

# Heavy Duty Starters

## Features and Benefits

**General**



Solid State Starter Class 14

### Standard Features

Size 00–4 magnetic starters include the following standard features:

- Rugged Industrial Design
- Half Sizes for Cost and Space Savings
- Dual Voltage, Dual Frequency Coils
- Solid State or Ambient Compensated Bimetal Overload Protection
- Wide Range of Accessories
- Easy Coil Access
- Overload Test Feature
- Straight Thru Wiring
- Gravity Dropout
- Large Silver Cadmium Contacts
- UL listed file #E14900 (class 14, 22, 30, 40 & 43)
- CSA certified file #LR 6535 (class 14, 22, 30, 40 & 43)

### Application

Heavy Duty starters are designed for across the line starting of single phase and polyphase motors.

These controls are available in NEMA Sizes 00 through 8. In addition to the usual NEMA Starter Sizes, Siemens offers three exclusive Half Sizes; 1¾, 2½ and 3½. These integral sizes offer the same rugged, industrial construction as our NEMA Sizes and ensure efficient operating performance. Half Sizes provide a real cost savings by cutting down on over capacity when NEMA Sizes exceed the motor ratings. All Siemens Heavy Duty controls, including our popular Half Sizes comply with applicable NEMA and UL tests.

All starters are supplied with a NO holding interlock that in conjunction with an appropriate pilot device will provide low voltage protection or release.

NEMA starters are ideal for applications requiring dependability and durability. Typical applications include use with machine tools, air conditioning equipment, material handling equipment, compressors, hoists and various production and industrial equipment as well as in demanding automotive applications.

Starters are available as an open type or in NEMA 1, 12/3/3R, 4 (painted), 4/4X (stainless), 4X (fiberglass), and 7 & 9 enclosures.

#### Gravity Dropout

For added reliability, the gravity dropout of the armature and contacts is assisted by stainless steel springs which help provide quick, precise opening of the contacts.

#### 45 Degree, Wedge Action Contacts

The 45 degree, wedge action contacts reduce tracking and provide faster arc quenching. The resulting self-cleaning and reduced contact bounce mean cooler operation and longer life for the large silver cadmium oxide contacts.

#### Terminal Design

Control terminals are self-rising pressure type.

#### Molded Coil

Magnetic coils are carefully wound and then sealed in epoxy. Encapsulation helps seal out moisture, promotes heat transfer and resists electrical, mechanical and thermal stresses.

#### Dual Voltage/Frequency Coil

Starters are available with dual voltage, dual frequency coils. They are designed to operate on either 50 or 60 Hertz.

#### Molded Stationary Contact Block

Thermoset materials resist arc tracking and the stresses of heat and severe impact.

#### Field Modification Kits

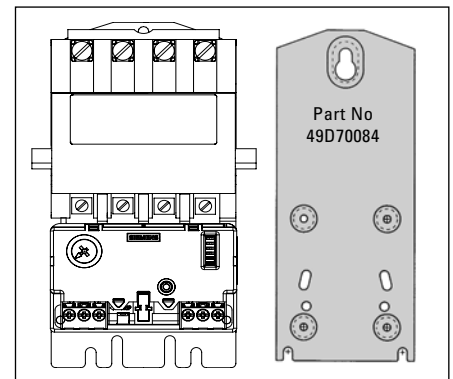
All starters can be modified in the field with a complete range of accessories. These include pushbuttons, selector switches, pilot lights, auxiliary contacts and surge suppressors.

#### Auxiliary Equipment

- NEMA starters are available with built-in START-STOP push buttons for 3-wire control or a HAND-OFF-AUTO selector switch for 2-wire control
- Field modifications such as auxiliary contacts, pilot lights, push buttons, selector switches, and fuse blocks

are available to meet particular application requirements

- Normally opened or normally closed auxiliary power pole kits are available for Sizes 00 through 1¾
- Transformers can be ordered as either factory or field modifications. In some cases these may require a larger enclosure
- A full line of replacement parts are available including contact kits, coils, and overload relays



Siemens Sizes 00–1¾ have as standard, universal mounting which fits the following:

Cutler Hammer—Citation Series  
—Freedom Series

GE —300 Line

Square D —Type S

The Starter with its existing backplate mounts onto the piggyback mounting plate and is secured in place with three mounting screws. The piggyback mounting plate fits the following:

Allen-Bradley —Bulletin 509  
—Bulletin 709

Westinghouse —Series A200

#### Size 5 & 6 Starters Additional Features

- Solid State Overload (3RB type) Standard
- Latest technology in arc quenching to extend contactor life
- Wide variety of enclosures in all starter configurations

#### Size 7 & 8 Starters Additional Features

- New Compact Design
- Can be mounted in any position
- Same coil voltage is AC or DC

# Heavy Duty Starters

## Features and Benefits



ESP200™ Solid State Starter

ESP200™ starters combine the rugged NEMA contactors with a state of the art solid state overload that provides phase loss, phase unbalance ground fault protection. It offers the user greater motor protection and extended life in heavy duty applications. The ESP200™ ultimately results in a cost savings to the user.

### ESP200™ Solid State Overload Relays

Standard features provide Improved Starter Performance:

- True phase loss protection; trips within 3 seconds
- Phase unbalanced prevents motor running inefficiently
- Ground fault trip when selected
- Selectable trip class 5, 10, 20 or 30
- Reset trip can be selected Auto/Manual restart
- Easy to select and use, Dip Switch selectable
- Overload is self powered, no need for external power source

### Half Size Starters

Half-Size starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

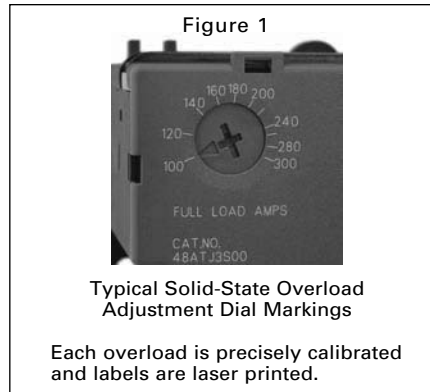
These additional starter sizes have the reserve capacity to handle occasional plugging and jogging applications without derating. Superior operating performance in heavy duty applications is assured by the large current carrying parts, not by derating the device.

Exclusive “half-sizes” save potentially hundreds, even thousands of dollars per project.

Using the table below, simply match the specific size starter to the horsepower rating of your motor. Every half-size starter saves you money—up to 31%.

All “half-sizes” comply to applicable NEMA and UL standards.

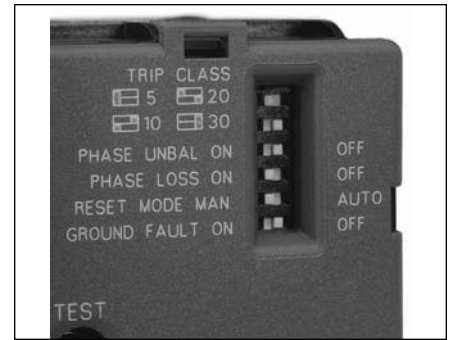
### ESP200® FLA Adjustment Dial—Set the adjustment dial on the overload to the FLA of the motor.



Typical Solid-State Overload Adjustment Dial Markings

Each overload is precisely calibrated and labels are laser printed.

## Selection



### DIP Switch Settings

Adjust DIP switch settings to the Trip Class desired 5, 10, 20, or 30.

- Set Phase Unbalance ON or OFF
- Set Phase Loss ON or OFF
- Set Reset to Manual or Automatic
- Set Ground Fault ON or OFF

### Savings for Siemens “Half-Size” Starters in NEMA 1 Enclosures, FVNR

Motor Size		Starter Size	Half Size	List Price \$	“Half-Size” Savings Over Next Full Size
230V	460V				
7½	10	1	—		—
10	15	—	1¾		31%
15	25	2	—		—
20	30	—	2½		20%
30	50	3	—		—
40	75	—	3½		13%
50	100	4	—		—


Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External



# Heavy Duty Motor Starters

## Solid State Overload with Auto/Manual Reset, Class 14

Selection

 <p>NEMA 1</p>	<b>Ordering Information</b> <ul style="list-style-type: none"> <li>▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</li> <li>▶ Field Modification Kits see page 17-93.</li> <li>▶ Factory Modifications see page 17-108.</li> <li>▶ Dimensions see page 17-129.</li> <li>▶ Wiring Diagrams see page 17-144.</li> <li>▶ Replacement Parts see page 17-170.</li> </ul>	<b>Coil Table</b> <table border="1"> <thead> <tr> <th>60Hz Voltage</th> <th>Letter</th> </tr> </thead> <tbody> <tr><td>24 Separate Control</td><td>J</td></tr> <tr><td>120 Separate Control</td><td>F</td></tr> <tr><td>110-120/220-240</td><td>A</td></tr> <tr><td>200-208</td><td>D</td></tr> <tr><td>220-240</td><td>G</td></tr> <tr><td>277</td><td>L</td></tr> <tr><td>220-240/440-480</td><td>C</td></tr> <tr><td>440-480</td><td>H</td></tr> <tr><td>575-600</td><td>E</td></tr> </tbody> </table> <p>For other voltages and frequencies, see Factory Modifications page 17-108.</p>	60Hz Voltage	Letter	24 Separate Control	J	120 Separate Control	F	110-120/220-240	A	200-208	D	220-240	G	277	L	220-240/440-480	C	440-480	H	575-600	E
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### Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload Amp Range	Frame Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts					NEMA 1 General Purpose	NEMA 4/4X Stainless <sup>①</sup> Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional) <sup>②</sup>	NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use	NEMA 12 NEMA 3/3R <sup>③</sup> Industrial Use Weatherproof (Field Convertible to 3/3R)	Catalog Number	List Price \$	Catalog Number	List Price \$
1/4	1/4	1/2	1/2	00	—	0.25-1	A	14BUA82B*	—	14CUA82W*	—	14CUA82H*	—	14CUA820*	—
1/2	1/2	1 1/2	2	00	—	0.75-3.4	A	14BUB82B*	—	14CUB82W*	—	14CUB82H*	—	14CUB820*	—
1 1/2	1 1/2	2	—	00	—	3-12	A1	14BUC82B*	—	14CUC82W*	—	14CUC82H*	—	14CUC820*	—
1/4	1/4	1/2	1/2	0	—	0.25-1	A	14CUA82B*	—	14CUA82W*	—	14CUA82H*	—	14CUA820*	—
1/2	1/2	1 1/2	2	0	—	0.75-3.4	A	14CUB82B*	—	14CUB82W*	—	14CUB82H*	—	14CUB820*	—
2	2	5	5	0	—	3-12	A1	14CUC82B*	—	14CUC82W*	—	14CUC82H*	—	14CUC820*	—
3	3	—	—	0	—	5.5-22	A1	14CUD82B*	—	14CUD82W*	—	14CUD82H*	—	14CUD820*	—
1/4	1/4	1/2	1/2	1	—	0.25-1	A	14DUA82B*	—	14DUA82W*	—	14DUA82H*	—	14DUA820*	—
1/2	1/2	1 1/2	2	1	—	0.75-3.4	A	14DUB82B*	—	14DUB82W*	—	14DUB82H*	—	14DUB820*	—
2	2	5	5	1	—	3-12	A1	14DUC82B*	—	14DUC82W*	—	14DUC82H*	—	14DUC820*	—
3	3	10	10	1	—	5.5-22	A1	14DUD82B*	—	14DUD82W*	—	14DUD82H*	—	14DUD820*	—
7 1/2	7 1/2	—	—	1	—	10-40	A1	14DUE82B*	—	14DUE82W*	—	14DUE82H*	—	14DUE820*	—
10	10	15	15	—	1 1/2	10-40	A1	14EUE82B*	—	14EUE82W*	—	14EUE82H*	—	14EUE820*	—
10	15	25	25	2	—	13-52	B	14FUF82B*	—	14FUF82W*	—	14FUF82H*	—	14FUF820*	—
15	20	30	30	—	2 1/2	25-100	B	14GUG82B*	—	14GUG82W*	—	14GUG82H*	—	14GUG820*	—
25	30	50	50	3	—	25-100	B	14HUG82B*	—	14HUG82W*	—	14HUG82H*	—	14HUG820*	—
30	40	75	75	—	3 1/2	50-200	B	14IUH82B*	—	14IUH82W*	—	14IUH82H*	—	14IUH820*	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For conduit hubs and conversion instructions, see page 17-99.

② For 316 Stainless Steel option see page 17-111.

# Heavy Duty Motor Starters

## Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 14

*Selection*



### Ordering Information

- ▶ Replace the (\*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 17-163. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- ▶ Field Modification Kits page 17-93.
- ▶ Factory Modifications page 17-108.
- ▶ Dimensions see page 17-116 open and 17-129 enclosed.
- ▶ Wiring Diagrams see page 17-144.
- ▶ Replacement Parts see page 17-170.

### Coil Table

60Hz Voltage	Letter
24 Separate Control	J
120 Separate Control	F
110-120/220-240	A
200-208	D
220-240	G
277	L
220-240/440-480	C
440-480	H
575-600	E

For other voltages and frequencies, see Factory Modifications page 17-108.

### Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type Standard Auxiliary Contacts <sup>④</sup>		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel <sup>⑤</sup>		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>②</sup> Industrial Use Weatherproof	
							Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
1 1/2	1 1/2	2	2	9	00	—	14BP32A*81	14BP32B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
3	3	5	5	18	0	—	14CP32A*81	14CP32B*81	14CP32W*81	—	14CP32F*81	—	14CP32H*81	—	14CP32J*81	—		
7 1/2	7 1/2	10	10	27	1	—	14DP32A*81	14DP32B*81	14DP32W*81	—	14DP32F*81	—	14DP32H*81	—	14DP32J*81	—		
10	10	15	15	40	—	1 1/4	14EP32A*81	14EP32B*81	14EP32W*81	—	14EP32F*81	—	14EP32H*81	—	14EP32J*81	—		
10	15	25	25	45	2	—	14FP32A*81	14FP32B*81	14FP32W*81	—	14FP32F*81	—	14FP32H*81	—	14FP32J*81	—		
15	20	30	30	60	—	2 1/2	14GP32A*81	14GP32B*81	14GP32W*81	—	14GP32F*81	—	14GP32H*81	—	14GP32J*81	—		
25	30	50	50	90	3	—	14HP32A*81	14HP32B*81	14HP32W*81	—	14HP32F*81	—	14HP32H*81	—	14HP32J*81	—		
30	40	75	75	115	—	3 1/2	14IP32A*81	14IP32B*81	14IP32W*81	—	14IP32F*81	—	14IP32H*81	—	14IP32J*81	—		
40	50	100	100	135	4	—	14JG32A*81	14JG32B*81	14JG32W*81	—	14JG32F*81	—	14JG32H*81	—	14JG32J*81	—		

### Open Type & Standard Width Enclosure, Single Phase, 2-Pole<sup>③</sup>

Max Hp			Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
115 Volts	208/230 Volts					Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel <sup>⑤</sup>		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>②</sup> Industrial Use Weatherproof	
						Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
1/2	1	9	9	00	—	14BP12A*81	14BP12B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—		
1	2	18	18	0	—	14CP12A*81	14CP12B*81	14CP12W*81	—	14CP12F*81	—	14CP12H*81	—	14CP12J*81	—		
2	3	27	27	1	—	14DP12A*81	14DP12B*81	14DP12W*81	—	14DP12F*81	—	14DP12H*81	—	14DP12J*81	—		
3	5	35	35	1P	—	14EP12A*81	14EP12B*81	14EP12W*81	—	14EP12F*81	—	14EP12H*81	—	14EP12J*81	—		
3	7 1/2	45	45	2	—	14FP12A*81	14FP12B*81	14FP12W*81	—	14FP12F*81	—	14FP12H*81	—	14FP12J*81	—		
5	10	60	60	—	2 1/2	14GP12A*81	14GP12B*81	14GP12W*81	—	14GP12F*81	—	14GP12H*81	—	14GP12J*81	—		

### Extra Wide Enclosure, 3-Phase, 3-Pole<sup>③</sup>

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless <sup>②</sup> Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel <sup>⑤</sup>		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R <sup>②</sup> Industrial Use Weatherproof	
							Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1 1/2	1 1/2	2	2	9	00	—	14BP82B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	
3	3	5	5	18	0	—	14CP82B*81	14CP82W*81	—	14CP82H*81	—	14CP82J*81	—	
7 1/2	7 1/2	10	10	27	1	—	14DP82B*81	14DP82W*81	—	14DP82H*81	—	14DP82J*81	—	
10	10	15	15	40	—	1 1/4	14EP82B*81	14EP82W*81	—	14EP82H*81	—	14EP82J*81	—	
10	15	25	25	45	2	—	14FP82B*81	14FP82W*81	—	14FP82H*81	—	14FP82J*81	—	
15	20	30	30	60	—	2 1/2	14GP82B*81	14GP82W*81	—	14GP82H*81	—	14GP82J*81	—	
25	30	50	50	90	3	—	14HP82B*81	14HP82W*81	—	14HP82H*81	—	14HP82J*81	—	
30	40	75	75	115	—	3 1/2	14IP82B*81	14IP82W*81	—	14IP82H*81	—	14IP82J*81	—	
40	50	100	100	135	4	—	14JG82B*81	14JG82W*81	—	14JG82H*81	—	14JG82J*81	—	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating. For higher Hp single phase motors, use 3-phase starters, wire and set per diagram on page 17-144.

- ① To receive a single phase starter in an extra wide enclosure, order the enclosure kit from pg 16-91 and the open style starter from pg 16-14 or 16-16 as separate items.
- ② For conduit hubs and conversion instructions, see page 17-99.

- ③ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.
- ④ Standard Auxiliary Contacts, Same as Contactors, refer to page 17-44.
- ⑤ For 316 Stainless Steel option see page 17-111.

NEMA & General Purpose Control

CONTROL PRODUCTS 17