

# A Spotless Record in Food and Beverage Production



POWER, CONTROL, SIGNAL & DATA CONNECTION SOLUTIONS



**LAPP GROUP**



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# Helping you maintain a safe and hygienic operation.

If you are involved with a food and beverage operation, you know that product safety and compliance are paramount. One of your biggest concerns is bacteria, which can form in the most unexpected places – including often-overlooked locations within your machine's cabling and connectors. Lapp Group has a long history of helping manufacturers keep these areas as clean and germ-free as possible through innovative products that are designed to resist bacteria and other contaminants.

We have been collaborating with many well-known organizations within all market segments to help them increase the productivity and safety compliance of their food and beverage operations.

- Dairy processing/technology
- Meat and fish processing
- Baking and confectionery processing
- Bottling plants
- Packaging equipment

You'll find Lapp Group components hard at work powering operations and providing optimum hygiene protection in three key manufacturing zones:

## 1 Food zone

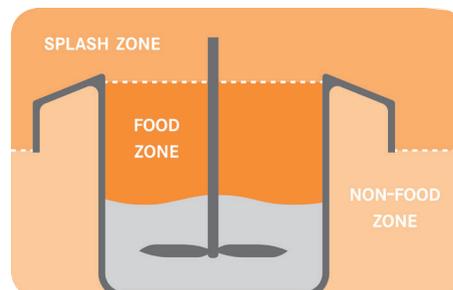
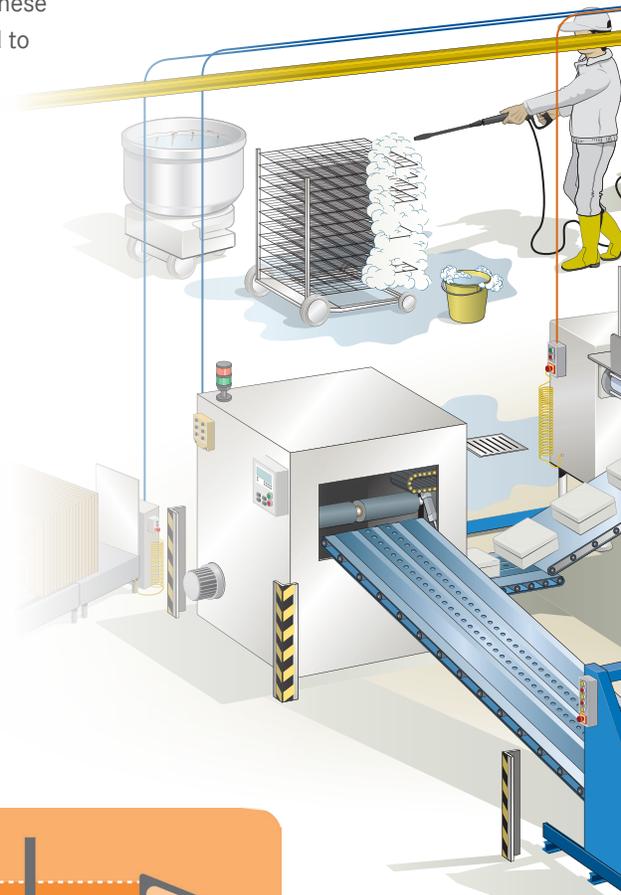
This is where machine parts such as stirrers, filling nozzles, blades, and cutters come in direct contact with food.

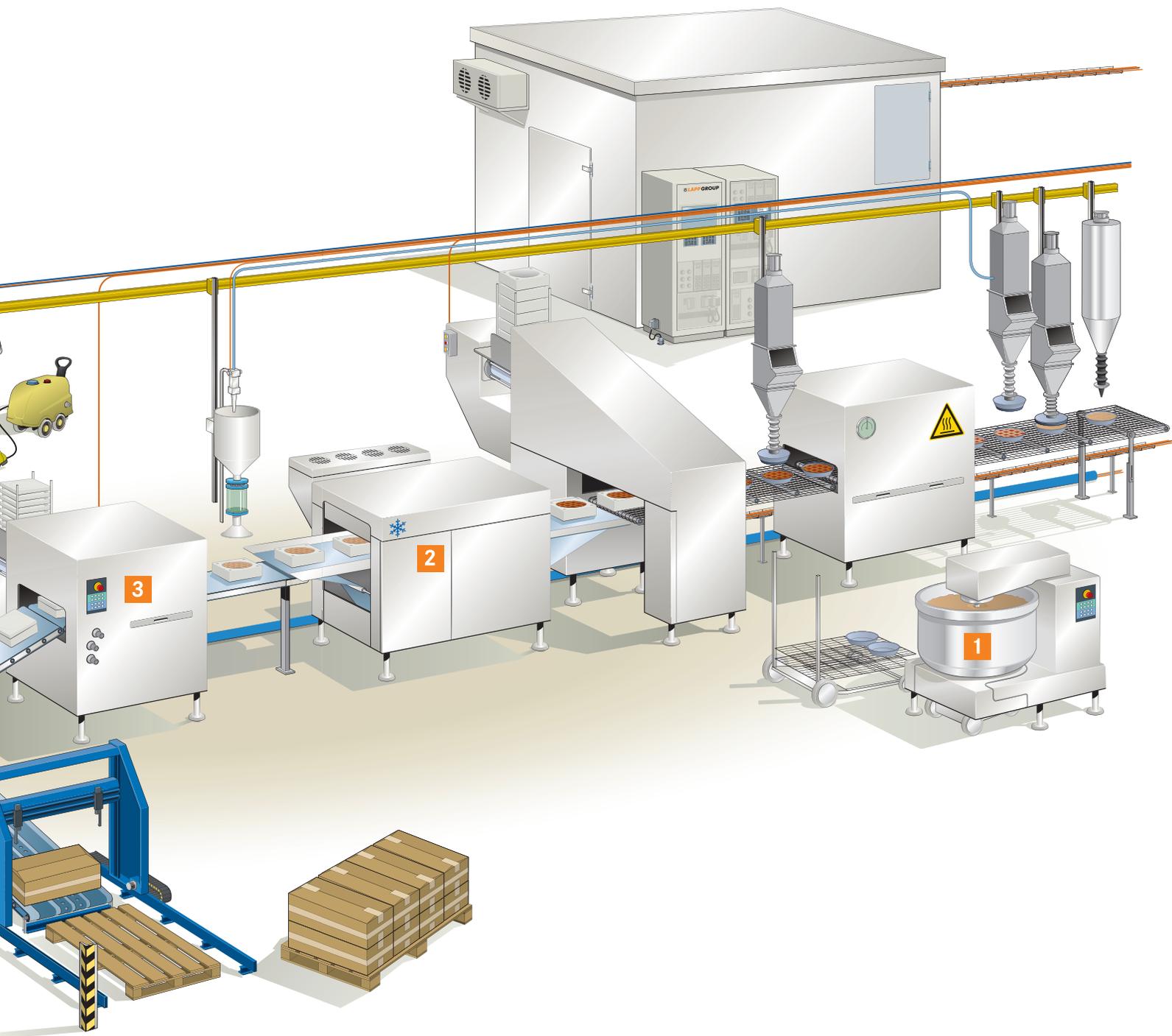
## 2 Splash zone

These are areas and machines that come in contact with food through spraying.

## 3 Non-food zone

This includes all parts of the plant not in direct contact with food, such as secondary packing machines, as well as equipment located outside washdown areas.







# A spotless record in food and beverage production.



The Food Safety Modernization Act of 2011 (FSMA) states that food producers must take all the necessary steps to prevent food-borne illnesses and pathogens. This reform is critically important to both manufacturers and consumers.

- One food-borne pathogen can shut down an entire plant, which along with the associated reopening, can result in many hours of downtime that can cost millions of dollars.
- Roughly one in six Americans will contract a food-borne illness every year.

Lapp Group helps manufacturers remain compliant by offering a reliable range of products that are Ecolab certified and use FDA approved materials. They provide maximum uptime and safety for food and beverage manufacturing applications; and with eight integrated brands to choose from, you can rely on Lapp Group to be the only resource you'll ever need.



Statistics from [www.cdc.gov](http://www.cdc.gov)



### **SKINTOP® INOX and SKINTOP® HYGIENIC**

Leading the way are our FSMA-compliant cable glands SKINTOP® INOX and SKINTOP® HYGIENIC. These are compact, corrosion-resistant stainless steel cable glands that have unique design features that prevent microorganisms and bacteria from sticking to surfaces. Their smooth surfaces and large corner radii, as well as the lack of exposed threads, prevent the accumulation of bacteria and fluids for the safest cleaning possible.

Both of these SKINTOP® products feature specially molded seals to eliminate any gaps between components where bacteria can collect. Instead of the traditional hexagonal capnut design, rounded edges and flat surfaces allow for the tightening of the gland without the corners and grooves in which microbes could settle. SKINTOP® cable glands are also compliant with industry standards for sanitary fabrication design.

### **Laboratory and workplace tested**

In laboratory tests, SKINTOP® HYGIENIC and SKINTOP® INOX have been classified as harmless in the production of food and beverages. HYGIENIC is built with FDA-approved materials and both carry ECOLAB certification. They also passed a mechanical load test for sealing ability and strain relief. With SKINTOP® glands, you can be assured of consistent, durable and contaminant-free performance.

### **SILVYN® protective cable conduit and connectors**

Lapp Group's SILVYN® line is the perfect complement to SKINTOP® at helping to ensure a bacteria-free connection environment. SILVYN® food-grade PVC conduits and connectors made with FDA-approved material and carry ECOLAB certification. Designed especially for food and beverage applications, Lapp Group's SILVYN® conduit and connectors have you covered by providing a pathogen-free connection environment.





# Eight brands. One powerful choice.

Only Lapp Group can deliver a complete range of power control, signal, and data connection solutions that have proven reliability, safety and durability; and are renowned for optimum performance in the most demanding food and beverage environments.

With Lapp Group, you will realize the many advantages of dealing with a single resource that offers global expertise, product innovation, personalized support, and local distribution. And you will be partnering with a recognized industry leader that offers so many benefits.

## **Consistent quality, performance, and durability across all brands**

From cables and glands to connectors and wires, each Lapp Group product line has proven to withstand the most extreme environments, while providing you with maximum uptime.

## **The best-integrated solutions**

All Lapp Group products are renowned for unrivaled reliability. A complete solution from Lapp only further enhances the performance of our individual products.

## **A single sales team that knows you and your needs**

When you make Lapp Group your one source, you partner with a team that knows your industry, applications, environment, and how to solve your most challenging problems.

## **Coast to coast distribution for greater product availability**

All of Lapp Group brands are delivered through distributors located strategically across North America. This helps ensure that you get the products you want when you need them.

## **Components or complete assemblies**

Lapp Group's full suite of brands allows us to provide products as complete assemblies or as individual components; offering you the right fit for every application.

## **Simplified ordering process**

The full assortment of Lapp Group brands is one call or online order away. You'll be able to deal with your current sales representative for all your product needs.

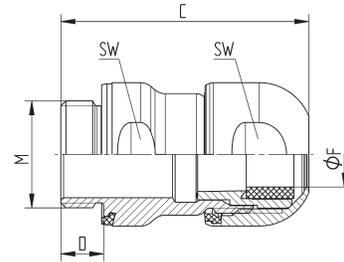
## **LAPP GROUP'S EIGHT BRANDS INCLUDE:**

- **ÖLFLEX®**  
Power & Control Cables
- **SKINTOP®**  
Strain Relief Glands
- **EPIC®**  
Industrial Connectors
- **UNITRONIC®**  
Data Cables
- **HITRONIC®**  
Fiber Optic Cables
- **SILVYN®**  
Protective Conduit
- **ETHERLINE®**  
Industrial Ethernet Cables
- **FLEXIMARK®**  
Cable Marking Systems



### SKINTOP® HYGIENIC/HYGIENIC-R

Stainless Steel Strain Relief with Metric Thread



SKINTOP® HYGIENIC is a stainless steel cable gland that uses FDA-approved material and is made with special design features that prevent micro-organisms and bacteria from sticking to the surface. The gland has an IP68/69K rating and withstands high pressure and high temperature washdowns.

#### Application Advantage

- Special sealing element for food and beverage industry
- FDA-approved sealing
- IP68/69K protection

#### Approvals



#### Technical Data

<b>Material:</b> - Body: Stainless steel: V4A - Insert: Polyamide - Sealing element: Special elastomer	<b>Temperature Range:</b> -20°C to +100°C  <b>IP Protection:</b> IP68 IP69K
<b>Locknuts:</b> Add SM-M locknuts	

Part Number	Thread Type & Size	øF Clamping Range		SW Wrenching Flats	C Overall Length	D Thread Length	Standard Pack Size
		(in)	(mm)	(in)	(in)	(in)	
<b>SKINTOP® HYGIENIC: Standard</b>							
53105100	M12 x 1.5	0.158 - 0.236	4 - 6	0.630	1.572	0.256	5
53105110	M16 x 1.5	0.256 - 0.355	6.5 - 9	0.788	1.710	0.276	5
53105120	M20 x 1.5	0.355 - 0.473	9 - 12	0.946	1.828	0.315	5
53105130	M25 x 1.5	0.453 - 0.611	11.5 - 15.5	1.143	1.927	0.315	5
<b>SKINTOP® HYGIENIC-R: Reducer Bushing</b>							
53105200	M12 x 1.5	0.079 - 0.177	2 - 4.5	0.630	1.572	0.256	5
53105210	M16 x 1.5	0.177 - 0.276	4.5 - 7	0.788	1.710	0.276	5
53105220	M20 x 1.5	0.276 - 0.394	7 - 10	0.946	1.828	0.315	5
53105230	M25 x 1.5	0.355 - 0.493	9 - 12.5	1.143	1.927	0.315	5

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## SILVYN® FG NM

## Flexible Liquid-Tight Conduit



SILVYN® FG NM is a flexible non-metallic conduit suitable for use in various industrial applications. SILVYN® is made with FDA-approved material, is ECOLOAB certified, and is ideal for applications in the production and processing of milk and meat products.

#### Application Advantage

- FDA-approved outer sheath
- Protects against liquids
- Flame retardant

#### Approvals



#### Complete the Installation



SILVYN®  
HYGIENIC



SILVYN®  
FG AMG-M

#### Technical Data

Material:	Special soft PVC sheath with hard PVC spiral	RAL Color:	Blue
Temperature Range:	-20°C to +60°C	Approvals:	RoHS
- Short-term:	up to +80°C		

Part Number	Outer Diameter		Inner Diameter		Stationary Bend Radius		Conduit Coil Put-Ups (ft)	Thread Size for Fittings
	(in)	(mm)	(in)	(mm)	(in)	(mm)		
55503370	0.701	17.8	0.496	12.6	2.758	70	98	M16 x 1.5
55503371	0.831	21.1	0.630	16.0	3.940	100	98	M20 x 1.5
55503372	1.040	26.4	0.827	21.0	5.122	130	98	M25 x 1.5
55503373	1.304	33.1	1.044	26.5	7.092	180	98	M32 x 1.5
55503374	1.647	41.8	1.383	35.1	8.865	225	49	M40 x 1.5
55503375	1.883	47.8	1.588	40.3	10.047	255	49	M50 x 1.5
55503376	2.360	59.9	2.033	51.6	12.214	310	49	M63 x 1.5

**SILVYN® HYGIENIC**

Stainless Steel Connector for SILVYN® FG/FG NM Conduit



SILVYN® HYGIENIC is a conduit connector designed especially for use with SILVYN® FG and SILVYN® FG NM to create a bacteria resistant, edge-free, robust and reliable connection. It has no gaps, voids or outer-facing thread, eliminating the risk of contamination of food machines, facilities or components. It also has high chemical and thermal stability with very aggressive media such as detergents and disinfectants, acids and alkalis, etc.

#### ■ Approvals

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#### ■ Technical Data

Material: <ul style="list-style-type: none"> <li>- Body: Stainless steel 316</li> <li>- Insert: Nickel-plated brass</li> <li>- Inner seal: Polyamide 6</li> <li>- Sealing: Special elastomer</li> </ul>	Temperature Range: -50°C to +135°C
IP Protection: <ul style="list-style-type: none"> <li>IP66</li> <li>IP67</li> <li>IP68 (2 bar)</li> <li>IP69</li> </ul>	

Part Number	Thread Size	Internal Diameter		Fits SILVYN® FG NM Conduit	Standard Pack Size
		(in)	(mm)		
55510700	M16 x 1.5	0.422	10.7	55503370	1
55510701	M20 x 1.5	0.571	14.5	55503371	1
55510702	M25 x 1.5	0.737	18.7	55503372	1
55510703	M32 x 1.5	0.969	24.6	55503373	1
55510704	M40 x 1.5	1.288	32.7	55503374	1
55510705	M50 x 1.5	1.485	37.7	55503375	1

## SILVYN® FG AMG-M

Stainless Steel Connector for SILVYN® FG NM Conduit



### ■ Approvals



SILVYN® AMG-M FG is a conduit connector designed especially for use in the food and beverage industry. The connector has special sealing that is FDA and NSF-approved.

### ■ Technical Data

Material:	- Body:	Stainless steel 316	Temperature Range:	-45 °C to +105 °C	
	- Inner seal:	Polyamide 6		IP Protection:	IP69
	- O-ring & outer seal:	FDA-approved TPE			

Part Number	Thread Size	Internal Diameter		Conduit Outer Diameter		Wrench Size		Fits SILVYN® FG NM Conduit	Standard Pack Size
		(in)	(mm)	(in)	(mm)	(in)	(mm)		
55503275	M16 x 1.5	0.402	10.2	0.701	17.8	1.064	27	55503370	10
55503276	M20 x 1.5	0.548	13.9	0.831	21.1	1.182	30	55503371	10
55503277	M25 x 1.5	0.729	18.5	1.040	26.4	1.418	36	55503372	5
55503278	M32 x 1.5	0.938	23.8	1.304	33.1	1.812	46	55503373	5
55503271	M40 x 1.5	1.253	31.8	1.647	41.8	2.128	54	55503374	2
55503269	M50 x 1.5	1.450	36.8	1.883	47.8	2.482	63	55503375	1
55503397	M63 x 1.5	1.883	47.8	2.360	59.9	3.034	77	55503376	1

### UNITRONIC® SENSOR HD M12

S/A Cable: Hygienic Design for Food & Beverage



These pre-tested molded cordsets utilize high-quality continuous flex cable and integral molded strain relief. Made specifically with food and beverage applications in mind, these cordsets have a hygienic design to provide interconnection between sensors and actuators with reliable performance.

#### Recommended Applications

Food production and packaging machinery, freezing plants, cold storage, washdown areas with frequent contact with cleaning agents

#### Construction

**Conductors:** Stranded tinned copper

**Jacket:** TPE halogen-free, grey (similar to RAL 7035)

**Knurl:** Stainless steel (V4A)

**Gripping body:** Polypropylene

#### Application Advantage

- Hygienic design for ideal cleaning results
- Guaranteed density by meeting the highest protection class
- Stainless steel knurl to ensure protection against corrosion
- Bright colors to quickly detect contamination

#### Approvals



#### Technical Data

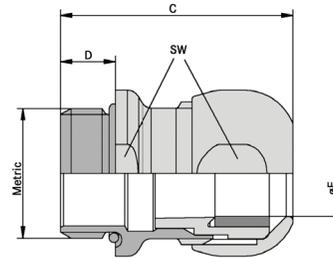
<b>Minimum Bend Radius:</b> - for stationary use: 5 x cable diameter - for continuous flexing: 10 x cable diameter	<b>Nominal Voltage:</b> 250V
<b>Temperature Range:</b> - for stationary use: -40°C to +105°C - for continuous flexing: -25°C to +105°C	<b>Coding:</b> A-coded

Part Number	Number of Pins	Length (ft)	Design
<b>Plugs</b>			
22262040	4	6.6	Straight
22262041	4	16.4	Straight
22262060	4	24.6	Straight
22262042	4	32.8	Straight
22262061	4	49.2	Straight
<b>Sockets</b>			
22262043	4	6.6	Straight
22262044	4	16.4	Straight
22262062	4	24.6	Straight
22262045	4	32.8	Straight
22262063	4	49.2	Straight
122262046	4	6.6	Angled
22262047	4	16.4	Angled
22262064	4	24.6	Angled
22262048	4	32.8	Angled
22262065	4	49.2	Angled

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## SKINTOP® INOX/INOX-R

Stainless Steel Strain Relief with NPT and Metric Thread



SKINTOP® INOX is a stainless steel cable gland with special design features that prevent micro-organisms and bacteria from sticking to the surface. The gland has an IP68/69K rating and withstands high-pressure and high-temperature wash downs.

### Application Advantage

- Highly corrosion-resistant
- Smooth surface
- No edges
- IP68/69K protection
- Wide variable clamping ranges

### Approvals



### Technical Data

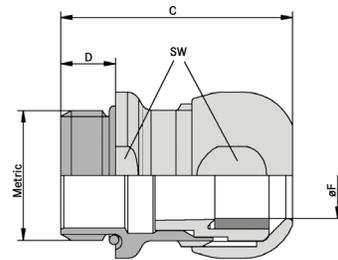
Material:	- Body:	Stainless steel: V4.A (1.4404/316L)	IP Protection:	IP68, 5 bar (Exceeds NEMA 6/6P pressure rating)
	- Insert:	Polyamide		IP69K
	- Sealing ring:	Silicone		
	- O-ring:	Silicone		
Temperature Range:	-40°C to +100°C		Approvals:	According to DIN EN ISO 14 159 According to DIN EN 1672-2 According to EHEDG

Part Number	Thread Type & Size	øF Clamping Range (in) (mm)		SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
<b>SKINTOP® INOX: Standard NPT</b>							
53806780	NPT ½"	0.276 - 0.512	7 - 13	0.945	1.673	0.591	5
53806781	NPT ¾"	0.354 - 0.669	9 - 17	1.142	1.819	0.591	5
53806782	NPT 1"	0.433 - 0.827	11 - 21	1.417	1.992	0.591	5
53806783	NPT 1¼"	0.748 - 1.102	19 - 28	1.772	2.331	0.669	5
53806784	NPT 1½"	1.063 - 1.378	27 - 35	2.126	2.488	0.669	5
<b>SKINTOP® INOX: Standard Metric</b>							
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
<b>SKINTOP® INOX-R: Reducer Bushing</b>							
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



### SKINTOP® INOX SC

Stainless Steel Strain Relief for EMC Applications



SKINTOP® INOX SC is a stainless steel cable gland for EMC applications with special design features that prevent micro-organisms and bacteria from sticking to the surface. The gland has an IP68/69K rating and withstands high-pressure and high-temperature washdowns.

#### Application Advantage

- Highly corrosion resistant
- Smooth surface
- No hard edges
- IP68/69K protection

#### Approvals



#### Technical Data

Material:	- Body:	Stainless steel: V4.A (1.4404/316L)	IP Protection:	IP68, 5 bar (Exceeds NEMA 6/6P pressure rating)
	- Insert:	Polyamide		IP69K
	- Sealing ring:	Silicone		
	- O-ring:	Silicone		
Temperature Range:	-40°C to +100°C		Approvals:	According to DIN EN ISO 14 159 According to DIN EN 1672-2 According to EHEDG

Part Number	Thread Type & Size	øF Clamping Range		SW Wrenching Flats (in)	C Overall Length (in)	D Thread Length (in)	Standard Pack Size
		(in)	(mm)				
<b>SKINTOP® INOX SC</b>							
53806720	M12 x 1.5	0.158 - 0.276	4.0 - 7.0	0.630	1.154	0.256	5
53806722	M16 x 1.5	0.236 - 0.394	6.0 - 10.0	0.788	1.277	0.276	5
53806724	M20 x 1.5	0.276 - 0.493	7.0 - 12.5	0.946	1.399	0.315	5
53806726	M25 x 1.5	0.355 - 0.670	9.0 - 17.0	1.143	1.214	0.315	5
53806728	M32 x 1.5	0.433 - 0.827	11.0 - 21.0	1.418	1.757	0.355	5

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EPIC® ULTRA HB Housings

EPIC® ULTRA HB housings have a hard, electrically conductive, and corrosion-resistant nickel finish. Latching levers and bolts are stainless steel for strength and corrosion resistance. An integrated SKINTOP® gland in the hoods and surface mount bases provides a self-centering radial seal and strain relief. For electrically noisy environments where shielded cable is used, a SKINTOP® BRUSH insert provides a 360° low-resistance contact area with the cable shield. This configuration forms a conductive shell around the wire terminations that virtually eliminates electrical interference.

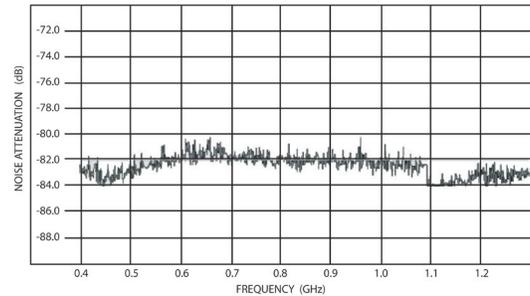


Housings					Plugs & Receptacles						
ULTRA	HBE	HA	HQ	STA	HEE	HBS	HBVE	HD	HDD	MC	Mixed Power
HB 6	HBE 6	—	—	—	HEE 10	—	—	—	HDD 24	2 Modules	—
HB 10	HBE 10	—	—	—	HEE 18	—	HBVE 3	—	HDD 42	3 Modules	—
HB 16	HBE 16	—	—	—	HEE 32	HBS 6	HBVE 6	HD 40	HDD 72	5 Modules	4+0, 4+2
HB 24	HBE 24	—	—	—	HEE 46	—	HBVE 10	HD 64	HDD 108	7 Modules	4+8

Technical Data

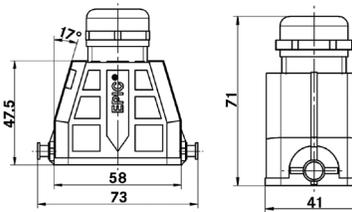
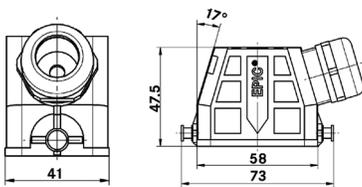
- Material:
  - Housing: Nickel-plated die-cast zinc
  - Lever & bolts: Stainless steel
  - Sealing: NBR
  - Gland cap nut: Nickel-plated brass
  - Gland insert: PA thermoplastic
  - Gland seal: Special chloroprene elastomer

EPIC ULTRA HB HOUSINGS w/BRUSH



EPIC® ULTRA HB 6 Hoods

Single Lever Bolts



All dimensions are in mm.



Technical Data

- Specifications: DIN EN 60529, DIN EN 6988
- Temperature Range: -40°C to +100°C
- Protection Class: IP65, UL 50E, certified to NEMA 4, 4X & 12
- Corrosion Resistance: 72-hour salt spray per DIN EN 60068-2, 480-hour salt spray per DIN EN ISO 9227
- Material: See EPIC® ULTRA HB Housings material specifications above

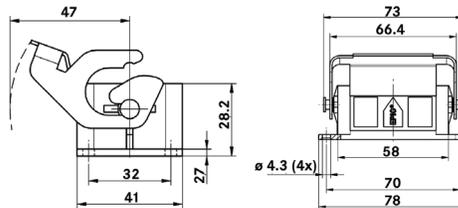
Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
<b>Top Entry</b>			
70250200	6-13 mm	—	No
70250201	9-17 mm	—	No
70250202	9-17 mm	6 mm	Yes
<b>Side Entry</b>			
70250203	6-13 mm	—	No
70250204	9-17 mm	—	No
70250205	9-17 mm	6 mm	Yes

Approvals



### EPIC® ULTRA HB 6 Panel Mount Bases

#### Single Lever



All dimensions are in mm.

#### Technical Data

**Specifications:** DIN EN 60529, DIN EN 6988

**Temperature Range:** -40°C to +100°C

**Protection Class:** IP65, UL 50E, certified to NEMA 4, 4X & 12

**Corrosion Resistance:** 72-hour salt spray per DIN EN 60068-2  
480-hour salt spray per DIN EN ISO 9227

**Material:** See EPIC® ULTRA HB Housings material specifications on page 17

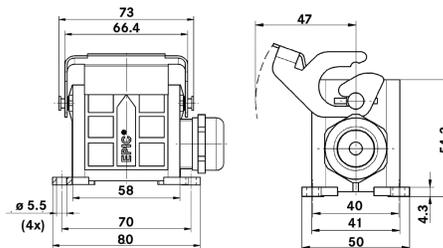
Description	Part Number
Panel Mount Base	70250206

#### Approvals



### EPIC® ULTRA HB 6 Surface Mount Bases

#### Single Lever



All dimensions are in mm.

#### Technical Data

**Specifications:** DIN EN 60529, DIN EN 6988

**Temperature Range:** -40°C to +100°C

**Protection Class:** IP65, UL 50E, certified to NEMA 4, 4X & 12

**Corrosion Resistance:** 72-hour salt spray per DIN EN 60068-2  
480-hour salt spray per DIN EN ISO 9227

**Material:** See EPIC® ULTRA HB Housings material specifications on page 17

Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
<b>1 Entry</b>			
70250207	6-13 mm	—	No
70250208	9-17 mm	—	No
70250209	9-17 mm	6 mm	Yes

#### Approvals

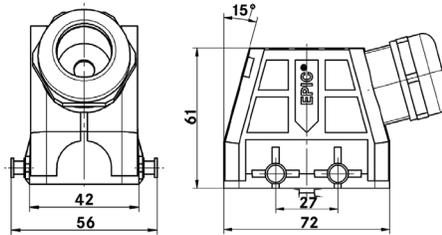


Photographs are not to scale and are not true representations of the products in question.

If not otherwise specified, all values relating to the product are nominal values. For current information go to our website.

EPIC® ULTRA HB 10 Hoods

Double Lever Bolts



All dimensions are in mm.



■ Technical Data

Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	IP65, UL 50E, certified to NEMA 4, 4X & 12		

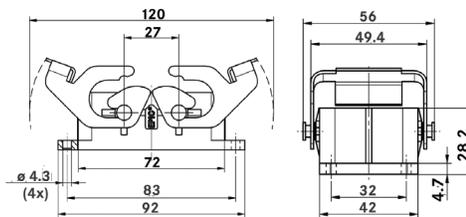
Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
<b>Side Entry</b>			
70250210	6 - 13 mm	—	No
70250211	9 - 17 mm	—	No
70250212	9 - 17 mm	6 mm	Yes

■ Approvals



EPIC® ULTRA HB 10 Panel Mount Bases

Double Levers



All dimensions are in mm.



■ Technical Data

Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	IP65, UL 50E, certified to NEMA 4, 4X & 12		

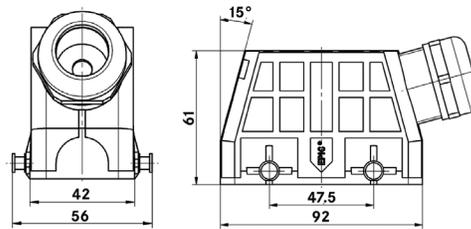
Description	Part Number
Panel Mount Base	70250213

■ Approvals



### EPIC® ULTRA HB 16 Hoods

#### Double Lever Bolts



All dimensions are in mm.

#### Technical Data

Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	IP65, UL 50E, certified to NEMA 4, 4X & 12		

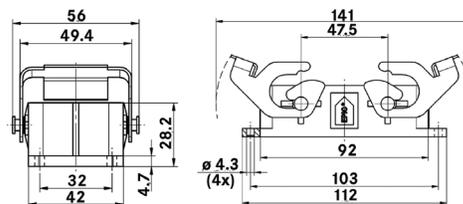
Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
<b>Side Entry</b>			
70250214	7 - 15 mm	—	No
70250215	11 - 21 mm	—	No
70250216	11 - 21 mm	8 mm	Yes

#### Approvals



### EPIC® ULTRA HB 16 Panel Mount Bases

#### Double Levers



All dimensions are in mm.

#### Technical Data

Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	IP65, UL 50E, certified to NEMA 4, 4X & 12		

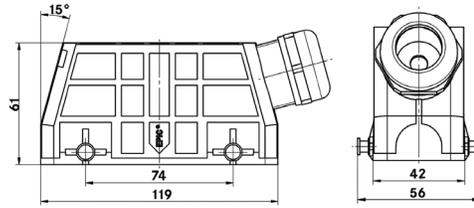
Description	Part Number
Panel Mount Base	70250217

#### Approvals



Photographs are not to scale and are not true representations of the products in question. If not otherwise specified, all values relating to the product are nominal values. For current information go to our website.

EPIC® ULTRA HB 24 Hoods  
Double Lever Bolts



All dimensions are in mm.

■ Technical Data

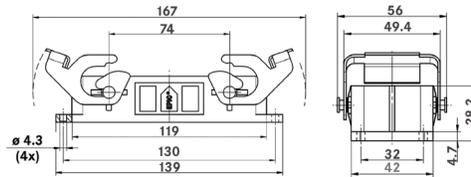
Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	NEMA 4, NEMA 4X, NEMA 12, IP65; Third party tested		

Part Number	Cable OD Range	Min. OD for Braided Shield	Brush
<b>Side Entry</b>			
70250219	7-15 mm	—	No
70250220	11-21 mm	—	No
70250221	11-21 mm	8 mm	Yes

■ Approvals



EPIC® ULTRA HB 24 Panel Mount Bases  
Double Levers



All dimensions are in mm.

■ Technical Data

Specifications:	DIN EN 60529, DIN EN 6988	Corrosion Resistance:	72-hour salt spray per DIN EN 60068-2 480-hour salt spray per DIN EN ISO 9227
Temperature Range:	-40°C to +100°C	Material:	See EPIC® ULTRA HB Housings material specifications on page 17
Protection Class:	NEMA 4, NEMA 4X, NEMA 12, IP65; Third party tested		

Description	Part Number
Panel Mount Base	70250222

■ Approvals



### EPIC® Pin & Sleeve Connectors & Devices

#### IP67 Watertight



Voltage / Current Rating	# of Poles	Ground-Clock Position	Color Code	CEE Plug	CEE Connector	CEE Angled Panel Mount Receptacle	CEE Flush Mount Receptacle	CEE Wall Mount Inlet	CEE Flush Mount Inlet	ULYSSE Mechanical Interlock*	ALUPRES Mechanical Interlock*
<b>20A North American Standard</b>											
125	1+N+PE	4	Yellow	477203FX	473203FX	471263FX	—	476203FX	—	400124FX	460124FX
250	2+PE	6	Blue	477303FX	473303FX	471363FX	—	476303FX	—	400126FX	460126FX
3Ø 250	3+PE	9	Blue	477313FX	473313FX	471373FX	—	476313FX	—	400139FX	460139FX
3Ø 480	3+PE	7	Red	477513FX	473513FX	471573FX	—	476513FX	—	400137FX	460137FX
<b>30A North American Standard</b>											
125	1+N+PE	4	Yellow	477206FX	473206FX	471267FX	—	476206FX	—	400224FX	460224FX
250	2+PE	6	Blue	477306FX	473306FX	471367FX	—	476306FX	—	400226FX	460226FX
3Ø 250	3+PE	9	Blue	477316FX	473316FX	471377FX	—	476316FX	—	400239FX	460239FX
3Ø 480	3+PE	7	Red	477516FX	473516FX	471577FX	—	476516FX	—	400237FX	460237FX
3Ø Y 120/208	3+N+PE	9	Blue	477326FX	473326FX	471387FX	—	476326FX	—	400249FX	460249FX
<b>60A North American Standard</b>											
3Ø 250	3+PE	9	Blue	477317FX	473317FX	546322FX	446322FX	—	476317FX	408339FX	—
3Ø 480	3+PE	7	Red	477517FX	346350FX	546350FX	446350FX	—	476517FX	408337FX	—
3Ø 120/208	3+N+PE	9	Blue	477327FX	473327FX	556322FX	456322FX	—	476327FX	408349FX	—
<b>100A North American Standard</b>											
3Ø 250	3+PE	9	Blue	477318FX	473318FX	549322FX	449322FX	—	476318FX	—	—
3Ø 480	3+PE	7	Red	249550FX	349550FX	549550FX	449550FX	—	749550FX	—	—
3Ø 120/208	3+N+PE	9	Blue	477328FX	473328FX	559322FX	459322FX	—	476328FX	—	—
<b>16A International Standard</b>											
110 - 130	2+PE	4	Yellow	477203	473203	471263	—	476203	—	400124	460124
200 - 250	2+PE	6	Blue	477303	473303	471363	—	476303	—	400126	460126
200 - 250	3+PE	9	Blue	477313	473313	471373	—	476313	—	400139	460139
380 - 415	3+PE	6	Red	477413	473413	471473	—	476413	—	400136	460136
200 - 250	3+N+PE	9	Blue	477323	473323	471333	—	476323	—	400149	—
380 - 415	3+N+PE	6	Red	477423	473423	471483	—	476423	—	400146	460146
<b>32A International Standard</b>											
110 - 130	2+PE	4	Yellow	477206	473206	471267	—	476206	—	400224	460224
200 - 250	2+PE	6	Blue	477306	473306	471367	—	476306	—	400226	460226
200 - 250	3+PE	9	Blue	477316	473316	471377	—	476316	—	400239	460239
380 - 415	3+PE	6	Red	477416	473416	471477	—	476416	—	400236	460236
200 - 250	3+N+PE	9	Blue	477326	473326	471387	—	476326	—	400249	460249
380 - 415	3+N+PE	6	Red	477426	473426	471487	—	476426	—	400246	460246
<b>63A International Standard</b>											
200 - 250	3+PE	9	Blue	477317	473317	546322	446322	—	476317	408339FX	—
380 - 415	3+PE	6	Red	477417	346338	546338	446338	—	746338	408337FX	—
200 - 250	3+N+PE	9	Blue	477327	473327	556322	456322	—	476327	408349FX	—
380 - 415	3+N+PE	6	Red	477427	356338	556338	456338	—	756338	—	—
<b>125A International Standard</b>											
200 - 250	3+PE	9	Blue	477318	473318	549322	449322	—	476318	—	—
380 - 415	3+PE	6	Red	249538	349538	549538	449538	—	749538	—	—
200 - 250	3+N+PE	9	Blue	477328	473328	559322	459322	—	476328	—	—
380 - 415	3+N+PE	6	Red	259538	359538	559538	459538	—	759538	—	—

\*For use with plugs. MULTIMAX IP67 plug & connectors are also available.

#### Watertight Covers for IP67 Plugs & Inlets North American & International Devices

Part Number	Device Rating	Plug Type
476903	20/16	2+PE
476913	20/16	3+PE
476923	20/16	3+N+PE
476905	30/32	2+PE
476905	30/32	3+PE
476925	30/32	3+N+PE
476907	60/63	all
476909	100/125	all



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# UNITRONIC® M12 Field Wireable Sensor/Actuator Connectors



### ■ Application Advantage

- Stainless steel knurl to ensure protection against corrosion
- Quick and easy on-site assembly
- Easy connection with screw clamp
- Space-saving due to compact dimensions
- For creating individual cable lengths

### ■ Approvals



### ■ Technical Data

Temperature Range:	-40°C to +85°C	Protection Rating:	IP67
Nominal Voltage:	250V	Coding:	A-coded

Part Number	Number of Pins	Cross-section		Cable Diameter	
		(AWG)	(mm <sup>2</sup> )	(in)	(mm)
<b>Plug, straight</b>					
22262049	4	24 - 19	0.25 - 0.75	0.157 - 0.236	4 - 6
<b>Socket, straight</b>					
22262050	4	24 - 19	0.25 - 0.75	0.157 - 0.236	4 - 6
<b>Socket, angled</b>					
22262051	4	24 - 19	0.25 - 0.75	0.157 - 0.236	4 - 6

### UNITRONIC® ROBUST

#### Low Frequency Halogen-free Data Transmission Cable

LAPP KABEL STUTTGART UNITRONIC® ROBUST



UNITRONIC® ROBUSt is a halogen-free data transmission cable with color coding according to DIN 47100. It is resistant to a wide range of chemical media.

#### Recommended Applications

Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works; production and processing equipment of milk and meat products; data processing, measurement and control engineering, safety related systems and as electronics cable; indoor and outdoor use.

#### Approvals



Cable Attributes			
OIL	OR-02	FLAME	FR-01
MOTION	FL-02	MECH.	MP-03

#### Unshielded Construction

**Conductors:** Stranded bare copper

**Insulation:** Special halogen-free compound

**Jacket:** Special TPE

#### Application Advantage

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with plant, animal or synthetic-based organic oils, greases and waxes
- Good resistance to ammonia compounds and bio-gases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Well-suited to frequent steam cleaning

#### Technical Data

Minimum Bend Radius: - for stationary use: 4x cable diameter - for flexible use: 10x cable diameter	Nominal Voltage: 350V
Temperature Range: - for stationary use: -50°C to +90°C - for flexible use: -40°C to +90°C	Test Voltage: 1200V
	Conductor Stranding: Class 5 fine wire
	Color Code: DIN 47100 without color repetition

Part Number	Number of Pairs	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>26 AWG (0.14 mm<sup>2</sup>)</b>					
1032000	2	0.125	3.2	3	15
1032001	3	0.133	3.4	4	17
1032002	4	0.141	3.6	6	21
1032003	5	0.153	3.9	7	25
1032004	7	0.165	4.2	10	30
1032005	8	0.192	4.9	11	40
1032006	10	0.204	5.2	14	41
1032007	12	0.220	5.6	17	50
1032009	16	0.240	6.1	22	63
1032011	25	0.303	7.7	35	95
<b>24 AWG (0.25 mm<sup>2</sup>)</b>					
1032012	2	0.149	3.8	5	21
1032013	3	0.157	4.0	7	25
1032014	4	0.169	4.3	10	31
1032015	5	0.185	4.7	12	38
1032016	7	0.200	5.1	17	47

Part Number	Number of Pairs	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>24 AWG (0.25 mm<sup>2</sup>)</b>					
1032017	8	0.250	6.2	19	66
1032018	10	0.314	6.8	24	71
1032019	12	0.275	7.0	29	81
1032021	16	0.303	7.7	38	104
1032024	25	0.374	9.5	60	151
<b>22 AWG (0.34 mm<sup>2</sup>)</b>					
1032025	2	0.165	4.2	7	29
1032026	3	0.173	4.4	10	32
1032027	4	0.188	4.8	13	41
1032028	5	0.216	5.5	16	52
1032030	7	0.232	5.9	23	65
1032031	8	0.279	7.1	26	90
1032032	10	0.299	7.6	33	93
1032033	12	0.307	7.8	39	107
1032035	16	0.342	8.7	52	138
1032038	25	0.440	11.2	82	213

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## UNITRONIC® ROBUST C

## Low Frequency Halogen-free Data Transmission Cable

LAPP KABEL STUTTGART UNITRONIC® ROBUST C



UNITRONIC® ROBUST C is a shielded halogen-free data transmission cable with color coding according to DIN 47100. It is resistant to a wide range of chemical media.

### Recommended Applications

Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works; food and beverage industry, especially for production and processing equipment of milk and meat products; data processing, measurement and control engineering, safety related systems and as electronics cable; indoor and outdoor use.

### Approvals



Cable Attributes					
	OIL	OR-02		FLAME	FR-01
	MOTION	FL-02		MECH.	MP-03

### Shielded Construction

**Conductors:** Stranded bare copper

**Insulation:** Special halogen-free compound

**Shielding:** Tinned copper braid

**Jacket:** Special TPE

### Application Advantage

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with plant, animal or synthetic-based organic oils, greases and waxes
- Good resistance to ammonia compounds and bio-gases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Well-suited to frequent steam cleaning

### Technical Data

	Minimum Bend Radius:			Peak Voltage:	350V
	- for stationary use:	4x cable diameter		Test Voltage:	1200V
	- for flexible use:	10x cable diameter		Conductor Stranding:	Class 5 fine wire
	Temperature Range:			Color Code:	DIN 47100 without color repetition
	- for installation:	-50°C to +90°C			
	- for flexible use:	-40°C to +90°C			

Part Number	Number of Pairs	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>26 AWG (0.14 mm<sup>2</sup>)</b>					
1032050	2	0.153	3.9	9	25
1032051	3	0.161	4.1	11	28
1032052	4	0.169	4.3	14	34
1032053	5	0.181	4.6	15	38
1032055	7	0.192	4.9	19	46
1032056	8	0.228	5.8	22	60
1032057	10	0.240	6.1	26	63
1032058	12	0.248	6.3	29	70
1032061	25	0.330	8.4	56	128
<b>24 AWG (0.25 mm<sup>2</sup>)</b>					
1032062	2	0.177	4.5	13	33
1032063	3	0.185	4.7	16	40
1032064	4	0.196	5.0	19	46
1032065	5	0.220	5.6	23	57
1032067	7	0.236	6.0	29	69

Part Number	Number of Pairs	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>24 AWG (0.25 mm<sup>2</sup>)</b>					
1032068	8	0.279	7.1	34	92
1032069	10	0.295	7.5	43	101
1032070	12	0.303	7.7	48	111
1032073	25	0.417	10.6	87	202
<b>22 AWG (0.34 mm<sup>2</sup>)</b>					
1032074	2	0.192	4.9	16	44
1032075	3	0.200	5.1	20	54
1032076	4	0.224	5.7	24	66
1032077	5	0.25	6.2	28	78
1032079	7	0.314	6.8	36	95
1032080	8	0.307	7.8	45	127
1032081	10	0.326	8.3	54	137
1032082	12	0.334	8.5	61	152
1032084	16	0.370	9.4	78	191
1032086	25	0.468	11.9	116	288



### UNITRONIC® ROBUST C (TP)

#### Low Frequency Halogen-free Data Transmission Cable

LAPP KABEL STUTTGART UNITRONIC® ROBUST C (TP)



UNITRONIC® ROBUST C (TP) is a shielded halogen-free data transmission cable with twisted pairs and color coding according to DIN 47100. It is resistant to a wide range of chemical media.

#### Recommended Applications

Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage work; production and processing equipment of milk and meat products; data processing, measurement and control engineering, safety related systems and as electronics cable; indoor and outdoor use.

#### Approvals



Cable Attributes					
	OIL	OR-02		FLAME	FR-01
	MOTION	FL-02		MECH.	MP-03

#### Shielded Construction

**Conductors:** Stranded bare copper

**Insulation:** Special halogen-free compound

**Shielding:** Tinned copper braid

**Jacket:** Special TPE

#### Application Advantage

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with plant, animal or synthetic-based organic oils, greases and waxes
- Good resistance to ammonia compounds and bio-gases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Well-suited to frequent steam cleaning

#### Technical Data

Minimum Bend Radius: - for stationary use: 4x cable diameter - for flexible use: 10x cable diameter	Nominal Voltage: 350V
Temperature Range: - for stationary use: -50°C to +90°C - for flexible use: -40°C to +90°C	Test Voltage: 1200V
	Conductor Stranding: Class 5 fine wire
	Color Code: DIN 47100 without color repetition

Part Number	Number of Pairs	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>26 AWG (0.14 mm<sup>2</sup>)</b>					
1032100	2	0.208	5.3	16	31
1032101	3	0.228	5.8	19	38
1032102	4	0.250	6.2	23	46
1032103	5	0.251	6.4	27	54
1032104	6	0.279	7.1	31	63
1032105	8	0.322	8.2	43	90
1032106	10	0.342	8.7	51	93
1032107	12	0.350	8.9	57	102
<b>24 AWG (0.25 mm<sup>2</sup>)</b>					
1032108	2	0.248	6.3	23	43
1032109	3	0.279	7.1	29	56
1032110	4	0.299	7.6	38	72
1032111	5	0.311	7.9	45	85
1032112	6	0.334	8.5	49	96
1032113	8	0.405	10.3	64	135
<b>22 AWG (0.35 mm<sup>2</sup>)</b>					
1032114	2	0.279	7.1	28	56
1032115	3	0.307	7.8	39	74
1032116	4	0.330	8.4	48	90
1032117	5	0.346	8.8	58	10

Part Number	Number of Pairs	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)
<b>20 AWG (0.50 mm<sup>2</sup>)</b>					
1032118	1	0.192	4.9	20	37
1032119	2	0.311	7.9	40	72
1032120	3	0.342	8.7	52	91
1032121	4	0.370	9.4	64	112
1032122	5	0.405	10.3	77	141
1032123	6	0.437	11.1	92	170
1032124	8	0.515	13.1	123	238
1032125	10	0.570	14.5	146	247
<b>19 AWG (0.75 mm<sup>2</sup>)</b>					
1032126	2	0.334	8.5	48	84
1032127	3	0.370	9.4	69	114
1032128	4	0.421	10.7	86	149
1032129	6	0.473	12.1	132	225
1032130	8	0.578	14.7	169	15
<b>18 AWG (1.0 mm<sup>2</sup>)</b>					
1032131	2	0.354	9.0	64	98
1032132	3	0.404	10.4	84	135
1032133	4	0.444	11.3	10	168

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# UNITRONIC® BUS PB ROBUST

For PROFIBUS-DP/FMS/FIP Bus Systems, for Stationary Applications

LAPP KABEL STUTTGART UNITRONIC® BUS PB ROBUST



UNITRONIC® BUS PB ROBUST is designed specifically for automation networking application areas requiring a higher level of chemical resistance from soaps and washdown environments.

### Recommended Applications

For use for PROFIBUS-DP or FIP systems in harsh industrial environments.

### Approvals



Cable Attributes			
OIL	OR-02	FLAME	FR-02
MOTION	FL-01	MECH.	MP-03

### Shielded Construction

Conductors: Solid bare copper

Insulation: polyethylene

Shielding: Foil tape and tinned copper braid

Jacket: Special TPE

### Application Advantage

- Robust PROFIBUS cable for use under harsh environmental conditions
- Water and chemical resistance for use in a wide range of industrial applications
- High resistance to detergents, soaps etc.
- Flame-retardant according to IEC 60332-1-2

### Technical Data

Minimum Bend Radius:		Nominal Voltage:	250V
- for stationary use:	75 mm	Test Voltage:	1500V
- for flexible use:	10x cable diameter	Characteristic Impedance:	50Ω ± 15Ω
Temperature Range:			
- for flexible use:	-40°C to +90°C		

Part Number	Size / Pairs	Nominal Outer Diameter (in) (mm)		Copper Weight (lb/mft)	Approx. Weight (lb/mft)
2170620	22 AWG/1pr	0.312	8.0	18	37

### ETHERLINE® 2 Pair: CAT.5; Flexible

Industrial Ethernet Cable for Flexible Applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5



#### Construction

**Conductors:** Stranded tinned copper

**Pairs:** 2 twisted pairs or star quad

**Shielding:** Foil and copper braid

**Jacket:** PVC; green

Flexible ETHERLINE® CAT.5 cables are constructed with a high-quality foil and copper braid shield for reliable data transfer in areas where EMI is pervasive.

#### Recommended Applications

Flexible applications, wiring of industrial network devices, sensors, actuators, and cordsets.

#### Application Advantage

- Excellent EMI protection
- Oil-, flame- & UV-resistant jacket
- Conforms to PROFINET® standard
- Fast connect style allows for quick installation

#### Approvals



Cable Attributes			
OIL	OR-00	FLAME	FR-03
MOTION	FL-02	MECH.	MP-01

Complete the Installation	
SKINTOP® INOX SC	RJ45 Connectors

ÖLFLEX® CONNECT Solution	
	Industrial Ethernet Cordsets

#### Technical Data

Minimum Bend Radius: - for flexible use:	15 x cable diameter	Color Code:	White, yellow, blue, orange
Temperature Range:	-20°C to +60°C	Approvals:	UL: AWM 21694 PLTC CMG Canada: c(UL) CMG Additional: ECOLAB RoHS
Nominal Voltage:	600V (UL AWM) (not for power applications)		
Characteristic Impedance:	100Ω ± 15Ω		

Part Number	Size / Pairs	Stranding	Jacket Material	Jacket Color	Approvals	Fast Connect	Nominal Outer Diameter (in) (mm)		Approx. Weight (lbs/mft)	SKINTOP® INOX SC Metric Thread
<b>CAT.5 Cable</b>										
2170886	22 AWG/2pr	7 wire	PVC	Green	PROFINET®, UL/CSA CMG, UL AWM, 600V, ECOLAB	Yes	0.256	6.5	45	53806720

PROFINET® is a registered trademark of the PNO (PROFIBUS User Organization).

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If not otherwise specified, all values relating to the product are nominal values. For current information go to our website.

ETHERLINE® ROBUST FR

Industrial Ethernet Cable for Flexible Applications



ETHERLINE® ROBUST FR flexible cables are suitable for CAT.5e and CAT.7 applications that require a flame-retardant jacket as well as chemical, UV, and weather resistance. They are designed with a foil and braid shield to protect against EMI and ensure reliable data transmission.

Recommended Applications

Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works, food and beverage industry, especially for production and processing of dairy and meat products.

Approvals



Cable Attributes			
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the Installation	
SKINTOP® INOX SC	RJ45 Connectors

ÖLFLEX® CONNECT Solution	
	ÖLFLEX® CONNECT CABLES

Technical Data		
Minimum Bend Radius: - for stationary use: 4 x cable diameter - for flexible use: 10 x cable diameter	Color Code: - 2 pair: White, yellow, blue, orange - 4 pair: White/blue & blue, white/orange & orange, white/green & green, white/brown & brown	
		Temperature Range: - for stationary use: -50°C to +80°C - for flexible use: -40°C to +80°C
Characteristic Impedance: 100Ω ± 15Ω (1 - 100 MHz)		

Part Number	Size / Pairs	Stranding	Jacket Material	Jacket Color	Approvals	Fast Connect	Nominal Outer Diameter (in)	Nominal Outer Diameter (mm)	Approx. Weight (lbs/mft)	SKINTOP® INOX SC Metric Thread
<b>CAT.5e Cable</b>										
2170454	22 AWG/2pr	7 wire	TPE	Black	PROFINET®	No	0.268	6.8	37	53806722
<b>CAT.7 Cable</b>										
2170455	24 AWG/4pr	7 wire	TPE	Black	PROFINET®	No	0.355	9.0	54	53806724
2170456	26 AWG/4pr	7 wire	TPE	Black	—	No	0.256	6.5	27	53806720

### ÖLFLEX® 190/190 CY

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



#### ■ Unshielded Construction

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

#### ■ Shielded Construction

- Conductors:** Finely stranded bare copper
- Insulation:** Specially formulated PVC/nylon
- Shielding:** PVC inner jacket; tinned copper braid (85% coverage)
- Jacket:** Specially formulated PVC/gray

ÖLFLEX® 190 is a multi-conductor cable with a highly oil-, coolant-, and solvent-resistant PVC jacket for control and power applications in an industrial environment. It is designed for use in all electrical equipment under dry, damp, and wet conditions. ÖLFLEX® 190 CY is a shielded version for EMI and RFI protection.

#### ■ Recommended Applications

CNC machining centers, grinding machines, bottling equipment, conveyors, processing equipment, assembly lines, control panels.

#### ■ Approvals



#### ■ Application Advantage

- Extremely oil-resistant (Oil Res I & II)
- Meets NFPA 79 machinery wiring standard
- Very flexible and number-coded for easy routing and termination
- Round jacket for optimal seal with a SKINTOP® strain relief cable gland

Cable Attributes			
OIL	OR-04	FLAME	FR-02
MOTION	FL-02	MECH.	MP-02

Complete the Installation	
SKINTOP® INOX SC	EPIC® Connectors

#### ■ Technical Data

Minimum Bend Radius:		Color Code:	Black with white numbers, plus green/yellow ground
- for stationary use:	4 x cable diameter		
- shielded:	6 x cable diameter		
Temperature Range:		Approvals:	UL: MTW per UL 1063 (P/Ns with * are not MTW)
- for stationary use:	-40°C to +90°C		Attributes: UL Oil Res I/II
- for flexible use:	-5°C to +90°C		NFPA 79
Nominal Voltage:			Canada: CSA AWM I/II A/B FT1
- UL MTW/CSA AWM:	600V		CSA C22.2 210.2
- UL AWM:	1000V		Additional: Passes Impact and Crush tests per UL 1277 (excluding 20 AWG)
Test Voltage:	2000V		CE & RoHS
Conductor Stranding:			
- 20 - 6 AWG:	Class 5 fine wire*		
- 4 AWG and larger:			
- MTW:	Class K fine wire		
- AWM only:	Class 5 fine wire		
* 18 AWG meets only Class 5 cross section and DC resistance			

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ÖLFLEX® 190

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® INOX NPT Thread	Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® INOX NPT Thread
<b>20 AWG (0.50 mm<sup>2</sup>)</b>							<b>14 AWG (2.50 mm<sup>2</sup>)</b>						
602002**	2	0.253	6.4	7	40	53806739†	621641*	41	0.988	25.1	407	768	53806783
602003	3	0.265	6.7	10	42	53806739†	601650	50	1.192	30.3	437	1020	53806784
602004	4	0.285	7.2	13	51	53806780	621650*	50	1.079	27.4	504	911	53806784
602005	5	0.308	7.8	17	60	53806780	601661	61	1.265	32.1	530	1180	53806784
602007	7	0.331	8.4	23	82	53806780	621661*	61	1.142	29.0	591	1036	53806784
602009	9	0.409	10.4	30	100	53806780	601402**	2	0.337	8.6	33	88	53806780
602012	12	0.421	10.7	39	168	53806780	601403	3	0.356	9.0	49	93	53806780
602018	18	0.487	12.4	59	198	53806780	601404	4	0.386	9.8	65	121	53806780
602025	25	0.586	14.9	82	242	53806781	601405	5	0.421	10.7	81	145	53806780
<b>18 AWG (1.00 mm<sup>2</sup>)</b>							<b>12 AWG (4 mm<sup>2</sup>)</b>						
601802**	2	0.277	7.0	13	42	53806741†	601407	7	0.457	11.6	113	192	53806780
601803	3	0.291	7.4	20	44	53806783	601409	9	0.609	15.5	145	317	53806781
601803NG	3	0.291	7.4	20	44	53806780	601412	12	0.628	16.0	194	401	53806781
601804	4	0.314	8.0	26	55	53806780	601418	18	0.729	18.5	290	575	53806782
601805	5	0.340	8.6	33	64	53806780	601425	25	0.872	22.1	404	860	53806783
601807	7	0.367	9.3	46	84	53806780	<b>10 AWG (6 mm<sup>2</sup>)</b>						
601809	9	0.454	11.5	59	119	53806780	601003	3	0.492	12.5	116	223	53806781
601812	12	0.471	12.0	79	141	53806780	601004	4	0.570	14.5	155	267	53806781
601818	18	0.579	14.7	118	207	53806781	601005	5	0.623	15.8	194	322	53806781
601825	25	0.656	16.7	164	278	53806782	<b>8 AWG (10 mm<sup>2</sup>)</b>						
601834	34	0.937	23.8	206	575	53806783	600804	4	0.695	17.7	258	436	53806782
621834*	34	0.783	19.9	232	475	53806782	600805	5	0.764	19.4	323	525	53806782
601841	41	1.041	26.4	250	680	53806783	<b>6 AWG (16 mm<sup>2</sup>)</b>						
621841*	41	0.846	21.5	289	541	53806783	600604	4	0.870	22.1	413	699	53806783
601850	50	1.092	27.7	305	825	53806784	600605	5	0.955	24.3	516	842	53806783
621850*	50	0.961	24.4	336	697	53806783	<b>4 AWG (25 mm<sup>2</sup>)</b>						
<b>16 AWG (1.50 mm<sup>2</sup>)</b>							<b>2 AWG (35 mm<sup>2</sup>)</b>						
601602**	2	0.303	7.7	20	57	53806780	600204***	4	1.292	32.8	876	1405	53806784
601603	3	0.319	8.1	29	62	53806780	620204*	4	1.091	27.7	904	1165	53806784
601604	4	0.345	8.8	39	75	53806780	600205***	5	1.422	36.1	1129	1752	No option
601605	5	0.375	9.5	49	90	53806780	<b>4 AWG (16 mm<sup>2</sup>)</b>						
601607	7	0.406	10.3	68	121	53806780	600404***	4	1.118	28.4	515	950	53806784
601609	9	0.509	12.9	88	174	53806781	620404*	4	0.976	24.8	646	863	53806783
601612	12	0.557	14.1	112	209	53806781	600405***	5	1.228	31.2	645	1200	53806784
601618	18	0.644	16.4	175	298	53806782	620405*	5	1.094	27.8	807	1105	53806784
601625	25	0.733	18.6	242	417	53806782	<b>2 AWG (35 mm<sup>2</sup>)</b>						
601634	34	1.020	25.9	296	760	53806783	600204***	4	1.292	32.8	876	1405	53806784
621634*	34	0.925	23.5	339	652	53806783	620204*	4	1.091	27.7	904	1165	53806784
601641	41	1.101	28.0	357	875	53806784	600205***	5	1.422	36.1	1129	1752	No option

ÖLFLEX® 190 CY

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® INOX SC Metric Thread	Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)		Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® INOX SC Metric Thread
<b>20 AWG (0.50 mm<sup>2</sup>)</b>							<b>14 AWG (2.50 mm<sup>2</sup>)</b>						
602002CY**	2	0.329	8.4	25	66	53806722	601403CY	3	0.432	11.0	75	148	53806724
602003CY	3	0.341	8.7	30	82	53806722	601404CY	4	0.462	11.7	93	181	53806724
602004CY	4	0.361	9.2	35	88	53806722	601405CY	5	0.497	12.6	115	218	53806726
602005CY	5	0.384	9.8	41	99	53806724	601407CY	7	0.572	14.5	147	282	53806726
602007CY	7	0.407	10.3	51	112	53806724	601412CY	12	0.736	18.7	253	516	53806728
602012CY	12	0.497	12.6	73	181	53806726	601418CY	18	0.905	23.0	361	741	No option
602025CY	25	0.678	17.2	139	295	53806728	<b>12 AWG (4 mm<sup>2</sup>)</b>						
<b>18 AWG (1.00 mm<sup>2</sup>)</b>							<b>10 AWG (6 mm<sup>2</sup>)</b>						
601802CY**	2	0.353	9.0	28	75	53806722	601003CY	3	0.623	15.8	164	311	53806726
601803CY	3	0.367	9.3	40	82	53806722	601004CY	4	0.669	17.0	208	386	53806728
601804CY	4	0.390	9.9	48	106	53806724	601005CY	5	0.731	18.6	255	474	53806728
601805CY	5	0.416	10.6	57	123	53806724	601007CY	7	0.786	20.0	335	639	53806728
601807CY	7	0.443	11.3	94	139	53806724	<b>8 AWG (10 mm<sup>2</sup>)</b>						
601812CY	12	0.586	14.9	153	229	53806726	600804CY	4	0.803	20.4	324	574	53806728
601818CY	18	0.678	17.2	216	317	53806728	<b>6 AWG (16 mm<sup>2</sup>)</b>						
601825CY	25	0.764	19.4	226	436	53806728	600604CY	4	0.994	25.2	494	1115	No option
<b>16 AWG (1.50 mm<sup>2</sup>)</b>							<b>4 AWG (25 mm<sup>2</sup>)</b>						
601603CY	3	0.395	10.0	52	115	53806724	620404CY*	4	1.133	28.8	777	1153	No option
601604CY	4	0.421	10.7	66	128	53806724	<b>2 AWG (35 mm<sup>2</sup>)</b>						
601605CY	5	0.451	11.5	76	150	53806724	620204CY*	4	1.247	31.7	1051	1987	No option
601607CY	7	0.482	12.2	98	181	53806726	<b>4 AWG (16 mm<sup>2</sup>)</b>						
601612CY	12	0.656	16.7	167	311	53806728	600204***	4	1.292	32.8	876	1405	53806784
601618CY	18	0.743	18.9	235	456	53806728	<b>2 AWG (35 mm<sup>2</sup>)</b>						
601625CY	25	0.897	22.8	313	639	No option	620204CY*	4	1.247	31.7	1051	1987	No option

\* Part numbers are not MTW. \*\* 2c cable does not include ground. \*\*\* 4 AWG cable is built with 21 mm<sup>2</sup> cross-section. 2 AWG cable is built with 33.7 mm<sup>2</sup> cross-section.  
† Metric threads

### ÖLFLEX® POWER IX

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

LAPP KABEL STÜTTGART ÖLFLEX® POWER IX



#### Construction

**Conductors:** Finely stranded bare copper

**Insulation:** Rubber

**Jacket:** Neoprene/black

#### Application Advantage

- International approvals: UL, CSA, <HAR> & CE
- One cable does the job of four, reducing inventory
- One specification for easy and safe installation
- Oil-, chemical-, and abrasion-resistant jacket
- Ideal for high-stress applications in dry and damp environments
- UV-resistant jacket for outdoor use

ÖLFLEX® POWER IX is a neoprene cordage with UL/CSA SOOW and <HAR> H07RN-F approval. It has an international color code and a jacket which is resistant to oil, chemicals, and abrasion. ÖLFLEX® POWER IX can be used in European, American, Asian, and Canadian cordage applications; one cable does the work of four.

#### Recommended Applications

Power cordage for domestic and exported machinery, portable tools, data processing, control systems, commercial appliances.

#### Approvals



Cable Attributes			
OIL	OR-02	FLAME	FR-01
MOTION	FL-02	MECH.	MP-02

Complete the Installation	
SKINTOP® Strain Relief	EPIC® Pin & Sleeve

#### Technical Data

Minimum Bend Radius:	7.5 x cable diameter	Conductor Stranding:	Class 5 fine wire
Temperature Range:	-40°C to +90°C	Color Code:	VDE 0293-308: See chart below
	- <HAR> H07RN-F: -25°C to +60°C	Approvals:	UL: SOOW per UL 62 Attributes: -40°C Cold Bend Sunlight Resistant
Nominal Voltage:	600V		Canada: c(UL) SOOW
	- <HAR> H07RN-F: 450/750V		Additional: <HAR> H07RN-F CE & RoHS
Test Voltage:	2000V		

Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)	Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread	Part Number	Number of Conductors (incl. ground)	Nominal Outer Diameter (in) (mm)	Copper Weight (lbs/mft)	Approx. Weight (lbs/mft)	SKINTOP® Non-Metallic PG Thread
<b>18 AWG (17 AWG/1.00 mm²)*</b>						<b>10 AWG (9 AWG/6 mm²)*</b>					
321803	3	0.380 9.7	19	84	S2113	321003	3	0.670 17.0	123	304	S2121
321804	4	0.410 10.4	26	96	S2113	321004	4	0.720 18.3	164	366	S2129
<b>14 AWG (13 AWG/2.50 mm²)*</b>						<b>8 AWG (7 AWG/10 mm²)*</b>					
321404	4	0.590 15.0	65	216	S2121	321005	5	0.790 20.1	205	442	S2129
<b>12 AWG (11 AWG/4 mm²)*</b>											
321204	4	0.670 17.0	103	300	S2121	320803	3	0.900 22.9	197	537	S2129
321205	5	0.740 18.8	129	355	S2129	320804	4	0.980 24.9	263	652	S2136

\* AWG in parentheses will be written on cable legend per the latest UL 62 requirements.

# of Conductors	Color
3	green/yellow ground + brown + blue
4	green/yellow ground + brown + black + gray
5	green/yellow ground + blue + brown + black + gray

Photographs are not to scale and are not true representations of the products in question. If not otherwise specified, all values relating to the product are nominal values. For current information go to our website.

# FLEXIMARK® Stainless Steel Starter Set



The FLEXIMARK® stainless steel marking kit contains all components that are needed to produce marking on-site. Character holders, character strips, and cable ties are all stainless steel—SISSS2348 (AISI-316).

FLEXIMARK® stainless steel starter kit contains:

- 5 pcs Holder: 11 x 285 mm
- 5 pcs Holder: 11 x 106 mm
- 5 pcs Holder: 11 x 82 mm
- 5 pcs Holder: 11 x 58 mm
- 5 pcs Holder: 11 x 46 mm
- 40 ea. Full alphabet A-Z (plus Å, Ä, Ö, Ü)
- 40 ea. Numbers 0-9
- 40 ea. Symbols + - ± ~ = . / : ü
- 40 ea. Blank characters
- 10 pcs Cable ties (stainless steel)

## ■ Approvals



Complete the Installation	
 <p>NM Character Holders</p>	 <p>MR Character Strips</p>

Part Number	Description	Standard Pack Size
83254220	Stainless steel starter kit	1



### 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

\*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.



### 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	—

## 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.

\*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.

## Mechanical Properties



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

\* Impact and crush tests not applicable for intended end use of product.

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

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