ÖLFLEX® | UNITRONIC® | EPIC® | SKINTOP® | ETHERLINE® | HITRONIC® | SILVYN® | FLEXIMARK®

Engineering

Make the right connection.

Engineering Specification Guide

LAPP GROUP

Make the right connection.

At the Lapp Group we understand the critical role electrical connectivity products play in a wide array of industrial manufacturing applications. And how our customers depend on the quality, performance and durability of Lapp's cable and connectivity solutions to keep their facilities and lines up and running, even in the most demanding conditions.

Helping our customers meet productivity goals at the lowest cost of ownership is the single focus of everything we do. Helping them make the right connection.

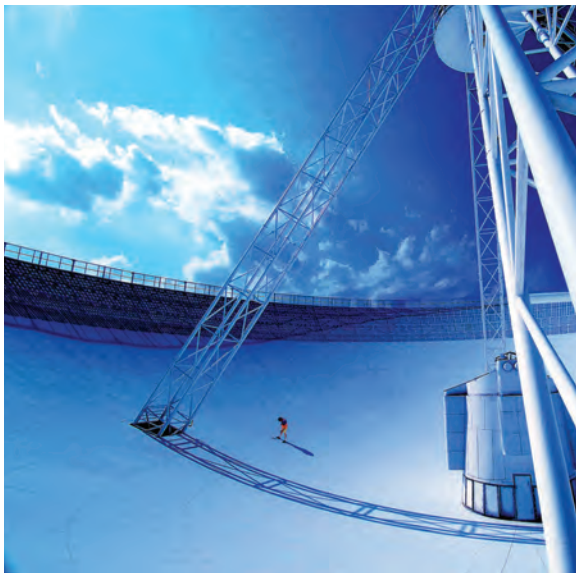
When you choose the Lapp Group you connect with a group of industry experts who embrace the company's rich history of developing solutions that enable our customers to achieve optimum productivity and greater business success. You'll have access to a robust line of products that provide more uptime and reduce downtime, no matter the job at hand. You'll connect with a global company that combines international capabilities with domestic manufacturing; which ensures the utmost in product quality and availability. And you'll connect with unrivaled customer support that is with you every step of the way.

First established in Germany in the 1950s and in the US in 1976, Lapp Group North America is headquartered in a newly renovated 130,000 square foot facility in Florham Park, New Jersey. The North American facility includes our state-of-the-art cable manufacturing plant, Lapp Cable Works. Lapp's domestic manufacturing enables a fast and flexible focus on customer needs, greater inventory and the ability to meet demanding needs quickly. Additionally, Lapp has invested in engineering know-how to develop new products, and to support real-world applications with an in-house UL Certified Test Data Lab that is unique in the industry.

Lapp Group's complete connectivity solutions for industrial machine and infrastructure applications include a full suite of power and control cable, connectors, accessories and systems. These products and solutions are specifically tailored for a wide array of industries including automotive, food and beverage, wind energy, oil and gas, packaging and manufacturing.

Lapp brands include; **ÖLFLEX®, UNITRONIC®, EPIC®, SKINTOP®, ETHERLINE®, HITRONIC®, SILVYN®, AND FLEXIMARK®**

We welcome the opportunity to collaborate with you to make the right connection.



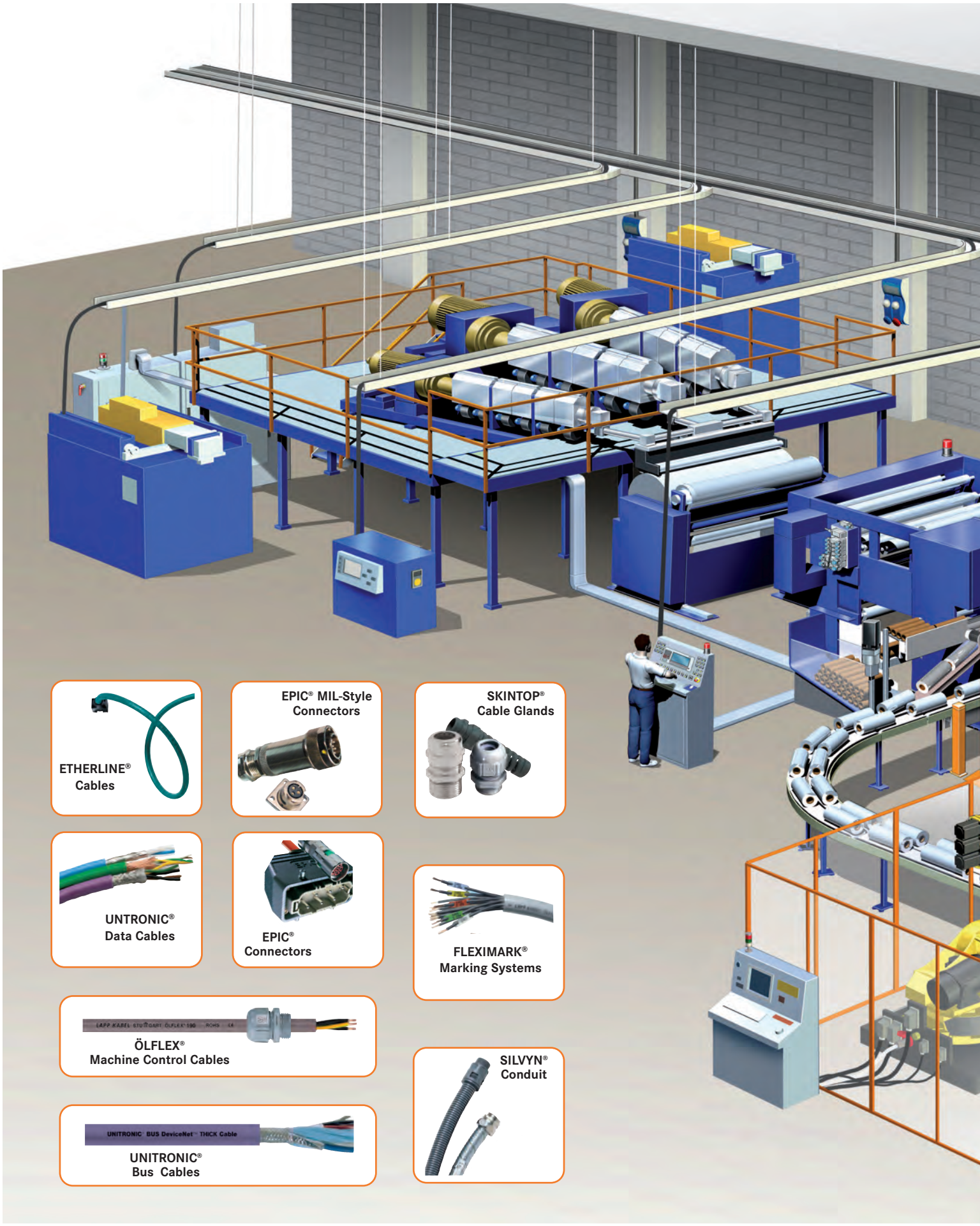
A Full Suite of Connectivity Solutions

- Machine Cables for all applications
- TC-ER Rated Tray Cables
- Cables for major VFDs and manufacturers of servo motors and drives
- Industrial Grade Data Cables for signal, control and networks
- Environmentally Protected Industrial Connectors for power, control, and data; including Rectangular, Circular, and IEC Pin and Sleeve Connectors
- Strain Relief Products
- Cable Management Accessories including: Conduit, Track, Sleeving and Marking Systems

Industry Leading Expertise

- Specially trained national sales team
- In-house team of engineers
- State-of-the-art cable manufacturing in North America
- North American based UL Client test Data Lab
- Worldwide logistics centers
- Extensive product inventory
- In-house Systems Group providing Custom Assemblies and Populated Cable Tracks
- ISO Certified

LAPP GROUP



ETHERLINE®
Cables

EPIC® MIL-Style
Connectors

SKINTOP®
Cable Glands

UNTRONIC®
Data Cables

EPIC®
Connectors

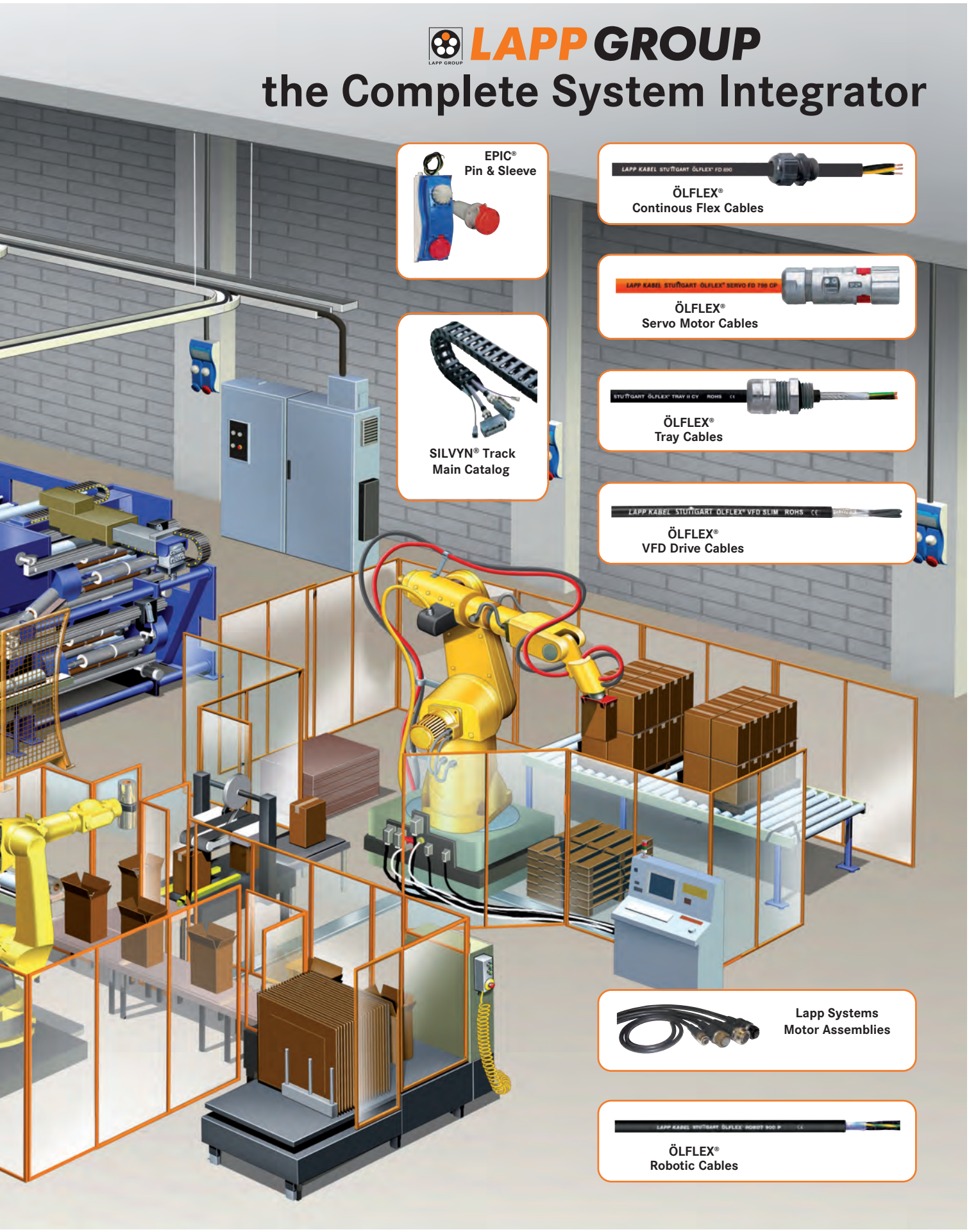
FLEXIMARK®
Marking Systems

ÖLFLEX®
Machine Control Cables

SILVYN®
Conduit

UNITRONIC®
Bus Cables

LAPP GROUP
the Complete System Integrator



EPIC®
Pin & Sleeve

SILVYN® Track
Main Catalog

ÖLFLEX®
Continous Flex Cables

ÖLFLEX®
Servo Motor Cables

ÖLFLEX®
Tray Cables

ÖLFLEX®
VFD Drive Cables

Lapp Systems
Motor Assemblies

ÖLFLEX®
Robotic Cables

Tray Cable

Products for Motors & Drives

Machine Cable

Electronic Cable

Products for Bus Systems

Environmentally Protected Industrial Connectors

Strain Relief Cable Glands

Technical Information & Reference

Cable	Page	Size (AWG)	Conductors	Shielding	Jacket Material
Tray Cable					
ÖLFLEX® TRAY II	12	18 - 1	Finely stranded bare copper	–	PVC
ÖLFLEX® TRAY II CY	12	18 - 6	Finely stranded bare copper	Foil tape; tinned copper braid (70% coverage)	PVC
ÖLFLEX® TC 600	13	18 - 6	Finely stranded bare copper	–	PVC
ÖLFLEX® TC 600 S	13	18 - 10	Finely stranded bare copper	Foil tape (100% coverage)	PVC
ÖLFLEX® CONTROL TM	14	18 - 10	Finely stranded bare copper	–	PVC
ÖLFLEX® CONTROL TM CY	14	18 - 10	Finely stranded bare copper	Foil tape; tinned copper braid (85% coverage)	PVC
I 304	15	20 - 16	Bare copper	Overall foil shield (100% coverage); individually shielded pairs/triads	PVC
Products for Motors & Drives					
ÖLFLEX® VFD SLIM	16	18 - 4	Finely stranded tinned copper	Foil tape (100% coverage); tinned copper braid (85% coverage)	PVC
ÖLFLEX® VFD XL	16	16 - 2	Finely stranded tinned copper	Foil tape (100% coverage); tinned copper braid (85% coverage)	PVC
ÖLFLEX® VFD with Signal	17	16 - 6	Finely stranded tinned copper	Foil tape (100% coverage); tinned copper braid (85% coverage)	PVC
V 2000	17	1 - 500 KCMIL	Bare stranded copper	Copper tape (100% coverage)	PVC
ÖLFLEX® SERVO FD 796 P	18	19 - 6	Extra fine bare copper	Pairs shielded with tinned copper braid (85% coverage)	PUR
ÖLFLEX® SERVO FD 796 CP	19	16 - 1	Extra fine bare copper	Pairs shielded with tinned copper braid; overall tinned copper braid	PUR
ÖLFLEX® SERVO FD 798 CP	20	see page	Extra fine tinned copper	Shielded pairs; tinned copper braid (85% coverage)	PUR
ÖLFLEX® CHAIN 896 P	21	16 - 4	Extra fine bare copper	–	PUR
Servo Cables acc. to SIEMENS® Standard 6FX Plus	22	26 - 1	Signal: tinned copper Power: bare copper	Pairs shielded with tinned copper braid; overall tinned copper braid	PUR
Servo Cables acc. to INDRAMAT® Standard INK	23	24 - 4	Finely stranded bare copper	Shielded pairs; tinned copper braid	PUR
Machine Cable					
ÖLFLEX® 190	24	20 - 2	Finely stranded bare copper	–	PVC
ÖLFLEX® 190 CY	24	20 - 6	Finely stranded bare copper	Tinned copper braid (85% coverage)	PVC
ÖLFLEX® 490	25	20 - 14	Finely stranded bare copper	–	PUR
ÖLFLEX® 490 CY	25	20 - 14	Finely stranded bare copper	Foil tape; tinned copper braid (85% coverage)	PUR
ÖLFLEX® FD 890	26	20 - 8	Finely stranded bare copper	–	PVC
ÖLFLEX® FD 890 CY	26	20 - 8	Finely stranded bare copper	Tinned copper braid (85% coverage)	PVC
ÖLFLEX® FD 855 P	27	20 - 14	Finely stranded bare copper	–	PUR
ÖLFLEX® FD 855 CP	27	20 - 14	Finely stranded bare copper	Tinned copper braid (85% coverage)	PUR
UNITRONIC® FD CP plus	28	26 - 22	Finely stranded bare copper	Tinned copper braid (85% coverage)	PUR
UNITRONIC® FD CP (TP) plus	28	24 - 20	Finely stranded bare copper	Pairs shielded; overall tinned copper braid	PUR
International Approved Hook-up Wire	29	22 - 4/0	Finely stranded tinned copper	–	PVC
ÖLFLEX® POWER QUAD II	30	18 - 14	Finely stranded bare copper	–	PVC
ÖLFLEX® POWER IX	30	18 - 8	Finely stranded bare copper	–	Neoprene
Electronic Cable					
C 304	31	24 - 16	Tinned copper	–	PVC
C 304 S	32	24 - 16	Tinner copper	Foil tape (100% coverage)	PVC
D 304 IS	33	24 - 18	Tinned copper	Shielded pairs; foil tape (100% coverage)	PVC
D 304 OS	34	24 - 14	Tinned copper	Foil tape (100% coverage)	PVC
UNITRONIC® 300	35	24 - 16	Finely stranded tinned copper	–	PVC
UNITRONIC® 300 S	35	24 - 16	Finely stranded tinned copper	Tri-laminate foil shield; tinned copper braid (85% coverage)	PVC

	Bend Radius x cable diam.	Voltage	Temperature Range	Approvals
	4 x OD	TC: 600V WTTC/AWM: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	6 x OD	TC: 600V WTTC/AWM: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	4 x OD	TC: 600V WTTC: 1000V	TC: -40°C to +90°C AWM: -40°C to +105°C	
	6 x OD	TC: 600V WTTC: 1000V	TC: -40°C to +90°C AWM: -40°C to +105°C	
	4 x OD	TC: 600V WTTC: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	6 x OD	TC: 600V WTTC: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	8 x OD	300V	Stationary: -30°C to +105°C Flexing: -10°C to +105°C	
	7.5 x OD	TC: 600V WTTC: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	7.5 x OD	TC: 600V WTTC: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	7.5 x OD	TC: 600V WTTC: 1000V	TC: -25°C to +90°C AWM: -40°C to +105°C	
	15 x OD	TC: 600/2000V RHH/RHW: 2000V	-25°C to +90°C	
	Stat.: 4 x OD Flex.: 7.5 x OD	UL/CSA: 1000V IEC: 600/1000V	Stationary: -60°C to +80°C Flexing: -40°C to +80°C	
	Stat.: 4 x OD Flex.: see page	UL/CSA: 1000V IEC: 600/1000V	Stationary: -50°C to +80°C Flexing: -40°C to +80°C	
	Stat.: 4 x OD Flex.: 7.5 x OD	30V	Stationary: -50°C to +80°C Flexing: -40°C to +80°C	
	Stat.: 4 x OD Flex.: 7.5 x OD	UL/CSA: 1000V IEC: 600/1000V	Stationary: -50°C to +80°C Flexing: -40°C to +80°C	
	Stat.: 4 x OD Flex.: see page	Signal: 30V Power: 1000V	Stationary: -50°C to +80°C Flexing: -20°C to +60°C	
	Signal: 10 x OD Power: 7.5 x OD	Signal: 300V Power: 1000V	Stationary: -50°C to +80°C Flexing: -30°C to +80°C	
	4 x OD	MTW: 600V AWM: 1000V	Stat.: -40°C to +90°C Flex.: -5°C to +90°C	
	6 x OD	MTW: 600V AWM: 1000V	Stat.: -40°C to +90°C Flex.: -5°C to +90°C	
	4 x OD	600V	Stat.: -20°C to +80°C Flex.: -10°C to +80°C	
	6 x OD	600V	Stat.: -20°C to +80°C Flex.: -10°C to +80°C	
	7.5 x OD	600V	Stat.: -25°C to +90°C Flex.: -5°C to +90°C	
	10 x OD	600V	Stat.: -25°C to +90°C Flex.: -5°C to +90°C	
	6 x OD	300/500V	Stat.: -50°C to +80°C Flex.: -40°C to +80°C	
	7.5 x OD	300/500V	Stat.: -50°C to +80°C Flex.: -40°C to +80°C	
	7.5 x OD	350V (not for power)	Flex.: -40°C to +80°C	
	7.5 x OD	250V (not for power)	Flex.: -40°C to +80°C	
	–	H05V-K: UL/CSA: 300V <HAR>/IEC: 300/500V H07V-K: UL/CSA: 300V <HAR>/IEC: 300/500V	UL/CSA: -40°C to +70°C <HAR>/IEC: -40°C to +70°C	
	4 x OD	UL/CSA: 300V <HAR>: 500V	UL/CSA: -25°C to +90°C <HAR>: -30°C to +70°C	
	7.5 x OD	UL/CSA: 600V <HAR>: 450/750V	UL/CSA: -40°C to +90°C <HAR>: -25°C to +60°C	
	7.5 x OD OD	300V	-20°C to +105°C	
	7.5 x OD	300V	SR-PVC insulation: -20°C to +105°C PE insulation: -20°C to +75°C	
	7.5 x OD	300V	-20°C to +75°C	
	7.5 x OD	300V	SR-PVC insulation: -20°C to +105°C PE insulation: -20°C to +75°C	
	4 x OD	300V	Stationary: -40°C to +105°C Flexing: -25°C to +105°C	
	6 x OD	300V	Stationary: -40°C to +105°C Flexing: -25°C to +105°C	

ÖLFLEX® TRAY II/TRAY II CY

Extremely Oil-Resistant & Flexible Tray Cable with UL & CSA; Unshielded & Shielded

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Jacket: Specially formulated oil-resistant black PVC

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Shielding: Double laminated foil tape; tinned copper braid (70% coverage)
Jacket: Specially formulated oil-resistant black PVC

Cable Attributes, page 83

OR-03	FR-03	WT-02	MP-03
OIL	FLAME	MOTION	MECH

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- UL/CSA TC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +105°C

Nominal Voltage:
- UL/CSA TC: 600V
- UL WTTC/CSA AWM: 1000V

Conductor Stranding:
- 18-6 AWG: Class 5 fine wire*
- 4-2 AWG: Class K fine wire

Color Code: Black with white numbers, plus green/yellow ground

Approvals:

UL: TC-ER per UL 1277
MTW per UL 1063
WTTC per UL 2277
Submersible Pump (14 AWG & larger)
PLTC-ER per UL 13 & ITC-ER per UL 2250 (18-12 AWG)

Attributes: DP-1 per UL 1690
AWM 20886
UL Oil Res I/II
75°C Wet; 90°C Dry
Sunlight Resistant
Direct Burial
NFPA 79 2012
NEC: Class 1 Division 2 per NEC Article 501

Canada: c(UL) CIC/TC FT4
CSA AWM I/II A/B FT4

Additional: Torsion Rated for Wind Market (± 90°/m) & (± 150°/m)
CE & RoHS
MSHA-P07-KA050016-MSHA (shielded only)

* 18 AWG meets only the Class 5 cross section and DC resistance

ÖLFLEX® TRAY II

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
221803	18 AWG/3c	0.297	7.5	57	S2111
221804	18 AWG/4c	0.320	8.1	66	S2111
221805	18 AWG/5c	0.346	8.8	77	S2111
221807	18 AWG/7c	0.373	9.5	99	S2111
221812	18 AWG/12c	0.477	12.1	172	S2116
221818	18 AWG/18c	0.587	14.9	245	S2121
221825	18 AWG/25c	0.664	16.9	322	S2121
221603	16 AWG/3c	0.325	8.3	68	S2111
221604	16 AWG/4c	0.351	8.9	84	S2111
221605	16 AWG/5c	0.381	9.7	99	S2113
221607	16 AWG/7c	0.412	10.5	128	S2113
221612	16 AWG/12c	0.565	14.4	220	S2121
221618	16 AWG/18c	0.652	16.6	289	S2121
221625	16 AWG/25c	0.741	18.8	397	S2129
221403	14 AWG/3c	0.362	9.2	88	S2111
221404	14 AWG/4c	0.392	10.0	106	S2113
221405	14 AWG/5c	0.427	10.8	128	S2113
221407	14 AWG/7c	0.463	11.8	170	S2116
221412	14 AWG/12c	0.636	16.2	309	S2121
221418	14 AWG/18c	0.737	18.7	439	S2129
221425	14 AWG/25c	0.886	22.5	586	S2129
221204	12 AWG/4c	0.460	11.7	152	S2113
221205	12 AWG/5c	0.503	12.8	187	S2116
221004	10 AWG/4c	0.578	14.7	264	S2121
221005	10 AWG/5c	0.631	16.0	317	S2121
220804	8 AWG/4c	0.703	17.9	384	S2129
220604	6 AWG/4c	0.899	22.8	580	S2129
220404	4 AWG/4c	1.094	27.8	952	S2136
220204	2 AWG/4c	1.272	32.3	1320	S2248
220104	1 AWG/4c	1.400	35.6	1563	S2142

ÖLFLEX® TRAY II CY

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2218030	18 AWG/3c	0.322	8.2	79	53112220
2218040	18 AWG/4c	0.346	8.8	93	53112220
2218050	18 AWG/5c	0.371	9.4	99	53112230
2218070	18 AWG/7c	0.398	10.1	130	53112230
2218120	18 AWG/12c	0.508	12.9	223	53112240
2218180	18 AWG/18c	0.618	15.7	295	53112250
2218250	18 AWG/25c	0.695	17.7	386	53112260
2216030	16 AWG/3c	0.350	8.9	97	53112220
2216040	16 AWG/4c	0.376	9.6	117	53112230
2216050	16 AWG/5c	0.406	10.3	128	53112230
2216070	16 AWG/7c	0.443	11.3	165	53112240
2216120	16 AWG/12c	0.596	15.1	287	53112250
2216180	16 AWG/18c	0.683	17.3	346	53112260
2216250	16 AWG/25c	0.772	19.6	430	53112260
2214030	14 AWG/3c	0.387	9.8	121	53112230
2214040	14 AWG/4c	0.423	10.7	150	53112230
2214050	14 AWG/5c	0.458	11.6	181	53112240
2214070	14 AWG/7c	0.494	12.5	220	53112240
2214120	14 AWG/12c	0.667	16.9	399	53112250
2214180	14 AWG/18c	0.768	19.5	527	53112260
2214250	14 AWG/25c	0.917	23.3	705	53112260
2212040	12 AWG/4c	0.491	12.5	212	53112240
2212050	12 AWG/5c	0.568	14.4	260	53112250
2212070	12 AWG/7c	0.612	15.5	335	53112250
2210040	10 AWG/4c	0.609	15.5	370	53112250
2210050	10 AWG/5c	0.662	16.8	412	53112250
2208040	8 AWG/4c	0.737	18.7	575	53112260
2206040	6 AWG/4c	0.918	23.3	811	53112260

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® TC 600/600 S

Flexible Tray Cable with TC-ER for Easier Installations; Unshielded & Shielded

TRAY CABLE

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Jacket: Specially formulated black PVC

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Shielding: Foil tape (100% coverage); drain wire
Jacket: Specially formulated black PVC

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- UL TC/CSA CIC: -40°C to +90°C
- for flexible use: -5°C to +90°C
- for stationary use: -40°C to +105°C

Nominal Voltage:
- UL TC/CSA CIC: 600V
- UL WTTC: 1000V

Conductor Stranding: Class B stranded wire

Color Code: Black with white numbers and color name per ICEA-NEMA (K-2): Chart 10, page 87, plus green/yellow ground

Approvals:

UL:	TC-ER per UL 1277 MTW per UL 1063 (14 AWG and larger) WTTC per UL 2277 Bus Drop Cable (14 AWG and larger, 3c & 4c) AWM 20886
Attributes:	UL Oil Res I 75°C Wet; 90°C Dry Sunlight Resistant Direct Burial NFPA 79 2012 NEC: Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC FT4 cRU AWM I/II A/B FT4
Additional:	CE & RoHS

Cable Attributes, page 83


OR-01 OIL


FR-03 FLAME


FL-01 MOTION


MP-03 MECH

ÖLFLEX® TC 600

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
211803	18 AWG/3c	0.287	7.3	55	S2111
211804	18 AWG/4c	0.310	7.9	64	S2111
211805	18 AWG/5c	0.335	8.5	75	S2111
211807	18 AWG/7c	0.361	9.2	97	S2111
211812	18 AWG/12c	0.462	11.7	165	S2116
211819	18 AWG/19c	0.569	14.5	262	S2121
211603	16 AWG/3c	0.311	7.9	66	S2111
211604	16 AWG/4c	0.337	8.6	79	S2111
211605	16 AWG/5c	0.364	9.2	95	S2111
211607	16 AWG/7c	0.394	10.0	123	S2113
211612	16 AWG/12c	0.508	12.9	214	S2116
211619	16 AWG/19c	0.624	15.8	287	S2121
211625	16 AWG/25c	0.718	18.2	311	S2129
211403*	14 AWG/3c	0.343	8.7	84	S2111
211404*	14 AWG/4c	0.373	9.5	104	S2111
211407	14 AWG/7c	0.439	11.2	163	S2113
211412	14 AWG/12c	0.602	15.3	298	S2121
211419	14 AWG/19c	0.699	17.8	450	S2129
211203*	12 AWG/3c	0.384	9.8	110	S2113
211204*	12 AWG/4c	0.419	10.6	148	S2113
211205	12 AWG/5c	0.456	11.6	181	S2113
211004*	10 AWG/4c	0.511	13.0	256	S2116
210804*	8 AWG/4c	0.650	16.5	335	S2121
210604*	6 AWG/4c	0.746	18.9	580	S2129

* UL Bus Drop Approval

ÖLFLEX® TC 600 S

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
211803S	18 AWG/3c	0.290	7.4	57	S2111
211804S	18 AWG/4c	0.313	8.0	66	S2111
211805S	18 AWG/5c	0.338	8.6	77	S2111
211807S	18 AWG/7c	0.364	9.2	99	S2111
211603S	16 AWG/3c	0.314	8.0	68	S2111
211604S	16 AWG/4c	0.340	8.6	84	S2111
211605S	16 AWG/5c	0.367	9.3	97	S2111
211607S	16 AWG/7c	0.397	10.1	126	S2113
211404S*	14 AWG/4c	0.376	9.6	108	S2113
211204S*	12 AWG/4c	0.422	10.7	152	S2113
211004S*	10 AWG/4c	0.514	13.1	264	S2116

* UL Bus Drop Approval

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CONTROL TM/TM CY

Extremely Oil-Resistant Flexible Control Cable with UL MTW & UL/CSA TC; Unshielded & Shielded

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Jacket: Specially formulated gray PVC

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Shielding: Foil tape and tinned copper braid (85% coverage)
Jacket: Specially formulated gray PVC

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- UL/CSA TC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +90°C

Nominal Voltage:
- UL/CSA TC: 600V
- UL WTTC: 1000V

Conductor Stranding: Class 5 fine wire*

Color Code: Black with white numbers, plus green/yellow ground

Approvals:

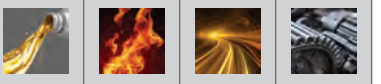
UL: TC-ER per UL 1277
MTW per UL 1063
WTTC per UL 2277
Bus Drop Cable (14 AWG & larger; 3c & 4c only)
AWM 2587 & 21098 (Oil)

Attributes: UL Oil Res I/II
75°C Wet; 90°C Dry
Sunlight Resistant
Direct Burial
NFPA 79 2012
NEC: Class 1, Division 2 per NEC Article 501

Canada: c(UL) CIC/TC FT4
CSA AWM I/II A/B FT4

Additional: Torsion rated for Wind Market (± 90°/m) & (± 150°/m)
Passes Impact and Crush test per UL 1277 (excluding 20 AWG)
CE & RoHS

Cable Attributes, page 83



OR-03	FR-03	WT-02	MP-03
OIL	FLAME	MOTION	MECH

* 18 AWG meets only the Class 5 cross section and DC resistance

ÖLFLEX® CONTROL TM

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
281803	18 AWG/3c	0.291	7.4	55	S1111
281804	18 AWG/4c	0.315	8.0	64	S1111
281805	18 AWG/5c	0.340	8.6	75	S1111
281807	18 AWG/7c	0.367	9.3	97	S1111
281812	18 AWG/12c	0.471	12.0	165	S1116
281818	18 AWG/18c	0.579	14.7	245	S1121
281825	18 AWG/25c	0.656	16.7	311	S1121
281603	16 AWG/3c	0.319	8.1	66	S1111
281604	16 AWG/4c	0.345	8.8	79	S1111
281605	16 AWG/5c	0.375	9.5	95	S1111
281607	16 AWG/7c	0.406	10.3	123	S1113
281612	16 AWG/12c	0.557	14.1	214	S1121
281618	16 AWG/18c	0.644	16.4	289	S1121
281625	16 AWG/25c	0.733	18.6	311	S1129
281403*	14 AWG/3c	0.356	9.0	88	S1111
281404*	14 AWG/4c	0.386	9.8	106	S1113
281405	14 AWG/5c	0.421	10.7	123	S1113
281407	14 AWG/7c	0.457	11.6	163	S1113
281204*	12 AWG/4c	0.454	11.5	148	S1113
281205	12 AWG/5c	0.497	12.6	181	S1116
281207	12 AWG/7c	0.573	14.6	324	S1121
281004*	10 AWG/4c	0.570	14.5	256	S1121

* Cable meets UL Bus Drop Approval

ÖLFLEX® CONTROL TM CY

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
281803CY	18 AWG/3c	0.316	8.0	79	53112220
281804CY	18 AWG/4c	0.339	8.6	93	53112220
281805CY	18 AWG/5c	0.365	9.3	99	53112220
281807CY	18 AWG/7c	0.392	10.0	130	53112230
281812CY	18 AWG/12c	0.502	12.8	223	53112240
281825CY	18 AWG/25c	0.687	17.4	386	53112260
281603CY	16 AWG/3c	0.344	8.7	97	53112220
281604CY	16 AWG/4c	0.370	9.4	117	53112230
281605CY	16 AWG/5c	0.400	10.2	128	53112230
281607CY	16 AWG/7c	0.437	11.1	165	53112230
281612CY	16 AWG/12c	0.588	14.9	287	53112250
281618CY	16 AWG/18c	0.675	17.1	326	53112260
281625CY	16 AWG/25c	0.764	19.4	476	53112260
281403CY*	14 AWG/3c	0.381	9.7	121	53112230
281404CY*	14 AWG/4c	0.411	10.4	150	53112230
281405CY	14 AWG/5c	0.452	11.5	181	53112240
281407CY	14 AWG/7c	0.488	12.4	220	53112240
281204CY*	12 AWG/4c	0.485	12.3	212	53112240
281205CY	12 AWG/5c	0.560	14.2	260	53112250
281004CY*	10 AWG/4c	0.601	15.3	370	53112250

* Cable meets UL Bus Drop Approval

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

I 304
300V PLTC ITC Instrumentation Cable with Individually Shielded Pairs/Triads; Overall Shield

Construction

Conductors: Bare copper
Insulation: PVC insulation (cabled pairs or triads); individually foil-shielded pairs or triads with a tinned copper drain wire; orange PVC communication wire*
Shield: Overall foil shield with a tinned copper drain wire (100% coverage)
Jacket: Specially blended black PVC

* Not required for single pair/triad construction

Technical Data

Minimum Bend Radius: 8 x cable diameter

Temperature Range:
- for stationary use: -30°C to +105°C
- for flexible use: -10°C to +105°C

Nominal Voltage: 300V

Conductor Stranding: Class B stranded wire

Color Code:
- Pairs: Black & white with printed #'s
- Triads: Black, white, red with printed numbers

Approvals:

UL: CMG per UL 444
PLTC per UL 13
ITC per UL 2250
AWM 2464
Attributes: Sunlight Resistant
Direct Burial
NFPA 79 2012
Canada: CSA CMG FT4
CSA AWM I/II A/B FT4
CSA C22.2 No.214: Communications Cable
CSA C22.2 No. 210: Appliance Wiring Material

Cable Attributes, page 83


OR-01 OIL


FR-03 FLAME


FL-01 MOTION


MP-01 MECH

I 304: Pairs

Part Number	Number of Pairs	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
2221312	20 AWG/1c	0.213	5.4	25	S2107
2221313	20 AWG/2c	0.327	8.3	54	S2111
2221314	20 AWG/8c	0.514	13.1	141	S2116
2221315	20 AWG/12c	0.637	16.2	207	S2121
2221285	18 AWG/1c	0.233	5.9	36	S2107
2221286	18 AWG/2c	0.408	10.4	81	S2113
2221287	18 AWG/4c	0.468	11.9	125	S2116
2221288	18 AWG/6c	0.530	13.5	163	S2116
2221289	18 AWG/8c	0.594	15.1	196	S2121
2221290	18 AWG/12c	0.737	18.7	283	S2129
2221291	18 AWG/16c	0.836	21.2	350	S2129
2221297	16 AWG/1c	0.257	6.5	46	S2109
2221298	16 AWG/2c	0.450	11.4	114	S2113
2221299	16 AWG/3c	0.481	12.2	138	S2116
2221300	16 AWG/4c	0.512	13.0	164	S2116
2221301	16 AWG/6c	0.600	15.2	218	S2121
2221302	16 AWG/8c	0.687	17.4	281	S2129
2221303	16 AWG/12c	0.822	20.9	386	S2129
2221304	16 AWG/16c	0.936	23.8	507	S2129
2221305	16 AWG/24c	1.149	29.2	714	S2136

I 304: Triads

Part Number	Number of Triads	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
2221292	18 AWG/1c	0.236	6.0	45	S2107
2221293	18 AWG/2c	0.450	11.4	116	S2113
2221294	18 AWG/4c	0.533	13.5	167	S2121
2221295	18 AWG/6c	0.593	15.1	221	S2121
2221296	18 AWG/8c	0.654	16.6	284	S2121
2221306	16 AWG/1c	0.271	6.9	59	S2109
2221307	16 AWG/2c	0.506	12.9	150	S2116
2221308	16 AWG/4c	0.569	14.5	224	S2121
2221309	16 AWG/6c	0.666	16.9	316	S2121
2221310	16 AWG/8c	0.704	17.9	389	S2129
2221311	16 AWG/12c	1.000	25.4	563	S2136

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

MOTOR & DRIVE

ÖLFLEX® VFD SLIM

Reduced-Diameter VFD Cable; 600V/1000V; UL & c(UL) TC Approval

Construction

Conductors: Finely stranded tinned copper
Insulation: "Lapp Surge Guard" insulation system
Shielding: Barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage)
Jacket: Specially formulated black PVC

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- UL/CSA TC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +105°C

Nominal Voltage:
- UL/CSA TC: 600V
- UL WTTC: 1000V
- UL Flexible Motor Supply: 1000V

Conductor Stranding:
- 18-6 AWG: Class 5 fine wire*
- 4-2 AWG: Class K fine wire

Color Code: Black with white numbers, plus green/yellow ground

Approvals:
UL: TC-ER per UL 1277
MTW per UL 1063
WTTC per UL 2277
AWM 20886

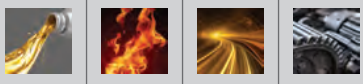
* 18 AWG meets only the Class 5 cross section and DC resistance

Attributes: UL Oil Res I/II
75°C Wet; 90°C Dry
-40°C Cold Bend;
-25° Cold Impact
Sunlight Resistant
Submersible Pump
(14 AWG & larger)
Direct Burial
NFPA 79 2012
NEC: Class 1 Division 2 per NEC Articles 336, 501
Canada: c(UL) CIC/TC FT4
CSA AWM I/II A/B FT4
Additional: MSHA P-07KA050013-MSHA
CE & RoHS

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH
761804	18 AWG/4c	0.394	10.0	112	53112230	–
761604*	16 AWG/4c	0.465	11.8	154	53112240	53112676
761404	14 AWG/4c	0.514	13.1	194	53112240	53112676
761204	12 AWG/4c	0.583	14.8	254	53112250	53112676
761004	10 AWG/4c	0.697	17.7	346	53112260	53112677
760804	8 AWG/4c	0.829	21.1	596	53112260	53112678
760604	6 AWG/4c	1.002	25.5	785	53112270	53112678
760404	4 AWG/4c	1.186	30.1	965	53112270	53112679

* 16 AWG cable has a drain wire

Cable Attributes, page 83



MOTOR & DRIVE

ÖLFLEX® VFD XL

Precision Control VFD Cable; 600/1000V; UL & c(UL) TC Approval

Construction

Conductors: Finely stranded tinned copper
Insulation: XLPE
Shielding: Barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage)
Jacket: Specially formulated black PVC

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- UL/CSA TC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +105°C

Nominal Voltage:
- UL/CSA TC: 600V
- UL WTTC: 1000V
- UL Flexible Motor Supply: 1000V

Conductor Stranding:
- 16-8 AWG: Class 5 fine wire
- 6-2 AWG: Class K fine wire

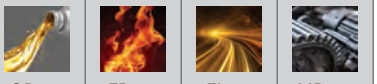
Color Code: Black with white numbers, plus green/yellow ground

Approvals:
UL: TC-ER per UL 1277
WTTC per UL 2277

Attributes: UL Oil Res I/II
90°C Wet or Dry
-40°C Cold Bend;
-25°C Cold Impact
Sunlight Resistant
Direct Burial
NFPA 79 2012
NEC: Class 1 Division 2 per NEC Articles 336, 501
Canada: c(UL) CIC/TC FT4
Additional: CE & RoHS

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
731604	16 AWG/4c	0.508	12.9	167	53112240	53112676
731404	14 AWG/4c	0.581	14.8	214	53112250	53112676
731204	12 AWG/4c	0.649	16.5	274	53112250	53112677
731004	10 AWG/4c	0.700	17.8	361	53112260	53112677
730804	8 AWG/4c	0.887	22.5	571	53112260	53112678
730604	6 AWG/4c	1.022	25.9	885	53112270	53112678
730404	4 AWG/4c	1.158	29.4	1136	53112270	53112679
730204	2 AWG/4c	1.332	33.8	1460	–	53112679

Cable Attributes, page 83



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ÖLFLEX® VFD with Signal

Flexible VFD Cable with a Pair for Signal or Temperature Sensor; 600/1000V; UL & c(UL) TC Approval

MOTOR & DRIVE

Construction

Conductors: Finely stranded tinned copper
Insulation: "Lapp Surge Guard" insulation system
Shielding: Barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage)
Jacket: Specially formulated black PVC

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- UL/CSA TC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +105°C

Nominal Voltage:
- UL/CSA TC: 600V
- UL WTTC: 1000V
- UL Flexible Motor Supply: 1000V

Conductor Stranding:
- 18-6 AWG: Class 5 fine wire
- 4 AWG: Class K fine wire

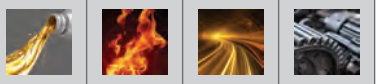
Color Code: Black with white numbers, plus green/yellow ground; one black pair with white numbers

Approvals:
UL: TC-ER per UL 1277
MTW per UL 1063
WTTC per UL 2277
AWM 20886

Attributes: UL Oil Res I/II
75°C Wet; 90°C Dry
-40°C Cold Bend;
-25°C Cold Impact
Sunlight Resistant
Direct Burial
Submersible Pump
(14 AWG & larger)
Bus Drop
NFPA 79 2012
NEC: Class 1 Division 2 per NEC Articles 336, 501
Canada: c(UL) CIC/TC FT4
CSA AWM I/II A/B FT4
Additional: MSHA P-07-KA050011-MSHA
CE & RoHS

Part Number	Size / Number of Conductors	1 Shielded Pair for Signal	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
7416048	16 AWG/4c	18 AWG	0.519	13.2	180	53112240	53112676
7414048	14 AWG/4c	18 AWG	0.573	14.6	216	53112250	53112676
7414044	14 AWG/4c	14 AWG	0.600	15.2	254	53112250	53112676
7412048	12 AWG/4c	18 AWG	0.632	16.1	286	53112250	53112677
7412044	12 AWG/4c	14 AWG	0.662	16.8	326	53112250	53112677
7410044	10 AWG/4c	14 AWG	0.745	18.9	406	53112260	53112677
7408044	8 AWG/4c	14 AWG	0.896	22.8	617	53112260	53112678
7406044	6 AWG/4c	14 AWG	1.026	26.1	848	53112270	53112678

Cable Attributes, page 83



V 2000

VFD Symmetrical 2kV Motor Supply Cable for Large HP VFD Drives; UL TC-ER Approval

MOTOR & DRIVE

Construction

Conductors: Bare stranded copper
Insulation: XLPE + 3 bare stranded copper grounds
Shielding: Helical copper tape (100% coverage)
Jacket: Black PVC

Technical Data

Minimum Bend Radius: 15 x cable diameter

Temperature Range: -25°C to +90°C

Nominal Voltage:
- UL TC: 600/2000V
- UL RHH/RHW: 2000V

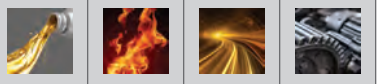
Conductor Stranding: Class B stranded wire

Color Code: Black with white numbers: 1, 2, 3, plus 3 bare symmetrical grounds

Approvals:
UL: TC-ER per UL 1277
Attributes: 90°C Wet or Dry
Sunlight Resistant
Direct Burial
NFPA 79 2012
NEC: Class 1 Division 2: Hazardous Locations
Class 1: Control Circuit

Part Number	Size / Number of Conductors	3 Symmetrical Grounds	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-M BRUSH Metric Thread
812984	1 AWG/3c	8 AWG	1.26	32.0	1427	53112679
812985	1/0 AWG/3c	6 AWG	1.35	34.3	1836	53112679
812986	2/0 AWG/3c	6 AWG	1.44	36.6	2137	53112680
812987	3/0 AWG/3c	5 AWG	1.55	39.4	2609	53112680
812988	4/0 AWG/3c	4 AWG	1.73	43.4	3254	53112680
812989	250 KCMIL/3c	2 AWG	1.90	48.3	3988	53112681
812990	350 KCMIL/3c	2 AWG	2.12	53.8	5106	53112681
812991	500 KCMIL/3c	1 AWG	2.40	61.0	6886	53112501

Cable Attributes, page 83



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ÖLFLEX® SERVO FD 796 P

High-Acceleration Continuous Flex Servo Cable with PUR Jacket; Unshielded

Construction

Conductors: Extra fine bare copper
Pairs: 1 pair: twisted together; tinned copper braid (85% coverage); 2 pair: laminated foil shield; drain wire; tinned copper braid (85% coverage)
Insulation: Polypropylene
Jacket: Black polyurethane

Cable Attributes, page 83

Acceleration: up to 50m/s³
Travel speed: up to 5m/s
Travel length: up to 100m

			
OR-05	FR-02	CF-04A	MP-05
OIL	FLAME	MOTION	MECH

Technical Data

Minimum Bend Radius:
- for continuous flexing: 7.5 x cable diameter
- for stationary use: 4 x cable diameter

Temperature Range:
- for continuous flexing: -40°C to +80°C
- for stationary use: -50°C to +80°C

Nominal Voltage:
- UL/CSA: 1000V
- IEC: 600/1000V

Test Voltage: 4000V

Conductor Stranding: Class 6 super fine wire

Color Code:
- Power: Black with white print: U/L1/C/L+; V/L2; W/L3/D/L- plus green/yellow ground
- 1 pair: Black & white
- 2 pair: Black with white numbers: 5, 6, 7, 8

Approvals:
UL: AWM 20234
Attributes: VW-1
Canada: cRU AWM I/II A/B 1kV FT1
Additional: VDE Reg. no 8591 (16 AWG & larger)
CE & RoHS

Part Number	Size / Number of Conductors Power Conductors + Control Pairs	Max. Outer Diameter (in)	Max. Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
0025319	16 AWG/4c + (16 AWG/1pr)	0.461	11.7	146	53112240	53112676
0025320	14 AWG/4c + (16 AWG/1pr)	0.516	13.1	181	53112240	53112676
0025321	12 AWG/4c + (16 AWG/1pr)	0.559	14.2	224	53112250	53112676
0025322	10 AWG/4c + (16 AWG/1pr)	0.630	16.0	271	53112250	53112676
0025323	8 AWG/4c + (16 AWG/1pr)	0.724	18.4	390	53112260	53112677
0025324	6 AWG/4c + (16 AWG/1pr)	0.870	22.1	596	53112650	53112678
0025326	19 AWG/4c + 2 x (22 AWG/1pr)	0.429	10.9	96	53112230	53112676
0025327	16 AWG/4c + 2 x (19 AWG/1pr)	0.484	12.3	140	53112240	53112676
0025328	14 AWG/4c + 2 x (18 AWG/1pr)	0.563	14.3	206	53112250	53112676
0025312	12 AWG/4c + 2 x (18 AWG/1pr)	0.606	15.4	256	53112250	53112676
0025329	12 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	0.614	15.6	261	53112250	53112676
0025330	10 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	0.673	17.1	309	53112260	53112677

( ) = shielded pairs

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SERVO FD 796 CP

High-Acceleration Continuous Flex Servo Cable with PUR Jacket; Shielded

Construction

Conductors: Extra fine bare copper
Pairs: One pair: shielded with tinned copper serve wires; non-woven wrapping; Two core pairs arranged as pair: shielded with foil, drain wire, tinned copper serve wires; non-woven wrapping twisted together
Insulation: Power and pair conductors: polypropylene
Shielding: Overall non woven wrapping; overall tinned copper braid
Jacket: Orange polyurethane

Technical Data

Minimum Bend Radius:
- for continuous flexing: see table below
- for stationary use: 4 x cable diameter

Temperature Range:
- for continuous flexing: -40°C to +80°C
- for stationary use: -50°C to +80°C

Nominal Voltage:
- UL/CSA: 1000V
- IEC U0/U: 600/1000V

Conductor Stranding: Class 6 fine wire

Color Code:
- Power: Black conductors with white letters: U/L1/C/L+; V/L2; W/L3/D/L-
plus green/yellow ground
- 1 pair: Black & white
- 2 pair: Black with white numbers: 5, 6, 7, 8

Approvals:
UL: AWM 20234
Attributes: Flame Retardant VW-1
Canada: cRU AWM I/II A/B 1kV FT1
Additional: VDE Reg. no 859
CE & RoHS

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Acceleration: up to 50m/s³
Travel speed: up to 5m/s
Travel length: up to 100m


OR-05 OIL


FR-02 FLAME


CF-04A MOTION


MP-05 MECH

Part Number	Size / Number of Conductors Power Conductors + Control Pairs			Min. Bend Radius for Cont. Flexing (x cable diameter)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
0027950	16 AWG/4c		–	7.5	0.362	9.2	94	53112220	–
0027951	14 AWG/4c		–	7.5	0.418	10.6	132	53112230	53112676
0027952	12 AWG/4c		–	7.5	0.469	11.9	180	53112240	53112676
0027953	10 AWG/4c		–	7.5	0.567	14.4	267	53112250	53112676
0027954	8 AWG/4c		–	7.5	0.693	17.6	397	53112260	53112677
0027955	6 AWG/4c		–	7.5	0.867	22.0	642	53112260	53112678
0027956	4 AWG/4c		–	10	0.993	25.2	898	53112270	53112678
0027957	2 AWG/4c		–	10	1.131	28.7	1189	53112270	53112679
0027958	1 AWG/4c		–	10	1.316	33.4	1658	–	53112679
0027959	16 AWG/4c	+	(16 AWG/1pr)	7.5	0.473	12.0	175	53112240	53112676
0027960	14 AWG/4c	+	(16 AWG/1pr)	7.5	0.544	13.8	214	53112240	53112676
0027961	12 AWG/4c	+	(16 AWG/1pr)	7.5	0.587	14.9	259	53112250	53112676
0027962	10 AWG/4c	+	(16 AWG/1pr)	7.5	0.670	17.0	327	53112250	53112677
0027963	8 AWG/4c	+	(16 AWG/1pr)	7.5	0.764	19.4	471	53112260	53112677
0027964	6 AWG/4c	+	(16 AWG/1pr)	7.5	0.938	23.8	704	53112260	53112678
0027965	4 AWG/4c	+	(16 AWG/1pr)	10	1.064	27.0	1030	53112270	53112678
0027966	2 AWG/4c	+	(16 AWG/1pr)	10	1.229	31.2	1409	53112270	53112679
0027967	1 AWG/4c	+	(16 AWG/1pr)	10	1.367	34.7	1829	–	53112679
0027969	16 AWG/4c	+	2 x (19 AWG/1pr)	7.5	0.481	12.2	210	53112240	53112676
0027970	14 AWG/4c	+	2 x (18 AWG/1pr)	7.5	0.575	14.6	265	53112250	53112676
0027971	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	7.5	0.642	16.3	326	53112250	53112676
0027972	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	7.5	0.713	18.1	395	53112260	53112677
0027973	8 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	7.5	0.859	21.8	550	53112260	53112678
0027974	6 AWG/4c	+	2 x (16 AWG/1pr)	7.5	1.005	25.5	763	53112270	53112678
0027975	4 AWG/4c	+	2 x (16 AWG/1pr)	10	1.139	28.9	1048	53112270	53112679
0027976	2 AWG/4c	+	2 x (16 AWG/1pr)	10	1.237	31.4	1406	53112270	53112679
0027977	1 AWG/4c	+	2 x (14 AWG/1pr)	10	1.450	36.8	1962	–	53112680

( ) = shielded pairs

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SERVO FD 798 CP

High-Acceleration Continuous Flex Encoder & Resolver Cable; UL & CSA Approval

RoHS

Construction

Conductors: Extra fine tinned copper
Pairs: Twisted and bundled; shielded (see chart)
Insulation: Polypropylene
Shielding: Tinned copper braid (85% coverage)
Jacket: Green polyurethane

Technical Data

Minimum Bend Radius:
- for continuous flexing: 7.5 x cable diameter
- for installation: 4 x cable diameter

Temperature Range:
- for stationary use: -50°C to +80°C
- for continuous flexing: -40°C to +80°C

Nominal Voltage: 30V

Conductor Stranding: Extra fine wire

Color Code: see color chart below

Approvals:
UL: AWM 20236
Attributes: VW-1
Canada: CSA AWM I/II A/B FT1
Additional: RoHS
MUD acc. to IEC 61892-4 Annex D

Part Number	Size / Number of Conductors Power Conductors + Control Pairs	Maximum Outer Diameter (in)	 (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
0036910	20 AWG/4c + 22 AWG/4pr	0.350	8.9	84	53112220	–
0036911	2 x (20 AWG/1c) + 3 x (26 AWG/1pr)	0.350	8.9	81	53112220	–
0036912	26 AWG/4c + 3 x (26 AWG/1pr) + 20 AWG/1pr	0.346	8.8	74	53112220	–
0036913	26 AWG/4c + 26 AWG/4c + 3 x (26 AWG/1pr) + 20 AWG/1pr	0.370	9.4	87	53112220	53112676
0036914	20 AWG/9c –	0.346	8.8	74	53112220	–
0036915	18 AWG/2c + 24 AWG/4pr	0.346	8.8	73	53112230	53112676
0036916	20 AWG/2c + 24 AWG/6pr	0.406	10.3	81	53112220	–
0036917	26 AWG/10c + 20 AWG/1pr	0.303	7.7	55	53112220	–
0036918	26 AWG/10c + 20 AWG/4c –	0.319	8.1	66	53112220	–
0036920	20 AWG/4c + 26 AWG/4pr	0.323	8.2	64	53112220	–
0036921	– 24 AWG/4pr	0.299	7.6	50	53112220	–
0036923	– 26 AWG/8pr	0.307	7.8	57	53112210	–
0036924	– 26 AWG/4pr	0.252	6.4	35	53112210	–
0036926	24 AWG/12c –	0.272	6.9	49	53112210	–
0036927	20 AWG/2c + 24 AWG/4pr	0.335	8.5	66	53112220	–
0036928	20 AWG/4c + (26 AWG/4c) + 26 AWG/2pr + 2 x (26 AWG/1pr)	0.358	9.1	91	53112220	–
0036929	20 AWG/2c + 2 x (24 AWG/1pr)	0.343	8.7	66	53112210	–
0036930	20 AWG/2c + 24 AWG/2pr	0.287	7.3	48	53112210	–

( ) = shielded pairs/conductors

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OIL

OR-05

FLAME

FR-02

MOTION

CF-04A

MECH

MP-05

Part Number	Power Cores Size	 Color Code & Shielding	Control Pairs Size	 Color Code & Shielding
0036910	20 AWG/4c	bl/w – bk/w – r/w – y/w	22 AWG/4pr	bk & br – r & o – y & gn – bl & v
0036911	20 AWG/2c	w – br	26 AWG/3pr	y & gn – r & bl – gy & pk
0036912	26 AWG/4c	gy – bl – w/y – w/bk	26 AWG/3pr 20 AWG/1pr	y & gn – bk & br – r & o br/r & br/bl
0036913	26 AWG/4c 26 AWG/4c	gy – bl – w/y – w/bk br/y – br/gy – gn/bk – gn/r	26 AWG/3pr 20 AWG/1pr	y & gn – bk & br – r & o br/r & br/bl
0036914*	20 AWG/9c	bl – w – r – pk – gn – y – br – bk – gy		–
0036915*	18 AWG/2c	w – br	24 AWG/4pr	br & gn – gy & pk – bl & v – r & bk
0036916*	20 AWG/2c	w – br	24 AWG/6pr	w & br – gn & y – gy & pk – bl & r – bk & v – gy/pk & r/bl
0036917	26 AWG/10c	w – br – gn – y – gy – pk – bl – r – bk – v	20 AWG/1pr	w & br
0036918	26 AWG/10c 20 AWG/4c	w – br – gn – y – gy – pk – bl – r – bk – v w – br – bl – bk		–
0036920	20 AWG/4c	w – bl – w/gn – br/gn	26 AWG/4pr	r & bk – br & gn – y & v – gy & pk
0036921		–	24 AWG/4pr	w & br – gn & y – gy & pk – bl & r
0036923		–	26 AWG/8pr	w/y & w/gn – w/r & w/o – w/bk & w/br – gy & w – bl & v y & gn – r & o – bk & br
0036924		–	26 AWG/4pr	bk & br – r & o – y & gn – bl & v
0036926	26 AWG/12c	bk – br – r – o – y – gn – bl – v – gy – w – w/bk – w/br		–
0036927*	20 AWG/2c	w – br	24 AWG/4pr	br & gn – gy & pk – bl & v – r & bk
0036928	26 AWG/4c 20 AWG/4c	w – br – gn – y w – br – gn – y	26 AWG/2pr 26 AWG/2pr	bl & r – gy & pk w & br – gn & y
0036929*	20 AWG/2c	pk – gy	24 AWG/2pr	w & br – gn & y
0036930*	20 AWG/2c	w – br	24 AWG/2pr	r & bk – gy & pk

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Servo Cable according to SIEMENS® Standard 6FX 8 Plus

Highly Flexible Servo Cable for High-Acceleration Continuous Flexing Motion

Construction

Conductors: Signal cables: tinned copper;
Power cables: bare copper
Pairs: Twisted together; shielded with tinned copper braid and non-woven wrap
Insulation: Polypropylene
Shielding: Overall tinned copper braid and non-woven wrap
Jacket: Feedback/signal: green polyurethane;
Servo/motor: orange polyurethane

Technical Data

Minimum Bend Radius:
- for continuous flexing: see table below
- for stationary use: 4 x cable diameter

Temperature Range:
- for continuous flexing: -20°C to +60°C
- for stationary use: -50°C to +80°C

Nominal Voltage:
- Signal conductors: 30V
- Power/control conductors: 1000V

Conductor Stranding: Class 6 super fine wire

Color Code:
- Feedback/signal: see color chart below
- Motor/servo: Black with white print:
  - 16-14 AWG: V/L2, U/L1/C/L+, W/L3/D/L-, plus green/yellow ground
  - 12-1 AWG: U/L1/C/L+, V/L2, W/L3/D/L-, plus green/yellow ground

Approvals:
- UL: AWM 21223, AWM 20236 (sensor leads)
- Canada: CSA AWM I/II A/B 1kV 80°C FT1
- Additional: Based on VDE specifications CE & RoHS

Part Number	Cable Type	Size / Number of Conductors	Min. Bend Radius Continuous Flexing (x cable diameter)	SIEMENS® Part Number	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
00277101	Feedback/Signal	26 AWG/8pr	8	6FX8008-1BD11	0.307	7.8	57	53112210	–
00277111	Feedback/Signal	22 AWG/4pr + 20 AWG/4c	8	6FX8008-1BD21	0.350	8.9	81	53112220	–
00277121	Feedback/Signal	3 x (26 AWG/1pr) + 2 x (20 AWG/1c)	8	6FX8008-1BD31	0.350	8.9	76	53112220	–
00277131	Feedback/Signal	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/1pr	8	6FX8008-1BD41	0.346	8.8	68	53112220	–
00277141	Feedback/Signal	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/2c + 26 AWG/4c	8	6FX8008-1BD51	0.370	9.4	93	53112220	53112676
00277151	Feedback/Signal	26 AWG/4pr	8	6FX8008-1BD61	0.252	6.4	36	53112220	–
00277161	Feedback/Signal	26 AWG/2pr	8	6FX8008-1BD71	0.197	5.0	24	53112210	–
00277171	Feedback/Signal	26 AWG/12c	8	6FX8008-1BD81	0.272	6.9	51	53112210	–
00277992	Feedback/Signal	26 AWG/2pr + 21 AWG/1pr	8	6FX8008-2DC00	0.283	7.2	50	53112210	–
0027784	Motor	16 AWG/4c	7.5	6FX8008-1BB11-Plus	0.359	9.1	101	53112220	53112676
0027785	Motor	14 AWG/4c	7.5	6FX8008-1BB21-Plus	0.418	10.6	148	53112230	53112676
0027786	Motor	12 AWG/4c	7.5	6FX8008-1BB31-Plus	0.469	11.9	202	53112240	53112676
0027787	Motor	10 AWG/4c	7.5	6FX8008-1BB41-Plus	0.571	14.5	302	53112250	53112676
0027788	Motor	8 AWG/4c	7.5	6FX8008-1BB51-Plus	0.690	17.5	444	53112260	53112677
0027789	Motor	6 AWG/4c	7.5	6FX8008-1BB61-Plus	0.851	21.6	679	53112260	53112678
0027790	Servo	16 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA11-Plus	0.457	11.6	155	53112230	53112676
0027791	Servo	14 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA21-Plus	0.528	13.4	202	53112240	53112676
0027792	Servo	12 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA31-Plus	0.583	14.8	255	53112250	53112676
0027793	Servo	10 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA41-Plus	0.662	16.8	356	53112250	53112676
0027794	Servo	8 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA51-Plus	0.764	19.4	514	53112260	53112677
0027795	Servo	6 AWG/4c + (16 AWG/1pr)	7.5	6FX8008-1BA61-Plus	0.910	23.1	732	53112660	53112678
0027796	Servo	4 AWG/4c + (16 AWG/1pr)	10	6FX8008-1BA25-Plus	1.048	26.6	1028	53112270	53112678
0027797	Servo	2 AWG/4c + (16 AWG/1pr)	10	6FX8008-1BA35-Plus	1.217	30.9	1371	53112270	53112679
0027798	Servo	1 AWG/4c + (16 AWG/1pr)	10	6FX8008-1BA50-Plus	1.340	34.0	1855	–	53112679

( ) = shielded pairs

Part Number	Size / Number of Conductors	Color Code
00277101	26 AWG/8pr	w/y & w/gn – w/r & w/o – w/bk & w/br – gy & w – bl & v – y & gn – r & o – bk & br
00277111	22 AWG/4pr	br & bk – r & o – y & gn – bl & v
	20 AWG/4c	w/bl – w/bk – w/r – w/y
00277121	26 AWG/3pr	y & gn – bk & br – r & o
	20 AWG/2c	bk – r
00277131	26 AWG/3pr	y & gn – bk & br – r & o
	26 AWG/4c	gy – bl – w/y – w/bk
	20 AWG/1pr	br/r & br/bl
00277141	26 AWG/3pr	y & gn – bk & br – r & o
	26 AWG/4c	gy – bl – w/y – w/bk
	26 AWG/4c	br/y – br/gy – gn/bk – gn/r
	20 AWG/2c	br/r – br/bl
00277151	26 AWG/4pr	bk & br – r & o – y & gn – bl & v
00277161	26 AWG/2pr	r & o – bk & br
00277171	26 AWG/12c	bk – br – r – o – y – gn – bl – v – gy – w – w/bk – w/br

Cable Attributes, page 83

Acceleration: up to 50m/s³
Travel speed: up to 5m/s
Travel length: up to 100m


OR-05 | OIL


FR-02 | FLAME


CF-04A | MOTION


MP-05 | MECH

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Servo Cable according to INDRAMAT® Standard INK

Continuous Flex Cable according to INDRAMAT® Standard INK

Construction

Conductors: Finely stranded bare copper
Insulation: Pairs & power conductors: TPE
Pairs: Shielded with foil and tinned copper
(not all feedback pairs are shielded)
Shielding: Overall tinned copper braid
Jacket: Orange polyurethane

Technical Data

Minimum Bend Radius:
- Feedback/signal cables: 10 x cable diameter
- Servo/motor cables: 7.5 x cable diameter

Temperature Range:
- for continuous flexing: -30°C to +80°C
- for stationary use: -50°C to +80°C

Nominal Voltage:
- Feedback/signal cond.: 300V
- Power/control cond: 1000V

Conductor Stranding: Class 6 fine wire

Color Code:
- Feedback cables: See color chart below
- Power conductors: Black with white numbers: 1, 2, 3 plus green/yellow ground
- Control pairs: Black with white numbers: 5/6, 7/8

Approvals:
UL: AWM 20234 (servo/motor)
AWM 20236 (signal)
Canada: CSA AWM I/II A/B FT1
Additional: CE & RoHS

Part Number	Cable Type	Size / Number of Conductors	INDRAMAT® Part Number	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-MC PG Thread	SKINTOP® MS-M BRUSH Metric Thread
7072400	Feedback/Signal	24 AWG/4pr + 18 AWG/2c	INK-0209	0.347	8.8	81	53112220	–
7072401	Feedback/Signal	24 AWG/4pr + 20 AWG/2c	INK-0448	0.335	8.5	67	53112220	–
7072402	Feedback/Signal	20 AWG/9c	INK-0208	0.347	8.8	85	53112220	–
7072414	Feedback/Signal	18 AWG/4c + 26 AWG/4pr + (26 AWG/4c)	INK-0532	0.382	9.7	94	53112220	53112676
7072415	Feedback/Signal	2 x (24 AWG/1pr) + 20 AWG/2c	INK-0234	0.343	8.7	60	53112220	–
7072416	Feedback/Signal	24 AWG/2pr + 20 AWG/2c	INK-0750	0.299	7.6	62	53112210	–
7072417	Servo/Motor	19 AWG/4c + 20 AWG/1pr	INK-0670	0.394	10.0	89	53112230	53112676
7072403	Servo/Motor	18 AWG/4c + 2 x (19 AWG/1pr)	INK-0653	0.453	11.5	152	53112240	53112676
7072404	Servo/Motor	16 AWG/4c + 2 x (19 AWG/1pr)	INK-0650	0.481	12.2	180	53112240	53112676
7072405	Servo/Motor	14 AWG/4C + 2 x (18 AWG/1pr)	INK-0602	0.595	15.1	215	53112250	53112676
7072406	Servo/Motor	12 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0603	0.630	16.0	316	53112250	53112676
7072407	Servo/Motor	10 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0604	0.741	18.8	403	53112260	53112677
7072408	Servo/Motor	8 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0605	0.867	22.0	571	53112260	53112678
7072409	Servo/Motor	6 AWG/4c + 2 x (16 AWG/1pr)	INK-0606	0.993	25.2	685	53112270	53112678
7072410	Servo/Motor	4 AWG/4c + 2 x (16 AWG/1pr)	INK-0607	1.103	28.0	954	53112270	53112679

( ) = shielded pairs

Part Number	Size / Number of Conductors	Color Code
7072400	24 AWG/4pr	brown & green – gray & pink – blue & violet – red & black
	18 AWG/2c	white – brown
7072401	24 AWG/4pr	brown & green – gray & pink – blue & violet – red & black
	20 AWG/2c	white – brown
7072402	20 AWG/9c	green – brown – gray – yellow – black – blue – red – white – pink
7072414	26 AWG/4c	yellow/black – blue/black – green/black – red/black
	26 AWG/4pr	red & black – brown & green – yellow & violet – gray & pink
	18 AWG/4c	white – brown/green – white/green – blue
7072415	2 x (24 AWG/1pr)	white & brown – green & yellow
	20 AWG/2c	pink – gray
7072416	24 AWG/2pr	red & black – gray & pink
	20 AWG/2c	white – brown

Cable Attributes, page 83


OR-05 OIL


FR-02 FLAME


CF-02 MOTION


MP-05 MECH

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® 190/190 CY

Extremely Oil-Resistant Flexible Control Cable with UL MTW; Unshielded & Shielded

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Jacket: Specially formulated oil-resistant gray PVC

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC/nylon
Inner Jacket: PVC
Shielding: Tinned copper braid (85% coverage)
Jacket: Specially formulated oil-resistant gray PVC

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- for stationary use: -40°C to +90°C
- for flexible use: -5°C to +90°C

Nominal Voltage:
- UL MTW/CSA AWM: 600V
- UL AWM: 1000V

Conductor Stranding:
- 20 - 6 AWG: Class 5 fine wire*
- 4 AWG and larger:
  - MTW: Class K fine wire
  - AWM only: Class 5 fine wire

Color Code: Black with white numbers, plus green/yellow ground

Approvals:
UL: MTW per UL 1063
Attributes: UL Oil Res I/II
NFPA 79 2012
Canada: CSA AWM I/II A/B FT1
CSA C22.2 210.2
Additional: Passes Impact and Crush tests per UL 1277, excluding 20 AWG
CE & RoHS

* 18 AWG meets only the Class 5 cross section and DC resistance

Cable Attributes, page 83


OR-04 | OIL


FR-02 | FLAME


FL-02 | MOTION


MP-02 | MECH

ÖLFLEX® 190

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
602003	20 AWG/3c	0.265	6.7	42	S1109
602004	20 AWG/4c	0.285	7.2	51	S1111
602005	20 AWG/5c	0.308	7.8	60	S1111
602007	20 AWG/7c	0.331	8.4	82	S1111
602012	20 AWG/12c	0.421	10.7	168	S1113
602018	20 AWG/18c	0.487	12.4	198	S1116
602025	20 AWG/25c	0.586	14.9	242	S1121
601803	18 AWG/3c	0.291	7.4	44	S1111
601804	18 AWG/4c	0.314	8.0	55	S1111
601805	18 AWG/5c	0.340	8.6	64	S1111
601807	18 AWG/7c	0.367	9.3	84	S1111
601812	18 AWG/12c	0.471	12.0	141	S1116
601818	18 AWG/18c	0.579	14.7	207	S1121
601825	18 AWG/25c	0.656	16.7	278	S1121
601603	16 AWG/3c	0.319	8.1	62	S1111
601604	16 AWG/4c	0.345	8.8	75	S1111
601605	16 AWG/5c	0.375	9.5	90	S1111
601607	16 AWG/7c	0.406	10.3	121	S1113
601612	16 AWG/12c	0.557	14.1	209	S1121
601618	16 AWG/18c	0.644	16.4	298	S1121
601625	16 AWG/25c	0.733	18.6	417	S1129
601403	14 AWG/3c	0.356	9.0	93	S1111
601404	14 AWG/4c	0.386	9.8	121	S1113
601405	14 AWG/5c	0.421	10.7	145	S1113
601407	14 AWG/7c	0.457	11.6	192	S1113
601412	14 AWG/12c	0.628	16.0	401	S1121
601418	14 AWG/18c	0.729	18.5	575	S1129
601425	14 AWG/25c	0.872	22.1	860	S1129
601203	12 AWG/3c	0.417	10.6	156	S1113
601204	12 AWG/4c	0.454	11.5	198	S1113
601003	10 AWG/3c	0.492	12.5	223	S1116
601004	10 AWG/4c	0.570	14.5	267	S1121
600804	8 AWG/4c	0.695	17.7	436	S1129
600805	8 AWG/5c	0.764	19.4	525	S1129
600604	6 AWG/4c	0.870	22.1	699	S1129
600404	4 AWG/4c	1.118	28.4	950	S1136
600204	2 AWG/4c	1.292	32.8	1405	S1248

ÖLFLEX® 190 CY

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
602003CY	20 AWG/3c	0.341	8.7	82	53112220
602007CY	20 AWG/7c	0.407	10.3	112	53112230
602012CY	20 AWG/12c	0.497	12.6	181	53112240
602025CY	20 AWG/25c	0.678	17.2	295	53112260
601803CY	18 AWG/3c	0.367	9.3	82	53112230
601804CY	18 AWG/4c	0.390	9.9	106	53112230
601805CY	18 AWG/5c	0.416	10.6	123	53112230
601807CY	18 AWG/7c	0.443	11.3	139	53112240
601812CY	18 AWG/12c	0.586	14.9	229	53112250
601818CY	18 AWG/18c	0.678	17.2	317	53112260
601825CY	18 AWG/25c	0.764	19.4	436	53112260
601603CY	16 AWG/3c	0.395	10.0	115	53112230
601604CY	16 AWG/4c	0.421	10.7	128	53112230
601605CY	16 AWG/5c	0.451	11.5	150	53112240
601607CY	16 AWG/7c	0.482	12.2	181	53112240
601612CY	16 AWG/12c	0.656	16.7	311	53112250
601618CY	16 AWG/18c	0.743	18.9	456	53112260
601625CY	16 AWG/25c	0.897	22.8	639	53112260
601403CY	14 AWG/3c	0.432	11.0	148	53112230
601404CY	14 AWG/4c	0.462	11.7	181	53112240
601405CY	14 AWG/5c	0.497	12.6	218	53112240
601407CY	14 AWG/7c	0.572	14.5	282	53112250
601412CY	14 AWG/12c	0.736	18.7	516	53112260
601204CY	12 AWG/4c	0.585	14.9	311	53112250
601004CY	10 AWG/4c	0.669	17.0	386	53112250
600804CY	8 AWG/4c	0.803	20.4	574	53112260
600604CY	6 AWG/4c	0.994	25.2	1115	53112270

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® 490 P/490 CP

Highly Abrasion-Resistant Control Cable with PUR Jacket & UL/CSA AWM; Unshielded & Shielded

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC
Jacket: Specially formulated gray polyurethane

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC
Shielding: Overall foil tape wrap with drain wire; tinned copper braid (85% coverage)
Jacket: Specially formulated gray polyurethane

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- for flexible use: -10°C to +80°C
- for stationary use: -20°C to +80°C

Nominal Voltage: 600V

Conductor Stranding: Class 5 fine wire*

Color Code: Black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 20234
Attributes: UL Oil Res I/II
Sunlight Resistant
NFPA 79 2012
Canada: CSA AWM I/II A/B FT1
Additional: CE & RoHS

* 18 AWG meets only the Class 5 cross section and DC resistance

Cable Attributes, page 83


OR-05 OIL


FR-02 FLAME


FL-01 MOTION


MP-06 MECH

ÖLFLEX® 490 P

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
402002*	20 AWG/2c	0.245	6.2	35	S1107
402003	20 AWG/3c	0.256	6.5	40	S1109
402004	20 AWG/4c	0.274	7.0	46	S1109
402005	20 AWG/5c	0.293	7.4	53	S1111
402007	20 AWG/7c	0.313	8.0	66	S1111
402009	20 AWG/9c	0.355	9.0	82	S1111
402012	20 AWG/12c	0.401	10.2	106	S1113
402018	20 AWG/18c	0.459	11.7	139	S1113
402025	20 AWG/25c	0.534	13.6	176	S1121
401802*	18 AWG/2c	0.269	6.8	44	S1109
401803	18 AWG/3c	0.281	7.1	51	S1111
401804	18 AWG/4c	0.303	7.7	64	S1111
401805	18 AWG/5c	0.325	8.3	75	S1111
401807	18 AWG/7c	0.349	8.9	93	S1111
401809	18 AWG/9c	0.399	10.1	119	S1113
401812	18 AWG/12c	0.451	11.5	143	S1113
401818	18 AWG/18c	0.519	13.2	203	S1116
401825	18 AWG/25c	0.607	15.4	264	S1121
401602*	16 AWG/2c	0.295	7.5	53	S1111
401603	16 AWG/3c	0.310	7.9	64	S1111
401604	16 AWG/4c	0.333	8.5	77	S1111
401605	16 AWG/5c	0.360	9.1	90	S1111
401607	16 AWG/7c	0.388	9.9	115	S1113
401609	16 AWG/9c	0.446	11.3	141	S1113
401612	16 AWG/12c	0.496	12.6	179	S1116
401618	16 AWG/18c	0.574	14.6	253	S1121
401625	16 AWG/25c	0.654	16.6	335	S1121
401402*	14 AWG/2c	0.329	8.4	66	S1111
401403	14 AWG/3c	0.347	8.8	75	S1111
401404	14 AWG/4c	0.374	9.5	108	S1111
401405	14 AWG/5c	0.406	10.3	121	S1113
401407	14 AWG/7c	0.439	11.2	170	S1113
401409	14 AWG/9c	0.507	12.9	194	S1116
401412	14 AWG/12c	0.567	14.4	238	S1121
401418	14 AWG/18c	0.659	16.7	357	S1121
401425	14 AWG/25c	0.754	19.2	474	S1129

* 2c cable does not include ground

ÖLFLEX® 490 CP

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
402002CP*	20 AWG/2c	0.270	6.9	46	53112210
402003CP	20 AWG/3c	0.281	7.1	55	53112220
402004CP	20 AWG/4c	0.299	7.6	66	53112220
402005CP	20 AWG/5c	0.318	8.1	73	53112220
402007CP	20 AWG/7c	0.338	8.6	84	53112220
402009CP	20 AWG/9c	0.380	9.7	104	53112230
402012CP	20 AWG/12c	0.426	10.8	117	53112230
402018CP	20 AWG/18c	0.490	12.4	163	53112240
402025CP	20 AWG/25c	0.565	14.4	214	53112250
401802CP*	18 AWG/2c	0.294	7.5	62	53112220
401803CP	18 AWG/3c	0.306	7.8	71	53112220
401804CP	18 AWG/4c	0.328	8.3	82	53112220
401805CP	18 AWG/5c	0.350	8.9	95	53112220
401807CP	18 AWG/7c	0.374	9.5	117	53112230
401809CP	18 AWG/9c	0.424	10.8	139	53112230
401812CP	18 AWG/12c	0.473	12.0	176	53112240
401818CP	18 AWG/18c	0.540	13.7	240	53112250
401825CP	18 AWG/25c	0.609	15.5	311	53112250
401602CP*	16 AWG/2c	0.320	8.1	73	53112220
401603CP	16 AWG/3c	0.335	8.5	82	53112220
401604CP	16 AWG/4c	0.358	9.1	97	53112220
401605CP	16 AWG/5c	0.385	9.8	112	53112230
401607CP	16 AWG/7c	0.413	10.5	137	53112230
401609CP	16 AWG/9c	0.477	12.1	170	53112240
401612CP	16 AWG/12c	0.527	13.4	216	53112240
401618CP	16 AWG/18c	0.605	15.4	295	53112250
401625CP	16 AWG/25c	0.685	17.4	384	53112260
401402CP*	14 AWG/2c	0.354	9.0	84	53112220
401403CP	14 AWG/3c	0.372	9.4	101	53112230
401404CP	14 AWG/4c	0.399	10.1	123	53112230
401405CP	14 AWG/5c	0.431	10.9	145	53112230
401407CP	14 AWG/7c	0.470	11.9	183	53112240
401409CP	14 AWG/9c	0.538	13.7	225	53112250
401412CP	14 AWG/12c	0.598	15.2	287	53112250
401418CP	14 AWG/18c	0.690	17.5	390	53112260
401425CP	14 AWG/25c	0.785	19.9	558	53112260

* 2c cable does not include ground

ÖLFLEX® FD 890/FD 890 CY

Super Flexible Heavy Duty Continuous Flex Control Cable with PVC Jacket

Unshielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC; dry lubricant; non-woven wrapping over outer layer
Jacket: Specially formulated UV- and oil-resistant black PVC

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Specially blended PVC; dry lubricant; non-woven wrapping over outer layer
Inner Jacket: Black PVC
Shielding: Tinned copper braid (85% coverage)
Jacket: Specially formulated UV- and oil-resistant black PVC

Technical Data

Minimum Bend Radius:
- for continuous flexing: 7.5 x cable diameter
- shielded: 10 x cable diameter

Temperature Range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -25°C to +90°C

Nominal Voltage: 600V

Conductor Stranding: Better than Class 6 super fine wire

Color Code: Black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 2587
AWM 21098 (Oil)
Attributes: UL Oil Res I/II
Sunlight resistant
NFPA 79 2012
UL 758 80°C Oil Test
Canada: CSA AWM I/II A/B FT1
CSA C22.2, 210.2
Additional: CE & RoHS

Cable Attributes, page 83


OR-04 | OIL


FR-02 | FLAME


CF-03 | MOTION


MP-02 | MECH

ÖLFLEX® FD 890

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
8920034	20 AWG/3c	0.264	6.7	43	S2109
8920044	20 AWG/4c	0.291	7.4	53	S2111
8920054	20 AWG/5c	0.323	8.2	68	S2111
8920074	20 AWG/7c	0.382	9.7	75	S2113
8920124	20 AWG/12c	0.457	11.6	124	S2113
8920184	20 AWG/18c	0.539	13.7	183	S2121
8920254	20 AWG/25c	0.677	17.2	265	S2121
8918034	18 AWG/3c	0.287	7.3	46	S2111
8918044	18 AWG/4c	0.327	8.3	60	S2111
8918054	18 AWG/5c	0.355	9.0	74	S2111
8918074	18 AWG/7c	0.429	10.9	102	S2113
8918124	18 AWG/12c	0.500	12.7	158	S2116
8918154	18 AWG/15c	0.559	14.2	202	S2121
8918184	18 AWG/18c	0.614	15.6	234	S2121
8918254	18 AWG/25c	0.763	19.4	336	S2129
8916034	16 AWG/3c	0.323	8.2	79	S2111
8916044	16 AWG/4c	0.358	9.1	106	S2111
8916054	16 AWG/5c	0.393	10.0	132	S2113
8916074	16 AWG/7c	0.480	12.2	138	S2116
8916124	16 AWG/12c	0.555	14.1	214	S2121
8916184	16 AWG/18c	0.685	17.4	323	S2129
8916254	16 AWG/25c	0.854	21.7	505	S2129
8914044	14 AWG/4c	0.456	11.6	148	S2113
8914074	14 AWG/7c	0.614	15.6	227	S2121
8912044	12 AWG/4c	0.531	13.5	208	S2121
8912074	12 AWG/7c	0.740	18.8	335	S2129
8910044	10 AWG/4c	0.640	16.3	275	S2121
8908044	8 AWG/4c	0.756	19.2	481	S2129

ÖLFLEX® FD 890 CY

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
8920034S	20 AWG/3c	0.342	8.7	82	53112220
8920044S	20 AWG/4c	0.370	9.4	97	53112230
8920054S	20 AWG/5c	0.409	10.4	108	53112230
8920074S	20 AWG/7c	0.468	11.9	137	53112240
8920124S	20 AWG/12c	0.551	14.0	214	53112250
8920184S	20 AWG/18c	0.657	16.7	293	53112250
8920254S	20 AWG/25c	0.803	20.4	421	53112260
8918034S	18 AWG/3c	0.375	9.5	91	53112230
8918044S	18 AWG/4c	0.419	10.6	112	53112230
8918054S	18 AWG/5c	0.447	11.4	131	53112240
8918074S	18 AWG/7c	0.528	13.4	198	53112240
8918124S	18 AWG/12c	0.636	16.2	271	53112250
8918184S	18 AWG/18c	0.719	18.3	357	53112260
8918254S	18 AWG/25c	0.887	22.5	538	53112260
8916034S	16 AWG/3c	0.409	10.4	121	53112230
8916044S	16 AWG/4c	0.444	11.3	154	53112240
8916054S	16 AWG/5c	0.480	12.2	170	53112240
8916074S	16 AWG/7c	0.598	15.2	258	53112250
8916124S	16 AWG/12c	0.673	17.1	366	53112260
8916184S	16 AWG/18c	0.826	21.0	493	53112260
8916254S	16 AWG/25c	0.996	25.3	687	53112270
8914044S	14 AWG/4c	0.551	14.0	181	53112250
8914074S	14 AWG/7c	0.709	18.0	347	53112260
8914184S	14 AWG/18c	1.012	25.7	762	53112270
8912044S	12 AWG/4c	0.650	16.5	302	53112250
8912074S	12 AWG/7c	0.858	21.8	194	53112260
8910044S	10 AWG/4c	0.752	19.1	333	53112260
8908044S	8 AWG/4c	0.882	22.4	701	53112260

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® FD 855 P/FD 855 CP

Halogen-Free Highly Flexible Cable for Small Bend Radius Applications with PUR Jacket

CE RoHS

Construction

Conductors: Finely stranded bare copper
Insulation: TPE; dry lubricant; non-woven wrapping over outer layer
Jacket: Specially formulated gray polyurethane

Construction

Conductors: Finely stranded bare copper
Insulation: TPE; dry lubricant; non-woven wrapping over outer layer
Inner Jacket: Gray TPE
Shielding: Tinned copper braid (85% coverage)
Jacket: Specially formulated gray polyurethane

Technical Data

Minimum Bend Radius:
- for continuous flexing: 5 x cable diameter
- shielded: 7.5 x cable diameter

Temperature Range:
- for continuous flexing: -40°C to +80°C
- for stationary use: -50°C to +80°C

Nominal Voltage: 300/500V

Conductor Stranding: Class 6 super fine wire

Color Code: Black with white numbers, plus green/yellow ground

Approvals: CE & RoHS
MUD acc. to IEC 61892-4 Annex D
Based on VDE 0250/0281/0282

Cable Attributes, page 83

OR-05	FR-02	CF-04	MP-05
OIL	FLAME	MOTION	MECH

ÖLFLEX® FD 855 P

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
0027530*	20 AWG/2c	0.201	5.1	23	S1107
0027531	20 AWG/3c	0.217	5.5	27	S1107
0027532	20 AWG/5c	0.260	6.6	37	S1109
0027534	20 AWG/7c	0.303	7.7	51	S1111
0027535	20 AWG/12c	0.358	9.1	77	S1111
0027536	20 AWG/18c	0.429	10.9	111	S1113
0027537	20 AWG/20c	0.453	11.5	121	S1113
0027545*	19 AWG/2c	0.220	5.6	28	S1107
0027546	19 AWG/3c	0.236	6.0	34	S1107
0027547	19 AWG/4c	0.264	6.7	40	S1109
0027548	19 AWG/5c	0.287	7.3	48	S1111
0027549	19 AWG/7c	0.346	8.8	67	S1111
0027550	19 AWG/12c	0.406	10.3	106	S1113
0027551	19 AWG/18c	0.488	12.4	147	S1116
0027552	19 AWG/20c	0.524	13.3	161	S1116
0027560*	18 AWG/2c	0.236	6.0	34	S1107
0027561	18 AWG/3c	0.256	6.5	41	S1109
0027562	18 AWG/4c	0.283	7.2	47	S1111
0027563	18 AWG/5c	0.307	7.8	62	S1111
0027564	18 AWG/7c	0.374	9.5	82	S1111
0027565	18 AWG/12c	0.441	11.2	132	S1113
0027566	18 AWG/18c	0.539	13.7	184	S1121
0027575*	16 AWG/2c	0.264	6.7	46	S1109
0027576	16 AWG/3c	0.287	7.3	56	S1111
0027586	16 AWG/4c	0.315	8.0	67	S1111
0027577	16 AWG/5c	0.354	9.0	86	S1111
0027578	16 AWG/7c	0.422	10.7	119	S1113
0027579	16 AWG/12c	0.500	12.7	185	S1116
0027580	16 AWG/18c	0.598	15.2	272	S1121
0027370	14 AWG/3c	0.350	8.9	81	S1111
0027371	14 AWG/4c	0.390	9.9	110	S1113
0027372	14 AWG/5c	0.433	11.0	132	S1113
0027373	14 AWG/7c	0.528	13.4	179	S1116
0027374	14 AWG/12c	0.622	15.8	300	S1121
0027375	14 AWG/18c	0.744	18.9	447	S1129

* 2c cable does not include ground

ÖLFLEX® FD 855 CP

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
0027605*	20 AWG/2c	0.264	6.7	45	53112210
0027606	20 AWG/3c	0.280	7.1	53	53112210
0027607	20 AWG/5c	0.323	8.2	72	53112220
0027608	20 AWG/6c	0.343	8.7	81	53112220
0027609	20 AWG/7c	0.374	9.5	89	53112230
0027610	20 AWG/12c	0.429	10.9	128	53112230
0027611	20 AWG/18c	0.508	12.9	165	53112240
0027612	20 AWG/20c	0.531	13.5	189	53112240
0027613	20 AWG/25c	0.614	15.6	247	53112250
0027620*	19 AWG/2c	0.283	7.2	53	53112220
0027621	19 AWG/3c	0.299	7.6	65	53112220
0027622	19 AWG/4c	0.327	8.3	75	53112220
0027623	19 AWG/5c	0.350	8.9	85	53112220
0027624	19 AWG/7c	0.417	10.6	111	53112230
0027625	19 AWG/12c	0.476	12.1	155	53112240
0027626	19 AWG/18c	0.575	14.6	222	53112250
0027628	19 AWG/25c	0.697	17.7	308	53112260
0027635*	18 AWG/2c	0.299	7.6	62	53112220
0027636	18 AWG/3c	0.319	8.1	73	53112220
0027637	18 AWG/4c	0.346	8.8	85	53112220
0027638	18 AWG/5c	0.378	9.6	99	53112230
0027639	18 AWG/7c	0.445	11.3	132	53112240
0027640	18 AWG/12c	0.520	13.2	196	53112240
0027641	18 AWG/18c	0.626	15.9	281	53112250
0027643	18 AWG/25c	0.768	19.5	386	53112260
0027649*	16 AWG/2c	0.327	8.3	77	53112220
0027650	16 AWG/3c	0.350	8.9	93	53112220
0027661	16 AWG/4c	0.386	9.8	105	53112230
0027651	16 AWG/5c	0.425	10.8	133	53112230
0027652	16 AWG/7c	0.492	12.5	171	53112240
0027653	16 AWG/12c	0.587	14.9	280	53112250
0027654	16 AWG/18c	0.685	17.4	379	53112260
0027656	16 AWG/25c	0.843	21.4	545	53112260
0027380	14 AWG/3c	0.421	10.7	130	53112230
0027381	14 AWG/4c	0.461	11.7	157	53112240
0027382	14 AWG/5c	0.504	12.8	197	53112240
0027383	14 AWG/7c	0.614	15.6	281	53112250
0027384	14 AWG/12c	0.709	18.0	423	53112260
0027385	14 AWG/18c	0.846	21.5	613	53112260
0027386	14 AWG/25c	1.043	26.5	851	53112270

* 2c cable does not include ground

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ÖLFLEX® CHAIN 896 P

High-Acceleration Continuous Flexing Control Cable with PUR Jacket

Construction

Conductors: Extra fine bare copper conductors
Insulation: Polypropylene; non-woven wrapping
Jacket: Black polyurethane

Cable Attributes, page 83

Acceleration:	up to 50m/sec³
Travel speed:	up to 5m/sec
Travel length:	up to 100m

OR-05	FR-02	CF-04A	MP-05
OIL	FLAME	MOTION	MECH

Technical Data

Minimum Bend Radius:

- for flexible use:	
- 16 - 6 AWG:	7.5 x cable diameter
- 4 AWG:	10 x cable diameter
- for stationary use:	4 x cable diameter

Temperature Range:

- for flexible use:	-40°C to +80°C
- for stationary use:	-50°C to +80°C

Nominal Voltage:

- UL/CSA:	1000V
- IEC:	600/1000V

Conductor Stranding: Class 6 super fine wire

Color Code: Black with white numbers

Approvals:

UL:	AWM 20234
Attributes:	VW-1
Canada:	cRU AWM I/II A/B 1kV FT1
Additional:	VDE Reg. no. 8661
	MUD acc. to IEC 61892-4 Annex D
	CE & RoHS

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
1023229	16 AWG/4c	0.378	9.6	81	S2113
1023230	16 AWG/5c	0.394	10.0	96	S2113
1023238	14 AWG/4c	0.433	11.0	117	S2113
1023239	14 AWG/5c	0.473	12.0	141	S2116
1023245	12 AWG/4c	0.493	12.5	163	S2116
1023246	12 AWG/5c	0.540	13.7	212	S2121
1023248	10 AWG/4c	0.563	14.3	225	S2121
1023249	10 AWG/5c	0.619	15.7	295	S2121
1023250	8 AWG/4c	0.670	17.0	338	S2121
1023251	8 AWG/5c	0.745	18.9	446	S2129
1023252	6 AWG/4c	0.835	21.2	544	S2129
1023253	6 AWG/5c	0.938	23.8	843	S2129
1023254	4 AWG/4c	1.020	25.9	843	S2136
1023255	4 AWG/5c	1.143	29.0	1063	S2136

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UNITRONIC® FD CP plus/FD CP (TP) plus

Continuous Flex Communication Cables; Shielded, & Twisted Pairs

Shielded Construction

Conductors: Finely stranded bare copper
Insulation: Polyolefin; non-woven wrapping
Shielding: Tinned copper braid (85% coverage)
Jacket: Specially formulated gray halogen-free polyurethane

Shielded Paired Construction

Conductors: Finely stranded bare copper
Insulation: Polyolefin
Pairs: Conductors are paired and twisted together; non-woven wrapping
Shielding: Tinned copper braid
Jacket: Specially formulated gray halogen-free PUR

Cable Attributes, page 83

OR-05	FR-02	CF-02	MP-05
OIL	FLAME	MOTION	MECH

Technical Data

Minimum Bend Radius:
- for shielded: 7.5 x cable diameter

Temperature Range:
- for continuous flexing:
  - FD CY plus: -40°C to +80°C
  - FD CY (TP) plus: -5°C to +80°C

Nominal Voltage:
- FD CY plus: 250V (not for power)
- FD CY (TP) plus: 350V (not for power)

Mutual Capacitance:
- FD CY plus:
  - Conductor/conductor: approx. 30 pF/ft
  - Conductor/shield: approx. 33 pF/ft
- FD CY (TP) plus:
  - up to 0.5 mm²: 18 pF/ft
  - up to 1.0 mm²: 21 pF/ft

Insulation Resistance: > 5 GΩ x cm

Inductance: approx. 0.65 mH/km

Conductor Stranding: Extra fine wire per VDE 0295

Color Code:
- FD CY TP plus: DIN 47100: Chart 8, p. 87
- FD CY (TP) plus: DIN 47100: Chart 7, p. 87

Approvals:
- FD/FD CY: Based on VDE 0812
  RoHS
- FD CP (TP) plus:
  UL: CMX
  Canada: c(UL) CMX
  Additional: RoHS

UNITRONIC® FD CP plus

Part Number	Size / Number of Pairs	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
0028880	26 AWG/3c	0.177	4.5	22	53112210
0028881	26 AWG/3c	0.185	4.7	24	53112210
0028882	26 AWG/4c	0.201	5.1	27	53112210
0028883	26 AWG/5c	0.213	5.4	30	53112210
0028884	26 AWG/7c	0.236	6.0	45	53112210
0028885	26 AWG/10c	0.276	7.0	58	53112210
0028886	26 AWG/14c	0.280	7.1	69	53112210
0028887	26 AWG/18c	0.303	7.7	79	53112220
0028888	26 AWG/25c	0.362	9.2	106	53112220
0028889	24 AWG/2c	0.201	5.1	26	53112210
0028890	24 AWG/3c	0.213	5.4	30	53112210
0028891	24 AWG/4c	0.228	5.8	35	53112210
0028892	24 AWG/5c	0.244	6.2	46	53112210
0028893	24 AWG/7c	0.276	7.0	56	53112210
0028894	24 AWG/10c	0.335	8.5	73	53112220
0028895	24 AWG/14c	0.339	8.6	91	53112220
0028896	24 AWG/18c	0.370	9.4	108	53112230
0028897	24 AWG/25c	0.449	11.4	143	53112240
0028898	22 AWG/2c	0.220	5.6	30	53112210
0028899	22 AWG/3c	0.232	5.9	41	53112210
0028900	22 AWG/4c	0.248	6.3	52	53112210
0028901	22 AWG/5c	0.268	6.8	56	53112210
0028902	22 AWG/7c	0.303	7.7	73	53112220
0028903	22 AWG/10c	0.370	9.4	99	53112230
0028904	22 AWG/14c	0.374	9.5	125	53112230
0028905	22 AWG/18c	0.421	10.7	145	53112230
0028906	22 AWG/25c	0.508	12.9	211	53112240

UNITRONIC® FD CP (TP) plus

Part Number	Size / Number of Pairs	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
0030910	26 AWG/2c	0.244	6.2	28	53112210
0030911	26 AWG/3c	0.256	6.5	36	53112210
0030912	26 AWG/4c	0.276	7.0	40	53112210
0030913	26 AWG/5c	0.299	7.6	50	53112220
0030914	26 AWG/6c	0.307	7.8	61	53112220
0030915	26 AWG/8c	0.358	9.1	73	53112220
0030916	26 AWG/10c	0.413	10.5	81	53112230
0030962	24 AWG/1c	0.201	5.1	18	53112210
0030919	24 AWG/2c	0.287	7.3	40	53112220
0030920	24 AWG/3c	0.303	7.7	48	53112220
0030921	24 AWG/4c	0.339	8.6	57	53112220
0030928	22 AWG/2c	0.323	8.2	54	53112220
0030929	22 AWG/3c	0.343	8.7	68	53112220
0030930	22 AWG/4c	0.374	9.5	80	53112230
0030937	20 AWG/2c	0.366	9.3	67	53112230
0030938	20 AWG/3c	0.398	10.1	87	53112230
0030939	20 AWG/4c	0.437	11.1	99	53112230
0030940	20 AWG/5c	0.484	12.3	113	53112240
0030941	20 AWG/6c	0.500	12.7	130	53112240
0030942	20 AWG/8c	0.594	15.1	191	53112250

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International Approved Hook-up Wire

H05V-K: UL AWM Style 1007 & 1569, UL/CSA; H07V-K: UL AWM Style 1015, UL MTW 1063, CSA

Construction

Conductors: Finely stranded tinned copper
Insulation: PVC

Technical Data

Temperature Range:
- <HAR>/IEC: -40°C to +70°C
- UL/CSA: -40°C to +105°C

Nominal Voltage:
- H05V-K:
  - <HAR>/IEC: 300/500V
  - UL/CSA: 300V
- H07V-K:
  - <HAR> /IEC: 450/750V
  - UL/CSA: 600V

Conductor Stranding: Class 5 fine wire

Color Code:

00: Green/Yellow	07: Violet
01: Black	08: Pink
02: Blue	09: Orange
03: Brown	10: Yellow**
04: Red	11: Green**
05: White	14: Dark Blue
06: Gray	

Approvals:

- H05V-K:	UL:	AWM 1007 & 1569
	Canada:	CSA AWM I A/B
	Additional:	<HAR> H05V-K
		CE & RoHS
- H07V-K:	UL:	MTW per UL 1063
		AWM 1015
	Canada:	TEW
	Additional:	<HAR> H07V-K
		CE & RoHS

Cable Attributes, page 83


OR-02 (OIL)


FR-02 (FLAME)


FL-02 (MOTION)


MP-01 (MECH)

** For these colors, no <HAR> approval for 1.5 mm² or larger.

H05V-K

Part Number	Size	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)
41804...	22 AWG (0.50 mm²)	0.098	2.5	6
41805...	20 AWG (0.75 mm²)	0.102	2.6	8
41806...	18 AWG (1.00 mm²)	0.110	2.8	10

For Lapp part number, add the double digit color code below to the part number prefix in the table; e.g.: 16 AWG H07V-K green/yellow = 4160400

H07V-K

Part Number	Size	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)
41604...	16 AWG (1.5 mm²)	0.134	3.4	15
41605...	14 AWG (2.5 mm²)	0.157	4.0	25
41606...	12 AWG (4 mm²)	0.181	4.6	30
41607...	10 AWG (6 mm²)	0.201	5.1	48
41608...	8 AWG (10 mm²)	0.268	6.8	81
41609...*	6 AWG (16 mm²)	0.354	9.0	126
41610...	4 AWG (25 mm²)	0.402	10.2	195
41611...	2 AWG (35 mm²)	0.461	11.7	268
41612...	1 AWG (50 mm²)	0.547	13.9	376
41613...	2/0 AWG (70 mm²)	0.630	16.0	521
41614...	3/0 AWG (95 mm²)	0.717	18.2	693
41615...	4/0 AWG (120 mm²)	0.780	19.8	864

* No <HAR> approval available

MACHINE CABLE

ÖLFLEX® POWER QUAD II

Oil-Resistant PVC Cordage with <HAR> & SJTO Approvals for Global Use

Construction

Conductors: Finely stranded bare copper
Insulation: Specially formulated PVC
Jacket: Specially formulated oil-resistant black PVC

Technical Data

Minimum Bend Radius: 4 x cable diameter

Temperature Range:
- UL/CSA SJTO: -25°C to +90°C
- <HAR> H05VV-F: -30°C to +70°C

Nominal Voltage:
- UL/CSA SJTO: 300V
- <HAR> H05VV-F: 500V

Conductor Stranding: Class 5 fine wire*

Color Code: VDE 0293-308: Chart 6, p. 86

Approvals:
UL: SJTO per UL 62
AWM 21098
Attributes: UL Oil Res I/II
Sunlight Resistant
-25°C Cold Bend

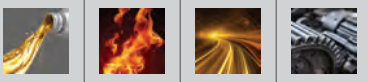
Canada: c(UL) SJTO
cRU AWM I/II A/B FT1
Additional: <HAR> H05VV-F
CE & RoHS

* 18 AWG meets only the Class 5 cross section and DC resistance

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
311802*	18 AWG/2c	0.265	6.7	44	S2109
311803	18 AWG/3c	0.283	7.2	53	S2111
311804	18 AWG/4c	0.304	7.7	66	S2111
311805	18 AWG/5c	0.348	8.8	93	S2111
311602*	16 AWG/2c	0.305	7.7	62	S2111
311603	16 AWG/3c	0.332	8.4	73	S2111
311604	16 AWG/4c	0.364	9.2	84	S2111
311605	16 AWG/5c	0.405	10.3	99	S2113
311403	14 AWG/3c	0.407	10.3	101	S2113
311404	14 AWG/4c	0.447	11.4	130	S2113
311405	14 AWG/5c	0.496	12.6	150	S2116

* 2c cable does not include ground

Cable Attributes, page 83



OR-04	FR-02	FL-02	MP-02
OIL	FLAME	MOTION	MECH

MACHINE CABLE

ÖLFLEX® POWER IX

Heavy Duty, Neoprene Cordage with <HAR> and SOOW Approvals for Global Use

Construction

Conductors: Finely stranded bare copper
Insulation: Rubber
Jacket: Neoprene

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- UL/CSA SOOW: -40°C to +90°C
- <HAR> H07RN-F: -25°C to +60°C

Nominal Voltage:
- UL/CSA: 600V
- <HAR> H07RN-F: 450/750V

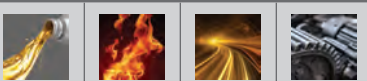
Conductor Stranding: Class 5 fine wire*

Color Code: VDE 0293-308: Chart 6, p. 86

Approvals:
UL: SOOW per UL 62
Attributes: -40°C Cold Bend
Sunlight Resistant
Canada: c(UL) SOOW
Additional: <HAR> H07RN-F
CE & RoHS

* 18 AWG meets only the Class 5 cross section and DC resistance

Cable Attributes, page 83



OR-02	FR-01	FL-02	MP-02
OIL	FLAME	MOTION	MECH

Part Number	Size / Number of Conductors (incl. ground)	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
321803	18 AWG/3c	0.380	9.7	84	S2113
321804	18 AWG/4c	0.410	10.4	96	S2113
321603	16 AWG/3c	0.400	10.2	99	S2113
321604	16 AWG/4c	0.450	11.4	125	S2113
321605	16 AWG/5c	0.520	13.2	165	S2116
321403	14 AWG/3c	0.550	14.0	183	S2121
321404	14 AWG/4c	0.590	15.0	216	S2121
321405	14 AWG/5c	0.670	17.0	277	S2121
321203	12 AWG/3c	0.620	15.7	249	S2121
321204	12 AWG/4c	0.670	17.0	300	S2121
321205	12 AWG/5c	0.740	18.8	355	S2129
321003	10 AWG/3c	0.670	17.0	304	S2121
321004	10 AWG/4c	0.720	18.3	366	S2129
321005	10 AWG/5c	0.790	20.1	442	S2129
320803	8 AWG/3c	0.900	22.9	537	S2129
320804	8 AWG/4c	0.980	24.9	652	S2136

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C 304
Multi-Conductor, Low-Voltage Communication, Audio & Control Cable; Unshielded

Construction

Conductors: Tinned copper
Insulation: SR-PVC
Jacket: Gray PVC

Technical Data

Minimum Bend Radius:	7.5 x cable diameter
Temperature Range:	-20°C to +105°C
Nominal Voltage:	300V
Test Voltage:	1500V
Conductor Stranding:	Fine wire

Color Code:	see table below
Approvals:	
UL:	CMG per UL 444
	AWM 2464
Attributes:	NFPA 79 2012
NEC:	Meets NEC Art. 800
Canada:	CSA CMG FT4
	CSA AWM I/II A/B FT1
Additional:	RoHS

Cable Attributes, page 83


OR-01 OIL


FR-03 FLAME


FL-01 MOTION


MP-01 MECH

* 24 & 22 AWG meet RS-232 applications.

Part Number	Size / Number of Conductors	Stranding	Wall Thickness (in)	Wall Thickness (mm)	Cable Outer Diameter (in)	Cable Outer Diameter (mm)	Color Code page 85	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
3020570	24 AWG/2c	7-strand	0.010	0.25	0.149	3.8	black, red	7	S1107
3020571	24 AWG/3c	7-strand	0.010	0.25	0.156	4.0	black, red, green	9	S1107
3020572	24 AWG/4c	7-strand	0.010	0.25	0.168	4.3	Chart 1	14	S1107
3020573	24 AWG/5c	7-strand	0.010	0.25	0.175	4.4	Chart 1	20	S1107
3020574	24 AWG/7c	7-strand	0.010	0.25	0.208	5.3	Chart 1	27	S1107
3020575	24 AWG/10c	7-strand	0.010	0.25	0.226	5.7	Chart 1	33	S1107
3020576	24 AWG/12c	7-strand	0.010	0.25	0.241	6.1	Chart 1	38	S1107
3020577	24 AWG/15c	7-strand	0.010	0.25	0.262	6.7	Chart 2	46	S1109
3020578	24 AWG/25c	7-strand	0.010	0.25	0.319	8.1	Chart 2	75	S1111
3020582	22 AWG/2c	7-strand	0.010	0.25	0.161	4.1	black, red	10	S1107
3020583	22 AWG/3c	7-strand	0.010	0.25	0.169	4.3	black, red, green	15	S1107
3020584	22 AWG/4c	7-strand	0.010	0.25	0.182	4.6	Chart 1	20	S1107
3020585	22 AWG/5c	7-strand	0.010	0.25	0.194	4.9	Chart 1	25	S1107
3020586	22 AWG/6c	7-strand	0.010	0.25	0.206	5.2	Chart 1	29	S1107
3020587	22 AWG/7c	7-strand	0.010	0.25	0.217	5.5	Chart 1	33	S1107
3020588	22 AWG/8c	7-strand	0.010	0.25	0.229	5.8	Chart 1	37	S1107
3020589	22 AWG/9c	7-strand	0.010	0.25	0.239	6.1	Chart 1	40	S1107
3020590	22 AWG/10c	7-strand	0.010	0.25	0.248	6.3	Chart 1	44	S1109
3020591	22 AWG/12c	7-strand	0.010	0.25	0.265	6.7	Chart 1	50	S1109
3020592	22 AWG/15c	7-strand	0.010	0.25	0.289	7.3	Chart 2	62	S1111
3020593	22 AWG/20c	7-strand	0.010	0.25	0.323	8.2	Chart 2	82	S1111
3020594	22 AWG/25c	7-strand	0.010	0.25	0.354	9.0	Chart 2	100	S1111
3020598	20 AWG/2c	7-strand	0.010	0.25	0.180	4.6	black, red	13	S1107
3020599	20 AWG/3c	7-strand	0.010	0.25	0.189	4.8	Chart 1	19	S1107
3020600	20 AWG/4c	7-strand	0.010	0.25	0.207	5.3	Chart 1	27	S1107
3020601	20 AWG/5c	7-strand	0.010	0.25	0.217	5.5	Chart 1	33	S1107
3020602	20 AWG/6c	7-strand	0.010	0.25	0.232	5.9	Chart 1	39	S1107
3020603	20 AWG/7c	7-strand	0.010	0.25	0.245	6.2	Chart 1	45	S1107
3020604	20 AWG/9c	7-strand	0.010	0.25	0.270	6.9	Chart 1	57	S1109
3020605	20 AWG/12c	7-strand	0.010	0.25	0.301	7.6	Chart 1	71	S1111
3020606	20 AWG/15c	7-strand	0.010	0.25	0.329	8.4	Chart 2	91	S1111
3020607	18 AWG/2c	16-strand	0.012	0.30	0.209	5.3	black, red	21	S1107
3020608	18 AWG/3c	16-strand	0.012	0.30	0.221	5.6	Chart 1	27	S1107
3020609	18 AWG/4c	16-strand	0.012	0.30	0.240	6.1	Chart 1	38	S1107
3020610	18 AWG/5c	16-strand	0.012	0.30	0.251	6.4	Chart 1	43	S1109
3020611	18 AWG/7c	16-strand	0.012	0.30	0.285	7.2	Chart 1	60	S1111
3020612	18 AWG/12c	16-strand	0.012	0.30	0.353	9.0	Chart 2	103	S1111
3020613	18 AWG/15c	16-strand	0.012	0.30	0.386	9.8	Chart 2	128	S1113
3020614	18 AWG/25c	16-strand	0.012	0.30	0.492	12.5	Chart 2	206	S1116
3020615	16 AWG/2c	26-strand	0.015	0.38	0.248	6.3	Chart 2	30	S1109
3020616	16 AWG/3c	26-strand	0.015	0.38	0.262	6.7	Chart 2	45	S1109
3020617	16 AWG/4c	26-strand	0.015	0.38	0.286	7.3	Chart 2	59	S1111
3020618	16 AWG/5c	26-strand	0.015	0.38	0.300	7.6	Chart 2	70	S1111
3020619	16 AWG/7c	26-strand	0.015	0.38	0.343	8.7	Chart 2	100	S1111
3020620	16 AWG/12c	26 strand	0.015	0.38	0.430	10.9	Chart 2	173	S1113
3020621	16 AWG/15c	26-strand	0.015	0.38	0.483	12.3	Chart 2	202	S1116
3020622	16 AWG/25c	26-strand	0.015	0.38	0.633	16.1	Chart 2	340	S1121

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

C 304 S

Multi-Conductor, Low-Voltage Communication, Audio & Control Cable; Shielded

Construction

Conductors: Tinned copper
Insulation: SR-PVC or polyethylene
Shielded: Foil tape facing out (100% coverage); drain wire
Jacket: Gray PVC

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- SR-PVC: -20°C to +105°C
- Polyethylene: -20°C to +75°C

Nominal Voltage: 300V

Test Voltage: 1500V

Conductor Stranding: Fine wire

Color Code: see table below

Approvals:
UL: CMG per UL 444
AWM 2464
Attributes: NFPA 79 2012
NEC: Meets NEC Art. 800
Canada: CSA CMG FT4
CSA AWM I/II A/B FT1
Additional: RoHS

Cable Attributes, page 83


OR-01 (OIL)


FR-03 (FLAME)


FL-01 (MOTION)


MP-01 (MECH)

* 24 & 22 AWG meet RS-232 applications.

Part Number	Size / Number of Conductors	Stranding	Primary Insulation	Wall Thickness (in)	Wall Thickness (mm)	Cable Outer Diameter (in)	Cable Outer Diameter (mm)	Color Code page 85	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
3020540**	24 AWG/1pr	7-strand	PE	0.010	0.25	0.135	3.4	Chart 1	13	S1107
3020631	24 AWG/3c	7-strand	SR-PVC	0.010	0.25	0.162	4.1	Chart 1	16	S1107
3020632	24 AWG/4c	7-strand	SR-PVC	0.010	0.25	0.173	4.4	Chart 1	19	S1107
3020633	24 AWG/5c	7-strand	SR-PVC	0.010	0.25	0.180	4.6	Chart 1	21	S1107
3020634	24 AWG/6c	7-strand	SR-PVC	0.010	0.25	0.191	4.9	Chart 1	26	S1107
3020635	24 AWG/7c	7-strand	SR-PVC	0.010	0.25	0.201	5.1	Chart 1	28	S1107
3020636	24 AWG/10c	7-strand	SR-PVC	0.010	0.25	0.228	5.8	Chart 1	35	S1107
3020637	24 AWG/12c	7-strand	SR-PVC	0.010	0.25	0.243	6.2	Chart 2	46	S1107
3020638	24 AWG/15c	7-strand	SR-PVC	0.010	0.25	0.264	6.7	Chart 2	52	S1109
3020639	24 AWG/25c	7-strand	SR-PVC	0.010	0.25	0.321	8.2	Chart 2	80	S1111
3020544**	22 AWG/1pr	7-strand	PE	0.015	0.38	0.169	4.3	Chart 1	16	S1107
3020641	22 AWG/3c	7-strand	PE	0.015	0.38	0.184	4.7	Chart 1	21	S1107
3020642	22 AWG/4c	7-strand	PE	0.015	0.38	0.200	5.1	Chart 1	25	S1107
3020643	22 AWG/5c	7-strand	SR-PVC	0.010	0.25	0.196	5.0	Chart 1	27	S1107
3020644	22 AWG/7c	7-strand	SR-PVC	0.010	0.25	0.219	5.6	Chart 1	36	S1107
3020645	22 AWG/8c	7-strand	SR-PVC	0.010	0.25	0.231	5.9	Chart 1	39	S1107
3020646	22 AWG/10c	7-strand	SR-PVC	0.010	0.25	0.250	6.4	Chart 1	43	S1109
3020647	22 AWG/12c	7-strand	SR-PVC	0.010	0.25	0.267	6.8	Chart 1	53	S1109
3020648	22 AWG/15c	7-strand	SR-PVC	0.010	0.25	0.291	7.4	Chart 2	64	S1111
3020649	22 AWG/25c	7-strand	SR-PVC	0.010	0.25	0.370	9.4	Chart 2	103	S1111
3020548**	20 AWG/1pr	7-strand	PE	0.015	0.38	0.191	4.9	Chart 1	22	S1107
3020651	20 AWG/3c	7-strand	PE	0.015	0.38	0.202	5.1	Chart 1	28	S1107
3020652	20 AWG/4c	7-strand	SR-PVC	0.010	0.25	0.209	5.3	Chart 1	31	S1107
3020653	20 AWG/5c	7-strand	SR-PVC	0.010	0.25	0.219	5.6	Chart 2	36	S1107
3020654	20 AWG/6c	7-strand	SR-PVC	0.010	0.25	0.234	5.9	Chart 2	42	S1107
3020655	20 AWG/7c	7-strand	SR-PVC	0.010	0.25	0.247	6.3	Chart 2	47	S1109
3020656	20 AWG/10c	7-strand	SR-PVC	0.010	0.25	0.283	7.2	Chart 2	63	S1111
3020657	20 AWG/12c	7-strand	SR-PVC	0.010	0.25	0.303	7.7	Chart 2	74	S1111
3020658	20 AWG/15c	7-strand	SR-PVC	0.010	0.25	0.331	8.4	Chart 2	94	S1111
3020659	20 AWG/25	7-strand	SR-PVC	0.010	0.25	0.409	10.4	Chart 2	148	S1113
3020552**	18 AWG/1pr	16-strand	PE	0.015	0.38	0.210	5.3	Chart 1	27	S1107
3020661	18 AWG/3c	16-strand	PE	0.015	0.38	0.222	5.6	Chart 1	34	S1107
3020662	18 AWG/4c	16-strand	SR-PVC	0.012	0.30	0.242	6.1	Chart 1	42	S1107
3020663	18 AWG/5c	16-strand	SR-PVC	0.012	0.30	0.253	6.4	Chart 2	49	S1109
3020664	18 AWG/7c	16-strand	SR-PVC	0.012	0.30	0.287	7.3	Chart 2	64	S1111
3020665	18 AWG/12c	16-strand	SR-PVC	0.012	0.30	0.355	9.0	Chart 2	107	S1111
3020666	18 AWG/15c	16-strand	SR-PVC	0.012	0.30	0.388	9.9	Chart 2	130	S1113
3020667	18 AWG/25c	16-strand	SR-PVC	0.012	0.30	0.520	13.2	Chart 2	190	S1116
3020556**	16 AWG/1pr	26-strand	PE	0.015	0.38	0.210	5.3	Chart 1	37	S1107
3020669	16 AWG/3c	26-strand	PE	0.015	0.38	0.250	6.4	Chart 1	48	S1109
3020670	16 AWG/4c	26-strand	SR-PVC	0.015	0.38	0.288	7.3	Chart 1	63	S1111
3020671	16 AWG/5c	26-strand	SR-PVC	0.015	0.38	0.302	7.7	Chart 2	75	S1111
3020672	16 AWG/7c	26-strand	SR-PVC	0.015	0.38	0.345	8.8	Chart 2	103	S1111
3020673	16 AWG/12c	26 strand	SR-PVC	0.015	0.38	0.432	11.0	Chart 2	167	S1113
3020674	16 AWG/15c	26-strand	SR-PVC	0.015	0.38	0.485	12.3	Chart 2	210	S1116
3020675	16 AWG/25c	26-strand	SR-PVC	0.015	0.38	0.635	16.1	Chart 2	350	S1121

** Part numbers will be marked D 304 OS

D 304 IS

Multi-Pair, Low-Voltage Communication, Audio, Signal & Control Cable; Individually Shielded Pairs

Construction

Conductors: Tinned copper
Pairs: Pairs are isolated
Insulation: See table below
Shielding: Foil tape facing in (100% coverage); drain wire for each pair
Jacket: Gray PVC

Technical Data

Minimum Bend Radius:	7.5 x cable diameter
Temperature Range:	-20°C to +75°C
Nominal Voltage:	300V
Test Voltage:	1500V
Conductor Stranding:	Fine wire

Color Code:	see table below
Approvals:	
UL:	CMG per UL 444
Attributes:	NFPA 79 2012
NEC:	Meets NEC Art. 800
Canada:	CSA CMG FT4
	CSA AWM I/II A/B FT1
Additional:	RoHS

Cable Attributes, page 83


OR-01 (OIL)


FR-03 (FLAME)


FL-01 (MOTION)


MP-01 (MECH)

* 24 & 22 AWG meet RS-232 applications.

Part Number	Size / Number of Conductors	Stranding	Primary Insulation	Wall Thickness (in)	Wall Thickness (mm)	Cable Outer Diameter (in)	Cable Outer Diameter (mm)	Nominal Capacitance pF/ft A†	Nominal Capacitance pF/ft B‡	Color Code page 85	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
3020540**	24 AWG/1pr	7-strand	PE	0.010	0.25	0.135	3.4	18	37	Chart 1	13	S1107
3020502	24 AWG/2c	7-strand	FPE	0.013	0.33	0.234	5.9	12.5	23	Chart 3	27	S1107
3020503	24 AWG/3c	7-strand	FPE	0.013	0.33	0.249	6.3	12.5	23	Chart 3	34	S1109
3020504	24 AWG/4c	7-strand	FPE	0.013	0.33	0.274	7.0	12.5	23	Chart 3	46	S1109
3020505	24 AWG/6c	7-strand	FPE	0.013	0.33	0.309	7.8	12.5	23	Chart 3	52	S1111
3020506	24 AWG/9c	7-strand	FPE	0.013	0.33	0.369	9.4	12.5	23	Chart 3	80	S1111
3020507	24 AWG/11c	7-strand	FPE	0.013	0.33	0.395	10.0	12.5	23	Chart 3	94	S1113
3020508	24 AWG/15c	7-strand	FPE	0.013	0.33	0.451	11.5	12.5	23	Chart 3	124	S1113
3020509	24 AWG/27c	7-strand	FPE	0.013	0.33	0.626	15.9	12.5	23	Chart 3	218	S1121
3020544**	22 AWG/1pr	7-strand	PE	0.015	0.38	0.169	4.3	24	47	Chart 1	16	S1107
3020511	22 AWG/2c	7-strand	PP	0.010	0.25	0.220	5.6	30	55	bk/r, gn/w	27	S1107
3020512	22 AWG/3c	7-strand	PP	0.010	0.25	0.235	6.0	30	55	Chart 3	34	S1107
3020513	22 AWG/6c	7-strand	PP	0.010	0.25	0.260	6.6	30	55	Chart 3	45	S1109
3020514	22 AWG/9c	7-strand	PP	0.010	0.25	0.369	9.4	30	55	Chart 3	96	S1111
3020515	22 AWG/11c	7-strand	PP	0.010	0.25	0.395	10.0	30	55	Chart 3	117	S1113
3020516	22 AWG/15c	7-strand	PP	0.010	0.25	0.451	11.5	30	55	Chart 3	150	S1113
3020517	22 AWG/27c	7-strand	PP	0.010	0.25	0.654	16.6	30	55	Chart 3	278	S1121
3020548**	20 AWG/1pr	7-strand	PE	0.015	0.38	0.191	4.9	27	49	Chart 1	22	S1107
3020519	20 AWG/2c	7-strand	PP	0.010	0.25	0.250	6.4	27	49	bk/r, gn/w	36	S1109
3020520	20 AWG/3c	7-strand	PP	0.010	0.25	0.267	6.8	30	55	Chart 3	46	S1109
3020521	20 AWG/4c	7-strand	PP	0.010	0.25	0.296	7.5	30	55	Chart 3	60	S1111
3020522	20 AWG/6c	7-strand	PP	0.010	0.25	0.355	9.0	30	55	Chart 3	84	S1111
3020523	20 AWG/9c	7-strand	PP	0.010	0.25	0.422	10.7	30	55	Chart 3	126	S1113
3020524	20 AWG/11c	7-strand	PP	0.010	0.25	0.452	11.5	30	55	Chart 3	150	S1113
3020525	20 AWG/15c	7-strand	PP	0.010	0.25	0.525	13.3	30	55	Chart 3	204	S1116
3020552**	18 AWG/1pr	16-strand	PE	0.015	0.38	0.210	5.3	30	44	Chart 1	27	S1107
3020527	18 AWG/2c	16-strand	PP	0.015	0.38	0.326	8.3	30	55	Chart 3	50	S1111
3020528	18 AWG/3c	16-strand	PP	0.015	0.38	0.348	8.8	30	55	Chart 3	66	S1111
3020529	18 AWG/4c	16-strand	PP	0.015	0.38	0.386	9.8	30	55	Chart 3	85	S1113
3020530	18 AWG/6c	16-strand	PP	0.015	0.38	0.447	11.4	30	55	Chart 3	120	S1113
3020531	18 AWG/9c	16-strand	PP	0.015	0.38	0.531	13.5	30	55	Chart 3	172	S1121
3020532	18 AWG/11c	16-strand	PP	0.015	0.38	0.568	14.4	30	55	Chart 3	206	S1121
3020533	18 AWG/15c	16-strand	PP	0.015	0.38	0.643	16.3	30	55	Chart 3	264	S1121

** Part number will be marked D304 OS and foil shield is facing out
† Capacitance between conductors
‡ Capacitance between one conductor & the other conductors connected to the shield

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

D 304 OS

Multi-Pair, Low-Voltage Communication, Audio, Signal & Control Cable; Overall Shield

Construction

Conductors: Tinned copper
Insulation: See next page
Shielding: Foil tape facing out (100% coverage); drain wire for each pair
Jacket: Gray PVC

Technical Data

Minimum Bend Radius: 7.5 x cable diameter

Temperature Range:
- SR-PVC: -20°C to +105°C
- Polyethylene: -20°C to +75°C

Nominal Voltage: 300V

Conductor Stranding: Fine wire

Color Code: See table below

Approvals:
UL: CMG per UL 444
AWM 2464
Attributes: NFPA 79 2012
NEC: Meets NEC Art. 800
Canada: CSA CMG FT4
CSA AWM I/II A/B FT1
Additional: RoHS

Cable Attributes, page 83

OR-01	FR-03	FL-01	MP-01
OIL	FLAME	MOTION	MECH

* 24 & 22 AWG meet RS-232 applications.

Part Number	Size / Number of Pairs	Stranding	Primary Insulation	Wall Thickness (in)	Wall Thickness (mm)	Cable Outer Diameter (in)	Cable Outer Diameter (mm)	Color Code page 85	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
3020540	24 AWG/1pr	7-strand	PE	0.010	0.25	0.135	3.4	Chart 1	13	S1107
3020541	24 AWG/2pr	7-strand	SR-PVC	0.010	0.25	0.211	5.4	Chart 3	19	S1107
3020542	24 AWG/3 pr	7-strand	SR-PVC	0.010	0.25	0.224	5.7	Chart 3	27	S1107
3020543	24 AWG/4pr	7-strand	SR-PVC	0.010	0.25	0.244	6.2	Chart 3	33	S1107
3020544	22 AWG/1pr	7-strand	PE	0.015	0.38	0.169	4.3	Chart 1	16	S1107
3020545	22 AWG/2pr	7-strand	SR-PVC	0.010	0.25	0.232	5.9	Chart 3	26	S1107
3020546	22 AWG/3pr	7-strand	SR-PVC	0.010	0.25	0.245	6.2	Chart 3	31	S1107
3020547	22 AWG/4pr	7-strand	SR-PVC	0.010	0.25	0.268	6.8	Chart 3	41	S1109
3020548	20 AWG/1pr	7-strand	PE	0.015	0.38	0.191	4.9	Chart 1	22	S1107
3020549	20 AWG/2pr	7-strand	SR-PVC	0.010	0.25	0.262	6.7	Chart 3	33	S1109
3020550	20 AWG/3pr	7-strand	SR-PVC	0.010	0.25	0.274	7.0	Chart 3	44	S1109
3020551	20 AWG/4pr	7-strand	SR-PVC	0.010	0.25	0.304	7.7	Chart 3	55	S1111
3020552	18 AWG/1pr	16-strand	PE	0.015	0.38	0.210	5.3	Chart 1	27	S1107
3020553	18 AWG/2pr	16-strand	SR-PVC	0.012	0.3	0.304	7.7	Chart 3	45	S1111
3020554	18 AWG/3pr	16-strand	SR-PVC	0.012	0.3	0.323	8.2	Chart 3	63	S1111
3020555	18 AWG/4pr	16-strand	SR-PVC	0.012	0.3	0.356	9.0	Chart 3	79	S1111
3020556	16 AWG/1pr	26-strand	PE	0.015	0.38	0.236	6.0	Chart 1	37	S1107
3020557	16 AWG/2pr	26-strand	SR-PVC	0.015	0.38	0.366	9.3	Chart 3	71	S1111
3020558	16 AWG/3pr	26-strand	SR-PVC	0.015	0.38	0.390	9.9	Chart 3	95	S1113
3020559	16 AWG/4pr	26-strand	SR-PVC	0.015	0.38	0.434	11.0	Chart 3	122	S1113
3020560	14 AWG/1pr	41-strand	PE	0.030	0.76	0.338	8.6	Chart 1	62	S1111
3020561	14 AWG/2pr	41-strand	SR-PVC	0.015	0.38	0.414	10.5	Chart 3	98	S1113
3020562	14 AWG/3pr	41-strand	SR-PVC	0.015	0.38	0.442	11.2	Chart 3	133	S1113
3020563	14 AWG/4pr	41-strand	SR-PVC	0.015	0.38	0.490	12.4	Chart 3	171	S1116

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® 300/300 S

Multi-Conductor, 300V Flexible Industrial Signal & Control Cable; Unshielded

Unshielded Construction

Conductors: Finely stranded tinned copper
Insulation: Blended PVC
Jacket: Oil-resistant gray PVC

Shielded Construction

Conductors: Finely stranded tinned copper
Insulation: Blended PVC
Shielding: Tri-laminate foil shield and tinned copper braid (75% coverage); drain wire
Jacket: Oil-resistant gray PVC

Technical Data

Minimum Bend Radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature Range:
- for stationary use: -40°C to +105°C
- for flexible use: -25°C to +105°C

Nominal Voltage: 300V

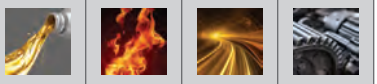
Conductor Stranding: Fine wire

Color Code:
- 24 - 22 AWG: Chart 4, page 86
- 20 - 16 AWG: Chart 5, page 86

Approvals:

UL: CMG per UL 444
PLTC-ER per UL 13
ITC-ER per UL 2250
AWM 2464
Attributes: UL Oil Res I
-40°C Cold Bend; -25°C Cold Impact
Sunlight Resistant
Direct Burial
NEC: Meets NEC Art. 725 & 800
Class 1 Division 2 (PLTC only)
Canada: c(UL) CMG FT4
CSA AWM I/II A/B FT1
Additional: 24 AWG is not PLTC
18 & 16 AWG rated PLTC-ER & ITC-ER
CE & RoHS

Cable Attributes, page 83



OR-02	FR-03	WT-02	MP-02
OIL	FLAME	MOTION	MECH

UNITRONIC® 300

Part Number	Size / Number of Conductors	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
302403	24 AWG/3c	0.172	4.4	15	S1107
302404	24 AWG/4c	0.183	4.6	18	S1107
302406	24 AWG/6c	0.209	5.3	22	S1107
302408	24 AWG/8c	0.223	5.7	29	S1107
302410	24 AWG/10c	0.253	6.4	35	S1109
302202	22 AWG/2c	0.179	4.5	15	S1107
302203	22 AWG/3c	0.187	4.7	20	S1107
302204	22 AWG/4c	0.200	5.1	22	S1107
302206	22 AWG/6c	0.229	5.8	31	S1107
302208	22 AWG/8c	0.245	6.2	37	S1107
302210	22 AWG/10c	0.289	7.3	44	S1111
302215	22 AWG/15c	0.324	8.2	62	S1111
302220	22 AWG/20c	0.355	9.0	99	S1111
302225	22 AWG/25c	0.414	10.5	126	S1113
302002	20 AWG/2c	0.225	5.7	37	S1107
302003	20 AWG/3c	0.237	6.0	40	S1107
302004	20 AWG/4c	0.256	6.5	51	S1109
302006	20 AWG/6c	0.308	7.8	66	S1111
302008	20 AWG/8c	0.331	8.4	90	S1111
302010	20 AWG/10c	0.381	9.7	97	S1113
302015	20 AWG/15c	0.452	11.5	121	S1113
301802	18 AWG/2c	0.241	6.1	42	S1107
301803	18 AWG/3c	0.254	6.5	44	S1109
301804	18 AWG/4c	0.285	7.2	53	S1111
301602	16 AWG/2c	0.263	6.7	55	S1109
301603	16 AWG/ 3c	0.288	7.3	60	S1111
301604	16 AWG/ 4c	0.312	7.9	75	S1111

UNITRONIC® 300 S

Part Number	Number of Conductors	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
302403S	24 AWG/3c	0.201	5.1	22	53112210
302404S	24 AWG/4c	0.209	5.3	26	53112210
302406S	24 AWG/6c	0.236	6.0	31	53112210
302408S	24 AWG/8c	0.248	6.3	37	53112210
302202S	22 AWG/2c	0.202	5.1	22	53112210
302203S	22 AWG/3c	0.210	5.3	26	53112210
302204S	22 AWG/ 4c	0.223	5.7	31	53112210
302206S	22 AWG/ 6c	0.252	6.4	42	53112210
302208S	22 AWG/ 8c	0.278	7.1	48	53112210
302210S	22 AWG/ 10c	0.312	7.9	57	53112220
302215S	22 AWG/ 15c	0.347	8.8	77	53112220
302220S	22 AWG/ 20c	0.378	9.6	95	53112230
302225S	22 AWG/ 25c	0.445	11.3	117	53112240
302002S	20 AWG/2c	0.248	6.3	48	53112210
302003S	20 AWG/3c	0.260	6.6	51	53112210
302004S	20 AWG/ 4c	0.289	7.3	62	53112220
302006S	20 AWG/ 6c	0.331	8.4	79	53112220
302008S	20 AWG/ 8c	0.354	9.0	106	53112220
302010S	20 AWG/ 10c	0.426	10.8	115	53112230
302015S	20 AWG/ 15c	0.483	12.3	143	53112240
302020S	20 AWG/ 20c	0.528	13.4	203	53112240
302025S	20 AWG/ 25c	0.585	14.9	271	53112250
301802S	18 AWG/2c	0.266	6.8	53	53112210
301803S	18 AWG/ 3c	0.289	7.3	57	53112220
301804S	18 AWG/ 4c	0.310	7.9	68	53112220
301806S	18 AWG/ 6c	0.358	9.1	88	53112220
301808S	18 AWG/ 8c	0.383	9.7	115	53112230
301810S	18 AWG/ 10c	0.469	11.9	154	53112240
301815S	18 AWG/ 15c	0.525	13.3	196	53112240
301820S	18 AWG/ 20c	0.575	14.6	256	53112250
301825S	18 AWG/ 25c	0.660	16.8	311	53112250
301602S	16 AWG/2c	0.298	7.6	66	53112220
301603S	16 AWG/ 3c	0.313	8.0	79	53112220
301604S	16 AWG/ 4c	0.337	8.6	95	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

Cable Selection Guide
Construction Specifications

Bus System	Cable	Page	Size (AWG)	Conductors	Shielding	Jacket Material
UNITRONIC® Products for Bus Systems						
DeviceNet	UNITRONIC® BUS DeviceNet™ Gray	38	see page	Stranded tinned copper	Pairs shielded with tri-laminated foil; overall foil wrap and braid (65% coverage)	PVC
DeviceNet	UNITRONIC® BUS DeviceNet™ Violet	38	see page	Stranded tinned copper	Pairs shielded with tri-laminated foil; overall foil wrap and braid	PVC, HF
PROFIBUS	UNITRONIC® BUS PB	39	24 - 22	Bare copper	Foil and tinned copper braid	PVC, HF
PROFIBUS	UNITRONIC® BUS PB FD	39	24	Stranded bare copper	Foil and tinned copper braid	PUR
PROFIBUS	UNITRONIC® BUS PB TORSION	39	22	Stranded bare copper	Foil and tinned copper braid	HF
CAN BUS	UNITRONIC® BUS CAN	40	24 - 19	Stranded bare copper	Foil wrap; tinner copper braid	PVC
CAN BUS	UNITRONIC® BUS CAN FD	40	24 - 20	Stranded bare copper	Tinned copper braid	PUR
ETHERLINE® Products for Industrial Ethernet Networks						
	ETHERLINE® 2 Pair: CAT.5/5e	41	26 - 22	Solid or stranded bare copper	Foil and braid	PVC, PUR, HF
	ETHERLINE® 2 Pair: CAT.5 TORSION	41	22	Stranded tinned copper	Non-woven wrap; tinned copper braid	PUR
	ETHERLINE® 4 Pair: CAT.5e	42	26 - 24	Solid or stranded bare copper	Foil and/or tinned copper braid	PUR, HF
	ETHERLINE® 4 Pair: CAT.6	42	26	Stranded tinned copper	Foil and braid	PUR
	ETHERLINE® 4 Pair: CAT.6A/7; Stationary	43	22	Solid bare copper	Copper braid	PVC, PUR, HF
	ETHERLINE® 4 Pair: CAT.6A; Continuous Flex	43	24	Stranded tinned copper	Foil, foil-laminated fleece, and tinned copper braid	PVC, PUR
	ETHERLINE® 4 Pair: CAT.6A TORSION	44	24	Stranded tinned copper	Foil, foil-laminated fleece, and tinned copper braid	PVC, PUR

UNITRONIC® Cable Attributes

Bus System	Part Number	Cable Attributes, page 83			
		Oil Resistance	Flame Resistance	Motion Type	Mechanical Properties
DeviceNet™	4001, 4002	OR-01	FR-02	FL-02	MP-01
	6001, 6002	OR-01	FR-03	CF-02	MP-01
	2170342, 2170343	OR-02	FR-03	CF-02	MP-01
	2170340, 2170341	OR-00	FR-03	CF-02	MP-01
	2170344, 2170345	OR-04	FR-02	CF-02	MP-05
	2170346, 2170347	OR-02	FR-03	CF-02	MP-01
PROFIBUS	2170220	OR-00	FR-01	FL-01	MP-01
	2170219	OR-00	FR-02	FL-01	MP-01
	2170824	OR-00	FR-02	FL-02	MP-01
	2170820	OR-00	FR-03	FL-01	MP-01
	2170853	OR-04	FR-03	FL-01	MP-05
	2170222	OR-04	FR-01	CF-02	MP-05
	2170822, 2170322	OR-04	FR-02	CF-02	MP-05
	2170332	OR-04	FR-02	FL-02 (Torsion ±180°/m)	MP-05
CAN Bus	2170260 to 2170270	OR-00	FR-02	FL-02	MP-01
	2170272 to 2170279	OR-04	FR-02	CF-02	MP-05

	Bend Radius x cable diam.	Voltage	Temperature Range	Approvals
	10 x OD	300V	-20°C to +75°C	
	Stat.: 7.5 x OD Flex.: 15 x OD	300V	see page	
	10 x OD	–	PVC: -40°C to +80°C HF: -30°C to +80°C	
	Flex.: 9 x OD FC: 15 x OD	–	Stationary: -40°C to +80°C Flexing: -30°C to +70°C	
	Stat.: 4 x OD Flex.: 15 x OD	–	-25°C to +75°C	
	10 x OD	250V	-30°C to +80°C	
	15 x OD	250V	Stat.: -40°C to +80°C Flex.: -30°C to +70°C	
	Stat: 10 x OD Flex.: 15 x OD	see page	see page	
	5 x OD	100V (not for power)	-40°C to +80°C	
	Stat.: 8 x OD Flex.: 15 x OD	125V (not for power)	see page	
	Stat.: 4 x OD Flex.: 7.5 x OD	100V (not for power)	Stat.: -40°C to +80°C Flex.: -30°C to +70°C	
	10 x OD	100V (not for power)	PUR/PVC: -40°C to +80°C HF: -25°C to +80°C	
	15 x OD	125V (not for power)	Stat.: -40°C to +80°C Flex.: -10°C to +70°C	
	15 x OD	125V (not for power)	Stat.: -40°C to +80°C Flex.: -10°C to +70°C	

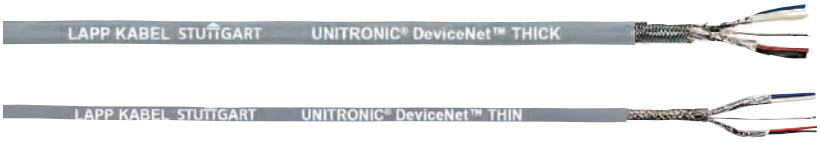
ETHERLINE® Cable Attributes

Pairs	Application	Part Number	Category	Cable Attributes, page 83			
				Oil Resistance	Flame Resistance	Motion Type	Mechanical Protection
2 Pair	Stationary	2170893	CAT.5	OR-00	FR-03	FL-01	MP-01
	Flexible	2170886	CAT.5	OR-00	FR-03	FL-02	MP-01
		2170283	CAT.5e	OR-00	FR-01	FL-02	MP-01
		2170284	CAT.5e	OR-04	FR-01	FL-02	MP-05
	Continuous Flex	2170894	CAT.5	OR-04	FR-02	CF-01	MP-05
		2170289	CAT.5e	OR-04	FR-00	CF-02	MP-05
	Torsion	2170888	CAT.5	OR-04	FR-01	FL-02 (torsion ± 180°/m)	MP-05
4 Pair	Stationary	2170296	CAT.5e	OR-00	FR-01	FL-01	MP-01
		2170297	CAT.5e	OR-04	FR-01	FL-01	MP-05
		2170464	CAT.6A	OR-00	FR-03	FL-01	MP-01
		2170465	CAT.6A	OR-04	FR-01	FL-01	MP-05
		2170466	CAT.6A	OR-00	FR-03	FL-01	MP-01
		2170474	CAT.7	OR-00	FR-03	FL-01	MP-01
		2170475	CAT.7	OR-04	FR-01	FL-01	MP-05
		2170476	CAT.7	OR-00	FR-03	FL-01	MP-01
	Flexible	2170299	CAT.5e	OR-00	FR-01	FL-02	MP-01
		2170300	CAT.5e	OR-04	FR-01	FL-02	MP-05
	Continuous Flex	2170489	CAT.5e	OR-04	FR-00	CF-02	MP-05
		2170488	CAT.6	OR-04	FR-02	CF-02	MP-05
		2170485	CAT.6A	OR-00	FR-02	CF-01	MP-01
		2170484	CAT.6A	OR-04	FR-02	CF-01	MP-05
	Torsion	2170482	CAT.6A	OR-00	FR-02	FL-02 (torsion ± 180°/m)	MP-01
		2170483	CAT.6A	OR-04	FR-02	FL-02 (torsion ± 180°/m)	MP-05

BUS SYSTEMS

UNITRONIC® BUS DeviceNet™ Gray

For DeviceNet Bus Systems; Stationary & Continuous Flex Applications; 120 Ω



Construction

Conductors: Stranded tinned copper
Insulation: Power conductors: PVC;
Data conductors: Polyethylene
Shielding: Pairs: tri-laminated foil (100% coverage); tinned copper drain wire; overall foil wrap and braid (65% coverage)
Jacket: Gray PVC

Technical Data

Minimum Bend Radius: 10 x cable diameter
Temperature Range: -20°C to +75°C
Nominal Voltage: 300V
Impedance: 120 Ω
Nominal Capacitance: 12 pF/ft

Color Code:
- Power pair: Red & black
- Data pair: Blue & white

Approvals:
UL: CL2
CM (6002)
Canada: CSA AWM (4001, 4002, 6001)
CSA CMG (6002)

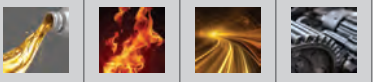
Rate Tables

Communication Rate	Maximum Length: Trunk Cable			
	THICK		THIN	
	(feet)	(meters)	(feet)	(meters)
125 Kbps	1640	500	328	100
250 Kbps	820	250	328	100
500 Kbps	328	100	328	100

Communication Rate	Maximum Length: Drop Cable			
	THICK		THIN	
	(feet)	(meters)	(feet)	(meters)
125 Kbps	512	156	20	6
250 Kbps	256	78	20	6
500 Kbps	128	39	20	6

Part Number	Type	Conductor Description	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Stationary: PVC Jacket						
4001	Thick	18 AWG/1pr + 15 AWG/1pr	0.437	11.1	140	53112240
4002	Thin	24 AWG/1pr + 22 AWG/1pr	0.260	6.6	43	53112210
Continuous Flex: PVC Jacket						
6001	Thick	18 AWG/1pr + 14 AWG/1pr	0.468	11.9	145	53112240
6002	Thin	24 AWG/1pr + 22 AWG/1pr	0.283	7.2	43	53112210

Cable Attributes, page 83



OR-01	FR-02	FL-02 or CF-02	MP-01
OIL	FLAME	MOTION	MECH

BUS SYSTEMS

UNITRONIC® BUS DeviceNet™ Violet

For DeviceNet Bus Systems; Stationary & Continuous Flex Applications; 120 Ω

Construction

Conductors: Stranded tinned copper
Insulation: Power conductors: PVC (PVC jacket); polyethylene (Halogen-free jacket);
Data conductors: Polyethylene
Shielding: Pairs: tri-laminated foil; tinned copper drain wire; overall foil wrap and braid
Jacket: Violet PVC or halogen-free polyurethane

Technical Data

Minimum Bend Radius:
- for installation: 7.5 x cable diameter
- for continuous flexing: 15 x cable diameter

Temperature Range: see table below
Nominal Voltage: 300V
Impedance: 120 Ω
Nominal Capacitance: 12 pF/ft

Color Code:
- Power pair: Red & black
- Data pair: Blue & white

Approvals: see table below

Cable Attributes, page 83

see table on page 36

OIL FLAME MOTION MECH

Part Number	Type	Conductor Description	Temperature Range	Approvals	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Stationary: PVC Jacket								
2170342	Thick	18 AWG/1pr + 15 AWG/1pr	-20°C to +75°C	UL/CSA CMG, UL PLTC	0.480	12.2	129	53112240
2170343	Thin	24 AWG/1pr + 22 AWG/1pr	-20°C to +75°C	UL/CSA CMG, UL CL2	0.272	6.9	45	53112210
Stationary: Halogen-Free & Flame Retardant (FRNC) Jacket								
2170340	Thick	18 AWG/1pr + 15 AWG/1pr	-25°C to +75°C	UL/CSA CMG, UL PLTC	0.480	12.2	131	53112240
2170341	Thin	24 AWG/1pr + 22 AWG/1pr	-25°C to +75°C	UL/CSA CMG	0.272	6.9	47	53112210
Continuous Flex: PUR Jacket								
2170344	Thick	18 AWG/1pr + 15 AWG/1pr	-40°C to +75°C	UL/CSA CMX, UL CLX2	0.480	12.2	124	53112240
2170345	Thin	24 AWG/1pr + 22 AWG/1pr	-40°C to +75°C	UL/CSA CMX, UL CLX2	0.272	6.9	45	53112210
Continuous Flex: PVC Jacket								
2170346	Thick	18 AWG/1pr + 15 AWG/1pr	-10°C to +75°C	UL/CSA CMG, UL PLTC	0.480	12.2	131	53112240
2170347	Thin	24 AWG/1pr + 22 AWG/1pr	-10°C to +75°C	UL/CSA CMG, UL CL2	0.272	6.9	47	53112210

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UNITRONIC® BUS PB

For PROFIBUS-DP/FMS/FIP Bus Systems; Stationary Applications; 150 Ω

Construction

Conductors: Solid and stranded bare copper
Insulation: Polyethylene
Shielding: Specially designed foil/tinned copper braid
Jacket: Violet PVC (except 2170853: halogen-free)

Technical Data

Minimum Bend Radius:
- for installation: 10 x cable diameter

Temperature Range:
- PVC: -40°C to +80°C
- Halogen-free: -30°C to +80°C

Impedance: 150 Ω ± 15 Ω

Nominal Capacitance: 9 pF/ft

Color Code: Red & green pair

Approvals: see table below

Maximum Cable Length by Bit Rate

Communication Rate	Length of Cable Segment (feet)	(meters)
93.75 Kbps	3936	1200
187.5 Kbps	3280	1000
500 Kbps	1312	400
1.5 Mbps	656	200
12.0 Mbps	328	100

Cable Attributes, page 83
see table on page 36
OIL FLAME MOTION MECH

Part Number	Jacket Type	Size / Number of Pairs	Approvals	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Stationary							
2170220	PVC	22 AWG/1pr	–	0.315	8	50	53112220
2170219	PVC	22 AWG/1pr	UL/CSA CMX	0.315	8	38	53112220
2170824*	PVC	24 AWG/1pr, 7 wire	UL/CSA CMG, UL CL3	0.315	8	37	53112220
Stationary: Fast Connect							
2170820	PVC	22 AWG/1pr	UL/CSA CMG, UL CL3	0.315	8	56	53112220
2170853	Halogen-free	22 AWG/1pr	UL/CSA CMG	0.315	8	50	53112220

*For applications where vibrations occur.

UNITRONIC® BUS PB FD & PB TORSION

For PROFIBUS-DP/FMS/FIP Bus Systems; Continuous Flex & Torsion Applications; 150 Ω

Construction

Conductors: Stranded bare copper
Insulation: Polyethylene
Shielding: Specially designed foil/tinned copper braid
Jacket: Violet polyurethane (PB Torsion: halogen-free polyurethane)

Technical Data

Minimum Bend Radius: see table below

Temperature Range:
- for stationary use: -40°C to +80°C
- for flexible use: -30°C to +70°C
- torsion: -25°C to +75°C

Impedance: 150 Ω ± 15 Ω

Nominal Capacitance: 9 pF/ft

Color Code: Red & green pair

Approvals: see table below

Cable Attributes, page 83
see table on page 36
OIL FLAME MOTION MECH

Part Number	Jacket Type	Size / Number of Pairs	Min. Bend Radius (x cable diameter)	Approvals	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Continuous Flex								
2170222	PUR	24 AWG/1pr	9	Torsion Rated	0.315	8	43	53112220
2170822	PUR	24 AWG/1pr	9	UL/CSA CMX, Torsion Rated	0.315	8	39	53112220
Continuous Flex: Fast Connect								
2170322	PUR	24 AWG/1pr	15	UL/CSA CMX	0.315	8	53	53112220
Torsion								
2170332	PUR	22 AWG/1pr	4 (stationary), 15 (flexible)	UL/CSA CMX, Torsion Rated	0.315	8	44	53112220

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BUS SYSTEMS

UNITRONIC® BUS CAN

For CAN Bus Systems; Stationary Applications; 120 Ω

Construction

Conductors: 7-wire strands of bare copper
Insulation: Polyethylene
Shielding: Foil wrap; tinned copper braid
Jacket: Violet PVC

Technical Data

Minimum Bend Radius: 10 x cable diameter

Temperature Range: -30°C to +80°C

Nominal Voltage: 250V

Impedance: 120 Ω ± 15%

Nominal Capacitance: 12 pF/ft

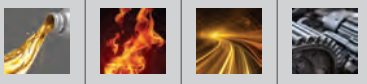
Color Code: DIN 47100: Chart 8, page 87
- Pair 1: White & brown
- Pair 2: Green & yellow

Approvals:
UL: CMX
Canada: c(UL) CMX

Rate Table (ISO 11898)

Distance (m)	AWG	Max. Rate
0 - 40	22	1 Mbps @ 40 m
40 - 300	22, 20	50 kbps @ 100 m
300 - 600	20	100 kbps @ 500 m
600 - 1000	19	50 kbps @1 km

Cable Attributes, page 83



Part Number	Size / Number of Pairs	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170260	24 AWG/1pr	0.224	5.7	28	53112220
2170261	24 AWG/2pr	0.299	7.6	46	53112220
2170263	22 AWG/1pr	0.268	6.8	37	53112220
2170264	22 AWG/2pr	0.335	8.5	59	53112220
2170266	20 AWG/1pr	0.296	7.5	60	53112220
2170267	20 AWG/2pr	0.382	9.7	71	53112230
2170269	19 AWG/1pr	0.343	8.7	73	53112220
2170270	19 AWG/2pr	0.453	11.5	95	53112230

BUS SYSTEMS

UNITRONIC® BUS CAN FD

For CAN Bus Systems; Continuous Flex Applications; 120 Ω

Construction

Construction: 7-wire strands of bare copper
Insulation: Polyethylene
Shielding: Tinned copper braid
Jacket: Violet halogen-free polyurethane

Technical Data

Minimum Bend Radius: 15 x cable diameter

Temperature Range:
- for installation: -40°C to +80°C
- for continuous flexing: -30°C to +70°C

Nominal Voltage: 250V

Impedance: 120 Ω ± 15 %

Nominal Capacitance: 18 pF/ft

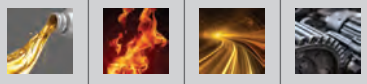
Color Code: DIN 47100: Chart 8, page 87
- Pair 1: White & brown
- Pair 2: Green & yellow

Approvals:
UL: CMX
Canada: c(UL) CMX

Rate Table (ISO 11898)

Distance (m)	AWG	Max. Rate
0 - 40	22	1 Mbps @ 40 m
40 - 300	22, 20	50 kbps @ 100 m
300 - 600	20	100 kbps @ 500 m
600 - 1000	19	50 kbps @1 km

Cable Attributes, page 83



Part Number	Size / Number of Pairs	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170272	24 AWG/1pr	0.252	6.4	27	53112210
2170273	24 AWG/2pr	0.331	8.4	44	53112220
2170275	22 AWG/1pr	0.268	6.8	40	53112210
2170276	22 AWG/2pr	0.378	9.6	59	53112230
2170278	20 AWG/1pr	0.315	8.0	50	53112220
2170279	20 AWG/2pr	0.426	10.8	67	53112230

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ETHERLINE® 2 Pair: CAT.5/5e
Industrial Ethernet Cables for Stationary, Flexing & Continuous Flex Applications

Construction

Conductors: Solid or stranded bare copper
Pairs: Two twisted pairs or star quad
Insulation: Polyethylene
Shielding: Foil and braid (2170289: braid only)
Jacket: Green or teal PVC, polyurethane, or halogen-free

Cable Attributes, page 83
see table on page 37
OIL FLAME MOTION MECH

Technical Data

Minimum Bend Radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter
- for continuous flexing: 15 x cable diameter

Temperature Range:
- for stationary use: -40°C to +80°C
- for flexible use:
  - CAT.5 cable: -20°C to +60°C
  - CAT.5e cable: -5°C to +60°C
- for continuous flexing: -20°C to +60°C

Nominal Voltage: see table below

Impedance: 100Ω ± 15Ω

Color Code:
- CAT.5 cable: White, yellow, blue, orange
- CAT.5e cable: White/orange & orange, white/green & green

Approvals: see table below

Part Number	Size / Pairs	Stranding	Jacket	Category	Nominal Voltage (not for power)	Approvals	Fast Connect	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Stationary											
2170893	22 AWG/2pr	Solid	Green PVC	CAT.5	600V	PROFINET, UL AWM, UL/CSA CMG, 600V	Yes	0.256	6.5	47	53112210
Flexing											
2170886	22 AWG/2pr	7 wire	Green PVC	CAT.5	600V	PROFINET, UL AWM, UL/CSA CMG, 600V	Yes	0.256	6.5	45	53112210
2170283*	26 AWG/2pr	7 wire	Teal HF	CAT.5e	125V	–	No	0.213	5.4	29	53112210
2170284*	26 AWG/2pr	7 wire	Teal PUR	CAT.5e	125V	UL/CSA AWM	No	0.228	5.8	30	53112210
Continuous Flex											
2170894	22 AWG/2pr	7 wire	Green PUR	CAT.5	100V	PROFINET, UL/CSA CMX	Yes	0.256	6.5	42	53112210
2170289*	26 AWG/2pr	19 wire	Teal PUR	CAT.5e	125V	UL/CSA AWM	No	0.240	6.1	32	53112210

* Max cable run: 196 ft (60 m)

ETHERLINE® 2 Pair: CAT.5 TORSION
Industrial Ethernet Cable Suitable for Torsion Stress

Construction

Conductors: Stranded tinned copper
Pairs: Star quad
Insulation: Foamed polyethylene
Shielding: Tinned copper braid; non-woven wrap
Jacket: Green halogen-free polyurethane

Technical Data

Minimum Bend Radius: 5 x cable diameter

Temperature Range: -40°C to +80°C

Nominal Voltage: 100V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White, yellow, blue, orange

Approvals:
UL: AWM 21161
Additional: RoHS

Cable Attributes, page 83
OR-04 FR-01 FL-02* MP-05
OIL FLAME MOTION MECH

* Torsion ±180°/m

Part Number	Size / Pairs	Stranding	Jacket	Approvals	Fast Connect	Nominal Outer Diameter (in)	(mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170888	22 AWG/2pr	19 wire	Green PUR	PROFINET, UL AWM	No	0.256	6.5	35	53112210

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available. Photographs are not to scale and are not true representations of the products in question. For current information go to our website. If not otherwise specified, all values relating to the product are nominal values.

ETHERLINE® 4 Pair: CAT.5e

Industrial Ethernet Cables for Stationary, Flexing & Continuous Flex Applications

Construction

Conductors: Solid or stranded bare copper
Pairs: 4 pairs twisted together
Insulation: Foam skin, polyethylene, or polyolefin
Shielding: Foil and tinned copper braid (2170489: braid only)
Jacket: Teal polyurethane or halogen-free

Technical Data

Minimum Bend Radius:
- for stationary use: 8 x cable diameter
- for flexible use: 15 x cable diameter

Temperature Range: see table below

Nominal Voltage: 125V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals: RoHS

Cable Attributes, page 83

see table on page 37

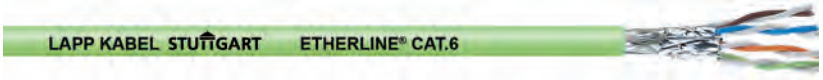
OIL | FLAME | MOTION | MECH

Part Number	Size / Pairs	Stranding	Jacket	Temperature Range for stationary use	Temperature Range for flexible use	Approvals	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
Stationary											
2170296	24 AWG/4pr	Solid	Teal HF	-30°C to +80°C	–	–	No	0.248	6.3	36	53112210
2170297	24 AWG/4pr	Solid	Teal PUR	-30°C to +80°C	–	UL/CSA AWM	No	0.248	6.3	42	53112210
Flexing											
2170299*	26 AWG/4pr	7 wire	Teal HF	-20°C to +75°C	-5°C to +50°C	–	No	0.240	6.1	32	53112210
2170300*	26 AWG/4pr	7 wire	Teal PUR	-40°C to +80°C	-5°C to +60°C	UL/CSA AWM	No	0.240	6.1	36	53112210
Continuous Flex											
2170489*	26 AWG/4pr	19 wire	Teal PUR	-30°C to +80°C	-20°C to +70*C	UL/CSA AWM	No	0.248	6.3	36	53112210

* Max cable run: 196 ft (60 m)

ETHERLINE® 4 Pair: CAT.6

Industrial Ethernet Cable for Continuous Flex Applications



Construction

Conductors: Stranded tinned copper
Pairs: 4 pairs divided by central filler element
Insulation: Polypropylene
Inner Jacket: FRNC
Shielding: Foil and braid
Jacket: Green polyurethane

Technical Data

Minimum Bend Radius:
- for stationary use: 4 x cable diameter
- for continuous flexing: 7.5 x cable diameter

Temperature Range:
- for stationary use: -40°C to +80°C
- for continuous flexing: -30°C to +70°C

Nominal Voltage: 100V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White & blue, white & orange, white & green, white & brown

Approvals:
UL: CMX
Canada: c(UL) CMX
Additional: RoHS

Cable Attributes, page 83

 OR-04 |  FR-02 |  CF-02 |  MP-05

OIL | FLAME | MOTION | MECH

Part Number	Size / Pairs	Stranding	Jacket	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170488*	26 AWG/4pr	19 wire	Green PUR	No	0.307	7.8	42	53112220

* Max cable run: 196 ft (60 m)

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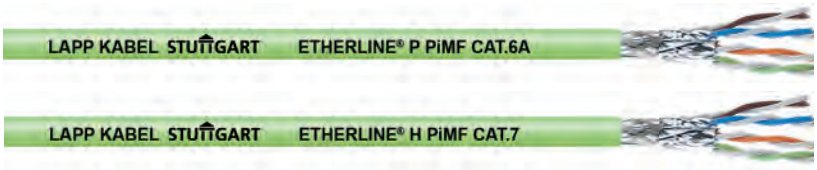
ETHERLINE® 4 Pair: CAT.6A/7; Stationary
Industrial Ethernet Cable for Stationary Applications



EtherCAT. RoHS

Construction
Conductors: Solid bare copper
Pairs: 4 pairs, individually shielded with foil tape
Insulation: Polyethylene
Shielding: Overall copper braid
Jacket: Green PVC, polyurethane, or halogen-free

Technical Data
Minimum Bend Radius:
- for stationary use: 10 x cable diameter

Temperature Range:
- PUR & PVC: -40°C to +80°C
- Halogen-free: -25°C to +80°C

Nominal Voltage: 100V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Cable Attributes, page 83
see table on page 37
OIL FLAME MOTION MECH

Part Number	Size / Pairs	Stranding	Jacket	Category	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170464	22 AWG/4pr	Solid	Green PVC	CAT.6A	No	0.343	8.7	66	53112220
2170465	22 AWG/4pr	Solid	Green PUR	CAT.6A	No	0.343	8.7	61	53112220
2170466	22 AWG/4pr	Solid	Green HF	CAT.6A	No	0.343	8.7	67	53112220
2170474	22 AWG/4pr	Solid	Green PVC	CAT.7	No	0.343	8.7	66	53112220
2170475	22 AWG/4pr	Solid	Green PUR	CAT.7	No	0.343	8.7	61	53112220
2170476	22 AWG/4pr	Solid	Green HF	CAT.7	No	0.343	8.7	67	53112220

ETHERLINE® 4 Pair: CAT.6A; Continuous Flex
Industrial Ethernet Cable for Continuous Flex Applications

BUS SYSTEMS

cULus cULus PROFINET EtherCAT. RoHS

Construction
Conductors: Stranded tinned copper
Pairs: 4 pairs individually shielded with aluminum compound foil
Insulation: Foam skin
Shielding: Foil-laminated fleece and tinned copper braid
Jacket: Green PVC or polyurethane

Technical Data
Minimum Bend Radius:
- for continuous flexing: 15 x cable diameter

Temperature Range:
- for stationary use: -40°C to +80°C
- for continuous flexing: -10°C to +70°C

Nominal Voltage: 125V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Part Number	Size / Pairs	Stranding	Jacket	Category	Approvals	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170485	24 AWG/4pr	7 wire	Green PVC	CAT.6A	PROFINET	No	0.355	9.0	59	53112220
2170484	24 AWG/4pr	7 wire	Green PVC	CAT.6A	UL/CSA AWM, PROFINET	No	0.355	9.0	60	53112220

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BUS SYSTEMS

ETHERLINE® 4 Pair: CAT.6A TORSION

Industrial Ethernet Cable for Torsion Stress

Technical Data

Minimum Bend Radius: 15 x cable diameter

Temperature Range:
- for stationary use: -40°C to +80°C
- for flexible use: -10°C to +70°C

Nominal Voltage: 125V (not for power)

Impedance: 100Ω ± 15Ω

Color Code: White/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Construction

Conductors: Stranded tinned copper
Pairs: 4 pairs individually shielded with aluminum compound foil
Insulation: Foam skin
Shielding: Foil-laminated fleece and tinned copper braid
Jacket: Green PVC or polyurethane

Part Number	Size / Pairs	Stranding	Jacket	Category	Approvals	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® MS-SC PG Thread
2170482	24 AWG/4pr	7 wire	Green PVC	CAT.6A	PROFINET	No	0.355	9.0	59	53112220
2170483	24 AWG/4pr	7 wire	Green PUR	CAT.6A	PROFINET, UL/CSA AWM	No	0.355	9.0	60	53112220

BUS SYSTEMS

RJ45 Field Wireable Connectors

RJ45 CAT.5e FM45

- Suitable for solid and stranded conductors
- Provides IP20 protection
- Tool-free, re-switchable field termination
- Tension- and vibration-resistant
- Can accommodate both screened and unscreened cables
- IDC/piercing terminal acc. to IEC 60352-4

Part Number	Conductor Size	Max. Cable Outer Diameter (in)	Max. Cable Outer Diameter (mm)	Standard Pack
21700540	26 - 23 AWG*	0.315	8.0	1

* 22 AWG is possible, with restrictions

RJ45 CAT.5e, PROFINET

- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Color coded to PROFINET standards
- Conforms to IEC 60603-7-51

Part Number	Conductor Size Stranded	Conductor Size Solid	Max. Cable Outer Diameter (in)	Max. Cable Outer Diameter (mm)	Standard Pack
21700605	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10

RJ45 CAT.6A

- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Supports 10 Gigabit Ethernet
- Color coded to TIA/EIA-568 standards
- Conforms to IEC 60603-7-51

Part Number	Conductor Size Stranded	Conductor Size Solid	Color Code	Max. Cable Outer Diameter (in)	Max. Cable Outer Diameter (mm)	Standard Pack
21700600	27 - 22 AWG (7 wire)	24 - 22 AWG	T568A	0.197 - 0.354	5.0 - 9.0	10
21700601	27 - 22 AWG (7 wire)	24 - 22 AWG	T568B	0.197 - 0.354	5.0 - 9.0	10

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M12 Field Wireable Connectors

C5E201C

Technical Data

Temperature Range:	Max. 85°C
Nominal Voltage:	up to 60V
Nominal Current:	up to 4A
Screw Connection:	PG 9
Protection Rating:	IP67

C5E200C

Part Number	Plug/ Receptacle	Number of Positions	Max. Conductor Cross Section	Cable Diameter (mm) Min.	Max.
C5E201C	Plug	8	18 AWG	6	8
C5E200C	Receptacle	8	18 AWG	6	8

CAT.6A M12 Field Wireable Connector

Technical Data

Temperature Range:	-40°C to +85°C
Nominal Voltage:	48V
Nominal Current:	0.5A
Contact Resistance:	100 mΩ
Coding:	X
Approvals:	RoHS

RoHS

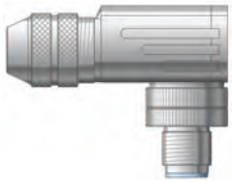
Part Number	Plug/ Receptacle	Number of Positions	Coding	Conductor Size Stranded	Solid	Cable Outer Diameter (in)	(mm)
21700602	Plug	8	X	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.382	5.0 - 9.7

M12 Field Wireable Connectors for PROFINET

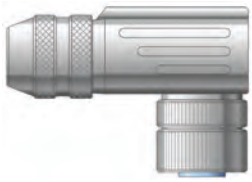
C5E203C

C5E202C

C5E205C



C5E204C



Technical Data

Temperature Range:	-40°C to +85°C
Nominal Voltage:	250V
Nominal Current:	4A
Coding:	D

Part Number	Description	Number of Positions	Coding	Screw Connection	Fast Connect
C5E203C	Male Straight	4	D	PG 9	Yes
C5E205C	Male 90°	4	D	PG 9	Yes
C5E202C	Female Straight	4	D	PG 9	Yes
C5E204C	Female 90°	4	D	PG 9	Yes

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EPIC® Connectors
For Power, Signal/Control & Data Applications

	Connector Type	Application: Power	Application: Control/ Signal	Application: Data	Number of Contacts	Rated Voltage	Rated Current	Termination Type*	Wire Range (AWG)	IP/NEMA Rating	Approvals
RECTANGULAR	HBE	✔	✔		6, 10, 16, 24, 32, 48 (+PE)	600V	16A	SC, CR, CC	20 - 14, 20 - 12	IP65, NEMA 4, 4X, 12	UL CSA VDE
	HA	✔	✔		3, 4, 10, 16, 32, 48, 64 (+PE)	600V	10A, 14A	SC	20 - 14	IP65, NEMA 4, 12	UL CSA VDE
	HQ	✔	✔		5 (+PE)	600V	16A	CR	20 - 12	IP65, NEMA 4, 12	UL CSA VDE
	STA		✔		6, 14, 20, 40	48V	10A	SC, SOL	20 - 16	IP65, NEMA 4, 12	UL CSA VDE
	HEE	✔	✔		10, 18, 32, 46, 64, 92 (+PE)	600V	16A	CR	20 - 12	IP65, NEMA 4, 4X, 12	UL CSA VDE
	HBS	✔			6, 12 (+PE)	600V	35A	SC	20 - 10	IP65, NEMA 4, 4X, 12	UL CSA VDE
	HBVE	✔			3, 6, 10 (+PE)	600V	16A	SC	20 - 14	IP65, NEMA 4, 4X, 12	UL CSA VDE
	HD		✔		7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)	600V	10A	CR	26 - 14	IP65, NEMA 4, 4X, 12	UL CSA VDE
	HDD		✔		24, 42, 72, 108, 144, 216 (+PE)	600V	8.5A	CR	26 - 14	IP65, NEMA 4, 4X, 12	UL CSA VDE
	MC	✔	✔	✔	2 - 280, Data Bus (+PE), Pneumatic	30V - 1000V	1A - 82A	SC, CR, CC, HO	28 - 4	IP65, NEMA 4, 4X, 12	UL CSA VDE
	MP	✔	✔		4/0, 4/2, 4/8 (+PE)	600V	16A, 80A	SC	12 - 6, 20 - 14	IP65, NEMA 4, 4X, 12	UL CSA VDE
CIRCULAR	EAB	✔			3, 14	500V	13A, 23A	CR	18 - 16, 14 - 12	up to IP67	MIL-C-5015
	EAC	✔			4, 6, 17	200V, 500V, 900V	13A, 23A	CR	18 - 16, 14 - 12	up to IP67	MIL-C-5015
	EPT	✔	✔		5, 6, 8+4, 10, 19	600V, 1000V	7.5A, 13A	CR	24 - 20, 20 - 16	up to IP67	MIL-C-26482
	LS1	✔			5+PE, 3+PE+4	600V	26A, 27A	CR	20 - 12, 24 - 18	IP67, IP68	cULus VDE
	M23	✔	✔		6, 7, 8+1, 9, 12, 16, 17	50V, 100V, 150V	7A, 14A	CR, SOL	18 - 14, 26 - 18	IP67, IP68	cULus VDE
PIN & SLEEVE	MULTIMAX	✔			1+N+PE, 2+PE, 3+PE, 3+N+PE	125V - 600V	16A - 32A	SC	16 - 12, 12 - 8	IP44	cULus
	CEE	✔			1+N+PE, 2+PE, 3+PE, 3+N+PE	125V - 500V	16A - 125A	SC	16 - 12, 12 - 8, 10 - 6, 4 - 1	IP67	cULus
	ULYSSE	✔			1+N+PE, 2+PE, 3+PE, 3+N+PE	125V - 500V	16A - 63A	SC	16 - 12, 12 - 8, 10 - 6	IP66, IP67	cULus
	ALUPRES	✔			1+N+PE, 2+PE, 2+N+PE, 3+PE, 3+N+PE	125V - 500V	16A - 63A	SC	6 - 12, 12 - 8, 10 - 6	IP67, IP55	cULus

* Termination Type: SC = Screw, CR = Crimp, CC = Cage Clamp, SOL = Solder, HO = Hose

EPIC® Connectors to Cable Cross Reference

ÖLFLEX® VFD SLIM page 16

			Rectangular Connectors, page 56					page 69	page 72
Part Number	Size / Number of Conductors*	Outer Diameter	HBE 6 Max OD 17 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 21 mm	MP 4/0 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	Pin & Sleeve Max OD below
761804	18 AWG/4c	10.0 mm	✔ ULTRA				✔		
761604	16 AWG/4c	11.6 mm	✔ ULTRA	✔	✔ ULTRA		✔	✔	✔ (15.3)
761404	14 AWG/4c	12.6 mm	✔ ULTRA	✔	✔ ULTRA		✔	✔	✔ (15.3)
761204	12 AWG/4c	14.1 mm	✔ ULTRA		✔ ULTRA	✔ ULTRA	✔	✔**	✔ (15.3)
761004	10 AWG/4c	17.2 mm			✔ ULTRA	✔ ULTRA	✔		✔ (21.3)
760804	8 AWG/4c	22.3 mm				✔	✔		✔ (21.3)
760604	6 AWG/4c	25.2 mm				✔*	✔*		✔ (28.5)
760404	4 AWG/4c	30.1 mm							✔ (49.0)

* Select an appropriate SKINTOP® gland to accommodate the cable OD

ULTRA = Inserts in EPIC® ULTRA HB Housing

** Styles D6 & F6 only

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EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® TRAY II/II CY

page 12

				Rectangular Connectors, page 56						Circular Connectors, page 69		page 72
ÖLFLEX® TRAY II	ÖLFLEX® TRAY II CY	Size / Number of Conductors	Outer Diameter (TRAY II / II CY)	HBE Series Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS Series Max OD 25 mm	HD Series Max OD 25 mm	MP Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve* Max OD below (mm)
221603	2216030	16 AWG/3c	8.3 / 8.9 mm	✔	✔	✔			✔	✔		✔ (13.5)
221604	2216040	16 AWG/4c	8.9 / 9.6 mm	✔	✔	✔			✔	✔	✔ (13)	✔ (15.3)
221605	2216050	16 AWG/5c	9.7 / 10.3 mm	✔	✔	✔	✔		✔	✔	✔ (13)	✔ (15.3)
221607	2216070	16 AWG/7c	10.5 / 11.3 mm	✔		✔	✔		✔			
221609		16 AWG/9c	12.1 mm	✔		✔	✔		✔		✔ (21)	
221612	2216120	16 AWG/12c	14.4 / 15.1 mm	✔		✔	✔		✔		✔ (21)	
221618	2216180	16 AWG/18c	16.6 / 17.3 mm	✔			✔		✔			
221625	2216250	16 AWG/25c	18.8 / 19.6 mm	✔			✔		✔			
221403	2214030	14 AWG/3c	9.2 / 9.8 mm	✔	✔	✔			✔	✔	✔ (17)	✔ (13.5)
221404	2214040	14 AWG/4c	10.0 / 10.7 mm	✔	✔	✔			✔	✔	✔ (21) (U)	✔ (15.3)
221405	2214050	14 AWG/5c	10.8 / 11.6 mm	✔	✔	✔	✔		✔	✔		✔ (15.3)
221407	2214070	14 AWG/7c	11.8 / 12.5 mm	✔		✔	✔		✔			
221409		14 AWG/9c	14.5 mm	✔		✔	✔		✔			
221412	2214120	14 AWG/12c	16.2 / 16.9 mm	✔		✔	✔		✔			
221418	2214180	14 AWG/18c	18.7 / 19.5 mm	✔			✔		✔			
221425	2214250	14 AWG/25c	22.5 / 23.3 mm	✔			✔		✔			
221203		12 AWG/3c	10.7 mm	✔	✔	✔		✔	✔		✔ (17)	✔ (13.5)
221204	2212040	12 AWG/4c	11.7 / 12.5 mm	✔	✔	✔		✔	✔		✔ (21)	✔ (15.3)
221205	2212050	12 AWG/5c	12.8 / 14.4 mm	✔	✔ (U)	✔		✔	✔	✔** (S)		✔ (15.3)
221207	2212070	12 AWG/7c	14.8 / 15.5 mm	✔		✔			✔			
221003		10 AWG/3c	12.6 mm			✔		✔	✔			✔ (21.3)
221004	2210040	10 AWG/4c	14.7 / 15.5 mm			✔		✔	✔			✔ (21.3)
221005	2210050	10 AWG/5c	16.0 / 16.8 mm			✔		✔	✔			✔ (21.3)
221007	2210070	10 AWG/7c	17.4 / 18.2 mm			✔			✔			
220804	2208040	8 AWG/4c	17.9 / 18.7					✔	✔			✔ (21.3)
220805		8 AWG/5c	19.6 mm					✔	✔			✔ (21.3)
220604	2206040	6 AWG/4c	22.8 / 23.3 mm					✔	✔			✔ (28.5)
220605		6 AWG/5c	24.9 mm					✔	✔			✔ (28.5)
220404	2204040	4 AWG/4c	27.8 / 28.6 mm					✔				✔ (49.0)
220204	2202040	2 AWG/4c	32.3 / 33.3 mm									✔ (49.0)

* Pin & sleeve for unshielded cables only

** Styles D6 and F6 only

(U) = Unshielded cable only

(S) = Shielded cable only

ÖLFLEX® VFD XL

page 16

			Rectangular Connectors, page 56				page 69
Part Number	Size / Number of Conductors*	Outer Diameter	HBE 6 Max OD 17 mm	HBS 6 Max OD 21 mm	MP 4/0 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm
731604	16 AWG/4c	12.9 mm	✔ ULTRA	✔ ULTRA			✔
731404	14 AWG/4c	14.8 mm	✔ ULTRA	✔ ULTRA			✔
731204	12 AWG/4c	16.5 mm	✔ ULTRA	✔ ULTRA			
731004	10 AWG/4c	17.8 mm		✔ ULTRA	✔ ULTRA		
730804	8 AWG/4c	22.5 mm			✔	✔	
730604	6 AWG/4c	26.2 mm			✔*	✔*	
730404	4 AWG/4c	29.4 mm				✔*	
730204	2 AWG/4c	33.8 mm					

* Select an appropriate SKINTOP® gland to accommodate the cable OD

ULTRA = Inserts for EPIC® ULTRA HB Housing

EPIC® Connectors to Cable Cross Reference
Find the Right Connector for your Cable

ÖLFLEX® TC 600/600 S page 13

				Rectangular Connectors, page 56						Circular Connectors, page 69		page 72
ÖLFLEX® TC 600	ÖLFLEX® TC 600 S	Size / Number of Conductors	Outer Diameter (TC 600 / TC 600 S)	HBE Series Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS Series Max OD 25 mm	HD Series Max OD 25 mm	MP Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve Max OD below (mm)
211603	211603S	16 AWG/3c	7.9 / 8.0 mm	✔	✔	✔			✔	✔		✔**
211604	211604S	16 AWG/4c	8.6 / 8.6 mm	✔	✔	✔			✔	✔		✔ **
211605	211605S	16 AWG/5c	9.2 / 9.3 mm	✔	✔	✔	✔		✔	✔	✔ (13)	✔ (15.3)
211607	211607S	16 AWG/7c	10.0 / 10.1 mm	✔		✔	✔		✔		✔ (21) (U)	
211609	211609S	16 AWG/9c	11.6 / 11.6 mm	✔		✔	✔		✔		✔ (21)	
211612	211612S	16 AWG/12c	12.9 / 13.0 mm	✔		✔	✔		✔		✔ (21)	
211619	211619S	16 AWG/19c	15.8 / 15.9 mm	✔			✔		✔			
211625	211625S	16 AWG/25c	18.2 / 18.3 mm	✔			✔		✔			
211403	211403S	14 AWG/3c	8.8 / 8.8 mm	✔	✔	✔			✔	✔	✔ (17) (U)	✔ (13.5)
211404	211404S	14 AWG/4c	9.5 / 9.6 mm	✔	✔	✔			✔	✔	✔ (21) (U)	✔ (15.3)
211405	211405S	14 AWG/5c	10.3 / 10.4 mm	✔	✔ (U)	✔	✔		✔	✔		✔ (15.3)
211407	211407S	14 AWG/7c	11.2 / 11.2 mm	✔		✔	✔		✔			
	211409S	14 AWG/9c	13.0 mm	✔		✔	✔		✔			
211412	211412S	14 AWG/12c	15.3 / 15.4 mm	✔		✔	✔		✔			
211419	211419S	14 AWG/19c	17.8 / 17.8 mm	✔			✔		✔			
211425	211425S	14 AWG/25c	20.5 / 20.6 mm	✔			✔		✔			
211203	211203S	12 AWG/3c	9.8 / 9.8 mm	✔	✔	✔		✔	✔		✔ (17)	✔ (13.5)
211204	211204S	12 AWG/4c	10.6 / 10.7 mm	✔	✔	✔		✔	✔		✔ (21)	✔ (15.3)
211205	211205S	12 AWG/5c	11.6 / 11.7 mm	✔	✔ (U)	✔		✔	✔			✔ (15.3)
211207	211207S	12 AWG/7c	12.6 / 12.7 mm	✔		✔			✔			
211209	211209S	12 AWG/9c	15.5 / 15.6 mm	✔		✔			✔			
211212	211212S	12 AWG/12c	17.3 / 17.4 mm	✔		✔			✔			
211219	211219S	12 AWG/19c	20.2 / 20.2 mm	✔					✔			
211225	211225S	12 AWG/25c	24.4 / 24.5 mm	✔					✔			
211003		10 AWG/3c	11.8 mm			✔		✔	✔			✔ (21.3)
211004	211004S	10 AWG/4c	13.0 / 13.1 mm			✔		✔	✔			✔ (21.3)
211005	211005S	10 AWG/5c	15.0 / 15.1 mm			✔		✔	✔			✔ (21.3)
211007	211007S	10 AWG/7c	16.3 / 16.4 mm			✔			✔			
210804		8 AWG/4c	16.5 mm					✔	✔			✔ (21.3)
210604		6 AWG/4c	18.9 mm					✔	✔			✔ (28.5)

* Pin & sleeve for unshielded cables only

** Select an appropriate SKINTOP® gland to accommodate the cable OD

(U) = Unshielded cable only

ÖLFLEX® VFD with Signal page 17

			Rectangular Connectors, page 56				page 69
Part Number	Size / Number of Conductors*	Outer Diameter	HBE 6 Max OD 17 mm	HBS 6 Max OD 21 mm	MP 4/2 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm
7416048	16 AWG/4c + 18 AWG/2c	13.1 mm	✔ ULTRA	✔ ULTRA			✔
7414044	14 AWG/4c + 18 AWG/2c	14.1 mm	✔ ULTRA	✔ ULTRA			✔
7414048	14 AWG/4c + 14 AWG/2c	14.8 mm	✔ ULTRA	✔ ULTRA			✔
7412044	12 AWG/4c + 18 AWG/2c	15.5 mm	✔ ULTRA	✔ ULTRA			✔**
7412048	12 AWG/4c + 14 AWG/2c	16.1 mm	✔ ULTRA	✔ ULTRA			✔**
7410044	10 AWG/4c + 14 AWG/2c	18.4 mm		✔ ULTRA	✔ ULTRA		
7408044	8 AWG/4c + 14 AWG/2c	24.2 mm			✔	✔	
7406044	6 AWG/4c + 14 AWG/2c	27.5 mm			✔*	✔*	
7404044	4 AWG/4c + 14 AWG/2c	33.6 mm				✔*	

* Select an appropriate SKINTOP® gland to accommodate the cable OD

ULTRA = Inserts in EPIC® ULTRA HB Housing

** Styles D6 & F6 only

EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® SERVO FD 796 P/796 CP page 18/19

				Rectangular Connectors, page 56				page 69
SERVO FD 796 P	SERVO FD 796 CP	Size / Number of Conductors*	Outer Diameter (796 P / 796 CP)	HB Series Max OD 25 mm	HBS Series Max OD 25 mm	MP Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm
	0027950	16 AWG/4c	9.2 mm	✔	✔		✔	✔
	0027951	14 AWG/4c	10.6 mm	✔	✔		✔	✔
	0027952	12 AWG/4c	11.9 mm	✔	✔	✔	✔	
	0027953	10 AWG/4c	14.4 mm		✔	✔	✔	
	0027954	8 AWG/4c	17.6 mm			✔	✔	
	0027955	6 AWG/4c	22.0 mm			✔	✔	
	0027956	4 AWG/4c	25.2 mm				✔ †	
0025319	0027959	16 AWG/4c + 16 AWG/1pr	11.7 / 12.0 mm	✔	✔		✔	✔
0025320	0027960	14 AWG/4c + 16 AWG/1pr	13.1 / 13.8 mm	✔	✔		✔	✔
0025321	0027961	12 AWG/4c + 16 AWG/1pr	14.2 / 14.9 mm	✔	✔	✔	✔	✔ **
0025322	0027962	10 AWG/4c + 16 AWG/1pr	16.0 / 17.0 mm		✔	✔	✔	
0025323	0027963	8 AWG/4c + 16 AWG/1pr	18.4 / 19.4 mm			✔	✔	
0025324	0027964	6 AWG/4c + 16 AWG/1pr	22.1 / 23.8 mm			✔	✔	
	0027965	4 AWG/4c + 16 AWG/1pr	27.0 mm				✔ †	
0025326		19 AWG/4c + 22 AWG/2pr	10.9 mm	✔			✔	✔
0025327	0027969	16 AWG/4c + 19 AWG/2pr	12.3 / 12.2 mm	✔			✔	✔
0025328	0027970	14 AWG/4c + 18 AWG/2pr	14.3 / 14.6 mm	✔			✔	✔
0025312		12 AWG/4c + 18 AWG/2pr	15.4 mm	✔		✔	✔	✔ **
0025329	0027971	12 AWG/4c + 18 AWG/1pr + 16 AWG/1pr	15.6 / 16.3 mm	✔		✔	✔	
0025330	0027972	10 AWG/4c + 18 AWG/1pr + 16 AWG/1pr	17.1 / 18.1 mm			✔	✔	
	0027973	8 AWG/4c + 18 AWG/1pr + 16 AWG/1pr	21.8 mm			✔	✔	
	0027974	6 AWG/4c + 16 AWG/2pr +	25.5 mm			✔	✔ †	

* Pairs are individually shielded ** Styles D6 & F6 only † Requires adapter and SKINTOP® gland to match cable OD

ÖLFLEX® SERVO FD 798 CP page 20

			Rectangular Connectors, page 56				page 69
Part Number	Size / Number of Conductors*	Outer Diameter	HD 7 Max OD 13.5 mm	HD 8 Max OD 13.5 mm	HD 15 Max OD 20 mm	Modular Max OD 25 mm	CIRCON M23 Max OD 13.5 mm
0036910	20 AWG/4c + 22 AWG/4pr	8.9 mm			✔	✔	✔
0036911	2 x 20 AWG/1c + 3 x (26 AWG/1pr)	8.9 mm		✔		✔	✔
0036912	26 AWG/4c + 3 x 26 AWG/1pr + 20 AWG/1pr	8.8 mm			✔	✔	✔
0036913	26 AWG/4c + 26 AWG/4c + 3 x 26 AWG/1pr + 20 AWG/1pr	9.4 mm				✔	✔
0036914	20 AWG/9c	8.8 mm			✔	✔	✔
0036915	18 AWG/2c + 24 AWG/4pr	8.8 mm			✔	✔	✔
0036916	20 AWG/2c + 24 AWG/6pr	10.3 mm			✔	✔	✔
0036917	26 AWG/10c + 20 AWG/1pr	7.7 mm			✔	✔	✔
0036918	26 AWG/10c + 20 AWG/4c	8.1 mm			✔	✔	✔
0036920	20 AWG/4c + 26 AWG/4pr	8.2 mm			✔	✔	✔
0036921	24 AWG/4pr	7.6 mm		✔		✔	✔
0036923	26 AWG/8pr	7.8 mm				✔	✔
0036924	26 AWG/4pr	6.4 mm		✔		✔	
0036926	24 AWG/12c	6.9 mm			✔	✔	
0036927	20 AWG/2c + 24 AWG/4pr	8.5 mm			✔	✔	✔
0036928	20 AWG/4c + 26 AWG/4c + 26 AWG/2pr + 2 x 26 AWG/1pr	9.1 mm				✔	✔
0036929	20 AWG/2c + 2 x 24 AWG/1pr	8.7 mm	✔			✔	✔
0036930	20 AWG/2c + 24 AWG/2pr	7.3 mm	✔			✔	✔

* See cable catalog page for shielding configuration

EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® CONTROL TM page 14

			Rectangular Connectors, page 56					page 69	page 72
Part Number	Size / Number of Conductors	Outer Diameter	HBE 6 Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 25 mm	MP 4/0 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	Pin & Sleeve Max OD below (mm)
281803	18 AWG/3c	7.4 mm	✔	✔	✔		✔	✔	
281804	18 AWG/4c	8.0 mm	✔	✔	✔		✔	✔	
281805	18 AWG/5c	8.6 mm	✔	✔	✔		✔	✔	
281804	18 AWG/7c	9.3 mm	✔		✔		✔		
281603	16 AWG/3c	8.1 mm	✔	✔	✔		✔	✔	✔ (13.5)
281604	16 AWG/4c	8.8 mm	✔	✔	✔		✔	✔	✔ (15.3)
281605	16 AWG/5c	9.5 mm	✔	✔	✔		✔	✔	✔ (15.3)
281607	16 AWG/7c	10.3 mm	✔		✔		✔		
281403	14 AWG/3c	9.0 mm	✔	✔	✔		✔	✔	✔ (13.5)
281404	14 AWG/4c	9.8 mm	✔	✔	✔		✔	✔	✔ (15.3)
281405	14 AWG/5c	10.7 mm	✔	✔	✔		✔	✔	✔ (15.3)
281407	14 AWG/7c	11.6 mm	✔		✔		✔		
281203	12 AWG/3c	10.6 mm	✔	✔	✔	✔	✔		✔ (13.5)
281204	12 AWG/4c	11.5 mm	✔	✔	✔	✔	✔		✔ (15.3)
281205	12 AWG/5c	12.6 mm	✔	✔	✔	✔	✔		✔ (15.3)
281207	12 AWG/7c	14.6 mm	✔		✔		✔		
281003	10 AWG/3c	12.5 mm			✔	✔	✔		✔ (21.3)
281004	10 AWG/4c	14.5 mm			✔	✔	✔		✔ (21.3)
281005	10 AWG/5c	15.8 mm			✔	✔	✔		✔ (21.3)
281007	10 AWG/7c	17.2 mm			✔		✔		

SIEMENS® 6FX 8 Plus page 21

			Rectangular Connectors, page 56			Circular Connectors, page 69	
Part Number	Size / Number of Conductors	Outer Diameter	ULTRA HBE 6 Max OD 17 mm	ULTRA HBS 6 Max OD 21 mm	MP 4/0 Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm
Motor Cables							
0027789	6 AWG/4c	21.6 mm			✔		
0027788	8 AWG/4c	17.5 mm			✔		
0027787	10 AWG/4c	14.5 mm		✔ ULTRA	✔ ULTRA		
0027786	12 AWG/4c	11.9 mm	✔ ULTRA	✔ ULTRA			
0027785	14 AWG/4c	10.6 mm	✔ ULTRA			✔	✔
0027784	16 AWG/4c	9.1 mm	✔ ULTRA			✔	✔
Servo Cables							
0027798	1 AWG/4c + 16 AWG/1pr	34.0 mm					
0027797	2 AWG/4c + 16 AWG/1pr	30.9 mm					
0027796	4 AWG/4c + 16 AWG/1pr	26.6 mm					
0027795	6 AWG/4c + 16 AWG/1pr	23.4 mm			✔		
0027794	8 AWG/4c + 16 AWG/1pr	19.4 mm			✔ ULTRA		
0027793	10 AWG/4c + 16 AWG/1pr	16.8 mm		✔ ULTRA	✔ ULTRA		
0027792	12 AWG/4c + 16 AWG/1pr	14.8 mm	✔ ULTRA	✔ ULTRA			
0027791	14 AWG/4c + 16 AWG/1pr	13.4 mm	✔ ULTRA	✔ ULTRA		✔	✔
0027790	16 AWG/4c + 16 AWG/1pr	11.6 mm	✔ ULTRA	✔ ULTRA		✔	✔
Feedback/Signal Cables							
00277101	26 AWG/8pr	7.8 mm					✔
00277111	20 AWG/4c + 22 AWG/4pr	8.9 mm					✔
00277121	20 AWG/4c + (26 AWG/3pr)	9.0 mm					✔
00277131	26 AWG/4c + (26 AWG/3pr) + 20 AWG/1pr	8.9 mm					✔
00277141	26 AWG/4c + (26 AWG/3pr) + 24 AWG/4c + 20 AWG/1pr	9.5 mm					✔
00277151	26 AWG/4pr	6.4 mm					
00277161	26 AWG/2pr	5.0 mm					
00277171	22 AWG/12pr	6.9 mm					
00277991	24 AWG/2pr + 21 AWG/1pr	7.2 mm					✔

ULTRA = Inserts for EPIC® ULTRA HB Housing ( ) = Shielded pairs

EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

INDRAMAT® INK page 22

Part Number	Size / Number of Conductors	Outer Diameter	Circular Connectors, page 69	
			CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm
7072400	18 AWG/2c + 24 AWG/4pr	8.8 mm		✔
7072401	20 AWG/2c + 24 AWG/4pr	8.5 mm		✔
7072402	20 AWG/9c	8.8 mm		✔
7072403	18 AWG/4c + 19 AWG/2pr	11.5 mm	✔	
7072404	16 AWG/4c + 19 AWG/2pr	12.2 mm	✔	
7072405	14 AWG/4c + 18 AWG/2pr	15.1 mm	✔	
7072406	12 AWG/4c + 18 AWG/1pr +16 AWG/1pr	16.0 mm		
7072407	10 AWG/4c + 18 AWG/1pr +16 AWG/1pr	18.8 mm		
7072408	8 AWG/4c + 18 AWG/1pr +16 AWG/1pr	22.0 mm		

ÖLFLEX® 190/190 CY page 23

ÖLFLEX® 190	ÖLFLEX® 190 CY	Size / Number of Conductors	Outer Diameter (190 / 190 CY)	Rectangular Connectors, page 56					Circular Connectors, page 69			page 72
				HBE Series Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 25 mm	MP Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve* Max OD below (mm)
601803	601803CY	18 AWG/3c	7.4 / 9.3 mm	✔	✔			✔	✔	✔		
601804	601804CY	18 AWG/4c	8.0 / 9.9 mm	✔	✔			✔	✔	✔	✔ (13)	
601805	601805CY	18 AWG/5c	8.6 / 10.6 mm	✔	✔			✔	✔	✔	✔ (13)	
601807	601807CY	18 AWG/7c	9.3 / 11.3 mm	✔				✔		✔		
601812	601812CY	18 AWG/12c	12.0 / 14.9 mm	✔				✔		✔ (U)		
601818	601818CY	18 AWG/18c	14.7 / 17.2 mm	✔				✔				
601825	601825CY	18 AWG/25c	16.7 / 19.4 mm	✔				✔				
601603	601603CY	16 AWG/3c	8.1 / 10.0 mm	✔	✔	✔		✔	✔	✔		✔ (13.5)
601604	601604CY	16 AWG/4c	8.8 / 10.7 mm	✔	✔	✔		✔	✔	✔	✔ (13)	✔ (15.3)
601605	601605CY	16 AWG/5c	9.5 / 11.5 mm	✔	✔	✔		✔	✔	✔	✔ (13)	✔ (15.3)
601607	601607CY	16 AWG/7c	10.3 / 12.2 mm	✔		✔		✔		✔		
601612	601612CY	16 AWG/12c	14.1 / 16.7 mm	✔				✔				
601618	601618CY	16 AWG/18c	16.4 / 18.9 mm	✔				✔				
601625	601625CY	16 AWG/25c	18.6 / 22.8 mm	✔				✔				
601403	601403CY	14 AWG/3c	9.0 / 11.0 mm	✔	✔	✔		✔	✔	✔	✔ (17)	✔ (13.5)
601404	601404CY	14 AWG/4c	9.8 / 11.7 mm	✔	✔	✔		✔	✔	✔	✔ (21)	✔ (15.3)
601405	601405CY	14 AWG/5c	10.7 / 12.6 mm	✔	✔	✔		✔	✔	✔		✔ (15.3)
601407	601407CY	14 AWG/7c	11.6 / 14.5 mm	✔		✔		✔		✔ (U)		
601412	601412CY	14 AWG/12c	16.0 / 18.7 mm	✔				✔				
601418	601418CY	14 AWG/18c	18.5 / 23.0 mm	✔				✔				
601425		14 AWG/25c	22.1 mm	✔				✔				
601203	601203CY	12 AWG/3c	10.6 / 12.7 mm	✔	✔	✔		✔			✔ (17)	✔ (13.5)
601204	601204CY	12 AWG/4c	11.5 / 14.9 mm	✔	✔ (U)	✔		✔	✔** (S)		✔ (21)	✔ (15.3)
601205	601205CY	12 AWG/5c	12.6 / 16.0 mm	✔	✔ (U)	✔		✔	✔** (S)			✔ (15.3)
601207	601207CY	12 AWG/7c	14.6 / 17.1 mm	✔		✔		✔				
601004	601004CY	10 AWG/4c	14.5 / 17.0 mm			✔	✔	✔				✔ (21.3)
601005	601005CY	10 AWG/5c	15.8 / 18.6 mm			✔	✔	✔				✔ (21.3)
	601007CY	10 AWG/7c	20.0 mm			✔		✔				
600804	600804CY	8 AWG/4c	17.7 / 20.4 mm				✔	✔				✔ (21.3)
600805		8 AWG/5c	19.4 mm				✔	✔				✔ (21.3)
600604	600604CY	6 AWG/4c	22.1 / 25.2 mm				✔	✔				✔ (28.5)
600605		6 AWG/5c	24.3 mm				✔	✔				✔ (28.5)
600404	600404CY	4 AWG/4c	28.4 / 28.8 mm					✔†				✔ (49)
600405		4 AWG/5c	31.2 mm					✔†				✔ (49)
600204	600204CY	2 AWG/4c	32.8 / 31.7 mm									✔ (49)

* Pin & sleeve for unshielded cables only ** Styles D6 & F6 only † Requires adapter and SKINTOP® gland to match cable OD (U) = Unshielded cable only (S)= shielded only

EPIC® Connectors to Cable Cross Reference
Find the Right Connector for your Cable

ÖLFLEX® CHAIN 896 P page 27

			Rectangular Connectors, page 56						page 69
Part Number	Size / Number of Conductors*	Outer Diameter	HA 3 Max OD 13.5 mm	HA 4 Max OD 13.5 mm	HBE 6 Max OD 25 mm	HBS 6 Max OD 25 mm	MP 4/0 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm
1023229	16 AWG/4c	9.6 mm	✔	✔	✔	✔		✔	✔
1023230	16 AWG/5c	10.0 mm		✔	✔	✔		✔	✔
1023238	14 AWG/4c	11.0 mm	✔	✔	✔	✔		✔	✔
1023239	14 AWG/5c	12.0 mm		✔	✔	✔		✔	✔
1023245	12 AWG/4c	12.5 mm			✔	✔	✔	✔	
1023246	12 AWG/5c	13.7 mm			✔	✔	✔	✔	
1023248	10 AWG/4c	14.3 mm				✔	✔	✔	
1023249	10 AWG/5c	15.7 mm				✔	✔	✔	
1023250	8 AWG/4c	17.0 mm					✔	✔	
1023251	8 AWG/5c	18.9 mm					✔	✔	
1023252	6 AWG/4c	21.2 mm					✔	✔	
1023253	6 AWG/5c	23.8 mm					✔	✔	
1023254	4 AWG/4c	25.9 mm						✔*	
1023255	4 AWG/5c	29.0 mm						✔*	

* Select an appropriate SKINTOP® gland to accommodate the cable OD

ÖLFLEX® FD 890/890 CY page 25

				Rectangular Connectors, page 56					Circular Connectors, page 69			page 72
ÖLFLEX® FD 890	ÖLFLEX® FD 890 CY	Size / Number of Conductors	Outer Diameter (890 / 890 CY)	HBE 24 Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 25 mm	MP Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve* Max OD below (mm)
8918034	8918034S	18 AWG/3c	7.3/ 9.5 mm	✔	✔			✔	✔ (S)	✔		
8918044	9818044S	18 AWG/4c	8.3 / 10.6 mm	✔	✔			✔	✔	✔	✔ (13)	
8918054	8918054S	18 AWG/5c	9.0 / 11.4 mm	✔	✔			✔	✔	✔	✔ (13)	
8918074	8918074S	18 AWG/7c	10.9 / 13.4 mm	✔				✔		✔		
8918124	8918124S	18 AWG/12c	12.7 / 16.2 mm	✔				✔		✔ (U)	✔ (21)	
8918184	8918148S	18 AWG/18c	15.6 / 18.3 mm	✔				✔				
8918254	8918254S	18 AWG/25c	19.4 / 22.5 mm	✔				✔				
8916034	8916034S	16 AWG/3c	8.2 / 10.4 mm	✔	✔	✔		✔	✔	✔		✔ (13.5)
8916044	8916044S	16 AWG/4c	9.1 / 11.3 mm	✔	✔	✔		✔	✔	✔	✔ (13)	✔ (15.3)
8916054	8916054S	16 AWG/5c	10.0 / 12.2 mm	✔	✔ (U)	✔		✔	✔	✔	✔ (13)	✔ (15.3)
8916074	8916074S	16 AWG/7c	12.2 / 15.2 mm	✔		✔		✔		✔ (U)		
8916124	8916124S	16 AWG/12c	14.1 / 17.1 mm	✔				✔			✔ (21)	
8916184	8916184S	16 AWG/18c	17.4 / 21.0 mm	✔				✔				
8916254	8916254S	16 AWG/25c	21.7 / 25.3 mm	✔** (S only)				✔** (S only)				
8914044	8914044S	14 AWG/4c	11.6 / 14.0 mm	✔	✔ (U)	✔		✔	✔	✔ (U)	✔ (21)	✔ (15.3)
8914074	8914074S	14 AWG/7c	15.6 / 18.0 mm	✔		✔		✔				
	8914184S	14 AWG/18c	25.7 mm	✔*				✔**				
8912044	8912044S	12 AWG/4c	13.5 / 16.5 mm	✔	✔ (U)	✔		✔	✔† (S)		✔ (21)	✔ (15.3)
8912074	8912074S	12 AWG/7c	18.8 / 21.8 mm	✔		✔		✔				
8910044	8910044	10 AWG/4c	16.3 / 19.1 mm			✔	✔	✔				✔ (21.3)
8908044	8908044S	8 AWG/4c	19.2 / 22.4 mm				✔	✔				✔ (21.3)
8906044	8906044S	6 AWG/4c	23.1 / 27.1 mm				✔** (S only)	✔** (S only)				✔ (28.5)
8904044		4 AWG/4c	26.9 mm					✔**				✔ (49)
8902044		2 AWG/4c	31.8 mm									✔ (49)

* Pin & sleeve for unshielded cables only
(U) = Unshielded cable only

** Requires adapter and SKINTOP® gland to accommodate the cable OD
(S) = Shielded cable only

† Styles D6 & F6 only

EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® FD 490 P/490 CP page 24

				Rectangular Connectors, page 56				Circular Connectors, page 69			page 72
ÖLFLEX® FD 490 P	ÖLFLEX® FD 490 CP	Size / Number of Conductors	Outer Diameter (490 P / 490 CP)	HBE Series Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve* Max OD below (mm)
401803	401803CP	18 AWG/3c	7.1 / 7.8 mm	✔	✔		✔	✔ (S)	✔		
401804	401804CP	18 AWG/4c	7.7 / 8.3 mm	✔	✔		✔	✔	✔	✔ (13)	
401805	401805CP	18 AWG/5c	8.3 / 8.9 mm	✔	✔		✔	✔	✔	✔ (13)	
401807	401807CP	18 AWG/7c	8.9 / 9.5 mm	✔			✔		✔		
401809	401809CP	18 AWG/9c	10.1 / 10.8 mm	✔			✔		✔		
401812	401812CP	18 AWG/12c	11.5 / 12.0 mm	✔			✔		✔	✔ (21)	
401818	401818CP	18 AWG/18c	13.2 / 13.7 mm	✔			✔				
401825	401825CP	18 AWG/25c	15.4 / 15.5 mm	✔			✔				
401603	401603CP	16 AWG/3c	7.9 / 8.5 mm	✔	✔	✔	✔	✔	✔		✔**
401604	401604CP	16 AWG/4c	8.5 / 9.1 mm	✔	✔	✔	✔	✔	✔	✔ (13)	✔**
401605	401605CP	16 AWG/5c	9.1 / 9.8 mm	✔	✔	✔	✔	✔	✔	✔ (13)	✔ (15.3)
401607	401607CP	16 AWG/7c	9.9 / 10.5 mm	✔		✔	✔		✔		
401609	401609CP	16 AWG/9c	11.3 / 12.1 mm	✔			✔				
401612	401612CP	16 AWG/12c	12.6 / 13.4 mm	✔		✔	✔			✔ (21)	
401618	401618CP	16 AWG/18c	14.6 / 15.4 mm	✔			✔				
401625	401625CP	16 AWG/25c	16.6 / 17.4 mm	✔			✔				
401403	401403CY	14 AWG/3c	8.8 / 9.4 mm	✔	✔	✔	✔	✔	✔	✔ (17)	✔ (13.5)
401404	401404CY	14 AWG/4c	9.5 / 10.1 mm	✔	✔	✔	✔	✔	✔	✔ (21)	✔ (15.3)
401405	401405CY	14 AWG/5c	10.3 / 10.9 mm	✔	✔	✔	✔	✔	✔		✔ (15.3)
401407	401407CY	14 AWG/7c	11.2 / 11.9 mm	✔		✔	✔		✔		
401409	401409CY	14 AWG/9c	12.9 / 13.7 mm	✔			✔				
401412	401412CY	14 AWG/12c	14.4 / 15.2 mm	✔		✔	✔				
401418	401418CY	14 AWG/18c	16.7 / 17.5 mm	✔			✔				
401425	401425CY	14 AWG/25c	19.2 / 19.9 mm	✔			✔				

* Pin & sleeve for unshielded cables only ** Select an appropriate SKINTOP® gland to match cable OD (S) = Shielded cable only

ÖLFLEX® FD 855 P/855 CP page 26

				Rectangular Connectors, page 56				Circular Connectors, page 69			page 72
ÖLFLEX® FD 855 P	ÖLFLEX® FD 855 CP	Size / Number of Conductors	Outer Diameter (855 P / 855 CP)	HBE Series Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS Series Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	CIRCON M23 Max OD 13.5 mm	EAB/EAC Max OD below (mm)	Pin & Sleeve* Max OD below (mm)
0027561	0027636	18 AWG/3c	6.5 / 8.1 mm	✔	✔		✔	✔ (S)	✔ (S)		
0027562	0027637	18 AWG/4c	7.2 / 8.8 mm	✔	✔		✔	✔ (S)	✔	✔ (13)	
0027563	0027638	18 AWG/5c	7.8 / 9.6 mm	✔	✔		✔	✔	✔	✔ (13)	
0027564	0027639	18 AWG/7c	9.5 / 11.3 mm	✔			✔		✔		
0027565	0027640	18 AWG/12c	11.2 / 13.2 mm	✔			✔		✔	✔ (21)	
0027566	0027641	18 AWG/18c	13.7 / 15.9 mm	✔			✔				
0027568	0027643	18 AWG/25c	16.8 / 19.5 mm	✔			✔				
0027576	0027650	16 AWG/3c	7.3 / 8.9 mm	✔	✔	✔	✔	✔ (S)	✔		✔**
0027586	0027661	16 AWG/4c	8.0 / 9.8 mm	✔	✔	✔	✔	✔	✔	✔ (13)	✔**
0027577	0027651	16 AWG/5c	9.0 / 10.8 mm	✔	✔	✔	✔	✔	✔	✔ (13)	✔ (15.3)
0027578	0027652	16 AWG/7c	10.7 / 12.5 mm	✔		✔	✔		✔		
0027579	0027653	16 AWG/12c	12.7 / 14.9 mm	✔		✔	✔		✔ (U)	✔ (21)	
0027580	0027654	16 AWG/18c	15.2 / 17.4 mm	✔			✔				
0027582	0027656	16 AWG/25c	18.8 / 21.4 mm	✔			✔				
0027370	0027380	14 AWG/3c	8.9 / 10.7 mm	✔	✔	✔	✔	✔	✔	✔ (17)	✔ (13.5)
0027371	0027381	14 AWG/4c	9.9 / 11.7 mm	✔	✔	✔	✔	✔	✔	✔ (21)	✔ (15.3)
0027372	0027382	14 AWG/5c	11.0 / 12.8 mm	✔	✔	✔	✔	✔	✔		✔ (15.3)
0027373	0027383	14 AWG/7c	13.4 / 15.6 mm	✔		✔	✔		✔ (U)		
0027374	0027384	14 AWG/12c	15.8 / 18.0 mm	✔		✔	✔				
0027375	0027385	14 AWG/18c	18.9 / 21.5 mm	✔			✔				
0027376	0027386	14 AWG/25c	23.5 / 26.5 mm	✔** (S only)			✔** (S only)				

* Pin & sleeve for unshielded cables only ** Select an appropriate SKINTOP® gland to match cable OD (U) = Unshielded cable only (S) = Shielded cable only

EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® POWER IX page 30

			Rectangular Connectors, page 56					page 69	page 72
Part Number	Size / Number of Conductors*	Outer Diameter	HBE 6 Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 25 mm	MP 4/0 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	Pin & Sleeve Max OD below
321603	16 AWG/3c	10.2 mm	✔	✔	✔		✔	✔	✔ (13.5)
321604	16 AWG/4c	11.4 mm	✔	✔	✔		✔	✔	✔ (15.3)
321605	16 AWG/5c	13.2 mm	✔	✔	✔		✔	✔	✔ (15.3)
321403	14 AWG/3c	14.0 mm	✔		✔		✔	✔	✔ (14.0)**
321404	14 AWG/4c	15.0 mm	✔		✔		✔	✔	✔ (15.3)
321405	14 AWG/5c	17.0 mm	✔		✔		✔		✔ (18.0)**
321203	12 AWG/3c	15.7 mm			✔	✔	✔	✔ A	
321204	12 AWG/4c	17.0 mm			✔	✔	✔	✔ A	✔ (18.0)**
321205	12 AWG/5c	18.8 mm			✔	✔	✔		
321003	10 AWG/3c	17.0 mm			✔	✔	✔		✔ (21.3)
321004	10 AWG/4c	18.3 mm			✔	✔	✔		✔ (21.3)
321005	10 AWG/5c	20.1 mm			✔	✔	✔		✔ (21.3)
320803	8 AWG/3c	22.9 mm				✔	✔		
320804	8 AWG/4c	24.9 mm				✔	✔		✔ (25.0)**

* Select an appropriate SKINTOP® gland to accommodate the cable OD

** Requires a backshell enlarger and a SKINTOP® gland

A Styles D6 & F6 only

UNITRONIC® 300/300 S page 35

				Rectangular Connectors, page 56					Circular Connectors, page 69	
UNITRONIC® 300	UNITRONIC® 300 S	Size / Number of Conductors*	Outer Diameter (300 / 300 S)	HA 3/4 Max OD 13.5 mm	HD 7/8 Max OD 13.5 mm	HD 15 Max OD 20 mm	HD 25 Max OD 20 mm	Modular Max OD 17 mm	CIRCON M23 Max OD 13.5 mm	ZYLIN 3.0 Max OD 16 mm
302002	302002S	20 AWG/2c	5.7 / 6.3 mm							
302003	302003S	20 AWG/3c	6.0 / 6.6 mm	✔ (S)						
302004	302004S	20 AWG/4c	6.5 / 7.3 mm	✔	✔				✔ (S)	
302006	302006S	20 AWG/6c	7.8 / 8.4 mm		✔				✔	
302008	302008S	20 AWG/8c	8.4 / 9.0 mm		✔			✔	✔	
302010	302010S	20 AWG/10c	9.7 / 10.8 mm			✔		✔	✔	
302015	302015S	20 AWG/15c	11.5 / 12.3 mm			✔		✔	✔	
302020	302020S	20 AWG/20c	12.6 / 13.4 mm				✔	✔		✔
302025	302025S	20 AWG/25c	14.1/14.9 mm				✔	✔		✔
301802	301802S	18 AWG/2c	6.1 / 6.8 mm	✔ (S)						
301803	301803S	18 AWG/3c	6.5 / 7.3 mm	✔						
301804	301804S	18 AWG/4c	7.2 / 7.9 mm	✔	✔				✔ (S)	
301806	301806S	18 AWG/6c	8.5 / 9.1 mm		✔				✔	
301808	301808S	18 AWG/8c	9.1 / 9.7 mm		✔			✔	✔	
301810	301810S	18 AWG/10c	11.1 / 11.9 mm			✔		✔	✔	
301815	301815S	18 AWG/15c	12.5 / 13.3 mm			✔		✔	✔	
301820	301820S	18 AWG/20c	13.8 / 14.6 mm				✔	✔		✔
301825	301825S	18 AWG/25c	16.0 / 16.8 mm				✔	✔		
301602	301602S	16 AWG/2c	6.7 / 7.6 mm	✔						
301603	301603S	16 AWG/3c	7.3 / 8.0 mm	✔						
301604	301604S	16 AWG/4c	7.9 / 8.6 mm	✔	✔				✔	
301606	301606S	16 AWG/6c	9.3 / 10.5 mm		✔				✔	
301608	301608S	16 AWG/8c	10.6 / 11.4 mm		✔			✔	✔	
301610	301610S	16 AWG/10c	12.2 / 13.0 mm			✔		✔	✔	
301615	301615S	16 AWG/15c	13.9 / 14.7 mm			✔		✔		
301620	301620S	16 AWG/20c	15.3 / 16.6 mm				✔	✔		✔ (U)
301625	301625S	16 AWG/25c	17.7 / 18.5 mm				✔	✔		

* See cable page for shielding configuration

(U) = Unshielded cable only

(S) = Shielded cable only

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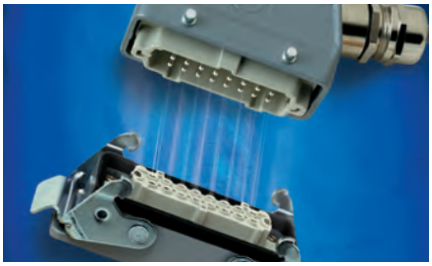
EPIC® Connectors to Cable Cross Reference

Find the Right Connector for your Cable

ÖLFLEX® POWER QUAD II page 30

Part Number	Size / Number of Conductors	Outer Diameter	Rectangular Connectors, page 56				page 63	page 72
			HBE 6 Max OD 25 mm	HQ 5 Max OD 13.5 mm	HBS 6 Max OD 25 mm	Modular Max OD 25 mm	CIRCON LS1 Max OD 15.5 mm	Pin & Sleeve Max OD below
311603	16 AWG/3c	8.4 mm	✔	✔	✔	✔	✔	✔ (13.5)
311604	16 AWG/4c	9.2 mm	✔	✔	✔	✔	✔	✔ (15.3)
311605	16 AWG/5c	10.3 mm	✔	✔	✔	✔	✔	✔ (15.3)
311403	14 AWG/3c	10.3 mm	✔	✔	✔	✔	✔	✔ (13.5)
311404	14 AWG/4c	11.4 mm	✔	✔	✔	✔	✔	✔ (15.3)
311405	14 AWG/5c	12.6 mm	✔	✔	✔	✔	✔	✔ (15.3)

EPIC® Rectangular Housings Overview



EPIC® rectangular connectors comply with all applicable requirements of Underwriters Laboratory (UL) Standards 1977 and 498, VDE Standard 0110 for creepage and clearance distances, and VDE Standard 0627 for the connector design.

The recognized UL file number and Canadian Standards Association (CSA) for EPIC® connectors are UL #E75770 and CSA #LR53004-1.

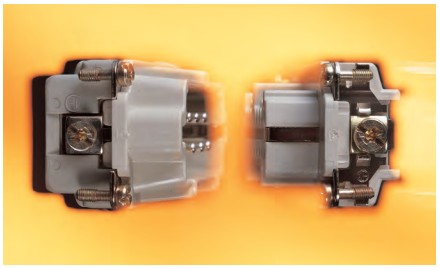
EPIC® connectors meet IP65, NEMA 4, 4X, and NEMA 12 standards only when in the mated condition.

Housing		Plugs & Receptacles										
Standard Gray	ULTRA HB	HBE	HA	HQ	STA	HEE	HBS	HBVE	HD	HDD	MC	Mixed Power
HB 6	HB 6	HBE 6	–	–	–	HEE 10	–	–	–	HDD 24	MC 2	–
HB 10	HB 10	HBE 10	–	–	–	HEE 18	–	HBVE 3	–	HDD 42	MC 3	–
HB 16	HB 16	HBE 16	–	–	–	HEE 32	HBS 6	HBVE 6	HD 40	HDD 72	MC 5	4+0, 4+2
HB 24	HB 24	HBE 24	–	–	–	HEE 46	–	HBVE 10	HD 64	HDD 108	MC 7	4+8
HB 32	–	HBE 32	–	–	–	HEE 64	HBS 12	–	HD 80	HDD 144	MC 10	–
HB 48	–	HBE 48	–	–	–	HEE 92	–	–	HD 128	HDD 216	MC 14	–
HA 3/4	–	–	HA 3/4	HQ 5	STA 6	–	–	–	HD 7/8	–	–	–
HA 10	–	–	HA 10	–	STA 14	–	–	–	HD 15	–	–	–
HA 16	–	–	HA 16	–	STA 20	–	–	–	HD 25	-	–	–
HA 32	–	–	HA 32	–	STA 40	–	–	–	HD 50	–	–	–
HA 48	–	–	HA 48	–	–	–	–	–	–	–	–	–
HA 64	–	–	HA 64	–	–	–	–	–	–	–	–	–

	Housing Size	EPIC® Standard Gray Housing	EPIC® ULTRA HB Housing
Specification		DIN 43652	DIN 43652
Temperature Range		-40°C to +100°C (short term up to +125°C)	-40°C to +100°C
Protection Class		IP65, NEMA 4 & 12	IP65, NEMA 4, 4X & 12
Material	HA 3/4	Powder-coated zinc or thermoplastic with zinc-plated steel hardware	–
	HA 10 - 64	Powder-coated aluminum with zinc-plated steel hardware	–
	HB 6 - 24	Powder-coated aluminum with zinc-plated steel hardware	Nickel-plated zinc with stainless steel hardware
	HB 32 - 48	Powder-coated aluminum with zinc-plated steel hardware	–
Seal		NBR	NBR

EPIC® Rectangular Inserts Overview

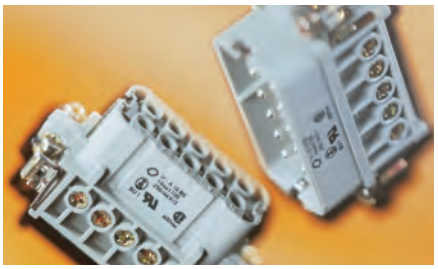
EPIC® HBE



Technical Data

# of Contacts:	6, 10, 16, 24, 32, 48 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Screw, crimp, cage clamp
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²) Crimp available in 12 AWG (4 mm²)

EPIC® HA



Technical Data

# of Contacts:	3, 4, 10, 16, 32, 48, 64 (+PE)
Rated Voltage:	600V
Rated Current:	
- HA 3/4:	10A
- HA 10-64:	14A
Termination:	Screw
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

EPIC® HQ

Technical Data

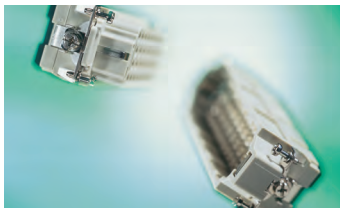
# of Contacts:	5 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Crimp
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

EPIC® STA

Technical Data

# of Contacts:	6, 14, 20, 40 (+PE)
Rated Voltage:	48V
Rated Current:	10A
Termination:	Screw, solder
Wire Size:	20 - 16 AWG (0.5 - 1.5 mm²)

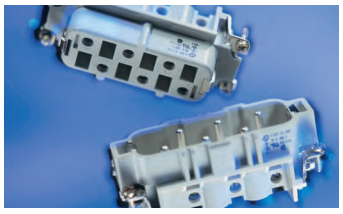
EPIC® HEE



Technical Data

# of Contacts:	10, 18, 32, 46, 64, 92 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Crimp
Wire Size:	20 - 12 AWG (0.5 - 4 mm²)

EPIC® HBS



Technical Data

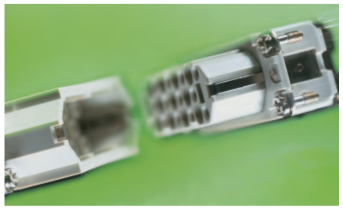
# of Contacts:	6, 12 (+PE)
Rated Voltage:	600V
Rated Current:	35A
Termination:	Screw
Wire Size:	20 - 10 AWG (0.5 - 6 mm²)

EPIC® HBVE

Technical Data

# of Contacts:	3, 6, 10 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Screw
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

EPIC® HD



Technical Data

# of Contacts:	7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)
Rated Voltage:	600V
Rated Current:	10A
Termination:	Crimp
Wire Size:	22 - 14 AWG (0.14 - 2.5 mm²)

EPIC® HDD

Technical Data

# of Contacts:	24, 42, 72, 108, 144, 216 (+PE)
Rated Voltage:	600V
Rated Current:	8.5A
Termination:	Crimp
Wire Size:	22 - 14 AWG (0.14 - 2.5 mm²)

EPIC® MC

Technical Data

# of Contacts:	2 - 280 (+PE)
Rated Voltage:	30 - 1000V
Rated Current:	1 - 82A
Termination:	Screw, crimp, coax, cage clamp
Wire Size:	28 - 4 AWG (0.06 - 25 mm²)

EPIC® Mixed Power

Technical Data

# of Contacts:	4 pwr, 4 pwr/2 sig, 4 pwr/8 sig
Rated Voltage:	600V
Rated Current:	16A, 80A
Termination:	Screw
Wire Size:	
- Power	≤ 6 AWG (16 mm²)
- Signal	≤14 AWG (2.5 mm²)

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EPIC® HBE

Cage Clamp

Crimp-Terminated
Contacts not included.

Screw-Terminated

Technical Data

# of Contacts:	6, 10, 16, 24, 32, 48 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Screw, crimp, cage clamp
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²) 12 AWG (4 mm²) crimp available

Description	Termination	Wire Protection	HBE 6 page 297	HBE 10 page 298	HBE 16 page 299	HBE 24 page 301	HBE 32 page 303	HBE 48 page 303
Plug	Screw	Yes	10190000	10192000	10194000	10196000	10202000	10204000
Receptacle	Screw	Yes	10191000	10193000	10195000	10197000	10203000	10205000
Plug	Screw	No	10190100	10192100	10194100	10196100	10202100	10204100
Receptacle	Screw	No	10191100	10193100	10195100	10197100	10203100	10205100
Plug	Crimp	–	10180000	10182000	10184000	10186000	10184200	10186200
Receptacle	Crimp	–	10181000	10183000	10185000	10187000	10185200	10187200
Plug	Cage Clamp	–	10400000	10400100	10400200	10400300	10400400	10400500
Receptacle	Cage Clamp	–	10401000	10401100	10401200	10401300	10401400	10401500
Left Ground	Terminal Block	–	–	–	70314100	70316100	–	–
Right Ground	Terminal Block	–	–	–	70315100	70317100	–	–

HBE 32 = HBE 16 (x2) HBE 48 = HBE 24 (x2)
Note: Page references refer to Lapp full line catalog

Mating Housings

Insert	Housing
HBE 6	HB 6
HBE 10	HB 10
HBE 16	HB 16
HBE 24	HB 24
HBE 32	HB 32
HBE 48	HB 48

Use 2.5 mm crimp contacts: page 60

EPIC® HA

Technical Data

# of Contacts:	3, 4, 10, 16, 32, 48, 64 (+PE)
Rated Voltage:	600V
Rated Current:	
- HA 3/4:	10A
- HA 10-64:	14A
Termination:	Screw
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

Description	Termination	Wire Protection	HA 3 page 304	HA 4 page 304	HA 10 page 305	HA 16 page 306	HA 32 page 306	HA 48 page 307	HA 64 page 307
Plug	Screw	Yes	10420000	10431000	10440100	10530000	10540000	10540100	105300LE64
Receptacle	Screw	Yes	10421000	10432000	10441100	10531000	10541000	10541100	105310LE64
Plug	Screw	No	–	–	10440000	10532000	10542000	10542100	–
Receptacle	Screw	No	–	–	10441000	10533000	10543000	10543100	–

HA 32 = HA 16 (x2) HA 48 = HA 16 (x3) HA 64 = HA 16 (x4)
Note: Page references refer to Lapp full line catalog

Mating Housings

Insert	Housing
HA 3/4	HA 3/4
HA 10	HA 10
HA 16	HA 16
HA 32	HA 32
HA 48	HA 48
HA 64	HA 64

EPIC® HQ

Technical Data

# of Contacts:	5 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Crimp
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

Description	HQ 5 page 309
Plug	10431500
Receptacle	10432500

Note: Page references refer to Lapp full line catalog

Mating Housings

Insert	Housing
HQ 5	HA 3/4

Contacts not included.

Use 2.5 mm crimp contacts: page 60

EPIC® STA

Technical Data

# of Contacts:	6, 14, 20, 40 (+PE)
Rated Voltage:	48V
Rated Current:	10A
Termination:	Screw, solder
Wire Size:	20 - 16 AWG (0.5 - 1.5 mm²)

Description	Termination	STA 6 page 311	STA 14 page 311	STA 20 page 312
Plug	Screw	10488100	10493100	10503100
Receptacle	Screw	10486100	10491100	10501100
Plug	Solder	10487200	10492200	10502200
Receptacle	Solder	10485200	10490200	10500200

STA 40 = STA 20 (x2)
Note: Page references refer to Lapp full line catalog

Mating Housings

Insert	Housing
STA 6	HA 3/4
STA 14	HA 10
STA 20	HA 16
STA 40	HA 32

Quick Select Summary
Plugs & Receptacles

EPIC® HEE

Technical Data

# of Contacts:	10, 18, 32, 45, 64, 92 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Crimp
Wire Size:	20 - 12 AWG (0.5 - 4.0 mm²)

Mating Housings

Insert	Housing
HEE 10	HB 6
HEE 18	HB 10
HEE 32	HB 16
HEE 46	HB 24
HEE 64	HB 32
HEE 92	HB 48

Use 2.5 mm crimp contacts: page 60

Contacts not included

Description	HEE 10 page 314	HEE 18 page 314	HEE 32 page 315	HEE 46 page 315	HEE 64 page 316	HEE 92 page 316
Plug	10180400	10182400	10184400	10186400	10184500	10186500
Receptacle	10181400	10183400	10185400	10187400	10185500	10187500

HEE 64 = HEE 32 (x2)
HEE 92 = HEE 46 (x2)

Note: Page references refer to Lapp full line catalog

EPIC® HBS

Technical Data

# of Contacts:	6, 12 (+PE)
Rated Voltage:	600V
Rated Current:	35A
Termination:	Screw
Wire Size:	20 - 10 AWG (0.5 - 6.0 mm²)

Description	HBS 6 page 318	HBS 12 page 318
Plug	10170000	10170600
Receptacle	10171000	10171600

Mating Housings

Insert	Housing
HBS 6	HB 16
HBS 12	HB 32

HBS 12 = HBS 6 (x2)
Note: Page references refer to Lapp full line catalog

EPIC® HBVE

Technical Data

# of Contacts:	3, 6, 10 (+PE)
Rated Voltage:	600V
Rated Current:	16A
Termination:	Screw
Wire Size:	20 - 14 AWG (0.5 - 2.5 mm²)

Description	Wire Protection	HBVE 3 page 320	HBVE 6 page 320	HBVE 10 page 320
Plug	Yes	10210010	10239010	10270010
Receptacle	Yes	10211010	10240010	10271010
Plug	No	10210110	10239110	10270110
Receptacle	No	10211110	10240110	10271110

Mating Housings

Insert	Housing
HBVE 3	HB 10
HBVE 6	HB 16
HBVE 10	HB 24

Note: Page references refer to Lapp full line catalog

EPIC® HD

Technical Data

# of Contacts:	7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)
Rated Voltage:	600V
Rated Current:	10A
Termination:	Crimp
Wire Size:	26 - 14 AWG (0.14 - 2.5 mm²)

Mating Housings

Insert	Housing	Insert	Housing
HD 7, 8	HA 3/4	HD 50	HA 32
HD 15	HA 10	HD 64	HB 24
HD 25	HA 16	HD 80	HB 32
HD 40	HB 16	HD 128	HB 48

Contacts not included

Use 1.6 mm machined contacts: page 60

Use 1.6 mm stamped contacts: page 60

Description	Contact Type	HD 7 page 323	HD 8 page 325	HD 15 page 326	HD 25 page 328	HD 40 page 330	HD 50 page 332	HD 64 page 334	HD 80 page 336	HD 128 page 338
Plug	Machined	11250500	11252500	11283200	11283300	11265200	11283300	11272000	11265200	11272000
Receptacle	Machined	11251500	11253500	11282200	11282300	11266200	11282300	11273000	11266200	11273000
Plug	Stamped & Formed	11250000	–	11255000	11260000	11265000	11260000	11270000	11265000	11270000
Receptacle	Stamped & Formed	11251000	–	11256000	11261000	11266000	11261000	11271000	11266000	11271000

HD 50 = HD 25 (x2) HD 80 = HD 40 (x2) HD 128 = HD 64 (x2)

Note: Page references refer to Lapp full line catalog

EPIC® HDD

Technical Data

# of Contacts:	24, 42, 72, 108, 144, 216 (+PE)
Rated Voltage:	600V
Rated Current:	8.5A
Termination:	Crimp
Wire Size:	26 - 14 AWG (0.14 - 2.5 mm²)

Mating Housings

Insert	Housing
HDD 24	HB 6
HDD 42	HB 10
HDD 72	HB 16
HDD 108	HB 24
HDD 144	HB 32
HDD 216	HB 48

Use 1.6 mm machined contacts: page 60

Contacts not included

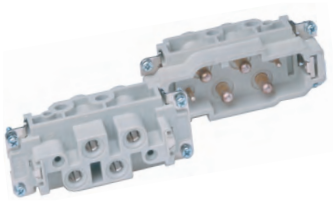
Description	HDD 24 page 341	HDD 42 page 341	HDD 72 page 342	HDD 108 page 342	HDD 144 page 343	HDD 216 page 343
Plug	11285000	11285100	11285200	11285300	11285400	11285500
Receptacle	11286000	11286100	11286200	11286300	11286400	11286500

HDD 144 = HDD 72 (x2) HDD 216 = HDD 108 (x2)

Note: Page references refer to Lapp full line catalog

Quick Select Summary
Plugs & Reeptacles

EPIC® Mixed Power



Technical Data

# of Contacts:	4 pwr/0 sig, 4 pwr/2 sig, 4 pwr/8 sig
Rated Voltage:	600V
Rated Current:	16 - 80A
Termination:	Screw
Wire Size:	
- Power:	up to 6 AWG (16 mm²)
- Signal:	up to 14 AWG (2.5 mm²)

Description	4 pwr + 0 sig page 365	4 pwr + 2 sig page 365	4 pwr + 8 sig page 365
Plug	MP/M400	MP/M402	11/2408
Receptacle	MP/F400	MP/F402	11/1408

Note: Page references refer to Lapp full line catalog

Mating Housings	
Insert	Housing
4p/0s	HB 16
4p/2s	HB 16
4p/8s	HB 24

EPIC® Modular Connectors

Color of components may be different than shown

Technical Data

# of Contacts:	2 - 280 (+PE)
Rated Voltage:	30 - 1000V
Rated Current:	1 - 82A
Termination:	Screw, crimp, coax, cage clamp
Wire Size:	28 - 4 AWG (0.06 - 25 mm²)

Modules	Contacts (next 2 pages)	Plug	Receptacle	Rated Voltage	Rated Current	Page
2 Contact Module: 2 Working Contacts		10344100	10345100	1000V	82A	348
2 Contact Module: 1 Working Contact, 1 Ground		10344600	10345600	1000V	82A	348
3 Contact Coax Module	Coax	10399200	10399300	250V	–	349
3 Contact Module	3.6 mm Machined	10382000	10382100	630V	40A	350
3 Contact Module: High Voltage	3.6 mm Machined	10399800	10399900	1000V	50A	351
4 Contact Module	2.5 mm Machined	10399000	10399100	630V	25A	352
4+PE Contact Module: High Voltage	2.5 mm Stamped	10383200	10383300	1000V	16A	353
5 Contact Module	2.5 mm Machined	10382200	10382300	400V	20A	354
10 Contact Module: Machined Contacts	1.6 mm Machined	10382400	10382500	250V	10A	355
10 Contact Module: Stamped & Formed Contacts	1.6 mm Stamped	10383400	10383500	250V	10A	356
20 Contact Module	1.0 mm Stamped	10383600	10383700	100V	4A	357
Dummy Module		10399400	10399500	–	–	358
4 Contact Cage Clamp Module		10399600	10399700	400V	14A	358
PROFIBUS DP Module		10390400	10390500	30V	1A	358
Ethernet Module: RJ45 connectors + 4 power contacts		10344300	10345300	600V	10A	359
Universal Bus Modules		10390600	10390700	30V	1A	359
Pneumatic Module: 1 Port with 2.5 mm Hose Diameter (inside)		44424004	44424005	145psi	–	360
Pneumatic Module: 1 Port with 4.0 mm Hose Diameter (inside)		44424006	44424007	145psi	–	360
Pneumatic Module: 2 Ports with 2.5 mm Hose Diameter (inside)		44424008	44424009	145psi	–	360
Pneumatic Module: 2 Ports with 4.0 mm Hose Diameter (inside)		44424010	44424011	145psi	–	360

Frames*	For Plugs	For Receptacles	Corresponding Housing	Page
Frame for 2 Modules	10381000	10381100	HB 6	360
Frame for 3 Modules	10381200	10381300	HB 10	360
Frame for 5 Modules	10381400	10381500	HB 16	361
Frame for 7 Modules	10381600	10381700	HB 24	361
Frame for 10 Modules	10381400 (x2)	10381500 (x2)	HB 32	362
Frame for 14 Modules	10381600 (x2)	10381700 (x2)	HB 48	362

* Modules snap into frames.
Note: Page references refer to Lapp full line catalog

Quick Select Summary
Contacts & Tools

Machined Contacts: 2.5 mm diameter
for HBE crimp, HEE, HQ & MC Part # 10399000 & 10399100

Part number = 1 contact, sold in bags of 100

Accessories

Crimp Tool:	11147000
Crimp Die:	11147100
Locator:	11147200
Removal Tool:	11182500

AWG	mm²	Silver		1 µ Gold		2 µ Gold	
		Pin	Socket	Pin	Socket	Pin	Socket
20	0.5	11190000	11195000	11192000	11197000	11194000	11199000
18	0.75 - 1.0	11190100	11195100	11192100	11197100	11194100	11199100
16	1.5	11190200	11195200	11192200	11197200	11194200	11199200
14	2.5	11190300	11195300	–	–	–	–
12	4.0	11190400	11195400	–	–	–	–

Machined Contacts: 1.6 mm diameter
for HD machine, HDD & MC Part # 10382400 & 10382500

Part number = 1 contact, sold in bags of 100

AWG	mm²	Silver		Gold	
		Pin	Socket	Pin	Socket
26 - 22	0.14 - 0.37	13162000	13163000	13162500	13163500
20	0.5	13162100	13163100	13162600	13163600
18	0.75 - 1.0	13162200	13163200	13162700	13163700
16	1.5	13162300	13163300	13162800	13163800
14	2.5	13162400	13163400	13162900	13163900

Accessories

Crimp Tool:	11147000
Crimp Die:	11147100
Locator:	11147200
Removal Tool:	11161000

Stamped & Formed Contacts: 1.6 mm diameter
for HD stamped & MC Part # 10383400 & 10383500

Part number = 1 contact, sold in bags of 100 or 1 reel

Accessories

Crimp Tool:
- for contacts: 11147000

Crimp Dies for Contacts:
- 26 - 20 AWG: 11147170
- 20 - 16 AWG: 11147180
- 16 - 14 AWG: 11147190

Crimp Tool for Reel: (includes tool, locator, & die)
- 26 - 20 AWG: 11147004
- 20 - 16 AWG: 11147005
- 16 - 14 AWG: 11147006

Locator: 11147300

Removal Tool: 11161000

AWG	mm²	Silver		Gold		Reel of 200	
		Pin	Socket	Pin	Socket	Pin	Socket
26 - 20	0.14 - 0.5	11241100	11231100	11243100	11233100	11240700	11230700
20 - 16	0.5 - 1.5	11221000	11236100	11221300	11238100	11220700	11235700
16 - 14	1.5 - 2.5	11223500	11228500	–	–	11223000	11228000

Reel of 2000

AWG	mm²	Right-hand Feed - Silver		Right-hand Feed - Gold		Left-hand Feed - Silver	
		Pin	Socket	Pin	Socket	Pin	Socket
26 - 20	0.14 - 0.5	11240000	11230000	–	–	11240400	11230400
20 - 16	0.5 - 1.5	11220000	11235000	11220100	11235200	11226000	11226500
16 - 14	1.5 - 2.5	–	–	–	–	11222700	11227700

Silver Machined Contacts: 2.5 mm diameter for MC Part # 10382200 & 10382300

Part number = 1 contact, sold in bags of 100

AWG	mm²	Pin	Socket
20	0.5	1121300C	1121800C
18	0.75 - 1.0	1121310C	1121810C
16	1.5	1121320C	1121820C
14	2.5	1121330C	1121830C
12	4.0	1121340C	1121840C

Accessories

Crimp Tool:	11147000
Crimp Die:	11147100
Locator:	11147200
Removal Tool:	11171000

Stamped & Formed Contacts: 2.5 mm diameter for MC Part # 10383200 & 10383300

Part number = 1 contact, sold in bags of 100

Accessories

Crimp Tool:	
- for contacts:	11147000
- for reel:	11153500
Crimp Dies for Contacts:	
- 20 - 16 AWG:	11147180
- 16 - 14 AWG:	11147190

Crimp Dies for Reel:	
- 20 - 16 AWG:	11153700
- 16 - 14 AWG:	11153800
Locator for Contacts:	11147300
Removal Tool:	11160000

AWG	mm²	Silver		Reel of 200	
		Pin	Socket	Pin	Socket
20 - 16	0.5 - 1.5	11201000	11205000	11208000	11209000
16 - 14	1.5 - 2.5	11202000	11206000	11208500	11209500

Silver Machined Contacts: 3.6 mm diameter for MC Part # 10382000 & 10382100, 10399800 & 10399900

Part number = 1 contact, sold in bags of 100

AWG	mm²	Pin	Socket
16	1.5	1121070C	1121570C
14	2.5	1121060C	1121560C
12	4.0	1121000C	1121500C
10	6.0	1121010C	1121510C
8	10	1121020C	1121520C

Accessories

Crimp Tool:	11147000
Crimp Dies:	
- 16 - 14 AWG:	11147110
- 12 - 8 AWG:	11147120
Locator:	11147210
Removal Tool:	11171100

Gold Stamped & Formed D-Sub Contacts: 1.0 mm for MC Part # 10383600 & 10383700

Accessories

Crimp Tool:	11158400
Removal Tool:	11132500

AWG	mm²	Pin	Socket
28 - 25	0.08 - 0.2	44429013	44429009
25 - 20	0.2 - 0.52	44429014	44429010

Coax Contacts for MC Part # 10399200 & 10399300

Part number = 1 contact, sold in bags of 100

Accessories

Crimp Tool:	11147000
Crimp Die:	11147130
Removal Tool:	11171100

Size	Pin	Socket
RG 58	11214200	11219200

Quick Select Summary

EPIC® HB Series Housings with Single Lever on Base

Description	PG	NPT	EPIC® HB Series Rectangular Connectors HB 6	HB 10	HB 16	HB 24	HB 48	Complete with a PG SKINTOP® Gray	Black	Metal	MS-SC
Top Entry Hood with Single Lever Bolts											
	13.5	½"	100110	–	–	–	–	53015030	53015330	52015700	53112230
	16	½"	100210	100409	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	–	100407	100809	101219	–	53015050	53015350	52015750	53112250
	29	1"	–	–	–	101119	101550	53015060	53015360	52015760	53112260
	36	1¼"	–	–	–	–	101560	53015070	53015370	52015765	53112270
	42	–	–	–	–	–	101570	53015080	53015380	52015766	–
Top Entry High Profile Hood with Single Lever Bolts											
	21	¾"	700202	700442	700942	701444	–	53015050	53015350	52015750	53112250
	29	1"	700204R	700444	700944	701446	–	53015060	53015360	52015760	53112260
Side Entry Hood with Single Lever Bolts											
	13.5	½"	100120	–	–	–	–	53015030	53015330	52015700	53112230
	16	½"	100220	100429	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	–	100428	100829	101139	–	53015050	53015350	52015750	53112250
	29	1"	–	–	100929	101239	101580	53015060	53015360	52015760	53112260
	36	1¼"	–	–	–	–	101590	53015070	53015370	52015765	53112270
	42	–	–	–	–	–	101600	53015080	53015380	52015766	–
Side Entry High Profile Hood with Single Lever Bolts											
	21	¾"	700222	700542	701042	701544	–	53015050	53015350	52015750	53112250
	29	1"	700224R	700544	701044	701546	–	53015060	53015360	52015760	53112260
Panel Mount Base with Single Lever											
without dust cover	–	–	10030C0	10032900	10072900	10102900	10161000	–	–	–	–
with dust cover	–	–	10040C0	10033900	10073900	10103900	10152500	–	–	–	–
with dust cover, no bolts	–	–	–	–	–	–	10152000	–	–	–	–
Surface Mount Base with Single Lever											
2 entries	16	½"	100060	100359	–	–	–	53015040	53015340	52015740	53112240
1 entry	16	½"	100050	100349	–	–	–	53015040	53015340	52015740	53112240
2 entries with dust cover	16	½"	100090	100389	–	–	–	53015040	53015340	52015740	53112240
1 entry with dust cover	16	½"	100070	100369	–	–	–	53015040	53015340	52015740	53112240
2 entries	21	¾"	–	–	100759	101059	–	53015050	53015350	52015750	53112240
1 entry	21	¾"	–	100347	100749	101049	–	53015050	53015350	52015750	53112250
2 entries with dust cover	21	¾"	–	–	100789	101099	–	53015050	53015350	52015750	53112250
1 entry with dust cover	21	¾"	–	–	100769	101079	–	53015050	53015350	52015750	53112250
High Profile Surface Mount Base with Single Lever											
2 entries	21	¾"	700062	700612	701112	701612	–	53015050	53015350	52015750	53112250
1 entry	21	¾"	700052	700602	701102	701602	–	53015050	53015350	52015750	53112250
2 entries with dust cover	21	¾"	700162	700652	701152	701652	–	53015050	53015350	52015750	53112250
1 entry with dust cover	21	¾"	700152	700642	701142	701642	–	53015050	53015350	52015750	53112250
2 entries	29	1"	–	700614	701114	701614	101660	53015060	53015360	52015760	52015760
1 entry	29	1"	700054	700604	701104	701604	101650	53015060	53015360	52015760	52015760
2 entries with dust cover	29	1"	–	700654	701154	701654	101682	53015060	53015360	52015760	52015760
1 entry with dust cover	29	1"	–	700644	701144	701644	101670	53015060	53015360	52015760	52015760
2 entries	36	1¼"	–	–	–	–	101661	53015070	53015370	52015765	53112270
1 entry	36	1¼"	–	–	–	–	101651	53015070	53015370	52015765	53112270
2 entries with dust cover	36	1¼"	–	–	–	–	101681	53015070	53015370	52015765	53112270
1 entry with dust cover	36	1¼"	–	–	–	–	101671	53015070	53015370	52015765	53112270
Cable Coupler Hood with Single Lever											
	13.5	½"	100140	–	–	–	–	53015030	53015330	52015700	53112230
	16	½"	100240	100469	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	–	700422	100869	101279	–	53015050	53015350	52015750	53112250
	29	1"	–	–	–	101179	–	53015060	53015360	52015760	53112260
High Profile Cable Coupler Hood with Single Lever											
	21	¾"	700102	700424	70092200	701424	–	53015050	53015350	52015750	53112250
	29	1"	700104	700426	70092400	701426	-	53015060	53015360	52015760	53112260

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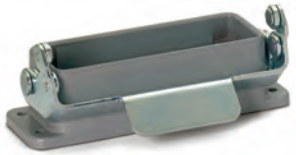

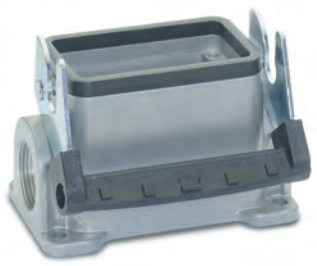

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Quick Select Summary
EPIC® HB Series Housings with Double Levers on Base

Description	PG	NPT	EPIC® HB Series Rectangular Connectors HB 10	HB 16	HB 24	HB 32	Complete with a PG SKINTOP® Gray	Black	Metal	MS-SC
Top Entry Hood with Double Lever Bolts										
	16	½"	100400	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	100401	100800	101210	101330	53015050	53015350	52015750	53112250
	29	1"	–	100900	101110	101340	53015060	53015360	52015760	53112260
	36	1¼"	–	–	–	–	53015070	53015370	52015765	53112270
Top Entry High Profile Hood with Double Lever Bolts										
	21	¾"	700504	701002	701504	–	53015050	53015350	52015750	53112250
	29	1"	700506	701004	701506	–	53015060	53015360	52015760	53112260
Side Entry Hood with Double Lever Bolts										
	16	½"	100420	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	100421C0	100820	101130	101350	53015050	53015350	52015750	53112250
	29	1"	–	100920	101230	101360	53015060	53015360	52015760	53112260
Side Entry High Profile Hood with Double Lever Bolts										
	21	¾"	700524	701022	701524	–	53015050	53015350	52015750	53112250
	29	1"	700526	701024	701526	–	53015060	53015360	52015760	53112260
Panel Mount Base with Double Levers										
	–	–	100320C0	100720C0	101020C0	101320C0	–	–	–	–
Surface Mount Base with Double Levers										
2 entries	16	½"	100350	–	–	–	53015040	53015340	52015740	53112240
1 entry	16	½"	100340	–	–	–	53015040	53015340	52015740	53112240
2 entries	21	¾"	–	100750	101050	–	53015050	53015350	52015750	53112250
1 entry	21	¾"	–	100740	101040	–	53015050	53015350	52015750	53112250
2 entries	29	1"	–	–	–	101380	53015060	53015360	52015760	53112260
1 entry	29	1"	–	–	–	101370	53015060	53015360	52015760	53112260
High Profile Surface Mount Base with Double Levers										
2 entries	21	¾"	700362	700862	701362	–	53015050	53015350	52015750	53112250
1 entry	21	¾"	700352	700852	701352	–	53015050	53015350	52015750	53112250
2 entries	29	1"	700364	700864	701364	–	53015060	53015360	52015760	53112260
1 entry	29	1"	700354	700854	701354	–	53015060	53015360	52015760	53112260
Cable Coupler Hood with Double Levers										
	16	½"	100460	–	–	–	53015040	53015340	52015740	53112240
	21	¾"	700402	100860	101270	101390	53015050	53015350	52015750	53112250
	29	1"	–	100960C0	101170	101395	53015060	53015360	52015760	53112260
High Profile Cable Coupler Hood with Double Levers										
	21	¾"	700404R	–	701404R	–	53015050	53015350	52015750	53112250
	29	1"	700406	700904	701406	–	53015060	53015360	52015760	53112260

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EPIC® connectors mate with SKINTOP® glands without locknuts. Use of tapered (NPT) threads is not recommended with EPIC® rectangular connectors, unless a thread sealant is used.

EPIC® HA 3/4 Rectangular Connectors with Single Lever on Base

Material	PG	NPT	Rectangular Hoods: PG with cable gland Top Entry	PG with cable gland Side Entry	NPT without cable gland Top Entry	NPT without cable gland Side Entry	Surface Mount Bases & Cable Coupler Hoods: PG with cable gland Base	PG with cable gland Coupler	NPT without cable gland Base	NPT without cable gland Coupler	Panel Mount Bases: Standard	Angled	With Cover
Zinc Die Cast	11	½"	10426500	10427500	105121NP	105123NP	10424500	10429500	105127NP	105129NP	10422500	10423500	44429015
Black Plastic	11	½"	10426700	10620600	104255NP	104273NP	–	10620300	–	104292NP	10422200	10423100	-
Gray Plastic	11	½"	10426400	10427100	104260NP	104270NP	10424200	10429100	104240NP	104290NP	10422000	10423000	-

Complete with a SKINTOP®

PG	Gray	Black	Metal	MS-SC
11	53015020	53015320	52015720	53112220

Quick Select Summary

EPIC® HA Series Connectors with Single Lever on Base

Description	PG	NPT	EPIC® HA Series Rectangular Connectors: HA 10 Standard	HA 10 High Profile	HA 16 Standard	HA 16 High Profile	HA 64	Complete with a PG SKINTOP®: Gray	Black	Metal	MS-SC
Top Entry Hood with Single Lever Bolts											
	13.5	½”	104460	–	–	–	–	53015030	53015330	52015800	53112230
	16	½”	104461	704602	105650	704902	–	53015040	53015340	52015810	53112240
	21	¾”	–	704604	105652	704904	–	53015050	53015350	52015820	53112250
	29	1”	–	–	–	–	101550HA	53015060	53015360	52015830	53112260
	36	1¼”	–	–	–	–	101560HA	53015070	53015370	52015831	53112270
	42	–	–	–	–	–	101570HA	53015080	53015380	52015832	–
Side Entry Hood with Single Lever Bolts											
	16	½”	104450	704622	105640	704922	–	53015040	53015340	52015810	53112240
	21	¾”	104455	704624	105645	704924	–	53015050	53015350	52015820	53112250
	29	1”	–	–	–	–	101580HA	53015060	53015360	52015830	53112260
	36	1¼”	–	–	–	–	101590HA	53015070	53015370	52015831	53112270
	42	–	–	–	–	–	101600HA	53015080	53015380	52015832	–
Panel Mount Base with Single Lever											
without dust cover	–	–	104420C0	–	104620C0	–	101610HA	–	–	–	–
with dust cover	–	–	704440C0	–	704740C0	–	101525HA	–	–	–	–
with dust cover, no bolts	–	–	–	–	–	–	101520HA	–	–	–	–

Description	PG	NPT	HA 10	HA 10 with cover	HA 16	HA 16 with cover	HA 64	Gray	Black	Metal	MS-SC
Surface Mount Base with Single Lever											
2 entries	16	½”	104501	704562	105681	704862	–	53015040	53015340	52015810	53112240
1 entry	16	½”	104481	704552	105671	704852	–	53015040	53015340	52015810	53112240
2 entries	21	¾”	104500	704564	105680	–	–	53015050	53015350	52015820	53112250
1 entry	21	¾”	104480	704554	105670	704854	–	53015050	53015350	52015820	53112250
2 entries	29	1”	–	–	–	–	101660HA	53015060	53015360	52015830	53112260
1 entry	29	1”	–	–	–	–	101650HA	53015060	53015360	52015830	53112260
2 entries with dust cover	29	1”	–	–	–	–	101680HA	53015060	53015360	52015830	53112260
1 entry with dust cover	29	1”	–	–	–	–	101670HA	53015060	53015360	52015830	53112260
2 entries	36	1¼”	–	–	–	–	101661HA	53015070	53015370	52015831	53112270
1 entry	36	1¼”	–	–	–	–	101651HA	53015070	53015370	52015831	53112270
2 entries with dust cover	36	1¼”	–	–	–	–	101681HA	53015070	53015370	52015831	53112270
1 entry with dust cover	36	1¼”	–	–	–	–	101671HA	53015070	53015370	52015831	53112270

Description	PG	NPT	HA 10 Standard	HA 10 High Profile	HA 16 Standard	HA 16 High Profile	HA 64	Gray	Black	Metal	MS-SC
Cable Coupler Hood with Single Lever											
	13.5	½”	104390	–	–	–	–	53015030	53015330	52015800	53112230
	16	½”	704500	–	105630	704802	–	53015040	53015340	52015810	53112240
	29	1”	–	704504	–	704804	–	53015050	53015350	52015820	53112250

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EPIC® connectors mate with SKINTOP® glands without locknuts. Use of tapered (NPT) threads is not recommended with EPIC® rectangular connectors, unless a thread sealant is used.

EPIC® HA Series Connectors with Double Levers on Base

Description	PG	NPT	EPIC® HA Series Rectangular Connectors: HA 32	HA 48	Complete with a PG SKINTOP®: Gray	Black	Metal	MS-SC
Top Entry Hood with Double Lever Bolts								
	21	¾”	105820	–	53015050	53015350	52015820	53112250
	29	1”	105830	106318	53015060	53015360	52015830	53112260
Side Entry Hood with Double Lever Bolts								
	21	¾”	105760	–	53015050	53015350	52015820	53112250
	29	1”	105770	106308	53015060	53015360	52015830	53112260
Panel Mount Base with Double Levers								
	–	–	104720C0	106255C0	–	–	–	–
Surface Mount Base with Double Levers								
2 entries with dust cover	21	¾”	104820	–	53015050	53015350	52015820	53112250
1 entry with dust cover	21	¾”	104740	–	53015050	53015350	52015820	53112250
2 entries with dust cover	29	1”	104821	106348	53015060	53015360	52015830	53112260
1 entry with dust cover	29	1”	104741	106338	53015060	53015360	52015830	53112260
Cable Coupler Hood with Double Levers								
	21	¾”	105880	–	53015050	53015350	52015820	53112250
	29	1”	105885	–	53015060	53015360	52015830	53112260

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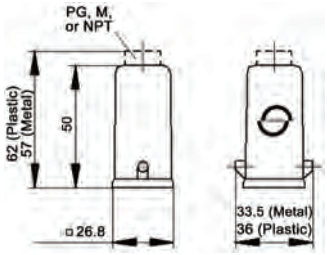
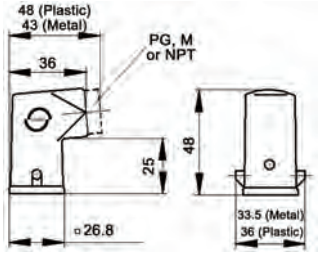
Diagrams

EPIC® HA & HB Series Connectors with Single Lever and Bolts

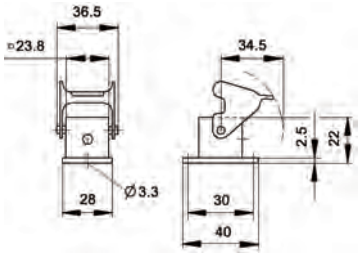
EPIC® HA 3/4 Top Entry Hood; Single Lever Bolts



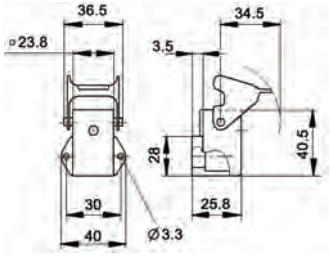
EPIC® HA 3/4 Side Entry Hood; Single Lever Bolts



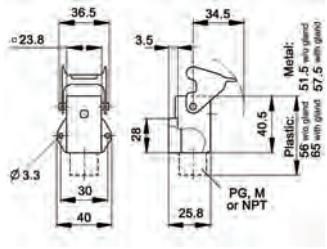
EPIC® HA 3/4 Panel Mount Base; Single Lever



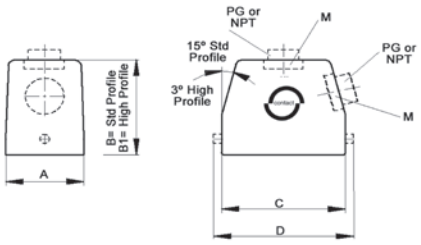
EPIC® HA 3/4 Angled Panel Mount Base; Single Lever



EPIC® HA 3/4 Surface Mount Base; Single Lever

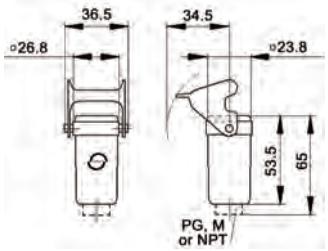


EPIC® HA/HB Top & Side Entry Hoods; Single Lever Bolts

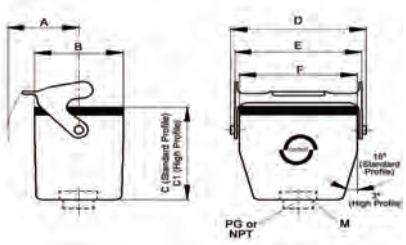


Series	HA/HB Hood Dimension (mm)				
	A	B	B1	C	D
HA 10	29.5	53.3	67.3	63	73
HA 16	29.5	58.3	72.3	79	89
HA 64	90	105	–	132	152
HB 6	43	52	72	60	74.8
HB 10	43	52	72	73	90
HB 16	43	61	76	93.3	110
HB 24	43	61	76	120	137
HB 48	90	105	–	132	152

EPIC® HA 3/4 Cable Coupler Hood; Single Lever

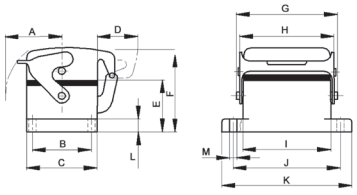


EPIC® HA/HB Cable Coupler Hood; Single Lever



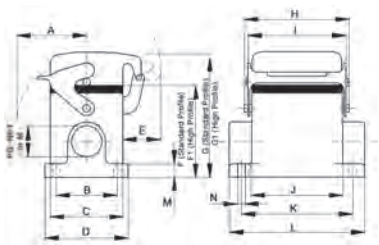
Series	HA/HB Hood Dimension (mm)						
	A	B	C	C1	D	E	F
HA 10	36.5	29.5	48	62	74.4	71.4	63
HA 16	36.5	29.5	53	67	90.4	87.8	79
HB 6	44	43	54.8	74.8	74.8	70	60
HB 10	50	43	54.8	74.8	91	88.5	73
HB 16	50	43	63.5	78.8	111	109.5	93.3
HB 24	50	43	63.5	78.8	138	136.5	120

EPIC® HA/HB Panel Mount Base; Single Lever



Series	HA/HB Hood Dimension (mm)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
HA 10	36.5	17.5	29.5	25	25	42	74.4	71.4	63	70	81	3.5	3.6
HA 16	36.5	17.5	29.5	25	25	42	90.4	87.5	79	86	96	3.5	3.6
HA 64	105	70	90	30	39.5	56.5	152	139.5	132	148	165	10	7
HB 6	44	32	43	25	27.8	44.8	74.8	70	60	70	80	4	4.3
HB 10	50	32	43	25	27.8	44.8	91	88.5	73	83	93	4	4.3
HB 16	50	32	43	25	27.8	44.8	111	109.5	93.3	103	113	4	4.3
HB 24	50	32	43	25	27.8	44.8	138	136.5	120	130	140	4	4.3
HB 48	105	70	90	30	39.5	56.5	152	139.5	132	148	165	10	7

EPIC® HA/HB Surface Mount Base; Single Lever



Series	HA/HB Hood Dimension (mm)															
	A	B	C	D	E	F	F1	G	G1	H	I	J	K	L	M	N
HA 10	36.5	40	29.5	50	25	57	–	74	–	74.4	71.4	63	48	80	3.5	4.5
HA 16	36.5	40	29.5	50	25	57	–	74	–	90.4	87.8	79	64	96	3.5	4.5
HA 64	105	106	90	120	30	100	–	117	–	152	139.5	132	111	132	12	6.5
HB 6	44	40	43	52	25	54	74	71	91	74.8	70	60	70	84	*	5.5
HB 10	50	40	43	52	25	57	74	74	91	91	88.5	73	82	94	*	5.5
HB 16	50	45	43	57	25	64	84	81	101	111	109.5	93	105	117	*	5.5
HB 24	50	45	43	57	25	64	84	81	101	138	136.5	120	132	144	*	5.5
HB 48	105	106	90	120	30	100	–	117	–	152	139.5	132	111	132	12	6.5

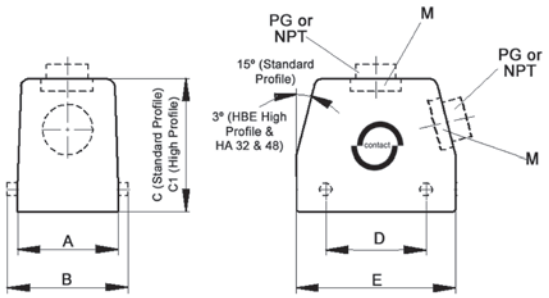
* M dimension for HB 6, 10, 16 & 24 is 4.5mm (standard profile) or 6mm (high profile).

Diagrams

EPIC® HA & HB Series Connectors with Double Levers and Bolts

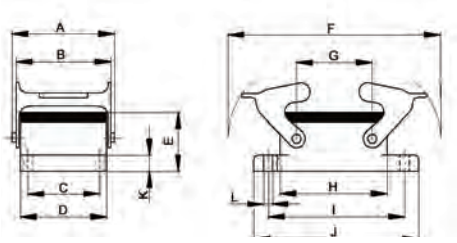
HA/HB Top & Side Entry Hoods with Double Lever Bolts

Series	HA/HB Hood Dimension (mm)					
	A	B	C	C1	D	E
HA 32	56	67.8	75	–	49.6	82
HA 48	79	89.5	95	–	64.5	93.5
HB 10	43	55	52	72	27	73
HB 16	43	55	61	76	47.5	93.3
HB 24	43	55	61	76	74	120
HB 32	79	89.5	95	–	64.5	93.5



HA/HB Panel Mount Base with Double Levers

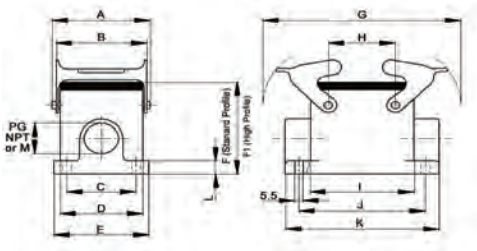
Series	HA/HB Hood Dimension (mm)											
	A	B	C	D	E	F	G	H	I	J	K	L
HA 32	67.8	66	42	56	25.4	124.5	49.6	82	92	102	4	4.3
HA 48	93.8	87.8	65	79	30.3	136.5	64.5	93.5	110	124	5	5.5
HB 10	55	53	32	43	27.8	116	27	73	83	93	4	4.3
HB 16	55	53	32	43	27.8	136.5	47.5	93.3	103	113	4	4.3
HB 24	55	53	32	42	27.8	163	74	120	130	140	4	4.3
HB 32	93.8	87.8	65	79	30.3	136.5	64.5	93.5	110	124	5	5.5



HA/HB Surface Base with Double Levers

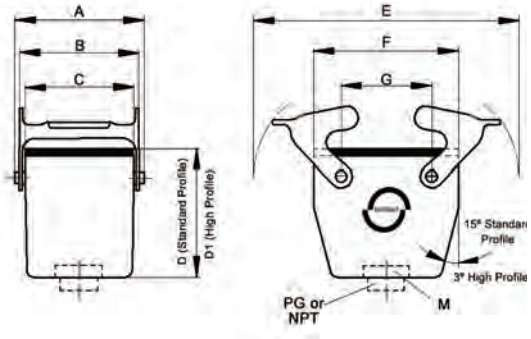
Series	HA/HB Hood Dimension (mm)											
	A	B	C	D	E	F	F1	G	H	I	J	K	L
HA 32	67.8	66	46	56	57	75	–	124.5	49.6	82	94	106	4
HA 48	93.8	87.8	67	79	81	72	–	136.5	64.5	82	94	106	5
HB 10	55	53	40	43	54	57	74	116	27	73	82	94	*
HB 16	55	53	45	43	57	64	84	136.5	47.5	93	105	117	*
HB 24	55	53	45	43	57	64	84	163	74	120	132	144	*
HB 32	93.8	87.8	67	79	81	72	–	136.5	64.5	93.5	112	124.5	5

* L dimension for HB3 10, 16 & 24 is 4.5mm (standard profile) or 6mm (high profile).



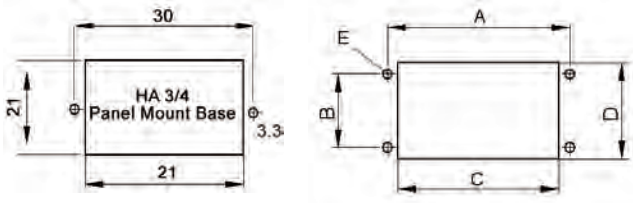
HA/HB Cable Coupler Hood with Double Levers

Series	HA/HB Hood Dimension (mm)							
	A	B	C	D	D1	E	F	G
HA 32	67.8	66	56	76.5	–	124.5	82	49.6
HB 10	55	53	43	54.8	74.8	116	73	27
HB 16	55	53	43	63.6	78.8	136.5	93.3	47.5
HB 24	55	53	43	63.6	78.8	163	120	74
HB 32	93.8	87.8	79	97	–	136.5	93.5	64.5



HA/HB Panel Mount Base Cut-Outs

Series	HA/HB Cut–Out Dimension (mm)				
	A	B	C	D	E
HA 3/4	30	–	21	21	3.3
HA 10	70	17.5	57.5	24	3.6
HA 16	86	17.5	73.7	24	3.6
HA 32	92	42	74.2	48.4	4.3
HA 48	110	65	85.5	71	5.5
HA 64	148	70	117	82	7
HB 6	70	32	52.2	35	4.3
HB 10	83	32	65.2	35	4.3
HB 16	103	32	85.5	35	4.3
HB 24	130	32	112.2	35	4.3
HB 32	110	65	85.5	71	5.5
HB 48	148	70	117	82	7



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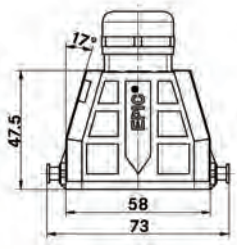
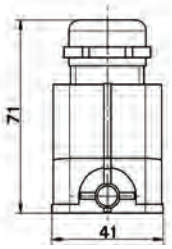
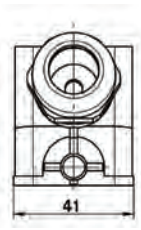
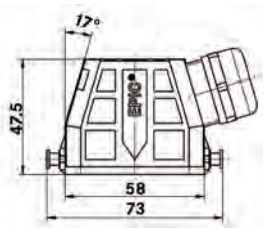
EPIC® ULTRA HB 6
Hood & Panel Mount Base; Single Lever



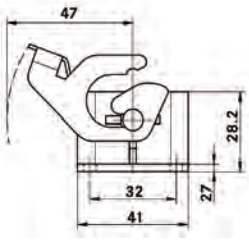


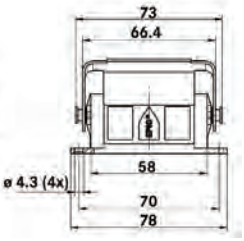




Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
Top Entry			
70250200	6 - 13 mm	–	No
70250201	9 - 17 mm	–	No
70250202	9 - 17 mm	6 mm	Yes

Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
Side Entry			
70250203	6 - 13 mm	–	No
70250204	9 - 17 mm	–	No
70250205	9 - 17 mm	6 mm	Yes



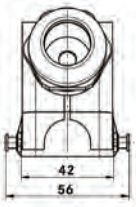


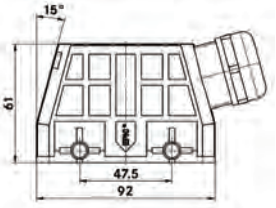
RoHS

Part Number
70250206

All dimensions are in mm.

EPIC® ULTRA HB 16
Hood & Panel Mount Base; Double Lever

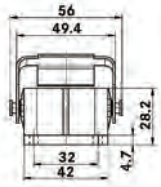


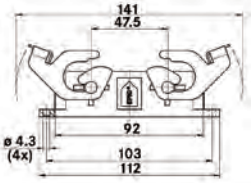


Part Number	Cable OD Range	Brush
70250216	11 - 21 mm	Yes

RoHS

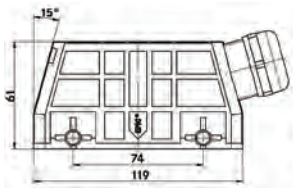
All dimensions are in mm.

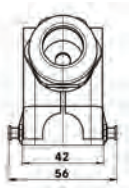




Part Number
70250217

EPIC® ULTRA HB 24
Hood & Panel Mount Base; Double Lever

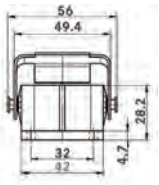


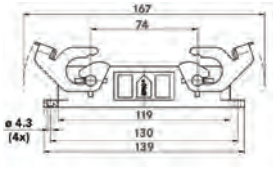


Part Number	Cable OD Range	Brush
70250221	11 - 21 mm	Yes

RoHS

All dimensions are in mm.





Part Number
70250222

EPIC® Rectangular Connector Crimp Tools

Crimp Tool & Case

Crimp Tool

Crimp Die

Contact Locator

Removal Tool

Description	Part Number	EPIC® Series
Crimp tool & case	11147000	All rectangular series
Crimp tool for reel	11158400	MC20
Crimp die	11147110	MC3 (16 - 14 AWG)
Crimp die	11147120	MC3 (12 - 8 AWG)
Crimp die	11147100	MC5, MC10
Contact locator	11147210	MC3
Contact locator	11147200	MC5, MC10
Removal tool	11171100	MC3
Removal tool	11171000	MC5
Removal tool	11161000	MC10
Removal tool	11132500	MC20

EPIC® Rectangular Hole Punch

For EPIC® HB Panel Mount Bases

EPIC® rectangular hole punches provide a quick, accurate means of cutting clearance holes for mounting EPIC® HB series rectangular panel mount bases and SKINTOP® CUBE multi-cable bushing systems without sawing or filing. The dies include four drill guide holes for the base's screw mounting holes. Centering alignment marks are also included for easy squaring of the die with the panel cabinet. The unique 2-piece die configuration simplifies scrap slug removal.

The EPIC® hole punches can be used with mild steel up to 14 GA (2.0 mm) thickness or aluminum up to 10 GA (2.54 mm). These punches are intended for manual use with a ratchet or other suitable wrench or with a hand- or foot-operated hydraulic driver and ram using a ¾" draw stud.

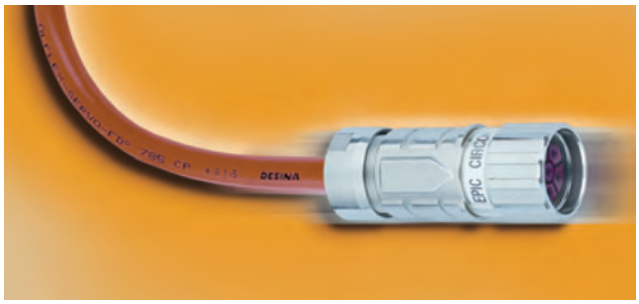
¾" x 7" Draw Stud Set

Description	Part Number
¾" x 7" Draw Stud Set	61U00197
¾" x 7" Draw Stud	61U00198

Set includes:
draw stud, drive nut, counter nut, ball bearing, and spacer

Punch & Die Sets

Size	Part Number	Max. Panel Thickness
HB 6	61U00199	Mild Steel: 14 GA (2.0 mm) Aluminum: 10 GA (2.54 mm)
HB 10	61U00200	
HB 16	61U00201	
HB 24	61U00203	



EPIC® CIRCON LS1 5+PE

View from contact side

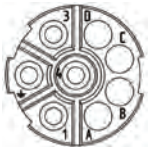
Male Insert

Female Insert

EPIC® CIRCON LS1 3+PE+4

View from contact side

Male Insert



Female Insert

Technical Data

Number of Contacts:	5+PE, 3+PE+4
Temperature Range:	-25°C to +125°C
Rated Voltage:	
- UL:	600V
- VDE:	
- 2 mm contacts:	630V
- 1 mm contacts:	250V
Rated Current:	
- 2 mm contacts:	25A (5+PE) 26A (3+PE+4)
- 1 mm contacts:	7A
Impulse Voltage:	
- 2 mm contacts:	6kV
- 1 mm contacts:	4kV
Protection Class:	IP67/68 (10h/1m)

Wire Gauge (Crimp Termination):	
- 2 mm contacts:	
- Styles A1, A3, G5:	20 - 14 AWG (0.5 - 2.5 mm²)
- Styles D, F, A6:	20 - 12 AWG (0.5 - 4.0 mm²)
- 1 mm contacts:	24 - 18 AWG (0.14 - 1.0 mm²)
Cable Diameter:	7.5 - 15.5 mm
- Styles D & F:	14 - 17 mm (12 AWG contacts)
Mating Cycles:	500
Materials:	
- Housing:	Nickel-plated die-cast zinc
- Insulation body:	PA, PBT, V-0 per UL 94
- Contacts:	Gold-plated copper alloy
- Gaskets & seals:	FPM
Contact Resistance:	< 4 mΩ
Approvals:	DIN EN 61984 cRUus #E75770

Style A1
Straight Panel Mount

Contact Configuration	Part Number
5+PE	76003000
3+PE+4	76004000

Style A3
Angled Panel Mount

Contact Configuration	Part Number
5+PE	24420058
3+PE+4	24420056

Style A6
Panel Mount Socket

Contact Configuration	Part Number
5+PE	76083000
3+PE+4	76084000

Style D6
Cable Connector

Contact Configuration	Part Number		Short Body
	12 - 14 AWG	12 AWG	
5+PE	76123000	44420091	76123100
3+PE+4	76124000	44420089	76124100

Style F6
Cable Coupler

Contact Configuration	Part Number	
	up to 14 AWG	12 AWG
5+PE	76133000	44420095
3+PE+4	76134000	44420093

Crimp Tool
& Locator

Description	Part Number
Crimp tool	11148000
Locator	11148200

EPIC® CIRCON M23 Circular Connectors

Technical Data

Number of Contacts:	6, 7, 8+1, 9, 12, 16, 17
Temperature Range:	-25°C to +125°C
Rated Voltage:	
- 6, 7, 8+1 & 9 poles:	150V
- 12 & 16 poles:	100V
- 17 poles:	50V
Rated Current:	
- 6 & 7 poles:	14A
- 8+1, 9, 12, 16 & 17 poles:	7A
Impulse Voltage:	
- 6 & 7 poles:	4kV
- 8+1 poles:	2.5kV
- 9, 12 & 16 poles:	1.5kV
- 17 poles:	0.8kV
Protection Class:	IP67/68 (10h/1m)
- Style A3:	IP65

Wire Gauge:	
- Crimp termination:	
- 1 mm contacts:	26 - 18 AWG (0.14 - 1.0 mm^2)
- 2 mm contacts:	18 - 14 AWG (1.0 - 2.5 mm^2)
- Solder termination:	
- 1 mm contacts:	up to 18 AWG (1.0 mm^2)
- 2 mm contacts:	up to 14 AWG (2.5 mm^2)
Cable Diameter:	7.0 - 13.5 mm
Mating Cycles:	100 minimum
Materials:	
- Housing:	Nickel-plated die-cast zinc
- Style C2:	Nickel-plated copper alloy
- Insulation body:	PA, PBT, V-0 per UL 94
- Contacts:	Gold-plated copper alloy
- Gaskets & seals:	FPM
Contact Resistance:	< 4 mΩ
Approvals:	DIN EN 61984 cRUus #E75770

Style A1
Straight Panel Mount

Keying	Part Number
N	72004000
-20°	72004100
+20°	72004200

Style A3
Angled Panel Mount

Part Number
24420055

Style D6
Cable Connector

Keying	Part Number
N	44420037
-20°	44420036
+20°	44420038

Style F6
Cable Coupler

Keying	Part Number
N	44420040
-20°	44420039
+20°	44420041

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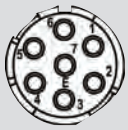
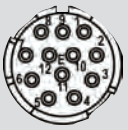
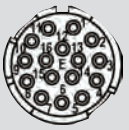
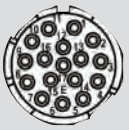
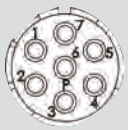
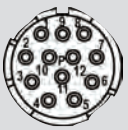
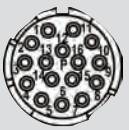
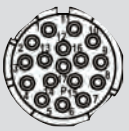
EPIC® CIRCON M23 Circular Connectors

Connector inserts will accept both male and female contacts.
A complete connection requires one E-Type insert and one P-Type insert.

# of contacts	6	7	8+1	9	12	16	17
E-Type Inserts							
without contacts	73002766	44420154	73002742	73002730	73002718	73002706	73008500
with male solder contacts	73002768	44420156	73002744	73002732	73002720	73002708	73028500
with female solder contacts	73002770	44420158	73002746	73002734	73002722	73002710	73018500
E-Type Inserts	 2 mm contacts 	 2 mm contacts 	 1 & 2 mm contacts 	 1 mm contacts 	 1 mm contacts 	 1 mm contacts 	 1 mm contacts 
	Clockwise numbered contacts viewed from the mating side						
P-Type Inserts							
without contacts	73002760	44420148	73002736	73002724	73002712	73002700	73008000
with male solder contacts	73002762	44420150	73002738	73002726	73002714	73002702	73028000
with female solder contacts	73002764	44420152	73002740	73002728	73002716	73002704	73018000
P-Type Inserts	 2 mm contacts 	 2 mm contacts 	 1 & 2 mm contacts 	 1 mm contacts 	 1 mm contacts 	 1 mm contacts 	 1 mm contacts 
	Counter-clockwise numbered contacts viewed from the mating side						

Note: 12 & 17 pole inserts for PCB soldering are available on request (non-stock)

1 mm & 2 mm Contacts for EPIC® M23 Series Connectors


Size AWG	Size mm²	Description	Termination Type	Part Number	Standard Pack Size
1 mm M23 Contacts					
26 - 18	0.14 - 1.0	M23 gold male contacts	Crimp	72400000	100
26 - 18	0.14 - 1.0	M23 gold female contacts	Crimp	74200600	100
26 - 18	0.14 - 1.0	M23/LS1 HYP gold female contacts	Crimp	74034500	100
up to 18	up to 1.0	M23 gold male contacts	Solder	72402000	100
up to 18	up to 1.0	M23 gold female contacts	Solder	72402600	100
2 mm M23 Contacts					
18 - 14	1.0 - 2.5	M23 gold male contacts	Crimp	72401000	100
18 - 14	1.0 - 2.5	M23 gold female contacts	Crimp	72401600	100
up to 14	up to 2.5	M23 gold male contacts	Solder	72403000	100
up to 14	up to 2.5	M23 gold female contacts	Solder	72404000	100

EPIC® Pin & Sleeve Connectors
IEC 60309 Connectors

Technical Data

Impact Resistance:	8 J
Ambient Temperature:	-25°C to +50°C

Flame Resistance:

- Glow wire test:	
- Enclosure:	850°C
- Contact carrier:	850°C
- Self-extinguishing:	
- Enclosure:	V-2 per UL 94
- Contact carrier:	V-2 per UL 94

CEE SERIES
IP 67




Wire Size (AWG)	Number of Wires	Number of Poles	Pin & Sleeve Max OD (mm)	Amp	Voltage	Male Plug	Female Connector	Female Receptacle	Male Inlet
4 - 1	4	3+PE	49	100A	3ø250	477318FX	4773318FX	549322FX	476318FX
					3ø480	249550FX	349550FX	549550FX	749550FX
6	4	3+PE	28.5	60A	3ø250	477317FX	473317FX	546322FX	476317FX
					3ø480	477517FX	346350FX	546350FX	476517FX
10 - 8	3	1+N+PE	21.3*	30A	125	477206FX	473206FX	471267FX	476206FX
		2+PE			250	477306FX	473306FX	471367FX	476306FX
10 - 8	4	3+PE	21.3*	30A	3ø250	477316FX	4773316FX	471377FX	476316FX
					3ø480	477516FX	477516FX	471577FX	476516FX
10 - 8	5	3+N+PE	21.3*	30A	3ø120/208	473326FX	473326FX	471387FX	476326FX
12 - 16	3	1+N+PE	13.5**	20A	125	477203FX	473203FX	471263FX	476203FX
12 - 16	3	2+PE	13.5**	20A	250	477303FX	473303FX	471363FX	476303FX
12 - 16	4	3+PE	15.3†	20A	3ø250	477313FX	473313FX	471373FX	476313FX
					3ø480	477513FX	473513FX	471573FX	476513FX

* ÖLFLEX® POWER IX requires a CEE series plug or connector with enlarger 52004090 and SKINTOP® SL 53015060
** ÖLFLEX® POWER IX 14 AWG/3c requires a CEE series plug or connector with enlarger 52004050 and SKINTOP® SL 53015040
† ÖLFLEX® POWER IX 12 AWG/4c and 14 AWG/5c require a CEE series plug or connector with enlarger 52004070 and SKINTOP® SL 53015050

MULTIMAX & CEE SERIES
IP 44




Wire Size (AWG)	Number of Wires	Number of Poles	Pin & Sleeve Max OD (mm)	Amp	Voltage	Male Plug	Female Connector	Female Receptacle	Male Inlet
10 - 8	3	1+N+PE	17.3	30A	125	700224FX	720224FX	433211FX	476205FX
		2+PE			250	700226FX	720226FX	433222FX	476305FX
10 - 8	4	3+PE	19.3	30A	3ø250	700239FX	720239FX	433222FX	476315FX
					3ø480	700237FX	720237FX	443250FX	476515FX
10 - 8	5	3+N+PE	21.3	30A	3ø120/208	700249FX	720249FX	453222FX	476325FX
12 - 16	3	1+N+PE	14	20A	125	700124FX	720124FX	431611FX	476202FX
		2+PE			250	700126FX	720126FX	431622FX	476302FX
12 - 16	4	3+PE	15.3†	20A	3ø250	700139FX	720139FX	441622FX	476312FX
					3ø480	700137FX	720137FX	441650FX	476512FX

EPIC® Pin & Sleeve Connectors
Switched-Socket Outlets with Mechanical Interlock

Color Code	Voltage / Current Rating	Number of Wires	Number of Poles	Ground-Clock Position	EPIC® ULYSSE IP 66/67	EPIC® ALUPRES Direct Connect IP67/IP55
North American Standard: 20 Amps						
	125	3	1+N+PE	4	400124FX	460124FX
	250	3	2+PE	6	400126FX	460126FX
	3ø250	4	3+PE	9	400139FX	460139FX
	3ø480	4	3+PE	7	400137FX	460137FX
North American Standard: 30 Amps						
	125	3	1+N+PE	4	400224FX	460224FX
	250	3	2+PE	6	400226FX	460226FX
	3ø250	4	3+PE	9	400239FX	460239FX
	3ø480	4	3+PE	7	400237FX	460237FX
	3ø Y 120/208	5	3+N+PE	9	400249FX	460249FX
North American Standard: 60 Amps						
	3ø250	4	3+PE	9	408339FX	460339FX
	3ø480	4	3+PE	7	408337FX	460337FX
	3ø Y 120/208	5	3+N+PE	9	408349FX	460349FX
International Standard: 16 Amps						
	110 - 130	3	2+PE	4	400124	460124
	200 - 250	3	2+PE	6	400126	460126
	200 - 250	4	3+PE	9	400139	460139
	200 - 250	5	3+N+PE	9	400149	–
	380 - 415	4	3+PE	6	400136	460136
	380 - 415	5	3+N+PE	6	400146	460146
International Standard: 32 Amps						
	110 - 130	3	2+PE	4	400224	460224
	200 - 250	3	2+PE	6	400226	460226
	200 - 250	4	3+PE	9	400239	460239
	200 - 250	5	3+N+PE	9	400249	460249
	380 - 415	4	3+PE	6	400236	460236
	380 - 415	5	3+N+PE	6	400246	460246
International Standard: 63 Amps						
	200 - 250	4	3+PE	9	400339	460339
	200 - 250	5	3+N+PE	9	400349	460349
	380 - 415	4	3+PE	6	400336	–
	380 - 415	5	3+N+PE	6	400346	–

EPIC® ULYSSE with Fuse Holder: IP66/67

EPIC® ALUPRES Direct Connect: IP67

North American Specifications

Number of Contacts: 3, 4, 5

Temperature Range: 1+N+PE, 2+PE, 3+PE, 3+N+PE

Rated Voltage: 125V, 250V, 480V, 120/208V (others available)

Rated Current: 20A, 30A, 60A

Switched Category: AC23A

Wire Gauge:
- 20A: 12 AWG
- 30A: 8 AWG
- 60A: 6 AWG

Cable Diameter:
- EPIC® ULYSSE: 11 - 25 mm
- EPIC® ALUPRES (with entry flange):
  - 20A: 9 - 20 mm
  - 30A, 60A: 9 - 26 mm

Protection Class:
- EPIC® ULYSSE: IP66, IP67
- EPIC® ALUPRES:
  - 20A, 30A: IP67
  - 60A: IP55

Housing Material:
- EPIC® ULYSSE: UV-stabilized thermoset plastic
- EPIC® ALUPRES: Die-cast aluminum alloy

Flammability: Self-extinguishing V-0 per UL 94

Standards of Conformity: UL 508, UL 1682, UL 1686

Approvals: CE, c(UL)us, E330239

International Specifications

Number of Contacts: 3, 4, 5

Temperature Range: 2+PE, 3+PE, 3+N+PE

Rated Voltage: 110 - 130V, 200 - 250V, 380 - 415V (others available)

Rated Current: 16A, 32A, 63A

Switched Category: AC23A

Wire Gauge:
- 16A: 12 AWG
- 32A: 8 AWG
- 63A: 6 AWG

Cable Diameter:
- EPIC® ULYSSE: 11 - 25 mm
- EPIC® ALUPRES (with entry flange):
  - 20A: 9 - 20 mm
  - 30A, 60A: 9 - 26 mm

Protection Class:
- EPIC® ULYSSE: IP66, IP67
- EPIC® ALUPRES:
  - 20A, 30A: IP67
  - 60A: IP55

Housing Material:
- EPIC® ULYSSE: UV-stabilized thermoset plastic
- EPIC® ALUPRES: Die-cast aluminum alloy

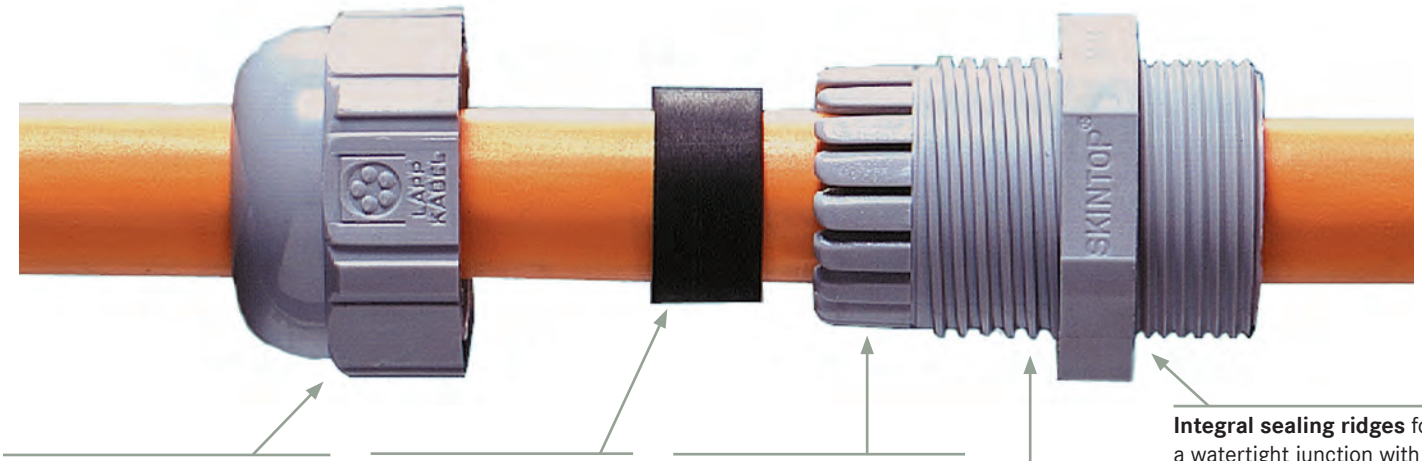
Flammability: Self-extinguishing V-0 per UL 94

Standards of Conformity: IEC 60309-1 & -2, IEC 60529, IEC 60947-3

Approvals: CE, IMQ

SKINTOP® Cable Glands

Strain Relief Cable Glands: Secured by a Single Turn of the Hand



Cap nut with ergonomically designed gripping grooves. The gripping surfaces are generously dimensioned for wrenches. Integral locking feature for vibration-resistant assembly.

Neoprene sealing for a hermetic seal. A reducing seal insert for smaller cable diameters is available.

Lamellar design for optimum strain relief and protection of the cable. A widely variable clamping range makes only a few gland sizes necessary.

Multiple trapezoidal thread for secure and instant assembly.

Integral sealing ridges for a watertight junction with the housing.

Shown here are the carefully matched components of the SKINTOP® screw-type cable glands. These parts guarantee maximum reliability.

With SKINTOP® you can install the cable in an instant: just feed the cable in and turn the nut until tight. Your cable is centered, hermetically sealed, and completely strain relieved with a turn of the hand. If you do not wish to use your hands, you can work with a spanner wrench or SKINMATIC® RZ tool. Either way, with SKINTOP® you can achieve maximum reliability. SKINTOP® quality is continuously monitored to ensure a level of reliability that has resulted in many international approvals.

Resistance Properties

Rated Temperature:	
- SKINTOP® NPT & PG:	-20°C to +80°C
- SKINTOP® Metric:	
- Static:	-40°C to +100°C
- Dynamic:	-20°C to +100°C
Testing:	SKINTOP® Incandescent wire test to IEC 695, Part 2-1:
- Test temperature:	750°C
- Strain relief:	to DIN VDE 0619
- Protection class:	IP68* Tested to DIN 40050 & 40052
Approvals:	UL #E146370 CSA #LR50370-10 VDE #57986 (metric threads) SEV #100989

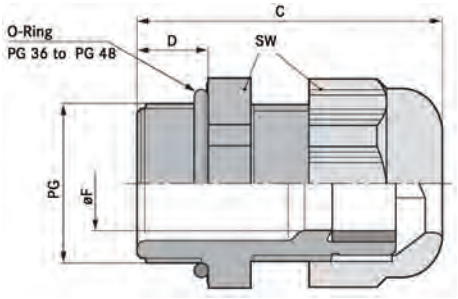
Chemical Resistance:*

+ : resistant
o : limited resistance
- : not resistant

+	Alcohols
+	Aromatic hydrocarbons
+	Ethers
+	Benzene
o	Chlorinated hydrocarbons
+	Esters
+	Grease, animal/vegetable
+	Fluorinated hydrocarbons
+	Ketones
+	Motor fuels
+	Weak alkali solutions
-	Strong alkali solutions
+	Petroleum oils
+	Weak acids
-	Strong acids
+	Trichloroethylene

* Additional and more detailed information on chemical resistance of plastics can be found on page 713 of our full line catalog.

SKINTOP® SL/SLR
Strain Relief with PG Thread



Technical Data

Material:
- Body: Polyamide
- Bushing: CR

Locknuts: Included for "S" part numbers

Temperature Range:
- Static: -40°C to +80°C
- Dynamic: -20°C to +80°C

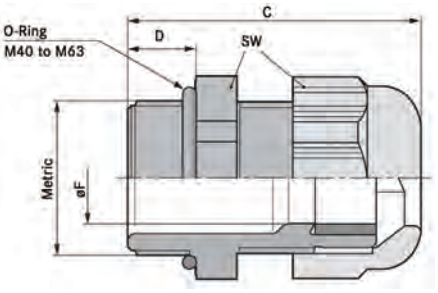
Color: Black (RAL 9005), UV resistant
Gray (RAL 7001)

Protection: 70 PSI
- Seal: IP68, 5 bar
(Exceeds NEMA 6/6P pressure rating)

Part Number with Locknut		Part Number without Locknut*		Thread Type & Size	UL Status	øF Clamping Range		SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
Black	Gray	Black	Gray			(in)	(mm)				
SKINTOP® SL: Standard											
S2107	S1107	53015200	53015000	PG 7	Recognized	0.098 - 0.256	2.5 - 6.5	0.591	1.260	0.315	100
S2109	S1109	53015210	53015010	PG 9	Recognized	0.138 - 0.315	3.5 - 8.0	0.748	1.417	0.315	100
S2111	S1111	53015220	53015020	PG 11	Recognized	0.157 - 0.394	4.0 - 10.0	0.866	1.496	0.315	100
S2113	S1113	53015230	53015030	PG 13	Listed	0.236 - 0.472	6.0 - 12.0	0.945	1.614	0.354	100
S2116	S1116	53015240	53015040	PG 16	Listed	0.354 - 0.551	9.0 - 14.0	1.063	1.732	0.394	50
S2121	S1121	53015250	53015050	PG 21	Listed	0.512 - 0.709	13.0 - 18.0	1.299	1.929	0.433	50
S2129	S1129	53015260	53015060	PG 29	Recognized	0.551 - 0.984	14.0 - 25.0	1.654	2.205	0.433	25
S2136	S1136	53015270	53015070	PG 36	Listed	0.945 - 1.260	24.0 - 32.0	2.087	2.598	0.512	10
S2142	S1142	53015280	53015080	PG 42	Recognized	1.378 - 1.496	35.0 - 38.0	2.362	2.677	0.512	5
S2148	S1148	53015290	53015090	PG 48	Listed	1.535 - 1.732	39.0 - 44.0	2.559	2.717	0.551	5
SKINTOP® SLR: Reducer Bushing											
S2207	S1207	53015300	53015100	PG 7	Recognized	0.059 - 0.197	1.5 - 5.0	0.591	1.260	0.315	100
S2209	S1209	53015310	53015110	PG 9	Recognized	0.079 - 0.236	2.0 - 6.0	0.748	1.417	0.315	100
S2211	S1211	53015320	53015120	PG 11	Recognized	0.079 - 0.276	2.0 - 7.0	0.866	1.496	0.315	100
S2213	S1213	53015330	53015130	PG 13	Listed	0.157 - 0.354	4.0 - 9.0	0.945	1.614	0.354	100
S2216	S1216	53015340	53015140	PG 16	Listed	0.236 - 0.472	6.0 - 12.0	1.063	1.732	0.394	50
S2221	S1221	53015350	53015150	PG 21	Listed	0.354 - 0.630	9.0 - 16.0	1.299	1.929	0.433	50
S2229	S1229	53015360	53015160	PG 29	Recognized	0.433 - 0.787	11.0 - 20.0	1.654	2.205	0.433	25
S2236	S1236	53015370	53015170	PG 36	Listed	0.669 - 1.024	17.0 - 26.0	2.087	2.598	0.512	10
S2242	S1242	53015380	53015180	PG 42	Recognized	0.866 - 1.220	22.0 - 31.0	2.362	2.677	0.512	5
S2248	S1248	53015390	53015190	PG 48	Listed	1.024 - 1.378	26.0 - 35.0	2.559	2.717	0.551	5

Orders of 2000 pieces or more per item will be bulk packaged unless otherwise requested.
* If the end-use application consists of inserting the SKINTOP® cable gland through a non-threaded hole, then the use of a locknut is required per UL.

SKINTOP® SLM/SLRM
Strain Relief with Metric Thread



Technical Data

Material:
- Body: Polyamide
- Bushing: CR

Locknuts: Included for "S" part numbers

Temperature Range:
- Static: -40°C to +100°C
- Dynamic: -20°C to +100°C

Color: Black (RAL 9005), UV resistant
Gray (RAL 7001)

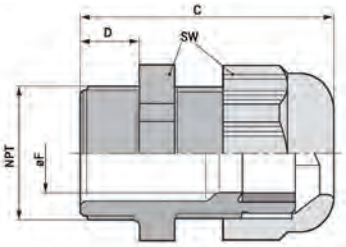
Protection: 70 PSI
- Seal: IP69K
IP68, 5 bar
(Exceeds NEMA 6/6P pressure rating)

Part Number with Locknut		Part Number without Locknut**		Thread Type & Size	UL Status	øF Clamping Range		SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
Black	Gray	Black	Gray			(in)	(mm)				
SKINTOP® SLM: Standard											
S2507	S1507	53111200	53111000	M12 x 1.5	Recognized	0.138 - 0.276	3.5 - 7.0	0.591	1.181	0.315	100
S2509	S1509	53111210	53111010	M16 x 1.5*	Recognized	0.177 - 0.394	4.5 - 10.0	0.748	1.339	0.315	100
S2513	S1513	53111220	53111020	M20 x 1.5*	Listed	0.276 - 0.512	7.0 - 13.0	0.984	1.457	0.354	100
S2516	S1516	53111230	53111030	M25 x 1.5*	Listed	0.354 - 0.669	9.0 - 17.0	1.181	1.575	0.394	50
S2521	S1521	53111240	53111040	M32 x 1.5	Listed	0.433 - 0.827	11.0 - 21.0	1.417	1.850	0.394	25
S2529	S1529	53111250	53111050	M40 x 1.5	Listed	0.748 - 1.102	19.0 - 28.0	1.811	2.047	0.394	10
S2536	S1536	53111260	53111060	M50 x 1.5	Listed	1.063 - 1.378	27.0 - 35.0	2.165	2.441	0.472	5
S2542	S1542	53111270	53111070	M63 x 1.5	Listed	1.339 - 1.772	34.0 - 45.0	2.598	2.795	0.472	5
SKINTOP® SLRM: Reducer Bushing											
S2607	S1607	53111300	53111100	M12 x 1.5	Recognized	0.039 - 0.197	1.0 - 5.0	0.591	1.181	0.315	100
S2609	S1609	53111310	53111110	M16 x 1.5*	Recognized	0.079 - 0.276	2.0 - 7.0	0.748	1.339	0.315	100
S2613	S1613	53111320	53111120	M20 x 1.5*	Listed	0.197 - 0.394	5.0 - 10.0	0.984	1.457	0.354	100
S2616	S1616	53111330	53111130	M25 x 1.5*	Listed	0.236 - 0.512	6.0 - 13.0	1.181	1.575	0.394	50
S2621	S1621	53111340	53111140	M32 x 1.5	Listed	0.276 - 0.591	7.0 - 15.0	1.417	1.850	0.394	25
S2629	S1629	53111350	53111150	M40 x 1.5	Listed	0.591 - 0.906	15.0 - 23.0	1.811	2.047	0.394	10
S2636	S1636	53111360	53111160	M50 x 1.5	Listed	0.866 - 1.142	22.0 - 29.0	2.165	2.441	0.472	5
S2642	S1642	53111370	53111170	M63 x 1.5	Listed	1.102 - 1.535	28.0 - 39.0	2.598	2.795	0.472	5

Orders of 2000 pieces or more per item will be bulk packaged unless otherwise requested.
* Metric sizes M16, M20, and M25 also available in an extended thread version. To maintain UL rating, please use a locknut.
** If the end-use application consists of inserting the SKINTOP® cable gland through a non-threaded hole, then the use of a locknut is required per UL.

SKINTOP® SLN/SLRN
Strain Relief with NPT Thread

STRAIN RELIEF



Technical Data

Material:
- Body: Polyamide
- Bushing: CR

Locknuts: Not included, add GMP Locknuts, pg. 81

Temperature Range:
- Static: -40°C to +80°C
- Dynamic: -20°C to +80°C

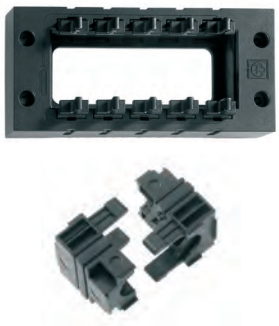
Color: Black (RAL 9005), UV resistant Gray (RAL 7001)

Protection: 70 PSI
- Seal: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating)

Part Number Black	Part Number Gray	Thread Type & Size	UL Status	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
SKINTOP® SLN: Standard									
S2138	S1138	NPT ⅜"	Recognized	0.138 - 0.315	3.5 - 8.0	0.748	1.693	0.591	100
S2112	S1112	NPT ½"	Listed	0.197 - 0.472	5.0 - 12.0	0.945	1.772	0.591	100
S2134	S1134	NPT ¾"	Listed	0.512 - 0.709	13.0 - 18.0	1.299	2.087	0.591	50
S2101	S1101	NPT 1"	Listed	0.748 - 1.000	19.0 - 25.4	1.654	2.362	0.591	25
SKINTOP® SLRN: Reducer Bushing									
S2238	S1238	NPT ⅜"	Recognized	0.079 - 0.236	2.0 - 6.0	0.748	1.693	0.591	100
S2212	S1212	NPT ½"	Listed	0.157 - 0.354	4.0 - 9.0	0.945	1.772	0.591	100
S2234	S1234	NPT ¾"	Listed	0.354 - 0.630	9.0 - 16.0	1.299	2.087	0.591	50
S2201	S1201	NPT 1"	Listed	0.551 - 0.827	14.0 - 21.0	1.654	2.362	0.591	25

SKINTOP® CUBE
Multi-Cable Bushing System

STRAIN RELIEF



UL Pending

Technical Data

Material:
- Frame: Glass fiber reinforced polyamide
- Frame seal: CR
- Clip module: Special polypropylene
- Clip module seal: LSE 2

Temperature Range: -20°C to +80°C

Color: Black

Protection: IP64

Part Number	Size	Clamping Range ø (in)	Clamping Range ø (mm)	Max. Number of Modules	Standard Pack Size
Frame					
52220000	16 Panel Cut-out (36 x 86 mm)	–	–	8	1
52220001	24 Panel Cut-out (36 x 112 mm)	–	–	10	1
Module					
52220004	20x20 Blank Module	0.039 - 0.118	1 - 3	–	5
52220002	20x20 Small Module	0.157 - 0.236	4 - 6	–	5
52220003	20x20 Large Module	0.236 - 0.354	6 - 9	–	5
52220040	20x20 AS-i Module	ASi bus cable	ASi bus cable	–	5
52220005	40x40 Small Module	0.354 - 0.472	9 - 12	–	5
52220006	40x40 Large Module	0.472 - 0.630	12 - 16	–	5
52220007	40x40 Blank Module	–	–	–	5

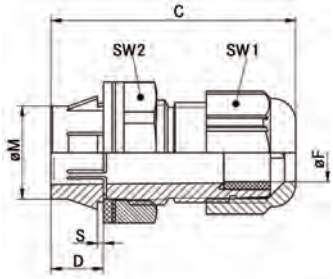
Use together with EPIC® Rectangular hole punch, page 68

STRAIN RELIEF

SKINTOP® CLICK/CLICK-R

Strain Relief with Quick "Click" Insertion System

1 disassembly tool included per pack



Technical Data

Material:
- Body: Special polyamide
- Seal: Special elastomer

Temperature Range:
- Static: -40°C to +100°C
- Dynamic: -20°C to +100°C

Color: Black (RAL 9005), UV resistant
Gray (RAL 7001)

Protection:
- M12: IP68, 4 bar
- M16 to M32: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating)

Part Number* Black	Part Number* Gray	Mounting Hole Size	UL Status	øF Clamping Range (in)	øF Clamping Range (mm)	SW1/SW2 Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	øM Hole (in)	Standard Pack Size
SKINTOP® CLICK: Standard										
53112923	53112921	M12	Recognized	0.138 - 0.276	3.5 - 7.0	0.591/0.709	1.576	0.315	0.484 (-.008)	50
53112882	53112876	M16	Recognized	0.197 - 0.354	5.0 - 9.0	0.748/0.866	1.654	0.315	0.642 (-.008)	50
53112883	53112877	M20	Listed	0.276 - 0.512	7.0 - 13.0	0.985/1.063	1.792	0.315	0.799 (-.008)	25
53112884	53112878	M25	Listed	0.354 - 0.669	9.0 - 17.0	1.182/1.339	1.910	0.315	0.996 (-.008)	25
53112924	53112922	M32	Listed	0.433 - 0.827	11.0 - 21.0	1.417/1.576	2.167	0.315	1.272 (-.008)	25
SKINTOP® CLICK-R: Reducer Bushing										
53112929	53112927	M12	Recognized	0.039 - 0.197	1.0 - 5.0	0.591/0.709	1.576	0.315	0.484 (-.008)	50
53112885	53112879	M16	Recognized	0.157 - 0.276	4.0 - 7.0	0.748/0.866	1.654	0.315	0.642 (-.008)	50
53112886	53112880	M20	Listed	0.197 - 0.394	5.0 - 10	0.985/1.063	1.792	0.315	0.799 (-.008)	25
53112887	53112881	M25	Listed	0.236 - 0.512	6.0 - 13	1.182/1.339	1.910	0.315	0.996 (-.008)	25
53112931	53112928	M32	Listed	0.276 - 0.591	7.0 - 15	1.417/1.576	2.167	0.315	1.272 (-.008)	25

* Suitable for wall thickness of 1 - 4 mm (0.039 - 0.157 inches)

STRAIN RELIEF

SKINTOP® INOX/INOX-R

Stainless Steel Strain Relief with Metric Thread

Technical Data

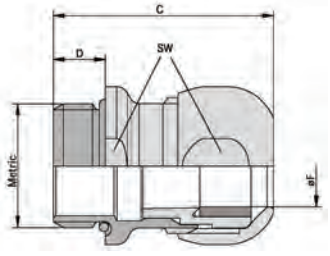
Material:
- Body: Stainless steel: V4.A (1.4404/316L)
- Insert: Polyamide
- Sealing ring: Silicone
- O-ring: Silicone

Temperature Range: -40°C to +100°C

Protection: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating) IP69K

Approvals: Acc. to DIN EN ISO 14 159
Acc. to DIN EN 1672-2
EHEDG

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
SKINTOP® INOX							
53806739	M12 x 1.5	0.157 - 0.275	4.0 - 7.0	0.630	1.154	0.256	5
53806740	M16 x 1.5	0.197 - 0.394	5.0 - 10.0	0.788	1.276	0.275	5
53806741	M20 x 1.5	0.275 - 0.512	7.0 - 13.0	0.945	1.398	0.315	5
53806742	M25 x 1.5	0.354 - 0.669	9.0 - 17.0	1.142	1.544	0.315	5
53806743	M32 x 1.5	0.433 - 0.827	11.0 - 21.0	1.418	1.757	0.354	5
SKINTOP® INOX-R							
53806749	M12 x 1.5	0.118 - 0.197	3.0 - 5.0	0.630	1.154	0.256	5
53806750	M16 x 1.5	0.177 - 0.275	4.5 - 7.0	0.788	1.276	0.275	5
53806751	M20 x 1.5	0.236 - 0.394	6.0 - 10.0	0.945	1.398	0.315	5
53806752	M25 x 1.5	0.275 - 0.512	7.0 - 13.0	1.142	1.544	0.315	5
53806753	M32 x 1.5	0.315 - 0.591	8.0 - 15.0	1.418	1.757	0.354	5



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SKINTOP® MS/MSR
Nickel-Plated Brass Strain Relief with PG Thread

STRAIN RELIEF

Technical Data

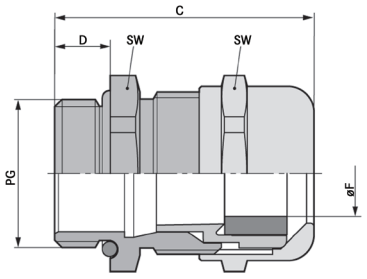
Material:
- Body: Nickel-plated brass
- Insert: Polyamide
- Bushing: CR
- O-ring: NBR

Locknuts: Add SM locknuts, page 82

Temperature Range:
- Dynamic: -25°C to +100°C
- Static: -40°C to +100°C

IP Protection: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating when used with O-ring)

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
SKINTOP® MS: Standard							
52015700	PG 7	0.078 - 0.256	2.0 - 6.5	0.551	0.985	0.197	100
52015710	PG 9	0.157 - 0.315	4.0 - 8.0	0.669	1.142	0.236	100
52015720	PG 11	0.157 - 0.394	4.0 - 10	0.788	1.260	0.236	50
52015730	PG 13	0.197 - 0.472	5.0 - 12.0	0.866	1.339	0.256	50
52015740	PG 16	0.315 - 0.551	8.0 - 14.0	0.945	1.379	0.256	50
52015750	PG 21	0.433 - 0.709	11.0 - 18.0	1.182	1.576	0.275	25
52015760	PG 29	0.630 - 0.985	16.0 - 25.0	1.576	1.891	0.315	25
52015765	PG 36	0.748 - 1.260	19.0 - 32.0	1.970	2.442	0.591	10
52015766	PG 42	1.103 - 1.497	28.0 - 38.0	2.245	2.442	0.591	5
52015767	PG 48	1.339 - 1.733	34.0 - 44.0	2.521	2.442	0.591	5
SKINTOP® MSR: Reducer Bushing							
52015770	PG 7	0.078 - 0.197	2.0 - 5.0	0.551	0.985	0.197	100
52015780	PG 9	0.078 - 0.236	2.0 - 6.0	0.669	1.142	0.236	100
52015790	PG 11	0.118 - 0.275	3.0 - 7.0	0.787	1.260	0.236	50
52015800	PG 13	0.157 - 0.354	4.0 - 9.0	0.866	1.339	0.256	50
52015810	PG 16	0.236 - 0.512	6.0 - 13.0	0.945	1.379	0.256	50
52105820	PG 21	0.315 - 0.630	8.0 - 16.0	1.182	1.576	0.275	25
52015830	PG 29	0.413 - 0.788	10.5 - 20.0	1.576	1.891	0.315	25
52015831	PG 36	0.748 - 1.024	19.0 - 26.0	1.970	2.442	0.591	10
52015832	PG 42	0.945 - 1.221	24.0 - 31.0	2.245	2.442	0.591	5
52015833	PG 48	1.103 - 1.379	28.0 - 35.0	2.521	2.442	0.591	5



CE RoHS

SKINTOP® MS-M BRUSH
Nickel-Plated Brass Strain Relief for EMC Applications with Metric Thread

STRAIN RELIEF

see Lapp full line catalog for NPT threaded glands

Technical Data

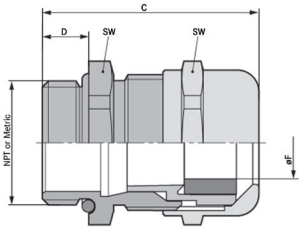
Material:
- Body: Nickel-plated brass
- Brush: Brass
- Insert: Polyamide
- Bushing: Special elastomer
- O-ring: Special elastomer

Locknuts: Add SM-PE-M locknuts, page 82

Temperature Range:
- Dynamic: -25°C to +100°C
- Static: -40°C to +100°C

IP Protection:
- M25 - M63: IP69K
- M63 plus & larger: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating)

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Min. ø Above Braiding (in)	Standard Pack Size
53112676	M25 x 1.5	0.354 - 0.669	9.0 - 17.0	1.142	1.418	0.315	0.236	10
53112677	M32 x 1.5	0.433 - 0.827	11.0 - 21.0	1.418	1.663	0.354	0.315	1
53112678	M40 x 1.5	0.748 - 1.103	19.0 - 28.0	1.773	2.344	0.354	0.394	1
53112679	M50 x 1.5	1.063 - 1.379	27.0 - 35.0	2.127	2.049	0.394	0.551	1
53112680	M63 x 1.5	1.339 - 1.773	34.0 - 45.0	2.639	2.415	0.591	0.788	1
53112681	M63 x 1.5, plus	1.733 - 2.167	44.0 - 55.0	2.955	2.719	0.591	0.985	1
53112501	M75 x 1.5	2.088 - 2.482	53.0 - 63.0	3.743	4.137	0.591	1.379	1
53112500	M75 x 1.5, plus	2.285 - 2.679	58.0 - 68.0	3.743	4.137	0.591	1.379	1
53112503*	M90 x 2.0	2.600 - 3.073	66.0 - 78.0	4.531	5.339	0.788	1.773	1
53112505*	M110 x 2.0	2.994 - 3.467	76.0 - 88.0	5.319	6.068	0.985	2.167	1
53112504*	M110 x 2.0, plus	3.388 - 3.861	86.0 - 98.0	5.319	6.068	0.985	2.167	1

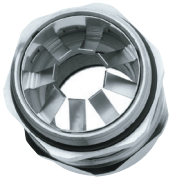


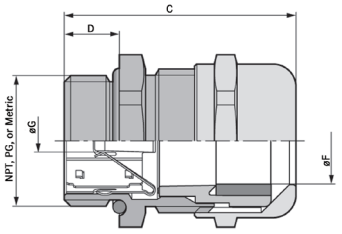
c UL us DVE DNV

CE RoHS

SKINTOP® MS-SC/MS-SC-XL

Nickel-Plated Brass Strain Relief for EMC Applications with NPT, PG & Metric Thread





Technical Data

Material:

- Body:	Nickel-plated brass
- Insert:	Polyamide
- Bushing:	CR
- O-ring:	NBR

Locknuts: Add SM-PE locknuts, page 82

Temperature Range:

- Dynamic:	-25°C to +100°C
- Static:	-40°C to +100°C

Protection: IP68, 5 bar (Exceeds NEMA 6/6P pressure rating) when used with an O-ring

SKINTOP® MS-SC: NPT Threads

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Min. ø Above Braiding (in)	Standard Pack Size
53112910	NPT ⅜"	0.177 - 0.394	4.5 - 10.0	0.788	1.564	0.591	0.158	100
53112920	NPT ½"	0.275 - 0.512	7.0 - 13.0	0.945	1.674	0.591	0.197	50
53112930	NPT ¾"	0.354 -0.669	9.0 - 17.0	1.142	1.753	0.591	0.296	25
53112940	NPT 1"	0.433 - 0.827	11.0 - 21.0	1.418	1.930	0.591	0.355	25
53112950	NPT 1¼"	0.748 - 1.103	19.0 - 28.0	1.773	2.264	0.669	0.591	10
53112960	NPT 1½"	1.063 - 1.379	27.0 - 35.0	2.127	2.423	0.669	0.827	5

SKINTOP® MS-SC: PG Threads

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Min ø Above Braiding (in)	Standard Pack Size
SKINTOP® MS-SC: Standard PG Thread								
53112210	PG 9	0.118 - 0.315	3.0 - 8.0	0.669	1.142	0.236	0.158	50
53112220	PG 11	0.157 - 0.394	4.0 - 10.0	0.787	1.260	0.236	0.158	50
53112230	PG 13	0.197 - 0.472	5.0 - 12.0	0.866	1.339	0.256	0.158	25
53112240	PG 16	0.315 - 0.551	8.0 - 14.0	0.945	1.378	0.256	0.236	25
53112250	PG 21	0.433 - 0.689	11.0 - 17.5	1.181	1.575	0.275	0.315	25
53112260	PG 29	0.630 - 0.985	16.0 - 25.0	1.575	1.890	0.315	0.512	10
53112270	PG 36	0.748 - 1.260	19.0 - 32.0	1.969	2.441	0.591	0.630	5
SKINTOP® MS-SCL: Long PG Thread								
53112310	PG 9	0.118 - 0.315	3.0 - 8.0	0.669	1.378	0.472	0.158	50
53112320	PG 11	0.157 - 0.394	4.0 - 10.0	0.787	1.496	0.472	0.158	50
53112330	PG 13	0.197 - 0.472	5.0 - 12.0	0.866	1.555	0.472	0.158	25
53112340	PG 16	0.315 - 0.551	8.0 - 14.0	0.945	1.594	0.472	0.236	25
53112350	PG 21	0.433 - 0.689	11.0 - 17.5	1.181	1.772	0.472	0.315	25
53112360	PG 29	0.630 - 0.985	16.0 - 25.0	1.575	2.047	0.591	0.512	10

SKINTOP® MS-SC: PG Threads

Part Number	Thread Type & Size	øF Clamping Range (in)	øF Clamping Range (mm)	SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Min ø Above Braiding (in)	Standard Pack Size
SKINTOP® MS-M-SC: Standard Metric Thread								
53112610	M12 x 1.5	0.137 - 0.275	3.5 - 7.0	0.630	1.043	0.256	0.079	50
53112620	M16 x 1.5	0.177 - 0.354	4.5 - 9.0	0.788	1.299	0.275	0.158	50
53112630	M20 x 1.5	0.275 - 0.492	7.0 - 12.5	0.945	1.457	0.315	0.197	25
53112640	M25 x 1.5	0.354 - 0.650	9.0 - 16.5	1.142	1.516	0.315	0.296	25
53112650	M32 x 1.5	0.433 - 0.827	11.0 - 21.0	1.418	1.791	0.354	0.355	25
53112660	M40 x 1.5	0.748 - 1.103	19.0 - 28.0	1.773	1.890	0.354	0.591	10
53112670	M50 x 1.5	1.063 - 1.379	27.0 - 35.0	2.127	2.185	0.394	0.827	5
SKINTOP® MS-M-SCL: Long Metric Thread								
53112625	M16 x 1.5	0.177 - 0.354	4.5 - 9.0	0.788	1.496	0.472	0.158	50
53112635	M20 x 1.5	0.275 - 0.492	7.0 - 12.5	0.945	1.614	0.472	0.197	25
53112645	M25 x 1.5	0.354 - 0.650	9.0 - 16.5	1.142	1.673	0.472	0.296	25
53112655	M32 x 1.5	0.433 - 0.827	11.0 - 21.0	1.418	2.028	0.591	0.355	25
53112665	M40 x 1.5	0.748 - 1.103	19.0 - 28.0	1.773	2.126	0.591	0.591	10
53112675	M50 x 1.5	1.063 - 1.379	27.0 - 35.0	2.127	2.382	0.591	0.827	5

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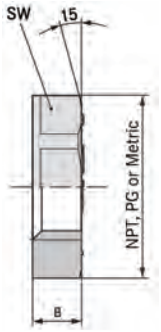
SKINTOP® GMP-GL/GMP-HF

Hexagonal Locknuts for NPT, PG & Metric Strain Relief Cable Glands



Technical Data

Material:

- Body:	Polyamide, glass fiber-reinforced
- Halogen-free:	Halogen-free polyamide, V-0 per UL 94

Temperature Range: -20°C to +100°C

Color: Black (RAL 9005), UV resistant
Gray (RAL 7001)
Light gray (RAL 7035), halogen-free

SKINTOP® GMP-GL: NPT Threads

Part Number Black	Part Number Gray	Part Number Light Gray Halogen-free	Thread Type & Size	SW Wrenching Flats (in)	B Nut Thickness (in)	Standard Pack Size
911370	–	–	NPT ⅜"	0.866	0.198	100
911371	–	–	NPT ½"	1.063	0.236	100
911372	–	–	NPT ¾"	1.417	0.276	50
911373	–	–	NPT 1"	1.654	0.276	50

SKINTOP® GMP-GL: PG Threads*

Part Number Black	Part Number Gray	Part Number Light Gray Halogen-free	Thread Type & Size	SW Wrenching Flats (in)	B Nut Thickness (in)	Standard Pack Size
53019200	53019000	–	PG 7	0.748	0.197	100
53019210	53019010	–	PG 9	0.866	0.197	100
53019220	53019020	–	PG 11	0.945	0.197	100
53019230	53019030	–	PG 13	1.063	0.236	100
53019240	53019040	–	PG 16	1.181	0.236	100
53019250	53019050	–	PG 21	1.418	0.276	50
53019260	53019060	–	PG 29	1.812	0.276	50
53019270	53019070	–	PG 36	2.364	0.315	25
53019280	50319080	–	PG 42	2.561	0.315	25
53019290	53019090	–	PG 48	2.758	0.315	25

* UL only when used with UL approved SKINTOP® polyamide cable glands

SKINTOP® GMP-GL/GMP-HF: Metric Threads*

Part Number Black	Part Number Gray	Part Number Light Gray Halogen-free**	Thread Type & Size	SW Wrenching Flats (in)	B Nut Thickness (in)	Standard Pack Size
53119100	53119000	53119200	M12 x 1.5	0.669	0.197	100
53119110	53119010	53119210	M16 x 1.5	0.866	0.197	100
53119120	53119020	53119220	M20 x 1.5	1.063	0.236	100
53119130	53119030	53119230	M25 x 1.5	1.339	0.236	100
53119140	53119040	53119240	M32 x 1.5	1.615	0.276	100
53119150	53119050	53119250	M40 x 1.5	1.970	0.276	25
53119160	53119060	53119260	M50 x 1.5	2.364	0.315	25
53119170	53119070	53119270	M63 x 1.5	2.955	0.315	25

* UL only when used with UL approved SKINTOP® polyamide cable glands
** Halogen-free locknuts are not UL Recognized

STRAIN RELIEF

SKINDICHT® SM Locknuts

Nickel-Plated Brass Locknuts for NPT, PG & Metric Strain Relief Cable Glands

NPT

PG & Metric

CE RoHS

Technical Data

Material:
- NPT: Stamped steel
- PG & metric: Nickel-plated brass

SKINDICHT® SM: NPT Threads

Part Number	Thread Type & Size	Wrenching Flats	Nut Thickness (in)	Standard Pack Size
811092*	NPT ⅜"	0.945	0.138	100
811093	NPT ½"	1.102	0.157	100
811094	NPT ¾"	1.378	0.157	50
811095	NPT 1"	1.693	0.157	50

* Product features a hex design

SKINDICHT® SM: Metric Threads

Part Number	Thread Type & Size	Wrenching Flats	Nut Thickness (in)	Standard Pack Size
52103000	M12 x 1.5	0.591	0.118	100
52013010	M16 x 1.5	0.748	0.118	100
52103020	M20 x 1.5	0.945	0.138	100
52103030	M25 x 1.5	1.182	0.157	100
52103040	M32 x 1.5	1.418	0.157	100
52103050	M40 x 1.5	1.812	0.197	50
52103060	M50 x 1.5	2.364	0.197	50
52103070	M63 x 1.5	2.758	0.197	25
52103071	M75 x 1.5	3.349	0.315	5
52103072	M90 x 2.0	4.018	0.394	1
52103073	M110 x 2.0	4.885	0.472	1

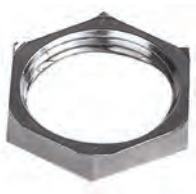
SKINDICHT® SM: PG Threads

Part Number	Thread Type & Size	Wrenching Flats	Nut Thickness (in)	Standard Pack Size
52003490	PG 7	0.591	0.110	100
52003500	PG 9	0.709	0.110	100
52003510	PG 11	0.827	0.118	100
52003520	PG 13	0.906	0.118	100
52003530	PG 16	1.024	0.118	100
52003540	PG 21	1.260	0.137	50
52003550	PG 29	1.614	0.157	50
52003560	PG 36	2.009	0.197	25
52003570	PG 42	2.364	0.197	25
52003580	PG 48	2.521	0.216	25

STRAIN RELIEF

SKINDICHT® SM-PE Locknuts

Nickel-Plated Brass Grounding Locknuts for PG & Metric Cable Glands



CE RoHS

Technical Data

Material: Nickel-plated brass

SKINDICHT® SM-PE: PG Threads

Part Number	Thread Type & Size	Wrenching Flats	Nut Thickness (in)	Standard Pack Size
52103200	PG 7	0.591	0.185	100
52103210	PG 9	0.709	0.185	100
52103220	PG 11	0.827	0.185	100
52103230	PG 13	0.906	0.185	100
52103240	PG 16	1.024	0.185	100
52103250	PG 21	1.260	0.204	50
52103260	PG 29	1.615	0.224	50
52103270	PG 36	2.009	0.263	50

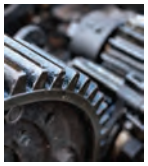
SKINDICHT® SM-PE: Metric Threads

Part Number	Thread Type & Size	Wrenching Flats	Nut Thickness (in)	Standard Pack Size
52103300	M12 x 1.5	0.591	0.137	100
52103310	M16 x 1.5	0.748	0.137	100
52103320	M20 x 1.5	0.945	0.145	100
52103330	M25 x 1.5	1.182	0.165	50
52103340	M32 x 1.5	1.418	0.185	50
52103350	M40 x 1.5	1.812	0.216	25
52103360	M50 x 1.5	2.364	0.216	10
52103370	M63 x 1.5	2.758	0.275	10
52103371	M75 x 1.5	3.349	0.315	5
52103372	M90 x 2.0	4.018	0.394	1
52103373	M110 x 2.0	4.885	0.472	1

OIL RESISTANCE

FLAME RESISTANCE

MOTION TYPE



MECHANICAL PROTECTION

OIL RESISTANCE			
Level	**USA**	**CSA***	**Europe***
OR-00	Minimal oil resistance characteristics	–	–
OR-01	UL 758 In oil for 7 days @ 60°C 75% Unaged Tensile Strength 75% Unaged Elongation	C22.2 No. 49 In oil for 7 days @ 60°C 75% Unaged Tensile Strength 75% Unaged Elongation	VDE 0281 Part 1 In oil for 7 days @ 60°C ± 30% Unaged Tensile Strength ± 30% Unaged Elongation
OR-02	UL Oil Res. I In oil for 4 days @ 100°C 50% Unaged Tensile Strength 50% Unaged Elongation	C22.2 No. 230 In oil for 4 days @ 100°C 50% Unaged Tensile Strength 50% Unaged Elongation	VDE 0472 Sect. 803A In oil for 1 day @ 100°C ± 25% Unaged Tensile Strength ± 25% Unaged Elongation
OR-03	UL Oil Res. II In oil for 60 days @ 75°C 65% Unaged Tensile Strength 65% Unaged Elongation	C22.2 No. 210.2 In oil for 4 days @ 100°C 65% Unaged Tensile Strength 65% Unaged Elongation	SEV TP 20 B In oil for 30 days @ 70°C No cracking after bending
OR-04	UL AWM 21098 In oil for 60 days @ 80°C 65% Unaged Tensile Strength 65% Unaged Elongation	C22.2 No 0.3 In oil for 60 days @ 80°C 65% Unaged Tensile Strength 65% Unaged Elongation	VDE 0472 Sect. 803B In oil for 7 days @ 90°C ± 25% Unaged Tensile Strength ± 25% Unaged Elongation
OR-05	In oil for 4 weeks @ 100°C 40% Unaged Tensile Strength 40% Unaged Elongation	–	–

Note: These oil immersion standards are mentioned for purposes of reference only. Some Canadian and European test standards are not necessarily represented here as complete equivalents to the US Standards but have been referenced due to similarities in requirements. Refer to the individual standards for detailed test procedures and any comparable evaluations.

FLAME RESISTANCE			
Level	**USA**	**CSA***	**Europe***
FR-01	UL 62: Horizontal Flame Test One 30-second flame application. Cable must not emit flame or glowing particles.	FT2: One 30-second flame application. Cable must not emit flame or glowing particles.	VDE 0472 Part 804 One 1-minute flame application. Cable must not ignite or emit flames.
FR-02	UL VW-1 (UL 1581): Vertical Flame Test Five 15-second flame applications. Cable must not emit flame or glowing particles.	FT1: Vertical Flame Test Five 15-second flame applications. Cable must not emit flame or glowing particles.	IEC 60332-1 Flame application time varies by cable diameter. Cable must self-extinguish.
FR-03	UL 1581: Vertical Tray Test Exposed to flame (70,000 BTU) for 20 min. Damage cannot exceed 8 feet.	FT4: Vertical Tray Test Exposed to flame for 20 min. Damage cannot exceed 5 feet.	IEC 60332-3-24 Exposed to flame for 20 min. Damage cannot exceed 8.2 feet.

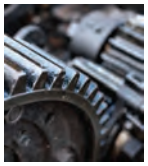
Note: These flame standards are mentioned for purposes of reference only. Some Canadian and European test standards are not necessarily represented here as complete equivalents to the US Standards but have been referenced due to some similarities in requirements. Refer to the individual standards for detailed test procedures and any comparable evaluations.

Cable Attributes
Motion Type & Mechanical Protection

OIL RESISTANCE

FLAME RESISTANCE

MOTION TYPE



MECHANICAL PROTECTION

MOTION TYPE			
Level	**Description**	**Definition**	**Cycle Life Range**
FL-01	Flexible	Can be easily installed in machines, conduit, and cable tray when applicable	—
FL-02	Highly Flexible	High flexibility with continuous flexing design attributes	—
WT-02	Wind Turbine Torsion -40°C	Designed for basic wind torsion to an angle of ± 150°/m Application temperature: -40°C	up to 2,000 cycles
CF-01	Continuousing Flexing: Basic	Designed for basis continuous flexing and cable track applications, Distance- chain length up to 15 feet	1-2 million cycles
CF-02*	Continuous Flexing: Moderate	Designed for continuous flexing and cable track applications Distance - chain length up to 30 feet	2 - 8 million cycles
CF-03*	Continuous Flexing: High	Designed for high cycle continuous flexing and cable track applications Distance - chain length up to 30 feet	8 - 20 million cycles
CF-04*	Continuous Flexing: High-Extended	Designed for high cycle continuous flexing and long cable track applications Distance - chain length up to 300 feet	8 - 20 million cycles
CF-04A*	Continuous Flexing: High-Extended High Acceleration (A) applications	Designed for high cycle continuous flexing and long cable track applications, Distance- chain length up to 300 feet; Acceleration up to 50m/s2 for chain length up to 15 feet	8 - 20 million cycles

* When comparing cycle life data between cables, the following critical variables must be evaluated: bend radius, distance, acceleration, speed & weight

MECHANICAL PROTECTION								
Level	**Description**	**Impact**	**Crush**	**Cold Impact**	**Cold Bend**	**Tensile**	**Elongation**	**Standard**
MP-01	Average	–	*	*	–	1,500 psi	100%	ASTM D-412
MP-02	Good: Independent lab-tested for crush & impact	10/50 lb	1,000/ 2,000 lbf	–	-25°C	1,700 psi	175%	UL 1277 ASTM D-412
MP-03	Very Good: Rated for Exposed Run use (–ER)	10/50 lb	2,500/ 4,200 lbf	-25°C (CSA-TC)	-40°C (UL 62)	2,300 psi	275%	UL 1277 ASTM D-412
MP-05	Excellent	**	**	–	–	3,400 psi	325%	ASTM D-1457

* Impact and crush tests not applicable for intended end use of product.
** Testing is not required. If tested, these groups would meet or exceed UL 1277 impact and crush requirements by virtue of their superior mechanical properties.
*** Lapp standard.

Note: Lapp mechanical protection test values for each level meet or exceed the requirements of the standards referenced.

Color Code Charts
Chart 1

ÖLFLEX® 590 P/CP, C 304, C 304 S, D304 OS

Conductor	Color
1	black
2	white
3	red
4	green*

Conductor	Color
5	brown
6	blue
7	orange
8	yellow

Conductor	Color
9	violet
10	gray
11	pink
12	tan

* Cables with CE approval have green/yellow conductor for #4
Numbers are spaced 20 - 55 mm apart and are inverted with underline

Chart 2

C 304, C 304 S, UNITRONIC® 190/190 CY

Conductor	Color
1	black
2	white
3	red
4	green
5	orange
6	blue
7	white/black
8	red/black
9	green/black
10	orange/black
11	blue/black
12	black/white
13	red/white
14	green/white
15	blue/white
16	black/red

Conductor	Color
17	white/red
18	orange/red
19	blue/red
20	red/green
21	orange/green
22	black/white/red
23	white/black/red
24	red/black/white
25	green/black/white
26	orange/black/white
27	blue/black/white
28	black/red/green
29	white/red/green
30	red/black/green
31	green/black/orange
32	orange/black/green

Conductor	Color
33	blue/white/orange
34	black/white/orange
35	white/red/orange
36	orange/white/blue
37	white/red/blue
38	black/white/green
39	white/black/green
40	red/white/green
41	green/white/blue
42	orange/red/green
43	blue/red/green
44	black/white/blue
45	white/black/blue
46	red/white/blue
47	green/orange/red
48	orange/red/blue

Conductor	Color
49	blue/orange/red
50	black/orange/red
51	white/black/orange
52	red/orange/black
53	green/red/blue
54	orange/black/blue
55	blue/black/orange
56	black/orange/green
57	white/orange/green
58	red/orange/green
59	green/black/blue
60	orange/green/blue
61	black/orange/blue

Chart 3

D 304 IS, D 304 OS, UNITRONIC® CY (TP) plus

Pair	Color
1	black + red
2	black + white
3	black + green
4	black + blue
5	black + yellow
6	black + brown
7	black + orange
8	red + white
9	red + green
10	red + blue
11	red + yellow
12	red + brown
13	red + orange

Pair	Color
14	green + white
15	green + blue
16	green + yellow
17	green + brown
18	green + orange
19	white + blue
20	white + yellow
21	white + brown
22	white + orange
23	blue + yellow
24	blue + brown
25	blue + orange
26	brown + yellow

Pair	Color
27	brown + orange
28	orange + yellow
29	violet + orange
30	violet + red
31	violet + white
32	violet + dark green
33	violet + light blue
34	violet + yellow
35	violet + brown
36	violet + black
37	gray + white

Color Code Charts
Chart 4

UNITRONIC® 300/300 S (24 - 22 AWG)

Conductor	Color
1	black
2	brown
3	red
4	orange
5	yellow
6	green
7	blue
8	violet
9	gray
10	white
11	white/black
12	white/brown
13	white/red

Conductor	Color
14	white/orange
15	white/yellow
16	white/green
17	white/blue
18	white/violet
19	white/gray
20	white/black/brown
21	white/black/red
22	white/black/orange
23	white/black/yellow
24	white/black/green
25	white/black/blue
26	white/black/violet

Conductor	Color
27	white/black/gray
28	white/brown/red
29	white/brown/orange
30	white/brown/yellow
31	white/brown/green
32	white/brown/blue
33	white/brown/violet
34	white/brown/gray
35	white/red/orange
36	white/red/yellow
37	white/red/green
38	white/red/blue
39	white/red/violet

Conductor	Color
40	white/red/gray
41	white/orange/yellow
42	white/orange/green
43	white/orange/blue
44	white/orange/violet
45	white/orange/gray
46	white/yellow/green
47	white/yellow/blue
48	white/yellow/violet
49	white/yellow/gray
50	white/green/blue

Chart 5

UNITRONIC® 300/300 S (20 - 16 AWG)

Conductor	Color
1	black
2	red
3	white
4	green
5	orange
6	blue
7	brown
8	yellow
9	violet
10	gray
11	pink
12	tan
13	red/green

Conductor	Color
14	red/yellow
15	red/black
16	white/black
17	white/red
18	white/green
19	white/yellow
20	white/blue
21	white/brown
22	white/orange
23	white/gray
24	white/violet
25	white/black/red
26	white/black/green

Conductor	Color
27	white/black/yellow
28	white/black/blue
29	white/black/brown
30	white/black/orange
31	white/black/gray
32	white/black/violet
33	white/black/black
34	white/red/black
35	white/red/red
36	white/red/green
37	white/red/blue
38	white/red/brown
39	white/red/violet

Conductor	Color
40	white/green/black
41	white/green/red
42	white/green/green
43	white/green/blue
44	white/green/brown
45	white/green/violet
46	white/blue/black
47	white/blue/red
48	white/blue/green
49	white/blue/blue
50	white/blue/brown

Chart 6: VDE 0293-308

ÖLFLEX® POWER QUAD II, ÖLFLEX® POWER IX

# of Conductors	Cables with green/yellow ground	Cables without green/yellow ground
2	–	blue + brown
3	green/yellow ground + brown + blue	brown + black + gray
4	green/yellow ground + brown + black + gray	blue + brown + black + gray
5	green/yellow ground + blue + brown + black + gray	blue + brown + black + gray + black
6 and above	green/yellow ground with black printed numbers	black with printed numbers

Color Code Charts

Chart 7: DIN 47100 for Paired Cables (for telephone & electronic use only)

UNITRONIC® FD CP (TP) plus

Pair	Color
1	white + brown
2	green + yellow
3	gray + pink
4	blue + red
5	black + violet
6	gray/pink + red/blue
7	white/green + brown/green
8	white/yellow + yellow/brown
9	white/gray + gray/brown
10	white/pink + pink/brown
11	white/blue + brown/blue
12	white/red + brown/red

Pair	Color
13	white/black + brown/black
14	gray/green + yellow/gray
15	pink/green + yellow/pink
16	green/blue + yellow/blue
17	green/red + yellow/red
18	green/black + yellow/black
19	gray/blue + pink/blue
20	gray/red + pink/red
21	gray/ black + pink/black
22	blue/black + red/black
23 - 44	repeat 1-22
45 - 66	repeat 1-22

The color code for paired cables is in accordance with DIN 47100. At 23 pairs, the identification repeats itself for the first time and from 45 pairs for the second time.

Chart 8: DIN 47100 Without Color Repetition (for telephone & electronic use only)

UNITRONIC® BUS CAN/CAN FD

Conductor	Color
1	white
2	brown
3	green
4	yellow
5	gray
6	pink
7	blue
8	red
9	black
10	violet
11	gray/pink
12	red/blue
13	white/green
14	brown/green
15	white/yellow
16	yellow/brown

Conductor	Color
17	white/gray
18	gray/brown
19	white/pink
20	pink/brown
21	white/blue
22	brown/blue
23	white/red
24	brown/red
25	white/black
26	brown/black
27	gray/green
28	yellow/gray
29	pink/green
30	yellow/pink
31	green/blue
32	yellow/blue

Conductor	Color
33	green/red
34	yellow/red
35	green/black
36	yellow/black
37	gray/blue
38	pink/blue
39	gray/red
40	pink/red
41	gray/black
42	pink/black
43	blue/black
44	red/black
45	white/brown/black
46	yellow/green/black
47	gray/pink/black
48	red/blue/black

Conductor	Color
49	white/green/black
50	brown/green/black
51	white/yellow/black
52	yellow/brown/black
53	white/gray/black
54	gray/brown/black
55	white/pink/black
56	pink/brown/black
57	white/blue/black
58	brown/blue/black
59	white/red/black
60	brown/red/black
61	black/white

Chart 10: ICEA-NEMA (K-2)

ÖLFLEX® TC 600

Conductor	Color
1	black
2	red
3	blue
4	orange
5	yellow
6	brown

Conductor	Color
7	red/black
8	blue/black
9	orange/black
10	yellow/black
11	brown/black
12	black/red

Conductor	Color
13	blue/red
14	orange/red
15	yellow/red
16	brown/red
17	black/blue
18	red/blue

Conductor	Color
19	orange/blue
20	yellow/blue
21	brown/blue
22	black/orange
23	red/orange
24	blue/orange

The last conductor of the cable is always green/yellow (30% stripe width) with no printing.

Example:
Lapp USA P/N 2118152 is a 12 conductor cable. The base color for this cable is black and printed with white ink as follows:
1: black, 2: red, 3: blue, 4: orange, 5: yellow, 6: brown, 7: red/black, 8: blue/black, 9: orange/black, 10: yellow/black, 11: brown/black, 12: green/yellow

Table 310.15(B)(16)

Allowable Ampacities of Insulated Conductors Rated 0 - 2000 Volts, 60° to 90°C (140° to 194°F) Not More Than Three Conductors in Raceway or Cable or Earth (Directly Buried), Based on Ambient Temperature of 30°C (86°F)

Size	Temperature Rating		
	60°C (140°F) Types	75°C (167°F) Types	90°C (194°F) Types
	TW* UF*	FEPW* RH* RHW* THHW* THW* THWN* XHHW* USE* ZW*	TA TBS SA SIS FEP* FEPB* MI RHH* RHW-2 THHN* THHW* THW-2 THWN-2 USE-2 XHH XHHW* XHHW-2 ZW-2
18 AWG	–	–	14
16 AWG	–	–	18
14 AWG	20*	20*	25*
12 AWG	25*	25*	30*
10 AWG	30	35*	40*
8 AWG	40	50	55
6 AWG	55	65	75
4 AWG	70	85	95
3 AWG	85	100	110
2 AWG	95	115	130
1 AWG	110	130	150
1/0 AWG	125	150	170
2/0 AWG	145	175	195
3/0 AWG	165	200	225
4/0 AWG	195	230	260
250 KCMIL	215	255	290
300 KCMIL	240	285	320
350 KCMIL	260	310	350
400 KCMIL	280	335	380
500 KCMIL	320	380	430
600 KCMIL	355	420	475
700 KCMIL	385	460	520
750 KCMIL	400	475	535
800 KCMIL	410	490	555
900 KCMIL	435	520	585
1000 KCMIL	455	545	615
1250 KCMIL	495	590	665
1500 KCMIL	520	625	705
1750 KCMIL	545	650	735
2000 KCMIL	560	665	750

Table 310.15(B)(17)

Allowable Ampacities of Single Insulated Conductors Rated 0 - 2000 Volts, In Free Air, Based on Ambient Air Temperature of 30°C (86°F)

Size	Temperature Rating		
	60°C (140°F) Types	75°C (167°F) Types	90°C (194°F) Types
	TW* UF*	FEPW* RH* RHW* THHW* THW* THWN* XHHW* ZW*	TA TBS SA SIS FEP* FEPB* MI RHH* RHW-2 THHN* THHW* THW-2 THWN-2 USE-2 XHH XHHW XHHW-2 ZW-2
18 AWG	–	–	18
16 AWG	–	–	24
14 AWG	25*	30*	35*
12 AWG	30*	35*	40*
10 AWG	40*	50*	55*
8 AWG	60	70	80
6 AWG	80	95	105
4 AWG	105	125	140
3 AWG	120	145	165
2 AWG	140	170	190
1 AWG	165	195	220
1/0 AWG	195	230	260
2/0 AWG	225	265	300
3/0 AWG	260	310	350
4/0 AWG	300	360	405
250 KCMIL	340	405	455
300 KCMIL	375	445	505
350 KCMIL	420	505	570
400 KCMIL	455	545	615
500 KCMIL	515	620	700
600 KCMIL	575	690	780
700 KCMIL	630	755	855
750 KCMIL	655	785	885
800 KCMIL	680	815	920
900 KCMIL	730	870	985
1000 KCMIL	780	935	1055
1250 KCMIL	890	1065	1200
1500 KCMIL	980	1175	1325
1750 KCMIL	1070	1280	1445
2000 KCMIL	1155	1385	1560

* Unless otherwise specifically permitted elsewhere in this Code, the overcurrent protection for conductor types marked with an asterisk shall not exceed 15 amperes for No. 14 copper, 20 amperes for No. 12 copper, and 30 amperes for No. 10 copper, after any correction factors for ambient temperature and number of conductors have been applied.

Table 310.15(B)(3)(a)

Adjustment Factors for More than Three Current-Carrying Conductors in a Raceway or Cable.

Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown:

Number of Current-Carrying Conductors*	Percent of Values in Tables as Adjusted for Ambient Temperature (if necessary)
4 - 6	80
7 - 9	70
10 - 20	50
21 - 30	45
31 - 40	40
more than 40	35

* Does not include ground

Table 310.15(B)(2)(a)

Temperature Correction Factors

For ambient temperatures other than 30°C (86°F), multiply the allowable ampacities shown above by the appropriate factor shown below.

Ambient Temperature	60°C	75°C	90°C
30°C	1.00	1.00	1.00
40°C	0.82	0.88	0.91
50°C	0.58	0.75	0.82
60°C	–	0.58	0.71
70°C	–	0.33	0.58
80°C	–	–	–

Example:

- Using Lapp P/N 221007 (10 AWG, 6c + ground, 90°C THHN):

40 Amps × **0.80** = **32 Amps**
ampacity @ 30°C — Table 310.15(B)(3)(a)

- Using the same P/N at **40°C:**

40 Amps × **0.80** × **0.91** = **28 Amps**
ampacity @ 30°C — Table 310.15(B)(3)(a) — Table 310.15(B)(2)(a)

VFD Cable Selection Guide
AWG Selection Chart & Voltage Drop Factors

Motor Properties: AWG Size Selection Chart per NEC

Drive HP	230V 3ø AWG	460V 3ø AWG	575V 3ø AWG
½ - 3	14	14	14
5	14	14	14
7 ½	10	14	14
10	8	14	14
15	6	10	12
20	4	8	10
25	2	6	8
30	1	6	8
40	2/0	4	6
50	3/0	2	4

Drive HP	230V 3ø AWG	460V 3ø AWG	575V 3ø AWG
60	4/0	1	2
75	300 KCMIL	1/0	1
100	500 KCMIL	3/0	1/0
125	–	4/0	3/0
150	–	300 KCMIL	4/0
200	–	500 KCMIL	300 KCMIL
250	–	–	500 KCMIL
300	–	–	–
350	–	–	–
400 - 500	–	–	–

Note: The above table references the suggested wire AWG to use based on horse power (HP) and the full load current (FLC) × 125% per NEC Art. 430-122 (A).
Amperes (FLC) were determined from NEC Art. 430-250:

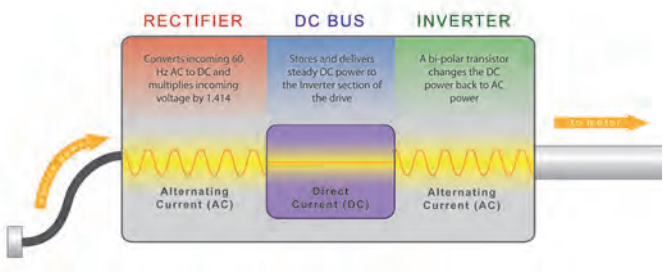
Example:
To calculate AWG size, three factors must be known: motor HP, motor voltage, and full load current (FLC).

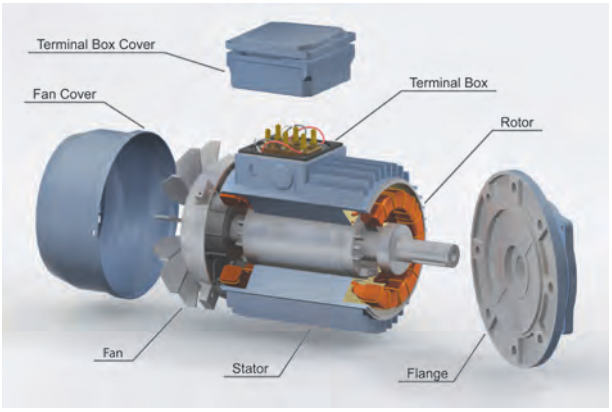
For a 30 HP and 460V motor, the FLC is 40A. Per NEC, FLC x 125% is required to calculate AWG size.

40A x 125% = 50 A, therefore the right AWG wire is 6 AWG per NEC Article 310.15.

See NEC table 310.15(B)(16) on previous page. 60°C column ampacities are referenced to avoid safety hazards that can occur when the maximum allowable temperature ratings of equipment and other non-cable components have been exceeded.

ADJUSTABLE SPEED DRIVE			
REG No. LAPP MOTOR EXAMPLE			
Power Input	Volts 460V	Power Output	Power 30 HP
	Amps 40A		Volts 500V
	Hertz 60 Hz		Amps 50A
Model No. LAPP MOTOR		LAPP GROUP	
Serial No. LAPP 12345			
ML No. 4DFJKJ48DK			





Voltage Drop Factors, Volts at FLC @ 20°C

Drive HP	Voltage Drop Factor (Vdf)		
	230V 3ø	460V 3ø	575V 3ø
½	0.00696	0.00348	0.00285
¾	0.01013	0.00506	0.00411
1	0.01329	0.00665	0.00538
1½	0.01899	0.00949	0.00759
2	0.02152	0.01076	0.00854
3	0.03038	0.01519	0.01234
5	0.04809	0.02405	0.01930
7 ½	0.02868	0.03481	0.02848
10	0.02105	0.04430	0.03481
15	0.02009	0.02738	0.03335
20	0.01914	0.02030	0.02868

Drive HP	Voltage Drop Factor (Vdf)		
	230V 3ø	460V 3ø	575V 3ø
25	0.01575	0.01627	0.02030
30	0.01732	0.01914	0.02406
40	0.01203	0.01843	0.01962
50	0.01185	0.01506	0.01843
60	0.01125	0.01667	0.01436
75	0.00872	0.01385	0.01667
100	0.00676	0.01130	0.01429
125	–	0.01139	0.01139
150	–	0.00818	0.01052
200	–	0.00655	0.00872
250	–	–	0.00660

The above table references the voltage drop over distances. It was determined by using selection criteria of the Motor Properties Table. In order to determine the voltage drop, multiply the length by the data above.

Example:
To calculate voltage drop over a specified distance, two factors must be known: the distance to the motor and the voltage drop factor.
For a 30 HP and 460V motor, the voltage drop for a distance of 200 feet would be **200 x 0.01914 = 3.83 volts**

In keeping with the principles of the Lapp Group, customer education is at the top of the list.
We strive to keep our customers aware of breaking industry changes. For a more detailed technical explanation, please visit Lapp USA's website.

Chemical Resistance

Cable Recommendations for Common Coolants used in Harsh Environments

Fluid Manufacturer	Product	ÖLFLEX® 90, 150, 190, 890, 891	ÖLFLEX® VFD, VFD with Signal VFD SLIM, TRAY II	UNITRONIC® 190, UNITRONIC® 300	ÖLFLEX® 855 P, 796 CP, 440 P, 540 P	ÖLFLEX® 491 P, 891 P, 900 P	ÖLFLEX® 490 P, 590 P	ÖLFLEX® CRF	ÖLFLEX® HEAT 180 EWKF	ÖLFLEX® HEAT 180 SiHF	HAR Hook-up Wire	SKINTOP® Clamps
		PVC	PVC	PVC	PUR	PUR	PUR	TPE	Silicone	Silicone	Neo	PA
Argent	H-114-LS	G	E	*	E	–	G	–	–	–	–	–
Argent	H-114-M	E	G	*	G	F	G	E	G	*	E	–
Argent	MS-5710-CG	G	E	G	E	–	–	–	–	–	–	–
Argent	MS5710F	E	E	G	G	G	F	E	E	E	E	–
Armour	Lard	E	G	*	G	E	E	–	E	E	*	E
Blaser Swiss	Vasco 1000/Art.2800	E	E	F	E	–	E	–	–	–	–	–
Blaser Swiss	Grindex Univ./Art.882	E	E	G	E	–	E	–	–	–	–	–
Blaser Swiss	Grindex Univ./Art892	F	F	G	G	*	*	E	E	E	E	–
Buckeye	Safe-T-Fluid #4	E	E	*	E	–	E	–	–	–	–	–
Buckeye	Safe-T-Oil #4	E	E	*	G	E	E	E	G	E	E	–
Buckeye	CT9612	E	G	*	E	–	G	–	–	–	–	–
Castrol	WY1-938A	E	G	G	E	–	–	–	–	–	–	–
Castrol	WY3-010C	E	E	*	E	*	G	–	G	F	E	E
Castrol	Syntillo 1023	G	E	G	E	–	–	–	–	–	–	–
Castrol	WS3-020A	G	G	F	E	–	–	–	–	–	–	–
Castrol	Clearedge 6519	E	E	G	G	–	–	–	–	–	–	–
Castrol	Clearedge 6550	G	E	F	G	–	–	–	–	–	–	–
Castrol	Superedge 6768	E	E	*	F	–	–	–	–	–	–	–
Castrol	GTX-SW30- Oil	E	G	*	G	–	–	–	–	–	–	–
Castrol	Type F Transmission	E	E	E	E	–	–	–	–	–	–	–
Castrol	DEXRON III Mercon	E	E	*	E	–	–	–	–	–	–	–
Castrol	Cooledge 8600	E	G	*	*	*	E	G	G	E	E	–
Castrol	Ilogrind FGO Series	E	G	*	F	G	E	E	E	E	E	–
Chem Tech	CT9612 (2)	E	G	F	E	–	E	–	–	–	–	–
Chem Tech	Tech Cool 3404MG	E	G	*	G	E	E	–	E	E	E	E
Chlorox	Sodium Hypochlorite	E	G	G	F	F	F	–	E	E	*	F
Cin. Millicron	Milpro 6000	E	E	*	E	E	E	E	E	E	E	–
Cin. Millicron	Quantalube 270	E	E	*	E	G	G	E	E	E	E	–
CITGO	Citcool 22 Conc.	E	E	*	F	G	G	–	–	E	E	E
CITGO	Citcool 33 Conc.	E	E	E	F	G	G	–	–	E	E	E
CITGO	Sentry 19	E	E	*	G	E	E	–	–	E	G	E
CITGO	Cutting Oil NC 205	E	E	*	*	F	G	–	–	*	*	E
CITGO	Cutting Oil NC 215	E	E	*	F	F	E	–	–	*	*	E
CLC Lubr.	CLC Finish HX-65	E	G	F	E	E	E	–	E	E	E	E
D.A. Stuart	Excelene 420	E	E	*	G	–	–	–	–	–	–	–

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Chemical Resistance

Cable Recommendations for Common Coolants used in Harsh Environments

Fluid Manufacturer	Product	ÖLFLEX® 90, 150, 190, 890, 891	ÖLFLEX® VFD, VFD with Signal VFD SLIM, TRAY II	UNITRONIC® 190, UNITRONIC® 300	ÖLFLEX® 855 P, 796 CP, 440 P, 540 P	ÖLFLEX® 491 P, 891 P, 900 P	ÖLFLEX® 490 P, 590 P	ÖLFLEX® CRF	ÖLFLEX® HEAT 180 EWKF	ÖLFLEX® HEAT 180 SiHF	HAR Hook-up Wire	SKINTOP® Clamps
		PVC	PVC	PVC	PUR	PUR	PUR	TPE	Silicone	Silicone	Neo	PA
D.A. Stuart	Dascool Nobalt KM	E	G	G	G	E	E	E	E	E	E	–
EPP Tech	400 Klear Kool	G	G	F	G	–	–	–	–	–	–	–
Fuchs Lubr.	GK225	E	G	*	G	F	G	G	G	*	G	–
Fuchs Lubr.	Renogrind FG16	G	G	*	F	G	E	–	–	G	F	E
Fuchs Lubr.	CPD 7003	E	E	*	G	E	E	–	–	F	G	E
Fuchs Lubr.	ECOSYN 975 (4%)	E	E	E	E	E	G	E	E	E	E	–
Fuchs Lubr.	ECOSYN 2205 CO	E	E	E	G	G	E	–	–	G	E	E
Fuchs Lubr.	Melsol Supersol	E	G	*	E	G	G	–	F	F	E	E
Fuchs Lubr.	Tuf Draw 2806-M-100	E	E	E	E	E	E	E	E	E	E	–
G-C Lubr.	Kool Grind 900N	E	G	*	F	G	E	–	–	F	F	E
G-C Lubr.	Kool Grind 960	E	E	*	F	E	E	G	E	F	F	E
G-C Lubr.	Aqua Kool PTC	E	G	*	F	F	G	–	–	G	*	E
G-C Lubr.	Aqua Syn 55	E	F	E	G	G	G	–	–	G	E	E
G-C Lubr.	SintoGrind TT	E	E	*	E	E	E	G	E	E	E	–
Hangsterfers	Missie Lube #1XL	G	G	*	G	E	E	–	–	F	G	E
Hangsterfers	Missie Lube #1XXL	G	G	*	G	F	E	–	–	F	E	–
Hangsterfers	Crystal Cut #322	E	G	E	F	F	F	–	–	G	F	–
Hangsterfers	Crystal Cut #322 @5%	E	G	E	E	E	G	–	–	G	G	–
Hangsterfers	R-100	E	E	E	E	E	E	–	E	E	G	E
Hangsterfers	R-100 @ 5%	E	G	E	E	G	E	–	–	E	G	–
Hangsterfers	S500CF	E	E	*	F	G	F	–	G	*	G	E
Hangsterfers	S500CF@10%	E	G	E	G	F	E	–	–	E	G	–
Hangsterfers	Hard Cut 5418	E	E	*	F	G	E	E	E	G	E	–
Hangsterfers	Way Oil #2	G	F	*	G	E	E	–	–	*	E	–
Hangsterfers	Antiwear 32	G	E	G	G	E	E	–	–	*	E	–
Hangsterfers	Antiwear 66	G	E	G	G	E	E	–	–	*	E	–
Hanilo	171	E	E	*	F	E	E	E	*	*	E	–
Humoco	Iodine	G	G	E	*	E	G	E	E	G	E	–
Itech	CT9612 (3)	E	G	*	E	–	E	–	–	–	–	–
J & J	Mineral Oil	E	G	*	E	E	E	–	F	E	G	E
Lubrisystems	Lubra-Cut UMC	E	E	E	F	G	E	–	–	E	G	–
Master Chem.	Trim O D250	E	G	F	G	F	E	G	G	E	E	–
Master Chem.	Trim VHP E210	E	E	G	*	G	G	E	E	E	E	–
Master Chem.	Trim WB 9303 12 2	E	E	*	E	*	G	G	F	F	E	–
Mobile	Mobile Met Upsilon	G	G	*	G	–	E	–	–	–	–	–

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		PVC	PVC	PVC	PUR	PUR	PUR	TPE	Silicone	Silicone	Neo	PA
Mobile	DTE 11M	E	E	*	G	G	E	G	E	E	E	–
Mobile	DTE FM 32	E	E	*	E	G	E	G	E	F	E	–
Monsanto	Glacier Motor	E	E	G	G	G	E	E	E	G	E	–
Motorex	SwissCool 7300 CF	E	G	F	F	E	G	–	E	G	E	E
Mullen	1270-4	E	G	*	E	–	E	–	–	–	–	–
NASCO	Acetone	*	*	*	E	F	*	E	E	E	G	–
National Oil	Nocco Grind (11) Conc.	G	E	*	F	G	E	–	–	G	F	E
National Oil	Nocco Grind (11) 10%	E	F	E	G	G	G	–	–	E	E	E
National Oil	Nocco Grind 11	E	E	*	E	E	E	G	E	G	E	–
National Oil	Nocco Grind Modl	E	E	*	E	E	E	G	E	G	E	–
Novamax	Circlene #FG 20AMO	G	E	F	E	–	G	–	–	–	–	–
Novamax	Circlene #FG 67	G	G	*	G	–	G	–	–	–	–	–
Quaker	13413	E	E	*	E	–	E	–	–	–	–	–
Rustick	WS-500A	E	E	*	F	F	G	–	–	F	*	E
Solutia	MCS-2638	E	G	*	G	F	G	E	E	E	E	–
Spartan	Carbide Grinder	G	G	F	E	–	E	–	–	*	–	–
Spartan	Synspar GP	G	G	G	G	–	–	–	–	*	–	–
Spartan	Cutter EXP	E	E	G	F	–	–	–	–	*	–	–
STP	Dot 3 Brake Fluid	G	G	F	*	*	*	E	E	E	E	–
STP	Dot 4 Brake Fluid	G	G	G	*	–	–	–	–	–	–	–
Texaco	Rando Oil HD 26	E	E	*	E	G	E	–	–	*	E	–
Texaco	Cleartex D	E	E	*	G	G	E	–	–	E	F	E
Texaco	Oil Coolant Reno 488	E	G	*	F	F	E	–	–	F	*	E
Uni-Pro	Pro Cool 3000	E	G	F	G	*	G	–	E	G	F	E
WD-40	WD-40	E	E	*	G	G	E	E	E	F	E	–
Wesson	Vegetable Oil	E	G	*	F	E	E	–	E	G	G	E
Westmont	Bio-Cool 55	E	G	G	G	E	G	–	E	G	E	E
Yushiro Chem.	Yushiron Oil #2	E	E	*	F	G	E	–	–	*	E	–
Zip Strip	Denaturated Alcohol	E	G	*	G	G	E	E	G	E	E	–
Zip Strip	MEK	*	*	*	*	*	*	E	E	E	G	–
Zip Strip	Naphtha	E	E	E	E	E	E	G	E	E	E	–
Zip Strip	Toulene	*	*	*	G	G	G	G	E	E	G	–
Zip Strip	Xylene	F	*	*	G	G	G	G	F	G	G	–
Zip Strip	Turpentine	E	E	*	E	E	E	G	E	E	E	–

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Installation Instructions for Lapp Cables in Cable Track

1. Only Lapp continuous flexing cables should be used in a moving cable track application.

2. When selecting cable for cable track, the following criteria must be taken into consideration: environmental conditions such as temperature, chemical influences, indoor or outdoor operation, traveling speed, and frequency of operation.

3. The recommended minimum bend radius of the cable should not be exceeded. Refer to the product pages of this catalog for minimum bend radius for flexing.

4. The cables must be prepared for installation into the cable track without twists, bends, or kinks in the cable. Therefore, the cable should always be unwound from the outside layer of the reel or spool. The cable should never be pulled from a coil. Before insertion into the track, it is important that the cable be laid out or hung at least 24 hours prior to installation into the cable track to relax any stresses resulting from transit or storage. If the cable cannot be relaxed, it should be shook out by grasping the cable length at its mid-point and shaking the cable as you move to each end. Then, wrap each end of the cable with masking tape and mark the top of each cable end. **Maintain this alignment throughout installation and clamping.**

5. When placing the cable into the cable track, the track should be laid out flat with the bending direction facing upward, then fitted with the cables in working position. The cables should be laid into the cable track and not weaved between or around other cables. The cables should lay loosely side by side in the track. A minimum clearance of five percent of the cable diameter should be allowed on each side of the cable. When cable is installed in track where spacers are provided, they should be separated from each other.

6. The cables should not be fixed to the track or tied together in the track.

7. The weight of the cables must be evenly distributed. Heavier cables should be placed towards the outside of the cable track, while lighter ones should occupy the center of the cable track. When the cable track is side-mounted, always place the larger cable towards the outside and the smaller cables toward the inside of the cable track. Cables must not be pulled tight against the inner track curve. Cables must not be pushed tight against the outer track curve.

8. After the cable track is installed, the cables should be cycled through several flexes and observed for freedom of movement. It is important to ensure the cables can move with complete freedom within the bend radius, so that movement of the cables among themselves and with the track is possible.

9. The cables should be clamped into position at both ends of the cable track. Prior to clamping, the alignment marks on the taped ends should be correctly positioned. Do not crush the cables when clamping. The clamping points must be located at a distance of 15 x cable diameter from the end point of the flexing movement.

NOTE: When calculating 15 x cable diameter, it is important to use the diameter of the largest cable in the track.

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IP Ratings
Modes of Protection per DIN VDE 0470-1 (IEC EN 60529)

Ingress Protection (IP) is a measure of protection against water and particles for devices. The level of protection offered by a device is laid down in the manufacturer's specification according to DIN 40050.

The first digit of the code states the level of protection against particle ingression. The second digit states the level of protection against penetration of water.

Degrees of protection against solid foreign objects

First digit of code

Digit	Protection
0	No particular protection
1*	Large solid foreign bodies with diameters ≥ 50 mm, and accidental contact with large surfaces of the body, e.g.: the back of the hand.
2*	Medium-sized solid foreign bodies with diameters ≥ 12 mm, e.g.: fingers.
3*°	Small solid foreign bodies with diameters ≥ 2.5 mm, e.g.: some tools, wires.
4*°	Granular foreign bodies with diameters ≥ 1 mm, e.g.: tools, small wires.
5•	Harmful accumulations of dust (dust protection). Penetration of dust is not entirely preventative, but must not penetrate in such quantities that operation is affected. Complete contact protection.
6	Penetration of dust (dust-proof). Complete contact protection.

* Protection levels 1 - 4: Consistently or inconsistently formed foreign bodies with three perpendicular dimensions (i.e.: cubic) larger than the specified diameter are also prevented from entering.

° Protection levels 3 & 4: This table is appropriate for devices with drain holes or cooling air apertures. It complies with the respective expert committee.

• Protection level 5: This table is appropriate for devices with drain holes. It complies with the respective expert committee.

Degrees of protection against water

Second digit of code

Digit	Protection
0	No particular protection
1	Water falling vertically (water drip).
2	Water sprays up to 15° from vertical (oblique water drip).
3	Water sprays up to 60° from vertical (water spray).
4	Water splashing onto the unit from any direction (water splash). Limited ingress is permitted, but must not affect operation.
5	Jets of water from any direction (water spray). Limited ingress is permitted, but must not affect operation.
6	Strong jets of water from any direction (flooding). Limited ingress is permitted, but must not affect operation, e.g.: ship decks
7	Immersion between 15 cm and 1 m (dipping).
8†	Permanent immersion under conditions defined by the manufacturer (immersion).
9 K	Ingress of water, even high-pressure or steam cleaning, from any direction.

† Protection level 8: This level of protection normally relates to air-tight field-operating devices. For certain devices, however, water may penetrate as long as proper operation is not affected.

Example:

IP65 provides protection against:
1. Penetration of dust (6)
2. Jets of water from any direction (5)

IP68, 5 bar provides protection against:
1. Penetration of dust (6)
2. Water protection up to 5 bar, i.e.: 70 psi

Size Conversion
American Wire Gauge (AWG) to mm²

American Wire Gauge (AWG) to mm²

AWG	mm²	AWG	mm²	AWG	mm²
30	0.05	12	4	4/0	120
28	0.08	10	6	250	120
26	0.14	8	10	300	150
24	0.25	6	16	350	185
22	0.34	4	25	400	185
20	0.50	2	35	450	240
19	0.75	1	50	500	240
18	1.0	1/0	50	600	300
16	1.5	2/0	70	750	400
14	2.5	3/0	95		

mm² to American Wire Gauge (AWG)

mm²	AWG	mm²	AWG
0.14	26	4	12
0.25	24	6	10
0.34	22	10	8
0.50	20	16	6
0.75	19	25	4
1.0	18	35	2, 1
1.5	16	50	1/0
2.5	14	70	2/0, 3/0

Conversion Factors

Length			
millimeter (mm)	= inch × 25.40	inch (in)	= millimeter × 0.0394
meter (m)	= foot × 0.3048	foot (ft)	= meter × 3.281
kilometer (km)	= mile × 1.609	mile (mi)	= kilometer × 0.6214
Ω/km	= Ω/mft × 0.3048	Ω/mft	= Ω/km × 3.281

Mass			
gram (g)	= ounce × 28.35	ounce (oz)	= gram × 0.0353
kilogram (kg)	= pound × 0.4536	pound (lb)	= kilogram × 2.205
kg/km	= lb/mft × 1.488	lb/mft	= kg/km × 0.6720

Area			
sq. centimeter (cm^2)	= sq. inch × 6.452	sq. inch (in^2)	= sq. centimeter × 0.1550
sq. meter (m^2)	= sq. foot × 0.0929	sq. foot (ft^2)	= sq. meter × 10.76
sq. kilometer (km^2)	= sq. mile × 2.590	sq. mile (mi^2)	= sq. kilometer × 0.3861
circular mil	= square mil × 1.273	square mil	= circular mil × 0.7854
mm^2 = (strand mm)^2 × (# strands) × 0.7854			

Volume			
cu. centimeter (cm^3)	= cu. inch x 16.39	cu. inch (in^3)	= cu. centimeter x 0.0610
cu. meter (m^3)	= cu. foot x 0.0283	cu. foot (ft^3)	= cu. meter x 35.31

Disclaimer

The products and specifications set forth in this brochure are subject to change without notice and Lapp Group disclaims any and all liability for such variations. The Lapp Group further disclaims any and all liability for typographical, printing, or production errors or changes affecting the products and/or the specifications.

For the use of our products is valid
The conformity of our products with the relevant European directives and compliance with the provisions contained therein shall be indicated by the CE marking.

The safety of our products is closely associated with how they are used. A knowledge of and adherence to the respective international/national standards of use (e.g.: DIN VDE 0100; 0298) are mandatory.

There are particular risks if installed improperly. This applies to all our products/items.

Processing is only to be done by an authorized electrician! Otherwise, there is a risk of an electric shock or a fire ignited by electric current!

Safety
Without exception our products are tested for application safety in accordance with established standards and our own regulations, which complement the standards. Relevant legal requirements and safety regulations are also observed. Provided due care and attention are paid, the possibility of product-specific danger to the user may thus reasonably be excluded. Where products are used carelessly or incorrectly, however, considerable danger to persons and the environment may arise. For this reason, our cables must only be processed and/or used responsibly by trained electricians or specialists. This catalog contains general information for the application of each product. Independent of such information, the application standards of DIN VDE 0298 and DIN VDE 001 for cables will apply. Excerpts from these standards, as well as complementary selection and application tables and design and installation guidelines, can be found in our full line catalog. Our machines and installation tools are where necessary designed in accordance with the machine guidelines and display the CE identification mark. It must be noted, however, that our machines and installation tools must only be used by trained specialized personnel and for the purpose for which they were designed.

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