101         ZB285Z3         19-40, 19-61, 19-101         ZB28         19-40, 19-61           ZB5SZ5         19-61         ZCD21 thru ZCD39         21-17           ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCD21 thru ZCDEP20         21-17           ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCEH2         21-16           ZB6AF1 thru ZB6AD28         19-19-16         ZCKD01 thru ZCKD02         221-19           ZB6AF1 thru ZB6AF9         19-16         ZCKD01 thru ZCKD109         21-23           ZB6AGA thru ZB6AGT         19-19         ZCKD31 thru ZCKD59         21-19           ZB6AS34 thru ZB6AS934         19-17         ZCKE055 thru ZCKE676         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKG00         21-29           ZB6AW1 thru ZB6CA9         19-16         ZCKG00         21-29           ZB6CD22 thru ZB6CD28         19-17, 19-18         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CP2 thru ZB6CD9         19-16         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CP1 thru ZB6CP9         19-16         ZCKJ019H7 thru ZCKJ04H7         21-27           ZB6CP1 thru ZB6CP9         19-16         ZCKJ11H7 thru ZCKJ04H7         21-27           ZB6CP1 thru Z				
ZBSSZ3				
ZB5SZ5         19-61         ZCD21 thru ZCD39         21-17           ZB6AA1 thru ZB6AA9         19-17         ZCDEF12 thru ZCDEP20         21-17           ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCEH2         21-16           ZB6AE1 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AF1 thru ZB6AF9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AGA thru ZB6AGT         19-19         ZCKD031 thru ZCKD109         21-23           ZB6AS34 thru ZB6AS934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE055 thru ZCKE67         21-28           ZB6AW1 thru ZB6AW9         19-16         ZCKG00         21-29           ZB6AW1 thru ZB6CA9         19-17         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CA1 thru ZB6CA9         19-17         ZCKJ019H7 thru ZCKJ28H7         21-29           ZB6CB1 thru ZB6CD28         19-17, 19-18         ZCKJ11H7 thru ZCKJ28H7         21-27           ZB6CGA thru ZB6CGT         19-16         ZCKJ11H7 thru ZCKJ4104H7         21-27           ZB6CW1 thru ZB6CW9         19-16         ZCKJ1H7 thru ZCKJ4104H7         21-27           ZB6CW1 thru ZB6CW9         19-16         ZCKJ1H7 thru ZCKJ1404H7				
ZB6AA1 thru ZB6AA9         19-17         ZCDEF12 thru ZCDEP20         21-17           ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCEH2         21-16           ZB6AE1 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AF1 thru ZB6AF9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AGA thru ZB6AGT         19-19         ZCKD31 thru ZCKD59         21-19           ZB6AS834 thru ZB6AS934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE055 thru ZCKE67         21-29           ZB6AV1 thru ZB6AW9         19-16         ZCKG00         21-29           ZB6CA1 thru ZB6CA9         19-17         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CD22 thru ZB6CD28         19-17, 19-18         ZCKJ1H7 thru ZCKJ3H7         21-27           ZB6CGA thru ZB6CF9         19-16         ZCKJ1H7 thru ZCKJ4104H7         21-27           ZB6CV1 thru ZB6CV9         19-16         ZCKJ1H7 thru ZCKJ4104H7         21-27           ZB6CV1 thru ZB6CV9         19-16         ZCKJ1H7 thru ZCKL18H7         21-23           ZB6DA1 thru ZB6CW9         19-16         ZCKJ1H7 thru ZCKL18H7         21-23           ZB6DD22 thru ZB6DD8         19-17, 19-18         ZCM				
ZB6AD22 thru ZB6AD28         19-17, 19-18         ZCE01 thru ZCEH2         21-16           ZB6AE1 thru ZB6AE9         19-16         ZCKD01 thru ZCKD02         21-19           ZB6AF1 thru ZB6AF9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AGA thru ZB6AGT         19-19         ZCKD31 thru ZCKD59         21-19           ZB6AS834 thru ZB6AS934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE055 thru ZCKE676         21-29           ZB6AV1 thru ZB6CA9         19-16         ZCKG00         21-23           ZB6AV1 thru ZB6CA9         19-16         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CD22 thru ZB6CD28         19-17, 19-18         ZCKJ11H7 thru ZCKJ28H7         21-27           ZB6CB1 thru ZB6CF9         19-16         ZCKJ1H7 thru ZCKJ4H7         21-27           ZB6CGA thru ZB6CGT         19-19         ZCKJ1H7 thru ZCKJ4104H7         21-27           ZB6CW1 thru ZB6CV9         19-16         ZCKL1H7 thru ZCKJ4104H7         21-27           ZB6CW1 thru ZB6CV9         19-16         ZCKL1H7 thru ZCKJ104H7         21-23           ZB6DA1 thru ZB6CV9         19-16         ZCKL1H7 thru ZCKY91         21-17           ZB6DA1 thru ZB6DA9         19-17         2CK11H7 t				
ZB6AE1 thru ZB6AE9       19-16       ZCKD01 thru ZCKD02       21-19         ZB6AF1 thru ZB6AF9       19-16       ZCKD02 thru ZCKD109       21-23         ZB6AGA thru ZB6AGT       19-19       ZCKD31 thru ZCKD59       21-19         ZB6AS834 thru ZB6AS934       19-17       ZCKE05 thru ZCKE67       21-28         ZB6AV1 thru ZB6AV9       19-16       ZCKE055 thru ZCKE676       21-29         ZB6AW1 thru ZB6AW9       19-16       ZCKG00       21-23         ZB6CA1 thru ZB6CA9       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17       2CKJ1H7 thru ZCKJ2BH7       21-27         ZB6CG1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ2BH7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKJ1H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-27         ZB6DA1 thru ZB6CW9       19-16       ZCKL1H7 thru ZCKY91       21-23         ZB6DD122 thru ZB6DA9       19-17       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27       20-27 </td <td></td> <td></td> <td></td> <td></td>				
ZB6AF1 thru ZB6AF9         19-16         ZCKD02 thru ZCKD109         21-23           ZB6AGA thru ZB6AGT         19-19         ZCKD31 thru ZCKD59         21-19           ZB6AS834 thru ZB6AS934         19-17         ZCKE05 thru ZCKE67         21-28           ZB6AV1 thru ZB6AV9         19-16         ZCKE055 thru ZCKE676         21-29           ZB6AW1 thru ZB6AW9         19-16         ZCKG00         21-23           ZB6CA1 thru ZB6CA9         19-17         ZCKJ019H7 thru ZCKJ04H7         21-29           ZB6CD22 thru ZB6CD28         19-17, 19-18         ZCKJ11H7 thru ZCKJ28H7         21-27           ZB6CE1 thru ZB6CF9         19-16         ZCKJ11H7 thru ZCKJ5H7         21-27           ZB6CV1 thru ZB6CV9         19-16         ZCKJ11H7 thru ZCKJ4104H7         21-27           ZB6CV1 thru ZB6CV9         19-16         ZCKL1H7 thru ZCKL18H7         21-23           ZB6CW1 thru ZB6CW9         19-16         ZCKS7 thru ZCKS9         21-19           ZB6DA1 thru ZB6DA9         19-17         ZCKY11 thru ZCKY91         21-23           ZB6DD1 thru ZB6DD2         19-17         2CKY11 thru ZCMC39L5         21-17           ZB6DF1 thru ZB6DE9         19-16         ZCMD21 thru ZCMD41         21-17           ZB6DV1 thru ZB6DF9         19-16         ZCP21 thru ZCP290 <td></td> <td></td> <td></td> <td>_</td>				_
ZB6AGA thru ZB6AGT       19-19       ZCKD31 thru ZCKD59       21-19         ZB6AS834 thru ZB6AS934       19-17       ZCKE05 thru ZCKE67       21-28         ZB6AV1 thru ZB6AV9       19-16       ZCKE055 thru ZCKE676       21-29         ZB6AW1 thru ZB6CM9       19-16       ZCKG00       21-23         ZB6CA1 thru ZB6CD28       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ1H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKJ1H7 thru ZCKJ4104H7       21-27         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCP21 thru ZCT25P16       21-17         ZB6DV1 thru ZB6DV9       19-16				
ZB6AS834 thru ZB6AS934       19-17       ZCKE05 thru ZCKE67       21-28         ZB6AV1 thru ZB6AV9       19-16       ZCKE055 thru ZCKE676       21-29         ZB6AW1 thru ZB6AW9       19-16       ZCKG00       21-23         ZB6CA1 thru ZB6CA9       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ11H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6DA1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DD28       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DGA thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCP21 thru ZCP29       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCP21 thru ZCT25P16       21-17         ZB6E1B thru ZB6DW9       19-16				
ZB6AV1 thru ZB6AV9       19-16       ZCKE055 thru ZCKE676       21-29         ZB6AW1 thru ZB6AW9       19-16       ZCKG00       21-23         ZB6CA1 thru ZB6CA9       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ11H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ11H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKJ215H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPE90       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DB1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15				_
ZB6AW1 thru ZB6AW9       19-16       ZCKG00       21-23         ZB6CA1 thru ZB6CA9       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ11H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6DA9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DE1 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCPED44 thru ZCPEP20       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6CA1 thru ZB6CA9       19-17       ZCKJ019H7 thru ZCKJ04H7       21-29         ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ11H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6DA9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DE1 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCP39       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				_
ZB6CD22 thru ZB6CD28       19-17, 19-18       ZCKJ11H7 thru ZCKJ28H7       21-27         ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DV1 thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCP21 thru ZCY91       21-17         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				_
ZB6CE1 thru ZB6CF9       19-16       ZCKJ1H7 thru ZCKJ5H7       21-27         ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF3 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-16       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCPED44 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6CGA thru ZB6CGT       19-19       ZCKJ215H7 thru ZCKJ4104H7       21-27         ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DF1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DGA thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCPED44 thru ZCPEP20       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101		•		
ZB6CV1 thru ZB6CV9       19-16       ZCKL1H7 thru ZCKL18H7       21-23         ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6CW1 thru ZB6CW9       19-16       ZCKS7 thru ZCKS9       21-19         ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DGA thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6DA1 thru ZB6DA9       19-17       ZCKY11 thru ZCKY91       21-23         ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6DD22 thru ZB6DD28       19-17, 19-18       ZCMC21L1 thru ZCMC39L5       21-17         ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6DE1 thru ZB6DE9       19-16       ZCMD21 thru ZCMD41       21-17         ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				_
ZB6DF1 thru ZB6DF9       19-16       ZCP21 thru ZCP39       21-17         ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101		•		
ZB6DGA thru ZB6DGT       19-19       ZCPED44 thru ZCPEP20       21-17         ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6DV1 thru ZB6DV9       19-16       ZCT21P16 thru ZCT25P16       21-17         ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6DW1 thru ZB6DW9       19-16       ZCY15 thru ZCY91       21-16         ZB6E1B thru ZB6E2E       19-15       ZENL1111 thru ZENL1121       19-101				
ZB6E1B thru ZB6E2E				
				_
2DOLD 1D till 2DOLINIOD				
	250ED 10 tilla 200EWOD	19-13	1.5011 unu 1.5001	14-0



1.5S1FSS	110	3108538150	4 A 4 4
	•••••••••••••••••••••••••••••••••••••••		
1003880A		3110112001	
100S3HNV	14-9	3110251450 thru 3110251451	
100SNA	3-7. 7-58	3110451250 thru 3112350156	16-107
100SV1A thru 100SV82A	14-8	3116118474 thru 3116155368	
1010004 thru 10100010		32510	
10S1F thru 10S8F			
		32521	
10S1FSS		32556	
10S40FSS	14-9	32570	7-41
112T3HNV	14-9	32595	7-44
14210 thru 14211	7-20	37S3HNV	14-9
150SV1A thru 150SV82A		3S1F thru 3S8F	
		3S1FSS thru 3S40FSS	
150T3HNV	_		
155DE175 thru 155DE200		3T2F thru 3T5F	• • • • • • • • • • • • • • • • • • • •
15S1FSS thru 15S40FSS	14-9	3T2FSS	14-9
15SM5010 thru 15SM5400	11-14	400SN	7-58
15T2F thru 15T75F	14-8	405WBAF010 thru 405WBAF400	11-14
15T2FSS		415WBAF010 thru 415WBAF400	
17400		4458D20X3 thru 4487D63XI	
175DE010 thru 175DE150	- ,	45T3HNV	
1S1F thru 1S8F		490NAD01103 thru 490NTW00080U	
1S1FSS	14-9	4X1.5S1FSS thru 4X9T2FSS	14-9
225SNA	3-7	500SV1B thru 500SV82B	
225T3HNV	_	50437 thru 50486	
2358C22G2 thru 2358C22G8		50S3HNV	
		50SV1A thru 50SV82A	
2358C6G2 thru 2358C6G8			
250SV1B thru 250SV82B		515608 thru 515614	
2510FF1 thru 2510FGJ6P		55DE010 thru 55DE450	
2510FK1 thru 2510FN6		56053 thru 56463	7-52
2510FO1 thru 2510FW2P	16-4	56370TD thru 56493TD	7-52
2510KF1 thru 2510KW6C	16-5	5GS010 thru 5GS200	11-7
2510MBA1 thru 2510MCW5		5J	
2510PB1		5S1F thru 5S8F	
		5S1FSS thru 5S40FSS	
2510TBG1 thru 2510TCO5			
2511KF11 thru 2511KO2T		5SM5010 thru 5SM5400	
2511MBG1 thru 2511MCO1		60100 thru 60299	
2511TBG1 thru 2511TCO1	16-9	60406 thru 60421	7-17
2512FF11 thru 2512FS202P	16-4	60488	7-20
2512KF11 thru 2512KO2T	16-5	60949 thru 60999	7-18
2512MBG1 thru 2512MCO1		6382G3MODEM thru 6382RS485G3KIT	
2512TBG1 thru 2512TCO1		6508804101	
2540902240		6508805201 thru 6508805206	
2550101002		6508805207 thru 6508805209	
2550101003		6508805210 thru 6508805216	
2550101013	19-86	6509701801 thru 6515802701	
2550101020	19-11, 19-86, 19-93	6512232801	19-76
2550101024	19-11	6516002379 thru 6516002382	19-120
2550101025 thru 2550101037	19-86	685823 thru 685831	7-48
2550101040		6T2F thru 6T5F	
2550105003 thru 2550105005	10-10 10-03	6T2FSS	
2550105007 thru 2550105014		7400ENT9 thru 7400ENT11	
25S1FSS thru 25S40FSS		7400SS3R18D22D thru 7400SS3R31D35F	
2600511000 thru 2600511500		750SV1F thru 750SV82F	
27105 thru 27118		75S3HNV thru 75T3HNV	
29007	1-22, 2-6, 2-15	7A1 thru 7S	21-9
29008W		7S1F thru 7S8F	
2920910001		7S1FSS thru 7S40FSS	
29287		8011010401 thru 8011010501	
2934D14G1 thru 2934D34G1		82254 thru 82455R	
29375		8501CDO15 thru 8501CO8	
2941101100		8501KA112	23-14
2S1F thru 2S8F		8501KF12 thru 8501KFD13	23-10
2S1FSS		8501KL	23-14
2W485C	4-15	8501KL12 thru 8501KLD12	
3000PLUC100 thru 3000PMUSITE	4-23	8501KP12	
300T3HNV		8501KP12P14	
3020B012 thru 3020E244		8501KP13	
			,
3090PS24		8501KP13P14	
3090SCCT022 thru 3090SCCT164		8501KPD12	
30T2F thru 30T75F		8501KPD12KA81KA82	23-14
30T2FSS thru 30T3HNV		8501KPD12P14	23-10
3003302753 thru 3003302754		8501KPD13	23-10, 23-14
3010215901		8501KPD13P14	23-10
3103248801 thru 3103281501		8501KU	
3105204101 thru 3105205901		8501KU12 thru 8501KUD13P14	
3105206750 thru 3105211101		8501NH7 thru 8501NH82	
3105217001 thru 3105211101		8501NR34 thru 8501NR82	
3103217001 unu 3103400401	19-93	อวบ IINกง4 แแน ชวบ IINกช2	23-14
i-34			© 2012 Schneider Electric
			All Rights Reserved
			<b>3</b>



8501NR34B thru 8501NR82B		23-14	8940XSG2075 thru 8940XSJ4600	
8501RS14 thru 8501RS4P14	23-12,	23-14	8941CBA06 thru 8941CFW47	
8501RSD14 thru 8501RSD4P14			8941DBA08 thru 8941DEW40	
8501XA1 thru 8501XDL			8941NBA10 thru 8941NFW50	
8501XDO00 thru 8501XDO80XDL		23-23	8941UBA10 thru 8941UEW40	
8501XJ1 thru 8501XM8			8965DPR13 thru 8965DPR44	
8501XMO20 thru 8501XMO608501XO00 thru 8501XO80XL			8998CP03 thru 8998CP24 8998HBA001AFSMA thru 8998HBA010XFTSS	17-6
8501XS1 thru 8501XTE2			8998HBF015 thru 8998HBF250	
8501XUDO0012 thru 8501XUDO80			8998HFA001AFSMA thru 8998HFA010XFTSS.	
8502S()A1			8998HFF030 thru 8998HFF100	
8502S()A2			8998SBA001AFSMA thru 8998SBC100XFTSS	
8502S()A3 thru 8502S()A5		16-17	8998SBA003AFSMA	
8502S()G1		16-16	8998SBF015 thru 8998SBF250	
8502S()G2			8998SFA001AFSMA thru 8998SFC100XFTSS.	
8502S()G3 thru 8502S()G5		16-16	8998SFF030 thru 8998SFF200	17-6
8502S()O1			9001A20 thru 9001A31	19-92
8502S()O2		16-14	9001A6 thru 9001A9	19-92
8502S()O3 thru 8502S()O5		16-16	9001B101 thru 9001B189R	19-103
8502S()R1		16-17	9001B111	9-70, 19-80, 19-92
8502S()̇R2			9001B110 thru 9001B189R	
8502S()R3 thru 8502S()R5		16-17	9001B19 thru 9001B25	
8502S()T1			9001B251 thru 9001B350	
8502S()T2		16-15	9001BFB107 thru 9001BFB226	
8502S()T3 thru 8502S()T5			9001BG101 thru 9001BG316	
8502S()T41			9001BGB107 thru 9001BGC315	
8502S()T42			9001BOC107 thru 9001BOC368	19-104, 19-117
8502S()T45			9001BR101 thru 9001BR218 9001BW100BU thru 9001BW102Y	19-103
8502S()W118502S()W12			9001BW146 thru 9001BW260	
8502S()W128502S()W15		16-14	9001BW90BU thru 9001BW98Y	
8502S()W138502S()W19		16-17	9001BWD219 thru 9001BWD220	
8502S()W22		16-17	9001BWRB thru 9001BWSR	19-103
8502S()W23		16-17	9001C20 thru 9001C31	
8502VFO3 thru 8502VHO3			9001C6 thru 9001C9	
8502WFO3 thru 8502WHO3			9001FB24 thru 9001FB120	
8536SAG11 thru 8536SJW2			9001G19 thru 9001G31	
8536WFO3 thru 8536WHO3		16-30	9001G6 thru 9001G9	19-92
8538SBA11 thru 8538SFW35			9001JN100 thru 9001JN799	19-11
8538SBA11S8 thru 8538SBW33S8		16-34	9001JP1 thru 9001JP38Y29	19-11
8538SCA11S8 thru 8538SCA44S8			9001JT1 thru 9001JT38Y29	
8538SCA12S1 thru 8538SCA24S1			9001K1	
8538SCG11S8 thru 8538SCG34S8			9001K107 thru 9001K110	
8538SCW11S8 thru 8538SCW34S8			9001K111	
8538SDA11S8 thru 8538SDA46S88538SDG11S8 thru 8538SDG36S8			9001K11J1 thru 9001K12J1R 9001K13B thru 9001K13M	
8538SDW11S8 thru 8538SDW36S88538SDW11S8 thru 8538SDW36S8			9001K13B trifu 9001K13M	
8539SBA1 thru 8539SHA56			9001K15	
8539SBA43S8 thru 8539SDW44S8			9001K16B thru 9001K17Y	
8539SBA71V03 thru 8539SDW74V03			9001K1L thru 9001K1LRH13	19-69
8539SCA18 thru 8539SDW18			9001K20 thru 9001K23	
8539SCA8 thru 8539SDW8			9001K25 thru 9001K28	
8539SEA41 thru 8539SJW41			9001K25J1 thru 9001K25J1R	
8539SEA51 thru 8539SJA51		16-36	9001K2L thru 9001K2LRH13	
8702SAG1 thru 8702SJW1	16-44,	16-45	9001K3	
8702WFO3 thru 8702WHO3V		16-50	9001K30 thru 9001K34H2	
8736SAG13 thru 8736SJW1			9001K34J1 thru 9001K34J1R	
8738SBA11 thru 8738SGW35			9001K35 thru 9001K37H2	
8739SBA1 thru 8739SHW5			9001K3L thru 9001K3LRH13	
8739SBA11 thru 8739SHA15			9001K4	
8739SBA43 thru 8739SHW46			9001K40	
8739SBA53 thru 8739SHA56			9001K401J thru 9001K702J1R	
8903L1L thru 8903LXWW808903SJA1 thru 8903SZW2			9001K41 thru 9001K49	
8903SJA1 thru 8903SZW28903SMA10 thru 8903SZW19			9001K42J thru 9001K79J1R 9001K5	
8903SMA60 thru 8903SZW19			9001K5	
8903SMW21 thru 8903SQW22			9001K509001K58	
8903SMW31 thru 8903SQW32			9001K56M	
8910DP11 thru 8910DP42			9001K57	
8910DPA12 thru 8910DPA93			9001K6	19-91
8911DPB1			9001K60 thru 9001K68	19-91
8911DPSG12 thru 8911DPSO53		16-74	9001K685	
8911DSS1			9001K69	
8940SSC2007 thru 8940SSG2100			9001K7	19-91
8940WC1S2V03 thru 8940WF3S2V06		16-76	9001K70 thru 9001K73H7	
8940XC1S2V03 thru 8940XF4S2V06			9001K8	
8940XSE2030V03 thru 8940XSF4100V06		16-75	9001K85	19-76

Alpha-Numeric Index



9001K92B thru 9001K95RM ...... 19-92 9001K96 thru 9001K97 ...... 19-91 9001KA1 thru 9001KA6......19-85, 19-97 9001SK52 ...... 19-122 9001SK88J thru 9001SK88J1R......19-82 9001KA12 thru 9001KA35......19-85 9001KA1G thru 9001KA6G ...... 19-85 9001SKN100 thru 9001SKN599...... 19-122 9001KA41 thru 9001KA55......19-87 9001KM1 thru 9001KM8 ......19-86 9001SKP1 thru 9001SKPR31......19-83 9001KMF1......19-86 9001SKR16......19-78 9001KN260 ...... 16-65 9001KP thru 9001KPR31 ...... 19-74 9001SKR8 thru 9001SKR9RH13...... 19-78 9001KQ11 thru 9001KQ15B ...... 19-75 9001SKRU1 thru 9001SKRU11......19-122 9001KR1 ...... 19-67 9001SKS11 thru 9001SKS25 ...... 19-80 9001SKS4 thru 9001SKS7 19-88 9001SKS401 thru 9001SKS702 19-81 9001KR11 thru 9001KR12UH1H1 ...... 19-76 9001KR131 thru 9001KR153 ...... 19-75 9001KR16 thru 9001KR16H13......19-68 9001SKS42 thru 9001SKS79 ...... 19-81 9001KR1B thru 9001KR1UH6......19-67 9001KR2 ...... 19-67, 19-88 9001SKT thru 9001SKTRR31...... 19-83 9001SKY1 thru 9001SKY6 ...... 19-105 9001SKY105 thru 9001SKY315A ...... 19-106 9001KR2B thru 9001KR2UH6......19-67 9001SSKS46BH2 ...... 19-81 9001KR3 ...... 19-67, 19-88 9001T5BE thru 9001T8YW...... 19-92 9001U19 ...... 19-92 9001KR67 ...... 19-76, 19-88 9001W6 thru 9001W9 ...... 19-92 9001KR7 ...... 19-76, 19-88 9002AC1 thru 9002AC8...... 19-124 9001KS11 thru 9001KS34K1 ...... 19-70 9002AW10 thru 9002AW22 ...... 19-124 9001KS4 thru 9001KS7...... 19-88 9001KS42 thru 9001KS79K ......19-71 9007AA0 thru 9007AA17 ...... 21-34 9001KT thru 9001KTRR31......19-74 9007AB21 thru 9007AB23 ...... 21-6 9007AB24 thru 9007AB41 ...... 21-6 9001KXBB06 thru 9001KXBD83.......19-95 9007AC1 thru 9007AO6......21-6 9001KXN100 thru 9001KXN799 ...... 19-98 9001KXPA1A thru 9001KXPC34WAGR ...... 19-95 9007B1 thru 9007B9......21-38 9001KXRA133 thru 9001KXRB34RH1 ...... 19-94, 19-96 9001KXRB35A thru 9001KXRB38W......19-96 9007BA0 thru 9007BA18 ...... 21-34 9001KXRC111 thru 9001KXRG137 ...... 19-94, 19-96 9007BA1M thru 9007BA18M ...... 21-35 9001KXRG35GWG thru 9001KXRH38RWG ...... 19-96 9007C1 thru 9007C3......21-38 9007C52A2 thru 9007C68T5 ...... 21-32, 21-33 9001KXRL121 thru 9001KXRL34GRGRH37......19-94 9007CA11 thru 9007CA18M......21-34, 21-35 9001KXRL35GGRR thru 9001KXRM38RWWG ...... 19-96 9007CB31 thru 9007CB41......21-6 9001KXSA125 thru 9001KXSHHB......19-95, 19-97 9007CC1......21-6 9001KXSJE35G thru 9001KXSJE38W ...... 19-97 9001KXSRE1 thru 9001KXSRE3...... 19-97 9001KXSVC5 thru 9001KXSVC10.......19-97 9007CP221 thru 9007CP325......21-6 9001KY1 thru 9001KY6.......19-105 9001KYAF1 thru 9001KYAF6 ...... 19-105 9001KYG1 thru 9001KYG12......19-105, 19-106 9001KYK11 thru 9001KYK33......19-106 9007DA0 thru 9007DA9M.......21-34, 21-35 9007DA11 thru 9007DA18M......21-34, 21-35 9001KYK110 thru 9001KYK326......19-106 9001KYSK101 thru 9001KYSK210 ...... 19-106 9001KYSS1 thru 9001KYSS6......19-105 9007E4 thru 9007E6 ...... 21-38 9001KYSS101 thru 9001KYSS111 ...... 19-106 9007EA0 thru 9007EA9M ...... 21-34, 21-35 9001KYSS201 thru 9001KYSS210.......19-106 9001L20 thru 9001L9 ......19-70, 19-80, 19-92 9001OA12 thru 9001OY24......19-10 9007F4 thru 9007F6 ...... 21-38 9001R19 thru 9001R94......19-70, 19-80, 19-92 9007HA0 thru 9007HA9......21-35 9001SK1L......19-79, 19-88 9007HA20 thru 9007HA26......21-35 9001SK1L1......19-79 9001SK1L1GH13 thru 9001SK1LRH13......19-79 9007J1 thru 9007J2 ...... 21-38 9001SK20 thru 9001SK23......19-82 9007JKC ...... 21-33 9001SK25J1 thru 9001SK25J1R ...... 19-80 9007K1 thru 9007K2......21-38 9001SK2L1G20H13 thru 9001SK2LRH13 ...... 19-79 9007KA1 thru 9007KA9 ...... 21-34 9007KA11 thru 9007KA21 ...... 21-34 9001SK34J1 thru 9001SK34J1R ...... 19-80



www.schneider-electric.us		, <b>.</b>	
9007KB11 thru 9007KB15		9070SDG4 thru 9070SF41B	
9007KC		9070SK1000A2D1 thru 9070SK750G3D1	
9007L		9070SK1000A2D1G13 thru 9070SK750G3D1G13	
9007LA1 thru 9007LA9		9070T1000D1 thru 9070TF75D50	
9007LA10 thru 9007LA19		9070T50 thru 9070T750	
9007MA0 thru 9007MA9M2	1-34, 21-35	9070UE7	
9007MA11 thru 9007MA18M2	1-34, 21-35	9080FB1211 thru 9080FB3631R	
9007ML01S0100 thru 9007ML13S0100		9080FBDIN3	24-19
9007MS01G0100 thru 9007MS09S0100		9080GA6	24-14, 24-15
9007MS10G0100 thru 9007MS13S0100		9080GA6188BC	
9007N1 thru 9007N2	21-38	9080GC6	
9007R		9080GC6B	24-13
9007R16 thru 9007R22		9080GCB01 thru 9080GCB70	
9007RA9 thru 9007RA11	21-34	9080GCB0115 thru 9080GCB20150	24-15
9007S9	21-36	9080GD6 thru 9080GD6B	24-13, 24-15
9007TBT1	21-35	9080GE6	
9007TCT10 thru 9007TCT13	21-35	9080GF6	24-14, 24-15
9007TSA1 thru 9007TSD3	21-37	9080GF694BC	24-15
9007TUA1 thru 9007TUD12	21-37	9080GF6B	24-14
9007WJ thru 9007WKC		9080GG6	24-14. 24-15
9007X1 thru 9007Z2	21-38	9080GH10 thru 9080GH91	
9012GAR1 thru 9012GFW4	22-14	9080GH103 thru 9080GH710	
9012GGW1 thru 9012GMW4		9080GK6 thru 9080GKY6	
9012GNG1 thru 9012GTO4		9080GLP3 thru 9080GLP6	
9013FHG12 thru 9013FHG9		9080GM6 thru 9080GMY6B	
9013FRG12 thru 9013FRG99		9080GP6 thru 9080GP6B	
9013FSG10 thru 9013FSW9		9080GR6 thru 9080GRY6	
9013FYG10 thru 9013FYW9		9080GS6 thru 9080GT6B	
9013GHB2 thru 9013GSW3		9080LB21 thru 9080LB53	
9016GAR1 thru 9016GAW22		9080LBA161101 thru 9080LBA365212	
9036DG2 thru 9036DW31R		9080LBC162101 thru 9080LBC365212	
9036FG30		9080MH203 thru 9080MH439	
9036GG2 thru 9036GW1R		9080MH82 thru 9080MHA10	
9037EG8 thru 9037EW13		92251 thru 92451	
9037HG30 thru 9037HG39		9421LC43 thru 9421LW7	
9037HR30 thru 9037HR39		9421V1A30 thru 9421V2W30	
9037HW30 thru 9037HW39		9422A1 thru 9422A10	
9038AG1 thru 9038AW1		9422AM2	
9038CG31 thru 9038CG36		9422AP1 thru 9422AP2	
9038CR31 thru 9038CR36		9422ATCF301 thru 9422BTEN10	
9038CW31 thru 9038CW36		9422C1	
9038DG7 thru 9038DG10		9422CFT10 thru 9422CFT51	
9038DW7 thru 9038DW8		9422CMP10 thru 9422CSF70	
9049A12 thru 9049A2022-22, 2		9422CSFD1 thru 9422CSFJD50	
9049A26S		9422CSJ10 thru 9422CSJ504	
9049A52 thru 9049A58		9422CSJD10 thru 9422CSJD51	
9049A6	,	9422D2 thru 9422R2	
9049A60 thru 9049A61		9422RM1 thru 9422RS1	
9049A6A thru 9049AF1		9422TC30 thru 9422TC33	
9049EF1 thru 9049ER722-24, 23		9422TCF30 thru 9422TCN30C	
9049HF3 thru 9049HF4		9422TD63	
9049T1 thru 9049T1S		9422TDF60 thru 9422TEN10C	
9049UMS1		9422TF1 thru 9422TG2	
9050JCK11 thru 9050JCK70		9423M10 thru 9423M9L	
9050JCK1F() thru 9050JCK5F()		9788EZCIRIGB thru 9788SER3200	
9050JCK21PT thru 9050JCK49PT		9991DPG1 thru 9991DPSG2	
9065CO1 thru 9065CO1R		9991EN1 thru 9991KE3	
9065DA2 thru 9065JA2		9991LG1 thru 9991LXG1	
9065FO1L thru 9065FO1R		9991MA1 thru 9991MW11	
9065GO11L thru 9065GO11R		9991SCA11 thru 9991SGG816-6	34 16-93 16-95
9065SDO4 thru 9065SDO17		9991UE1 thru 9991UE7	
9065SDO5B1 thru 9065SDO9B2		9998DA1 thru 9998DA3	
9065SEO5 thru 9065SEO15		9998DRC5 thru 9998DRC9	
9065SEO6B thru 9065SEO9B2		9998HR2 thru 9998HWA1	
9065SEO8		9998IL1	
9065SF020 thru 9065SFC20		9998ML1 thru 9998ML2	
9065SHA01Y59 thru 9065SJA01Y59	16-80	9998PB2 thru 9998PB15	
9065SM21		9998PBV02 thru 9998PBV39	
9065SR210 thru 9065SR520	16-22	9998PC177 thru 9998PC338	
9065SS010 thru 9065SSC20		9998RA10 thru 9998RA5B	
9065ST220 thru 9065ST720		9998SG120 thru 9998SG480	
9065TJF100 thru 9065TJF63			
9065TO1 thru 9065UO1		9998SJ19998SL2 thru 9998SL33	16 107
9066RA1 thru 9066W1			
9070FB1A thru 9070FB3B		9998SO1 thru 9998SO329998UB01 thru 9998UB14	
9070FP1 thru 9070LG1		9998WF thru 9998WH16-2	
9070MN100G0D1 thru 9070MN500G0D1G13	1 <del>4-</del> 17	9999AC04	, ,
Control of the state of the sta	14 10	3000/100T	10-111

Alpha-Numeric Index



9999SB6 thru 9999SB9 ...... 16-60, 16-112 9999SBT1......16-112 9999DA01 ...... 16-111 9999DD01 thru 9999DD20......16-71, 16-81, 16-110 9999SC2 thru 9999SC9...... 16-65, 16-109 9999DMB1 thru 9999DPC1.......16-71 9999SC22 ...... 16-65, 16-109 9999LB0 thru 9999LL0......16-111 9999SG1 thru 9999SG3 ...... 16-109 9999SJ2 thru 9999SJ4 ...... 16-115 9999MP1 thru 9999MP3 ...... 16-11 9999MRB12 thru 9999MRB34 ...... 16-75 9999PL10 thru 9999PL13G...... 16-11 9999SO11 thru 9999SO12 ...... 16-114 9999SO4 thru 9999SO5 ...... 16-74, 16-113 9999R10 thru 9999R13......16-110 9999R26 thru 9999R27 ......8-22, 16-41, 16-64 9999SP2R thru 9999SP29R ...... 16-65, 16-109 9999SR1 thru 9999SR5......8-16, 16-115 9999R35 thru 9999R36......8-16, 16-41, 16-64 9999R39 thru 9999R48......16-41, 16-115 9999ST1 thru 9999ST2...... 16-112 9999R6 thru 9999R9 ...... 16-41, 16-115 9999SX6 thru 9999SX17 ...... 16-64, 16-110 9999RB34 ...... 16-111 9999TC10 thru 9999TC21 ...... 3-7, 8-16, 16-41 9999WCX11 thru 9999WX11.......16-28, 16-30, 16-50 9999RR04 ...... 16-111 9999S1 thru 9999S5 ...... 16-115 9999SA2 thru 9999SA10......16-65, 16-109 

#### Conductor Ampacity Based on the 2011 National Electrical Code®

Ampacity based on NEC Table 310.15(B)(16) (Formerly Table 310.16) -Allowable Ampacities of Insulated Conductors Rated Up to and Including 2000 Volts, 60° Through 90°C (140° Through 194°F), Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried), Based on Ambient Temperature of 30°C (86°F)

#### For conduit fill see 2011 NEC Annex C.

For Information on Temperature Ratings of Terminations to Equipment See NEC 110.14(C).

Size		Temperatur	e Rating of Cond	uctor. [See Ta	Size		
	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	
AWG or kemil	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, USE, ZW	Types TBS, SA, SIS, FEP, FEPB, MI, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE- 2, XHH, XHHW, XHHW-2, ZW-2	Types TW, UF	Types RH, RHW, THHW, THW, THWN, XHHW, USE	Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	AWG or kcmil
		Copper	•	Aluminum	or Copper-0	Clad Aluminum	
18	_	_	14		_	_	_
16	_	_	18	_	_	_	_
14**	15	20	25	_	_	_	_
12**	20	25	30	15	20	25	12**
10**	30	35	40	25	30	35	10**
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	445	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	525	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	555	655	750	470	560	630	2000

<sup>\*</sup> Refer to 310\_15(B)(2)(a) for the ampacity correction factors where the ambient temperature is other than

### Ratings for 120/240 volts, 3-Wire, Single-Phase Dwelling Services— See NEC Table 310.15 (B)(7)

These are permitted ratings for Dwelling Unit service and feeder conductors which carry the total load of the dwelling.

Rating (amps)	100	110	125	150	175	200	225	250	300	350	400
Copper	4	3	2	1	1/0	2/0	3/0	4/0	250 kcmil	350 kcmil	400 kcmil
Aluminum	2	1	1/0	2/0	3/0	4/0	250 kcmil	300 kcmil	350 kcmil	500 kcmil	600 kcmil

### NEC 210.19 Conductors — Minimum Ampacity and Size

(A) Branch Circuit Not More Than 600 Volts.
(1) General. Branch-circuit conductors shall have an ampacity not less than the maximum load to be served. Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the minimum branchcircuit conductor size, before the application of any adjustment or correction factors, shall have an allowable ampacity not less than the noncontinuous load plus 125 percent of the continuous load.

#### **Correction Factors**

Based on NEC Table 310.15(B)(2)(a)[Formerly Table 310(16)] Ambient Temperature Correction Factors Based on 30°C (86°F)

_ Ambient	Tempera	Temperature Rating of Conductor			
Temperature (°C)	60°C	75°C	90°C	Temperature (°F)	
10 or less	1.29	1.20	1.15	50 or less	
11–15	1.22	1.15	1.12	51–59	
16–20	1.15	1.11	1.08	60–68	
21–25	1.08	1.05	1.04	69–77	
26–30	1.00	1.00	1.00	78–86	
31–35	0.91	0.94	0.96	87–95	
36–40	0.82	0.88	0.91	96–104	
41–45	0.71	0.82	0.87	105–113	
46–50	0.58	0.75	0.82	114–122	
51–55	0.41	0.67	0.76	123–131	
56–60	_	0.58	0.71	132-140	
61–65	_	0.47	0.65	141–149	
66–70	_	0.33	0.58	150–158	
71–75	_	_	0.50	159–167	
76–80	_	_	0.41	168–176	
81–85	_	_	0.29	177–185	

#### Adjustment Factors – See NEC Table 310.15 (B)(3)(a)

Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown in the following table:

Number of Conductors***	Percent of Values in Table 310.15(B)(16) through Table 310.15(B)(19) as Adjusted for Ambient Temperature if Necessary
4 through 6	80
7 through 9	70
10 through 20	50
21 through 30	45
31 through 40	40
41 and Above	35

<sup>\*\*\*</sup> Number of conductors is the total number of conductor in the raceway or cable adjusted in accordance with 310.15 (B)(5) and (6).

# NEC 210.20(A) Continuous and Noncontinuous

Where a branch-circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus 125 percent of the continuous load.

#### **NEC 240.4 Protection of Conductors**

Conductors, other than flexible cords, flexible cables, and fixture wires, shall be protected against overcurrent in accordance with their ampacities specified in 310.15, unless otherwise permitted or required in 240.4(A) through (G).

#### NEC 240.4 (D) Small Conductors

Unless specifically permitted in 240.4(E) or (G), the overcurrent protection shall not exceed that required by (D)(1) through (D)(7) after any correction factors for ambient temperature and number of conductors have been applied.

#### NEC 430.22(A) Direct-Current Motor-Rectifier Supplied.

For dc motors operating from a rectified power supply, the conductor ampacity on the input of the rectifier shall not be less than 125 percent of the rated input current to the rectifier. For dc motors operating from a rectified single-phase power supply, the conductors between the field wiring output terminals of the rectifier and the motor shall have an ampacity of not less than the following percentages of the motor fullload current rating:

- (1) Where a rectifier bridge of the single-phase, half-wave type is used, 190 percent.
- (2) Where a rectifier bridge of the single-phase, full-wave type is used, 150 percent.

<sup>\*\*</sup> See Section 240.4 (D) for conductor overcurrent protection limitations.



# Have questions? Need technical support or on-site service?

Now there's one toll-free number to get all the information you need.



£ 1-888-778-2733



# Customer Care Center

The Customer Care Center (CCC) is a single point of contact where qualified personnel answer your customer service and technical support questions.

Serving all Schneider Electric authorized distributors and customers anywhere in the United States.



# Schneider Flectric Services

Schneider Electric Services provides you with power, automation and control, and energy management services to support the lifecycle of your system, process or installation. Our solutions help you get the most out of your investment and keep your facility at peak operational performance. Any brand. Any industry. Any time.



www.schneider-electric.us

#### Schneider Electric USA, Inc.

1415 S. Roselle Road Palatine, IL 60067 Tel: 847-397-2600 Fax: 847-925-7500 www.schneider-electric.us