Main catalog 2018|19

North American edition

Last updated August 2023

LAPP

hello

Dear customers and business partners,

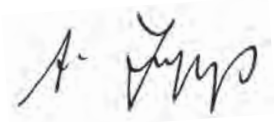
I am delighted to present our new main catalog for 2018/19 in its brand-new design. As ever, it has over 700 pages and guides you through our enormous range of reliable products, covering virtually the entire world of connection technology. We hope you like the layout and design, and that you can find the relevant products and information for your requirements in an instant.

As a successful global player, we enjoy a strong position in international markets and can help our customers wherever they are. This catalog is part of that. Available in 16 languages, it is proof of our commitment to our customers. You can also choose to browse our high-quality branded products either in printed form or online. Click, flip through, or swipe: the decision is yours.

Our company has long been characterized by continuity and progressive thinking. One example of this is our management team, which has now welcomed the third generation of the Lapp family. This is a strong signal of how we intend to remain a reliable partner in the future. A partner who focuses on helping you remain successful in the long term. LAPP is there for you wherever you are in the world. No matter where you contact us and what you order from us, you will recognize us by our consistent company logo: simply LAPP.

That is why, as a technology pioneer, we provide you with the solutions for a successful future – perfectly harmonized and ready for the challenges of the digital world. I hope you enjoy finding out more about our products.

Yours sincerely,



Andreas Lapp

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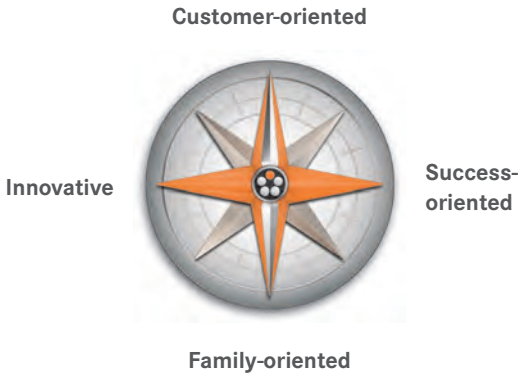
LAPP

Andreas Lapp,
Matthias Lapp,
Ursula Ida Lapp,
Alexander Lapp,
Siegbert Lapp.

family

On course for success



Family business and global player

LAPP is both. The history of our company has been one of success and expansion ever since it was founded in 1959 by Ursula Ida and Oskar Lapp. It remains resolutely family owned to this day. We safeguard our success by staying close to our customers and markets, maintaining our innovative strength and brand quality, and being a reliable partner. We provide continuity, always guided in our thoughts and actions by our values.

Success built on family values

At LAPP, we maintain values that promote cooperation and enable relationships with employees, suppliers, and customers based on partnership and trust. Good relations and mutual respect are key elements of our company culture and a central part of company policy. We know that our successful business development over the last decades is down to our 3,440 skilled and dedicated staff around the world, as well as the reliable partnership with our customers.

With 17 production facilities, over 40 sales companies, and hundreds of dedicated consultants, we are always close to the individual needs and challenges of our customers all over the globe. We are constantly developing our products and system solutions, setting standards in safety, quality, and functionality. This is why we are one of the world's leading manufacturers of integrated solutions and branded products in cable and connection technology. As our success story enters its third generation, we are aware of our duty to the future.

about us

Headquarters 4.0

Goodbye isolated individual offices!
LAPP's new European headquarters in Stuttgart features an open-space design, modern architecture and short distances that enable all-new forms of cooperation. Individual departments are no longer physically separated. Everything is bright and open. Plants are used to separate space, absorb noise and improve air quality.

Height-adjustable desks allow staff to concentrate better and to work more healthily. The open office design aims to improve our communication, teamwork, knowledge exchange, creativity and mobile working. This workplace concept is being rolled out worldwide.

Open office, open cooperation

Our new headquarters presents an entirely new concept of office life. Digital, connected, and flexible, it improves communication and cooperation which benefits both our employees and our customers. Our new spatial design allows us to react even more quickly and directly to our customers' needs. This is because departments that cooperate often are placed closer to each other. For example, sales and all sales-related departments have been brought together under one roof.

Despite this, there is still plenty of room for individuality and quiet places where staff can go for greater concentration. The building features team zones, project zones, think tanks, and lounges. Staff can also work in the espresso bar on the ground floor or on the roof terrace if they so wish. Here they can use bistro tables and even sun loungers.

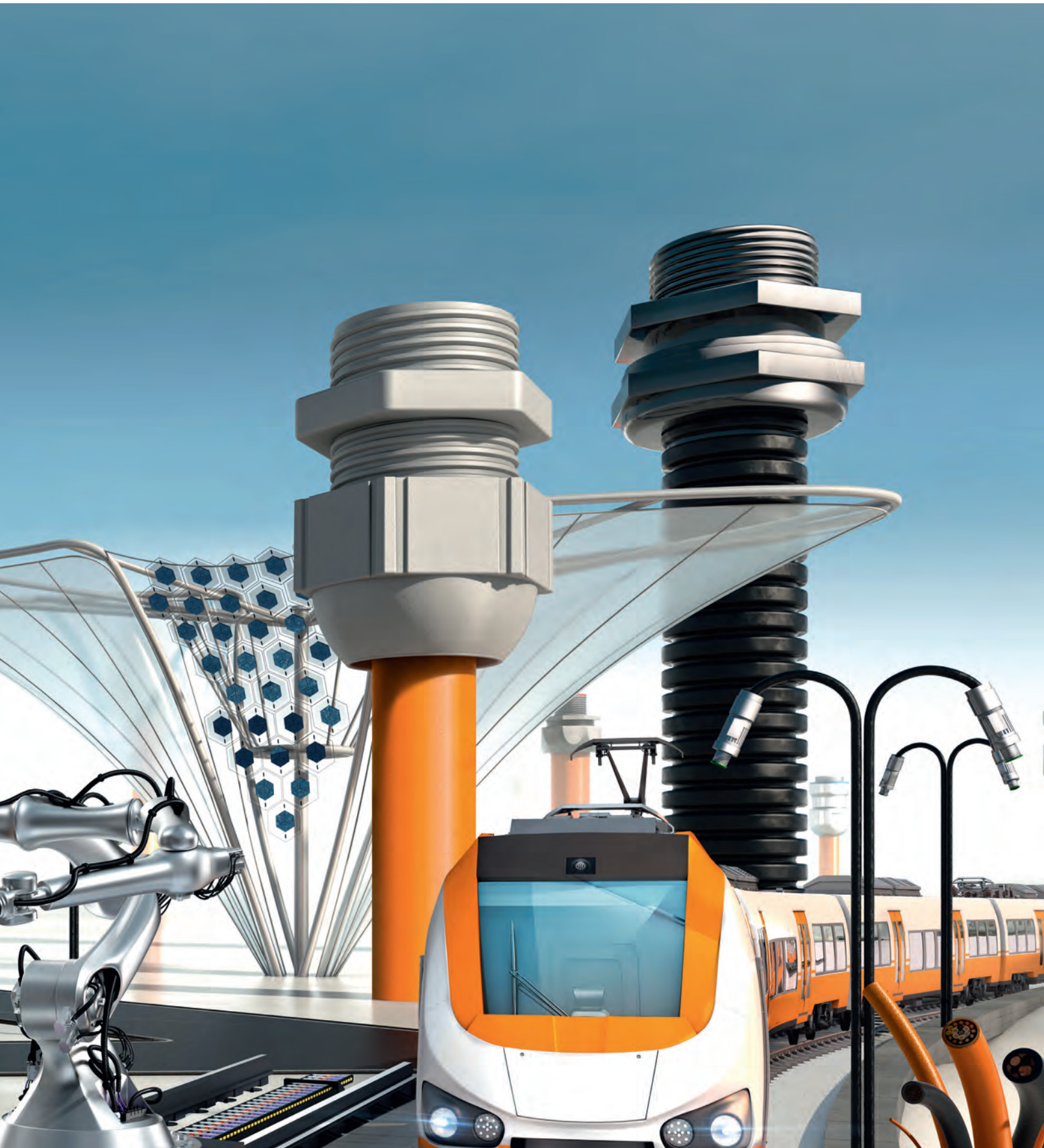
LAPP

industry

solutions

Tailored industry solutions

From E-mobility and wind energy to Industry 4.0, our global success is driven by pioneering innovations for a huge variety of sectors and markets. We offer specialized cable connection solutions for all industries, precisely tailored to their respective requirements. On the following pages, you can explore the areas in which our products are used and find out how we can help take your business forward with our industry-specific solutions.



The road to the future

Transport is changing. From electric cars to modern rail vehicles, high-performance connection technology is a vital part of future mobility. Based on 60 years of experience in the development and production of electric cables, connectors, and accessories, we have steadily developed and expanded our range of products for railway technology. With LAPP brands, we provide reliable solutions that make no compromises when it comes to safety, quality, and function. Our products meet tough national and international norms and standards like EN 45545-2, and are used in railway systems around the world, such as the high-speed trains of Korea Train eXpress (KTX). Our production facility for ÖLFLEX® TRAIN is certified in line with IRIS (International Rail Industry Standard).

mobility

321

Our range of rail technology products covers over 321 cable types and 485 connectors, along with cable glands, protective conduit, and accessories. We have over one million meters of cable in storage for the rail industry.

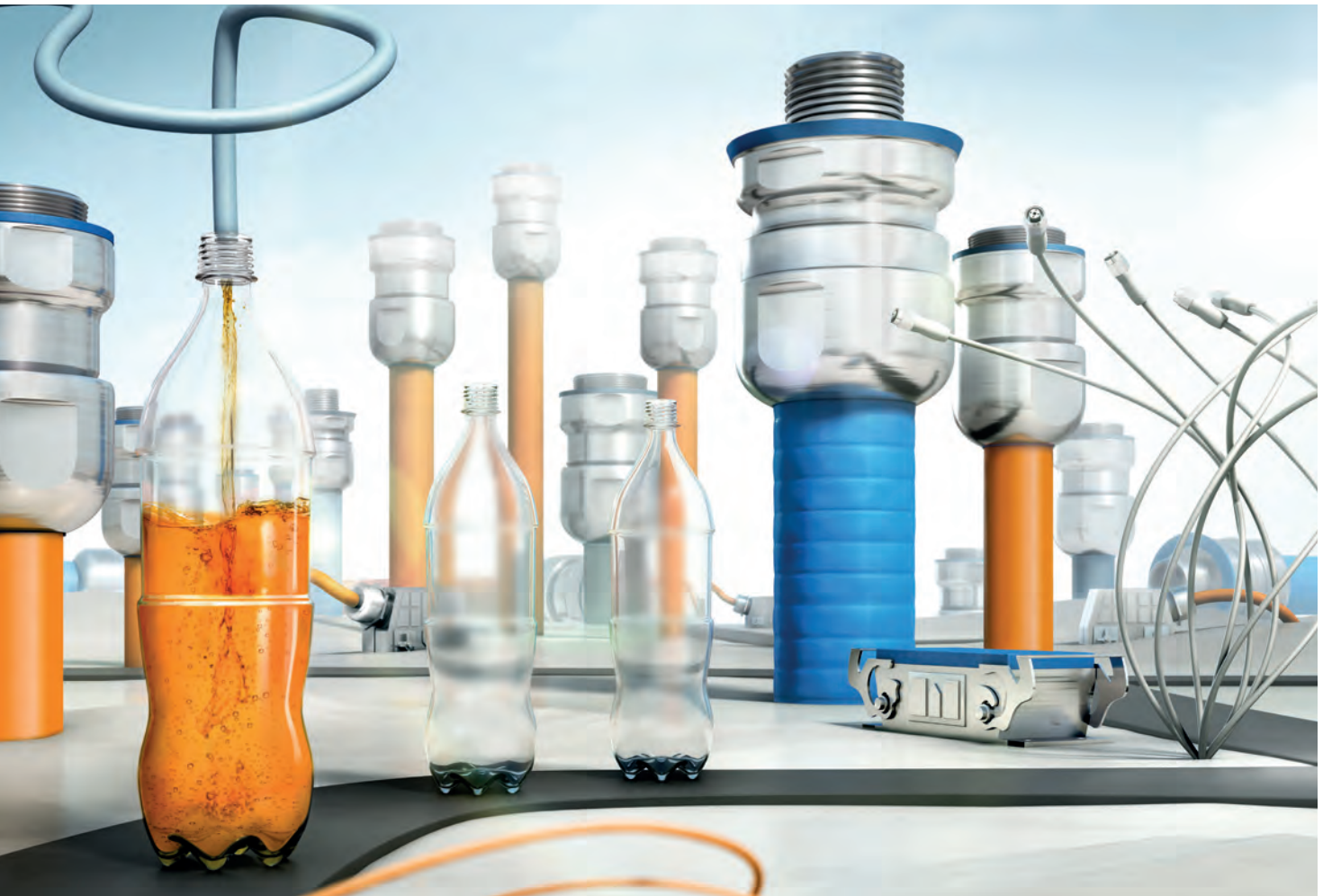
485

1,000,000

food & beverage

Hygiene first

In the food and beverage industry, operating conditions are complex and challenging. The most important thing here is hygiene. With this in mind, our cables and accessories have to meet demanding requirements and must withstand various chemical, thermal, and mechanical loads. Our extensive standard range really does stand the test under these tough operating conditions. Alongside this, we offer a variety of refined solutions that were developed and carefully tested specifically for the food and beverage industry in our in-house laboratory and test facilities for unbeatable quality, safety, and function.



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ÖLFLEX®

System solutions made by LAPP

With ÖLFLEX® CONNECT, we completed the step from component supplier to system supplier, offering complete solutions from a single source – from specialized cable assemblies and industry-standard servo connections to complex high-speed drag chain systems. We are constantly expanding our engineering, production and assembly capacities around the world.

The benefits for you:

- No capital expenditure for own production facilities
- Lean supply base leads to lower operating costs
- Low inventory levels thanks to complete assemblies
- Excellent functional reliability

ÖLFLEX® CONNECT CABLES

Cable systems made by LAPP

Our product range stretches from single and multi-condutor cables through to EMC-shielded cables, all of which can be fitted with a wide selection of crimp contacts, connectors, and housings. We also offer highly flexible, durable spiral cables as well as glass fiber assemblies, which we can produce, test, and deliver in both standard and custom lengths.

Our comprehensive range of services:

- Cable cutting as required
- Unwinding with specified bending radius
- Stripping, crimping, heat shrinking
- Markings & printings
- Testing

CONNECT

ÖLFLEX® CONNECT SERVO

Servo systems made by LAPP

As a leading manufacturer of assembled servo cable systems, we offer solutions for all industry standards for customers from different areas of mechanical engineering and drive systems. These range from the cost-effective **basic line** for applications free of aggressive environmental influences, to the **core line** that is specially designed for dynamic applications, right up to the highly dynamic performance class of the **extended line**. LAPP offers the right solution for every set of requirements.

basic line | **core line** | **extended line**

ÖLFLEX® CONNECT CHAIN

Power chain systems made by LAPP

When it comes to assembled drag chains, you can benefit from our extensive know-how and many years of experience.

basic chain | **core chain** | **extended chain**

basic chain
Nylon or steel drag chains with highly flexible cable, conduit, hydraulic or pneumatic hoses with **no termination** such as connectors or flanges

core chain
Nylon or steel drag chains with highly flexible cable, conduit, hydraulic or pneumatic hoses **including termination**

extended chain
Nylon or steel drag chains with highly flexible cable, conduit, hydraulic or pneumatic hoses **including termination and functional units** such as towing arms or supporting structures

ÖLFLEX® CONNECT CHAIN

System solutions made by LAPP

LAPP is there throughout all project phases – from design to component selection to assembly. Our experts work with you every step of the way:

1 Technical evaluation

- On-the-spot meeting
- Definition of project scope
- One contact person during project phase
- Planning and timing

2 Initial CAD design of the cable chain system

- Includes cable layout

3 Complete project management

- Documentation
- Drawings
- Selection of components (BOM)
- Cost and interface controlling

4 Completion of chain system design

- Delivery to operation site
- On-site installation service by LAPP specialists
- Shipping in professional LAPP packaging
- After-Sales-Services

Built upon our deep expertise in cable technology we have the capabilities to specify and assemble the right SILVYN® cable chain to protect the cable in any application. With **ÖLFLEX® CONNECT** CHAIN you get populated cable chains – from light duty nylon to steel or a combination of nylon and steel cable.

Our cable chain service

What can be included in a cable chain system:

- Nylon or steel cable chains in accordance with application requirements
- Highly flexible power, control, signal and data network cables including accessories (cable lugs, connectors, etc.)
- Protective cable conduits with conduit glands
- Hydraulic hoses with fittings
- Pneumatic hoses
- Towing arms or other functional units
- CAD drawing of your chain including cable layout (optimal placement and separation of all energy lines in a chain)

Upon request, comprehensive test reports and individual installation instructions can be provided.

Three system packages – the choice is yours

Optimize your assembly, procurement and logistics processes with three distinct system packages.

Series: nylon, steel or robot	•	•	•
All media, incl. layout (cables, hoses)	•	•	•
Accessories (channels, rollers)	•	•	•
Terminations (connectors, fittings)		•	•
No electrical installation needed		•	•
100 % electrical testing		•	•
No cable cutting loss		•	•
Plug-and-Play system		•	•
Multi-chain/ nested chain applications			•
Functional units (supporting structures, towing arms, cabinets)			•

Please find more info here:

Online configurator

Configure your individual **ÖLFLEX® CONNECT** CHAIN here online incl. all media (cables, hoses)

Optimized for tablet:

> **www.lappkabel.com/chainconfigurator**

ÖLFLEX® CONNECT CHAIN catalog

Find complete **ÖLFLEX® CONNECT** CHAIN catalog here online or download as pdf

> **www.lappkabel.com/catalogues**

Chain Engineering Guide

50 pages full of technical expert know-how around your chain configuration

> **www.lappkabel.com/chainguide**

service &quality

Uncompromising quality – worldwide

You will always be on the safe side with branded products from LAPP. At our headquarters in Stuttgart, we put our products through their paces in one of the most modern cable testing facilities in the world. Here we simulate all kinds of movements and determine the service life of cables and wires. In addition to load and endurance tests, state-of-the-art analysis methods are employed. Lapp uses x-ray methods such as EDX to detect any possible hazardous materials. This ensures that all cables and products from the standard delivery program are free from substances of high concern in accordance with the REACH regulation and components do not exceed the limit values set by the RoHS Directive. The result: uncompromising quality from LAPP.

Trial and test center

At our UL Client Test Data laboratory in Florham Park, New Jersey, we thoroughly test our products and constantly monitor electrical and mechanical parameters. Specialized teams also test all products in their intended field of use – sometimes in extremely hot or cold conditions or with particular environmental influences.

You are always welcome to put your own products through an evaluation at Lapp's trial and test center.

Regulatory markings
With the aid of internationally-approved markings, the directives, standards, and conformities to which our products comply can be easily recognized.

Regional North American or Canadian requirements are frequently required for the use of Lapp products. User-specific registrations such as RoHS, DNV, or WEEE are also common.

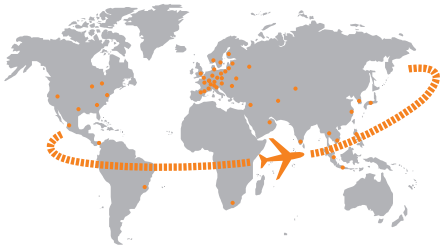
Certificates and quality seals
Many Lapp products are certified, just like our companies. Certificates are always awarded by independent bodies. They are both a seal of quality and a certificate of compliance, representing technical "passports" for international use.

Our ISO Certification:
https://lappusa.lappgroup.com/certificates

Reliably connecting the world

24/7

Always there for you



70,000 m² of storage space in Germany alone allows us to keep 48,000 km of ÖLFLEX® constantly in stock.

Who actually likes waiting for a product or service? We won't leave you hanging – we offer speedy delivery to anywhere in the world. After all, we have a close-knit network of logistics centers. With the finest in high-tech quality, we guarantee a smooth delivery service.

Logistics services

LAPP has its North American headquarters located in a 130,000 ft² facility in Florham Park, New Jersey. This location also houses our state-of-the-art cable manufacturing plant. LAPP's domestic manufacturing and coast-to-coast network of logistics centers allow us to provide greater inventory, flexibility, and the ability to deliver products quickly.

Perfect projects & customized solutions

We turn challenging projects into success stories. That is what drives us. From fiber-optic networks and control cables to power supply, you can put your trust in the infrastructure and product expertise of our outstanding project teams. Benefit from expert consulting and an all-round service that leaves almost nothing to be desired.

Working closely together, we determine what you need, create a precise schedule, develop the right solution for your specific requirements, clarify delivery times and product details, and coordinate logistics. Protect your resources, benefit from our expertise, and reap the rewards.

You will always be on the safe side with branded products from LAPP. Whether it's a standard product or a customized special production: every product launched has undergone a demanding development process. Only once the prototypes have been thoroughly tried and tested does production begin.

logistics

8 brands

Uncompromising quality – worldwide

ÖLFLEX®
Power and control cable

ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.

UNITRONIC®
Data communication systems

Our high-quality UNITRONIC® data network cables & field bus components provide a forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures, we offer a dependable cabling and connection solution for almost every situation.

ETHERLINE®
Data communication systems for Ethernet technology

Our ETHERLINE® data products open up a secure, fast, and reliable path to the future of Ethernet applications like PROFINET®. The systems are made up of durable, robust cable and connection components for passive and active network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

HITRONIC®
Optical transmission systems

HITRONIC® fiber optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation doesn't interfere with transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.

EPIC®
Industrial connectors

EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control, and drives. EPIC® is a flexible system of housings, inserts, and contacts: all extremely robust, absolutely safe, and simplicity itself to assemble.

SKINTOP®
Cable glands

Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and center your cable, hermetically seal it, and guarantee optimum strain relief.

SILVYN®
Protective cable conduit & cable carrier systems

The universal range of SILVYN® protection and guidance systems protects cables effectively against dust, moisture, mechanical, thermal, and chemical influences. The versatile SILVYN® CHAIN range of energy supply chains also protects and guides cable in dynamic applications.

FLEXIMARK®
Marking systems

The requirement: permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking and even electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

Variable Frequency Drive cable selector

http://lapp-applications.com/vfdselect/

SKINTOP® cable gland selector

http://lapp-applications.com/glandselect/

UNITRONIC® bus cable selector

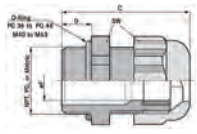
http://www.lapp-applications.com/automation/#/unitronic

EPIC® connector selector

http://lapp-applications.com/connectors/

ETHERLINE® Ethernet cable selector

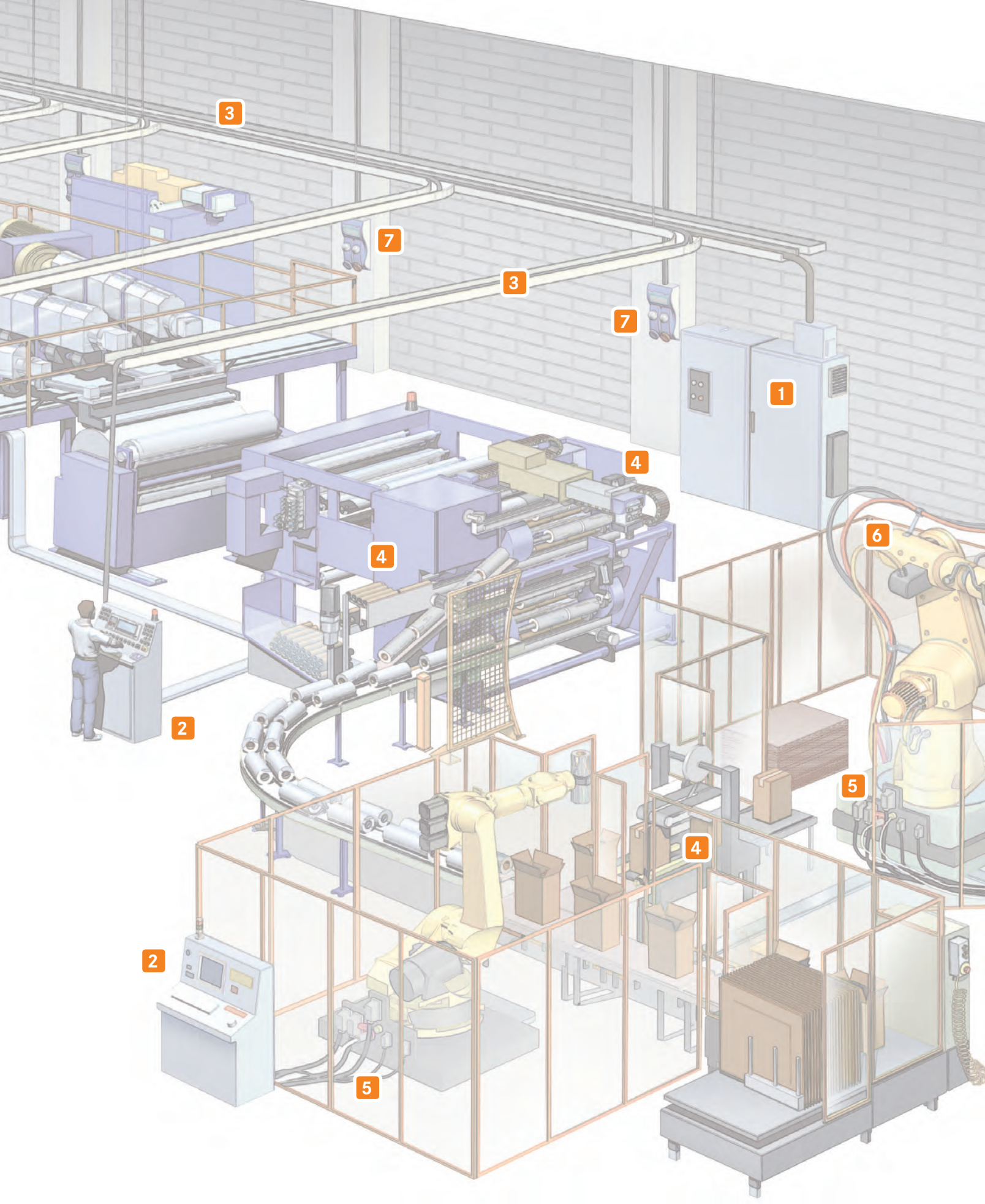
http://www.lapp-applications.com/automation/#/etherline



CAD product catalog

https://lapp.partcommunity.com/3d-cad-models/sso

selector tools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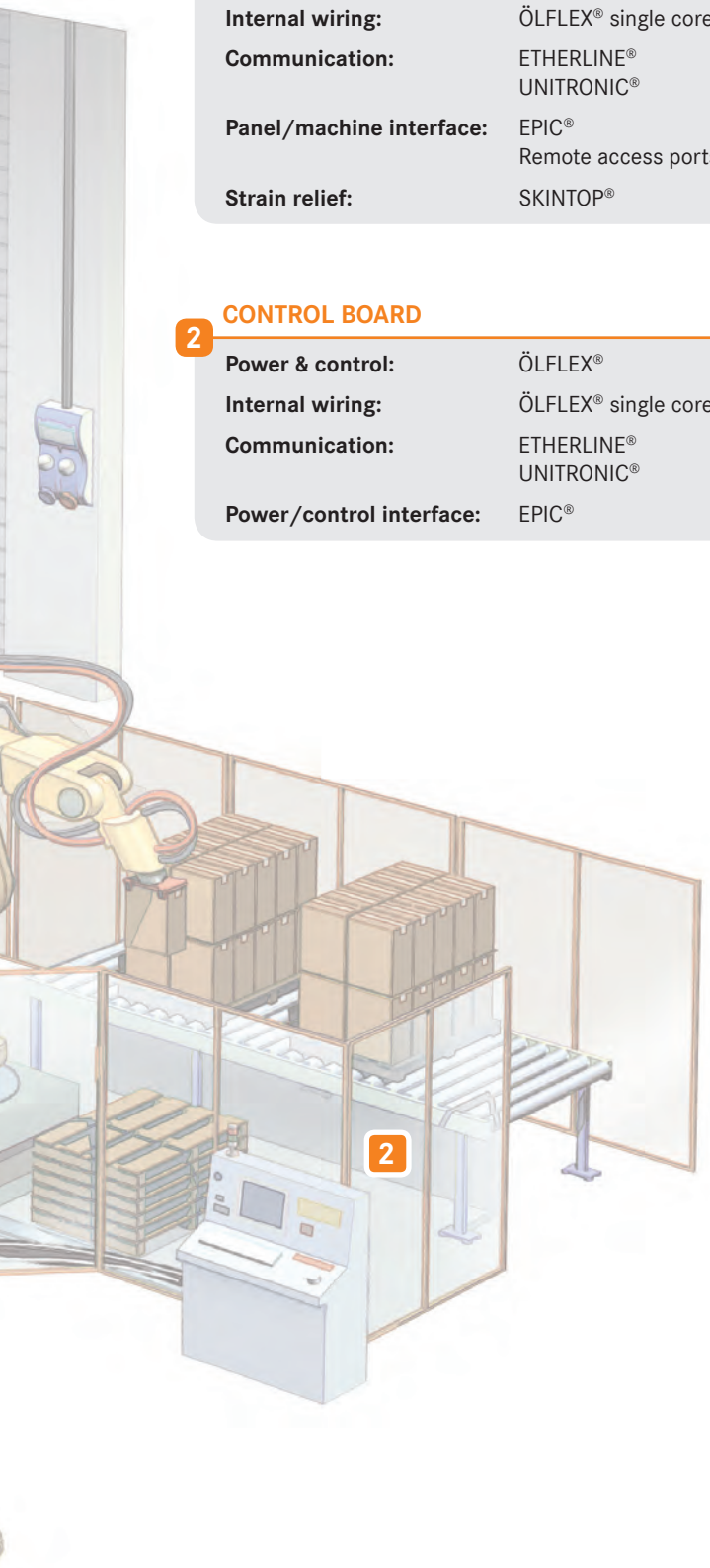


1 MAIN CONTROL BOX

Power & control:	ÖLFLEX®
Internal wiring:	ÖLFLEX® single core
Communication:	ETHERLINE® UNITRONIC®
Panel/machine interface:	EPIC® Remote access ports
Strain relief:	SKINTOP®

2 CONTROL BOARD

Power & control:	ÖLFLEX®
Internal wiring:	ÖLFLEX® single core
Communication:	ETHERLINE® UNITRONIC®
Power/control interface:	EPIC®

3 CABLE TRAY

Power & control:	ÖLFLEX®
Communication:	ETHERLINE® UNITRONIC®
Cable protection:	SILVYN®

4 MOTORS, DRIVES & CABLE TRACKS

Power & control:	ÖLFLEX® ETHERLINE® UNITRONIC®
Supply drives & control:	ÖLFLEX® ÖLFLEX® CONNECT SERVO
Feedback system:	ÖLFLEX® ÖLFLEX® CONNECT SERVO
Power/control disconnect:	EPIC®
All of the above:	ÖLFLEX® CONNECT CHAIN

5 ROBOT BASE

Control system:	ÖLFLEX® ETHERLINE® HITRONIC®
Power supply:	ÖLFLEX®
Signal transmission:	ETHERLINE®
Power/control/data interface:	EPIC® ÖLFLEX® CONNECT CABLES
Strain relief:	SKINTOP®
Cable protection:	SILVYN®

6 ROBOT ARM

Tool control:	ÖLFLEX®
Camera system:	ETHERLINE®
Sensor/actuator:	ÖLFLEX® UNITRONIC®
Servo power & feedback:	EPIC® circular
Strain relief:	SKINTOP®
Cable protection:	SILVYN®

7 POWER OUTLETS

Switched/interlocked supply:	EPIC® pin & sleeve
Strain relief:	SKINTOP®

what's new

ÖLFLEX®

34 ÖLFLEX® 409 P

64 ÖLFLEX® CHAIN TM/TM CY

72 ÖLFLEX® CHAIN 90 P/90 CP

76 ÖLFLEX® CHAIN 809 SC/809 SC CY

99 ÖLFLEX® VFD 2XL SYMMETRICAL

107 ÖLFLEX® SERVO 719

109 ÖLFLEX® SERVO 7TCE

111 ÖLFLEX® SERVO FD 7TCE

UNITRONIC®

158 UNITRONIC® SPIRAL LiF2Y11Y

176 UNITRONIC® BUS PB FD HYBRID/COMBI

199 UNITRONIC® BUS SAFETY

203 M12 T-coded connectors

ETHERLINE®

250 ETHERLINE® 4 pair: CAT.7; flexible

251 ETHERLINE® 4 pair: CAT.7 TORSION

263 Continuous flex Industrial Ethernet cordsets

264 Continuous flex PROFINET® cordsets

EPIC®

294 EPIC® HBE push-in inserts

341 EPIC® MH series

354 EPIC® MC HC2

355 EPIC® MC HHC2

356 EPIC® MC HHC1

368 EPIC® MC BUS

405 EPIC® ULTRA HA 3/4 housing

429 EPIC® ULTRA dust covers

SKINTOP®

507 SKINTOP® MULTI

521 SKINTOP® GRIP-M

527 SKINTOP® HYGIENIC SC

SILVYN®

567 SILVYN® ELU/ELÖ/ELT

573 SILVYN® HTDL

578 SILVYN® KLICK 90° N

585 SILVYN® MSK-M US

587 SILVYN® COMPACT

593 Conduit scissors

ÖLFLEX® CONNECT

609 AB assemblies for Rockwell Automation® VP series motors

PROFINET® is a registered trademark of the PNO (PROFIBUS User Organization).
Rockwell Automation® is a registered trademark of Rockell Automation, Inc.

1

ÖLFLEX®

Power & control cables

ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.

Application range

- Industrial machinery, machine tools, plant & equipment engineering
- Measurement, control, heating & air conditioning systems
- Wind power and photovoltaic systems
- Public buildings, airports & stations.
- Medical technology, chemical industry, composting plants & sewage works
- Food & beverage industry
- Power drive systems
- Robot applications
- Railway applications

Product range

25 Flexible power & control cable
51 Tray-rated cable
59 Continuous flex power & control cable
79 Torsional & robotic cable
85 High temperature cable
95 Flexible cable for drives, motors & assemblies
125 Harmonized European hook-up wire & cordage
137 Lift & crane cable
149 Spiral cable

ÖLFLEX®

Flexible power & control cable

Flexible power & control cable

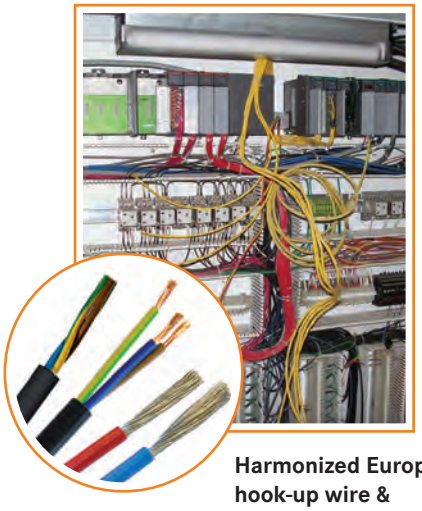
Tray-rated cable

Continuous flex power & control cable

Torsional & robotic cable

High temperature cable

Flexible cable for motors, drives & assemblies



Harmonized European hook-up wire & cordage

Lift & crane cable

Spiral cable

ÖLFLEX®

Flexible power & control cable

26 **Quick select chart**

UL/CSA PVC cable

28 **ÖLFLEX® 190/190 CY**
Extremely oil-resistant flexible control cable with UL TC & UL/CSA AWM

30 **ÖLFLEX® 150/150 CY**
Oil-resistant flexible control cable with <HAR> approval

32 **ÖLFLEX® CONTROL TM/TM CY**
Extremely oil-resistant flexible control cable with UL MTW & UL/CSA TC

UL/CSA PUR cable

34 **ÖLFLEX® 409 P** NEW
Oil and abrasion-resistant control cable with PUR jacket & UL/CSA AWM

36 **ÖLFLEX® 490 P/490 CP**
Highly abrasion-resistant control cable with PUR jacket & UL/CSA AWM

38 **ÖLFLEX® 590 P/590 CP**
Flexible heavy duty, indoor/outdoor cable with PUR jacket

40 **ÖLFLEX® POWER MULTI**
Flexible oil-resistant tray cable & STOOW extra hard service cordage

European PVC cable

41 **ÖLFLEX® CLASSIC 100/100 CY**
Flexible color-coded power & control cable

43 **ÖLFLEX® CLASSIC 100 SY**
Flexible color-coded power & control cable with steel braid

44 **ÖLFLEX® CLASSIC 110/110 CY**
Flexible number-coded power & control cable

46 **ÖLFLEX® CLASSIC 110 SY**
Flexible number-coded power & control cable with steel braid

Halogen-free cable

47 **ÖLFLEX® CLASSIC 110 H/110 CH**
Oil-resistant, low smoke, zero halogen control cable

49 **ÖLFLEX® CLASSIC 130 H BK/135 CH BK**
Low smoke, zero halogen control cable

Flexible power & control cable in other catalog sections

54 **ÖLFLEX® TRAY II/TRAY II CY**

104 **ÖLFLEX® SDP TC**

131 **ÖLFLEX® POWER QUAD II**

208 **UNITRONIC® 300/300 S**

Quick select chart

Product name	Construction			AWG range	Conductor count	
	shielding	insulation	jacket			
UL/CSA PVC cable						
ÖLFLEX® 190	no	PVC	thermoplastic polymer	20 - 2 AWG	2, 3, 4, 5, 7, 9, 12, 18, 25, 34, 41, 50	
ÖLFLEX® 190 CY	yes					
ÖLFLEX® 150	no	PVC	PVC	20 - 14 AWG	3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® 150 CY	yes			18 - 14 AWG	3, 4, 5, 7	
ÖLFLEX® CONTROL TM	no	PVC/nylon	thermoplastic polymer	18 - 10 AWG	3, 4, 5, 7, 9, 12, 18, 19, 25	
ÖLFLEX® CONTROL TM CY	yes					
UL/CSA PUR cable						
ÖLFLEX® 409 P	no	PVC	PUR	19 - 6 AWG	2, 3, 4, 5, 7, 10, 12, 18, 25	
ÖLFLEX® 490 P	no	PVC	PUR	20 - 14 AWG	2, 3, 4, 5, 7, 9, 12, 18, 25	
ÖLFLEX® 490 CP	yes					
ÖLFLEX® 590 P	no	TPE	PUR	18 - 10 AWG	2, 3, 4, 5, 7	
ÖLFLEX® 590 CP	yes				2, 3, 4, 5	
ÖLFLEX® POWER MULTI	no	PVC	thermoplastic polymer	18 - 8 AWG	3, 4, 5, 7, 12, 18, 25	
European PVC cable						
ÖLFLEX® CLASSIC 100	no	PVC	PVC	20 AWG - 350 KCMIL	2, 3, 4, 5	
ÖLFLEX® CLASSIC 100 CY	yes					
ÖLFLEX® CLASSIC 100 SY	yes (steel)	PVC	PVC	18 - 2 AWG	2, 3, 4, 5	
ÖLFLEX® CLASSIC 110	no	PVC	PVC	20 - 2 AWG	2, 3, 4, 5, 7, 12, 18, 25, 34, 41, 50, 52, 65, 80, 100	
ÖLFLEX® CLASSIC 110 CY	yes			20 - 6 AWG	2, 3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® CLASSIC 110 SY	yes (steel)	PVC	PVC	20 - 6 AWG	2, 3, 4, 5, 7, 12, 18, 25	
Halogen-free cable						
ÖLFLEX® CLASSIC 110 H	no	halogen-free	halogen-free	20 - 2 AWG	3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® CLASSIC 110 CH	yes					
ÖLFLEX® CLASSIC 130 H BK	no	halogen-free	halogen-free	20 - 4 AWG	2, 3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® CLASSIC 135 CH BK	yes			20 - 2 AWG		

	Nominal voltage	Temperature range		Approvals	Cable attributes, see page 648			Page
		low	high		oil resistance	flame resistance	mechanical properties	
	600V	-40°C	90°C		OR-04	FR-03	MP-02	28
	600V	-40°C	90°C		OR-04	FR-02	MP-02	30
	1000V	-40°C	90°C		OR-03	FR-03	MP-03	32
	1000V	-40°C	80°C		OR-05	FR-02	MP-05	34
	600V	-20°C	80°C		OR-05	FR-02	MP-05	36
	600V	-50°C	80°C		OR-05	FR-02	MP-05	38
	1000V	-40°C	90°C		OR-03	FR-03	MP-03	40
	500 - 750V	-40°C	80°C		OR-01	FR-02	MP-01	41
	500 - 750V	-40°C	80°C		OR-01	FR-02	MP-01	43
	500V	-40°C	80°C		OR-01	FR-02	MP-01	44
	500V	-40°C	80°C		OR-01	FR-02	MP-01	46
	600V	-40°C	75°C		OR-03	FR-04	MP-01	47
	1000V	-40°C	75°C		OR-01	FR-04	MP-01	49

ÖLFLEX® 190/190 CY

Extremely oil-resistant flexible control cable with UL TC & UL/CSA AWM

ÖLFLEX® 190 is a multi-conductor cable with a highly oil-, coolant-, and solvent-resistant thermoplastic polymer 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 is also UL TC approved so it can be routed in tray as well. 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

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: specially formulated thermoplastic polymer; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Shielding: PVC inner jacket; tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic polymer; gray

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
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Cable attributes			page 648
OIL	OR-04	FLAME	FR-03
MOTION	WT-02	MECH.	MP-03

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- UL 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 PLTC: 300V
- UL TC: 600V
- UL WTTC: 1000V
- UL/CSA AWM: 1000V

Test voltage: 2000V

Conductor stranding:
- 20 - 6 AWG: Class 5 fine wire*
- 4 AWG and larger: Class K fine wire

* 20 &18 AWG meet only Class 5 cross section and DC resistance

Color code: black with white numbers, plus green/yellow ground

Approvals:

UL: TC-ER per UL 1277
WTTC per UL 2277
PLTC-ER per UL 13 (20 AWG)
AWM 2587 & 21098 (Oil)

Attributes: UL Oil Res I/II
90°C wet; 90°C dry
sunlight resistant
direct burial
NFPA 79

NEC: Class 1 Division 2 per NEC Article 501

Canada: CSA AWM I/II A/B FT4
CSA C22.2 210.2

Additional: torsion rated for wind market (± 90°/m) & (± 150°/m) (18 - 2 AWG)
CE & RoHS

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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® SL PG thread
20 AWG (0.5 mm²)						
602002**	2	0.253	6.4	7	40	S1109
602003	3	0.265	6.7	10	42	S1109
602004	4	0.285	7.2	13	51	S1111
602005	5	0.308	7.8	17	60	S1111
602007	7	0.331	8.4	23	82	S1111
602009	9	0.409	10.4	30	100	S1113
602012	12	0.421	10.7	39	168	S1113
602018	18	0.487	12.4	59	198	S1116
602025	25	0.586	14.9	82	242	S1121
18 AWG (1 mm²)						
601802**	2	0.277	7.0	13	42	S1111
601803	3	0.291	7.4	20	44	S1111
601804	4	0.314	8.0	26	55	S1111
601805	5	0.340	8.6	33	64	S1111
601807	7	0.367	9.3	46	84	S1111
601809	9	0.454	11.5	59	119	S1113
601812	12	0.471	12.0	79	141	S1116
601818	18	0.579	14.7	118	207	S1121
601825	25	0.656	16.7	164	278	S1121
601834	34	0.761	19.3	206	575	S1129
601841	41	0.873	22.2	250	680	S1129
601850	50	0.927	23.5	305	825	S1129
16 AWG (1.5 mm²)						
601602**	2	0.303	7.7	20	57	S1111
601603	3	0.319	8.1	29	62	S1111
601604	4	0.345	8.8	39	75	S1111
601605	5	0.375	9.5	49	90	S1111
601607	7	0.406	10.3	68	121	S1113
601609	9	0.509	12.9	88	174	S1116
601612	12	0.557	14.1	112	209	S1121
601618	18	0.644	16.4	175	298	S1121
601625	25	0.733	18.6	242	417	S1129
601634	34	0.892	22.7	296	760	S1129
601641	41	0.974	24.7	357	875	S1236
601650	50	1.036	26.3	437	1020	S1136
601661	61	1.098	27.9	530	1180	S1136

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
601402**	2	0.337	8.6	33	88	S1111
601403	3	0.356	9.0	49	93	S1111
601404	4	0.386	9.8	65	121	S1113
601405	5	0.421	10.7	81	145	S1113
601407	7	0.457	11.6	113	192	S1113
601409	9	0.609	15.5	145	317	S1121
601412	12	0.628	16.0	194	401	S1121
601418	18	0.729	18.5	290	575	S1129
601425	25	0.872	22.1	404	860	S1129
12 AWG (4 mm²)						
601203	3	0.417	10.6	78	156	S1113
601204	4	0.454	11.5	104	198	S1113
601205	5	0.497	12.6	129	238	S1116
601207	7	0.573	14.6	181	363	S1121
601211	11	0.745	18.9	284	397	S1129
10 AWG (6 mm²)						
601003	3	0.466	11.8	116	223	S1116
601004	4	0.509	12.9	155	267	S1121
601005	5	0.590	15.0	194	322	S1121
8 AWG (10 mm²)						
600804	4	0.664	16.9	258	436	S1129
600805	5	0.728	18.5	323	525	S1129
6 AWG (16 mm²)						
600604	4	0.870	22.1	413	699	S1129
600605	5	0.955	24.3	516	842	S1129
4 AWG (21 mm²)						
600404	4	1.005	25.5	515	950	S1136
600405	5	1.105	28.1	645	1200	S1136
2 AWG (33.7 mm²)						
600204	4	1.178	29.9	876	1405	S1136
600205	5	1.300	33.0	1129	1752	S1248

* 2c cable does not include ground ** Part numbers are not -ER rated

ÖLFLEX® 190 CY

Part number	Number of conductors incl ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
602002CY**	2	0.329	8.4	25	66	53112220
602003CY	3	0.341	8.7	30	82	53112220
602004CY	4	0.361	9.2	35	88	53112220
602005CY	5	0.384	9.8	41	99	53112230
602007CY	7	0.407	10.3	51	112	53112230
602012CY	12	0.497	12.6	73	181	53112240
602025CY	25	0.678	17.2	139	295	53112260
18 AWG (1 mm²)						
601802CY**	2	0.353	9.0	28	75	53112220
601803CY	3	0.367	9.3	40	82	53112230
601804CY	4	0.390	9.9	48	106	53112230
601805CY	5	0.416	10.6	57	123	53112230
601807CY	7	0.443	11.3	94	139	53112240
601812CY	12	0.586	14.9	153	229	53112250
601818CY	18	0.678	17.2	216	317	53112260
601825CY	25	0.764	19.4	226	436	53112260
16 AWG (1.5 mm²)						
601603CY	3	0.395	10.0	52	115	53112230
601604CY	4	0.421	10.7	66	128	53112230
601605CY	5	0.451	11.5	76	150	53112240
601607CY	7	0.482	12.2	98	181	53112240
601612CY	12	0.656	16.7	167	311	53112250
601618CY	18	0.743	18.9	235	456	53112260
601625CY	25	0.888	22.6	313	639	53112260

Part number	Number of conductors incl ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
14 AWG (2.5 mm²)						
601403CY	3	0.432	11.0	75	148	53112230
601404CY	4	0.462	11.7	93	181	53112240
601405CY	5	0.497	12.6	115	218	53112240
601407CY	7	0.533	13.5	147	282	53112250
601412CY	12	0.727	18.5	253	516	53112260
601418CY	18	0.884	22.5	361	741	53112260
12 AWG (4 mm²)						
601203CY	3	0.500	12.7	124	227	53112240
601204CY	4	0.585	14.9	154	311	53112250
601205CY	5	0.628	16.0	180	359	53112250
601207CY	7	0.672	17.1	234	494	53112260
10 AWG (6 mm²)						
601003CY	3	0.565	14.4	164	311	53112250
601004CY	4	0.608	15.4	208	386	53112250
601005CY	5	0.689	17.5	255	474	53112260
601007CY	7	0.740	18.8	335	639	53112260
8 AWG (10 mm²)						
600804CY	4	0.763	19.4	324	574	53112260
6 AWG (16 mm²)						
600604CY	4	0.994	25.2	494	1115	53112270

* 2c cable does not include ground ** Part numbers are not -ER rated

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® 150/150 CY

Oil-resistant flexible control cable with <HAR> approval

ÖLFLEX® 150 is an internationally approved, 600V multi-conductor cable. It has UL & CSA AWM and <HAR> approvals for use as an interconnect cable for machinery. ÖLFLEX® 150 is extremely flexible for easier installation and has outstanding oil, coolant, and chemical resistance. ÖLFLEX® 150 CY is a shielded version with an inner PVC jacket and tinned copper braid shield.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: PVC

Jacket: specially formulated PVC; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: PVC

Shielding: PVC inner jacket; tinned copper braid (85% coverage)

Jacket: specially formulated PVC; gray

Recommended applications

Control and power on industrial machinery; food & beverage; processing & pharmaceutical equipment; machinery for export to Europe

Application advantage

- Industrial grade PVC jacket (Oil Res I & II)
- International approvals: UL, CSA, <HAR>
- Very flexible pressure-extruded jacket for easy installation
- Number-coded conductors for easy identification & wiring

Approvals

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	FL-01	MECH.	MP-02

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- for stationary use:
  - UL/CSA: -40°C to +90°C
  - <HAR>: -40°C to +70°C
- for flexible use:
  - UL/CSA: -5°C to +90°C
  - <HAR> -5°C to +70°C

Nominal voltage:
- UL/CSA: 600V
- <HAR> 300/500V

Test voltage: 3000V

Conductor stranding: Class 5 fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 2587 & 21098 (Oil)
Attributes: UL Oil Res I/II
NFPA 79
Canada: CSA AWM I/II A/B FT1
Additional: <HAR> H05VV5-F (non-shielded)
<HAR> H05VVC4V5-K (shielded)
CE & RoHS

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® 150

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
0015003	3	0.244	6.2	10	42	S1107
0015004	4	0.268	6.8	13	46	S1109
0015005	5	0.291	7.4	17	59	S1111
0015007	7	0.354	9.0	23	80	S1111
0015012	12	0.437	11.1	39	133	S1113
0015018	18	0.520	13.2	58	220	S1116
0015025	25	0.630	16.0	81	256	S1121
19 AWG (0.75 mm²)						
0015103	3	0.264	6.7	15	51	S1109
0015104	4	0.283	7.2	20	56	S1111
0015105	5	0.319	8.1	25	76	S1111
0015107	7	0.390	9.9	34	97	S1113
0015112	12	0.472	12.0	58	165	S1116
0015118	18	0.567	14.4	87	22	S1121
0015125	25	0.673	17.1	121	313	S1121
18 AWG (1 mm²)						
0015203	3	0.276	7.0	20	53	S1111
0015204	4	0.307	7.8	26	67	S1111
0015205	5	0.339	8.6	33	89	S1111
0015207	7	0.409	10.4	46	114	S1113
0015212	12	0.504	12.8	78	192	S1116
0015218	18	0.594	15.1	117	272	S1121
0015225	25	0.709	18.0	162	383	S1129

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
0015303	3	0.327	8.3	29	74	S1111
0015304	4	0.354	9.0	39	97	S1111
0015305	5	0.398	10.1	49	113	S1113
0015307	7	0.492	12.5	68	151	S1116
0015312	12	0.594	15.1	117	243	S1121
0015318	18	0.709	18.0	175	348	S1129
0015325	25	0.843	21.4	242	491	S1129
14 AWG (2.5 mm²)						
0015403	3	0.390	9.9	49	114	S1113
0015404	4	0.425	10.8	65	141	S1113
0015405	5	0.476	12.1	81	173	S1116
0015407	7	0.579	14.7	113	229	S1121
0015412	12	0.705	17.9	194	390	S1129
0015418	18	0.850	21.6	291	571	S1129
0015425	25	1.008	25.6	404	784	S1136

ÖLFLEX® 150 CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
0015703	3	0.370	9.4	52	97	53112230
0015704	4	0.394	10.0	54	121	53112230
0015705	5	0.433	11.0	64	136	53112230
0015707	7	0.512	13.0	80	183	53112240
16 AWG (1.5 mm²)						
0015803	3	0.413	10.5	57	107	53112230
0015804	4	0.449	11.4	64	142	53112240
0015805	5	0.500	12.7	82	162	53112240
0015807	7	0.594	15.1	97	205	53112250

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
14 AWG (2.5 mm²)						
0015903	3	0.469	11.9	81	164	53112240
0015904	4	0.520	13.2	115	198	53112240
0015905	5	0.579	14.7	138	245	53112250
0015907	7	0.689	17.5	162	322	53112260

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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

ÖLFLEX® CONTROL TM is a multi-conductor cable designed for use on machine tool equipment and other industrial machinery conforming to NFPA 79 wiring norms. ÖLFLEX® CONTROL TM is also UL/CSA TC approved so it can be routed in tray as well. ÖLFLEX® CONTROL TM CY has foil tape and a tinned copper braid shield for improved effectiveness against noise and interference.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon

Jacket: specially formulated thermoplastic polymer; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon

Shielding: foil tape; tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic polymer; gray

Recommended applications

Machine tool machinery; food & beverage; processing equipment; machine wiring for conformance to NFPA 79

Approvals

Application advantage

- Conforms to NFPA 79 standards for wiring machinery
- Gray jacket and number-coded for easy connection
- UL TC-ER approval so it can be installed off the machine and into an overhead tray without conduit
- Flexible copper stranding and pressure-extruded jacket, improved shielding effectiveness

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	WT-02	MECH.	MP-03

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

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

Test voltage: 2000V

Conductor stranding: Class 5 fine wire*
* 18 AWG meets only Class 5 cross section and DC resistance

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 20886 & 21098 (Oil)
Attributes:	UL Oil Res I/II 75°C wet; 90°C dry sunlight resistant direct burial NFPA 79
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

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CONTROL TM

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
281803	3	0.291	7.4	20	55	S1111
281804	4	0.315	8.0	26	64	S1111
281805	5	0.340	8.6	33	75	S1111
281807	7	0.367	9.3	46	97	S1111
281809	9	0.423	10.7	59	108	S1113
281812	12	0.471	12.0	79	165	S1116
281818	18	0.579	14.7	118	245	S1121
281819	19	0.579	14.7	124	262	S1121
281825	25	0.656	16.7	164	311	S1121
16 AWG (1.5 mm²)						
281603	3	0.319	8.1	29	66	S1111
281604	4	0.345	8.8	39	79	S1111
281605	5	0.375	9.5	48	95	S1111
281607	7	0.406	10.3	68	123	S1113
281609	9	0.470	11.9	88	165	S1116
281612	12	0.557	14.1	116	214	S1121
281618	18	0.644	16.4	175	289	S1121
281619	19	0.644	16.4	184	293	S1121
281625	25	0.733	18.6	242	311	S1129

* Cable meets UL bus drop approval

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
281403*	3	0.356	9.0	49	88	S1111
281404*	4	0.386	9.8	65	106	S1113
281405	5	0.421	10.7	81	123	S1113
281407	7	0.457	11.6	113	163	S1113
281409	9	0.563	14.3	146	218	S1121
281412	12	0.628	16.0	194	298	S1121
281419	19	0.729	18.5	307	450	S1129
281425	25	0.872	22.1	404	569	S1129
12 AWG (4 mm²)						
281203*	3	0.417	10.6	78	110	S1113
281204*	4	0.454	11.5	104	148	S1113
281205	5	0.497	12.6	129	181	S1116
281207	7	0.573	14.6	181	324	S1121
281209	9	0.665	16.9	233	359	S1121
10 AWG (6 mm²)						
281003*	3	0.492	12.5	117	194	S1116
281004*	4	0.570	14.5	155	256	S1121
281005	5	0.623	15.8	194	306	S1121
281007	7	0.678	17.2	271	430	S1121
281009	9	0.791	20.1	349	549	S1129

ÖLFLEX® CONTROL TM CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
281803CY	3	0.316	8.0	37	79	53112220
281804CY	4	0.339	8.6	41	93	53112220
281805CY	5	0.365	9.3	55	99	53112220
281807CY	7	0.392	10.0	69	130	53112230
281812CY	12	0.502	12.8	109	223	53112240
281819CY	19	0.610	15.5	172	295	53112250
281825CY	25	0.687	17.4	222	386	53112260
16 AWG (1.5 mm²)						
281603CY	3	0.344	8.7	44	97	53112220
281604CY	4	0.370	9.4	60	117	53112230
281605CY	5	0.400	10.2	72	128	53112230
281607CY	7	0.437	11.1	94	165	53112230
281612CY	12	0.588	14.9	151	287	53112250
281618CY	18	0.675	17.1	227	326	53112260
281625CY	25	0.764	19.4	305	476	53112260

* Cable meets UL bus drop approval

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
14 AWG (2.5 mm²)						
281403CY*	3	0.381	9.7	71	121	53112230
281404CY*	4	0.411	10.4	91	150	53112230
281405CY	5	0.452	11.5	108	181	53112240
281407CY	7	0.488	12.4	143	220	53112240
281412CY	12	0.659	16.7	246	399	53112250
281419CY	19	0.760	19.3	369	527	53112260
281425CY	25	0.903	22.9	474	705	53112260
12 AWG (4 mm²)						
281203CY*	3	0.448	11.4	104	161	53112240
281204CY*	4	0.485	12.3	133	212	53112240
281205CY	5	0.560	14.2	163	260	53112250
281207CY	7	0.604	15.3	217	452	53112250
10 AWG (6 mm²)						
281003CY*	3	0.555	14.1	150	271	53112250
281004CY*	4	0.601	15.3	191	370	53112250
281005CY	5	0.654	16.6	245	412	53112250
281007CY	7	0.709	18.0	330	575	53112260

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® 409 P

Oil and abrasion-resistant control cable with PUR jacket & UL/CSA AWM

ÖLFLEX® 409 P is a flexible control cable with a rugged, highly abrasion-resistant polyurethane jacket. It is UV-resistant and performs very well in mineral oils, cutting oils, and areas with high mechanical abuse. The innovative functional layer allows for easier stripping of the cable jacket compared to other PUR cables.

Construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: specially formulated polyurethane with gap-filling functional layer; black

Recommended applications

Machine tool equipment; handheld controls; any areas where the cable can be cut and damaged by sharp objects

Application advantage

- Rugged PUR jacket to resist cuts, nicks, and abrasion
- UL & CSA AWM approved
- Extremely oil and chemical resistant
- Able to be dragged on the floor with minimal damage
- Improved ease of jacket stripping compared to other PUR cables

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- for flexible use: 12.5 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -5°C to +80°C

Nominal voltage:
- UL/CSA: 1000V
- U_0/U: 300/500V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 20234
Attributes: VW-1, NFPA 79
Canada: cRU AWM I/II AB FT1
Additional: CE & RoHS

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If not otherwise specified, all values relating to the product are nominal values.
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ÖLFLEX® 409 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
19 AWG (0.75 mm²)						
1311852	2	0.272	6.9	10	41	S2111
1311103	3	0.283	7.2	15	48	S2111
1311104	4	0.303	7.7	19	56	S2111
1311105	5	0.327	8.3	24	67	S2111
1311107	7	0.350	8.9	34	82	S2111
1311110	10	0.425	10.8	48	121	S2113
1311112	12	0.437	11.1	58	133	S2113
1311118	18	0.504	12.8	87	185	S2116
1311125	25	0.571	14.5	121	245	S2121
18 AWG (1 mm²)						
1311902	2	0.283	7.2	13	46	S2111
1311203	3	0.295	7.5	19	54	S2111
1311204	4	0.315	8.0	26	65	S2111
1311205	5	0.343	8.7	32	79	S2111
1311207	7	0.366	9.3	45	95	S2111
1311210	10	0.449	11.4	65	142	S2113
1311212	12	0.461	11.7	77	157	S2116
1311218	18	0.531	13.5	116	220	S2121
1311225	25	0.606	15.4	161	294	S2121
16 AWG (1.5 mm²)						
1311952	2	0.307	7.8	19	58	S2111
1311303	3	0.323	8.2	29	70	S2111
1311304	4	0.346	8.8	39	85	S2111

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
1311305	5	0.374	9.5	48	101	S2111
1311307	7	0.402	10.2	68	126	S2113
1311312	12	0.512	13.0	116	211	S2116
1311318	18	0.591	15.0	174	296	S2121
1311325	25	0.677	17.2	242	401	S2121
14 AWG (2.5 mm²)						
1311403	3	0.374	9.5	48	101	S2111
1311404	4	0.402	10.2	65	124	S2113
1311405	5	0.437	11.1	81	151	S2113
1311407	7	0.472	12.0	113	190	S2116
1311412	12	0.610	15.5	194	323	S2121
12 AWG (4 mm²)						
1311504	4	0.465	11.8	103	179	S2116
1311505	5	0.508	12.9	129	218	S2116
10 AWG (6 mm²)						
1311604	4	0.516	13.1	155	241	S2116
1311605	5	0.563	14.3	194	294	S2121
8 AWG (10 mm²)						
1311704	4	0.650	16.5	258	393	S2121
1311705	5	0.717	18.2	323	485	S2129
6 AWG (16 mm²)						
1311804	4	0.752	19.1	413	579	S2129
1311805	5	0.870	22.1	516	744	S2129

* 2c cable does not include ground

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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

ÖLFLEX® 490 P is a flexible control cable with a rugged, highly abrasion-resistant polyurethane jacket. It is UV-resistant and performs very well in mineral oils, cutting oils, and areas with high mechanical abuse. ÖLFLEX® 490 CP is the shielded version, with an overall foil tape with drain wire and tinned copper braid for EMI and RFI protection.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: specially formulated polyurethane; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Shielding: overall foil tape wrap with drain wire; tinned copper braid (85% coverage)

Jacket: specially formulated polyurethane; gray

Recommended applications

Machine tool equipment; handheld controls; any areas where the cable can be cut and damaged by sharp objects

Application advantage

- Rugged PUR jacket to resist cuts, nicks, and abrasion
- UL & CSA AWM approved
- Extremely oil and chemical resistant
- Able to be dragged on the floor with minimal damage
- Number-coded for easy wiring

Approvals

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-01	MECH.	MP-06

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

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

Test voltage: 2000V

Conductor stranding: Class 5 fine wire*

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

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 20234
Attributes: UL Oil Res I/II, sunlight resistant, NFPA 79
Canada: CSA AWM I/II A/B FT1
Additional: CE & RoHS

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If not otherwise specified, all values relating to the product are nominal values.
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ÖLFLEX® 490 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
402002	2	0.245	6.2	7	35	S1107
402003	3	0.256	6.5	10	40	S1109
402004	4	0.274	7.0	13	46	S1109
402005	5	0.293	7.4	17	53	S1111
402007	7	0.313	8.0	23	66	S1111
402009	9	0.355	9.0	30	82	S1111
402012	12	0.401	10.2	38	106	S1113
402018	18	0.459	11.7	59	139	S1113
402025	25	0.534	13.6	79	176	S1121
18 AWG (1 mm²)						
401802	2	0.269	6.8	13	44	S1109
401803	3	0.281	7.1	20	51	S1111
401804	4	0.303	7.7	26	64	S1111
401805	5	0.325	8.3	31	75	S1111
401807	7	0.349	8.9	46	93	S1111
401809	9	0.399	10.1	59	119	S1113
401812	12	0.451	11.5	79	143	S1113
401818	18	0.519	13.2	118	203	S1116
401825	25	0.607	15.4	164	264	S1121

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
401602	2	0.295	7.5	20	53	S1111
401603	3	0.310	7.9	29	64	S1111
401604	4	0.333	8.5	39	77	S1111
401605	5	0.360	9.1	48	90	S1111
401607	7	0.388	9.9	68	115	S1113
401609	9	0.446	11.3	88	141	S1113
401612	12	0.496	12.6	117	179	S1116
401618	18	0.574	14.6	175	253	S1121
401625	25	0.654	16.6	242	335	S1121
14 AWG (2.5 mm²)						
401402	2	0.329	8.4	33	66	S1111
401403	3	0.347	8.8	49	75	S1111
401404	4	0.374	9.5	65	108	S1111
401405	5	0.406	10.3	81	121	S1113
401407	7	0.439	11.2	113	170	S1113
401409	9	0.507	12.9	146	194	S1116
401412	12	0.567	14.4	194	238	S1121
401418	18	0.659	16.7	290	357	S1121
401425	25	0.754	19.2	404	474	S1129

* 2c cable does not include ground

ÖLFLEX® 490 CP

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
402002CP	2	0.270	6.9	19	46	53112210
402003CP	3	0.281	7.1	24	55	53112220
402004CP	4	0.299	7.6	27	66	53112220
402005CP	5	0.318	8.1	33	73	53112220
402007CP	7	0.338	8.6	40	84	53112220
402009CP	9	0.380	9.7	53	104	
402012CP	12	0.426	10.8	69	117	53112230
402018CP	18	0.490	12.4	90	163	53112240
402025CP	25	0.565	14.4	119	214	53112250
18 AWG (1 mm²)						
401802CP	2	0.294	7.5	28	62	53112220
401803CP	3	0.306	7.8	35	71	53112220
401804CP	4	0.328	8.3	44	82	53112220
401805CP	5	0.350	8.9	51	95	53112220
401807CP	7	0.374	9.5	70	117	53112230
401809CP	9	0.424	10.8	89	139	53112230
401812CP	12	0.473	12.0	110	176	53112240
401818CP	18	0.540	13.7	155	240	53112250
401825CP	25	0.609	15.5	218	311	53112250

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
16 AWG (1.5 mm²)						
401602CP	2	0.320	8.1	43	73	53112220
401603CP	3	0.335	8.5	50	82	53112220
401604CP	4	0.358	9.1	60	97	53112220
401605CP	5	0.385	9.8	76	112	53112230
401607CP	7	0.413	10.5	98	137	53112230
401609CP	9	0.477	12.1	122	170	53112240
401612CP	12	0.527	13.4	156	216	53112240
401618CP	18	0.605	15.4	231	295	53112250
401625CP	25	0.685	17.4	307	384	53112260
14 AWG (2.5 mm²)						
401402CP	2	0.354	9.0	56	84	53112220
401403CP	3	0.372	9.4	76	101	53112230
401404CP	4	0.399	10.1	96	123	53112230
401405CP	5	0.431	10.9	116	145	53112230
401407CP	7	0.470	11.9	149	183	53112240
401409CP	9	0.538	13.7	188	225	53112250
401412CP	12	0.598	15.2	242	287	53112250
401418CP	18	0.690	17.5	359	390	53112260
401425CP	25	0.785	19.9	479	558	53112260

* 2c cable does not include ground

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® 590 P/590 CP

Flexible heavy duty, indoor/outdoor cable with PUR jacket

ÖLFLEX® 590 P is a color-coded, flexible power and control cable with a rugged, highly abrasion-resistant yellow polyurethane jacket. It is UV-resistant and performs very well in cold-temperature indoor and outdoor applications. ÖLFLEX® 590 CP is the shielded version, with an overall foil tape, drain wire, and tinned copper braid for EMI and RFI protection.

Unshielded construction

Conductors: finely stranded tinned copper

Insulation: TPE

Jacket: polyurethane; yellow

Shielded construction

Conductors: finely stranded tinned copper

Insulation: TPE

Shielding: overall foil tape with drain wire; tinned copper braid (85% coverage)

Jacket: specially formulated polyurethane; yellow

Recommended applications

Portable hand tools; utility & forestry trucks & equipment; cold temperature applications; areas where the cable can be cut or damaged by sharp objects

Application advantage

- Rugged PUR jacket resists cuts, nicks & abrasions
- TPE insulation for superior cold-temperature flexibility
- Safety colored yellow jacket
- Good for damp environments
- UL & CSA AWM approval

Approvals

FIRE PROTECTION

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-01	MECH.	MP-06

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 5 x cable diameter
- shielded: 8 x cable diameter

Temperature range:
- for flexible use: -50°C to +80°C

Nominal voltage: 600V

Test voltage: 2000V

Conductor stranding: Class 5 fine wire*
* 18 AWG meets only the Class 5 cross section and DC resistance

Color code: chart 1, page 680
(#4 conductor is green/yellow)

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

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® 590 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
501802	2	0.293	7.4	13	44	S2111
501803	3	0.308	7.8	19	51	S2111
501804	4	0.332	8.4	25	64	S2111
501805	5	0.357	9.1	31	77	S2111
501807	7	0.390	9.9	44	95	S2113
16 AWG (1.5 mm²)						
501602	2	0.321	8.2	18	51	S2111
501603	3	0.338	8.6	26	64	S2111
501604	4	0.366	9.3	39	77	S2111
501605	5	0.395	10.0	44	90	S2113
501607	7	0.427	10.8	62	115	S2113

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
501403	3	0.375	9.5	43	82	S2111
501404	4	0.407	10.3	57	101	S2113
501405	5	0.441	11.2	72	123	S2113
12 AWG (4 mm²)						
501203	3	0.399	10.1	72	117	S2113
501204	4	0.447	11.4	96	145	S2113
10 AWG (6 mm²)						
501003	3	0.481	12.2	105	161	S2116
501004	4	0.525	13.3	139	205	S2121

ÖLFLEX® 590 CP

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
501803CP	3	0.330	8.4	34	73	53112220
501804CP	4	0.354	9.0	41	84	53112220
501805CP	5	0.379	9.6	50	99	53112230
16 AWG (1.5 mm²)						
501602CP	2	0.348	9.6	37	73	53112220
501603CP	3	0.365	9.3	46	86	53112220
501604CP	4	0.391	9.3	56	99	53112230
501605CP	5	0.418	10.6	67	117	53112230
14 AWG (2.5 mm²)						
501403CP	3	0.402	10.2	71	108	53112230
501404CP	4	0.438	11.1	88	130	53112230
501405CP	5	0.474	12.0	103	161	53112240

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
12 AWG (4 mm²)						
501203CP	3	0.468	11.9	109	156	53112240
501204CP	4	0.506	12.9	136	190	53112240
501205CP	5	0.550	14.0	160	231	53112240
10 AWG (6 mm²)						
501003CP	3	0.514	13.1	147	216	53112240
501004CP	4	0.557	14.1	184	262	53112250
501005CP	5	0.626	15.9	222	315	53112250

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® POWER MULTI

Flexible oil-resistant tray cable & STOOW extra hard service cordage

ÖLFLEX® POWER MULTI is a multi-purpose power cable with cordage, tray, and NEC Class 1 Div. 1 (flexible use only) approvals.

Recommended applications

Power cord for equipment; paint booths; appliances; factory installations; any power hook-up in the plant

Approvals

c UL us · FIRE PROTECTION · CSA · CE · RoHS

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-02	MECH.	MP-03

Construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: specially formulated thermoplastic polymer; black

Application advantage

- UL & CSA STOOW cordage approval
- UL TC-ER & CSA TC approval
- One cable does the job of three
- Durable jacket for long performance life

Complete the installation

SKINTOP® strain relief page 492

EPIC® pin & sleeve page 465

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter

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

Nominal voltage:
- UL/CSA TC/STOOW: 600V

Test voltage: 2000V

Conductor stranding: Class 5 fine wire*
* 18 AWG meets only Class 5 cross section and DC resistance

Color code: color & number-coded
- 3c: black, white, green/yellow
- 4c: black, white, red, green/yellow
- 5c: black, white, red, brown, green/yellow
- 7c & higher: black with white numbers, plus green/yellow ground

Approvals:
UL: TC-ER per UL 1277; STOOW per UL 62
Attributes: UL Oil Res I/II; 75°C wet; 90°C dry; sunlight resistant; direct burial; NFPA 79
NEC: Class 1 Division 1 & 2 per NEC Article 501
Canada: c(UL) CIC/TC FT4; c(UL) STOOW; CSA AWM I/II A/B FT4
Additional: CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
611803	3	0.371	9.4	20	62	S2111
611804	4	0.399	10.1	26	71	S2113
611805	5	0.471	12.0	33	82	S2116
16 AWG (1.5 mm²)						
611603	3	0.399	10.1	29	75	S2113
611604	4	0.430	10.9	39	88	S2113
611605	5	0.507	12.9	49	104	S2116
611607	7	0.544	13.8	68	132	S2121
611612	12	0.719	18.3	117	225	S2129
611618	18	0.824	20.9	175	295	S2129
611625	25	0.966	24.5	242	401	S2136

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
611403	3	0.541	13.8	49	93	S2121
611404	4	0.584	14.8	65	112	S2121
611405	5	0.663	16.8	81	132	S2121
12 AWG (4 mm²)						
611203	3	0.631	16.0	78	126	S2121
611204	4	0.681	17.3	104	156	S2129
611205	5	0.739	18.8	129	192	S2129
10 AWG (6 mm²)						
611003	3	0.676	17.2	117	229	S2121
611004	4	0.732	18.6	155	271	S2129
8 AWG (10 mm²)						
610803	3	0.840	21.3	194	430	S2129
610804	4	0.943	24.0	258	566	S2129

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 100/100 CY

Flexible color-coded power & control cable

ÖLFLEX® CLASSIC 100 is a color-coded multi-conductor power and control cable for use in all electrical equipment in dry, damp, or wet conditions. It is a European-style cable, conforms to CE, and is available shielded or unshielded.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: PVC

Jacket: PVC; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: PVC

Shielding: Gray PVC inner jacket; tinned copper braid (85% coverage)

Jacket: PVC; transparent

Recommended applications

Control systems; assembly lines; control panels; data processing equipment; European machinery

Application advantage

- European color code for power
- Conforms to CE standards
- Available with inner jacket and tinned copper braid for EMI & RFI protection
- Pressure-extruded jacket for improved flexibility

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- for flexible use: -5°C to +70°C
- for stationary use: -40°C to +80°C

Nominal voltage:
- unshielded:
  - ≤ 16 AWG: 300/500V
  - ≥ 14 AWG: 450/750V
- shielded:
  - ≤ 18 AWG: 300/500V
  - ≥ 16 AWG: 450/750V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: VDE 0293-308: chart 6, page 681

Approvals: based on VDE specifications CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 100

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
00100004	2	0.189	4.8	6	24	S1107
00100014	3	0.201	5.1	10	28	S1107
00100024	4	0.224	5.7	13	36	S1107
00100034	5	0.244	6.2	16	42	S1107
18 AWG (1 mm²)						
00100414	2	0.224	5.7	13	36	S1107
00100424	3	0.236	6.0	19	44	S1107
00100434	4	0.256	6.5	26	53	S1109
00100444	5	0.280	7.1	32	63	S1111
16 AWG (1.5 mm²)						
00100634	2	0.248	6.3	19	46	S1109
00100644	3	0.264	6.7	29	56	S1109
00100654	4	0.283	7.2	39	70	S1111
00100664	5	0.319	8.1	48	86	S1111
14 AWG (2.5 mm²)						
0010086	2	0.350	8.9	32	86	S1111
0010087	3	0.378	9.6	48	109	S1113
00100883	4	0.421	10.7	65	136	S1113
00100893	5	0.465	11.8	81	163	S1116
12 AWG (4 mm²)						
0010100	2	0.409	10.4	52	126	S1113
0010210	3	0.441	11.2	77	164	S1113
00101013	4	0.492	12.5	103	200	S1116
00101023	5	0.539	13.7	129	239	S1121
10 AWG (6 mm²)						
0010105	3	0.496	12.6	116	214	S1116
00101063	4	0.543	13.8	155	265	S1121
00101073	5	0.614	15.6	194	329	S1121

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
8 AWG (10 mm²)						
0010301	3	0.626	15.9	194	342	S1121
00101093	4	0.693	17.6	258	437	S1129
00101103	5	0.776	19.7	323	532	S1129
6 AWG (16 mm²)						
0010302	3	0.720	18.3	310	489	S1129
00101123	4	0.803	20.4	413	730	S1129
00101133	5	0.898	22.8	516	751	S1129
4 AWG (25 mm²)						
0010303	3	0.906	23.0	484	932	S1129
00101153	4	1.000	25.4	645	1063	S1136
00101163	5	1.122	28.5	806	1190	S1136
2 AWG (35 mm²)						
0010304	3	1.008	25.6	677	1187	S1136
00101173	4	1.122	28.5	903	1416	S1136
00101183	5	1.256	31.9	1129	1771	S1248
1 AWG (50 mm²)						
0010305	3	1.220	31.0	968	1718	S1248
00101193	4	1.358	34.5	1290	1978	S1248
2/0 AWG (70 mm²)						
0010306	3	1.390	35.3	1355	2139	S1142
00101203	4	1.551	39.4	1806	2750	S1148
3/0 AWG (95 mm²)						
0010307	3	1.626	41.3	1839	3142	S1148
00101213	4	1.803	45.8	2451	3534	53112080**
4/0 AWG (120 mm²)						
0010308	3	1.874	47.6	2322	3776	53112080**
00103093	4	2.091	53.1	3096	4694	53112080**
350 KCMIL (185 mm²)						
00103123	4	2.472	62.8	4774	5578	53112510**

* 2c cable does not include ground
** SKINTOP® MS with metric thread

ÖLFLEX® CLASSIC 100 CY

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0035001	2	0.276	7.0	28	50	53112210
0035002	3	0.287	7.3	31	56	53112220
00350033	4	0.311	7.9	37	67	53112220
00352013	5	0.331	8.4	44	75	53112220
18 AWG (1 mm²)						
0035220	2	0.311	7.9	38	66	53112220
0035221	3	0.323	8.2	44	75	53112220
00352223	4	0.343	8.7	52	87	53112220
00352233	5	0.374	9.5	60	103	53112230
16 AWG (1.5 mm²)						
0035000	2	0.390	9.9	44	89	53112230
0035458	3	0.406	10.3	53	114	53112230
00354593	4	0.445	11.3	65	137	53112240
00354603	5	0.496	12.6	78	165	53112240
14 AWG (2.5 mm²)						
0035011	3	0.465	11.8	98	142	53112240
00350173	4	0.531	13.5	112	208	53112240
00350123	5	0.575	14.6	134	219	53112250
12 AWG (4 mm²)						
00350183	4	0.594	15.1	159	271	53112250
00350133	5	0.650	16.5	220	321	53112250
10 AWG (6 mm²)						
00350193	4	0.654	16.6	214	350	53112250
00350143	5	0.717	18.2	296	419	53112260

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
8 AWG (10 mm²)						
00350213	4	0.831	21.1	375	566	53112260
00352903	5	0.909	23.1	480	675	53112260
6 AWG (16 mm²)						
00350223	4	0.941	23.9	540	782	53112260
00350153	5	1.055	26.8	706	1216	53112270
4 AWG (25 mm²)						
00350233	4	1.157	29.4	866	1279	53112270
00350243	5	1.283	32.6	972	1595	53112670♦
2 AWG (35 mm²)						
00350253	4	1.276	32.4	1138	1673	53112670♦
00350263	5	1.417	36.0	1327	1862	53112680♦♦
1 AWG (50 mm²)						
00350273	4	1.528	38.8	1574	2259	53112680♦♦
2/0 AWG (70 mm²)						
00350283	4	1.720	43.7	2039	2499	53112680♦♦
3/0 AWG (95 mm²)						
00350293	4	1.984	50.4	2725	3931	53112681♦♦
4/0 AWG (120 mm²)						
00354303	4	2.236	56.8	3511	5046	53112501♦♦
300 KCMIL (150 mm²)						
00354313	4	2.449	62.2	4233	5242	53112500♦♦
350 KCMIL (185 mm²)						
00354323	4	2.669	67.8	5210	6630	53112503♦♦

* 2c cable does not include ground
♦ SKINTOP® MS-SC with metric thread
♦♦ SKINTOP® BRUSH with metric thread

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CLASSIC 100 SY

Flexible color-coded power & control cable with steel braid

ÖLFLEX® CLASSIC 100 SY is a color-coded multi-conductor power and control cable with a galvanized steel braided shield for mechanical and low frequency protection. It is for use in all electrical equipment in dry, damp, or wet conditions. It is a European-style cable conforming to CE.

Recommended applications

Control systems; assembly lines; control panels; data processing equipment; European machinery

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Construction

Conductors: finely stranded bare copper

Insulation: PVC

Inner jacket: PVC; gray

Shielding: galvanized steel braid (75% coverage)

Jacket: PVC; transparent

Application advantage

- Available with inner jacket and steel braid for mechanical protection
- Steel braid provides protection from low-frequency noise
- Pressure-extruded jacket for improved flexibility

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 6 x cable diameter

Temperature range:
- for flexible use: -5°C to +70°C
- for stationary use: -40°C to +80°C

Nominal voltage:
- ≤ 16 AWG: 300/500V
- ≥ 14 AWG: 450/750V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: VDE 0293-308: chart 6, page 681

Approvals: based on VDE specifications CE & RoHS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
0016043	3	0.346	8.8	19	103	S1111
00160443	4	0.374	9.5	26	121	S1111
00160453	5	0.398	10.1	32	136	S1113
16 AWG (1.5 mm²)						
0016065	3	0.382	9.7	29	128	S1113
00160663	4	0.402	10.2	39	146	S1113
00160673	5	0.437	11.1	48	180	S1113
14 AWG (2.5 mm²)						
0016088	3	0.496	12.6	48	187	S1116
00160893	4	0.547	13.9	65	228	S1121
00160903	5	0.598	15.2	81	267	S1121
12 AWG (4 mm²)						
0016101	2	0.535	13.6	52	221	S1121
00161023	4	0.618	15.7	103	307	S1121
00161033	5	0.673	17.1	129	366	S1121

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
10 AWG (6 mm²)						
0016106	3	0.622	15.8	116	365	S1121
00161073	4	0.677	17.2	155	461	S1121
00161083	5	0.740	18.8	194	536	S1129
8 AWG (10 mm²)						
00161103	4	0.838	21.3	258	677	S1129
00161113	5	0.917	23.3	323	803	S1129
6 AWG (16 mm²)						
00161133	4	0.949	24.1	413	929	S1129
4 AWG (25 mm²)						
00161163	4	1.157	29.4	645	1356	S1136
00161173	5	1.283	32.6	806	1654	S1248
2 AWG (35 mm²)						
00161183	4	1.276	32.4	903	1725	S1248

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 110/110 CY

Flexible number-coded power & control cable

ÖLFLEX® CLASSIC 110 is a number-coded multi-conductor power and control cable for use in all electrical equipment in dry, damp, or wet conditions. It is a European-style cable, conforms to CE, and is available unshielded or shielded.

Unshielded construction

Conductors: finely stranded bare copper
Insulation: PVC
Jacket: PVC; gray

Shielded construction

Conductors: finely stranded bare copper
Insulation: PVC
Inner jacket: PVC; gray
Shielding: tinned copper braid (85% coverage)
Jacket: PVC; transparent

Recommended applications

Control systems; assembly lines; control panels; data processing equipment; European machinery

Application advantage

- Common European control cable
- Conforms to CE standards
- Available with inner jacket and tinned copper braid for EMI & RFI protection
- Pressure-extruded jacket for improved flexibility

Approvals

VDE CE RoHS ECOLAB

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:	
- for installation:	4 x cable diameter
- shielded:	6 x cable diameter
Temperature range:	
- for flexible use:	-5°C to +70°C
- for stationary use:	-40°C to +80°C
Nominal voltage:	300/500V
Test voltage:	4000V
Conductor stranding:	Class 5 fine wire
Color code:	black with white numbers, plus green/yellow ground
Approvals:	based on VDE 7030 CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 110

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
1119752	2	0.189	4.8	6	24	S1107
1119003	3	0.201	5.1	10	28	S1107
1119004	4	0.224	5.7	13	36	S1107
1119005	5	0.244	6.2	16	42	S1107
1119007	7	0.264	6.7	23	54	S1109
1119012	12	0.350	8.9	39	88	S1111
1119018	18	0.413	10.5	58	126	S1113
1119025	25	0.488	12.4	81	175	S1116
1119035	35	0.571	14.5	113	239	S1121
1119052	52	0.681	17.3	168	347	S1129
1119065	65	0.772	19.6	210	433	S1129
1119080	80	0.831	21.1	258	524	S1129
1119100	100	0.929	23.6	323	655	S1129
18 AWG (1 mm²)						
1119852	2	0.224	5.7	13	36	S1107
1119203	3	0.236	6.0	19	44	S1107
1119204	4	0.256	6.5	26	53	S1109
1119205	5	0.280	7.1	32	63	S1111
1119207	7	0.315	8.0	45	85	S1111
1119212	12	0.413	10.5	77	138	S1113
1119218	18	0.500	12.7	116	215	S1116
1119225	25	0.579	14.7	161	274	S1121
1119234	34	0.673	17.1	219	370	S1121
1119241	41	0.740	18.8	265	444	S1129
1119250	50	0.811	20.6	323	536	S1129
1119265	65	0.929	23.6	419	694	S1129
1119280	80	0.996	25.3	516	841	S1136
1119300	100	1.114	28.3	645	1048	S1136
16 AWG (1.5 mm²)						
1119902	2	0.248	6.3	19	46	S1109
1119303	3	0.264	6.7	29	56	S1109
1119304	4	0.283	7.2	39	70	S1111
1119305	5	0.319	8.1	48	86	S1111
1119307	7	0.350	8.9	68	112	S1111
1119312	12	0.472	12.0	116	188	S1116
1119318	18	0.567	14.4	174	274	S1121
1119325	25	0.665	16.9	242	376	S1121
1119334	34	0.764	19.4	329	501	S1129
1119341	41	0.839	21.3	397	602	S1129
1119350	50	0.925	23.5	484	732	S1129
1119365	65	1.051	26.7	629	940	S1136
14 AWG (2.5 mm²)						
1119952	2	0.295	7.5	32	68	S1111
1119403	3	0.319	8.1	48	89	S1111
1119404	4	0.350	8.9	65	110	S1111
1119405	5	0.394	10.0	81	134	S1113
1119407	7	0.437	11.1	113	179	S1113
1119412	12	0.583	14.8	194	299	S1121
1119418	18	0.701	17.8	290	436	S1129
1119425	25	0.819	20.8	403	598	S1129
1119434	34	0.961	24.4	548	812	S1129
1119450	50	1.157	29.4	806	1179	S1136
12 AWG (4 mm²)						
1119503	3	0.390	9.9	77	135	S1113
1119504	4	0.425	10.8	103	167	S1113
1119505	5	0.476	12.1	129	198	S1116
1119507	7	0.528	13.4	181	274	S1116
10 AWG (6 mm²)						
1119603	3	0.461	11.7	116	194	S1116
1119604	4	0.512	13.0	155	245	S1116
1119605	5	0.571	14.5	194	300	S1121
1119607	7	0.630	16.0	271	403	S1121
8 AWG (10 mm²)						
1119614	4	0.638	16.2	258	397	S1121
6 AWG (16 mm²)						
1119624	4	0.740	18.8	413	731	S1129
4 AWG (25 mm²)						
1119634	4	0.925	23.5	645	1063	S1129
2 AWG (35 mm²)						
1119644	4	1.039	26.4	903	1415	S1136
1119645	5	1.165	29.6	1129	1771	S1136

* 2c cable does not include ground

ÖLFLEX® CLASSIC 110 CY

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
1135003	3	0.287	7.3	31	56	53112220
1135004	4	0.311	7.9	37	67	53112220
1135005	5	0.331	8.4	44	75	53112220
1135007	7	0.350	8.9	54	89	53112220
1135012	12	0.445	11.3	93	136	53112240
1135018	18	0.524	13.3	105	194	53112240
1135025	25	0.598	15.2	168	254	53112250
18 AWG (1 mm²)						
1135203	3	0.323	8.2	44	75	53112220
1135204	4	0.343	8.7	52	87	53112220
1135205	5	0.374	9.5	60	103	53112230
1135207	7	0.402	10.2	76	124	53112230
1135212	12	0.524	13.3	126	206	53112240
1135218	18	0.610	15.5	192	288	53112250
1135225	25	0.689	17.5	261	366	53112260
16 AWG (1.5 mm²)						
1135902	2	0.335	8.5	44	79	53112220
1135303	3	0.350	8.9	56	91	53112220
1135304	4	0.378	9.6	67	110	53112230
1135305	5	0.406	10.3	84	126	53112230
1135307	7	0.445	11.3	100	159	53112240
1135312	12	0.583	14.8	188	264	53112250
1135318	18	0.677	17.2	261	362	53112260
1135325	25	0.791	20.1	360	501	53112260
14 AWG (2.5 mm²)						
1135403	3	0.406	10.3	98	129	53112230
1135404	4	0.445	11.3	112	157	53112240
1135405	5	0.496	12.6	134	190	53112240
1135407	7	0.547	13.9	194	249	53112250
12 AWG (4 mm²)						
1135504	4	0.528	13.4	159	233	53112240
1135505	5	0.579	14.7	188	278	53112250
10 AWG (6 mm²)						
1135604	4	0.622	15.8	214	326	53112250
8 AWG (10 mm²)						
1135614	4	0.748	19.0	375	494	53112260
6 AWG (16 mm²)						
1135624	4	0.874	22.2	540	934	53112260

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CLASSIC 110 SY

Flexible number-coded power & control cable with steel braid

ÖLFLEX® CLASSIC 110 SY is a number-coded multi-conductor power and control cable with a galvanized steel braid shield for mechanical and low-frequency protection. It is a European-style cable conforming to CE, for use in all electrical equipment in dry, damp, or wet conditions.

Recommended applications

Control systems; assembly lines; control panels; data processing equipment; European machinery

Approvals

Construction

Conductors: finely stranded bare copper

Insulation: PVC

Inner jacket: PVC; gray

Shielding: galvanized steel braid (75% coverage)

Jacket: PVC; transparent

Application advantage

- European-style control and power cable
- Conforms to CE standards
- Inner jacket and steel braid for mechanical protection
- Steel braid provides protection from low-frequency noise
- Pressure-extruded jacket for improved flexibility

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® connectors
page 284

Technical data

Minimum bend radius: 6 x cable diameter

Temperature range:
- for flexible use: -5°C to +70°C
- for stationary use: -40°C to +80°C

Nominal voltage: 300/500V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals: based on VDE 7030 CE & RoHS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
1125003	3	0.319	8.1	10	64	53112220
1125004	4	0.335	8.5	13	72	53112220
1125005	5	0.362	9.2	16	83	53112220
1125007	7	0.382	9.7	23	99	53112230
1125012	12	0.469	11.9	39	143	53112240
1125018	18	0.547	13.9	58	196	53112250
1125025	25	0.614	15.6	81	252	53112250
18 AWG (1 mm²)						
1125852	2	0.335	8.5	13	71	53112220
1125203	3	0.346	8.8	19	80	53112220
1125204	4	0.374	9.5	26	95	53112230
1125205	5	0.398	10.1	32	110	53112230
1125207	7	0.433	11.0	45	134	53112230
1125212	12	0.547	13.9	77	208	53112250
1125218	18	0.626	15.9	116	279	53112250
1125225	25	0.713	18.1	161	368	53112260
16 AWG (1.5 mm²)						
1125303	3	0.382	9.7	29	101	53112230
1125304	4	0.402	10.2	39	116	53112230
1125305	5	0.437	11.1	48	136	53112230
1125307	7	0.469	11.9	68	167	53112240

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
1125312	12	0.606	15.4	116	266	53112250
1125318	18	0.693	17.6	174	362	53112260
1125325	25	0.799	20.3	242	479	53112260
14 AWG (2.5 mm²)						
1125403	3	0.437	11.1	48	138	53112230
1125404	4	0.476	12.1	65	167	53112240
1125405	5	0.520	13.2	81	198	53112240
1125407	7	0.563	14.3	113	251	53112250
1125412	12	0.717	18.2	194	394	53112260
1125418	18	0.843	21.4	290	553	53112260
1125425	25	0.961	24.4	403	734	53112260
12 AWG (4 mm²)						
1125503	3	0.500	12.7	77	192	53112240
1125504	4	0.551	14.0	103	234	53112250
1125505	5	0.594	15.1	129	276	53112250
10 AWG (6 mm²)						
1125604	4	0.638	16.2	155	324	53112250
1125605	5	0.697	17.7	194	389	53112260
8 AWG (10 mm²)						
1125614	4	0.764	19.4	258	491	53112260
6 AWG (16 mm²)						
1125624	4	0.882	22.4	413	930	53112260

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section. If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

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ÖLFLEX® CLASSIC 110 H/110 CH

Oil-resistant, low smoke, zero halogen control cable

ÖLFLEX® 110 H/110 CH is a low smoke, zero halogen (LSZH), multi-conductor control and power cable with improved oil resistance and flame protection. It is for use in all electrical equipment in dry or damp conditions. It is UV and weather resistant and comes in shielded and unshielded versions.

Unshielded construction

Conductors: finely stranded bare copper
Insulation: halogen-free
Jacket: halogen-free; gray

Shielded construction

Conductors: finely stranded bare copper
Insulation: halogen-free
Inner jacket: halogen-free; gray
Shielding: tinned copper braid (85% coverage)
Jacket: halogen-free; gray

Recommended applications

Public buildings; airports; railway stations; amusement rides; areas where human safety is a concern

Application advantage

- Low smoke, zero halogen (LSZH)
- Flame retardant
- Highly flexible and oil resistant
- UV-resistant jacket

Approvals

Cable attributes				page 648
OIL	OR-04	FLAME	FR-04	
MOTION	FL-01	MECH.	MP-01	

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- unshielded: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- for flexible use: -30°C to +70°C (UL: +75°C)
- for stationary use: -40°C to +80°C (UL: +75°C)

Nominal voltage:
- UL: 600V
- U_0/U: 300/500V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 21089
AWM 75°C, 600V
Attributes: Oil Res I/II
NFPA 79
sunlight resistant
Additional: based on VDE specifications
CE & RoHS
DNV-GL certified
LS acc. to IEC 61034-2
HF acc. to IEC 60754-1
Corrosiveness acc. to IEC 60754-2
FR acc. to IEC 60332-3-22/24/25

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 110 H

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
10019901	3	0.213	5.4	10	33	S1107
10019903	4	0.228	5.8	13	39	S1107
10019905	5	0.248	6.3	16	46	S1109
10019906	7	0.272	6.9	23	58	S1109
10019907	12	0.358	9.1	39	95	S1111
18 AWG (1 mm²)						
10019961	3	0.240	6.1	19	48	S1107
10019963	4	0.260	6.6	26	58	S1109
10019965	5	0.287	7.3	32	70	S1111
10019967	7	0.319	8.1	45	93	S1111
10019969	12	0.421	10.7	77	151	S1113
10019971	18	0.508	12.9	116	220	S1116
10019972	25	0.591	15.0	161	299	S1121
16 AWG (1.5 mm²)						
10019931	3	0.268	6.8	29	63	S1109
10019932	4	0.291	7.4	39	77	S1111
10019933	5	0.327	8.3	48	95	S1111
10019934	7	0.354	9.0	68	124	S1111
10019935	12	0.480	12.2	116	207	S1116
10019937	18	0.575	14.6	174	302	S1121
10019938	25	0.677	17.2	242	415	S1121

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
10019945	3	0.327	8.3	48	98	S1111
10019946	4	0.354	9.0	65	121	S1111
10019947	5	0.398	10.1	81	149	S1113
10019948	7	0.441	11.2	113	198	S1113
10019949	12	0.594	15.1	194	330	S1121
12 AWG (4 mm²)						
10019950	4	0.425	10.8	103	180	S1113
10019951	5	0.476	12.1	129	220	S1116
10019952	7	0.528	13.4	181	294	S1116
10 AWG (6 mm²)						
10019953	4	0.512	13.0	155	263	S1116
10019954	5	0.571	14.5	194	321	S1121
10019975	7	0.630	16.0	271	429	S1121
8 AWG (10 mm²)						
10019851	4	0.638	16.2	258	427	S2121
6 AWG (16 mm²)						
10019849	4	0.740	18.8	413	625	S2129
4 AWG (25 mm²)						
10019854	4	0.925	23.5	645	969	S2129
2 AWG (35 mm²)						
10019856	4	1.050	26.6	912	1288	S2136

ÖLFLEX® CLASSIC 110 CH

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
10035031	3	0.291	7.4	24	64	53112220
10035033	4	0.315	8.0	28	75	53112220
10035035	5	0.339	8.6	32	85	53112220
10035036	7	0.358	9.1	40	99	53112220
10035037	12	0.453	11.5	61	152	53112240
18 AWG (1 mm²)						
10035056	3	0.331	8.4	35	85	53112220
10035058	4	0.350	8.9	49	106	53112220
10035060	5	0.382	9.7	56	115	53112230
10035061	7	0.406	10.3	65	141	53112230
10035062	12	0.535	13.6	113	233	53112240
10035063	18	0.618	15.7	158	319	53112250
10035064	25	0.701	17.8	210	411	53112260
16 AWG (1.5 mm²)						
10035068	3	0.354	9.0	46	104	53112220
10035070	4	0.386	9.8	58	125	53112230
10035071	5	0.413	10.5	69	144	53112230
10035072	7	0.449	11.4	90	181	53112240
10035073	12	0.591	15.0	156	299	53112250
10035074	18	0.685	17.4	220	410	53112260
10035075	25	0.803	20.4	311	566	53112260

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
14 AWG (2.5 mm²)						
10035089	3	0.413	10.5	69	148	53112230
10035090	4	0.449	11.4	87	178	53112240
10035091	5	0.500	12.7	106	216	53112240
10035092	7	0.551	14.0	150	284	53112250
10035093	12	0.705	17.9	242	443	53112260
12 AWG (4 mm²)						
10035094	4	0.535	13.6	140	262	53112240
10035095	5	0.587	14.9	169	311	53112250
10035096	7	0.638	16.2	224	395	53112250
10 AWG (6 mm²)						
10035097	4	0.622	15.8	198	347	53112250
10035098	5	0.681	17.3	239	414	53112260
10035099	7	0.740	18.8	322	532	53112260
8 AWG (10 mm²)						
10035380	4	0.752	19.1	310	530	53112260
6 AWG (16 mm²)						
10035382	4	0.878	22.3	489	775	53112260
4 AWG (25 mm²)						
10035384	4	1.063	27.0	755	1214	53112270
2 AWG (35 mm²)						
10035386	4	1.197	30.4	1028	1560	53112270

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CLASSIC 130 H BK/135 CH BK

Low smoke, zero halogen control cable

ÖLFLEX® CLASSIC 130 H BK/135 CH BK is a low smoke, zero halogen (LSZH) multi-conductor power and control cable. It is for use in all electrical equipment in dry or damp conditions. It is UV and weather resistant and comes in shielded and unshielded versions.

Unshielded construction

Conductors: finely stranded bare copper
Insulation: halogen-free
Jacket: halogen-free; black

Shielded construction

Conductors: finely stranded bare copper
Insulation: halogen-free
Shielding: foil tape; tinned copper braid (85% coverage)
Jacket: halogen-free; black

Recommended applications

Public buildings; airports; railway stations; amusement rides; areas where human safety is a concern

Application advantage

- Low smoke, zero halogen (LSZH)
- Flame retardant
- Highly flexible
- UV-resistant jacket

Approvals

Cable attributes				page 648
OIL	OR-01	FLAME	FR-04	
MOTION	FL-01	MECH.	MP-01	

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius: 4 x cable diameter

Temperature range:
- for flexible use: -25°C to +70°C (UL: +75°C)
- for stationary use: -40°C to +80°C (UL: +75°C)

Nominal voltage:
- UL: 1000V
- U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code:
- up to 5c: VDE 0293-308: chart 6, page 681
- 6c & higher: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 21156
Attributes: sunlight resistant
NFPA 79
Additional: CE & RoHS
LS acc. to IEC 61034-2
HF acc. to IEC 60754-1
Corrosiveness acc. to IEC 60754-2
FR acc. to IEC 60332-3-22/24/25

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC 130 H BK

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1.0 mm²)						
1123410	2	0.339	8.6	13	72	S2111
1123411	3	0.355	9.0	19	83	S2111
1123412	4	0.378	9.6	26	97	S2113
1123413	5	0.410	10.4	32	112	S2113
1123414	7	0.437	11.1	45	138	S2113
1123415	12	0.552	14.0	77	211	S2221
1123416	18	0.634	16.1	116	288	S2121
1123417	25	0.733	18.6	161	382	S2229
16 AWG (1.5 mm²)						
1123418	2	0.378	9.6	19	92	S2113
1123419	3	0.398	10.1	29	108	S2113
1123420	4	0.426	10.8	39	128	S2113
1123421	5	0.461	11.7	48	149	S2113
1123422	7	0.496	12.6	68	185	S2116
1123423	12	0.634	16.1	116	287	S2121
1123424	18	0.741	18.8	174	401	S2229
1123425	25	0.855	21.7	242	537	S2129
14 AWG (2.5 mm²)						
1123426	2	0.426	10.8	32	124	S2113
1123427	3	0.445	11.3	48	147	S2113
1123428	4	0.481	12.2	65	176	S2116
1123429	5	0.524	13.3	81	206	S2116
1123430	7	0.567	14.4	113	262	S2221
1123431	12	0.737	18.7	194	419	S2229
1123432	18	0.867	22.0	290	591	S2129
1123433	25	1.017	25.8	403	814	S2236
12 AWG (4 mm²)						
1123434	3	0.496	12.6	77	195	S2116
1123435	4	0.540	13.7	103	236	S2116
1123436	5	0.587	14.9	129	280	S2221
10 AWG (6 mm²)						
1123437	3	0.548	13.9	116	253	S2221
1123438	4	0.595	15.1	155	311	S2121
1123439	5	0.662	16.8	194	376	S2121
8 AWG (10 mm²)						
1123440	4	0.737	18.7	258	509	S2229
1123441	5	0.816	20.7	323	615	S2129
6 AWG (16 mm²)						
1123442	4	0.839	21.3	413	719	S2129
1123443	5	0.930	23.6	516	871	S2129
4 AWG (25 mm²)						
1123444	4	1.032	26.2	645	1096	S2242

* 2c cable does not include ground

ÖLFLEX® CLASSIC 135 CH BK

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1.0 mm²)						
1123460	2	0.370	9.4	27	81	53112230
1123461	3	0.386	9.8	34	94	53112230
1123462	4	0.410	10.4	42	111	53112230
1123463	5	0.441	11.2	51	128	53112230
1123464	6	0.469	11.9	65	155	53112240
1123465	12	0.591	15.0	114	242	53112250
1123466	18	0.682	17.3	160	332	53112250
1123467	25	0.780	19.8	212	432	53112260
16 AWG (1.5 mm²)						
1123468	2	0.410	10.4	36	100	53112230
1123469	3	0.429	10.9	47	119	53112230
1123470	4	0.457	11.6	58	140	53112230
1123471	5	0.493	12.5	70	163	53112240
1123472	7	0.528	13.4	92	202	53112240
1123473	12	0.682	17.3	160	327	53112250
1123474	18	0.796	20.2	239	464	53112260
1123475	25	0.910	23.1	319	614	53112260
14 AWG (2.5 mm²)						
1123476	2	0.457	11.6	53	132	53112230
1123477	3	0.477	12.1	71	163	53112240
1123478	4	0.512	13.0	90	197	53112240
1123479	5	0.556	14.1	106	230	53112250
1123480	7	0.607	15.4	151	310	53112250
1123481	12	0.792	20.1	258	482	53112260
1123482	18	0.922	23.4	369	679	53112260
1123483	25	1.080	27.4	512	921	53112270
12 AWG (4 mm²)						
1123484	3	0.528	13.4	113	220	53112240
1123485	4	0.579	14.7	142	268	53112250
1123486	5	0.626	15.9	168	317	53112250
10 AWG (6 mm²)						
1123487	3	0.587	14.9	156	278	53112250
1123488	4	0.634	16.1	201	349	53112250
1123489	5	0.701	17.8	239	408	53112260
8 AWG (10 mm²)						
1123490	4	0.792	20.1	330	562	53112260
1123491	5	0.863	21.9	394	669	53112260
6 AWG (16 mm²)						
1123492	4	0.887	22.5	494	778	53112260
1123493	5	0.985	25.0	597	946	53112270
4 AWG (25 mm²)						
1123494	4	1.095	27.8	757	1131	53112270

* 2c cable does not include ground

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ÖLFLEX®
Tray-rated cable

52 **Quick select chart**

54 **ÖLFLEX® TRAY II/TRAY II CY**
Extremely oil-resistant & flexible tray cable with UL & CSA; unshielded & shielded

56 **ÖLFLEX® TRAY VTC/TRAY VTC S**
Flexible tray cable with TC-ER for easier installation

58 **ÖLFLEX® AUTO-I**
Heavy duty flexible tray cable with color-coded conductors for DC or AC control wiring

Tray-rated power & control cable in other catalog sections

28 **ÖLFLEX® 190/190 CY**

32 **ÖLFLEX® CONTROL TM/TM CY**

40 **ÖLFLEX® POWER MULTI**

64 **ÖLFLEX® CHAIN TM/TM CY**

78 **ÖLFLEX® FD AUTO-X**

98 **ÖLFLEX® VFD 2XL**

99 **ÖLFLEX® VFD 2XL SYMMETRICAL**

100 **ÖLFLEX® VFD 2XL with Signal**

101 **ÖLFLEX® VFD SLIM**

102 **ÖLFLEX® VFD with Signal**

103 **ÖLFLEX® FD VFD**

104 **ÖLFLEX® SDP TC**

109 **ÖLFLEX® SERVO 7TCE**

Tray-rated data cable in other catalog sections

169 **UNITRONIC® BUS DeviceNet™ Violet**

175 **UNITRONIC® BUS PB TRAY**

185 **UNITRONIC® BUS CAN TRAY**

208 **UNITRONIC® 300/300 S**

210 **UNITRONIC® 300 STP**

236 **ETHERLINE® CAT.5; Stationary**

237 **ETHERLINE® CAT.5; Flexible**

253 **ETHERLINE® TRAY CAT.5e**

Quick select chart

Product	Construction		AWG range	Conductor count other counts available on request	
	shielding	jacket			
Tray-rated cable					
ÖLFLEX® TRAY II	no	spec. form. thermoplastic polymer	18 AWG - 500 KCMIL	2, 3, 4, 5, 7, 8, 9, 12, 16, 18, 25, 41, 50, 61	
ÖLFLEX® TRAY II CY	yes		18 AWG - 2 AWG	2, 3, 4, 5, 7, 12,18, 25	
ÖLFLEX® TRAY VTC	no	spec. form. PVC	18 - 6 AWG	3, 4, 5, 7, 8, 9, 12, 16, 18, 19, 25	
ÖLFLEX® TRAY VTC S	yes	spec. form. PVC	10-18AWG	2,3,5,7,12,19,25	
ÖLFLEX® AUTO-I	no	spec. form. thermoplastic elastomer (TPE)	18 - 16 AWG	3, 5, 7, 11, 12, 19, 25, 33, 42, 49, 65	
Tray-rated power & control cables in other sections					
ÖLFLEX® 190	no	PVC	20 - 2 AWG	2, 3, 4, 5, 7, 9, 12, 18, 25, 34, 41, 50	
ÖLFLEX® 190 CY	yes				
ÖLFLEX® CONTROL TM	no	spec. form. thermoplastic polymer	18 - 10 AWG	3, 4, 5, 6, 7, 9, 10, 12, 15, 19, 20, 25	
ÖLFLEX® CONTROL TM CY	yes				
ÖLFLEX® POWER MULTI	no	spec. form. thermoplastic polymer	18 - 8 AWG	3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® CHAIN TM	no	spec. form. thermoplastic polymer	18 - 10 AWG	3, 4, 5, 7, 12, 18, 25	
ÖLFLEX® CHAIN TM CY	yes				
ÖLFLEX® FD AUTO-X	no	spec. form. thermoplastic elastomer (TPE)	18 - 16 AWG	3, 5, 7, 11, 12, 19, 25, 33, 42, 49, 55	
ÖLFLEX® VFD 2XL	yes	spec. form. thermoplastic elastomer (TPE)	16 - 2 AWG	4	
ÖLFLEX® VFD 2XL SYMMETRICAL	yes	spec. form. thermoplastic elastomer (TPE)	1 AWG - 500 KCMIL	3 + 3 symmetrical grounds	
ÖLFLEX® VFD 2XL with Signal	yes	spec. form. thermoplastic elastomer (TPE)	16 - 2 AWG	4 + 1 pair	
ÖLFLEX® VFD SLIM	yes	spec. form. thermoplastic polymer	18 - 2 AWG	4	
ÖLFLEX® VFD with Signal	yes	spec. form. thermoplastic polymer	16 - 4 AWG	4 + 1 pair	
ÖLFLEX® FD VFD	yes	spec. form. thermoplastic polymer	14 - 10 AWG	4	
ÖLFLEX® SDP TC	no	spec. form. thermoplastic elastomer (TPE)	14 - 1 AWG	4	
ÖLFLEX® SERVO 7TCE	yes	spec. form. thermoplastic elastomer (TPE)	18 - 10 AWG	4, 4 + 1 pair, 4 + 2 pairs	
Tray-rated data cables in other sections					
UNITRONIC® BUS DeviceNet™, Violet	yes	PVC, halogen-free (FRNC)	18 AWG + 16 AWG	2 pairs	
UNITRONIC® BUS PB TRAY	yes	PVC	22 AWG	1 pair	
UNITRONIC® BUS CAN TRAY	yes	PVC	22 AWG	2 pairs	
UNITRONIC® 300	no	spec. formulated PVC	24 - 16 AWG	2, 3, 4, 6, 8, 10, 15, 20, 25, 30, 40, 50	
UNITRONIC® 300 S	yes				
UNITRONIC® 300 STP	yes	spec. formulated PVC	24 - 16 AWG	1, 2, 3, 6, 9, 15 pairs	
ETHERLINE® CAT.5; Stationary	yes	PVC	22 AWG	2 pairs	
ETHERLINE® CAT.5; Flexible	yes	PVC	22 AWG	2 pairs	
ETHERLINE® TRAY CAT.5e	yes	spec. formulated PVC	22 AWG	4 pairs	

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	Stranding	Temperature range		Wet rating	Cable attributes, see page 648			Page
		low	high		oil resistance	flame resistance	mechanical properties	
	Class 5 / Class K fine wire	-40°C	90°C	75°C	OR-03	FR-03	MP-03	54
	Class B stranded wire	-25°C	90°C	90°C	OR-02	FR-03	MP-03	56
	Class B stranded wire	-25°C	90°C	90°C	OR-02	FR-03	MP-03	56
	Class K fine wire	-25°C	90°C	75°C	OR-02	FR-03	MP-03	58
	Class 5 / Class K fine wire	-40°C	90°C	90°C	OR-04	FR-03	MP-02	28
	Class 5 fine wire	-40°C	90°C	75°C	OR-03	FR-03	MP-03	32
	Class 5 fine wire	-40°C	90°C	75°C	OR-03	FR-03	MP-03	40
	Class 6 super fine wire	-40°C	105°C	75°C	OR-03	FR-03	MP-03	64
	Class M stranding	-25°C	90°C	75°C	OR-04	FR-03	MP-03	78
	Class 5 / Class K fine wire	-40°C	105°C	90°C	OR-03	FR-03	MP-03	98
	Class B stranded wire	-40°C	105°C	90°C	OR-01	FR-03	MP-02	99
	Class 5 / Class K fine wire	-40°C	105°C	90°C	OR-03	FR-03	MP-03	100
	Class 5 fine wire	-25°C	90°C	75°C	OR-03	FR-03	MP-03	101
	Class 5 fine wire	-25°C	105°C	75°C	OR-03	FR-03	MP-03	102
	Class 6 super fine wire	-25°C	105°C	75°C	OR-03	FR-03	MP-02	103
	Class 5 fine wire	-40°C	105°C	75°C	OR-03	FR-03	MP-03	104
	Class 5 fine wire	-40°C	105°C	90°C	OR-03	FR-03	MP-03	109
	stranded wire	-20°C	75°C	–	OR-00	FR-03	MP-01	169
	solid wire	-40°C	80°C	–	OR-02	FR-04	MP-03	175
	Class K fine wire	-40°C	80°C	–	OR-02	FR-04	MP-03	185
	Class 5 fine wire	-40°C	105°C	–	OR-02	FR-03	MP-02	208
	Class 5 fine wire	-40°C	105°C	–	OR-02	FR-03	MP-02	210
	solid wire	-40°C	80°C	–	OR-00	FR-03	MP-01	236
	solid wire	-20°C	60°C	–	OR-00	FR-03	MP-01	237
	solid wire	-40°C	80°C	–	OR-02	FR-05	MP-01	253

ÖLFLEX® TRAY II/TRAY II CY

Extremely oil-resistant & flexible tray cable with UL & CSA; unshielded & shielded

ÖLFLEX® TRAY II is an industrial grade tray cable with superior oil performance for long cable life. It has a pressure-extruded jacket and fine copper stranding for excellent flexibility, making it much easier to pull through tray. With UL TC-ER approval, no conduit is needed so you can reduce material costs along with saving on labor. ÖLFLEX® TRAY II CY is designed with foil tape and tinned copper braid shield for improved effectiveness.

Recommended applications

Industrial plant expansions; automotive plants; tray wiring; anywhere VNTC® cables are used

Approvals

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon

Jacket: specially formulated thermoplastic polymer; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon

Shielding: foil tape; tinned copper braid (70% coverage)

Jacket: specially formulated thermoplastic polymer; black

Application advantage

- Oil-resistant pressure-extruded jacket improves flexibility
- Easier to pull than standard tray cables; lower labor costs
- UL TC-ER reduces material costs; no conduit is needed
- Black numbered conductors for easy identification
- Improved shielding effectiveness

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	WT-02	MECH.	MP-03

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation:
  - < 1 AWG: 4 x cable diameter
  - ≥ 1 AWG: 6 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

Test voltage:
- up to 1 AWG: 2000V
- 1 AWG & larger: 4000V

Conductor stranding:
- 18-6 AWG: Class 5 fine wire*
- 4-2 AWG: Class K fine wire
- 1 AWG - 500 KCMIL: stranded wire

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

Color code: black with white printing, plus green/yellow ground

Approvals:

UL: TC-ER per UL 1277
MTW per UL 1063
WTTC per UL 2277
submersible pump (14 - 2 AWG)
PLTC-ER per UL 13 (18 - 12 AWG)
ITC-ER per UL 2250 (18 - 12 AWG)
DP-1 per UL 1690
AWM 20886 (18 - 2 AWG)

Attributes: UL Oil Res I/II
75°C wet; 90°C dry
sunlight resistant
direct burial
NFPA 79

NEC: Class 1 Division 2 per NEC Article 501

Canada: c(UL) CIC/TC FT4 (18 - 4/0 AWG)
CSA AWM I/II A/B FT4

Additional: torsion rated for wind market (± 90°/m) & (± 150°/m) (18 - 2 AWG)
CE & RoHS
MSHA: P-07-KA050016-MSHA (shielded only)

VNTC® is a registered trademark of General Cable.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® TRAY II

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
221803	3	0.297	7.5	20	57	S2111
221804	4	0.320	8.1	26	66	S2111
221805	5	0.346	8.8	33	77	S2111
221807	7	0.373	9.5	46	99	S2111
221809	9	0.429	10.9	59	112	S2113
221812	12	0.477	12.1	79	172	S2116
221818	18	0.587	14.9	118	245	S2121
221825	25	0.664	16.9	164	322	S2121
221850	50	0.939	23.9	303	646	S2129
16 AWG (1.5 mm²)						
221603	3	0.325	8.3	29	68	S2111
221604	4	0.351	8.9	39	84	S2111
221605	5	0.381	9.7	49	99	S2113
221607	7	0.412	10.5	68	128	S2113
221608	8	0.444	11.3	78	137	S2113
221609	9	0.476	12.1	88	172	S2116
221612	12	0.565	14.4	117	220	S2121
221616	16	0.621	15.8	155	271	S2121
221618	18	0.652	16.6	175	289	S2121
221625	25	0.741	18.8	242	397	S2129
221634	34	0.904	23.0	296	540	S2129
221641	41	0.986	25.0	357	626	S2136
221650	50	1.048	26.6	436	760	S2136
221661	61	1.085	27.6	533	771	S2136
14 AWG (2.5 mm²)						
221403	3	0.362	9.2	49	88	S2111
221404	4	0.392	10.0	65	106	S2113
221405	5	0.427	10.8	81	128	S2113
221407	7	0.463	11.8	113	170	S2116
221409	9	0.571	14.5	146	225	S2121
221412	12	0.636	16.2	194	309	S2121
221418	18	0.737	18.7	290	439	S2129
221425	25	0.886	22.5	404	586	S2129
12 AWG (4 mm²)						
221203	3	0.423	10.7	78	126	S2113
221204	4	0.460	11.7	104	152	S2113
221205	5	0.503	12.8	129	187	S2116
221207	7	0.581	14.8	181	258	S2121
10 AWG (6 mm²)						
221003	3	0.498	12.6	117	218	S2116
221004	4	0.578	14.7	155	264	S2121
221005	5	0.631	16.0	194	317	S2121
221007	7	0.686	17.4	271	445	S2129
8 AWG (10 mm²)						
220804	4	0.703	17.9	258	384	S2129
220805	5	0.772	19.6	323	518	S2129
6 AWG (16 mm²)						
220603	3	0.776	19.7	310	454	S2129
220604	4	0.899	22.8	413	580	S2129
220605	5	0.982	24.9	517	725	S2136
4 AWG (21 mm²)						
220403	3	0.999	25.3	386	919	S2136
220404	4	1.094	27.8	544	952	S2136
2 AWG (33.7 mm²)						
220203	3	1.155	29.3	658	1085	S2136
220204	4	1.272	32.3	859	1320	S2248
1 AWG (42.5 mm²)						
220104	4	1.373	34.9	1033	1780	53112170*
1/0 AWG (53.7 mm²)						
221104	4	1.474	37.4	1337	2035	53112070*
2/0 AWG (67.7 mm²)						
222204	4	1.601	40.7	1602	2475	53112070*
3/0 AWG (85.3 mm²)						
223304	4	1.828	46.4	2000	3015	53112080*
4/0 AWG (107.6 mm²)						
224404	4	1.980	50.3	2503	3835	53112080*
250 KCMIL (127.1 mm²)						
222504	4	2.190	55.6	3105	4405	53112511*
350 KCMIL (177.9 mm²)						
223504	4	2.337	59.4	4602	5995	53112511*
500 KCMIL (254.1 mm²)						
225004	4	2.813	71.5	5649	6216	53112512*

* SKINTOP® MS-M with metric thread

ÖLFLEX® TRAY II CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
2218030	3	0.322	8.2	29	79	53112220
2218040	4	0.346	8.8	38	93	53112220
2218050	5	0.371	9.4	45	99	53112230
2218070	7	0.398	10.1	59	130	53112230
2218120	12	0.508	12.9	101	223	53112240
2218180	18	0.618	15.7	145	295	53112250
2218250	25	0.695	17.7	238	386	53112260
16 AWG (1.5 mm²)						
2216030	3	0.350	8.9	41	97	53112220
2216040	4	0.376	9.6	51	117	53112230
2216050	5	0.406	10.3	63	128	53112230
2216070	7	0.443	11.3	88	165	53112240
2216120	12	0.596	15.1	144	287	53112250
2216180	18	0.683	17.3	210	346	53112260
2216250	25	0.772	19.6	280	430	53112260
14 AWG (2.5 mm²)						
2214030	3	0.387	9.8	62	121	53112230
2214040	4	0.423	10.7	85	150	53112230
2214050	5	0.458	11.6	101	181	53112240
2214070	7	0.494	12.5	136	220	53112240
2214120	12	0.667	16.9	225	399	53112250
2214180	18	0.768	19.5	328	527	53112260
2214250	25	0.917	23.3	461	705	53112260
12 AWG (4 mm²)						
2212040	4	0.491	12.5	126	212	53112240
2212050	5	0.568	14.4	157	260	53112250
2212070	7	0.612	15.5	209	335	53112250
10 AWG (6 mm²)						
2210040	4	0.609	15.5	183	370	53112250
2210050	5	0.662	16.8	224	412	53112250
2210070	7	0.717	18.2	308	575	53112260
8 AWG (10 mm²)						
2208040	4	0.737	18.7	295	575	53112260
6 AWG (16 mm²)						
2206040	4	0.918	23.3	470	811	53112260
4 AWG (21 mm²)						
2204040	4	1.127	28.6	579	1331	53112270
2 AWG (33.7 mm²)						
2202040	4	1.309	33.2	950	1951	53112670*

* SKINTOP® MS-SC with metric thread

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® TRAY VTC / VTC S

Flexible tray cable with TC-ER for easier installation

ÖLFLEX® TRAY VTC is a multi-conductor cable approved for use in cable trays. It is UL TC-ER & CSA CIC, making it perfect for new plant installations and factory expansions. Premium PVC insulation provides greater flexibility over PVC/nylon without sacrificing cable size.

Recommended applications

Plant expansion; contractor markets; A&E firm plant designs; tray wiring; anywhere VNTC® cables are used

Approvals

c UL us c UL us FIRE PROTECTION CE RoHS

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: specially formulated PVC; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Shielding: Foil tape (100% coverage); drain wire

Jacket: specially formulated PVC; black

Application advantage

- Easier to pull than standard tray cable
- PVC insulation provides greater flexibility over PVC/nylon
- UL TC-ER approval reduces material costs; no conduit is needed
- Black numbered conductors with printed color code for easy identification
- UV-resistant and direct burial
- UL wet rating 90°C

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	FL-01	MECH.	MP-03

Complete the installation

SKINTOP® strain relief page 492

EPIC® connectors page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- for shielded: 6 x cable diameter

Temperature range:
- UL TC/c(UL) CIC: -25°C to +90°C
- for stationary use: -40°C to +105°C
- for flexible use: -5°C to +90°C

Nominal voltage:
- UL TC: 600V
- UL WTTC: 1000V
- UL AWM/cRU AWM: 1000V

Test voltage: 2000V

Conductor stranding: Class B stranded wire

Color code: black with white numbers and color per ICEA-NEMA (K-2): chart 10, page 683, plus green/yellow ground

Approvals:

UL:	TC-ER per UL 1277
	WTTC per UL 2277
	AWM 20886
Attributes:	UL Oil Res I
	90°C wet; 90°C dry
	sunlight resistant
	direct burial
	NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC FT4
	cRU AWM I/II A/B FT4
Additional:	CE & RoHS

VNTC® is a registered trademark of General Cable.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® TRAY VTC

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (7 strand)						
201803	3	0.286	7.3	16	46	S2111
201804	4	0.307	7.8	21	56	S2111
201805	5	0.332	8.4	26	67	S2111
201807	7	0.358	9.1	37	84	S2111
201809	9	0.411	10.4	48	106	S2113
201812	12	0.458	11.6	63	133	S2116
201818	18	0.562	14.3	95	204	S2121
201819	19	0.562	14.3	101	211	S2121
201825	25	0.636	16.2	132	267	S2121
16 AWG (7 strand)						
201603	3	0.312	7.9	26	59	S2111
201604	4	0.336	8.5	34	73	S2111
201605	5	0.365	9.3	43	87	S2111
201607	7	0.394	10.0	60	112	S2113
201608	8	0.424	10.8	68	127	S2113
201609	9	0.455	11.6	77	142	S2116
201612	12	0.508	12.9	103	180	S2121
201616	16	0.593	15.1	137	249	S2121
201618	18	0.622	15.8	154	275	S2129
201619	19	0.622	15.8	162	284	S2129
201625	25	0.706	17.9	214	363	S2129
14 AWG (19 strand)						
201403	3	0.344	8.7	40	78	S2111
201404	4	0.372	9.4	54	98	S2111
201405	5	0.405	10.3	67	118	S2113
201407	7	0.439	11.2	94	154	S2113
201409	9	0.509	12.9	121	197	S2121
201412	12	0.602	15.3	161	269	S2129
201418	18	0.697	17.7	242	381	S2129
201419	19	0.697	17.7	255	396	S2129
201425	25	0.794	20.2	335	508	S2129
12 AWG (19 strand)						
201203	3	0.381	9.7	64	106	S2113
201204	4	0.413	10.5	85	110	S2113
201205	5	0.451	11.5	106	164	S2113
201207	7	0.490	12.4	149	217	S2116
201212	12	0.673	17.1	255	378	S2129
201216	16	0.743	18.9	341	488	S2129
10 AWG (19 strand)						
201003	3	0.433	11.0	102	150	S2116
201004	4	0.471	12.0	136	193	S2116
201005	5	0.516	13.1	170	236	S2121
201007	7	0.594	15.1	238	333	S2129
8 AWG (19 strand)						
200804	4	0.621	15.8	217	343	S2121
200805	5	0.680	17.3	271	392	S2129
6 AWG (19 strand)						
200604	4	0.756	19.2	343	484	S2129
200605	5	0.871	22.1	429	629	S2129

ÖLFLEX® TRAY VTC S

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (7 strand)						
201802S**	2	0.274	7.0	17	49	S2111
201803S	3	0.290	7.4	22	56	S2111
201805S	5	0.335	8.5	33	77	S2111
201807S	7	0.361	9.2	43	94	S2111
201812S	12	0.461	11.7	70	143	S2116
201819S	19	0.565	14.4	107	221	S2121
16 AWG (7 strand)						
201602S**	2	0.298	7.6	24	60	S2111
201603S	3	0.314	8.0	32	71	S2111
201604S	4	0.340	8.6	41	85	S2111
201607S	7	0.397	10.1	66	124	S2113
201625S	25	0.709	18.0	220	374	S2129
14 AWG (19 strand)						
201402S**	2	0.328	8.3	33	77	S2111
201403S	3	0.346	8.8	47	93	S2111
201404S	4	0.375	9.5	60	112	S2113
201405S	5	0.407	10.3	74	132	S2113
201407S	7	0.441	11.2	100	167	S2113
201409S	9	0.511	13.0	127	212	S2116
201412S	12	0.605	15.4	167	282	S2121
201425S	25	0.797	20.2	342	522	S2129
12 AWG (19 strand)						
201202S**	2	0.364	9.2	51	102	S2111
201203S	3	0.384	9.8	72	126	S2113
201204S	4	0.416	10.6	94	154	S2113
201205S	5	0.455	11.6	111	182	S2113
201207S	7	0.495	12.6	158	235	A2116
201209S	9	0.608	15.4	200	315	S2121
10 AWG (19 strand)						
201004S	4	0.474	12.0	144	216	S2116

2c cable does not include ground
** Part numbers are not -ER rated

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® AUTO-I

Heavy duty flexible tray cable with color-coded conductors for DC or AC control wiring

ÖLFLEX® AUTO-I is a UV-resistant, multi-conductor cable designed for use on machine tool equipment and other industrial machinery conforming to NFPA 79. ÖLFLEX® AUTO-I is color-coded with either blue, red, yellow, orange, or black conductors for DC, AC, and other control wiring.

Construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon

Jacket: specially formulated thermoplastic elastomer (TPE); gray

Recommended applications

Machine tool machinery; food & beverage; processing equipment; automotive and machine wiring for conformance to NFPA 79

Application advantage

- UL TC-ER & CSA CIC/TC approval
- Number coded for easy wiring with either blue, red, orange, black, or yellow conductors

Approvals

c UL us · FIRE PROTECTION · CSA · CE · RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	FL-02	MECH.	MP-03

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius: 4 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

Test voltage: 2000V

Conductor stranding: Class K fine wire

Color code:
- up to 3c: color & number-coded, plus green/yellow ground (black & blue have white numbers)
- 4c & higher (blue): no. 2 conductor is white/blue
- 4c & higher (red): no. 2 conductor is white
- 4c & higher (yellow): no. 2 conductor is white/yellow

Approvals:
- UL: TC-ER per UL 1277; WTTC per UL 2277
- Attributes: UL Oil Res I; 75°C wet; 90°C dry; sunlight resistant; direct burial; NFPA 79
- NEC: Class 1 Division 2 per NEC Article 501
- Canada: c(UL) CIC/TC FT4; CSA AWM I/II A/B FT4
- Additional: CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
251803IB	3	0.297	7.5	20	57	S1111
251805IB	5	0.346	8.7	33	77	S1111
251807IB	7	0.373	9.4	46	99	S1111
251811IB	11	0.463	11.8	71	156	S1116
251812IB	12	0.477	12.1	78	172	S1116
251819IB	19	0.583	14.8	123	253	S1121
251825IB	25	0.677	17.2	162	322	S1121
251833IB	33	0.736	18.7	200	397	S1129
251842IB	42	0.818	20.7	254	509	S1129
251849IB	49	0.908	23.0	317	617	S1129
251865IB	65	1.011	25.6	420	688	S1136

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
251603IB	3	0.323	8.2	26	66	S1111
251607IB	7	0.409	10.4	60	126	S1113
251611IB	11	0.541	13.7	94	203	S1121
251612IB	12	0.557	14.1	103	218	S1121
251617IB	17	0.638	16.1	145	256	S1121
251619IB	19	0.643	16.3	162	284	S1121
251625IB	25	0.737	18.7	213	397	S1129
251633IB	33	0.816	20.7	270	489	S1129
251642IB	42	0.950	24.1	343	628	S1129
251649IB	49	1.005	25.5	401	760	S1136
251665IB	65	1.123	28.5	531	1005	S1136

Part numbers shown are for blue conductors. For other colors, replace the 'B' with an 'R' for red, 'Y' for yellow, 'O' for orange, or 'BK' for black conductors

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX®

Continuous flex power & control cable

60 **Quick select chart**

61 **ÖLFLEX® CHAIN 896 P**
High-acceleration continuous flex power & control cable with PUR jacket

62 **ÖLFLEX® FD 855 P/855 CP**
Halogen-free highly flexible cable with PUR jacket

64 **ÖLFLEX® CHAIN TM/TM CY** NEW
Continuous flex control cable with TC-ER rating

66 **ÖLFLEX® FD 890/890 CY**
Super flexible heavy duty continuous flex control cable with PVC jacket

68 **ÖLFLEX® CHAIN 809/809 CY**
Continuous flex control cable with PVC jacket

70 **ÖLFLEX® CLASSIC FD 810/810 CY**
Continuous flex control cable with PVC jacket

72 **ÖLFLEX® CHAIN 90 P/90 CP** NEW
Highly flexible single-conductor cable with PUR jacket

74 **ÖLFLEX® FD 90/90 CY**
Flexible single-conductor power supply cable with PVC jacket

76 **ÖLFLEX® CHAIN 809 SC/809 SC CY** NEW
Highly flexible single-conductor cable with PVC jacket

78 **ÖLFLEX® FD AUTO-X**
Heavy duty continuous flex control cable

Continuous flex power & control cable in other catalog sections

103 **ÖLFLEX® FD VFD**

113 **ÖLFLEX® SERVO FD 796 CP**

115 **ÖLFLEX® SERVO FD 798 CP**

117 **ÖLFLEX® SERVO FD 7DSL**

Continuous flex data cable in other catalog sections

168 **UNITRONIC® BUS DeviceNet™ FD Gray**

170 **UNITRONIC® BUS DeviceNet™ FD Violet**

174 **UNITRONIC® BUS PB FD**

176 **UNITRONIC® BUS PB FD HYBRID**

184 **UNITRONIC® BUS CAN FD P**

189 **UNITRONIC® BUS LD FD P**

191 **UNITRONIC® BUS ASi FD**

194 **UNITRONIC® BUS INTERBUS FD**

197 **UNITRONIC® BUS CC-Link FD**

222 **UNITRONIC® FD 890**

223 **UNITRONIC® FD**

224 **UNITRONIC® FD CY**

225 **UNITRONIC® FD P plus**

226 **UNITRONIC® FD CP plus**

227 **UNITRONIC® FD CP (TP) plus**

238 **ETHERLINE® 2 pair: CAT.5/CAT.5e; continuous flex**

245 **ETHERLINE® 4 pair: CAT.5e; continuous flex**

246 **ETHERLINE® 4 pair: CAT.6; continuous flex**

248 **ETHERLINE® 4 pair: CAT.6A; continuous flex**

Quick select chart

Product	Shield	Jacket material	Temperature range		Nominal voltage	Flexing cycles	Page
			flexing	stationary			
ÖLFLEX® CHAIN 896 P	no	PUR	-40°C to +80°C	-50°C to +80°C	AWM: 1000V European: 600/1000V	10 million	61
ÖLFLEX® FD 855 P	no	PUR	-40°C to +80°C	-50°C to +80°C	AWM: 1000V European: 300/500V	10 million	62
ÖLFLEX® FD 855 CP	yes						
ÖLFLEX® CHAIN TM	no	spec. formulated thermoplastic polymer	-25°C to +90°C	-40°C to +105°C	UL TC: 600V UL AWM: 1000V European: 300/500V	5 million	64
ÖLFLEX® CHAIN TM CY	yes						
ÖLFLEX® FD 890	no	PVC	-5°C to +90°C	-25°C to +90°C	AWM: 600V	5 million	66
ÖLFLEX® FD 890 CY	yes						
ÖLFLEX® CHAIN 809	no	PVC	0°C to +80°C	-40°C to +80°C	AWM: 1000V European: 300/500V	2 million	68
ÖLFLEX® CHAIN 809 CY	yes						
ÖLFLEX® CLASSIC FD 810	no	PVC	0°C to +70°C	-40°C to +70°C	European: 300/500V	5 million	70
ÖLFLEX® CLASSIC FD 810 CY	yes						
ÖLFLEX® CHAIN 90 P	no	PUR	-35°C to +80°C	-45°C to +80°C	AWM: 1000V European: 600/1000V	10 million	72
ÖLFLEX® CHAIN 90 CP	yes						
ÖLFLEX® FD 90	no	PVC	-5°C to +90°C	-40°C to +90°C	AWM: 600V European: 600/1000V	5 million	74
ÖLFLEX® FD 90 CY	yes						
ÖLFLEX® CHAIN 809 SC	no	PVC	0°C to +90°C	-40°C to +90°C	AWM: 600V European: 600/1000V	2 million	76
ÖLFLEX® CHAIN 809 SC CY	yes						
ÖLFLEX® FD AUTO-X	no	TPE	-5°C to +90°C	-40°C to +105°C	UL TC/AWM: 600V UL WTTC: 1000V	5 million	78

ÖLFLEX® CHAIN 896 P

High-acceleration continuous flex power & control cable with PUR jacket

ÖLFLEX® CHAIN 896 P is specially designed, manufactured, and tested by LAPP for usage in modern high-acceleration cable track applications as well as long travel lengths. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Recommended applications

Factory automation; industrial machinery; cable tracks used in assembly & pick and place machinery; machine tools; transfer lines

Approvals

Construction

Conductors: extra fine bare copper conductors

Insulation: polypropylene; non-woven wrapping

Jacket: polyurethane; black

Application advantage

- High dynamic performance in cable tracks:
  - Acceleration up to 50 m/s²
  - Travel speed up to 5 m/s
  - Travel lengths up to 100 m
- Oil resistant, halogen-free, flame retardant & flexes at low temperatures

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	CF-04A	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CHAIN
page 617

Technical data

Minimum bend radius:
- for continuous flexing:
  - up to 6 AWG: 7.5 x cable diameter
  - 4 AWG: 10 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 U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 6 super fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 20234
Attributes: NFPA 79
Canada: cRU AWM FT1
CSA AWM I/II A
Additional: VDE Reg. no 8661
CE & RoHS
MUD acc. to IEC 61892-4 Annex D

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
1023229	4	0.378	9.6	39	81	S2113
1023230	5	0.394	10.0	48	96	S2113
14 AWG (2.5 mm²)						
1023238	4	0.433	11.0	65	117	S2113
1023239	5	0.473	12.0	81	141	S2116
12 AWG (4 mm²)						
1023245	4	0.493	12.5	103	163	S2116
1023246	5	0.540	13.7	129	212	S2121
10 AWG (6 mm²)						
1023248	4	0.563	14.3	155	225	S2121
1023249	5	0.619	15.7	194	295	S2121

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
8 AWG (10 mm²)						
1023250	4	0.670	17.0	258	338	S2121
1023251	5	0.745	18.9	323	446	S2129
6 AWG (16 mm²)						
1023252	4	0.835	21.2	413	544	S2129
1023253	5	0.938	23.8	516	716	S2129
4 AWG (25 mm²)						
1023254	4	1.020	25.9	645	843	S2136
1023255	5	1.143	29.0	806	1063	S2136

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® FD 855 P/855 CP

Halogen-free highly flexible cable with PUR jacket

ÖLFLEX® FD 855 P is designed for extreme mechanical stresses due to a tighter bend radius in continuous flex applications. Materials are halogen-free and environmentally friendly with an expanded temperature range. The polyurethane jacket is mechanically and chemically resistant to many environments. ÖLFLEX® FD 855 CP is a shielded version available with an overall tinned copper braid. This is recommended when electrical interference needs to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Unshielded construction

Conductors: finely stranded bare copper

Insulation: TPE; dry lubricant; non-woven wrapping over outer layer

Jacket: polyurethane; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: TPE; dry lubricant; non-woven wrapping over outer layer

Inner jacket: TPE

Shielding: tinned copper braid (85% coverage)

Jacket: polyurethane; gray

Recommended applications

Cable tracks; power chains; most automated manufacturing systems; gantry robots; pick and place units; conveyor systems; machine tools, continuous flexing applications

Application advantage

- Our highest-performing continuous flexing cable
- Bend radius of 5 x cable diameter
- Designed for long travel distances up to 100 m horizontal
- Oil- and abrasion-resistant PUR jacket
- Cold temperature resistant to -40°C

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	CF-04	MECH.	MP-05

Complete the installation

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ÖLFLEX® CONNECT solution

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page 617

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:
- UL/c(UL): 1000V
- IEC U_0/U: 300/500V

Test voltage: 3000V

Conductor stranding: Class 6 super fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 21576
Attributes: NFPA 79
Canada: cRU AWM I/II A/B
Additonal: CE & RoHS
MUD acc. to IEC 61892-4 Annex D
halogen-free: VDE 0472-815

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® FD 855 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
0027530	2	0.201	5.1	7	23	S1107
0027531	3	0.217	5.5	9	27	S1107
0027532	5	0.260	6.6	16	37	S1109
0027533	6	0.280	7.1	19	42	S1111
0027534	7	0.303	7.7	23	51	S1111
0027535	12	0.358	9.1	39	77	S1111
0027536	18	0.429	10.9	58	111	S1113
0027537	20	0.453	11.5	65	121	S1113
0027538	25	0.528	13.4	81	147	S1116
0027540	30	0.535	13.6	97	169	S1121
0027541	36	0.579	14.7	116	195	S1121
19 AWG (0.75 mm²)						
0027545	2	0.220	5.6	9	28	S1107
0027546	3	0.236	6.0	15	34	S1107
0027547	4	0.264	6.7	19	40	S1109
0027548	5	0.287	7.3	24	48	S1111
0027549	7	0.346	8.8	34	67	S1111
0027550	12	0.406	10.3	58	106	S1113
0027551	18	0.488	12.4	87	147	S1116
0027552	20	0.524	13.3	97	161	S1116
0027553	25	0.610	15.5	121	208	S1121
0027555	36	0.665	16.9	174	276	S1121

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
0027560	2	0.236	6.0	13	34	S1107
0027561	3	0.256	6.5	19	41	S1109
0027562	4	0.283	7.2	26	47	S1111
0027563	5	0.307	7.8	32	62	S1111
0027564	7	0.374	9.5	45	82	S1111
0027565	12	0.441	11.2	77	132	S1113
0027566	18	0.539	13.7	116	184	S1121
0027568	25	0.661	16.8	161	259	S1121
16 AWG (1.5 mm²)						
0027575	2	0.264	6.7	19	46	S1109
0027576	3	0.287	7.3	29	56	S1111
0027586	4	0.315	8.0	39	67	S1111
0027577	5	0.354	9.0	48	86	S1111
0027578	7	0.422	10.7	68	119	S1113
0027579	12	0.500	12.7	116	185	S1116
0027580	18	0.598	15.2	174	272	S1121
0027582	25	0.740	18.8	242	380	S1129
0027585	36	0.811	20.6	348	510	S1129
0027587	41	0.882	22.4	413	657	S1129
14 AWG (2.5 mm²)						
0027370	3	0.350	8.9	48	81	S1111
0027371	4	0.390	9.9	65	110	S1113
0027372	5	0.433	11.0	81	132	S1113
0027373	7	0.528	13.4	113	179	S1116
0027374	12	0.622	15.8	194	300	S1121
0027375	18	0.744	18.9	290	447	S1129
0027376	25	0.925	23.5	403	624	S1129

ÖLFLEX® FD 855 CP

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0027605	2	0.264	6.7	22	45	53112210
0027606	3	0.280	7.1	27	53	53112210
0027607	5	0.323	8.2	36	72	53112220
0027608	6	0.343	8.7	40	81	53112220
0027609	7	0.374	9.5	45	89	53112230
0027610	12	0.429	10.9	65	128	53112230
0027611	18	0.508	12.9	88	165	53112240
0027612	20	0.531	13.5	105	189	53112240
0027613	25	0.614	15.6	128	247	53112250
0027615	30	0.622	15.8	149	274	53112250
0027616	36	0.665	16.9	169	308	53112250
19 AWG (0.75 mm²)						
0027620	2	0.283	7.2	27	53	53112220
0027621	3	0.299	7.6	32	65	53112220
0027622	4	0.327	8.3	39	75	53112220
0027623	5	0.350	8.9	44	85	53112220
0027624	7	0.417	10.6	57	111	53112230
0027625	12	0.476	12.1	85	155	53112240
0027626	18	0.575	14.6	133	222	53112250
0027628	25	0.697	17.7	174	308	53112260
0027630	36	0.768	19.5	234	407	53112260

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
0027635	2	0.299	7.6	30	62	53112220
0027636	3	0.319	8.1	37	73	53112220
0027637	4	0.346	8.8	46	85	53112220
0027638	5	0.378	9.6	54	99	53112230
0027639	7	0.445	11.3	71	132	53112240
0027640	12	0.520	13.2	118	196	53112240
0027641	18	0.626	15.9	163	281	53112250
0027643	25	0.768	19.5	221	386	53112260
16 AWG (1.5 mm²)						
0027649	2	0.327	8.3	39	77	53112220
0027650	3	0.350	8.9	51	93	53112220
0027661	4	0.386	9.8	61	105	53112230
0027651	5	0.425	10.8	75	133	53112230
0027652	7	0.492	12.5	97	171	53112240
0027653	12	0.587	14.9	163	280	53112250
0027654	18	0.685	17.4	233	379	53112260
0027656	25	0.843	21.4	327	545	53112260
14 AWG (2.5 mm²)						
0027380	3	0.421	10.7	74	130	53112230
0027381	4	0.461	11.7	91	157	53112240
0027382	5	0.504	12.8	121	197	53112240
0027383	7	0.614	15.6	165	281	53112250
0027384	12	0.709	18.0	253	423	53112260
0027385	18	0.846	21.5	382	613	53112260
0027386	25	1.043	26.5	514	851	53112270

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CHAIN TM/TM CY

Continuous flex control cable with TC-ER rating

NEW

ÖLFLEX® CHAIN TM/TM CY are highly flexible multi conductor tray cables designed for continuous flex applications. ÖLFLEX® CHAIN TM CY has an overall tinned copper braid that provides protection against EMI and RFI. Fine stranding and a specially formulated thermoplastic polymer jacket optimize flex life and provide excellent resistance to mineral oils, synthetic oils, and water-based coolants. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon; non-woven wrapping over outer layer

Jacket: specially formulated thermoplastic polymer; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC/nylon; non-woven wrapping over outer layer

Shielding: tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic polymer; black

Recommended applications

Cable tracks & power chains; gantry robots; pick and place units; conveyor systems; machine tools; other continuous flexing applications

Application advantage

- UL TC-ER reduces material costs, as no conduit is needed
- Multi-standard approval reduces part numbers and cost
- Meets UL Oil Res I/II, resistant to harsh environments for a long service life
- Copper shielding complies with EMC requirements
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Approvals

c UL us · TÜV · FIRE PROTECTION · CSA · CE · Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492 · RoHS

Cable attributes				page 648
OIL	OR-03	FLAME	FR-03	
MOTION	CF-02*	MECH.	MP-03	

Complete the installation

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ÖLFLEX® CONNECT solution

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page 617

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter
- shielded: 10 x cable diameter

Temperature range:
- UL/CSA TC: -25°C to +90°C
- for continuous flexing: -25°C to +90°C
- for stationary use: -40°C to +105°C

Nominal voltage:
- UL/CSA TC: 600V
- UL AWM: 1000V
- IEC U_0/U: 300/500V

Test voltage: 2000V

Conductor stranding: Class 6 super 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 PLTC-ER per UL 13 ITC-ER per UL 2250 DP-1 per UL 1690 AWM 20886
Attributes:	UL Oil Res I/II 75°C Wet; 90°C Dry sunlight resistant direct burial NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 CSA AWM I/II A/B FT4
Additional:	CE & RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CHAIN TM

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
8718030	3	0.308	7.8	20	44	S1111
8718040	4	0.337	8.6	26	55	S1111
8718050	5	0.365	9.3	33	64	S1111
8718070	7	0.423	10.7	46	84	S1113
8718120	12	0.486	12.3	79	141	S1116
8718180	18	0.606	15.4	118	207	S1121
8718250	25	0.699	17.8	164	278	S1129
16 AWG (1.5 mm²)						
8716030	3	0.340	8.6	29	62	S1111
8716040	4	0.373	9.5	39	75	S1111
8716050	5	0.405	10.3	49	90	S1113
8716070	7	0.473	12.0	68	121	S1116
8716120	12	0.580	14.7	112	209	S1121
8716180	18	0.679	17.2	175	298	S1121
8716250	25	0.786	20.0	242	417	S1129

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
8714040	4	0.419	10.6	65	121	S1113
8714070	7	0.570	14.5	113	192	S1121
12 AWG (4 mm²)						
8712040	4	0.487	12.4	104	198	S1116
10 AWG (6 mm²)						
8710040	4	0.600	15.2	155	267	S1121

ÖLFLEX® CHAIN TM CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
18 AWG (1 mm²)						
8718030S	3	0.330	8.4	40	82	53112220
8718040S	4	0.359	9.1	48	106	53112220
8718050S	5	0.392	10	57	123	53112230
8718070S	7	0.450	11.4	94	139	53112240
8718120S	12	0.547	13.9	153	229	53112250
8718180S	18	0.633	16.1	216	317	53112250
8718250S	25	0.734	18.6	226	436	53112260
16 AWG (1.5 mm²)						
8716030S	3	0.362	9.2	52	115	53112220
8716040S	4	0.400	10.2	66	128	53112230
8716050S	5	0.432	11	76	150	53112230
8716070S	7	0.500	12.7	98	181	53112240
8716120S	12	0.607	15.4	167	311	53112250
8716180S	18	0.714	18.1	235	456	53112260
8716250S	25	0.870	22.1	313	639	53112260

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
14 AWG (2.5 mm²)						
8714040S	4	0.447	11.4	93	181	53112240
8714070S	7	0.597	15.2	147	282	53112250
12 AWG (4 mm²)						
8712040S	4	0.515	13.1	154	311	53112240
10 AWG (6 mm²)						
8710040S	4	0.635	16.1	208	386	53112250

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® FD 890/890 CY

Super flexible heavy duty continuous flex control cable with PVC jacket

ÖLFLEX® FD 890 is a time-tested, performance-proven multi-conductor cable designed for continuous flex applications. Fine stranding and specially formulated compounds optimize flexing life and provide excellent resistance to mineral oils, synthetic oils, and water-based coolants. ÖLFLEX® FD 890 CY is a shielded version available with an overall tinned copper braid. This is recommended when electrical interference needs to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC; dry lubricant; non-woven wrapping over outer layer

Jacket: specially formulated PVC; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC; dry lubricant; non-woven wrapping over outer layer

Inner jacket: PVC

Shielding: tinned copper braid (85% coverage)

Jacket: specially formulated PVC; black

Recommended applications

Cable tracks & power chains; gantry robots; pick and place units; conveyor systems; machine tool and other continuous flexing applications

Application advantage

- Meets Oil Res I/II, resistant to harsh environments for long service life
- Pressure-extruded jacket for precision connectorization
- Passes UL 1277 impact and crush tests

Approvals

Continuous Flex Test Method Verified UL VERIFIED A522492

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	CF-03*	MECH.	MP-02

Complete the installation

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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

Test voltage: 2000V

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 UL 758 80°C Oil Test
Canada:	CSA AWM I/II A/B FT1 CSA C22.2, 210.2
Additional:	CE & RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® FD 890

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
8920034	3	0.264	6.7	10	43	S2109
8920044	4	0.291	7.4	16	53	S2111
8920054	5	0.323	8.2	19	68	S2111
8920074	7	0.382	9.7	27	75	S2113
8920124	12	0.457	11.6	39	124	S2113
8920184	18	0.539	13.7	69	183	S2121
8920254	25	0.677	17.2	96	265	S2121
18 AWG (1 mm²)						
8918034	3	0.287	7.3	18	46	S2111
8918044	4	0.327	8.3	24	60	S2111
8918054	5	0.355	9.0	29	74	S2111
8918074	7	0.429	10.9	41	102	S2113
8918124	12	0.500	12.7	70	158	S2116
8918154	15	0.559	14.2	88	202	S2121
8918184	18	0.614	15.6	105	234	S2121
8918254	25	0.763	19.4	146	336	S2129
8918344	34	0.826	21.0	211	434	S2129
16 AWG (1.5 mm²)						
8916034	3	0.323	8.2	30	79	S2111
8916044	4	0.358	9.1	39	106	S2111
8916054	5	0.393	10.0	49	132	S2113

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
8916074	7	0.480	12.2	68	138	S2116
8916124	12	0.555	14.1	117	214	S2121
8916184	18	0.685	17.4	175	323	S2129
8916254	25	0.854	21.7	242	505	S2129
8916344	34	0.925	23.5	329	623	S2129
8916504	50	1.094	27.8	437	880	S2136
14 AWG (2.5 mm²)						
8914044	4	0.456	11.6	67	148	S2113
8914074	7	0.614	15.6	117	227	S2121
12 AWG (4 mm²)						
8912044	4	0.531	13.5	104	208	S2121
8912074	7	0.740	18.8	181	335	S2129
10 AWG (6 mm²)						
8910044	4	0.640	16.3	155	275	S2121
8 AWG (10 mm²)						
8908044	4	0.756	19.2	259	481	S2129
6 AWG (16 mm²)						
8906044	4	0.909	23.1	413	709	S2129
4 AWG (25 mm²)						
8904044	4	1.059	26.9	646	1005	S2136
2 AWG (35 mm²)						
8902044	4	1.252	31.8	904	1240	S2248

ÖLFLEX® FD 890 CY

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
8920034S	3	0.342	8.7	27	82	53112220
8920044S	4	0.370	9.4	38	97	53112230
8920054S	5	0.409	10.4	44	108	53112230
8920074S	7	0.468	11.9	52	137	53112240
8920124S	12	0.551	14.0	68	214	53112250
8920184S	18	0.657	16.7	112	293	53112250
8920254S	25	0.803	20.4	158	421	53112260
18 AWG (1 mm²)						
8918034S	3	0.375	9.5	40	91	53112230
8918044S	4	0.419	10.6	48	112	53112230
8918054S	5	0.447	11.4	57	131	53112240
8918074S	7	0.528	13.4	76	198	53112240
8918124S	12	0.636	16.2	125	271	53112250
8918184S	18	0.719	18.3	162	357	53112260
8918254S	25	0.887	22.5	218	538	53112260
8918344S	34	0.986	25.0	211	660	53112270
16 AWG (1.5 mm²)						
8916034S	3	0.409	10.4	54	121	53112230
8916044S	4	0.444	11.3	68	154	53112240

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
8916054S	5	0.480	12.2	81	170	53112240
8916074S	7	0.598	15.2	125	258	53112250
8916124S	12	0.673	17.1	174	366	53112260
8916184S	18	0.826	21.0	239	493	53112260
8916254S	25	0.996	25.3	320	687	53112270
8916344S	34	1.067	27.1	446	769	53112270
14 AWG (2.5 mm²)						
8914044S	4	0.551	14.0	103	181	53112250
8914074S	7	0.709	18.0	175	347	53112260
8914184S	18	1.012	25.7	385	762	53112270
12 AWG (4 mm²)						
8912044S	4	0.650	16.5	160	302	53112250
8912074S	7	0.858	21.8	251	517	53112260
10 AWG (6 mm²)						
8910044S	4	0.752	19.1	215	333	53112260
8 AWG (10 mm²)						
8908044S	4	0.882	22.4	330	701	53112260
6 AWG (16 mm²)						
8906044S	4	1.066	27.1	498	986	53112270

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CHAIN 809/809 CY

Continuous flex control cable with PVC jacket

ÖLFLEX® CHAIN 809 is a flexible multi-conductor cable designed for basic continuous flexing applications. ÖLFLEX® CHAIN 809 CY is a shielded version available with an overall tinned copper braid. This is recommended when electrical interference needs to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant; non-woven wrapping over outer layer

Jacket: PVC; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant; non-woven wrapping over outer layer

Shielding: tinned copper braid (85% coverage)

Jacket: PVC; gray

Recommended applications

Cable tracks; power chains; gantry robots; pick and place units; conveyor systems; machine tools; basic continuous flexing applications

Application advantage

- Designed with North American and European approvals
- Reduced-diameter shielded design
- Flame retardant: UL/CSA VW-1, FT1

Approvals

Continuous Flex Test Method Verified A522492

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-01*	MECH.	MP-01

Complete the installation

SKINTOP® strain relief page 492

EPIC® connectors page 284

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CHAIN page 617

Technical data

Minimum bend radius:
- for continuous flexing: 10 x cable diameter
- sliding applications: 12 x cable diameter

Temperature range:
- for continuous flexing: 0°C to +80°C
- for stationary use: -40°C to +80°C

Nominal voltage:
- UL/CSA: 1000V
- VDE U_0/U: 300/500V

Test voltage:
- conductor/conductor: 4000V
- conductor/shield: 2000V

Conductor stranding: Class 5 fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals:
UL: AWM 20886
Attributes: NFPA 79
Canada: cRU AWM I/II A/B FT1
Additional: CE & RoHS based on VDE 0281 Part 13
*UL Verified ID A522492: Continuous Flex Test Method Verified

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CHAIN 809

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
1026700	2	0.205	5.2	7	27	S1107
1026701	3	0.217	5.5	10	32	S1107
1026702	4	0.236	6.0	13	39	S1107
1026703	5	0.256	6.5	16	45	S1109
1026704	7	0.303	7.7	23	59	S1111
1026705	12	0.362	9.2	39	91	S1111
1026706	18	0.433	11.0	58	131	S1113
1026707	25	0.524	13.3	81	184	S1116
19 AWG (0.75 mm²)						
1026708	2	0.220	5.6	10	33	S1107
1026709	3	0.236	6.0	15	40	S1107
1026710	4	0.256	6.5	19	49	S1109
1026711	5	0.280	7.1	25	58	S1111
1026712	7	0.335	8.5	34	79	S1111
1026713	12	0.406	10.3	58	122	S1113
1026714	18	0.480	12.2	87	174	S1116
1026715	25	0.583	14.8	122	244	S1121
18 AWG (1 mm²)						
1026716	2	0.232	5.9	13	39	S1107
1026717	3	0.248	6.3	19	48	S1109
1026718	4	0.272	6.9	26	59	S1109
1026719	5	0.295	7.5	32	70	S1111
1026720	7	0.354	9.0	45	95	S1111
1026721	12	0.429	10.9	77	149	S1113
1026722	18	0.520	13.2	116	218	S1116
1026723	25	0.618	15.7	161	299	S1121
16 AWG (1.5 mm²)						
1026724	2	0.256	6.5	19	50	S1109
1026725	3	0.272	6.9	29	62	S1109
1026726	4	0.299	7.6	39	77	S1111
1026727	5	0.335	8.5	48	93	S1111
1026728	7	0.406	10.3	68	127	S1113
1026729	12	0.484	12.3	116	198	S1116
1026730	18	0.584	14.9	174	288	S1121
1026731	25	0.705	17.9	242	401	S1129
14 AWG (2.5 mm²)						
1026732	3	0.331	8.4	48	97	S1111
1026733	4	0.366	9.3	65	120	S1111
1026734	7	0.500	12.7	81	146	S1116
12 AWG (4 mm²)						
1026737	4	0.437	11.1	108	179	S1113

* 2c cable does not include ground

ÖLFLEX® CHAIN 809 CY

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
1026751	2	0.228	5.8	24	30	53112210
1026752	3	0.240	6.1	29	40	53112210
1026753	4	0.260	6.6	33	56	53112210
1026754	5	0.280	7.1	38	65	53112210
1026755	7	0.335	8.5	46	91	53112220
1026756	12	0.394	10.0	70	134	53112230
1026757	18	0.465	11.8	95	185	53112240
1026758	25	0.555	14.1	142	235	53112250
19 AWG (0.75 mm²)						
1026759	2	0.244	6.2	29	38	53112210
1026760	3	0.260	6.6	35	47	53112210
1026761	4	0.280	7.1	41	64	53112210
1026762	5	0.303	7.7	48	87	53112220
1026763	7	0.358	9.1	60	113	53112220
1026764	12	0.429	10.9	93	156	53112230
1026765	18	0.512	13.0	142	212	53112240
1026766	25	0.614	15.6	188	292	53112250
18 AWG (1 mm²)						
1026767	2	0.256	6.5	34	56	53112210
1026768	3	0.272	6.9	42	74	53112210
1026769	4	0.295	7.5	50	87	53112220
1026770	5	0.327	8.3	59	105	53112220
1026771	7	0.386	9.8	75	129	53112230
1026772	12	0.461	11.7	124	192	53112240
1026773	18	0.551	14.0	180	265	53112250
1026774	25	0.657	16.7	238	327	53112250
16 AWG (1.5 mm²)						
1026775	2	0.280	7.1	44	65	53112210
1026776	3	0.295	7.5	55	84	53112220
1026777	4	0.331	8.4	67	111	53112220
1026778	5	0.358	9.1	80	130	53112220
1026779	7	0.429	10.9	103	165	53112230
1026780	12	0.524	13.3	180	245	53112240
1026781	18	0.618	15.7	251	372	53112250
1026782	25	0.736	18.7	356	493	53112260
14 AWG (2.5 mm²)						
1026783	3	0.354	9.0	79	126	53112220
1026784	4	0.398	10.1	99	159	53112230
1026785	7	0.531	13.5	170	228	53112240
12 AWG (4 mm²)						
1026788	4	0.469	11.9	167	205	53112240

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CLASSIC FD 810/810 CY

Continuous flex control cable with PVC jacket

ÖLFLEX® CLASSIC FD 810 is a flexible multi-conductor cable designed for continuous flex applications. It is specially designed to optimize flex life and provides excellent resistance to minerals oils, synthetic oils, and water-based coolants. ÖLFLEX® CLASSIC FD 810 CY is a shielded version available with an overall tinned copper braid. This is recommended when electrical interference needs to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant; non-woven wrapping over outer layer

Jacket: PVC; gray

Shielded construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant; non-woven wrapping over outer layer

Inner jacket: PVC

Shielding: tinned copper braid (85% coverage)

Jacket: PVC; gray

Recommended applications

Cable tracks; power chains; gantry robots; pick and place units; conveyor systems; machine tools; continuous flexing applications

Application advantage

- European version with CE approvals
- Number-coded conductors for easier installation

Approvals

CE RoHS Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CHAIN
page 617

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: 0°C to +70°C
- for stationary use: -40°C to +70°C

Nominal voltage: 300/500V

Test voltage: 4000V

Conductor stranding: Class 6 super fine wire

Color code: black with white numbers, plus green/yellow ground

Approvals: CE & RoHS
based on VDE 0245/0281
*UL Verified ID A522492: Continuous Flex Test Method Verified

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CLASSIC FD 810

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
0026100	2	0.209	5.3	7	27	S1107
0026101	3	0.224	5.7	10	32	S1107
0026102	4	0.248	6.3	13	39	S1109
0026103	5	0.268	6.8	16	45	S1109
0026104	7	0.315	8.0	23	59	S1111
0026105	12	0.374	9.5	39	91	S1111
0026106	18	0.449	11.4	58	131	S1113
0026107	25	0.539	13.7	81	184	S1121
0026109	34	0.614	15.6	110	241	S1121
0026110	50	0.728	18.5	161	346	S1129
19 AWG (0.75 mm²)						
0026119	2	0.224	5.7	10	33	S1107
0026120	3	0.244	6.2	15	40	S1107
0026121	4	0.268	6.8	19	49	S1109
0026122	5	0.291	7.4	25	58	S1111
0026123	7	0.350	8.9	34	79	S1111
0026124	12	0.417	10.6	58	122	S1113
0026125	16	0.472	12.0	78	157	S1116
0026126	18	0.500	12.7	87	174	S1116
0026127	25	0.598	15.2	122	244	S1121
18 AWG (1 mm²)						
0026130	2	0.240	6.1	13	39	S1107
0026131	3	0.260	6.6	19	48	S1109
0026132	4	0.287	7.3	26	59	S1111
0026133	5	0.315	8.0	32	70	S1111
0026134	7	0.378	9.6	45	95	S1113
0026135	12	0.449	11.4	77	149	S1113
0026138	18	0.547	13.9	116	218	S1121

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
0026139	25	0.646	16.4	161	299	S1121
0026142	41	0.811	20.6	265	478	S1129
0026143	50	0.878	22.3	323	574	S1129
16 AWG (1.5 mm²)						
0026149	2	0.268	6.8	19	50	S1109
0026150	3	0.291	7.4	29	62	S1111
0026151	4	0.319	8.1	39	77	S1111
0026152	5	0.358	9.1	48	93	S1111
0026153	7	0.429	10.9	68	127	S1113
0026154	12	0.508	12.9	116	198	S1116
0026156	18	0.614	15.6	174	288	S1121
0026157	25	0.733	18.6	242	401	S1129
0026159	34	0.831	21.1	329	526	S1129
14 AWG (2.5 mm²)						
0026170	3	0.354	9.0	48	97	S1111
0026171	4	0.394	10.0	65	120	S1113
0026172	5	0.441	11.2	81	146	S1113
0026173	7	0.535	13.6	113	204	S1121
0026175	14	0.677	17.2	226	368	S1121
12 AWG (4 mm²)						
0026180	3	0.417	10.6	81	144	S1113
0026181	4	0.461	11.7	108	179	S1116
10 AWG (6 mm²)						
0026183	4	0.547	13.9	150	266	S1121
8 AWG (10 mm²)						
0026185	4	0.693	17.6	258	433	S1129
0026186	5	0.772	19.6	323	528	S1129
6 AWG (16 mm²)						
0026187	4	0.827	21.0	413	620	S1129

* 2c cable does not include ground

ÖLFLEX® CLASSIC FD 810 CY

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0026200	2	0.272	6.9	22	50	53112210
0026201	3	0.287	7.3	26	56	53112220
0026202	4	0.311	7.9	31	66	53112220
0026203	5	0.331	8.4	36	74	53112220
0026204	7	0.386	9.8	47	96	53112230
0026205	12	0.445	11.3	67	135	53112240
0026206	18	0.528	13.4	103	193	53112240
0026207	25	0.626	15.9	136	265	53112250
19 AWG (0.75 mm²)						
0026219	2	0.287	7.3	26	57	53112220
0026220	3	0.307	7.8	32	67	53112220
0026221	4	0.331	8.4	40	78	53112220
0026222	5	0.354	9.0	46	89	53112220
0026223	7	0.421	10.7	60	120	53112230
0026224	12	0.488	12.4	87	170	53112240
0026226	18	0.587	14.9	138	247	53112250
0026227	25	0.685	17.4	182	333	53112260
18 AWG (1 mm²)						
0026230	2	0.303	7.7	31	65	53112220
0026231	3	0.323	8.2	38	77	53112220
0026232	4	0.350	8.9	47	90	53112220
0026233	5	0.386	9.8	54	107	53112230
0026234	7	0.449	11.4	74	139	53112240
0026235	12	0.528	13.4	122	211	53112240
0026238	18	0.634	16.1	171	298	53112250
0026239	25	0.740	18.8	245	411	53112260

Part number	Number of conductors incl. ground*	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0026241	34	0.846	21.5	311	529	53112260
0026242	41	0.913	23.2	364	617	53112260
16 AWG (1.5 mm²)						
0026249	2	0.331	8.4	39	79	53112220
0026250	3	0.354	9.0	50	93	53112220
0026251	4	0.390	9.9	61	114	53112230
0026252	5	0.429	10.9	75	135	53112230
0026253	7	0.500	12.7	97	176	53112240
0026254	12	0.594	15.1	166	271	53112250
0026256	18	0.701	17.8	234	376	53112260
0026257	25	0.835	21.2	335	533	53112260
0026259	34	0.941	23.9	470	675	53112260
14 AWG (2.5 mm²)						
0026270	2	0.425	10.8	80	139	53112230
0026271	4	0.465	11.8	108	166	53112240
0026272	5	0.520	13.2	130	206	53112240
0026273	7	0.622	15.8	176	281	53112250
12 AWG (4 mm²)						
0026281	4	0.539	13.7	160	242	53112250
0026282	5	0.602	15.3	188	293	53112250
10 AWG (6 mm²)						
0026283	4	0.634	16.1	214	345	53112250
8 AWG (10 mm²)						
0026285	4	0.795	20.2	350	554	53112260
6 AWG (16 mm²)						
0026287	4	0.929	23.6	524	811	53112260

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CHAIN 90 P/90 CP

Highly flexible single-conductor cable with PUR jacket

NEW

ÖLFLEX® CHAIN 90 P is a highly flexible PUR 1000V single-conductor cable for continuous flex applications. The polyurethane jacket is mechanically and chemically resistant to many environments. ÖLFLEX® CHAIN 90 CP with tinned copper braid shielding is used for applications where EMI emissions need to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: special black or green/yellow compound based on TPE

Jacket: polyurethane; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: special black or green/yellow compound based on TPE

Shielding: tinned copper braid

Jacket: polyurethane; black

Recommended applications

Power chains or moving machine parts; for wiring of electric and electronic equipment in switch cabinets; test systems in the automotive industry; vehicles and stationary fuel cell systems

Application advantage

- Suitable for heavy duty power chain applications
- Can substitute multi-conductor power cables where space requirements can cause problems
- Suitable for dry or damp interior use
- Available in larger conductor sizes for power applications
- CSA FT1 flame retardant

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-04	MECH.	MP-05	

Complete the installation

SKINTOP® strain relief
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CHAIN
page 617

Technical data

Minimum bend radius:
- for installation: 3 x cable diameter
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -35°C to +80°C
- for flexible use: -50°C to +80°C

Nominal voltage:
- UL/CSA: 1000V
- IEC U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 6 super fine wire

Approvals:
UL: AWM 11624, VW-1
Attributes: NFPA 79
Canada: cRU AWM I/II A FT1
Additional: CE & RoHS

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CHAIN 90 P

black conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
1026514	1	0.248	6.3	10	32	S2109
14 AWG (2.5 mm²)						
1026516	1	0.272	6.9	16	42	S2109
12 AWG (4 mm²)						
1026518	1	0.283	7.2	26	52	S2109
10 AWG (6 mm²)						
1026520	1	0.303	7.7	39	64	S2111
8 AWG (10 mm²)						
1026522	1	0.358	9.1	65	98	S2111
6 AWG (16 mm²)						
1026524	1	0.417	10.6	103	138	S2113
4 AWG (25 mm²)						
1026526	1	0.484	12.3	161	195	S2116
2 AWG (35 mm²)						
1026528	1	0.524	13.3	226	278	S2116
1 AWG (50 mm²)						
1026530	1	0.626	15.9	323	360	S2121
2/0 AWG (70 mm²)						
1026532	1	0.709	18	452	522	S2129
3/0 AWG (95 mm²)						
1026534	1	0.783	19.9	614	672	S2129
4/0 AWG (120 mm²)						
1026536	1	0.886	22.5	775	840	S2129
250 KCMIL (150 mm²)						
1026538	1	0.969	24.6	969	1000	S2136
350 KCMIL (185 mm²)						
1026540	1	1.071	27.2	1195	1203	S2136
450 KCMIL (240 mm²)						
1026542	1	1.264	32.1	1550	1602	S2142
500 KCMIL (300 mm²)						
1026544	1	1.339	34	1938	1994	S2142

green/yellow conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
1026513	1	0.248	6.3	10	32	S2109
14 AWG (2.5 mm²)						
1026515	1	0.272	6.9	16	42	S2109
12 AWG (4 mm²)						
1026517	1	0.283	7.2	26	52	S2109
10 AWG (6 mm²)						
1026519	1	0.303	7.7	39	64	S2111
8 AWG (10 mm²)						
1026521	1	0.358	9.1	65	98	S2111
6 AWG (16 mm²)						
1026523	1	0.417	10.6	103	138	S2113
4 AWG (25 mm²)						
1026525	1	0.484	12.3	161	195	S2116
2 AWG (35 mm²)						
1026527	1	0.524	13.3	226	278	S2116
1 AWG (50 mm²)						
1026529	1	0.626	15.9	323	360	S2121
2/0 AWG (70 mm²)						
1026531	1	0.709	18	452	522	S2129
3/0 AWG (95 mm²)						
1026533	1	0.783	19.9	614	672	S2129
4/0 AWG (120 mm²)						
1026535	1	0.886	22.5	775	840	S2129
250 KCMIL (150 mm²)						
1026537	1	0.969	24.6	969	1000	S2136
350 KCMIL (185 mm²)						
1026539	1	1.071	27.2	1195	1203	S2136
450 KCMIL (240 mm²)						
1026541	1	1.264	32.1	1550	1602	S2142
500 KCMIL (300 mm²)						
1026543	1	1.339	34	1938	1994	S2142

ÖLFLEX® CHAIN 90 CP

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
16 AWG (1.5 mm²)						
1026547	1	0.276	7	16	40	53112210
14 AWG (2.5 mm²)						
1026548	1	0.299	7.6	28	61	53112220
12 AWG (4 mm²)						
1026549	1	0.311	7.9	40	67	53112220
10 AWG (6 mm²)						
1026550	1	0.331	8.4	55	81	53112220
8 AWG (10 mm²)						
1026551	1	0.386	9.8	83	121	53112230
6 AWG (16 mm²)						
1026553	1	0.445	11.3	126	161	53112230
4 AWG (25 mm²)						
1026555	1	0.512	13	189	229	53112240
2 AWG (35 mm²)						
1026557	1	0.559	14.2	268	323	53112250

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
1 AWG (50 mm²)						
1026559	1	0.661	16.8	371	410	53112250
2/0 AWG (70 mm²)						
1026561	1	0.752	19.1	520	592	53112260
3/0 AWG (95 mm²)						
1026563	1	0.850	21.6	698	781	53112260
4/0 AWG (120 mm²)						
1026565	1	0.929	23.6	860	929	53112260
250 KCMIL (150 mm²)						
1026567	1	1.020	25.9	1089	1124	53112270
350 KCMIL (185 mm²)						
1026569	1	1.122	28.5	1317	1332	53112270
450 KCMIL (240 mm²)						
1026571	1	1.315	33.4	1690	1750	53112670*
500 KCMIL (300 mm²)						
1026573	1	1.390	35.3	2097	2160	53112670*

* SKINTOP® MS-SC with metric thread.

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® FD 90/90 CY

Flexible single-conductor power supply cable with PVC jacket

ÖLFLEX® FD 90 is a flexible 600V UL and CSA approved single-conductor cable for continuous flex applications. It is designed with super fine wire stranding and specially formulated PVC compounds that are resistant to most mineral oils and water-based coolants. ÖLFLEX® FD 90 CY with tinned copper braid shielding is used for applications where EMI emissions need to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated black or green/yellow PVC; non-woven wrapping

Jacket: specially formulated PVC; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated black PVC; non-woven wrapping

Shielding: tinned copper braid

Jacket: specially formulated PVC; orange

Recommended applications

Power circuits and applications requiring flexible power cable to interconnect the power supply to the machine

Application advantage

- Core line for ordinary duty in power chain applications
- North American UL/CSA and European market approvals
- Suitable for dry, damp interior use
- Available in larger conductor sizes for power applications
- CSA FT1 flame retardant

Approvals

c UL us · FIRE PROTECTION · CSA · CE · Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492 · RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-01

Complete the installation

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ÖLFLEX® CONNECT solution

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Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter
- for stationary use: 3 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -40°C to +90°C

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

Test voltage: 4000V

Conductor stranding: Class 6 super fine wire

Approvals:
- UL: AWM 10107
- Attributes: NFPA 79
- Canada: CSA AWM I/II A/B FT1 (≤ 4/0 AWG); cRU AWM I/II A/B FT1 (≥ 300 KCMIL)
- Additional: CE & RoHS based on VDE 0250/0281
- *UL Verified ID A522492: Continuous Flex Test Method Verified

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® FD 90

black conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
8 AWG (10 mm²)						
0026601	1	0.354	9.0	65	118	S2111
6 AWG (16 mm²)						
0026604	1	0.413	10.5	103	161	S2113
4 AWG (25 mm²)						
0026608	1	0.465	11.8	161	243	S2116
2 AWG (35 mm²)						
0026611	1	0.559	14.2	226	324	S2121
1 AWG (50 mm²)						
0026614	1	0.638	16.2	323	444	S2121
2/0 AWG (70 mm²)						
0026617	1	0.720	18.3	452	603	S2129
3/0 AWG (95 mm²)						
0026620	1	0.780	19.8	613	792	S2129
4/0 AWG (120 mm²)						
0026623	1	0.921	23.4	774	1022	S2129
250 KCMIL (150 mm²)						
0026626	1	0.988	25.1	968	1169	S2136
350 KCMIL (185 mm²)						
0026629	1	1.106	28.1	1193	1549	S2136
450 KCMIL (240 mm²)						
0026635	1	1.244	31.6	1548	1978	S2248
500 KCMIL (300 mm²)						
0026641	1	1.319	33.5	1935	2382	S2248

green/yellow conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
8 AWG (10 mm²)						
0026600	1	0.354	9.0	65	118	S2111
6 AWG (16 mm²)						
0026603	1	0.413	10.5	103	161	S2113
4 AWG (25 mm²)						
0026607	1	0.465	11.8	161	243	S2116
2 AWG (35 mm²)						
0026610	1	0.559	14.2	226	324	S2121
1 AWG (50 mm²)						
0026613	1	0.638	16.2	323	444	S2121
2/0 AWG (70 mm²)						
0026616	1	0.720	18.3	452	603	S2129
3/0 AWG (95 mm²)						
0026619	1	0.780	19.8	613	792	S2129
4/0 AWG (120 mm²)						
0026622	1	0.921	23.4	774	1022	S2129
250 KCMIL (150 mm²)						
0026625	1	0.988	25.1	968	1169	S2136
350 KCMIL (185 mm²)						
0026628	1	1.106	28.1	1193	1549	S2136
450 KCMIL (240 mm²)						
0026634	1	1.244	31.6	1548	1978	S2248
500 KCMIL (300 mm²)						
0026640	1	1.319	33.5	1935	2382	S2248

ÖLFLEX® FD 90 CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
8 AWG (10 mm²)						
0026651	1	0.382	9.7	86	153	53112230
6 AWG (16 mm²)						
0026653	1	0.441	11.2	125	200	53112240
4 AWG (25 mm²)						
0026655	1	0.492	12.5	173	276	53112240
2 AWG (35 mm²)						
0026657	1	0.594	15.1	269	408	53112250
1 AWG (50 mm²)						
0026659	1	0.673	17.1	373	543	53112260
2/0 AWG (70 mm²)						
0026661	1	0.764	19.4	521	726	53112260

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
3/0 AWG (95 mm²)						
0026663	1	0.823	20.9	691	929	53112260
4/0 AWG (120 mm²)						
0026665	1	0.965	24.5	862	1177	53112270
250 KCMIL (150 mm²)						
0026667	1	1.031	26.2	948	1293	53112270
350 KCMIL (185 mm²)						
0026669	1	1.150	29.2	1300	1755	53112270
450 KCMIL (240 mm²)						
0026671	1	1.295	32.9	1697	2266	53112670*
500 KCMIL (300 mm²)						
0026673	1	1.370	34.8	2103	2759	53112670*

* SKINTOP® MS-SC with metric thread.

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® CHAIN 809 SC/809 SC CY

Highly flexible single-conductor cable with PVC jacket

NEW

ÖLFLEX® CHAIN 809 SC is a flexible 600V single-conductor cable for continuous flex applications. It is designed with fine wire stranding and specially formulated PVC compounds that are resistant to most mineral oils and water-based coolants. ÖLFLEX® CHAIN 809 SC CY with tinned copper braid shielding is used for applications where EMI emissions need to be suppressed. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Recommended applications

Power chains or moving machine parts; wiring electric and electronic equipment in switch cabinets; specially designed for power circuits of servo motors driven by frequency converters; test systems in the automotive industry; vehicles and stationary fuel cell systems.

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Unshielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated black or green/yellow PVC

Jacket: specially formulated PVC; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: specially formulated black PVC

Shielding: tinned copper braid

Jacket: specially formulated PVC; black

Application advantage

- Suitable for light & ordinary duty in power chain applications
- North American UL/CSA & European market approvals
- Suitable for dry or damp interior use
- Available in larger conductor sizes for power applications
- CSA FT1 flame retardant

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-01	MECH.	MP-01

Complete the installation

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ÖLFLEX® CONNECT solution

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Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- for flexible use: 10 x cable diameter

Temperature range:
- for continuous flexing: 0°C to +90°C
- for flexible use: -40°C to +90°C

Nominal voltage:
- UL/CSA: 600V
- IEC U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Approvals:
UL: AWM 10107
Attributes: NFPA 79
Canada: cRU AWM II AB FT1
Additional: CE & RoHS
based on VDE 0250/0285

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CHAIN 809 SC

black conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
10 AWG (6 mm²)						
1062901	1	0.291	7.4	36	68	S2109
8 AWG (10 mm²)						
1062903	1	0.354	9	65	106	S2111
6 AWG (16 mm²)						
1062905	1	0.390	9.9	103	146	S2113
4 AWG (25 mm²)						
1062907	1	0.445	11.3	161	207	S2113
2 AWG (35 mm²)						
1062909	1	0.516	13.1	226	287	S2116
1 AWG (50 mm²)						
1062911	1	0.626	15.9	323	411	S2121
2/0 AWG (70 mm²)						
1062913	1	0.693	17.6	452	524	S2129
3/0 AWG (95 mm²)						
1062915	1	0.780	19.8	613	683	S2129
4/0 AWG (120 mm²)						
1062917	1	0.906	23	774	872	S2129
250 KCMIL (150 mm²)						
1062919	1	0.976	24.8	968	1075	S2136
350 KCMIL (185 mm²)						
1062921	1	1.067	27.1	1193	1326	S2136
450 KCMIL (240 mm²)						
1062923	1	1.205	30.6	1548	1628	S2136

green/yellow conductor

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
10 AWG (6 mm²)						
1062900	1	0.291	7.4	36	68	S2109
8 AWG (10 mm²)						
1062902	1	0.354	9	65	106	S2111
6 AWG (16 mm²)						
1062904	1	0.390	9.9	103	146	S2113
4 AWG (25 mm²)						
1062906	1	0.445	11.3	161	207	S2113
2 AWG (35 mm²)						
1062908	1	0.516	13.1	226	287	S2116
1 AWG (50 mm²)						
1062910	1	0.626	15.9	323	411	S2121
2/0 AWG (70 mm²)						
1062912	1	0.693	17.6	452	524	S2129
3/0 AWG (95 mm²)						
1062914	1	0.780	19.8	613	683	S2129
4/0 AWG (120 mm²)						
1062916	1	0.906	23	774	872	S2129
250 KCMIL (150 mm²)						
1062918	1	0.976	24.8	968	1075	S2136
350 KCMIL (185 mm²)						
1062920	1	1.067	27.1	1193	1326	S2136
450 KCMIL (240 mm²)						
1062922	1	1.205	30.6	1548	1628	S2136

ÖLFLEX® CHAIN 809 SC CY

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
10 AWG (6 mm²)						
1062940	1	0.319	8.1	51	85	53112220
8 AWG (10 mm²)						
1062941	1	0.382	9.7	82	128	53112230
6 AWG (16 mm²)						
1062942	1	0.417	10.6	121	168	53112230
4 AWG (25 mm²)						
1062943	1	0.472	12	180	236	53112240
2 AWG (35 mm²)						
1062944	1	0.583	14.8	264	349	53112250
1 AWG (50 mm²)						
1062945	1	0.661	16.8	366	462	53112250
2/0 AWG (70 mm²)						
1062946	1	0.728	18.5	515	596	53112260

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
3/0 AWG (95 mm²)						
1062947	1	0.823	20.9	686	764	53112260
4/0 AWG (120 mm²)						
1062948	1	0.949	24.1	856	971	53112270
250 KCMIL (150 mm²)						
1062949	1	1.028	26.1	1072	1203	53112270
350 KCMIL (185 mm²)						
1062950	1	1.118	28.4	1306	1465	53112270
450 KCMIL (240 mm²)						
1062951	1	1.256	31.9	1694	1797	53112670*
500 KCMIL (300 mm²)						
1062952	1	1.319	33.5	2097	2220	53112670*

* SKINTOP® MS-SC with metric thread

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® FD AUTO-X

Heavy duty continuous flex control cable

ÖLFLEX® FD AUTO-X is a flexible oil- and UV-resistant multi-conductor control cable designed for continuous flexing industrial applications. It has worldwide approvals, including UL Type TC-ER, CSA AWM, and CE. For bending cycles and operation parameters, see www.lappusa.com/cf-rating.

Recommended applications

Cable tracks; power chains; gantry robots; pick and place units; conveyor systems; machine tools; continuous flexing applications

Approvals

Construction

Conductors: finely stranded bare copper

Insulation: PVC/nylon; dry lubricant

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- Meets Oil Res I/II
- Resistant to harsh environments for long service life
- Meets NFPA 79 machine wiring standard
- Available in number-coded blue or red conductors
- Round jacket for optimal seal with a SKINTOP® strain relief cable gland

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	CF-02*	MECH.	MP-03

Complete the installation

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ÖLFLEX® CONNECT solution

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Technical data

Minimum bend radius:
- for continuous flexing: 10 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -40°C to +105°C
- UL TC-ER: -25°C to +90°C

Nominal voltage:
- UL TC: 600V
- UL WTTC: 1000V

Test voltage: 2000V

Conductor stranding: Class M fine wire

Color code*:
- 3c: blue with white numbers, plus green/yellow ground
- 4c & higher (blue): no. 2 conductor is white/blue

* Optional colors for conductors are available upon request. Colors include red, orange, yellow, and black. Minimums may apply.

Approvals:

UL:	TC-ER per UL 1277 WTTC per UL 2277 AWM 20626
Attributes:	UL Oil Res I/II 75°C wet; 90°C dry -40°C cold bend; -25°C cold impact NFPA 79
NEC:	Class 1 Division 2 per NEC Articles 501, 336
Canada:	CSA AWM I/II A/B FT4 c(UL) CIC/TC FT4
Additional:	CE & RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
251803XB	3	0.309	7.8	16	55	S2111
251805XB	5	0.358	9.1	26	85	S2111
251807XB	7	0.425	10.8	36	110	S2113
251811XB	11	0.489	12.4	58	145	S2116
251812XB	12	0.489	12.4	64	160	S2116
251825XB	25	0.720	18.3	134	322	S2129
251833XB	33	0.748	19.0	175	385	S2129
251842XB	42	0.908	23.1	222	495	S2129
251849XB	49	0.942	23.9	259	595	S2129
251865XB	65	1.075	27.3	343	860	S2136

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
251603XB	3	0.335	8.5	26	71	S2111
251607XB	7	0.464	11.8	58	126	S2116
251611XB	11	0.569	14.5	94	203	S2121
251612XB	12	0.569	14.5	103	218	S2121
251619XB	19	0.698	17.7	162	284	S2129
251625XB	25	0.798	20.3	213	397	S2129
251633XB	33	0.877	22.3	280	509	S2129
251642XB	42	0.977	24.8	381	628	S2136
251649XB	49	1.043	26.5	418	760	S2136
251665XB	65	1.191	30.3	547	890	S2136

Replace the 'B' at the end of the part number with 'R' for red conductors, 'O' for orange conductors, 'Y' for yellow conductors, 'BK' for black conductors

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX®

Torsional & robotic cable

80 **Quick select chart**

81 **ÖLFLEX® ROBOT F1/F1 (C)**
Robotic cable for flexing & torsion motion with UL & c(UL) AWM

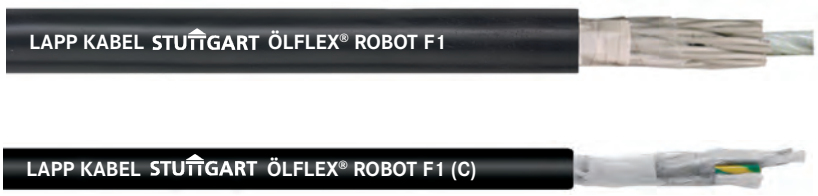
83 **ÖLFLEX® ROBOT 900 P/900 DP**
Robotic cable for flexing & torsion motion

Quick select chart

Product	Jacket material	Temperature range low	Temperature range high	Nominal voltage	Max. torsion twist	Torsion cycles	Page
ÖLFLEX® ROBOT F1	PUR	-40°C	80°C	AWM: 600V or 1000V	± 360°/m	5 million	81
ÖLFLEX® ROBOT F1 (C)					± 180°/m		
ÖLFLEX® ROBOT 900 P	PUR	-40°C	80°C	IEC: 300/500V	± 360°/m	5 million	83
ÖLFLEX® ROBOT 900 DP					± 180°/m		

ÖLFLEX® ROBOT F1/F1 (C)

Robotic cable for flexing & torsion motion with UL & c(UL) AWM



ÖLFLEX® ROBOT F1 is designed to transmit control and monitoring signals as well as power supply in environments where combined twisting and bending stresses occur. ÖLFLEX® ROBOT F1 (C) with copper shield is designed for use where EMI emissions need to be suppressed.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: TPE; conductors or pairs twisted into bundles or layers

Jacket: polyurethane; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: TPE; conductors or pairs twisted into bundles or layers

Shielding: tinned copper spiral shield

Jacket: polyurethane; black

Recommended applications

Multi-axis articulated robots with twisting and bending motion; automated handling equipment in cable tracks or moving machine parts

Application advantage

- UL AWM approval for USA and Canada
- Specially formulated PUR jacket protects against the harshest of industrial plant environments
- Maximum twist of ± 360°/m unshielded for wide variety of robot applications

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 649
OIL	OR-05	FLAME	FR-02
MOTION	TCF-01	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- unshielded: 10 x cable diameter
- shielded: 10 x cable diameter

Maximum torsion (twist):
- unshielded: ± 360°/m
- shielded: ± 180°/m

Temperature range: -40°C to +80°C

Nominal voltage:
- UL/CSA:
  - up to 16 AWG: 600V
  - 14 AWG & larger: 1000V
- IEC:
  - up to 22 AWG: 250V
  - 20 - 14 AWG: 300/500V

Conductor stranding: extra fine wire

Color code:
- up to 22 AWG: DIN 47100: chart 8, page 682
- 20 AWG & larger: white conductors with black numbers, plus green/yellow ground

Approvals:
UL: AWM 20940
Attributes: NFPA 79
Canada: cRU AWM I/II A/B
Additional: CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® ROBOT F1

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.25 mm²)						
0029590	7	0.264	6.7	11	42	S2109
0029591	12	0.354	9.0	20	82	S2111
0029592	18	0.417	10.6	30	105	S2113
0029593	25	0.492	12.5	40	138	S2116
22 AWG (0.34 mm²)						
0029594*	2	0.181	4.6	5	26	S2107
0029596	4	0.205	5.2	10	32	S2107
0029599	12	0.370	9.4	27	87	S2111
0029600	18	0.441	11.2	40	114	S2113
0029601	25	0.516	13.1	56	148	S2116
20 AWG (0.5 mm²)						
0029608	18	0.484	12.3	56	136	S2116
0029609	25	0.598	15.2	80	191	S2121

*2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
0029612	4	0.283	7.2	26	58	S2111
0029614	7	0.362	9.2	44	95	S2111
0029615	12	0.488	12.4	74	159	S2116
0029616	14	0.520	13.2	86	173	S2116
0029617	16 + 1pr	0.606	15.4	128	233	S2121
0029618	18	0.634	16.1	114	235	S2121
0029619	23 + 1pr	0.709	18.0	168	310	S2129
0029620	25	0.701	17.8	161	274	S2129
16 AWG (1.5 mm²)						
0029624	4	0.323	8.2	38	77	S2111
0029627	7	0.413	10.5	68	126	S2113
0029629	12	0.563	14.3	114	198	S2121
0029631	25	0.776	19.7	242	444	S2129
10 AWG (6 mm²)						
0029641	4	0.524	13.3	148	222	S2116

ÖLFLEX® ROBOT F1 (C)

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
24 AWG (0.5 mm²)						
0029653	3pr	0.315	8.0	26	67	53112220
0029654	25	0.543	13.8	77	188	53112250
22 AWG (0.34 mm²)						
0029655	2	0.205	5.2	12	36	53112210
0029656	3	0.213	5.4	13	38	53112210

*2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0029657	4	0.260	6.6	19	48	53112210
0029658	5pr	0.402	10.2	46	106	53112230
16 AWG (1.5 mm²)						
0029689	12	0.606	15.4	155	255	53112250
0029690	18	0.728	18.5	228	370	53112260

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

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ÖLFLEX® ROBOT 900 P/900 DP

Robotic cable for flexing & torsion motion

ÖLFLEX® ROBOT 900 P is a multi-conductor control and signal monitoring cable. It is designed to withstand the extreme demands of twisting and bending stresses in robotic applications. ÖLFLEX® ROBOT 900 DP has a tinned copper spiral shield and is designed for use where EMI emissions need to be suppressed.

Unshielded construction

Conductors: finely stranded bare copper

Insulation: TPE; conductors twisted in layers with low-friction core wrap

Jacket: polyurethane; black

Shielded construction

Conductors: finely stranded bare copper

Insulation: TPE; conductors twisted in layers with low-friction core wrap

Shielding: tinned copper spiral shield

Jacket: polyurethane; black

Recommended applications

Multi-axis articulated robots with twisting and bending motion; automated handling equipment; cable tracks or moving machine parts.

Application advantage

- Designed for applications where combined twisting and bending occur
- Specially formulated PUR jacket protects against the harshest of industrial plant environments
- Maximum twist of ± 360°/m (unshielded) for wide variety of robot applications

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	T-01	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- unshielded: 15 x cable diameter
- shielded: 15 x cable diameter

Maximum torsion (twist):
- unshielded: ± 360°/m
- shielded: ± 180°/m

Temperature range:
- for flexible use: -40°C to +80°C

Nominal voltage:
- up to 22 AWG: 48V AC
- 20 AWG & larger:
  - U_0/U: 300/500V

Test voltage:
- up to 22 AWG: 1500V
- 20 AWG & larger: 3000V

Conductor stranding: extra fine wire

Color code:
- up to 22 AWG: DIN 47100: chart 8, page 682
- 20 AWG & larger: black with white numbers, plus green/yellow ground

Approvals: CE & RoHS based on VDE 0281/0282 & 0812

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® ROBOT 900 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.25 mm²)						
0028110	7	0.244	6.2	11	32	S2107
0028116	25	0.402	10.2	40	95	S2113
20 AWG (0.5 mm²)						
0028145	18	0.441	11.2	58	81	S2113
0028146	25	0.524	13.3	81	171	S2116
19 AWG (0.75 mm²)						
0028160	4	0.260	6.6	19	42	S2109
0028164	14	0.441	11.2	68	134	S2113
18 AWG (1 mm²)						
0028170*	2	0.244	6.2	13	32	S2107
0028171	3	0.256	6.5	19	41	S2109
0028172	4	0.276	7.0	26	51	S2111
0028174	7	0.366	9.3	45	88	S2111
0028176	12	0.453	11.5	77	145	S2113
0028185	16 + 1pr	0.630	16.0	131	253	S2121
0028178	18	0.520	13.2	116	193	S2116
0028186	23 + 1 pr	0.681	17.3	176	316	S2129
0028180	25	0.646	16.4	161	291	S2121
0028190	34	0.783	19.9	219	384	S2129
0028191	41	0.878	22.3	264	474	S2129
16 AWG (1.5 mm²)						
0028198	18	0.622	15.8	174	300	S2121
14 AWG (2.5 mm²)						
0028181	3	0.366	9.3	48	91	S2111
0028182	4	0.398	10.1	65	115	S2113
6 AWG (10 mm²)						
0028400	3	0.843	21.4	310	484	S2129
4 AWG (25 mm²)						
0028187	3	1.031	26.2	484	791	S2136
2 AWG (35 mm²)						
0028189	3	1.134	28.8	677	1047	S2136

* 2c cable does not include ground

ÖLFLEX® ROBOT 900 DP

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0028100	12	0.264	6.7	29	46	53112210
0028105	3pr	0.244	6.2	11	30	53112210
24 AWG (0.25 mm²)						
0028126	25	0.437	11.1	70	123	53112230
22 AWG (0.34 mm²)						
0028135	4	0.224	5.7	14	31	53112210
0028136	5pr	0.358	9.1	43	77	53112220
16 AWG (1.5 mm²)						
0028195	12	0.551	14.0	174	265	53112250

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX®

High temperature cable

86 **Quick select chart**

87 **ÖLFLEX® HEAT 180 MS/180 C MS**
High temperature silicone control cable with North American approvals

89 **ÖLFLEX® HEAT 180 SiHF**
High temperature silicone control cable

90 **ÖLFLEX® HEAT 180 H05SS-F EWKF**
High temperature tear-resistant silicone control cable

91 **ÖLFLEX® HEAT 180 SiF A**
High temperature single-conductor silicone cable with North American approvals

92 **ÖLFLEX® HEAT 125 MC/125 C MC**
Highly flame retardant high temperature multi-conductor control cable

94 **ÖLFLEX® HEAT 125 SC**
Highly flame retardant high temperature single-conductor cable

736 **ÖLFLEX® HEAT 260 SC**
Highly flame retardant high temperature single-conductor cable

Quick select chart

Product	Shield	AWG range	Conductor count	Temperature range	Color	Key feature	Page
ÖLFLEX® HEAT 180 MS	no	20 - 8 AWG	2, 3, 4, 5, 7, 12, 18, 25	UL/CSA: -50°C to +150°C IEC: -50°C to +180°C	black	c UL us	87
ÖLFLEX® HEAT 180 C MS	yes						
ÖLFLEX® HEAT 180 SiHF	no	18 - 6 AWG	2, 3, 4, 5, 7, 12, 16, 20, 24	IEC: -50°C to +180°C	red	European standard	89
ÖLFLEX® HEAT 180 H05SS-F EWKF	no	18 - 10 AWG	2, 3, 4, 5	IEC: -50°C to +180°C	black	tear resistant	90
ÖLFLEX® HEAT 180 SiF A	no	24 - 3/0 AWG	1	UL/CSA: -50°C to +150°C IEC: -50°C to +180°C	various options	c UL us	91
ÖLFLEX® HEAT 125 MC	no	20 - 8 AWG	2, 3, 4, 5, 7, 12	IEC: -55°C to +125°C up to +145°C (short term)	black	highly flame retardant	92
ÖLFLEX® HEAT 125 C MC	yes						
ÖLFLEX® HEAT 125 SC	no	20 AWG - 450 KCMIL	1	IEC: -55°C to +125°C up to +145°C (short term)	various options	highly flame retardant	94

ÖLFLEX® HEAT 180 MS/180 C MS

High temperature silicone control cable with North American approvals

ÖLFLEX® HEAT 180 MS is a high temperature silicone cable with North American approvals. It has a temperature rating of 180°C and is halogen-free. ÖLFLEX® HEAT 180 C MS is a shielded version available with an overall tinned copper braid. This is recommended when electrical interference needs to be suppressed.

Unshielded construction

Conductors: finely stranded tinned copper

Insulation: silicone

Jacket: silicone; black

Shielded construction

Conductors: finely stranded tinned copper

Insulation: silicone

Shielding: tinned copper braid (85% coverage); plastic foil wrap

Jacket: silicone; black

Recommended applications

Foundries; steel mills; glass factories; furnaces; commercial baking equipment; other high-temperature applications

Approvals

cULus FIRE PROTECTION CE RoHS

Application advantage

- Rated for use up to 180°C and can handle rapid increases in heat
- Excellent low temperature rating of -50°C
- Passes FT1 vertical flame test
- Halogen-free & UV-resistant jacket
- Resistant to various oils, alcohols, vegetable & animal fats, and chemical substances

Cable attributes			page 648
OIL	OR-02	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- unshielded: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- UL: -50°C to +150°C
- VDE: -50°C to +180°C

Nominal voltage: 600V

Test voltage: 2000V

Conductor stranding: Class 5 fine wire

Color code:
- up to 5c: VDE 0293-308: chart 6, page 681
- 6c & higher: black with white numbers, plus green/yellow ground

Approvals:
- UL: AWM 4476
- Attributes: NFPA 79
- Canada: cRU AWM II A/B FT1
- Additional: CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 180 MS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
20 AWG (0.5 mm²)						
0046600	2	0.292	7.4	7	45	52032520
0046601	3	0.307	7.8	10	52	52032520
00466023	4	0.335	8.5	14	62	52032520
00466033	5	0.362	9.2	17	74	52032525
0046604	7	0.390	9.9	24	88	52032525
18 AWG (1 mm²)						
0046612	2	0.323	8.2	13	58	52032520
0046613	3	0.343	8.7	20	68	52032520
00466143	4	0.370	9.4	26	83	52032525
00466153	5	0.406	10.3	33	99	52032525
0046616	7	0.437	11.1	46	121	52032540
0046617	12	0.587	14.9	78	214	52032560
16 AWG (1.5 mm²)						
0046618	2	0.347	8.8	20	70	52032520
0046619	3	0.366	9.3	30	84	52032525
00466203	4	0.398	10.1	39	103	52032525
00466213	5	0.437	11.1	49	124	52032540

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
0046622	7	0.473	12.0	69	153	52032540
0046623	12	0.634	16.1	117	272	52032560
0046625	18	0.741	18.8	175	381	52032560
0046626	25	0.902	22.9	242	562	52032570
14 AWG (2.5 mm²)						
0046628	2	0.378	9.6	33	91	52032525
0046629	3	0.402	10.2	49	111	52032525
00466303	4	0.437	11.1	65	137	52032540
00466313	5	0.481	12.2	81	167	52032540
12 AWG (4 mm²)						
0046633	3	0.453	11.5	78	165	52032540
00466343	4	0.496	12.6	104	206	52032540
00466353	5	0.559	14.2	130	261	52032560
10 AWG (6 mm²)						
0046636	3	0.587	14.9	116	246	52032560
00466373	4	0.646	16.4	155	308	52032560
00466383	5	0.709	18.0	194	378	52032560

* 2c cable does not include ground

ÖLFLEX® HEAT 180 C MS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
20 AWG (0.5 mm²)						
0046701	3	0.339	8.6	30	67	52032520
0046702	4	0.366	9.3	38	82	52032525
0046703	5	0.394	10.0	41	92	52032525
18 AWG (1 mm²)						
0046708	2	0.355	9.0	33	70	52032520
0046709	3	0.374	9.5	44	88	52032525
0046710	4	0.402	10.2	51	102	52032525
0046711	5	0.433	11.0	62	122	52032525
0046712	7	0.469	11.9	80	153	52032540
16 AWG (1.5 mm²)						
0046716	2	0.378	9.6	44	85	52032525
0046717	3	0.398	10.1	54	102	52032525
0046718	4	0.429	10.9	68	125	52032525
0046719	5	0.465	11.8	83	149	52032540
0046720	7	0.504	12.8	107	189	52032540

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
0046721	12	0.666	16.9	165	290	52032560
0046723	18	0.772	19.6	233	403	52032570
0046724	25	0.942	23.9	334	560	52032570
14 AWG (2.5 mm²)						
0046728	3	0.433	11.0	78	132	52032525
0046729	4	0.469	11.9	99	164	52032540
0046730	5	0.508	12.9	120	196	52032540
12 AWG (4 mm²)						
0046734	3	0.485	12.3	112	175	52032540
0046735	4	0.528	13.4	143	218	52032540
0046736	5	0.587	14.9	173	261	52032560
10 AWG (6 mm²)						
0046740	4	0.678	17.2	204	324	52032560
0046741	5	0.737	18.7	248	390	52032560
8 AWG (10 mm²)						
0046742	4	0.898	22.8	342	539	52032570

* 2c cable does not include ground

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 180 SiHF

High temperature silicone control cable

ÖLFLEX® HEAT 180 SiHF is a high temperature silicone cable. It has a temperature rating of 180°C and is halogen-free.

Construction

Conductors: finely stranded tinned copper

Insulation: silicone

Jacket: silicone; red-brown

Recommended applications

Foundries; steel mills; glass factories; furnaces; commercial baking equipment; other high-temperature applications

Application advantage

- Rated for use up to 180°C and can handle rapid increases in heat
- Excellent low temperature rating of -50°C
- Halogen-free
- Fine stranding for improved flexibility

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-01
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius:	4 x cable diameter
Temperature range:	-50°C to +180°C
Nominal voltage:	300/500V
Test voltage:	2000V
Conductor stranding:	Class 5 fine wire
Color code:	
- up to 5c:	VDE 0293-308: chart 6, page 681
- 6c & higher:	black with white numbers, plus green/yellow ground
Approvals:	CE & RoHS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
18 AWG (1 mm²)						
0046007	2	0.260	6.6	13	44	52032520
0046008	3	0.276	7.0	20	53	52032520
00460093	4	0.311	7.9	26	68	52032520
00460103	5	0.347	8.8	33	85	52032520
0046012	7	0.374	9.5	46	105	52032525
16 AWG (1.5 mm²)						
0046013	2	0.299	7.6	20	60	52032520
0046014	3	0.315	8.0	29	73	52032520
00460153	4	0.347	8.8	39	90	52032520
00460163	5	0.378	9.6	49	110	52032525
0046018	7	0.410	10.4	68	136	52032525
0046039	12	0.552	14.0	117	242	52032560
0046040	16	0.638	16.2	155	321	52032560
0046041	20	0.690	17.5	194	386	52032560
0046042	24	0.780	19.8	233	484	52032570
14 AWG (2.5 mm²)						
0046019	2	0.347	8.8	33	86	52032520
0046020	3	0.382	9.7	49	112	52032525
00460213	4	0.418	10.6	65	138	52032525
00460223	5	0.457	11.6	81	169	52032540
0046024	7	0.496	12.6	113	210	52032540

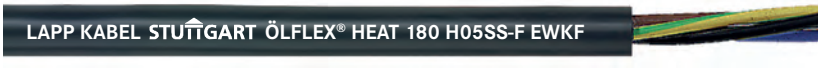
Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
12 AWG (4 mm²)						
0046025	2	0.426	10.8	52	132	52032525
0046026	3	0.453	11.5	78	162	52032540
00460273	4	0.496	12.6	104	202	52032540
00460283	5	0.552	14.0	130	251	52032560
0046030	7	0.615	15.6	181	327	52032560
10 AWG (6 mm²)						
0046031	2	0.489	12.4	78	180	52032540
0046032	3	0.520	13.2	117	224	52032540
00460333	4	0.579	14.7	155	286	52032560
00460343	5	0.654	16.6	194	362	52032560
0046036	7	0.733	18.6	271	474	52032560
8 AWG (10 mm²)						
00460373	4	0.764	19.4	259	475	52032570
00460453	5	0.851	21.6	323	590	52032570
6 AWG (16 mm²)						
00460383	4	0.843	21.4	413	675	52032570

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 180 H05SS-F EWKF

High temperature tear-resistant silicone control cable



ÖLFLEX® HEAT 180 H05SS-F EWKF is a high temperature tear-resistant silicone control cable with <HAR> approval. It has a high temperature rating of 180°C, is halogen-free, and is designed for applications where high temperatures and mechanical abuse can cause other cables to deteriorate.

Construction

Conductors: finely stranded tinned copper

Insulation: silicone

Jacket: silicone; black

Recommended applications

Foundries; steel mills; glass factories; furnaces; commercial baking equipment; other high-temperature applications with mechanical abuse

Application advantage

- Rated for use up to 180°C and can handle rapid increases in temperature
- Tear-resistant jacket
- Excellent low temperature rating of -50°C
- Halogen-free and UV resistant

Approvals

<HAR> CE RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-01
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius:	4 x cable diameter	**Conductor stranding:**	Class 5 fine wire
Temperature range:	-50°C to +180°C	**Color code:**	VDE 0293-308: chart 6, page 681
Nominal voltage:	300/500V	**Approvals:**	<HAR> H05SS-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	SKINDICHT® CN PG thread
18 AWG (1 mm²)						
0046904	2	0.268	6.8	13	42	52032520
0046905	3	0.284	7.2	20	54	52032520
00469063	4	0.311	7.9	26	66	52032520
00469073	5	0.347	8.8	33	81	52032520
16 AWG (1.5 mm²)						
0046908	2	0.331	8.4	20	56	52032520
0046909	3	0.351	8.9	29	69	52032520
00469103	4	0.390	9.9	39	86	52032525
00469113	5	0.429	10.9	49	103	52032525

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
14 AWG (2.5 mm²)						
0046912	2	0.386	9.8	33	95	52032525
0046913	3	0.410	10.4	49	106	52032525
00469143	4	0.457	11.6	65	131	52032540
00469153	5	0.508	12.9	81	162	52032540
12 AWG (4 mm²)						
0046916	3	0.485	12.3	78	161	52032540
00469173	4	0.540	13.7	104	210	52032540
10 AWG (6 mm²)						
0046919	3	0.552	14.0	117	232	52032560
00469203	4	0.615	15.6	155	303	52032560

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 180 SiF A

High temperature single-conductor silicone cable with North American approvals

ÖLFLEX® HEAT 180 SiF A is a silicone single-core cable for extended temperatures with North American approvals. It has a temperature rating of 180°C and is halogen-free.

Construction

Conductors: finely stranded tinned copper

Insulation: silicone

Recommended applications

Thermal and heating elements; lighting technology; switchboards and cabinets; other high-temperature appliances

Application advantage

- Resistant to a multitude of oils, alcohols, and vegetable & animal fats
- Halogen-free and flame retardant

Approvals

c UL us CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius: 6 x cable diameter

Temperature range:
- UL: -50°C to +150°C
- IEC: -50°C to +180°C

Nominal voltage:
- UL: 1000V
- IEC: 600/1000V

Test voltage: 3000V

Conductor stranding: Class 5 fine wire

Color code:

50:	green/yellow*	62:	gray
52:	black*	64:	violet
54:	blue*	66:	dark blue
56:	brown*	68:	orange
58:	red*	70:	yellow
60:	white*	72:	green

* color codes are different for 6 AWG & larger: see below

Approvals: UL: AWM 3644; Canada: cRU AWM FT2; Additional: CE & RoHS

Part number	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
24 AWG (0.25 mm²)				
1249..0	0.087	2.2	2	5
20 AWG (0.5 mm²)				
1249..2	0.095	2.4	3	7
19 AWG (0.75 mm²)				
1249..3	0.106	2.7	5	9
18 AWG (1 mm²)				
1249..4	0.110	2.8	6	12
16 AWG (1.5 mm²)				
1249..5	0.122	3.1	10	15
14 AWG (2.5 mm²)				
1249..6	0.138	3.5	16	22
12 AWG (4 mm²)				
1249..7	0.162	4.1	26	33
10 AWG (6 mm²)				
1249..8	0.217	5.5	39	53

Part number	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
8 AWG (10 mm²)				
1249..9	0.299	7.6	65	89
6 AWG (16 mm²)				
1249..0*	0.331	8.4	103	129
4 AWG (25 mm²)				
1249..1*	0.386	9.8	161	194
2 AWG (35 mm²)				
1249..2*	0.429	10.9	226	259
1 AWG (50 mm²)				
1249..3*	0.532	13.5	323	375
2/0 AWG (70 mm²)				
1249..4*	0.611	15.5	452	521
3/0 AWG (95 mm²)				
1249..5*	0.690	17.5	613	675

For LAPP part number, add the double digit color code (see above) to the part number in the table, e.g.: 16 AWG green/yellow = 4726501

* Color codes are different for cables 6 AWG & larger: 51 – green/yellow; 53 – black; 55 – blue; 57 – brown; 59 – red; 61 – white.
Violet, dark blue, orange, yellow & green are only available up to 14 AWG; gray to 10 AWG; brown to 6 AWG; green/yellow, blue & white to 4 AWG; red to 1 AWG

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 125 MC/125 C MC

Highly flame retardant high temperature multi-conductor control cable

The ÖLFLEX® HEAT 125 MC series are heat resistant, highly flame retardant, halogen-free multi-conductor cables with a cross-linked polyolefin copolymer compound. Cables are available in both shielded and non-shielded versions.

Unshielded construction

Conductors: finely stranded tinned copper
Insulation: cross-linked polyolefin copolymer
Jacket: cross-linked polyolefin copolymer; black

Shielded construction

Conductors: finely stranded tinned copper
Insulation: cross-linked polyolefin copolymer
Shielding: tinned copper braid
Jacket: cross-linked polyolefin copolymer; black

Recommended applications

Lighting equipment; heating appliances; switch gear cabinets; other high-temperature and outdoor appliances

Application advantage

- Resistant to humidity, ozone & UV
- Highly flame retardant
- Abrasion and notch resistant
- Halogen-free
- DNV-GL type-approved product

Approvals

CE RoHS DNV·GL

Cable attributes			page 648
OIL	OR-01	FLAME	FR-03
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for stationary use: 4 x cable diameter
- shielded: 5 x cable diameter

Temperature range: -55°C to +125°C
short term up to 145°C

Nominal voltage:
- up to 18 AWG: 300/500V
- 16 AWG & larger: 450/750V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code:
- ÖLFLEX® HEAT 125 MC:
  - up to 5c: VDE 0293-308: chart 6, page 681
  - 6c & higher: black with white numbers, plus green/yellow ground
- ÖLFLEX® HEAT C 125 MC: VDE 0293-308: chart 6, page 681 or black with white numbers, plus green/yellow ground

Approvals: CE & RoHS
DNV-GL certified

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 125 MC

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
20 AWG (0.5 mm²)						
1024300	2	0.236	6.0	6	26	52032525
1024301	3	0.248	6.3	10	31	52032525
19 AWG (0.75 mm²)						
1024307	2	0.252	6.4	10	27	52032525
1024308	3	0.268	6.8	15	36	52032525
1024309	4	0.292	7.4	19	46	52032525
1024310	5	0.327	8.3	24	58	52032525
1024311	7	0.355	9.0	34	85	52032525
18 AWG (1 mm²)						
1024315	2	0.260	6.6	13	34	52032525
1024316	3	0.276	7.0	19	45	52032525
1024317	4	0.307	7.8	26	58	52032525
1024318	5	0.339	8.6	32	72	52032525
1024319	7	0.374	9.5	45	102	52032525
1024320	12	0.504	12.8	77	149	52032540

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
16 AWG (1.5 mm²)						
1024323	2	0.299	7.6	19	48	52032525
1024324	3	0.327	8.3	29	65	52032525
1024325	4	0.355	9.0	39	83	52032525
1024326	5	0.398	10.1	48	105	52032525
1024327	7	0.441	11.2	68	151	52032525
1024328	12	0.595	15.1	116	212	52032525
14 AWG (2.5 mm²)						
1024333	2	0.355	9.0	32	69	52032525
1024334	3	0.386	9.8	48	97	52032525
1024335	4	0.426	10.8	65	127	52032525
1024336	5	0.469	11.9	81	158	52032540
1024337	7	0.520	13.2	113	231	52032540
12 AWG (4 mm²)						
1024341	4	0.500	12.7	103	185	52032540
1024342	5	0.552	14.0	129	224	52032540
10 AWG (6 mm²)						
1024346	4	0.556	14.1	155	229	52032540
1024347	5	0.623	15.8	194	290	52032560

ÖLFLEX® HEAT 125 C MC

color-coded

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
20 AWG (0.5 mm²)						
1024400	2	0.268	6.8	28	30	52032525
1024401	3	0.280	7.1	31	40	52032525
19 AWG (0.75 mm²)						
1024407	2	0.284	7.2	31	53	52032525
1024408	3	0.299	7.6	39	65	52032525
1024409	4	0.331	8.4	43	78	52032525
1024410	5	0.359	9.1	52	93	52032525
18 AWG (1 mm²)						
1024415	2	0.292	7.4	38	60	52032525
1024416	3	0.315	8.0	44	70	52032525
1024417	4	0.339	8.6	52	87	52032525
1024418	5	0.378	9.6	60	103	52032525
16 AWG (1.5 mm²)						
1024423	2	0.339	8.6	44	77	52032525
1024424	3	0.359	9.1	56	89	52032525
1024425	4	0.394	10.0	67	110	52032525
1024426	5	0.437	11.1	84	134	52032525
14 AWG (2.5 mm²)						
1024433	2	0.394	10.0	75	106	52032525
1024434	3	0.422	10.7	98	133	52032525
1024435	4	0.457	11.6	112	159	52032525
1024436	5	0.508	12.9	134	193	52032540
12 AWG (4 mm²)						
1024441	4	0.540	13.7	159	213	52032540
10 AWG (6 mm²)						
1024446	4	0.595	15.1	214	271	52032560
8 AWG (10 mm²)						
1024451	4	0.760	19.3	375	450	52032560

* 2c cable does not include ground

black with white numbers

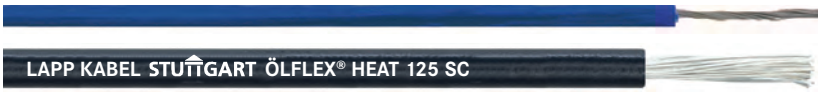
Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® CN PG thread
19 AWG (0.75 mm²)						
1024480	2*	0.284	7.2	31	53	52032525
1024481	3*	0.299	7.6	39	65	52032525
1024482	4*	0.331	8.4	43	78	52032525
1024411	7	0.394	10.0	69	125	52032525
1024483	7*	0.394	10.0	69	125	52032525
1024412	12	0.528	13.4	119	147	52032540
18 AWG (1 mm²)						
1024484	2*	0.292	7.4	38	60	52032525
1024485	3*	0.315	8.0	44	70	52032525
1024419	7	0.406	10.3	76	142	52032525
1024420	12	0.552	14.0	126	179	52032540
16 AWG (1.5 mm²)						
1024486	2*	0.339	8.6	44	77	52032525
1024487	4*	0.394	10.0	67	110	52032525
1024427	7	0.473	12.0	100	183	52032540
1024488	7*	0.473	12.0	100	183	52032540
1024428	12	0.642	16.3	121	249	52032560
14 AWG (2.5 mm²)						
1024489	3*	0.422	10.7	98	133	52032525
1024490	4*	0.457	11.6	112	159	52032525
1024437	7	0.567	14.4	194	259	52032540
1024438	12	0.760	19.3	321	382	52032560

* Cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® HEAT 125 SC

Highly flame retardant high temperature single-conductor cable



ÖLFLEX® HEAT 125 SC are heat-resistant halogen-free single conductors, insulated with a cross-linked LSZH polyolefin copolymer compound with excellent fire characteristics and a wide temperature range.

Recommended applications

Internal wiring of lamps; heating appliances; switchboards and cabinets; other high temperature appliances

Approvals

Construction

Conductors: finely stranded tinned copper

Insulation: cross-linked polyolefin copolymer

Application advantage

- Highly flame retardant
- Halogen-free
- Minimizes damage to equipment caused by the formation of toxic acid fumes in fires
- Abrasion and notch-resistant
- DNV-GL type-approved product

Cable attributes page 648

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

Complete the installation

SKINDICHT® CN
page 530

EPIC® connectors
page 284

Technical data

Minimum bend radius: 4 x cable diameter

Temperature range:
- short term: -55°C to +125°C
up to 145°C

Nominal voltage:
- H05Z-K: 300/500V
- H07Z-K: 450/750V

Test voltage: 3500V

Conductor stranding: Class 5 fine wire

Color code:

000:	green/yellow	007:	violet
001:	black	009:	orange
002:	blue	104:	red
003:	brown	105:	white
005:	yellow	106:	grey
006:	green	114:	dark blue

Approvals: H05Z-K & H07Z-K acc. to EN 50525-3-41
CE & RoHS
DNV-GL certified

Part number	Standard	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
H05Z-K					
20 AWG (0.5 mm²)					
1232..	H05Z-K	0.087	2.2	3	5
19 AWG (0.75 mm²)					
1233..	H05Z-K	0.095	2.4	11	7
18 AWG (1 mm²)					
1234..	H05Z-K	0.099	2.5	6	9
H07Z-K					
16 AWG (1.5 mm²)					
1235..	H07Z-K	0.118	3.0	10	14
14 AWG (2.5 mm²)					
1236..	H07Z-K	0.142	3.6	16	22
12 AWG (4 mm²)					
1237..	H07Z-K	0.169	4.3	26	33
10 AWG (6 mm²)					
1238..	H07Z-K	0.189	4.8	39	45
8 AWG (10 mm²)					
1239..	H07Z-K	0.244	6.2	65	75
6 AWG (16 mm²)					
1240..	H07Z-K	0.284	7.2	103	116

Part number	Standard	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
4 AWG (25 mm²)					
1241..	H07Z-K	0.351	8.9	161	176
2 AWG (35 mm²)					
1242..	H07Z-K	0.398	10.1	226	243
1 AWG (50 mm²)					
1243..	H07Z-K	0.493	12.5	226	243
2/0 AWG (70 mm²)					
1244..	H07Z-K	0.559	14.2	452	477
3/0 AWG (95 mm²)					
1245..	H07Z-K	0.654	16.6	613	630
4/0 AWG (120 mm²)					
1246..	H07Z-K	0.717	18.2	774	779
250 KCMIL (150 mm²)					
1247..	H07Z-K	0.812	20.6	968	972
350 KCMIL (185 mm²)					
1248..	H07Z-K	0.887	22.5	1193	1203
450 KCMIL (240 mm²)					
1249..	H07Z-K	1.040	26.4	1548	1558

For LAPP part number, add the double digit color code (see above) to the part number in the table, e.g.: 16 AWG H07Z-K green/yellow = 1235000
Violet, yellow & green are only available up to 14 AWG; white to 12 AWG; orange to 12 AWG (but not 18 AWG); grey & dark blue to 10 AWG; brown to 8 AWG; blue to 6 AWG; green/yellow to 2/0 AWG and 250 KCMIL

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ÖLFLEX®

Flexible cable for drives, motors & assemblies

96 **Quick select chart**

VFD cable

98 **ÖLFLEX® VFD 2XL**
Flexible VFD cable; 600V/1000V/2000V; UL & c(UL) TC-ER approval

732 **ÖLFLEX® VFD 1XL** NEW
Flexible VFD cable; 600V/1000V; UL & c(UL) TC-ER approval

742 **ÖLFLEX® VFD 1XLC**
Flexible VFD cable; 600V/1000V; c(UL) CIC/TC-ER approval

99 **ÖLFLEX® VFD 2XL SYMMETRICAL**
Symmetrical 2kV motor supply cable for large HP VFD drives; UL & c(UL) TC approval

100 **ÖLFLEX® VFD 2XL with Signal**
Flexible VFD cable with a control pair; 600V/1000V/2000V; UL & c(UL) TC-ER approval

733 **ÖLFLEX® VFD 1XL with Signal** NEW
Flexible VFD cable with a control pair; 600V/1000V; UL & c(UL) TC-ER approval

743 **ÖLFLEX® VFD 1XLC with Signal**
Flexible VFD cable with a control pair; 600V/1000V; c(UL) CIC/TC-ER approval

101 **ÖLFLEX® VFD SLIM**
Reduced-diameter VFD cable; 600V/1000V; UL & c(UL) TC-ER approval

102 **ÖLFLEX® VFD with Signal**
Flexible VFD cable with a control pair; 600V/1000V; UL & c(UL) TC-ER approval

103 **ÖLFLEX® FD VFD**
Continuous flex VFD cable; 600V/1000V; UL & c(UL) TC-ER approval

104 **ÖLFLEX® SDP TC**
Severe duty power cable; bus drop cable; 600V/1000V; UL & c(UL) TC approval

Servo & VFD cable

105 **ÖLFLEX® SERVO 9YSLCY-JB**
Flexible low capacitance, double-shielded, large-gauge motor cable for servo & VFD applications

106 **ÖLFLEX® SERVO 2YSLCY-JB**
Flexible low capacitance, double-shielded, large-gauge motor cable for servo & VFD applications

Servo cable

730 **ÖLFLEX® SERVO FD 7FTC** NEW
Continuous Flex encoder/feedback cable

107 **ÖLFLEX® SERVO 719/719 CY**
Flexible servo cable for stationary applications; unshielded & shielded

109 **ÖLFLEX® SERVO 7TCE** NEW
Flexible tray-rated servo cable; 600/1000V; UL TC-ER approval

111 **ÖLFLEX® SERVO FD 7TCE** NEW
Continuous flex tray-rated servo cable; 600/1000V; UL TC approval

113 **ÖLFLEX® SERVO FD 796 CP**
High-acceleration continuous flex servo cable with PUR jacket; shielded

115 **ÖLFLEX® SERVO FD 798 CP**
High-acceleration continuous flex encoder & resolver cable

117 **ÖLFLEX® SERVO FD 7DSL**
Continuous flex hybrid cable: one connection between drive, motor & feedback systems

118 **ÖLFLEX® SERVO 7DSL**
Flexible hybrid cable: one connection between drive, motor & feedback system

119 **Servo cable according to SIEMENS® standard 6FX 8PLUS**
Continuous flex servo cable with PUR jacket; shielded

121 **Servo cable according to SIEMENS® standard 6FX 5008**
Flexible servo cable for stationary applications

123 **Servo cable according to INDRAMAT® standard INK**
Continuous flex servo cable with PUR jacket; shielded

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INDRAMAT® is a registered trademark of Bosch Rexroth AG.

Quick select chart

Product name	AWG range	Jacket material	Nominal voltage	Stationary temperature range	
				low	high
VFD cable					
ÖLFLEX® VFD 2XL	16 - 2 AWG	TPE	600/2000V	-40°C	+105°C
ÖLFLEX® VFD 2XL SYMMETRICAL	1 AWG - 500 KCMIL	TPE	600/2000V	-40°C	+105°C
ÖLFLEX® VFD 2XL with Signal	16 - 2 AWG	TPE	600/2000V	-40°C	+105°C
ÖLFLEX® VFD SLIM	18 - 2 AWG	PVC	600/1000V	-40°C	+105°C
ÖLFLEX® VFD with Signal	16 - 4 AWG	PVC	600/1000V	-40°C	+105°C
ÖLFLEX® FD VFD	14 - 10 AWG	PVC	600/1000V	-40°C cont. flex: -5°C	+105°C cont. flex: +90°C
ÖLFLEX® SDP TC	14 - 1 AWG	TPE	600/1000V	-40°C	+105°C

Product name	AWG range		Application	Jacket	
	power	signal pairs		material	color
Servo & VFD cable					
ÖLFLEX® SERVO 9YSLCY-JB	1 AWG - 450 KCMIL	–	power	PVC	transparent, black
ÖLFLEX® SERVO 2YSLCY-JB	1 AWG - 350 KCMIL	–	power	PVC	transparent, black
Servo cable					
ÖLFLEX® SERVO 719/719 CY	19 - 1 AWG	22 - 16 AWG	power	PVC	orange
ÖLFLEX® SERVO 7TCE	18 - 10 AWG	18 - 16 AWG	power	TPE	orange
ÖLFLEX® SERVO FD 7TCE	18 - 10 AWG	18 - 16 AWG	power	TPE	orange
ÖLFLEX® SERVO FD 796 CP	16 - 1 AWG	19 - 14 AWG	power	PUR	orange
ÖLFLEX® SERVO FD 798 CP	26 - 18 AWG	–	feedback	PUR	green
ÖLFLEX® SERVO FD 7DSL	16 - 12 AWG	22 or 18 AWG	power & feedback	PUR	orange
ÖLFLEX® SERVO 7DSL	16 - 12 AWG	22 or 18 AWG	power & feedback	PVC	orange
Servo cable according to SIEMENS® standard 6FX 8PLUS	16 - 1 AWG	26 - 16 AWG	power & feedback	PUR	orange, green
Servo cable according to SIEMENS® standard 6FX 5008	16 - 1 AWG	16 AWG	power & feedback	PVC	orange, green
Servo cable according to INDRAMAT® standard INK	19 - 4 AWG	19 - 16 AWG	power & feedback	PUR	orange

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	Nominal voltage	Temperature range stationary	flexible	high (IEC)	ÖLFLEX® CONNECT SERVO	Approvals	Page
	1000V	-40°C to +80°C	-5°C to +80°C	+80°C	no		105
	1000V	-40°C to +70°C	-5°C to +70°C	+70°C	no		106
	600/1000V	-40°C to +80°C	-5°C to +80°C	+80°C	yes		107
	600/1000V	-40°C to +105°C	-25°C to +90°C	–	yes		109
	600/1000V	-40°C to +105°C	-25°C to +90°C	–	yes		111
	600/1000V	-50°C to +80°C	-40°C to +80°C (continuous flex)	+90°C	yes		113
	30V	-50°C to +80°C	-40°C to +80°C (continuous flex)	+90°C	yes		115
	600/1000V	-50°C to +80°C	-40°C to +80°C (continuous flex)	+90°C	yes		117
	600/1000V	-40°C to +80°C	-5°C to +80°C	+80°C	yes		118
	power/control:1000V signal: 30V	-50°C to +80°C	-20°C to +60°C (continuous flex)	+80°C/60°C	yes		119
	power/control: 1000V signal: 30V	-20°C to +80°C	0°C to +60°C	+80°C/60°C	yes		121
	power/control: 1000V signal: 300V	-50°C to +80°C	-30°C to +80°C (continuous flex)	+80°C	yes		123

ÖLFLEX® VFD 2XL

Flexible VFD cable; 600V/1000V/2000V; UL & c(UL) TC-ER approval

ÖLFLEX® VFD 2XL is a robust oil- and UV-resistant shielded motor cable for VFD drives. The XLPE (plus) insulation with enhanced electrical properties can withstand twice the dielectric voltage test, provides extended performance, and is suitable for 2kV applications.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications

Approvals

Construction

Conductors: finely stranded tinned copper

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage); tinned copper drain wire

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- One cable for applications up to 2kV
- Low capacitance design
- Industrial grade phthalate-free jacket designed for harsh environments
- UL TC-ER & c(UL) CIC/TC approved
- Reduces space and weight in tray
- No conduit required due to TC-ER rating

Cable attributes page 648

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

Complete the installation

SKINTOP® MS-M BRUSH page 524

EPIC® ULTRA HB page 404

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 TC: 600V/2000V
- UL Flexible Motor Supply: 1000V
- c(UL) CIC/TC: 600V
- cRU AWM: 1000V

Test voltage: 6000V

Conductor stranding:
- 16 - 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
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
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 cRU AWM I/II A/B FT4
Additional:	CE (50V - 1kV) & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.5 mm²)							
700700	4 + drain	0.509	12.9	70	160	53112240	53112676
14 AWG (2.5 mm²)							
700701	4 + drain	0.582	14.8	100	196	53112250	53112676
12 AWG (4 mm²)							
700702	4 + drain	0.656	16.7	144	258	53112250	53112677
10 AWG (6 mm²)							
700703	4 + drain	0.707	18.0	199	320	53112260	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (10 mm²)							
700704	4 + drain	0.887	22.5	298	575	53112260	53112678
6 AWG (16 mm²)							
700705	4	1.022	25.9	518	885	53112270	53112678
4 AWG (21 mm²)							
700706	4	1.158	29.4	642	1055	53112270	53112679
2 AWG (33.7 mm²)							
700707	4	1.332	33.8	980	1460	–	53112679

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If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® VFD 2XL SYMMETRICAL

Symmetrical 2kV motor supply cable for large HP VFD drives; UL & c(UL) TC approval

ÖLFLEX® VFD 2XL SYMMETRICAL is a robust oil- & UV-resistant large AWG 2kV VFD cable designed with three symmetrical grounds and a helical copper tape shield. It is resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries.

Recommended applications

VFD drive & motor connections for large HP applications; pumps; compressors; conveyors; elevators; extruders; HVAC; large presses; on/off, slow down/speed up applications

Approvals

Construction

Conductors: bare stranded copper

Insulation: XLPE (plus) + 3 bare stranded copper grounds

Shielding: helical copper tape (100% coverage)

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- 100% copper tape shield for EMI & RFI protection
- Low capacitance design
- UL TC-ER & c(UL) CIC/TC approved (CIC/TC approval depending on AWG)
- 3 ground design for optimal electrical performance
- Industrial grade phthalate-free jacket designed for harsh environments
- Flexible for easier routing
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Cable attributes				page 648
OIL	OR-03	FLAME	FR-03	
MOTION	FL-01	MECH.	MP-03	

Complete the installation

SKINTOP® MS-M BRUSH
page 524

Technical data

Minimum bend radius: 15 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 TC: 600/2000V
- UL WTTC: 1000V
- UL Flexible Motor Supply: 1000V
- c(UL) CIC/TC: 600V
- cRU AWM: 1000V

Test voltage: 6000V

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 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
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 (1–4/0 AWG only) cRU AWM I/II A/B FT4
Additional:	CE (50V–1kV) & RoHS

Part number	3 symmetrical grounds	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
1 AWG (42.4 mm²)						
700720	8 AWG	1.328	33.7	1024	1427	53112679
1/0 AWG (53.7 mm²)						
700721	6 AWG	1.396	35.5	1332	1836	53112680
2/0 AWG (67.5 mm²)						
700722	6 AWG	1.502	38.2	1592	2137	53112680
3/0 AWG (85.1 mm²)						
700723	5 AWG	1.616	41.0	1995	2609	53112680

Part number	3 symmetrical grounds	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
4/0 AWG (107.2 mm²)						
700724	4 AWG	1.801	45.7	2485	3254	53112681
250 KCMIL (126.7 mm²)						
700725	2 AWG	1.996	50.7	3099	3988	53112681
350 KCMIL (177.6 mm²)						
700726	2 AWG	2.229	56.6	4051	5106	53112501
500 KCMIL (253.7 mm²)						
700727	1 AWG	2.468	62.7	5641	6886	53112500

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ÖLFLEX® VFD 2XL with Signal

Flexible VFD cable with a control pair; 600V/1000V/2000V; UL & c(UL) TC-ER approval

ÖLFLEX® VFD 2XL with Signal is a robust oil- and UV-resistant shielded motor cable for VFD drives, with a pair for brake or temperature sensor. The XLPE (plus) insulation with enhanced electrical properties can withstand twice the dielectric voltage test, provides extended performance, and is suitable for 2kV applications.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications

Approvals

Construction

Conductors: finely stranded tinned copper

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application Advantage

- One cable for applications up to 2kV
- Low capacitance design
- Industrial grade phthalate-free jacket designed for harsh environments
- UL TC-ER & c(UL) CIC/TC approved
- Reduces space and weight in tray
- No conduit required due to TC-ER rating

Cable attributes page 648

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

Complete the installation

SKINTOP® MS-SC page 522

EPIC® ULTRA HB page 404

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 TC: 600V/2000V
- UL Flexible Motor Supply: 1000V
- c(UL) CIC/TC: 600V
- cRU AWM: 1000V

Test voltage: 6000V

Conductor stranding:
- 16 - 6 AWG: Class 5 fine wire
- 4 - 2 AWG: Class K fine wire

Color code: black with white numbers, plus green/yellow ground and one black pair with white numbers

Approvals:

UL:	TC-ER per UL 1277
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
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4
	cRU AWM I/II A/B FT4
Additional:	CE (50V - 1kV) & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.5 mm²)							
700710	4 + (18 AWG)	0.652	16.6	91	200	53112250	53112677
14 AWG (2.5 mm²)							
700711	4 + (18 AWG)	0.687	17.4	132	252	53112250	53112677
12 AWG (4 mm²)							
700712	4 + (18 AWG)	0.752	19.1	160	294	53112260	53112677
10 AWG (6 mm²)							
700713	4 + (18 AWG)	0.798	20.3	215	354	53112260	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (10 mm²)							
700714	4 + (14 AWG)	0.986	25.0	334	690	53112270	53112678
6 AWG (16 mm²)							
700715	4 + (14 AWG)	1.112	28.2	504	905	53112270	53112679
4 AWG (21 mm²)							
700716	4 + (14 AWG)	1.259	32.0	667	1125	–	53112679
2 AWG (33.7 mm²)							
700717	4 + (14 AWG)	1.403	35.6	1027	1580	–	53112680

( ) = shielded pair

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ÖLFLEX® VFD SLIM

Reduced-diameter VFD cable; 600V/1000V; UL & c(UL) TC-ER approval

ÖLFLEX® VFD SLIM is a reduced-diameter shielded motor cable for VFD drives. It is designed with the LAPP Surge Guard insulation system, which includes a semiconductive layer made to withstand nonlinear power distortions associated with VFD drives and to disperse increases in voltage caused by wave reflection, spikes, in-rush current, and harmonics. It is resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries.

Recommended applications

VFD drive and motor applications; web presses; HVAC; conveyors; on/off, slow down/speed up applications

Approvals

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 thermoplastic polymer; black

Application Advantage

- LAPP Surge Guard insulation protection
- UL TC-ER & c(UL) CIC/TC approved
- Double shielded for extra protection
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-01	MECH.	MP-03

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® ULTRA HB
page 404

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
- UL/CSA AWM: 1000V

Test voltage: 2000V

Peak voltage: 7500V

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

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

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
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
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 CSA AWM I/II A/B 1000V FT4
Additional:	MSHA P-07KA050013-MSHA CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
18 AWG (1 mm²)							
761804	4	0.394	10.0	53	112	53112230	–
16 AWG (1.5 mm²)							
761604	4 + drain	0.465	11.8	73	154	53112240	53112676
14 AWG (2.5 mm²)							
761404	4	0.514	13.1	100	194	53112240	53112676
12 AWG (4 mm²)							
761204	4	0.583	14.8	139	254	53112250	53112676
10 AWG (6 mm²)							
761004	4	0.697	17.7	195	346	53112260	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (10 mm²)							
760804	4	0.829	21.1	326	596	53112260	53112678
6 AWG (16 mm²)							
760604	4	1.002	25.5	494	785	53112270	53112678
4 AWG (21 mm²)							
760404	4	1.186	30.1	648	965	53112270	53112679
2 AWG (33.7 mm²)							
760204	4	1.395	35.4	985	1339	–	53112680

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ÖLFLEX® VFD with Signal

Flexible VFD cable with a control pair; 600V/1000V; UL & c(UL) TC-ER approval

ÖLFLEX® VFD with Signal is an extremely oil- and UV-resistant shielded motor power cable for VFD drives, with an additional pair for brake or temperature sensor. It is designed with LAPP Surge Guard insulation, which includes a semiconductive layer made to withstand nonlinear power distortions associated with VFD drives and to disperse increases in voltage. It is resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries.

Recommended applications

VFD drive and motor connections with temperature sensors or brake mechanisms; web presses; HVAC; on/off, slow down/speed up applications

Approvals

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 thermoplastic polymer; black

Application advantage

- LAPP Surge Guard insulation system
- UL TC-ER & c(UL) CIC TC approved
- Double-shielded for extra protection
- Contains pair for brake or temperature sensor
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Cable attributes page 648

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

Complete the installation

SKINTOP® MS-SC page 522

EPIC® ULTRA HB page 404

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
- UL/CSA AWM: 1000V

Test voltage: 2000V

Peak voltage: 7500V

Conductor stranding:
- 16-6 AWG: Class 5 fine wire
- 4 AWG: Class K fine wire

Color code: black with white numbers, plus green/yellow ground and 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 NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 CSA AWM I/II A/B 1000V FT4
Additional:	MSHA P-07-KA050011-MSHA CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.5 mm²)							
7416048	4 + (18 AWG)	0.519	13.2	88	180	53112240	53112676
14 AWG (2.5 mm²)							
7414048	4 + (18 AWG)	0.573	14.6	118	216	53112250	53112676
7414044	4 + (14 AWG)	0.600	15.2	141	254	53112250	53112676
12 AWG (4 mm²)							
7412048	4 + (18 AWG)	0.632	16.1	162	286	53112250	53112677
7412044	4 + (14 AWG)	0.662	16.8	187	326	53112250	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
10 AWG (6 mm²)							
7410044	4 + (14 AWG)	0.745	18.9	260	406	53112260	53112677
8 AWG (10 mm²)							
7408044	4 + (14 AWG)	0.896	22.8	375	617	53112260	53112678
6 AWG (16 mm²)							
7406044	4 + (14 AWG)	1.026	26.1	472	848	53112270	53112678
4 AWG (21 mm²)							
7404044	4 + (14 AWG)	1.324	33.6	643	1251	–	53112679

( ) = shielded pair

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ÖLFLEX® FD VFD

Continuous flex VFD cable; 600V/1000V; UL & c(UL) TC-ER approval

ÖLFLEX® FD VFD is a shielded continuous flex motor supply cable. It is designed with the LAPP Surge Guard insulation system, which includes a semiconductive layer made to withstand nonlinear power distortions associated with VFD drives in industrial applications. It is resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Recommended applications

VFD drives and motor connections in continuous flex applications; plastic extrusion; on/off, slow down/speed up applications

Approvals

c UL us · FIRE PROTECTION · CSA · CE · RoHS · Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	CF-02*	MECH.	MP-03

Construction

Conductors: finely stranded bare copper

Insulation: LAPP Surge Guard insulation system

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic polymer; black

Application advantage

- Continuous flex rated for cable chain applications
- Double-shielded for extra protection
- UL TC-ER & c(UL) CIC/TC approval
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® ULTRA HB
page 404

Technical data

Minimum bend radius:
- for flexible use: 5 x cable diameter
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -40°C to +105°C
- UL/CSA: -25°C to +90°C

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

Test voltage: 2000V

Peak voltage: 7500V

Conductor stranding: Class M 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
Attributes:	UL Oil Res I/II 75°C wet; 90°C dry -40°C cold bend; -25°C cold impact sunlight resistant direct burial NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 CSA AWM I/II A/B 1000V FT4
Additional:	CE & RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
14 AWG (2.5 mm²)							
771404	4	0.500	12.7	84	133	53112240	53112676
12 AWG (4 mm²)							
771204	4	0.575	14.6	122	180	53112250	53112676

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	SKINTOP® MS-M BRUSH metric thread
10 AWG (6 mm²)							
771004	4	0.690	17.5	180	271	53112260	53112677

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ECOLAB® is a registered trademark of Ecolab, Inc.
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SDP TC

Severe duty power cable; bus drop cable; 600V/1000V; UL & c(UL) TC approval

ÖLFLEX® SDP TC is a motor supply cable with Bus Drop approval. It is designed with more flexible stranding and a pressure-extruded jacket, which makes routing easier. ÖLFLEX® SDP TC is also UL TC-ER and c(UL) CIC/TC approved for tray applications.

Construction

Conductors: finely stranded bare copper

Insulation: specially blended PVC/nylon

Jacket: specially formulated thermoplastic elastomer (TPE); orange

Recommended applications

Motor connections in industrial environments; automotive machinery; machine tool; food & beverage industry

Application advantage

- UL TC-ER & c(UL) CIC TC approved
- UL Oil Res I/II
- Bus Drop approval

Approvals

c UL us · FIRE PROTECTION · CSA · CE · RoHS

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-01	MECH.	MP-03

Complete the installation

SKINTOP® strain relief
page 492

EPIC® ULTRA HB
page 404

Technical data

Minimum bend radius: 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 +90°C

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

Test voltage: 2000V

Conductor stranding:
- 14-6 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 WTTC per UL 2277 bus drop cable AWM 20626
Attributes:	UL Oil Res I/II 75°C wet; 90°C dry -40°C cold bend; -25°C cold impact sunlight resistant direct burial NFPA 79 bus drop approval
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC/TC FT4 CSA AWM I/II A/B FT4
Additional:	CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (2.5 mm²)						
781404	4	0.406	10.3	65	126	S2113
12 AWG (4 mm²)						
781204	4	0.474	12.0	104	171	S2116
10 AWG (6 mm²)						
781004	4	0.584	14.8	156	257	S2121
8 AWG (10 mm²)						
780804	4	0.708	18.0	258	427	S2129

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
6 AWG (16 mm²)						
780604	4	0.883	22.4	413	586	S2129
4 AWG (21 mm²)						
780404	4	1.093	27.8	551	871	S2136
2 AWG (33.7 mm²)						
780204	4	1.282	32.6	876	1283	S2248
1 AWG (42.3 mm²)						
780104	4	1.407	35.7	1064	3891	S2142

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 9YSLCY-JB

Flexible low capacitance, double-shielded, large-gauge motor cable for servo & VFD applications

ÖLFLEX® SERVO 9YSLCY-JB is a highly flexible power cable for large horsepower motors and VFD drives. It has a double shield with polypropylene-insulated conductors for optimal low-loss power transmission when compared to PVC.

Recommended applications

Motor connections for large motors and drives; textile; paper; chemical; machine tool; heavy industry; conveying technology

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Construction

Conductors: finely stranded bare copper

Insulation: polypropylene

Shielding: overall foil and tinned copper braid

Jacket: PVC; transparent or black

Application advantage

- Flexible for easier routing
- UL & CSA AWM approved
- Black-jacketed version: 3 symmetrical grounds for improved EMC performance

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-02

Complete the installation

SKINTOP® MS-M BRUSH
page 524

EPIC® ULTRA HB
page 404

Technical data

Minimum bend radius: 4 x cable diameter

Temperature range:
- for stationary use (UL/CSA): -40°C to +80°C
- for flexible use (UL/CSA): -5°C to +80°C

Nominal voltage: 1000V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code: VDE 0293-308: chart 6, page 681
black, brown, gray,
plus 1 or 3 green/yellow ground(s)

Approvals:
UL: AWM 2570
Attributes: VW-1
NFPA 79
Canada: cRU AWM I/II A/B 1000V FT1
Additional: based on VDE 0276, 0250, 0207
CE & RoHS

three power conductors + one ground, transparent jacket

Part number	Size of ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
1 AWG (50 mm²)						
0037008	1 AWG	1.344	34.1	1482	1982	53112679
2/0 AWG (70 mm²)						
0037009	2/0 AWG	1.611	40.9	2017	2654	53112680
3/0 AWG (95 mm²)						
0037010	3/0 AWG	1.789	45.4	2691	3562	53112681
4/0 AWG (120 mm²)						
0037011	4/0 AWG	1.962	49.8	3433	4435	53112681
250 KCMIL (150 mm²)						
0037012	250 KCMIL	2.210	56.1	4183	4733	53112501
350 KCMIL (185 mm²)						
0037013	350 KCMIL	2.419	61.4	5086	5634	53112501
450 KCMIL (240 mm²)						
0037014	450 KCMIL	2.675	68.0	6680	8165	53112503

three power conductors + three grounds, black jacket

Part number	Size of ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
1 AWG (50 mm²)						
0037023	8 AWG	1.225	31.1	1449	1612	53112679
2/0 AWG (70 mm²)						
0037024	8 AWG	1.462	37.1	2003	2054	53112680
3/0 AWG (95 mm²)						
0037025	6 AWG	1.576	40.0	2656	2797	53112680
4/0 AWG (120 mm²)						
0037026	6 AWG	1.678	42.6	3250	3410	53112680
250 KCMIL (150 mm²)						
0037027	4 AWG	1.970	50.0	3637	4118	53112681
350 KCMIL (185 mm²)						
0037028	2 AWG	2.191	55.6	4756	5255	53112501

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 2YSLCY-JB

Flexible low capacitance, double-shielded, large-gauge motor cable for servo & VFD applications

ÖLFLEX® SERVO 2YSLCY-JB is a highly flexible power cable for large horsepower motors and VFD drives. It has a double shield with polyethylene-insulated conductors for optimal low-loss power transmission when compared to PVC.

Recommended applications

Motor connections for large motors and drives; textile; paper; chemical; machine tool; heavy industry; conveying technology

Approvals

CE RoHS

Construction

Conductors: finely stranded bare copper

Insulation: polyethylene

Shielding: overall foil and tinned copper braid

Jacket: PVC; transparent or black

Application advantage

- Flexible for easier routing
- For large power drive systems
- Black jacketed version: 3 symmetrical grounds for improved EMC performance

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® MS-M BRUSH
page 524

EPIC® ULTRA HB
page 404

Technical data

Minimum bend radius:	4 x cable diameter	**Conductor stranding:**	Class 5 fine wire
Temperature range:		**Color code:**	VDE 0293-308: chart 6, page 681
- for stationary use:	-40°C to +70°C		black, brown, gray,
- for flexible use:	-5°C to +70°C		plus 1 or 3 green/yellow ground(s)
Nominal voltage:	1000V	**Approvals:**	CE & RoHS
Test voltage:	4000V		

three conductors + one ground, transparent jacket

Part number	Size of ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
1 AWG (50 mm²)						
0036433	1 AWG	1.411	35.8	1576	1982	53112680
2/0 AWG (70 mm²)						
0036434	2/0 AWG	1.588	40.3	2148	2654	53112680
3/0 AWG (95 mm²)						
0036435	3/0 AWG	1.832	46.5	2900	3562	53112681
4/0 AWG (120 mm²)						
0036436	4/0 AWG	2.096	53.2	3652	4435	53112681
250 KCMIL (150 mm²)						
0036437	250 KCMIL	2.258	57.3	4296	4733	53112501
350 KCMIL (185 mm²)						
0036438	350 KCMIL	2.455	62.3	5132	5634	53112500

three conductors + three grounds, black jacket

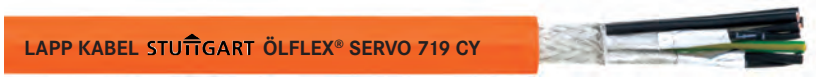
Part number	Size of ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-M BRUSH metric thread
1 AWG (50 mm²)						
0036447	8 AWG	1.284	32.6	1449	1612	53112679
2/0 AWG (70 mm²)						
0036448	6 AWG	1.434	36.4	1929	2054	53112680
3/0 AWG (95 mm²)						
0036449	6 AWG	1.655	42.0	2656	2797	53112680
4/0 AWG (120 mm²)						
0036450	6 AWG	1.883	47.8	3250	3410	53442681
250 KCMIL (150 mm²)						
0036451	4 AWG	2.033	51.6	3636	4118	53112681

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 719/719 CY

Flexible servo cable for stationary applications; unshielded & shielded

NEW



ÖLFLEX® SERVO 719/719 CY is a flexible, low-capacitance, oil resistant servo cable which is suitable for servo motor systems of well-known drive manufacturers. It is available with signal pairs for brake and temperature monitoring requirements. ÖLFLEX® SERVO 719 CY is a shielded version for EMI and RFI protection.

Unshielded construction

Conductors: finely stranded bare copper
Insulation: polypropylene
Pairs: individually shielded control pairs, twisted together
Jacket: specially formulated PVC; black

Shielded construction

Conductors: finely stranded bare copper
Insulation: polypropylene
Pairs: individually shielded control pairs, twisted together
Shielding: tinned copper braid (85% coverage)
Jacket: specially formulated PVC; orange

Recommended applications

Power drive systems in automation engineering; connecting cable between servo controller and motor assemblies; pick & place machinery; machine tools; transfer lines; fixed or stationary applications

Application advantage

- Replaces ÖLFLEX® SERVO 700 CY and 709 CY servo cables
- Multi-standard approval reduces part numbers and cost
- Longer cable installation lengths due to low capacitance design

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-02
MOTION	FL-02	MECH.	MP-02

Complete the installation

EPIC® POWER LS1
page 441

Technical data

Minimum bend radius:
- for flexible use: 15 x cable diameter
- for stationary use: 6 x cable diameter

Temperature range:
- for flexible use: -5°C to +80°C
- for stationary use: -40°C to +80°C

Nominal voltage:
- UL/CSA: 1000V
- IEC U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 5 fine wire

Color code:
- power conductors: black 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
- 22 AWG pairs: white/brown, green/yellow

Approvals:
UL: AWM 2570
Attributes: NFPA 79
Canada: cRU AWM I/II A/B FT1
Additional: CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 719

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration
Power conductors + 1 control pair								
1020060	16 AWG/4c	+	(19 AWG/1pr)	0.378	9.7	56	119	3+PE+4
1020065	16 AWG/4c	+	(16 AWG/1pr)	0.421	10.8	73	144	3+PE+4
1020061	16 AWG/5c	+	(19 AWG/1pr)	0.413	10.6	66	136	3+PE+4
1020062	16 AWG/7c	+	(19 AWG/1pr)	0.449	11.5	85	162	3+PE+4
1020063	14 AWG/4c	+	(19 AWG/1pr)	0.433	11.1	82	160	3+PE+4
1020066	14 AWG/4c	+	(16 AWG/1pr)	0.476	12.2	99	185	3+PE+4
1020064	14 AWG/7c	+	(19 AWG/1pr)	0.495	12.7	130	218	3+PE+4
1020067	12 AWG/4c	+	(16 AWG/1pr)	0.542	13.9	137	242	3+PE+4
1020068	10 AWG/4c	+	(16 AWG/1pr)	0.628	16.1	189	321	–
1020069	8 AWG/4c	+	(16 AWG/1pr)	0.710	18.2	292	439	–
Power conductors + 2 control pairs								
1020071	19 AWG/4c	+	2 x (22 AWG/1pr)	0.351	9.0	42	81	3+PE+4
1020072	16 AWG/4c	+	2 x (19 AWG/1pr)	0.452	11.6	75	136	3+PE+4
1020073	14 AWG/4c	+	2 x (18 AWG/1pr)	0.530	13.6	108	192	3+PE+4
1020074	12 AWG/4c	+	2 x (18 AWG/1pr)	0.597	15.3	146	253	3+PE+4
1020075	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.605	15.5	160	266	3+PE+4
1020076	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.679	17.4	211	344	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

ÖLFLEX® SERVO 719 CY

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration
4 power conductors + 0 control pairs								
1020010	16 AWG/4c		–	0.331	8.4	56	87	5+PE
1020011	14 AWG/4c		–	0.390	9.9	84	128	5+PE
1020012	12 AWG/4c		–	0.461	11.7	128	183	5+PE
1020013	10 AWG/4c		–	0.540	13.7	195	265	–
1020014	8 AWG/4c		–	0.658	16.7	304	390	–
1020015	6 AWG/4c		–	0.792	20.1	485	594	–
1020016	4 AWG/4c		–	0.957	24.3	739	906	–
1020017	2 AWG/4c		–	1.091	27.7	1040	1236	–
1020018	1 AWG/4c		–	1.328	33.7	1445	1777	–
4 power conductors + 1 control pair								
1020019	16 AWG/4c	+	(16 AWG/1pr)	0.453	11.5	98	163	3+PE+4
1020020	14 AWG/4c	+	(16 AWG/1pr)	0.508	12.9	127	206	3+PE+4
1020021	12 AWG/4c	+	(16 AWG/1pr)	0.591	15.0	182	282	3+PE+4
1020022	10 AWG/4c	+	(16 AWG/1pr)	0.670	17.0	236	355	–
1020023	8 AWG/4c	+	(16 AWG/1pr)	0.768	19.5	363	505	–
4 power conductors + 2 control pairs								
1020024	19 AWG/4c	+	2 x (22 AWG/1pr)	0.382	9.7	67	110	3+PE+4
1020025	16 AWG/4c	+	2 x (19 AWG/1pr)	0.485	12.3	101	165	3+PE+4
1020026	14 AWG/4c	+	2 x (18 AWG/1pr)	0.579	14.7	150	240	3+PE+4
1020027	12 AWG/4c	+	2 x (18 AWG/1pr)	0.646	16.4	194	304	3+PE+4
1020028	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.654	16.6	206	315	3+PE+4
1020029	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.729	18.5	283	415	–
1020030	8 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.871	22.1	395	573	–
1020031	6 AWG/4c	+	2 x (16 AWG/1pr)	0.985	25.0	589	781	–
1020032	4 AWG/4c	+	2 x (16 AWG/1pr)	1.131	28.7	825	1068	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SERVO 7TCE

Flexible tray-rated servo cable; 600/1000V; UL TC-ER approval

ÖLFLEX® SERVO 7TCE is a highly flexible and oil resistant servo cable suitable for mounting either in equipment or in cable tray, eliminating the need for two different types of cable in a single run. A longer cable connection is possible between the drive and the motor due to its low-capacitance design. This one cable solution is ideal for installing power to servo motor systems.

Construction

Conductors: finely stranded bare copper

Insulation: XLPE

Pairs: one pair: shielded with foil & tinned copper braid (85% coverage) • two Pairs: individually shielded with foil, drain wire, tinned copper braid (85% coverage); twisted together

Shielding: overall tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic elastomer (TPE); orange

Recommended applications

Motor connections between servo controller and motors on industrial machinery; in tray applications and moving machine parts; assembly handling and production lines with North American and European approvals

Application Advantage

- Tray rated cable for servo applications
- Low capacitance design
- UL TC-ER & c(UL) CIC approvals
- Oil & UV resistant; flame retardant
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Approvals

c UL us · c RU · CE · RoHS

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-02	MECH.	MP-03

Complete the installation

EPIC® POWER LS1
page 441

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:	6 x cable diameter
Temperature range:	
- for stationary use:	-40°C to +105°C
- UL TC:	-25°C to +90°C
Nominal voltage:	
- UL TC-ER:	600V
- UL Flexible Motor Supply:	1000V
- VDE U_0/U:	600/1000V
Test voltage:	2000V
Conductor stranding:	Class 5 fine wire
Color code:	
- power conductors:	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:	TC-ER per UL 1277 Flexible Motor Supply 1000V
Attributes:	UL Oil Res I/II -40°C cold bend; -25°C cold impact UV resistant direct burial NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC FT4 (18 - 14 AWG) cRU AWM II A/B FT4
Additional:	CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 7TCE

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration
4 power conductors								
700730	16 AWG/4c		–	0.385	9.78	59	96	5+PE
700731	14 AWG/4c		–	0.433	11.00	89	134	5+PE
700732	12 AWG/4c		–	0.504	12.80	134	192	5+PE
700733	10 AWG/4c		–	0.555	14.10	189	251	–
4 power conductors + 1 control pair								
700734	16 AWG/4c	+	(16 AWG/1pr)	0.494	12.55	99	161	3+PE+4
700735	14 AWG/4c	+	(16 AWG/1pr)	0.524	13.31	128	202	3+PE+4
700736	12 AWG/4c	+	(16 AWG/1pr)	0.620	15.75	174	290	3+PE+4
700737	10 AWG/4c	+	(16 AWG/1pr)	0.669	17.00	238	333	–
4 power conductors + 2 control pairs								
700738	18 AWG/4c	+	2 x (18 AWG/1pr)	0.520	13.21	112	186	3+PE+4
700739	16 AWG/4c	+	2 x (18 AWG/1pr)	0.547	13.89	126	211	3+PE+4
700740	14 AWG/4c	+	2 x (18 AWG/1pr)	0.610	15.49	154	260	3+PE+4
700741	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.669	17.00	219	327	3+PE+4
700742	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.712	18.08	275	386	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SERVO FD 7TCE

Continuous flex tray-rated servo cable; 600/1000V; UL TC-ER approval

NEW

ÖLFLEX® SERVO FD 7TCE is a continuous flex and oil resistant servo cable suitable for mounting either in equipment or in cable tray, eliminating the need for two different types of cable in a single run. A longer cable connection is possible between the drive and the motor due to its low-capacitance design. This one cable solution is ideal for installing power to servo motor systems.

Construction

Conductors: finely stranded bare copper

Insulation: EPR

Pairs: one pair: shielded with foil & tinned copper braid (85% coverage) • two pairs: individually shielded with foil, drain wire, tinned copper braid (85% coverage)

Shielding: overall wrapping; overall tinned copper braid (85% coverage)

Jacket: specially formulated thermoplastic elastomer (TPE); orange

Recommended applications

Motor connections between servo controller and motors on industrial machinery; in tray applications and cable tracks or moving machine parts; assembly handling; production lines and robotic systems with North American and European approvals

Application advantage

- Tray rated cable for servo applications
- Low capacitance design
- UL TC-ER & c(UL) CIC approvals
- Oil & UV resistant; flame retardant

Approvals

Continuous Flex Test Method Verified UL VERIFIED verifyULcom A522492

Cable attributes				page 648
OIL	OR-03	FLAME	FR-03	
MOTION	CF-02*	MECH.	MP-03	

Complete the installation

EPIC® POWER LS1
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter
- for stationary use: 5 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -40°C to +105°C
- UL TC: -25°C to +90°C

Nominal voltage:
- UL TC-ER: 600V
- UL Flexible Motor Supply: 1000V
- VDE U_0/U: 600/1000V

Test voltage: 4000V

Conductor stranding: Class 6 super 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:	TC-ER per UL 1277 Flexible Motor Supply 1000V
Attributes:	UL Oil Res I/II -40°C cold bend; -25°C cold impact UV resistant direct burial NFPA 79
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC FT4 (18 - 14 AWG) cRU AWM II A/B FT4
Additional:	CE & RoHS
UL Verified ID A522492:	Continuous Flex Test Method Verified

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO FD 7TCE

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration
4 power conductors								
700750	16 AWG/4c		–	0.400	10.2	61	117	5+PE
700751	14 AWG/4c		–	0.448	11.4	95	154	5+PE
700752	12 AWG/4c		–	0.514	13.1	135	214	5+PE
700753	10 AWG/4c		–	0.590	15.0	190	289	–
4 power conductors + 1 control pair								
700754	16 AWG/4c	+	(16 AWG/1pr)	0.500	12.7	97	174	3+PE+4
700755	14 AWG/4c	+	(16 AWG/1pr)	0.543	13.8	134	239	3+PE+4
700756	12 AWG/4c	+	(16 AWG/1pr)	0.635	16.1	184	300	3+PE+4
700757	10 AWG/4c	+	(16 AWG/1pr)	0.674	17.1	232	360	–
4 power conductors + 2 control pairs								
700758	18 AWG/4c	+	2 x (18 AWG/1pr)	0.523	13.3	102	188	3+PE+4
700759	16 AWG/4c	+	2 x (18 AWG/1pr)	0.584	14.8	128	238	3+PE+4
700760	14 AWG/4c	+	2 x (18 AWG/1pr)	0.625	15.9	153	275	3+PE+4
700761	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.705	17.9	214	352	–
700762	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.741	18.8	262	411	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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

ÖLFLEX® SERVO FD 796 CP is specially designed, manufactured, and tested by LAPP for usage in modern high-acceleration cable chain applications as well as over long travel lengths. It replaces seven ÖLFLEX® SERVO FD cables: 755 CP, 755 CP DESINA, 781 CP, 785 CP, 785 CP DESINA, 790 CP & 795 CP. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Construction

Conductors: extra fine bare copper

Pairs: one pair: shielded with tinned copper braid; non-woven wrapping • two pairs: shielded with foil, drain wire, tinned copper braid; non-woven wrapping twisted together

Insulation: polypropylene

Shielding: overall non woven wrapping; tinned copper braid (85% coverage)

Jacket: polyurethane; orange

Recommended applications

Motor connections between servo controllers and motors on industrial machinery; in cable chains or moving machine parts; assembly handling; production lines and robotic systems with North American and European approvals

Application advantage

- High dynamic performance in cable chains:
  - Acceleration up to 50 m/s²
  - Travel speed up to 5 m/s
  - Travel lengths up to 100 m
- Abrasion-, cut-, and oil-resistant; halogen-free, flame-retardant, and flexible at low temperatures

Approvals

c UL us · FIRE PROTECTION · VDE · CE · RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	CF-04A	MECH.	MP-05

Complete the installation

EPIC® POWER LS1
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:		**Conductor stranding:**	Class 6 super fine wire
- for continuous flexing:			
- 16-6 AWG:	7.5 x cable diameter	**Color code:**	
- 4-1 AWG:	10 x cable diameter	- power conductors:	black conductors with white letters: U/L1/C/L+; V/L2; W/L3/D/L- plus green/yellow ground
- for stationary use:	4 x cable diameter		
Temperature range:		- 1 pair:	black & white
- for continuous flexing:	-40°C to +80°C	- 2 pair:	black with white numbers: 5, 6, 7, 8
- for stationary use:	-50°C to +80°C		
Nominal voltage:		**Approvals:**	UL: AWM 20234
- UL/CSA:	1000V		Attributes: NFPA 79
- IEC U_0/U:	600/1000V		Canada: cRU AWM I/II A/B FT1
Test voltage:	4000V		Additional: VDE Reg. no 8591 CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO FD 796 CP

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration
4 power conductors								
0027950	16 AWG/4c		–	0.362	9.2	53	94	5+PE
0027951	14 AWG/4c		–	0.418	10.6	87	132	5+PE
0027952	12 AWG/4c		–	0.469	11.9	125	180	5+PE
0027953	10 AWG/4c		–	0.567	14.4	199	267	–
0027954	8 AWG/4c		–	0.693	17.6	302	397	–
0027955	6 AWG/4c		–	0.867	22.0	481	642	–
0027956	4 AWG/4c		–	0.993	25.2	721	898	–
0027957	2 AWG/4c		–	1.131	28.7	995	1189	–
0027958	1 AWG/4c		–	1.316	33.4	1421	1658	–
4 power conductors + 1 control pair								
0027959	16 AWG/4c	+	(16 AWG/1pr)	0.473	12.0	91	175	3+PE+4
0027960	14 AWG/4c	+	(16 AWG/1pr)	0.544	13.8	126	214	3+PE+4
0027961	12 AWG/4c	+	(16 AWG/1pr)	0.587	14.9	158	259	3+PE+4
0027962	10 AWG/4c	+	(16 AWG/1pr)	0.670	17.0	221	327	–
0027963	8 AWG/4c	+	(16 AWG/1pr)	0.764	19.4	346	471	–
0027964	6 AWG/4c	+	(16 AWG/1pr)	0.938	23.8	509	704	–
0027965	4 AWG/4c	+	(16 AWG/1pr)	1.064	27.0	771	1030	–
0027966	2 AWG/4c	+	(16 AWG/1pr)	1.229	31.2	1034	1409	–
0027967	1 AWG/4c	+	(16 AWG/1pr)	1.367	34.7	1466	1829	–
4 power conductors + 2 control pairs								
0027969	16 AWG/4c	+	2 x (19 AWG/1pr)	0.481	12.2	107	210	3+PE+4
0027970	14 AWG/4c	+	2 x (18 AWG/1pr)	0.575	14.6	139	265	3+PE+4
0027971	12 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.642	16.3	231	326	3+PE+4
0027972	10 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.713	18.1	293	395	–
0027973	8 AWG/4c	+	(18 AWG/1pr) + (16 AWG/1pr)	0.859	21.8	410	550	–
0027974	6 AWG/4c	+	2 x (16 AWG/1pr)	1.005	25.5	538	763	–
0027975	4 AWG/4c	+	2 x (16 AWG/1pr)	1.139	28.9	798	1048	–
0027976	2 AWG/4c	+	2 x (16 AWG/1pr)	1.237	31.4	1067	1406	–
0027977	1 AWG/4c	+	2 x (14 AWG/1pr)	1.450	36.8	1718	1962	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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

ÖLFLEX® SERVO FD 798 CP is specially designed, manufactured, and tested by LAPP for usage in modern high-acceleration cable chain applications as well as over long travel lengths. It replaces four ÖLFLEX® SERVO FD encoder/resolver cables: 760 CP/CP DESINA & 770 CP/CP DESINA. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Recommended applications

Connecting cable between servo controller and encoder/resolver; connecting cable between servo controller and speed generators, cable chains, and machine parts; transfer lines and production lines

Approvals

Construction

Conductors: extra fine tinned copper

Pairs: twisted and bundled; shielded (see chart)

Insulation: polypropylene

Shielding: tinned copper braid (85% coverage)

Jacket: polyurethane; green

Application advantage

- High dynamic performance in cable chains:
  - Acceleration up to 50 m/s²
  - Travel speed up to 5 m/s
  - Travel lengths up to 100 m
- Abrasion-, cut-, and oil-resistant; abrasion-resistant, halogen-free, flame retardant, flexes at low temperatures

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-04A	MECH.	MP-05	

Complete the installation

EPIC® SIGNAL M23
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
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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

Test voltage:
- conductor/conductor: 1500V
- conductor/shield: 750V

Conductor stranding: extra fine wire

Color code: see following color chart

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	Conductor description power conductors	+	control pairs	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® SIGNAL M23 # of contacts
Power conductors + control pairs								
0036910	20 AWG/4c	+	22 AWG/4pr	0.350	8.9	53	84	12
0036911	2 x (20 AWG/1c)	+	3 x (26 AWG/1pr)	0.350	8.9	47	81	8+1
0036912	26 AWG/4c	+	3 x (26 AWG/1pr) + 20 AWG/1pr	0.346	8.8	46	74	12
0036913	26 AWG/4c + 24 AWG/4c	+	3 x (26 AWG/1pr) + 20 AWG/1pr	0.370	9.4	54	87	16
0036914	20 AWG/9c		–	0.346	8.8	48	74	9
0036915	18 AWG/2c	+	24 AWG/4pr	0.346	8.8	42	73	12
0036916	20 AWG/2c	+	24 AWG/6pr	0.406	10.3	45	81	16
0036917	26 AWG/10c	+	20 AWG/1pr	0.303	7.7	28	55	12
0036918	26 AWG/10c + 20 AWG/4c		–	0.319	8.1	36	66	16
0036920	20 AWG/4c	+	26 AWG/4pr	0.323	8.2	34	64	12
0036921	–		24 AWG/4pr	0.299	7.6	26	50	9
0036923	–		26 AWG/8pr	0.307	7.8	34	57	16
0036924	–		26 AWG/4pr	0.252	6.4	20	35	8+1
0036926	24 AWG/12c		–	0.272	6.9	30	49	12
0036927	20 AWG/2c	+	24 AWG/4pr	0.335	8.5	42	66	12
0036928	20 AWG/4c + (26 AWG/4c)	+	26 AWG/2pr + 2 x (26 AWG/1pr)	0.358	9.1	53	91	16
0036929	20 AWG/2c	+	2 x (24 AWG/1pr)	0.343	8.7	31	66	6
0036930	20 AWG/2c	+	24 AWG/2pr	0.287	7.3	26	48	6

( ) = shielded

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO FD 798 CP

Part number	Conductor description			Nominal outer diameter		Copper weight	Approx. weight	EPIC® SIGNAL M23
	power conductors	+	control pairs	in	mm	lbs/mft	lbs/mft	# of contacts
Power conductors + control pairs								
0036949	2 x (20 AWG/1c)	+	3 x (26 AWG/1pr)	0.378	9.6	47	80	8
0036942		+	(25 AWG/2pr)	0.197	5	16	32	4
0036943	18AWG/4c +(26 AWG/4c)	+	26 AWG/4pr	0.382	9.7	69	117	16
0036944	24 AWG/3c + 18 AWG/2c	+	3 x (24 AWG/1pr)	0.366	9.3	64	109	11
0036946		+	3 x (26 AWG/1pr) + (20 AWG/1pr)	0.394	10	45	95	8
0036941	(26 AWG/3c)	+	3 x (26 AWG/1pr)	0.362	9.2	38	84	9
0036945	18 AWG/2c	+	4 x (26 AWG/1pr)	0.449	11.4	62	77	10
0036947			24 AWG/5pr	0.354	9	34	84	10
0036940			24 AWG/6pr	0.366	9.3	48	96	12
0036948			22 AWG/5pr	0.342	8.7	50	73	10
0036931	2 x (18 AWG/1c)	+	3 x (26 AWG/1pr)	0.358	9.1	50	92	8
0036932	20 AWG/4c + (26 AWG/4c)	+	26 AWG/4pr	0.327	8.3	59	90	16
0036933	20 AWG/2c	+	24 AWG/3pr	0.331	8.4	34	58	8
0036934	20 AWG/2c	+	24 AWG/5pr–	0.374	9.5	46	76	12
0036935			24 AWG/3pr	0.256	6.5	24	47	6
0036936	20 AWG/2c	+	26 AWG/5pr	0.307	7.8	34	68	12
0036937	20 AWG/5c	+	25 AWG/2pr)	0.299	7.6	42	74	9
0036938	20 AWG/6c	+	25 AWG/5pr	0.342	8.7	53	76	16
0036939			28 AWG/10pr	0.244	6.2	27	47	20

ÖLFLEX® SERVO FD 798 CP color code chart on page 744 of LAPP North America digital catalog.

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SERVO FD 7DSL

Continuous flex hybrid cable: one connection between drive, motor & feedback systems

ÖLFLEX® SERVO FD 7DSL is a specially designed continuous flexing hybrid cable suitable for Hiperface DSL® motor-feedback systems. It is EMC compliant. For fixed or stationary applications, ÖLFLEX® SERVO 7DSL is the right cable. For bending cycles and operation parameters, see www.lappusa.com/cf-rating

Recommended applications

Power drive systems in automation engineering, connecting cable between servo controller and motor, assemblies, pick & place machinery, machine tools, transfer lines, cable chain applications

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	CF-04	MECH.	MP-05

Construction

Conductors: super fine stranded bare copper • signal pair: tinned copper

Insulation: polypropylene

Pairs: signal pair: shielded with foil tape and tinned copper braid (85% coverage) • control pair: shielded with tinned copper braid (85% coverage)

Shielding: overall non-woven wrapping; tinned copper braid (85% coverage)

Jacket: polyurethane; orange

Application advantage

- Only one cable needed for power and feedback circuits
- Available with or without additional control pair
- Low capacitance design
- Suitable for damp, wet, or dry areas
- Oil resistant and flame retardant
- Halogen-free and UV-resistant jacket

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter
- for stationary use: 5 x cable diameter

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

Conductor stranding: Class 6 super fine wire
- signal pair: 19 strand
- control pair (optional): Class 6 super fine wire

Nominal voltage:
- power & control:
  - UL: 1000V
  - IEC U_0/U: 600/1000V
- signal pair: 300V (not for power)

Test voltage:
- power & control: 4000V
- signal pair: 1000V

Color code:
- power conductors: black with white letters: U/L1/C/L+; V/L2; W/L3/D/L- plus green/yellow ground
- signal pair: white & blue
- control pair (optional): black with white numbers: 5, 6

Approvals:
UL: AWM 21223
Attributes: NFPA 79
Canada: cRU AWM I/II A/B FT1
Additional: based on VDE specifications
CE & RoHS

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft
4 power conductors + 1 control pair							
1023275	16 AWG/4c	+	(22 AWG/1pr)	0.441	11.2	115	128
1023276	14 AWG/4c	+	(22 AWG/1pr)	0.496	12.6	160	263
1023277	12 AWG/4c	+	(22 AWG/1pr)	0.551	14.0	218	313
4 power conductors + 2 control pairs							
1023278	16 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.520	13.2	152	256
1023279	14 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.551	14.0	185	393
1023280	12 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.622	15.8	268	407

( ) = shielded pair

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO 7DSL

Flexible hybrid cable: one connection between drive, motor & feedback system

ÖLFLEX® SERVO 7DSL is a specially designed hybrid cable suitable for fixed or stationary installations in Hiperface DSL® motor-feedback systems. It is EMC compliant. For continuous flexing installations, ÖLFLEX® SERVO FD 7DSL is the right cable.

Recommended applications

Power drive systems in automation engineering, connecting cable between servo controller and motor, assemblies, pick & place machinery, machine tools, transfer lines, fixed or stationary applications

Approvals

c UL us · FIRE PROTECTION · CE · RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-02

Construction

Conductors: finely stranded bare copper • signal pair: tinned copper

Insulation: polypropylene

Pairs: signal pair: shielded with foil tape and tinned copper braid (85% coverage) • control pair: shielded with tinned copper braid (85% coverage)

Shielding: overall non-woven wrapping; tinned copper braid (85% coverage)

Jacket: specially formulated PVC; orange

Application advantage

- Only one cable needed for power and feedback circuits
- Available with or without additional control pair
- Low capacitance design
- Suitable for damp, wet, or dry areas
- Oil and flame resistant

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius: 5 x cable diameter

Temperature range: -40°C to +80°C

Conductor stranding:
- signal pair: 7 strand
- control pair (optional): Class 5 fine wire

Nominal voltage:
- power & control:
  - UL: 1000V
  - IEC U_0/U: 600/1000V
- signal pair: 300V (not for power)

Test voltage:
- power & control: 4000V
- signal pair: 1000V

Color code:
- power conductors: black with white letters: U/L1/C/L+; V/L2; W/L3/D/L- plus green/yellow ground
- signal pair: white & blue
- control pair (optional): black with white numbers: 5, 6

Approvals:
UL: AWM 2570
Attributes: NFPA 79
Canada: cRU AWM I/II A/B FT1
Additional: based on VDE specifications CE & RoHS

Part number	Conductor description power conductors + control pairs			Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
4 power conductors + 1 control pair							
1023290	16 AWG/4c	+	(22 AWG/1pr)	0.441	11.2	74	130
1023291	14 AWG/4c	+	(22 AWG/1pr)	0.496	12.6	99	170
1023292	12 AWG/4c	+	(22 AWG/1pr)	0.551	14.0	140	223
4 power conductors + 2 control pairs							
1023293	16 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.520	13.2	94	168
1023294	14 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.551	14.0	124	191
1023295	12 AWG/4c	+	(18 AWG/1pr) + (22 AWG/1pr)	0.622	15.8	166	262

( ) = shielded pair

Hiperface DSL® is a registered trademark of SICK AG.
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

Servo cable according to SIEMENS® standard 6FX 8PLUS

Continuous flex servo cable with PUR jacket; shielded

Servo cables according to SIEMENS® standard 6FX 8PLUS are continuous flexing, oil-resistant, UL, CSA, VDE & CE rated power supply, feedback and signal cables for signal transmission or motor connections. They are designed for dynamic performance in cable chains. Servo cable according to SIEMENS® standard 6FX 8PLUS replaces SIEMENS® standard 6FX 7008 and 8008.

Discontinued
Successor product lines:
ÖLFLEX® SERVO FD 796 CP
ÖLFLEX® SERVO FD 798 CP

Recommended applications

Power drive systems; sensor leads for signal transmission and motor connections; connections between servo controllers, encoders/resolvers, and motors; assembly lines; all machines utilizing servo motors

Approvals

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: tinned copper braid; non-woven wrap

Jacket: feedback/signal: polyurethane; green • servo/motor: polyurethane; orange

Application advantage

- High dynamic performance in cable chains:
  - Acceleration up to 50 m/s²
  - Travel speed up to 5 m/s
  - Travel lengths up to 100 m
- Abrasion-, cut- and oil-resistant; halogen-free, flame-retardant, and flexible at low temperatures

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-04	MECH.	MP-05	

Complete the installation

EPIC® POWER LS1
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EPIC® SIGNAL M23
page 446

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:
- power cable:
  - for continuous flexing:
    - 16 - 6 AWG: 7.5 x cable diameter
    - 4 - 1 AWG: 10 x cable diameter
  - for stationary use: 4 x cable diameter
- signal cable:
  - for continuous flexing: 8 x cable diameter
  - 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

Test voltage:
- signal conductors: 500V
- power conductors: 4000V

Conductor stranding: Class 6 super fine wire

Color code:
- feedback/signal cables: see following color chart
- motor/servo cables: black with white letters:
  - 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
  - control pair: black & white

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

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

Servo cable according to SIEMENS® standard 6FX 8PLUS

color code: feedback/signal cable

Part number	Conductor description	Color code
00277101	26 AWG/8pr	white/yellow & white/green white/red & white/orange white/black & white/brown gray & white • blue & violet yellow & green • red & orange • black & brown
00277111	22 AWG/4pr	brown & black • red & orange yellow & green • blue & violet
	20 AWG/4c	white/blue • white/black white/red • white/yellow
00277121	26 AWG/3pr	yellow & green • black & brown • red & orange
	20 AWG/2c	black • red
00277131	26 AWG/3pr	yellow & green • black & brown • red & orange
	26 AWG/4c	gray • blue • white/yellow • white/black
	20 AWG/1pr	brown/red & brown/blue

Part number	Conductor description	Color code
00277141	26 AWG/3pr	yellow & green • black & brown • red & orange
	26 AWG/4c	gray • blue • white/yellow • white/black
	26 AWG/4c	brown/yellow • brown/gray green/black • green/red
	20 AWG/2c	brown/red • brown/blue
00277151	26 AWG/4pr	black & brown • red & orange yellow & green • blue & violet
00277161	26 AWG/2pr	red & orange • black & brown
00277171	26 AWG/12c	black • brown • red orange • yellow • green • blue violet • gray • white • white/black • white/brown

Discontinued. Successor product lines: ÖLFLEX® SERVO FD 796 CP, ÖLFLEX® SERVO FD 798 CP

Part number	Conductor description	SIEMENS® part number	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration	EPIC® SIGNAL M23 # of contacts
Feedback/signal cable								
00277101	26 AWG/8pr	6FX8008-1BD11	0.307	7.8	36	57	–	16
00277111	22 AWG/4pr + 20 AWG/4c	6FX8008-1BD21	0.350	8.9	52	81	–	12
00277121	3 x (26 AWG/1pr) + 2 x (20 AWG/1c)	6FX8008-1BD31	0.350	8.9	46	76	–	9
00277131	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/1pr	6FX8008-1BD41	0.346	8.8	44	68	–	12
00277141	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/2c + 26 AWG/4c	6FX8008-1BD51	0.370	9.4	58	93	–	16
00277151	26 AWG/4pr	6FX8008-1BD61	0.252	6.4	23	36	–	8+1
00277161	26 AWG/2pr	6FX8008-1BD71	0.197	5.0	16	24	–	6
00277171	26 AWG/12c	6FX8008-1BD81	0.272	6.9	32	51	–	12
00277992	26 AWG/2pr + 21 AWG/1pr	6FX8008-2DC00	0.283	7.2	26	50	–	6
Motor cable								
0027784	16 AWG/4c	6FX8008-1BB11-Plus	0.359	9.1	61	101	5+PE	–
0027785	14 AWG/4c	6FX8008-1BB21-Plus	0.418	10.6	89	148	5+PE	–
0027786	12 AWG/4c	6FX8008-1BB31-Plus	0.469	11.9	138	202	5+PE	–
0027787	10 AWG/4c	6FX8008-1BB41-Plus	0.571	14.5	212	302	–	–
0027788	8 AWG/4c	6FX8008-1BB51-Plus	0.690	17.5	328	444	–	–
0027789	6 AWG/4c	6FX8008-1BB61-Plus	0.851	21.6	517	679	–	–
Servo cable								
0027790	16 AWG/4c + (16 AWG/1pr)	6FX8008-1BA11-Plus	0.457	11.6	98	155	3+PE+4	–
0027791	14 AWG/4c + (16 AWG/1pr)	6FX8008-1BA21-Plus	0.528	13.4	126	202	3+PE+4	–
0027792	12 AWG/4c + (16 AWG/1pr)	6FX8008-1BA31-Plus	0.583	14.8	174	255	3+PE+4	–
0027793	10 AWG/4c + (16 AWG/1pr)	6FX8008-1BA41-Plus	0.662	16.8	245	356	–	–
0027794	8 AWG/4c + (16 AWG/1pr)	6FX8008-1BA51-Plus	0.764	19.4	376	514	–	–
0027795	6 AWG/4c + (16 AWG/1pr)	6FX8008-1BA61-Plus	0.910	23.1	548	732	–	–
0027796	4 AWG/4c + (16 AWG/1pr)	6FX8008-1BA25-Plus	1.048	26.6	784	1028	–	–
0027797	2 AWG/4c + (16 AWG/1pr)	6FX8008-1BA35-Plus	1.217	30.9	1044	1371	–	–
0027798	1 AWG/4c + (16 AWG/1pr)	6FX8008-1BA50-Plus	1.340	34.0	1470	1855	–	–

( ) = shielded

* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

Servo cable according to SIEMENS® standard 6FX 5008

Flexible servo cable for stationary applications

Servo cables according to SIEMENS® standard 6FX 5008 are flexible, oil-resistant, UL, CSA, VDE & CE rated power supply, feedback and signal cables for signal transmission or motor connections.

Discontinued.
Successor product lines:
ÖLFLEX® SERVO 719 CY
ÖLFLEX® SERVO 728 CY

Construction

Conductors: finely stranded bare copper

Insulation: 16 - 10 AWG: polypropylene • 8 AWG & larger: PVC

Pairs: shielded with tinned copper braid (not all feedback pairs are shielded)

Shielding: overall tinned copper braid

Jacket: feedback/signal: green PVC • servo/motor: orange PVC

Recommended applications

Sensor leads for signal transmission and motor connections; servo and power drive systems for food & beverage, automotive, packaging, and other industries

Application advantage

- Built in accordance with SIEMENS® standard 6FX 5008
- Colored jackets in accordance with DESINA®
- All cables have an overall shield for EMI & RFI protection
- Oil-resistant jacket
- Cables can be provided as a complete assembly: call factory for price and delivery information

Approvals

Cable attributes			page 648
OIL	OR-02	FLAME	FR-02
MOTION	FL-01	MECH.	MP-02

Complete the installation

EPIC® POWER LS1
page 441

EPIC® SIGNAL M23
page 446

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius: 5 x cable diameter

Temperature range:
- for flexible use: 0°C to +60°C
- for stationary use: -20°C to +80°C

Nominal voltage:
- UL/CSA:
  - power conductors: 1000V
  - control conductors: 1000V
  - feedback/signal cond.: 30V

Test voltage:
- power conductors: 4000V
- control conductors: 2000V
- feedback/signal cond.: 500V

Conductor stranding: Class 5 fine wire

Color code:
- feedback/signal cables: see following color chart
- motor/servo cables: black with white letters: U/L1/C/L+; V/L2; W/L3/D/L- plus green/yellow ground

Approvals:
UL: AWM 2570 (motor)
AWM 2502 (signal)
Canada: CSA AWM II A/B FT1
Additional: based on VDE specifications
CE & RoHS

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Servo cable according to SIEMENS® standard 6FX 5008

color code: feedback/signal cable

Part number	Conductor description	Color code
0025724	22 AWG/4pr	brown & black • red & orange yellow & green • blue & violet
	20 AWG/4c	blue/white • black/white red/white • yellow/white
0025725	26 AWG/3pr	yellow & green • black & brown • red & orange
	26 AWG/4c	gray • blue • white/yellow • white/black
	20 AWG/1pr	brown/red & brown/blue

Part number	Conductor description	Color code
0025726	26 AWG/3pr	yellow & green • black & brown • red & orange
	26 AWG/4c	gray • blue • white/yellow • white/black
	24 AWG/4c	brown/yellow • brown/gray green/black • green/red
	20 AWG/1pr	brown/red & brown/blue

Discontinued. Successor product lines: ÖLFLEX® SERVO 719 CY, ÖLFLEX® SERVO 728 CY

Part number	Conductor description	SIEMENS® part number	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration	EPIC® SIGNAL M23 # of contacts
feedback/signal cables								
0025724	22 AWG/4 pr + 20 AWG/4c	6FX5008-1BD21	0.354	9.0	51	81	–	12
0025725	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/1pr	6FX5008-1BD41	0.350	8.9	42	67	–	12
0025726	3 x (26 AWG/1pr) + 26 AWG/4c + 20 AWG/1pr + 24 AWG/4c	6FX5008-1BD51	0.374	9.5	46	93	–	16
motor cables								
00257001	16 AWG/4c	6FX5008-1BB11LC	0.315	8.0	59	88	5+PE	–
00257011	14 AWG/4c	6FX5008-1BB21LC	0.378	9.6	89	147	5+PE	–
00257021	12 AWG/4c	6FX5008-1BB31LC	0.433	11.0	131	210	5+PE	–
00257031	10 AWG/4c	6FX5008-1BB41LC	0.516	13.1	188	255	–	–
0025704	8 AWG/4c	6FX5008-1BB51	0.760	19.3	299	417	–	–
0025705	6 AWG/4c	6FX5008-1BB61	0.918	23.3	480	712	–	–
0025706	4 AWG/4c	6FX5008-1BB25	1.060	26.9	746	1102	–	–
0025707	2 AWG/4c	6FX5008-1BB35	1.194	30.3	1035	1552	–	–
0025708	1 AWG/4c	6FX5008-1BB50	1.438	36.5	1451	2177	–	–
servo cables								
00257151	16 AWG/4c + (16 AWG/1pr)	6FX5008-1BA11LC	0.410	10.4	101	167	3+PE+4	–
00257161	14 AWG/4c + (16 AWG/1pr)	6FX5008-1BA21LC	0.473	12.0	130	208	3+PE+4	–
00257171	12 AWG/4c + (16 AWG/1pr)	6FX5008-1BA31LC	0.536	13.6	183	299	3+PE+4	–
00257181	10 AWG/4c + (16 AWG/1pr)	6FX5008-1BA41LC	0.615	15.6	236	379	–	–
0025719	8 AWG/4c + (16 AWG/1pr)	6FX5008-1BA51	0.827	21.0	360	542	–	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

Servo cable according to INDRAMAT® standard INK

Continuous flex servo cable with PUR jacket; shielded

Servo cables according to INDRAMAT® standard INK are highly flexible, oil-resistant, and are UL, CSA, and CE rated. Power cables with pairs and feedback/signal cables are in accordance to INDRAMAT standards.

Discontinued.
Successor product line:
ÖLFLEX® SERVO FD 796 CP
ÖLFLEX® SERVO FD 798 CP

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: tinned copper braid

Jacket: polyurethane, orange

Recommended applications

Motor connections for servo motors; machine tools; food & beverage, automotive, and packaging industries for continuous flexing cable chain

Application advantage

- Built in accordance with INDRAMAT® standards
- Overall shield for EMI & RFI protection
- Abrasion-, oil-, and cut-resistant, halogen-free jacket
- Cables can be provided as a complete assembly

Approvals

Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-02*	MECH.	MP-05	

Complete the installation

EPIC® POWER LS1
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EPIC® SIGNAL M23
page 446

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

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 conductors: 1000V

Conductor stranding: Class 6 super fine wire

Color code:
- feedback cables: see following color chart
- 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
*UL Verified ID A522492: Continuous Flex Test Method Verified

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Servo cable according to INDRAMAT® standard INK

color code: feedback/signal cable

Part number	Conductor description	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

Part number	Conductor description	Color code
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

Discontinued.
Successor product lines:
ÖLFLEX® SERVO FD 796 CP
ÖLFLEX® SERVO FD 798 CP

Part number	Conductor description	INDRAMAT® part number	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® POWER LS1* configuration	EPIC® SIGNAL M23 # of contacts
Feedback/signal cables								
7072400	24 AWG/4pr + 18 AWG/2c	INK-0209	0.347	8.8	50	81	–	12
7072401	24 AWG/4pr + 20 AWG/2c	INK-0448	0.335	8.5	47	67	–	12
7072402	20 AWG/9c	INK-0208	0.347	8.8	50	85	–	9
7072414	18 AWG/4c + 26 AWG/4pr + (26 AWG/4c)	INK-0532	0.382	9.7	54	94	–	16
7072415	2 x (24 AWG/1pr) + 20 AWG/2c	INK-0234	0.343	8.7	31	60	–	6
7072416	24 AWG/2pr + 20 AWG/2c	INK-0750	0.299	7.6	24	62	–	9
Servo/motor cables								
7072417	19 AWG/4c + 20 AWG/1pr	INK-0670	0.394	10.0	49	89	3+PE+4	–
7072403	18 AWG/4c + 2 x (19 AWG/1pr)	INK-0653	0.453	11.5	114	152	3+PE+4	–
7072404	16 AWG/4c + 2 x (19 AWG/1pr)	INK-0650	0.481	12.2	127	180	3+PE+4	–
7072405	14 AWG/4c + 2 x (18 AWG/1pr)	INK-0602	0.595	15.1	142	215	3+PE+4	–
7072406	12 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0603	0.630	16.0	206	316	3+PE+4	–
7072407	10 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0604	0.741	18.8	246	403	–	–
7072408	8 AWG/4c + (18 AWG/1pr) + (16 AWG/1pr)	INK-0605	0.867	22.0	380	571	–	–
7072409	6 AWG/4c + 2 x (16 AWG/1pr)	INK-0606	0.993	25.2	563	685	–	–
7072410	4 AWG/4c + 2 x (16 AWG/1pr)	INK-0607	1.103	28.0	827	954	–	–

( ) = shielded
* Check connection on motor prior to selecting EPIC® POWER LS1 connector type

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ÖLFLEX®

Harmonized European hook-up wire & cordage

126 **Quick select chart**

127 **Harmonized European cable**

Harmonized hook-up wire

128 **Multi-standard <HAR> hook-up wire**
H05V-K: UL AWM Style 1007 & 1569, UL/CSA • H07V-K: UL AWM Style 1015, UL MTW 1063, CSA

129 **<HAR> hook-up wire**
Type H05V-K & H07V-K

130 **Halogen-free <HAR> hook-up wire**
Type H05Z-K & H07Z-K

Harmonized cordage

131 **ÖLFLEX® POWER QUAD II**
Oil-resistant PVC cordage with <HAR> & SJTO approvals for global use

132 **H05VV-F cordage**
Flexible European cordage with PVC jacket & <HAR> approval

133 **ÖLFLEX® POWER IX**
Heavy duty neoprene cordage with <HAR> and SOOW approvals for global use

134 **H07RN-F cordage**
Heavy duty flexible neoprene European cordage with <HAR> approval

135 **H07RN-F enhanced cordage**
Heavy duty halogen-free rubber European cordage with <HAR> approval

Quick select chart

Product	Material insulation/jacket	Approval	Description	Page
Harmonized hook-up wire				
Multi-standard <HAR> hook-up wire, H05V-K	PVC	H05V-K	<HAR> • 500V • 70°C • IEC 60332.1.2 Flame	128
		UL 1007	UL AWM • 300V • 80°C • VW-1	
		UL 1569	UL AWM • 300V • 105°C • VW-1	
Multi-standard <HAR> hook-up wire, H07V-K	PVC	H07V-K	<HAR> • 750V • 70°C • IEC 60332.1.2 Flame	128
		UL 1015	UL AWM • 600V • 105°C • VW-1	
		UL 1063	UL MTW • 600V • 90°C • VW-1	
<HAR> hook-up wire	PVC	H05V-K	<HAR> • 500V • 70°C • IEC 60332.1.2 Flame	129
		H07V-K	<HAR> • 750V • 70°C • IEC 60332.1.2 Flame	
Halogen-free <HAR> hook-up wire	halogen-free	H05Z-K	<HAR> • 500V • 90°C • IEC 60332.1.2 Flame	130
		H07Z-K	<HAR> • 750V • 90°C • IEC 60332.1.2 Flame	
Harmonized cordage				
ÖLFLEX® POWER QUAD II	PVC / PVC	UL/CSA SJTO, H05VV-F	<HAR> • service cord • oil resistant 300V • 90°C • FT1	131
H05VV-F cordage	PVC / PVC	H05VV-F	<HAR> • 500V • 70°C • IEC 60332.1.2 Flame	132
ÖLFLEX® POWER IX	rubber / neoprene	UL/CSA SOOW, H07RN-F	<HAR> • service cord oil & weather resistant • 600V • 90°C • FT2	133
H07RN-F cordage	rubber / neoprene	H07RN-F	<HAR> • 750V • 60°C • IEC 60332.1.2 Flame	134
H07RN-F enhanced cordage	rubber / rubber	H07RN-F	<HAR> • 750V • 90°C IEC 60332.1.2 Flame • halogen-free	135

Harmonized European cable

LAPP's harmonized and CE-conforming cables are utilized on electronic and electrical equipment intended for use in Europe.

The development and implementation of common standards for the European marketplace facilitates export trade to European countries. An international safety standards agency called CENELEC (European Committee for Electrotechnical Standardization) was formed to develop electrical standards that would be universally acceptable to all CENELEC member nations.

CENELEC members are national organizations entrusted with electrotechnical standardization, recognized both at National and European level as being able to represent all standardization interests in their country. Only one organization per country may be member of CENELEC. For more information see www.cenelec.eu

The electrical standards are classified as Harmonization Documents. LAPP's <HAR> cordage and hook-up wire conforms to the EN 50525 series European standards.

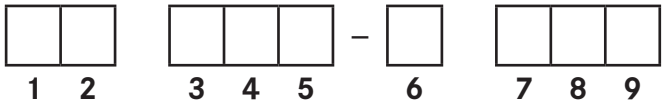
In order to identify a harmonized wire or cable, one of the following identification methods are required: (1) Printed letters <HAR> on either the overall jacket or the insulation, or (2) printed tape or identification threads.

Recommended applications as defined in the Harmonization Documents are as follows:

- **PVC cord (H05VV-F)**
  For use in offices, domestic premises and household appliances. Permitted for cooking and heating applications, provided cable does not contact hot parts and is not subjected to radiation. NOT SUITABLE FOR OUTDOOR USE.
- **Rubber cord (H05RR-F / H07RN-F)**
  For use when cable is subjected to mechanical stress in dry or damp areas. May be used as power supply cable for portable motors, appliances, domestic electric and electrical tools, and agricultural and utility water equipment. May be installed on plaster or directly on structural parts of heavy machinery.

The CE symbol (CE) identifies a product that conforms to a European Directive developed by the European Union. This compliance is necessary for exporting certain cable types to countries within the European community.

Harmonized wire coding system



1 Basic type
- H harmonized type
- A national type

2 Working voltage
- 03 300V
- 05 300/500V
- 07 450/750V

3 Insulation
- V PVC
- R rubber
- S silicone rubber
- Z halogen-free

4 Sheath-cladding
- V PVC
- R rubber
- N chloroprene rubber
- J glass-filament braiding
- T textile braiding

5 Special features
- H ribbon cable, separable
- H2 ribbon cable, non-separable

6 Conductor types
- U single wire
- R multi wire
- K fine wire for stationary use
- F fine wire for flexible use
- H super fine wire
- Y tinsel strand

7 Number of conductors

8 Protective conductor
- X without protective conductor
- G with protective conductor

9 Conductor cross-section
area specified in mm^2

Multi-standard <HAR> hook-up wire

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

This internationally approved hook-up wire was designed to meet North American and European market requirements. It passes <HAR> H05V-K, <HAR> H07V-K, UL AWM, UL MTW (16 AWG & larger), CSA TEW & CE.

Recommended applications

Panel and machine wiring for domestic and export usage; internal wiring of devices, electrical, and medical equipment

Approvals

Construction

Conductors: finely stranded tinned copper

Insulation: PVC

Application advantage

- Only one inventory vs. two for domestic and export consumption
- 13 standard color options
- UL MTW (16 AWG & larger)
- Available in large cardboard barrels for easy pull (16 AWG & larger)
- Embossed cable marking available upon request

Cable attributes page 648

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

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

Test voltage:
- H05V-K: 2000V
- H07V-K: 2500V

Conductor stranding: Class 5 fine wire

Color code:

* No <HAR> for yellow or green wires ≥ 16 AWG

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

Part number	Standard	Maximum outer diameter in	Maximum outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
H05V-K					
22 AWG (0.5 mm²)					
41804..	H05V-K	0.098	2.5	3	6
20 AWG (0.75 mm²)					
41805..	H05V-K	0.102	2.6	5	8
18 AWG (1 mm²)					
41806..	H05V-K	0.110	2.8	6	10
H07V-K					
16 AWG (1.5 mm²)					
41604..	H07V-K	0.134	3.4	10	15
14 AWG (2.5 mm²)					
41605..	H07V-K	0.157	4.0	16	25
12 AWG (4 mm²)					
41606..	H07V-K	0.181	4.6	26	30
10 AWG (6 mm²)					
41607..	H07V-K	0.201	5.1	39	48

Part number	Standard	Maximum outer diameter in	Maximum outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
8 AWG (10 mm²)					
41608..	H07V-K	0.268	6.8	65	81
6 AWG (16 mm²)					
41609..*	H07V-K	0.354	9.0	103	126
4 AWG (25 mm²)					
41610..	H07V-K	0.402	10.2	161	195
2 AWG (35 mm²)					
41611..	H07V-K	0.461	11.7	226	268
1 AWG (50 mm²)					
41612..	H07V-K	0.547	13.9	323	376
2/0 AWG (70 mm²)					
41613..	H07V-K	0.630	16.0	452	521
3/0 AWG (95 mm²)					
41614..	H07V-K	0.717	18.2	613	693
4/0 AWG (120 mm²)					
41615..	H07V-K	0.780	19.8	774	864

* No <HAR> approval available for 6 AWG (X07V-K)
For LAPP part number, add the double digit color code (see above) to the part number prefix in the table; e.g.: 16 AWG H07V-K green/yellow = 4160400

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

<HAR> hook-up wire

Type H05V-K & H07V-K

This hook-up wire is <HAR> approved and conforms to European standards. It can be used to wire electronic and electrical equipment for export to Europe.

Recommended applications

Panel & machine wiring for export usage; electronic & medical equipment; wire bundling; MRO replacement or European equipment and machinery

Approvals

◁HAR▷ CE RoHS

Construction

Conductors: finely stranded bare copper

Insulation: PVC

Application advantage

- 14 standard color options
- <HAR> approval
- Large AWG range: 22 AWG to 480 KCMIL
- Flexible stranding vs. solid core and 7-strand
- Embossed cable marking available upon request

Cable attributes page 648

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

Technical data

Temperature range:
- for stationary use: -30°C to +80°C

Nominal voltage:
- H05V-K: 300/500V
- H07V-K: 450/750V

Test voltage:
- H05V-K: 2000V
- H07V-K: 2500V

Conductor stranding: Class 5 fine wire

Color code:

* No <HAR> for transparent, yellow, or green wires ≥ 16 AWG

00:	green/yellow	07:	violet
01:	black	08:	pink
02:	blue	09:	orange
03:	brown	10:	transparent*
04:	red	11:	yellow*
05:	white	12:	green*
06:	gray	14:	dark blue

Approvals: <HAR> H05V-K & H07V-K
CE & RoHS

Part number	Standard	Outer diameter in	Outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
H05V-K					
22 AWG (0.5 mm²)					
4510..1	H05V-K	0.083 - 0.099	2.1 - 2.5	3	6
20 AWG (0.75 mm²)					
4510..2	H05V-K	0.087 - 0.106	2.2 - 2.7	5	8
18 AWG (1 mm²)					
4510..3	H05V-K	0.095 - 0.110	2.4 - 2.8	6	10
H07V-K					
16 AWG (1.5 mm²)					
4520..1	H07V-K	0.110 - 0.134	2.8 - 3.4	10	15
14 AWG (2.5 mm²)					
4520..2	H07V-K	0.134 - 0.161	3.4 - 4.1	16	25
12 AWG (4 mm²)					
4520..3	H07V-K	0.154 - 0.189	3.9 - 4.8	26	30
10 AWG (6 mm²)					
4520..4	H07V-K	0.173 - 0.209	4.4 - 5.3	39	48
8 AWG (10 mm²)					
4520..5	H07V-K	0.224 - 0.268	5.7 - 6.8	65	81
6 AWG (16 mm²)					
4520..6	H07V-K	0.264 - 0.319	6.7 - 8.1	103	126

Part number	Standard	Outer diameter in	Outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
4 AWG (25 mm²)					
4521..1	H07V-K	0.331 - 0.402	8.4 - 10.2	161	195
2 AWG (35 mm²)					
4521..2	H07V-K	0.382 - 0.461	9.7 - 11.7	226	268
1 AWG (50 mm²)					
4521..3	H07V-K	0.453 - 0.547	11.5 - 13.9	323	376
2/0 AWG (70 mm²)					
4521..4	H07V-K	0.520 - 0.630	13.2 - 16.0	452	521
3/0 AWG (95 mm²)					
4521..5	H07V-K	0.594 - 0.717	15.1 - 18.2	613	693
4/0 AWG (120 mm²)					
4521..6	H07V-K	0.657 - 0.795	16.7 - 20.2	774	864
300 KCMIL (150 mm²)					
4521..7	H07V-K	0.732 - 0.886	18.6 - 22.5	968	1050
370 KCMIL (185 mm²)					
4521..8	H07V-K	0.811 - 0.980	20.6 - 24.9	1193	1287
480 KCMIL (240 mm²)					
4521..9	H07V-K	0.925 - 1.118	23.5 - 28.4	1548	1714

For LAPP part number, add the double digit color code (see above) to the part number prefix in the table; e.g.: 16 AWG H07V-K green/yellow = 4520001

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

Halogen-free <HAR> hook-up wire

Type H05Z-K & H07Z-K

Construction

Conductors: finely stranded bare copper

Insulation: cross-linked, halogen-free

Application advantage

- Low smoke, zero halogen (LSZH)
- Flame retardant
- 13 standard color options
- Embossed cable marking available upon request

Recommended applications

Wiring devices, switch gear cabinets, and distribution boxes; in tubes on, in, or under plaster; closed installation ducts; dry rooms; areas where human safety and damage to electronic components are a concern

Approvals

◁HAR▷ CE RoHS

Cable attributes page 648

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

Technical data

Temperature range: -15°C to +90°C

Nominal voltage:
- H05Z-K: 300/500V
- H07Z-K: 450/750V

Test voltage:
- H05Z-K: 2000V
- H07Z-K: 2500V

Conductor stranding: Class 5 fine wire

Color code:

* No <HAR> for yellow or green wires ≥ 16 AWG

00:	green/yellow	07:	violet
01:	black	08:	pink
02:	blue	09:	orange
03:	brown	11:	yellow*
04:	red	12:	green*
05:	white	14:	dark blue
06:	gray		

Approvals:

Attributes: low smoke/low smoke density acc. to IEC 61034
flame retardant acc. to IEC 60332.1.2

Additional: <HAR> H05Z-K & H07Z-K
CE & RoHS

Part number	Standard	Outer diameter in	Outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
H05Z-K					
22 AWG (0.5 mm²)					
4725..1	H05Z-K	0.083 - 0.102	2.1 - 2.6	3	6
20 AWG (0.75 mm²)					
4725..2	H05Z-K	0.087 - 0.110	2.2 - 2.8	5	7
18 AWG (1 mm²)					
4725..3	H05Z-K	0.094 - 0.114	2.4 - 2.9	6	9
H07Z-K					
16 AWG (1.5 mm²)					
4726..1	H07Z-K	0.110 - 0.138	2.8 - 3.5	10	13
14 AWG (2.5 mm²)					
4726..2	H07Z-K	0.134 - 0.169	3.4 - 4.3	16	22
12 AWG (4 mm²)					
4726..3	H07Z-K	0.154 - 0.193	3.9 - 4.9	26	30
10 AWG (6 mm²)					
4726..4	H07Z-K	0.173 - 0.217	4.4 - 5.5	39	44

Part number	Standard	Outer diameter in	Outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
8 AWG (10 mm²)					
4726..5	H07Z-K	0.224 - 0.280	5.7 - 7.1	65	74
6 AWG (16 mm²)					
4726..6	H07Z-K	0.264 - 0.331	6.7 - 8.4	103	114
4 AWG (25 mm²)					
4726..7	H07Z-K	0.331 - 0.417	8.4 - 10.6	161	195
2 AWG (35 mm²)					
4726..8	H07Z-K	0.382 - 0.476	9.7 - 12.1	226	255
1 AWG (50 mm²)					
4726..9	H07Z-K	0.453 - 0.567	11.5 - 14.4	323	356
2/0 AWG (70 mm²)					
4727..1	H07Z-K	0.520 - 0.654	13.2 - 16.6	452	504
3/0 AWG (95 mm²)					
4727..2	H07Z-K	0.594 - 0.740	15.1 - 18.8	613	672

For LAPP part number, add the double digit color code (see above) to the part number in the table, e.g.: 16 AWG H07Z-K green/yellow = 4726001

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® POWER QUAD II

Oil-resistant PVC cordage with <HAR> & SJTO approvals for global use

ÖLFLEX® POWER QUAD II is a PVC cordage with UL/CSA SJTO and <HAR> H05VV-F approval. It has a very oil-resistant jacket and an international color code. ÖLFLEX® POWER QUAD II can be used in European, American, Asian, and Canadian cordage applications; one cable does the work of four.

Construction

Conductors: finely stranded bare copper

Insulation: specially formulated PVC

Jacket: PVC; black

Recommended applications

Power cordage for domestic machinery; portable tools; data processing; control systems; commercial appliances

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-resistant PVC jacket meets UL Oil Res I/II
- UV-resistant jacket

Approvals

c UL us · VDE · <HAR> · CE · RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	FL-02	MECH.	MP-02

Complete the installation

SKINTOP® strain relief
page 492

EPIC® pin & sleeve
page 465

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

Test voltage: 2000V

Conductor stranding: Class 5 fine wire

Color code: VDE 0293-308: chart 6, page 681

Approvals:
UL: SJTO per UL 62
AWM 21098
Attributes: UL Oil Res I/II
sunlight resistant
-25°C cold bend
Canada: cUL SJTO
cRU AWM I/II A/B FT1
Additional: <HAR> H05VV-F
CE & RoHS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (17 AWG/1.00 mm²)**						
311802	2	0.265	6.7	13	44	S2109
311803	3	0.283	7.2	19	53	S2111
311804	4	0.304	7.7	25	66	S2111
311805	5	0.348	8.8	32	93	S2111
16 AWG (15 AWG/1.50 mm²)**						
311602	2	0.305	7.7	19	62	S2111
311603	3	0.332	8.4	28	73	S2111
311604	4	0.364	9.2	37	84	S2111
311605	5	0.405	10.3	46	99	S2113

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
14 AWG (13 AWG/2.50 mm²)**						
311403	3	0.407	10.3	45	101	S2113
311404	4	0.447	11.4	60	130	S2113
311405	5	0.496	12.6	75	150	S2116

* 2c cable does not include ground
** AWG in parentheses will be written on cable legend per the latest UL 62 requirements

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

H05VV-F cordage

Flexible European cordage with PVC jacket & <HAR> approval

H05VV-F is a PVC cordage that meets <HAR> H05VV-F approval. It is designed for power supply use on European equipment.

Construction

Conductors: finely stranded bare copper

Insulation: PVC

Jacket: PVC; black

Recommended applications

Power cordage for European machinery; portable tools; data processing; control systems; commercial appliances; MRO repair for European machinery

Application advantage

- Meets <HAR> directives for power cordage
- MRO replacement cable for European machinery
- UV-resistant jacket

Approvals

<HAR> CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-01
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
page 492

EPIC® pin & sleeve
page 465

Technical data

Minimum bend radius:	5 x cable diameter	**Conductor stranding:**	Class 5 fine wire
Temperature range:	-30°C to +70°C	**Color code:**	VDE 0293-308: chart 6, page 681
Nominal voltage:	300/500V	**Approvals:**	<HAR> H05VV-F CE & RoHS
Test voltage:	3000V		

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
19 AWG (0.75 mm²)						
1601103	2	0.252	6.4	10	35	S1109
1601102	3	0.268	6.8	15	42	S1109
16011263	4	0.291	7.4	20	50	S1111
18 AWG (1 mm²)						
1601109	3	0.283	7.2	20	50	S1111
16011193	4	0.307	7.8	26	62	S1111
16011293	5	0.346	8.8	33	76	S1111

* 2c cable does not include ground

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
16 AWG (1.5 mm²)						
1601114	2	0.303	7.7	19	57	S1111
1601111	3	0.335	8.5	29	71	S1111
16011163	4	0.374	9.5	39	90	S1111
16011233	5	0.417	10.6	49	112	S1113
14 AWG (2.5 mm²)						
1601121	2	0.366	9.3	33	85	S1111
1601125	3	0.394	10.0	49	106	S1113
16011353	4	0.433	11.0	65	132	S1113
16011123	5	0.484	12.3	81	163	S1116

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

ÖLFLEX® POWER IX

Heavy duty neoprene cordage with <HAR> and SOOW approvals for global 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. This allows it to be used in European, American, Asian, and Canadian 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

UL · c UL · <HAR> · CE · RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-01
MOTION	FL-02	MECH.	MP-02

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

Complete the installation

SKINTOP® strain relief
page 492

EPIC® pin & sleeve
page 465

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

Test voltage: 2000V

Conductor stranding: Class 5 fine wire

Color code: VDE 0293-308: chart 6, page 681

Approvals:
- UL: SOOW per UL 62
- Attributes: -40°C cold bend, sunlight resistant
- NEC: Class 1, Division 1&2 per NEC Article 501
- Canada: c(UL) SOOW
- Additional: <HAR> H07RN-F, IEC 60245, CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (17 AWG/1.00 mm²)*						
321803	3	0.380	9.7	19	84	S2113
321804	4	0.410	10.4	26	96	S2113
14 AWG (13 AWG/2.50 mm²)*						
321404	4	0.590	15.0	65	216	S2121
12 AWG (11 AWG/4 mm²)*						
321204	4	0.689	17.5	103	300	S2121
321205	5	0.740	18.8	129	355	S2129

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
10 AWG (9 AWG/6 mm²)*						
321003	3	0.693	17.6	123	304	S2121
321004	4	0.752	19.1	164	366	S2129
321005	5	0.815	20.7	205	442	S2129
8 AWG (7 AWG/10 mm²)*						
320803	3	0.914	23.2	197	537	S2129
320804	4	1.031	26.2	263	652	S2136

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

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

H07RN-F cordage

Heavy duty flexible neoprene European cordage with <HAR> approval

H07RN-F is a neoprene cordage that meets <HAR> H07RN-F approval. It has an international color code and a jacket which is resistant to oil, chemicals, and abrasion.

Construction

Conductors: finely stranded bare copper

Insulation: rubber

Jacket: neoprene; black

Recommended applications

Power cordage for European machinery; portable tools; data processing; control systems; commercial appliances; MRO replacement for European machinery

Application advantage

- Oil-, chemical-, and abrasion-resistant jacket
- Ideal for high-stress applications in dry and damp environments
- MRO replacement for European machinery
- UV-resistant jacket for outdoor use

Approvals

<HAR> CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-01
MOTION	FL-01	MECH.	MP-02

Complete the installation

SKINTOP® strain relief
page 492

EPIC® pin & sleeve
page 465

Technical data

Minimum bend radius:	8 x cable diameter	**Conductor stranding:**	Class 5 fine wire
Temperature range:	-25°C to +60°C	**Color code:**	VDE 0293-308: chart 6, page 681
Nominal voltage:	450/750V	**Approvals:**	<HAR> H07RN-F CE & RoHS
Test voltage:	2500V		

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
18 AWG (1 mm²)					
1600117	3	0.327 - 0.421	8.3 - 10.7	20	87
16 AWG (1.5 mm²)					
1600103	3	0.362 - 0.469	9.2 - 11.9	29	111
16001233	4	0.402 - 0.516	10.2 - 13.1	39	134
16001043	5	0.441 - 0.567	11.2 - 14.4	49	161
14 AWG (2.5 mm²)					
1600118	3	0.429 - 0.551	10.9 - 14.0	49	158
16001053	4	0.476 - 0.610	12.1 - 15.5	65	195
16001293	5	0.524 - 0.669	13.3 - 17.0	81	198
12 AWG (4 mm²)					
1600119	3	0.500 - 0.638	12.7 - 16.2	77	215
16001063	4	0.551 - 0.705	14.0 - 17.9	104	265
16001303	5	0.614 - 0.783	15.6 - 19.9	130	326
10 AWG (6 mm²)					
1600120	3	0.555 - 0.709	14.1 - 18.0	117	242
16001073	4	0.618 - 0.787	15.7 - 20.0	155	319
16001313	5	0.689 - 0.874	17.5 - 22.2	194	511

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
8 AWG (10 mm²)					
1600121	3	0.752 - 0.953	19.1 - 24.2	194	591
16001083	4	0.917 - 1.043	23.3 - 26.5	259	712
16001093	5	0.902 - 1.146	22.9 - 29.1	323	874
6 AWG (16 mm²)					
16001103	4	0.937 - 1.185	23.8 - 30.1	413	904
16001113	5	1.039 - 1.311	26.4 - 33.3	517	1129
4 AWG (25 mm²)					
16001123	4	1.138 - 1.441	28.9 - 36.6	646	1341
16001133	5	1.260 - 1.591	32.0 - 40.4	807	1660
2 AWG (35 mm²)					
16001143	4	1.280 - 1.618	32.5 - 41.1	904	1777
1 AWG (50 mm²)					
16001153	4	1.484 - 1.870	37.7 - 47.5	1291	2443
2/0 AWG (70 mm²)					
16001163	4	1.681 - 2.126	42.7 - 54.0	1807	3246
3/0 AWG (95 mm²)					
16001283	4	1.906 - 2.402	48.4 - 61.0	2452	4247

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H07RN-F enhanced cordage

Heavy duty halogen-free rubber European cordage with <HAR> approval

H07RN-F enhanced cordage is a low smoke, halogen free cordage that meets <HAR> H07RN-F approval. It is highly flexible with a better temperature range than H07RN-F. It has an international color code and a jacket which is resistant to oil, chemicals, and abrasion.

Construction

Conductors: finely stranded bare copper

Insulation: specially formulated rubber

Jacket: specially formulated rubber; black

Recommended applications

Power cordage for European machinery; portable tools; data processing; control systems; commercial appliances; MRO replacement for European machinery

Application advantage

- Oil-, chemical-, and abrasion-resistant jacket
- MRO replacement for European machinery
- AD8 submersible
- Low smoke, zero halogen (LSZH)
- Meets torsion requirements for wind turbine applications

Approvals

◁HAR▷ CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	WT-02	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
page 492

EPIC® pin & sleeve
page 465

Technical data

Minimum bend radius:	4 x cable diameter
Temperature range:	
- for stationary use:	-50°C to +90°C
- for flexible use:	-40°C to +90°C
Nominal voltage:	450/750V
Test voltage:	2500V
Conductor stranding:	Class 5 fine wire
Color code:	
- up to 5c:	VDE 0293-308: chart 6, page 681
- more than 5c:	black with white numbers, plus green/yellow ground
Approvals:	<HAR> H07RN-F CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

H07RN-F enhanced cordage

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
18 AWG (1 mm²)					
4533027	3	0.327 - 0.422	8.3 - 10.7	19	94
4533061	4	0.362 - 0.469	9.2 - 11.9	26	108
4533091	5	0.402 - 0.516	10.2 - 13.1	32	134
16 AWG (1.5 mm²)					
4533029	3	0.362 - 0.469	9.2 - 11.9	29	116
4533063	4	0.402 - 0.516	10.2 - 13.1	39	134
4533093	5	0.441 - 0.567	11.2 - 14.4	48	168
4533111	7	0.579 - 0.736	14.7 - 18.7	68	289
4533113	12	0.693 - 0.882	17.6 - 22.4	116	417
14 AWG (2.5 mm²)					
4533031	3	0.429 - 0.552	10.9 - 14.0	48	151
4533065	4	0.476 - 0.611	12.1 - 15.5	65	192
4533095	5	0.524 - 0.670	13.3 - 17.0	81	232
4533115	12	0.811 - 1.031	20.6 - 26.2	194	571
12 AWG (4 mm²)					
4533033	3	0.500 - 0.638	12.7 - 16.2	77	218
4533067	4	0.551 - 0.705	14.0 - 17.9	103	265
4533097	5	0.614 - 0.784	15.6 - 19.9	129	326
10 AWG (6 mm²)					
4533035	3	0.555 - 0.709	14.1 - 18.0	116	279
4533069	4	0.618 - 0.788	15.7 - 20.0	155	360
4533099	5	0.689 - 0.875	17.5 - 22.2	194	435
8 AWG (10 mm²)					
4533004	1	0.374 - 0.469	9.5 - 11.9	65	129
4533037	3	0.752 - 0.953	19.1 - 24.2	194	478
4533071	4	0.823 - 1.044	20.9 - 26.5	258	618
6 AWG (16 mm²)					
4533005	1	0.425 - 0.528	10.8 - 13.4	103	176
4533039	3	0.858 - 1.087	21.8 - 27.6	310	665
4533073	4	0.937 - 1.186	23.8 - 30.1	413	867
4 AWG (25 mm²)					
4533006	1	0.500 - 0.623	12.7 - 15.8	161	252
4533041	3	1.028 - 1.300	26.1 - 33.0	484	937
4533075	4	1.138 - 1.442	28.9 - 36.6	645	1297
4533101	5	1.260 - 1.591	32.0 - 40.4	806	1680

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
2 AWG (35 mm²)					
4533007	1	0.563 - 0.705	14.3 - 17.9	226	331
4533043	3	1.154 - 1.462	29.3 - 37.1	677	1220
4533077	4	1.280 - 1.619	32.5 - 41.1	903	1660
4533103	5	1.406 - 1.776	35.7 - 45.1	1129	2184
1 AWG (50 mm²)					
4533008	1	0.650 - 0.812	16.5 - 20.6	323	454
4533045	3	1.343 - 1.690	34.1 - 42.9	968	1660
4533079	4	1.484 - 1.872	37.7 - 47.5	1290	2231
4533105	5	1.646 - 2.087	41.8 - 53.0	1613	2962
2/0 AWG (70 mm²)					
4533009	1	0.732 - 0.918	18.6 - 23.3	452	614
4533081	4	1.681 - 2.126	42.7 - 54.0	1806	2970
4533107	5	1.870 - 1.895	47.5 - 60.0	2258	3940
3/0 AWG (95 mm²)					
4533010	1	0.819 - 1.024	20.8 - 26.0	613	806
4533083	4	1.906 - 2.403	48.4 - 61.0	2451	3864
4533109	5	2.126 - 2.638	54.0 - 67.0	3064	5065
4/0 AWG (120 mm²)					
4533011	1	0.898 - 1.126	22.8 - 28.6	774	995
4533085	4	2.087 - 2.600	53.0 - 66.0	3097	4697
250 KCMIL (150 mm²)					
4533012	1	0.992 - 1.237	25.2 - 31.4	968	1232
4533087	4	2.283 - 2.876	58.0 - 73.0	3871	5813
350 KCMIL (185 mm²)					
4533013	1	1.087 - 1.355	27.6 - 34.4	1193	1472
4533089	4	2.520 - 3.152	64.0 - 80.0	4774	6576
450 KCMIL (240 mm²)					
4533014	1	1.205 - 1.509	30.6 - 38.3	1548	1868
600 KCMIL (300 mm²)					
4533015	1	1.319 - 1.650	33.5 - 41.9	1935	2224
750 KCMIL (400 mm²)					
4533016	1	1.472 - 1.843	37.4 - 46.8	2580	2903
1000 KCMIL (500 mm²)					
4533017	1	1.626 - 2.047	41.3 - 52.0	3226	3590

If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX®
Lift & crane cable

138 **Quick select chart**

139 **Crane cable installation instructions**

140 **Lift cable installation instructions**

Lift & crane cable

141 **ÖLFLEX® CRANE NSHTÖU**
Reelable cable for low to medium mechanical stress

142 **ÖLFLEX® CRANE**
Highly flexible weather-proof rubber cable with supporting element

143 **ÖLFLEX® CRANE PUR**
Reelable PUR cable for low, medium & high mechanical stress

144 **ÖLFLEX® CRANE 2S**
PVC cable with external steel supporting elements

145 **ÖLFLEX® FLAT**
Flat festoon cable with PVC jacket; UL/CSA approval

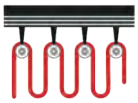
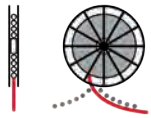
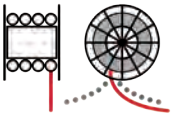
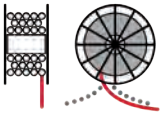
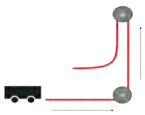
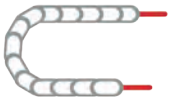
146 **ÖLFLEX® CRANE F**
Flat festoon weather-proof rubber cable

147 **ÖLFLEX® LIFT F**
Flat festoon cable with PVC jacket

Quick select chart

✔ Main application

✔ Possible application

Application	Diagram	page 141 ÖLFLEX® CRANE NSHTÖU	142 ÖLFLEX® CRANE	143 ÖLFLEX® CRANE PUR	144 ÖLFLEX® CRANE 2S	145 ÖLFLEX® FLAT	146 ÖLFLEX® CRANE F	147 ÖLFLEX® LIFT F
Cable trailer systems			✔			✔	✔	✔
Reeling, light stress (monospiral configuration: stacked)		✔		✔				
Reeling, moderate stress (multispiral configuration: single layer)		✔		✔				
Reeling, heavy stress (multispiral configuration: multilayer)				✔				
Vertical reeling				✔				
Reel storage (horizontal)				✔				
Reel storage (vertical)				✔				
Re-routing under tensile load				✔				
Push-button control unit				✔	✔			
Drag chain		✔	✔	✔		✔	✔	✔
Lift						✔	✔	✔

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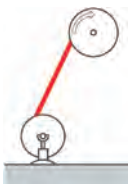
Crane cable installation instructions

1. Whenever possible, the delivery reel should be transported to the installation site. Avoid rolling the reel. If the reel cannot be mounted directly onto the equipment, the cable should be unreeled with the aid of idle pulleys and a drag rope.

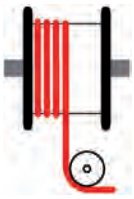
2. During unreeling, the cable must be taken only from revolving reels and only from the top while ensuring that tension is maintained and the cable is neither deflected nor dragged over sharp edges.

3. Before installation, the cable must be laid out and stretched. If this is not possible, it is essential to keep the distance between the delivery reel and the equipment reels as long as possible. Avoid S-bends or other deflections when the cable is laid in position.

INCORRECT:
reels too close



INCORRECT:
cable is deflected



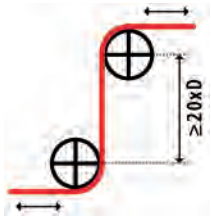
4. The cable must be spooled onto the equipment reel without twisting. It is equally important to avoid twisting when making connections.

5. It is essential to use properly sized clamps (length 4 x cable diameter) for fastening the cable ends in order to prevent crushing. The length of cable left unreeled before the fastening point must be at least 40 x diameter, but it is advisable to use a compensating pulley here also.

6. At least two coils must remain on the equipment reel when the cable has run out.

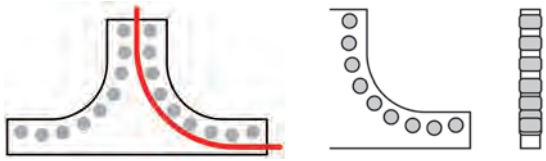
7. For cables with an outer diameter up to 21.5 mm, the inner bending diameter should not be less than 10 x the cable diameter. For cable diameters larger than 21.5 mm, the bending diameter should not be less than 12.5 x the cable diameter.

8. S-bends in the cable must be avoided. However, if this is not possible, the center spacing must be as shown below:



9. The maximum permissible reeling speed is 2 m/s with a maximum acceleration of 0.4 m/s².

10. The stationary continuous tensile stress should not exceed 15 N/mm² of the total copper cross section and the dynamic peak tensile stress may not exceed 25 N/mm². For cables with large outer diameters, use guide pulleys to minimize friction when changing direction, as shown below:



11. The actual current rating in continuous operation is limited by:
    - The conductor cross section (see Table 1)
    - The ambient temperature (see Table 2)
    - The number of layers spooled on the reel (see Table 3)

The maximum permissible current on the installed cable is obtained from the following formula: $I = I_{max} \times f_1 \times f_2$

Table 1

Conductor cross-section (mm²)	I_{max}
1.5	18A
2.5	26A
4	34A
6	44A
10	61A
16	82A
25	108A
35	135A

Table 2

Ambient temperature (°C)	f_1
≤ 30	1.00
31 - 35	0.91
36 - 40	0.82
41 - 45	0.71
46 - 50	0.58
51 - 55	0.41

Table 3

Number of layers	f_2
1	0.80
2	0.68
3	0.58
4	0.60
5	0.48
6	0.46

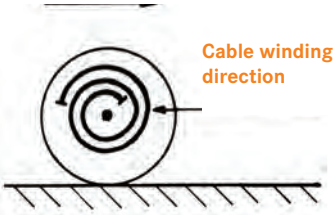
Lift cable installation instructions

A: General information

1. The cables must be free of twists when being installed, and this should be done at temperatures of at least +5 °C. See VDE 0298-4: Table 1, on previous page.
2. The inner bending radius of the cable must not be less than 20 x cable outer diameter.
3. The maximum suspension length depends on the supporting element in the cable in each case (see product catalog page), and may only be exceeded by max. 10 % of the specified value.
4. The delivery drum must be transported to (or as close as possible to) the installation location. If possible, avoid rolling the drum. If the drum must be rolled, only move the drum in the specified direction (see fig. 1).

fig. 1

Direction for rolling drum



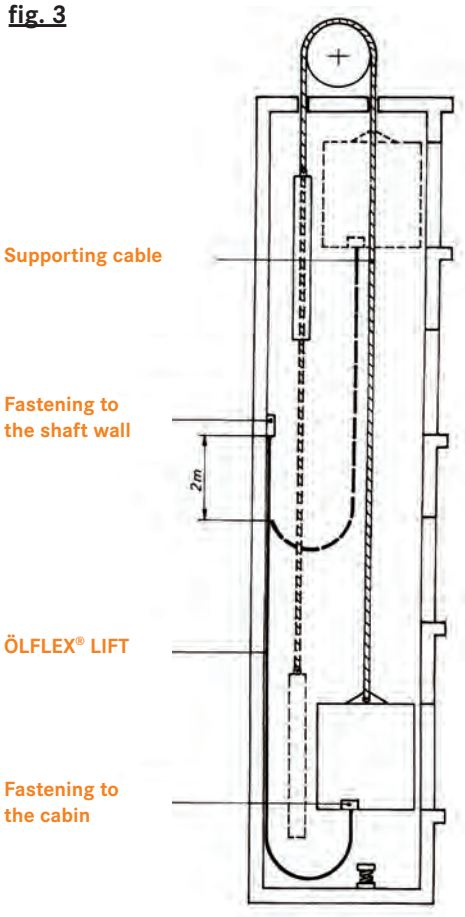
B: Suspending the cables

1. When pulling the cables into the shaft, unreel them tangentially from the drum. Unreeling the cable axially from the drum will result in the cable twisting and will affect the core stranding, which may in turn cause malfunctions (see fig. 2).
2. To ensure the cable is fitted without twists, allow the cable to briefly hang freely in the shaft. The best way to do this is to pull the control cable into the lift shaft from the bottom of the shaft.
3. The gap between the lift cabin and bottom of the shaft must be sufficiently large, and must be used in full for the cable loop height (see fig. 3).

fig. 2

5. It is essential that sufficiently large clamps are used to secure the cables (e.g., LAPP cable wedge clamps type EKK or DKK). For suspension lengths greater than 50 m, the supporting element must also be damped separately.
6. The fastening point on the shaft wall must be at least 2 m above the center of the travel distance (see fig. 3).
7. If the cable does not run smoothly, i.e. if the cable leaves the max. gradient line during operation, rotate the control cable slightly at one of the fastening points until the cable runs smoothly again.
8. If several control cables need to be installed for the lift unit, we recommend suspending the individual cables such that the height of the various loops differs by approx. 15 cm (stepped suspension).

fig. 3



ÖLFLEX® CRANE NSHTÖU

Reelable cable for low to medium mechanical stress

ÖLFLEX® CRANE NSHTÖU pendant and reel cable is constructed with a reinforced neoprene jacket and is designed for use wherever cable operation requires frequent reeling and unreeling on pulleys, drums, or rollers under tensile load.

Construction

Conductors: stranded tinned copper

Insulation: rubber

Jacket: reinforced rubber with integrated support braid; black

Application advantage

- Rugged jacket is resistant to mechanical abuse and chemicals
- Weather-resistant black polychloroprene jacket
- Designed for crucial bending radius
- Reinforced jacket for added strength

Recommended applications

Hoists; transport and conveyor systems; dry or damp interiors, outdoors, or in industrial water; reeling/unreeling during operation without fixing

Approvals

CE · VDE · RoHS

Cable attributes				page 648
OIL	OR-01	FLAME	FR-01	
MOTION	FL-02	MECH.	MP-02	

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:	see installation instructions, page 139	**Conductor stranding:**	Class 5 fine wire
Temperature range:	-25°C to +80°C	**Color code:** - up to 5c: - 6c & higher:	VDE 0293-308: chart 6, page 681 black with white numbers, plus green/yellow ground
Nominal voltage:	600/1000V		
Test voltage:	4000V	**Approvals:**	<VDE> NSHTÖU cable type certification acc. to VDE 0250-814 CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
16 AWG (1.5 mm²)						
0043006	3	0.551	14.0	30	128	52015740
00430053	4	0.583	14.8	39	148	52015750
00430073	5	0.618	15.7	54	175	52015750
0043008	7	0.717	18.2	77	255	52015760
0043009	12	0.941	23.9	132	484	52015760
0043010	18	0.941	23.9	182	517	52015760
0043011	24	1.067	27.1	263	672	52015765
0043012	30	1.189	30.2	290	887	52015765
14 AWG (2.5 mm²)						
0043013	3	0.610	15.5	50	168	52015750
00430303	4	0.665	16.9	67	222	52015750
00430143	5	0.709	18.0	83	262	52015760
0043015	7	0.811	20.6	121	343	52015760
0043016	12	1.079	27.4	207	652	52015765
0043017	18	1.079	27.4	303	739	52015765
0043018	24	1.244	31.6	414	974	52015833
0043019	30	1.429	36.3	518	1310	52015766
12 AWG (4 mm²)						
00430203	4	0.724	18.4	106	296	52015760
00430333	5	0.772	19.6	148	349	52015760

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
10 AWG (6 mm²)						
00430213	4	0.780	19.8	162	356	52015760
00430343	5	0.854	21.7	213	464	52015760
8 AWG (10 mm²)						
00430223	4	0.921	23.4	271	558	52015760
00430003	5	0.992	25.2	343	672	52015765
6 AWG (16 mm²)						
00430233	4	1.004	25.5	431	786	52015765
00430323	5	1.083	27.5	516	941	52015765
4 AWG (25 mm²)						
00430243	4	1.283	32.6	675	1230	52015833
2 AWG (35 mm²)						
00430253	4	1.370	34.8	948	1532	52015833
1 AWG (50 mm²)						
00430263	4	1.598	40.6	1351	2164	52015767
2/0 AWG (70 mm²)						
00430283	4	1.764	44.8	1806	2822	53112070*
3/0 AWG (95 mm²)						
00430293	4	2.016	51.2	2451	3716	53112080*

* SKINTOP® MS with metric thread

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CRANE

Highly flexible weather-proof rubber cable with supporting element

ÖLFLEX® CRANE is a small-diameter pendant control cable. Thanks to its extremely durable and flexible jacket, this cable can be used on machinery and equipment that is permanently exposed to harsh outdoor environments. The internal supporting element provides strain relief.

Recommended applications

Machinery & equipment that is exposed to harsh weather conditions; conveying & hoisting equipment; construction machinery; shipyard machinery; in industrial or sea water; cables up to 24c can be used in cable tracks

Construction

Conductors: stranded bare copper wire

Insulation: rubber; conductors twisted in layers around central supporting element

Jacket: rubber; black

Application advantage

- Weather-resistant for harsh environmental conditions
- Very flexible, due to extra-fine wire conductor design
- Supporting element provides strain relief
- Flame retardant

Cable attributes page 648

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

Complete the installation

SKINTOP® strain relief page 492

EPIC® connectors page 284

Approvals

CE RoHS

Technical data

Minimum bend radius:
- for flexible use: 12.5 x cable diameter

Temperature range:
- for flexible use: -25°C to +80°C
- for stationary use: -40°C to +80°C

Nominal voltage: 300/500V

Test voltage: 3000V

Conductor stranding:
- 18 AWG: 0.15 mm wire diameter
- 16 AWG & larger: 0.20 mm wire diameter

Color code:
- up to 5c: VDE 0293-308: chart 6, page 681
- 6c & higher: black with white numbers, plus green/yellow ground

Approvals: based on VDE 0250 CE & RoHS

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Tension lbs	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
18 AWG (1 mm²)							
0039001	2	0.291	7.4	67	13	60	52015720
0039002	3	0.327	8.3	67	20	71	52015720
00390033	4	0.350	8.9	67	27	85	52015720
00390043	5	0.409	10.4	67	32	100	52015730
0039107	7	0.508	12.9	67	46	138	52015740
0039109	9	0.567	14.4	67	61	189	52015750
0039054	12	0.728	18.5	81	83	284	52015760
0039116	16	0.705	17.9	108	111	274	52015760
0039055	18	0.756	19.2	121	124	303	52015760
0039120	20	0.807	20.5	135	138	356	52015760
0039056	24	0.870	22.1	162	166	434	52015760
0039057	36	1.028	26.1	243	249	580	52015765
0039148	48	1.165	29.6	324	310	821	52015765
16 AWG (1.5 mm²)							
0039017	2	0.315	8.0	67	20	73	52015720
0039018	3	0.343	8.7	67	30	86	52015720
00390193	4	0.390	9.9	67	40	106	52015730
00390203	5	0.429	10.9	67	50	126	52015730
0039061	7	0.551	14.0	71	69	175	52015750
0039208	8	0.598	15.2	81	82	202	52015750
0039209	9	0.626	15.9	91	93	252	52015750
0039210	10	0.669	17.0	101	103	287	52015750
0039058	12	0.783	19.9	121	124	374	52015760
0039059	18	0.823	20.9	182	186	409	52015760
0039060	24	0.921	23.4	243	249	554	52015760

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Tension lbs	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
14 AWG (2.5 mm²)							
0039034	2	0.382	9.7	67	33	97	52015730
0039035	3	0.402	10.2	67	50	116	52015730
00390363	4	0.457	11.6	67	66	147	52015730
00390373	5	0.488	12.4	84	81	174	52015740
0039307	7	0.654	16.6	118	115	254	52015750
0039309	9	0.744	18.9	152	154	348	52015760
0039312	12	0.917	23.3	202	207	517	52015760
0039316	16	0.898	22.8	270	276	503	52015760
0039318	18	0.961	24.4	304	290	562	52015760
0039324	24	1.122	28.5	405	387	796	52015765
0039336	36	1.307	33.2	607	581	1098	52015833
12 AWG (4 mm²)							
00390463	4	0.598	15.2	108	106	206	52015750
00390473	5	0.661	16.8	135	132	265	52015750
10 AWG (6 mm²)							
00390483	4	0.661	16.8	162	159	275	52015750
00390493	5	0.756	19.2	202	198	355	52015760
8 AWG (10 mm²)							
00390503	4	0.858	21.8	270	264	469	52015760
00390513	5	0.969	24.6	337	330	573	52015765
6 AWG (16 mm²)							
00390523	4	1.000	25.4	432	423	655	52015765
00390533	5	1.102	28.0	540	529	824	52015765

* 2c cable does not include ground

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CRANE PUR

Reelable PUR cable for low, medium & high mechanical stress

ÖLFLEX® CRANE PUR is a halogen-free pendant cable with a PUR jacket. It is designed with a smaller outer diameter to save space and weight. The central supporting element absorbs tensile loads, allowing reeling, unreeling, and deflection for free-hanging cables, even over large distances. The integrated support braid prevents undesirable cable twists and corkscrews.

Construction

Conductors: stranded bare copper wire

Insulation: TPE compound

Jacket: polyurethane with integrated support element; yellow

Application advantage

- Cost-saving due to use of smaller drums, guide rollers, and drive engines
- Good oil, chemical, thermal & mechanical resistance
- Halogen-free and flame retardant

Recommended applications

Hoists; transport and conveyor systems; reeling/unreeling guided by roller trains; dry or damp interiors, outdoors, or in industrial water

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:	7.5 x cable diameter	**Conductor stranding:**	Class 6 super fine wire
Temperature range:		**Color code:**	
- for flexible use:	-40°C to +80°C	- up to 5c:	VDE 0293-308: chart 6, page 681
		- 6c & higher:	black with white numbers, plus green/yellow ground
Nominal voltage:	600/1000V		
Test voltage:	4000V	**Approvals:**	CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Tension lbs	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
16 AWG (1.5 mm²)							
0045207	4	0.429	10.9	112	39	114	52015730
0045209	5	0.457	11.6	225	48	132	52015730
0045210	7	0.508	12.9	562	68	161	52015740
0045211	12	0.693	17.6	562	116	269	52015760
0045212	18	0.689	17.5	562	174	341	52015760
0045213	24	0.815	20.7	562	232	452	52015760
0045215	30	1.280	32.5	674	290	1028	52015833
0045214	36	1.236	31.4	674	348	679	52015833
14 AWG (2.5 mm²)							
0045216	4	0.480	12.2	112	65	153	52015740
0045218	5	0.520	13.2	450	81	184	52015740
0045220	7	0.606	15.4	674	113	241	52015750
0045221	12	0.850	21.6	674	194	416	52015760
0045222	18	0.846	21.5	674	290	533	52015760
0045223	24	1.004	25.5	674	387	755	52015765
0045224	30	1.366	34.7	674	484	1103	52015833

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Tension lbs	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
12 AWG (4 mm²)							
0045225	4	0.563	14.3	225	103	229	52015750
0045227	5	0.610	15.5	450	129	276	52015750
10 AWG (6 mm²)							
0045228	4	0.654	16.6	337	155	307	52015750
0045229	5	0.697	17.7	450	194	362	52015760
8 AWG (10 mm²)							
0045230	4	0.756	19.2	450	258	453	52015760
0045237	5	0.850	21.6	562	323	554	52015760
6 AWG (16 mm²)							
0045231	4	0.874	22.2	562	413	649	52015760
0045238	5	1.008	25.6	787	516	821	52015765
4 AWG (25 mm²)							
0045232	4	1.087	27.6	787	645	1012	52015765
2 AWG (35 mm²)							
0045233	4	1.220	31.0	1012	903	1347	52015833
1 AWG (50 mm²)							
0045234	4	1.421	36.1	1349	1290	1907	52015766

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® CRANE 2S

PVC cable with external steel supporting elements

ÖLFLEX® CRANE 2S is a cold-flexible PVC-jacketed power and control cable with two opposite supporting elements for flexible use. It is designed for use in dry, damp, or wet rooms. Outdoor use is possible. This cable is widely resistant to oils and acids at room temperature.

Recommended applications

Connection of movable control panels & consoles; self-supporting shaft cable; suitable for outdoor applications; NOT suitable for lift applications

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-02

Construction

Conductors: stranded bare copper wire

Insulation: PVC; special wrapping to improve sliding movement between jacket and cores

Jacket: PVC with two external steel support elements; black

Application advantage

- Steel support elements absorb tensile forces during operation
- Tensile strength of 472 lbs (2100 N) per supporting element
- Flexible at low temperatures
- Flame retardant acc. to IEC 60332.1.2

Complete the installation

SKINTOP® strain relief
page 492

Technical data

Minimum bend radius:	20 x cable diameter
Temperature range: - for flexible use:	-15°C to +70°C
Nominal voltage:	300/500V
Test voltage:	3000V
Conductor stranding:	Class 6 super fine wire
Color code:	black with white numbers, plus green/yellow ground
Approvals:	based on VDE 0250 CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
16 AWG (1.5 mm²)						
0027503	8	0.579	14.7	77	250	52015750

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS PG thread
0027504	12	0.638	16.2	116	295	52015750
0027505	20	0.791	20.1	194	453	52015760

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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ÖLFLEX® FLAT

Flat festoon cable with PVC jacket; UL/CSA approval

ÖLFLEX® FLAT* is a UL/CSA approved PVC festoon power and control cable. The specially formulated PVC compound is UV-resistant and allows continuous festooning over a wide temperature range for both indoor and outdoor applications. *Trade product, no LAPP product.

Recommended applications

Overhead cranes; material handling systems; supply lines for moving machine parts

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Construction

Conductors: stranded bare copper wire

Insulation: PVC

Jacket: PVC; black or yellow

Shielded version: individually shielded conductors; tinned copper braid (90% coverage)

Application advantage

- Flat construction allows cables to be stacked for applications where space is limited
- Meets North American approvals

Approvals

UL, CSA, RoHS

Complete the installation

SKINDICHT® SVF
page 529

EPIC® connectors
page 284

Technical data

Temperature range:
- for flexible use: -10°C to +70°C
- for stationary use: -40°C to +105°C

Rated voltage: 600V

Color code: ICEA-NEMA (K-2): chart 10, page 683

Approvals:
UL: Listed Festoon Cable
Canada: Certified Festoon Cable
Additional: RoHS

Part number		Number of conductors	Nominal outer diameter (height × width)		Copper weight	Approx. weight	SKINDICHT® SVF
black jacket	yellow jacket		in	mm	lbs/mft	lbs/mft	PG thread
16 AWG: unshielded							
811261	811234	8	0.200 x 1.110	5.1 x 28.2	64	180	52005500
811262	811232	12	0.200 x 1.605	5.1 x 40.8	96	270	52005520
16 AWG: shielded							
811358	–	4	0.225 x 0.700	5.7 x 17.8	69	160	52005490
811357	–	8	0.270 x 1.450	6.9 x 36.8	138	220	52005510
14 AWG							
811259	811269	4	0.240 x 0.690	6.1 x 17.5	51	120	52005490
811263	811233	8	0.240 x 1.334	6.1 x 33.9	103	220	52005510
811267	811272	12	0.240 x 1.950	6.1 x 49.5	155	340	52005530
12 AWG							
811264	811235	4	0.230 x 0.711	5.8 x 18.0	83	160	52005490
811273	811236	8	0.230 x 1.340	5.8 x 34.0	166	320	52005510
10 AWG							
811266	811237	4	0.270 x 0.880	6.9 x 22.4	132	240	52005500
8 AWG							
811270	811238	4	0.365 x 1.190	9.3 x 30.2	212	420	52005510
6 AWG							
811271	811239	4	0.430 x 1.450	10.9 x 36.8	333	600	52005510
4 AWG							
811279	811280	4	0.486 x 1.656	12.3 x 42.1	560	750	–
2 AWG							
811274	811240	4	0.559 x 1.959	14.2 x 49.8	852	1270	–

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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ÖLFLEX® CRANE F

Flat festoon weather-proof rubber cable

ÖLFLEX® CRANE F is a flexible oil-resistant festoon, power, and control cable. The flat design allows space-saving installation and a smaller bending radius.

Construction

Conductors: stranded bare copper

Insulation: rubber

Jacket: rubber compound; black

Recommended applications

Overhead crane & material handling systems; shipyards; waste water treatment plants; steel mills; high rack warehouses; indoor and outdoor use

Application advantage

- Weather- and UV-resistant jacket for extreme environmental conditions
- Flame-retardant jacket
- May be used in continuous flex applications over a wide temperature range
- Flat construction allows cables to be stacked for a space-saving installation

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINDICHT® SVF
page 529

EPIC® connectors
page 284

Technical data

Minimum bend radius: 10 x cable height

Temperature range:
- for flexible use: -25°C to +90°C

Nominal voltage: 300/500V

Test voltage: 3000V

Conductor stranding:
- 16 - 4 AWG: Class 6 fine wire
- 2 AWG & larger: Class 5 fine wire

Color code:
- up to 5c: VDE 0293-308: chart 6, page 681
- 6c & higher: black with white numbers, plus green/yellow ground

Approvals: based on VDE 0250 (NGFLGÖU) CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter (height x width) in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® SVF PG thread
16 AWG (1.5 mm²)						
0041041	4	0.244 x 0.690	6.2 x 17.5	39	134	52005490
0041042	5	0.244 x 0.847	6.2 x 21.5	48	161	52005500
0041043	7	0.244 x 1.143	6.2 x 29.0	68	242	52005500
0041044	8	0.244 x 1.241	6.2 x 31.5	77	249	52005510
0041045	10	0.256 x 1.576	6.5 x 40.0	97	349	52005510
0041046	12	0.256 x 1.852	6.5 x 47.0	116	417	52005530
14 AWG (2.5 mm²)						
0041047	4	0.296 x 0.827	7.5 x 21.0	65	188	52005490
0041048	5	0.296 x 1.064	7.5 x 27.0	81	269	52005500
0041049	7	0.296 x 1.379	7.5 x 35.0	113	349	52005510
0041050	8	0.296 x 1.537	7.5 x 39.0	129	370	52005510
0041051	12	0.315 x 2.206	8.0 x 56.0	194	538	–
12 AWG (4 mm²)						
0041052	4	0.355 x 1.024	9.0 x 26.0	103	276	52005500
0041053	7	0.355 x 1.655	9.0 x 42.0	181	470	52005520
10 AWG (6 mm²)						
0041054	4	0.374 x 1.143	9.5 x 29.0	155	403	52005500
0041055	5	0.374 x 1.379	9.5 x 35.0	194	437	52005510
0041056	7	0.374 x 1.655	9.5 x 42.0	271	571	52005520

Part number	Number of conductors incl. ground	Nominal outer diameter (height x width) in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® SVF PG thread
8 AWG (10 mm²)						
0041057	4	0.433 x 1.300	11.0 x 33.0	258	538	52005510
0041058	5	0.433 x 1.734	11.0 x 44.0	323	672	52005520
6 AWG (16 mm²)						
0041059	4	0.512 x 1.497	13.0 x 38.0	413	773	–
4 AWG (25 mm²)						
0041060	4	0.591 x 1.950	15.0 x 49.5	645	1142	–
2 AWG (35 mm²)						
0041061	4	0.670 x 2.167	17.0 x 55.0	903	1478	–
1/0 AWG (50 mm²)						
0041062	4	0.749 x 2.482	19.0 x 63.0	1290	2016	–
2/0 AWG (70 mm²)						
0041063	4	0.867 x 2.797	22.0 x 71.0	1806	2688	–

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ÖLFLEX® LIFT F

Flat festoon cable with PVC jacket

ÖLFLEX® LIFT F is a flat control cable with special cold-resistant PVC insulation and black PVC jacket. According to VDE definition, this cable can also be used as an elevator control cable.

Recommended applications

Conveyor systems; hoists; cable trolleys; supply lines for moving machine parts; cable tracks; lift applications

Construction

Conductors: finely stranded bare copper

Insulation: PVC

Jacket: PVC; black

Application advantage

- Flame-retardant jacket
- Improved flexibility due to finely stranded conductors
- Meets requirements of the harmonized PVC flat cable H05VVH6-F & H07VVH6-F

Cable attributes				page 648
OIL	OR-01	FLAME	FR-02	
MOTION	FL-02	MECH.	MP-01	

Complete the installation

SKINDICHT® SVF
page 529

EPIC® connectors
page 284

Approvals

CE RoHS

Technical data

Minimum bend radius: 10 x cable height

Temperature range:
- for flexible use:
  - 18 AWG: 0°C to +70°C
  - 16 AWG & larger: -15°C to +70°C

Nominal voltage:
- 18 AWG: 300/500V
- 16 AWG & larger: 450/750V

Conductor stranding: Class 5 fine wire

Color code:
- up to 5c: VDE 0293-308: chart 6, page 681
- 6c & higher: black with white numbers, plus green/yellow ground

Approvals: based on EN 50214/VDE 0283-2 (H05VVH6-F or H07VVH6-F)
CE & RoHS

Part number	Number of conductors incl. ground	Single wire diameter in	Single wire diameter mm	Nominal outer diameter (height x width) in	Nominal outer diameter (height x width) mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINDICHT® SVF PG thread
18 AWG (1 mm²)								
0042020	12	0.008	0.21	0.185 x 1.418	4.7 x 36.0	77	263	52005510
0042021	16	0.008	0.21	0.185 x 1.911	4.7 x 48.5	103	350	–
0042022	20	0.008	0.21	0.185 x 2.325	4.7 x 59.0	129	433	–
0042023	24	0.008	0.21	0.185 x 2.817	4.7 x 71.5	155	519	–
16 AWG (1.5 mm²)								
00420013	4	0.006	0.15	0.205 x 0.611	5.2 x 15.5	39	89	52005480
00420023	5	0.006	0.15	0.205 x 0.776	5.2 x 19.7	48	114	52005490
0042003	7	0.006	0.15	0.205 x 1.064	5.2 x 27.0	68	159	52005500
0042004	8	0.006	0.15	0.205 x 1.143	5.2 x 29.0	77	179	52005500
0042005	10	0.006	0.15	0.205 x 1.438	5.2 x 36.5	97	224	52005510
0042006	12	0.006	0.15	0.205 x 1.655	5.2 x 42.0	116	284	52005520
14 AWG (2.5 mm²)								
00420073	4	0.006	0.15	0.232 x 0.749	5.9 x 19.0	65	138	52005490
00420083	5	0.006	0.15	0.232 x 0.946	5.9 x 24.0	81	173	52005500
0042009	7	0.006	0.15	0.232 x 1.281	5.9 x 32.5	113	232	52005510
0042010	8	0.006	0.15	0.232 x 1.379	5.9 x 35.0	129	262	52005510
0042050	12	0.006	0.15	0.232 x 2.069	5.9 x 52.5	194	390	–
12 AWG (4 mm²)								
00420113	4	0.006	0.15	0.268 x 0.827	6.8 x 21.0	103	230	52005490
0042012	7	0.006	0.15	0.268 x 1.497	6.8 x 38.0	181	396	52005510
10 AWG (6 mm²)								
00420133	4	0.008	0.20	0.288 x 0.946	7.3 x 24.0	155	286	52005500
8 AWG (10 mm²)								
00420143	4	0.012	0.30	0.374 x 1.202	9.5 x 30.5	258	476	52005500
6 AWG (16 mm²)								
00420153	4	0.012	0.30	0.426 x 1.379	10.8 x 35.0	413	682	52005500
4 AWG (25 mm²)								
00420163	4	0.012	0.30	0.512 x 1.655	13.0 x 42.0	645	918	–

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ÖLFLEX®
Spiral cable

150 **Quick select chart**

151 **ÖLFLEX® special-design custom coil cords**
Non-standard quotation inquiry form

152 **ÖLFLEX® SPIRAL 400 P**
Retractable control cable with PUR jacket

154 **ÖLFLEX® SPIRAL 540 P**
Retractable power supply cable with safety yellow PUR jacket

156 **UNITRONIC® SPIRAL**
Retractable shielded data cable with PUR jacket

158 **UNITRONIC® SPIRAL LiF2Y11Y** NEW
Retractable unshielded data cable with PUR jacket

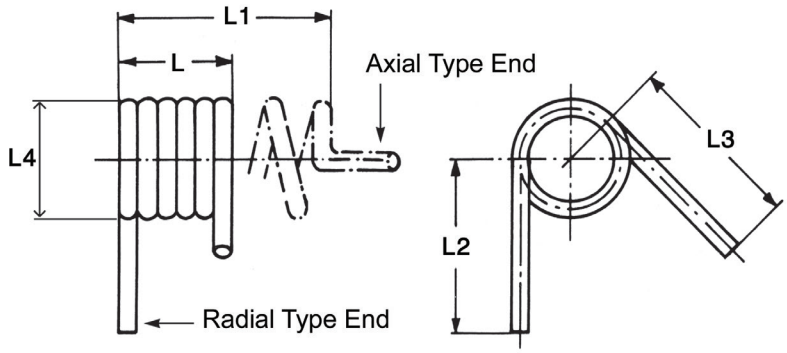
160 **SPIRAL H07BQ-F BLACK**
Retractable power supply cable with PUR jacket

Quick select chart

Product	Jacket material	AWG range	Temperature range	Nominal voltage rating	Extension capability	Page
ÖLFLEX® SPIRAL 400 P	PUR	18 - 14 AWG	+5°C to +50°C	300/500V	x 3	152
ÖLFLEX® SPIRAL 540 P	PUR	18 - 14 AWG	-30°C to +50°C	18 AWG: 300/500V 16 - 14 AWG: 450/750V	x 3.5	154
UNITRONIC® SPIRAL	PUR	26 - 24 AWG	-5°C to +50°C	250V (not for power)	x 4	156
UNITRONIC® SPIRAL LiF2Y11Y	PUR	26 - 24 AWG	-5°C to +50°C	250V (not for power)	x 4	158
SPIRAL H07BQ-F BLACK	PUR	16 AWG	-25°C to +50°C	450/750V	x 3	160

ÖLFLEX® special-design custom coil cords

Non-standard quotation inquiry form



ÖLFLEX® cable type: ☐ 400 P ☐ 490 P ☐ 540 P ☐ 590 P ☐ 855 P ☐ Other

Cable part number: _____ AWG & number of conductors: _____

Description: _____

Retracted length (L): _____ in. Extended length (L1): _____ in.

Retracted tail length (L2): _____ in. Extended tail length (L3): _____ in.

Retracted tail type: ☐ Radial ☐ Axial Extended tail type: ☐ Radial ☐ Axial

Spiral outer diameter (L4): _____ in.

Quantity: _____ Breaks (if required): _____

Contact name: _____

Company name: _____

Phone: _____

Fax completed form to 973-660-9330 or email to sales@lappusa.com or your local LAPP representative.

ÖLFLEX® SPIRAL 400 P

Retractable control cable with PUR jacket

ÖLFLEX® SPIRAL 400 P is a retractable multi-conductor control cable with a rugged abrasion-resistant polyurethane jacket and an extension capability of up to 3 times its retracted length.

Construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant

Jacket: specially formulated polyurethane; gray

Recommended applications

Machine tool manufacturing; cranes and hoists

Application advantage

- Excellent resistance to mineral oils and cutting fluids
- Highly resistant to mechanical abuse typically found in industrial applications
- Special spiral designs are available, see page 151

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Length & type of tails:	8 in (200 mm), tangential 24 in (600 mm), tangential	**Conductor stranding:**	Class 5 fine wire
Temperature range:	+5°C to +50°C	**Color code:**	black with white numbers, plus green/yellow ground
Nominal voltage:	300/500V	**Approvals:**	CE & RoHS
Test voltage:	3000V		

If not otherwise specified, all values relating to the product are nominal values.
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ÖLFLEX® SPIRAL 400 P

Part number	Number of conductors* incl. ground	Nominal outer diameter in	mm	Nominal spiral outer diameter in	mm	Extended spiral length in	mm	Retracted spiral length in	mm	Copper weight lbs/100 pcs.	Approx. weight lbs/100 pcs.	SKINTOP® SL PG thread
18 AWG (1 mm²)												
70002646	2	0.224	5.7	0.788	20	59	1500	20	500	20	48	S1107
70002647	2	0.224	5.7	0.788	20	118	3000	39	1000	36	88	S1107
70002648	2	0.224	5.7	0.788	20	177	4500	59	1500	51	121	S1107
70002649	2	0.224	5.7	0.788	20	236	6000	79	2000	61	158	S1107
70002651	3	0.236	6.0	0.827	21	59	1500	20	500	29	58	S1109
70002652	3	0.236	6.0	0.827	21	118	3000	39	1000	54	109	S1109
70002653	3	0.236	6.0	0.827	21	177	4500	59	1500	78	156	S1109
70002654	3	0.236	6.0	0.827	21	236	6000	79	2000	93	196	S1109
70002656	4	0.256	6.5	0.946	24	59	1500	20	500	39	76	S1109
70002657	4	0.256	6.5	0.946	24	118	3000	39	1000	72	134	S1109
70002658	4	0.256	6.5	0.946	24	177	4500	59	1500	111	190	S1109
70002659	4	0.256	6.5	0.946	24	236	6000	79	2000	130	257	S1109
70002661	5	0.280	7.1	0.985	25	59	1500	20	500	49	84	S1111
70002662	5	0.280	7.1	0.985	25	118	3000	39	1000	90	145	S1111
70002663	5	0.280	7.1	0.985	25	177	4500	59	1500	133	212	S1111
70002664	5	0.280	7.1	0.985	25	236	6000	79	2000	165	301	S1111
70002666	7	0.315	8.0	1.182	30	49	1250	20	500	73	119	S1111
70002667	7	0.315	8.0	1.182	30	98	2500	39	1000	125	213	S1111
70002668	7	0.315	8.0	1.182	30	148	3750	59	1500	170	320	S1111
70002669	7	0.315	8.0	1.182	30	197	5000	79	2000	260	408	S1111
70002670	12	0.414	10.5	1.4578	37	59.1	1500	19.7	500	132	215	S1113
70002671	12	0.414	10.5	1.4578	37	118.2	3000	39.4	1000	223	372	S1113
70002672	18	0.500	12.7	1.773	45	59.1	1500	19.7	500	196	287	S1116
70002673	18	0.500	12.7	1.773	45	118.2	3000	39.4	1000	309	548	S1116
16 AWG (1.5 mm²)												
70002681	2	0.248	6.3	0.906	23	59	1500	20	500	32	65	S1109
70002682	2	0.248	6.3	0.906	23	118	3000	39	1000	59	119	S1109
70002683	2	0.248	6.3	0.906	23	177	4500	59	1500	84	165	S1109
70002684	2	0.248	6.3	0.906	23	236	6000	79	2000	109	229	S1109
70002687	3	0.264	6.7	0.946	24	59	1500	20	500	47	82	S1109
70002688	3	0.264	6.7	0.946	24	118	3000	39	1000	81	143	S1109
70002689	3	0.264	6.7	0.946	24	177	4500	59	1500	110	207	S1109
70002690	3	0.264	6.7	0.946	24	236	6000	79	2000	147	280	S1109
70002699	5	0.319	8.1	1.182	30	49	1250	20	500	75	119	S1111
70002700	5	0.319	8.1	1.182	30	98	2500	39	1000	132	213	S1111
70002701	5	0.319	8.1	1.182	30	148	3750	59	1500	191	311	S1111
70002702	5	0.319	8.1	1.182	30	197	5000	79	2000	259	432	S1111
70002705	7	0.350	8.9	1.221	31	49	1250	20	500	101	143	S1111
70002706	7	0.350	8.9	1.221	31	98	2500	39	1000	179	253	S1111
70002707	7	0.350	8.9	1.221	31	148	3750	59	1500	245	394	S1111
70002708	7	0.350	8.9	1.221	31	197	5000	79	2000	332	489	S1111
70002709	12	0.473	12	1.8124	46	59.1	1500	19.7	500	214	284	S1113
70002710	12	0.473	12	1.8124	46	118.2	3000	39.4	1000	366	529	S1113
70002711	18	0.528	13.4	2.0488	52	59.1	1500	19.7	500	278	432	S1116
70002712	18	0.528	13.4	2.0488	52	118.2	3000	39.4	1000	499	740	S1116
14 AWG (2.5 mm²)												
70002716	3	0.319	8.1	1.123	29	49	1250	20	500	75	120	S1111
70002717	3	0.319	8.1	1.123	29	98	2500	39	1000	142	264	S1111
70002718	3	0.319	8.1	1.123	29	148	3750	59	1500	196	322	S1111
70002719	3	0.319	8.1	1.123	29	197	5000	79	2000	237	429	S1111
70002721	5	0.394	10.0	1.458	37	49	1250	20	500	138	202	S1113
70002722	5	0.394	10.0	1.458	37	98	2500	39	1000	236	364	S1113
70002723	5	0.394	10.0	1.458	37	148	3750	59	1500	329	540	S1113
70002724	5	0.394	10.0	1.458	37	197	5000	79	2000	437	681	S1113

* 2c cable does not include ground

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

ÖLFLEX® SPIRAL 540 P

Retractable power supply cable with safety yellow PUR jacket

ÖLFLEX® SPIRAL 540 P is a multi-conductor, TPE-insulated, retractable power supply cable with a yellow polyurethane outer jacket. It may be used both indoors and outdoors in wet, dry, or hot conditions. The cable has an extension capability of up to 3.5 times its retracted length.

Construction

Conductors: finely stranded bare copper

Insulation: TPE; dry lubricant

Jacket: flame-retardant polyurethane; yellow

Recommended applications

Power supply for machine tools, cranes, and hoists

Application advantage

- Highly visible safety yellow jacket
- Abrasion- and cut-resistant jacket
- Highly resistant to oils and low temperatures
- Halogen-free jacket
- Special spiral designs are available, see page 151

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Length & type of tails:	8 in (200 mm), tangential 24 in (600 mm), tangential	**Conductor stranding:**	Class 5 fine wire
Temperature range:	-30°C to +50°C	**Color code:** - up to 5c: - 7c:	 VDE 0293-308: chart 6, page 681 black with white numbers, plus green/yellow ground
Nominal voltage: - 18 AWG: - 16 - 14 AWG:	 300/500V 450/750V	**Approvals:**	CE & RoHS
Test voltage:	3000V		

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If not otherwise specified, all values relating to the product are nominal values.
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ÖLFLEX® SPIRAL 540 P

Part number	Number of conductors incl. ground*	Nominal outer diameter in	mm	Nominal spiral outer diameter in	mm	Extended spiral length in	mm	Retracted spiral length in	mm	Copper weight lbs/100 pcs.	Approx. weight lbs/100 pcs.	SKINTOP® SL PG thread
18 AWG (1 mm²)												
73220123	2	0.276	7.0	0.946	24	39	1000	12	300	14	38	S2111
73220124	2	0.276	7.0	0.946	24	79	2000	24	600	23	60	S2111
73220125	2	0.276	7.0	0.946	24	138	3500	39	1000	35	92	S2111
73220126	2	0.276	7.0	0.946	24	197	5000	59	1500	49	138	S2111
73220127	3	0.292	7.4	1.143	29	39	1000	12	300	24	54	S2111
73220128	3	0.292	7.4	1.143	29	79	2000	24	600	41	91	S2111
73220129	3	0.292	7.4	1.143	29	138	3500	39	1000	61	142	S2111
73220130	3	0.292	7.4	1.143	29	197	5000	59	1500	87	210	S2111
71220131	4	0.323	8.2	1.182	30	39	1000	12	300	30	63	S2111
71220132	4	0.323	8.2	1.182	30	79	2000	24	600	50	97	S2111
71220133	4	0.323	8.2	1.182	30	138	3500	39	1000	78	155	S2111
71220134	4	0.323	8.2	1.182	30	197	5000	59	1500	109	232	S2111
71220135	5	0.355	9.0	1.261	32	39	1000	12	300	36	70	S2113
71220136	5	0.355	9.0	1.261	32	79	2000	24	600	60	115	S2113
71220137	5	0.355	9.0	1.261	32	138	3500	39	1000	93	187	S2113
71220138	5	0.355	9.0	1.261	32	197	5000	59	1500	123	262	S2113
73220139	7	0.430	10.9	1.576	40	39	1000	14	350	53	114	S2113
73220140	7	0.430	10.9	1.576	40	79	2000	28	700	96	209	S2113
73220141	7	0.430	10.9	1.576	40	138	3500	47	1200	155	340	S2113
73220142	7	0.430	10.9	1.576	40	197	5000	67	1700	203	425	S2113
16 AWG (1.5 mm²)												
73220143	2	0.331	8.4	1.221	31	39	1000	12	300	23	62	S2111
73220144	2	0.331	8.4	1.221	31	79	2000	24	600	38	101	S2111
73220145	2	0.331	8.4	1.221	31	138	3500	39	1000	58	163	S2111
73220146	2	0.331	8.4	1.221	31	197	5000	59	1500	84	239	S2111
73220147	3	0.351	8.9	1.261	32	39	1000	12	300	33	69	S2113
73220148	3	0.351	8.9	1.261	32	79	2000	24	600	52	116	S2113
73220149	3	0.351	8.9	1.261	32	138	3500	39	1000	81	183	S2113
73220150	3	0.351	8.9	1.261	32	197	5000	59	1500	114	263	S2113
71220151	5	0.430	10.9	1.576	40	39	1000	14	350	63	120	S2113
71220152	5	0.430	10.9	1.576	40	79	2000	28	700	99	205	S2113
71220153	5	0.430	10.9	1.576	40	138	3500	47	1200	172	336	S2113
71220154	5	0.430	10.9	1.576	40	197	5000	67	1700	237	447	S2113
73220155	7	0.532	13.5	2.049	52	39	1000	14	350	85	185	S2121
73220156	7	0.532	13.5	2.049	52	79	2000	28	700	150	325	S2121
73220157	7	0.532	13.5	2.049	52	138	3500	47	1200	255	543	S2121
73220158	7	0.532	13.5	2.049	52	197	5000	67	1700	351	786	S2121
14 AWG (2.5 mm²)												
73220159	3	0.418	10.6	1.576	40	39	1000	14	350	61	118	S2113
73220160	3	0.418	10.6	1.576	40	79	2000	28	700	102	201	S2113
73220161	3	0.418	10.6	1.576	40	138	3500	47	1200	170	345	S2113
73220162	3	0.418	10.6	1.576	40	197	5000	67	1700	226	486	S2113
71220163	5	0.528	13.4	2.009	51	39	1000	14	350	110	187	S2116
71220164	5	0.528	13.4	2.009	51	79	2000	28	700	192	335	S2116
71220165	5	0.528	13.4	2.009	51	138	3500	47	1200	305	553	S2116
71220166	5	0.528	13.4	2.009	51	197	5000	67	1700	416	744	S2116

* 2c cable does not include ground

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® SPIRAL

Retractable shielded data cable with PUR jacket

UNITRONIC® SPIRAL is a shielded multi-conductor signal and data cable designed to extend 4 times its retracted length. With a polyurethane outer jacket, UNITRONIC® SPIRAL is robust for heavier duty applications.

Construction

Conductors: finely stranded bare copper

Insulation: PVC; dry lubricant

Shielding: copper spiral shield

Jacket: specially formulated polyurethane; black

Recommended applications

Computers; data transmission; office equipment; process, control, and instrumentation applications

Application advantage

- Overall shield prevents interference for accurate pulse transmission
- Highly flexible
- Excellent for confined areas where installation is tight
- Polyurethane jacket for extra ruggedness
- Special spiral designs are available, see page 151

Approvals

RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Length & type of tails:	8 in (200 mm), tangential 24 in (600 mm), tangential
Temperature range:	-5°C to +50°C
Nominal voltage:	250V (not for power applications)
Test voltage:	1200V
Conductor stranding:	Class 6 fine wire
Color code:	DIN 47100: chart 8, page 682
Approvals:	based on VDE specifications RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Nominal spiral outer diameter in	Nominal spiral outer diameter mm	Extended spiral length in	Extended spiral length mm	Retracted spiral length in	Retracted spiral length mm	SKINTOP® SL PG thread
26 AWG (0.14 mm²)										
73220200	2	0.162	4.1	0.591	15	16	400	4	100	S2107
73220201	2	0.162	4.1	0.591	15	32	800	8	200	S2107
73220202	2	0.162	4.1	0.591	15	47	1200	12	300	S2107
73220203	2	0.162	4.1	0.591	15	63	1600	16	400	S2107
73220204	2	0.162	4.1	0.591	15	79	2000	20	500	S2107
73220205	3	0.169	4.3	0.709	18	16	400	4	100	S2107
73220206	3	0.169	4.3	0.709	18	32	800	8	200	S2107
73220207	3	0.169	4.3	0.709	18	47	1200	12	300	S2107
73220208	3	0.169	4.3	0.709	18	63	1600	16	400	S2107
73220209	3	0.169	4.3	0.709	18	79	2000	20	500	S2107
73220210	4	0.177	4.5	0.748	19	16	400	4	100	S2107
73220211	4	0.177	4.5	0.748	19	32	800	8	200	S2107

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If not otherwise specified, all values relating to the product are nominal values.
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UNITRONIC® SPIRAL

Part number	Number of conductors incl. ground	Nominal outer diameter		Nominal spiral outer diameter		Extended spiral length		Retracted spiral length		SKINTOP® SL
		in	mm	in	mm	in	mm	in	mm	PG thread
73220212	4	0.177	4.5	0.748	19	47	1200	12	300	S2107
73220213	4	0.177	4.5	0.748	19	63	1600	16	400	S2107
73220214	4	0.177	4.5	0.748	19	79	2000	20	500	S2107
73220215	5	0.189	4.8	0.787	20	16	400	4	100	S2107
73220216	5	0.189	4.8	0.787	20	32	800	8	200	S2107
73220217	5	0.189	4.8	0.787	20	47	1200	12	300	S2107
73220218	5	0.189	4.8	0.787	20	63	1600	16	400	S2107
73220219	5	0.189	4.8	0.787	20	79	2000	20	500	S2107
73220220	6	0.217	5.5	0.827	21	16	400	4	100	S2109
73220221	6	0.217	5.5	0.827	21	32	800	8	200	S2109
73220222	6	0.217	5.5	0.827	21	47	1200	12	300	S2109
73220223	6	0.217	5.5	0.827	21	63	1600	16	400	S2109
73220224	6	0.217	5.5	0.827	21	79	2000	20	500	S2109
73220225	7	0.232	5.9	0.906	23	16	400	4	100	S2109
73220226	7	0.232	5.9	0.906	23	31	800	8	200	S2109
73220227	7	0.232	5.9	0.906	23	47	1200	12	300	S2109
73220228	7	0.232	5.9	0.906	23	63	1600	16	400	S2109
73220229	7	0.232	5.9	0.906	23	79	2000	20	500	S2109
73220230	12	0.284	7.2	1.063	27	16	400	4	100	S2111
73220231	12	0.284	7.2	1.063	27	32	800	8	200	S2111
73220232	12	0.284	7.2	1.063	27	47	1200	12	300	S2111
73220233	12	0.284	7.2	1.063	27	63	1600	16	400	S2111
73220234	12	0.284	7.2	1.063	27	79	2000	20	500	S2111
73220235	18	0.315	8.0	1.142	29	16	400	4	100	S2111
73220236	18	0.315	8.0	1.142	29	32	800	8	200	S2111
73220237	18	0.315	8.0	1.142	29	47	1200	12	300	S2111
73220238	18	0.315	8.0	1.142	29	63	1600	16	400	S2111
73220239	18	0.315	8.0	1.142	29	79	2000	20	500	S2111
24 AWG (0.25 mm²)										
73220240	2	0.185	4.7	0.709	18	16	400	4	100	S2107
73220241	2	0.185	4.7	0.709	18	31	800	8	200	S2107
73220242	2	0.185	4.7	0.709	18	47	1200	12	300	S2107
73220243	2	0.185	4.7	0.709	18	63	1600	16	400	S2107
73220244	2	0.185	4.7	0.709	18	79	2000	20	500	S2107
73220245	3	0.209	5.3	0.748	19	16	400	4	100	S2109
73220246	3	0.209	5.3	0.748	19	31	800	8	200	S2109
73220247	3	0.209	5.3	0.748	19	47	1200	12	300	S2109
73220248	3	0.209	5.3	0.748	19	63	1600	16	400	S2109
73220249	3	0.209	5.3	0.748	19	79	2000	20	500	S2109
73220250	4	0.220	5.6	0.787	20	16	400	4	100	S2109
73220251	4	0.220	5.6	0.787	20	31	800	8	200	S2109
73220252	4	0.220	5.6	0.787	20	47	1200	12	300	S2109
73220253	4	0.220	5.6	0.787	20	63	1600	16	400	S2109
73220254	4	0.220	5.6	0.787	20	79	2000	20	500	S2109
73220255	5	0.236	6	0.827	21	16	400	4	100	S2109
73220256	5	0.236	6	0.827	21	31	800	8	200	S2109
73220257	5	0.236	6	0.827	21	47	1200	12	300	S2109
73220258	5	0.236	6	0.827	21	63	1600	16	400	S2109
73220259	5	0.236	6	0.827	21	79	2000	20	500	S2109
73220260	6	0.268	6.8	0.984	25	16	400	4	100	S2111
73220261	6	0.268	6.8	0.984	25	31	800	8	200	S2111
73220262	6	0.268	6.8	0.984	25	47	1200	12	300	S2111
73220263	6	0.268	6.8	0.984	25	63	1600	16	400	S2111
73220264	6	0.268	6.8	0.984	25	79	2000	20	500	S2111
73220265	7	0.287	7.3	1.024	26	16	400	4	100	S2111
73220266	7	0.287	7.3	1.024	26	31	800	8	200	S2111
73220267	7	0.287	7.3	1.024	26	47	1200	12	300	S2111
73220268	7	0.287	7.3	1.024	26	63	1600	16	400	S2111
73220269	7	0.287	7.3	1.024	26	79	2000	20	500	S2111
73220270	12	0.331	8.4	1.181	30	16	400	4	100	S2113
73220271	12	0.331	8.4	1.181	30	31	800	8	200	S2113
73220272	12	0.331	8.4	1.181	30	47	1200	12	300	S2113
73220273	12	0.331	8.4	1.181	30	63	1600	16	400	S2113
73220274	12	0.331	8.4	1.181	30	79	2000	20	500	S2113
73220275	18	0.374	9.5	1.220	31	16	400	4	100	S2113
73220276	18	0.374	9.5	1.220	31	31	800	8	200	S2113
73220277	18	0.374	9.5	1.220	31	47	1200	12	300	S2113
73220278	18	0.374	9.5	1.220	31	63	1600	16	400	S2113
73220279	18	0.374	9.5	1.220	31	79	2000	20	500	S2113

Custom configurations are available. Utilize the custom cable design form on page 151 or contact your LAPP sales representative.

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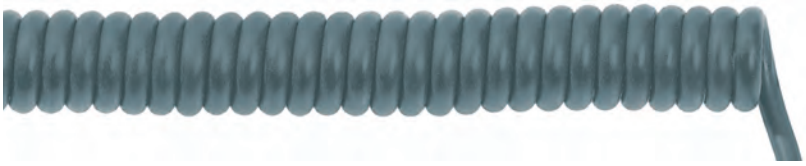
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® SPIRAL LiF2Y11Y

Retractable unshielded data cable with PUR jacket



UNITRONIC® SPIRAL LiF2Y11Y is an unshielded multi-conductor signal and data cable designed to extend up to 4 times its retracted length. Designed with a polyurethane outer jacket, it is robust for heavier duty applications.

Construction

Conductors: finely stranded bare copper

Insulation: based on polyolefin

Jacket: specially formulated polyurethane, gray

Recommended applications

Electronic applications; measurement and control engineering; handling and measurement equipment; conveyor and transport systems

Application advantage

- Abrasion- and cut-resistant jacket
- Very high flexibility
- Halogen-free and flame retardant
- Special spiral designs are available, see page 151

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Length & Type of Tails:	8 in (200 mm), tangential 24 in (600 mm), tangential
Temperature range:	-5°C to +50°C
Nominal voltage:	250V (not for power applications)
Test voltage:	1200V
Conductor stranding:	Class 6 fine wire
Color code:	DIN 47100: chart 8, page 682
Approvals:	CE & RoHS

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Nominal spiral outer diameter in	Nominal spiral outer diameter mm	Extended spiral length in	Extended spiral length mm	Retracted spiral length in	Retracted spiral length mm	SKINTOP® SL PG thread
26 AWG (0.14 mm²)										
73220300	2	0.134	3.4	0.551	14	16	400	4	100	S1107
73220301	2	0.134	3.4	0.551	14	31	800	8	200	S1107
73220302	2	0.134	3.4	0.551	14	47	1200	12	300	S1107
73220303	2	0.134	3.4	0.551	14	63	1600	16	400	S1107
73220304	2	0.134	3.4	0.551	14	79	2000	20	500	S1107
73220305	3	0.154	3.9	0.591	15	16	400	4	100	S1107
73220306	3	0.154	3.9	0.591	15	31	800	8	200	S1107
73220307	3	0.154	3.9	0.591	15	47	1200	12	300	S1107
73220308	3	0.154	3.9	0.591	15	63	1600	16	400	S1107
73220309	3	0.154	3.9	0.591	15	79	2000	20	500	S1107
73220310	4	0.165	4.2	0.669	17	16	400	4	100	S1107
73220311	4	0.165	4.2	0.669	17	31	800	8	200	S1107

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® SPIRAL LiF2Y11Y

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Nominal spiral outer diameter in	Nominal spiral outer diameter mm	Extended spiral length in	Extended spiral length mm	Retracted spiral length in	Retracted spiral length mm	SKINTOP® SL PG thread
73220312	4	0.165	4.2	0.669	17	47	1200	12	300	S1107
73220313	4	0.165	4.2	0.669	17	63	1600	16	400	S1107
73220314	4	0.165	4.2	0.669	17	79	2000	20	500	S1107
73220315	5	0.177	4.5	0.748	19	16	400	4	100	S1107
73220316	5	0.177	4.5	0.748	19	31	800	8	200	S1107
73220317	5	0.177	4.5	0.748	19	47	1200	12	300	S1107
73220318	5	0.177	4.5	0.748	19	63	1600	16	400	S1107
73220319	5	0.177	4.5	0.748	19	79	2000	20	500	S1107
73220320	6	0.189	4.8	0.748	19	16	400	4	100	S1107
73220321	6	0.189	4.8	0.748	19	31	800	8	200	S1107
73220322	6	0.189	4.8	0.748	19	47	1200	12	300	S1107
73220323	6	0.189	4.8	0.748	19	63	1600	16	400	S1107
73220324	6	0.189	4.8	0.748	19	79	2000	20	500	S1107
73220325	7	0.201	5.1	0.787	20	16	400	4	100	S1109
73220326	7	0.201	5.1	0.787	20	31	800	8	200	S1109
73220327	7	0.201	5.1	0.787	20	47	1200	12	300	S1109
73220328	7	0.201	5.1	0.787	20	63	1600	16	400	S1109
73220329	7	0.201	5.1	0.787	20	79	2000	20	500	S1109
73220330	12	0.232	5.9	0.827	21	16	400	4	100	S1109
73220331	12	0.232	5.9	0.827	21	31	800	8	200	S1109
73220332	12	0.232	5.9	0.827	21	47	1200	12	300	S1109
73220333	12	0.232	5.9	0.827	21	63	1600	16	400	S1109
73220334	12	0.232	5.9	0.827	21	79	2000	20	500	S1109
73220335	18	0.268	6.8	1.063	27	16	400	4	100	S1109
73220336	18	0.268	6.8	1.063	27	31	800	8	200	S1109
73220337	18	0.268	6.8	1.063	27	47	1200	12	300	S1109
73220338	18	0.268	6.8	1.063	27	63	1600	16	400	S1109
73220339	18	0.268	6.8	1.063	27	79	2000	20	500	S1109
24 AWG (0.25 mm²)										
73220340	2	0.169	4.3	0.709	18	16	400	4	100	S1107
73220341	2	0.169	4.3	0.709	18	31	800	8	200	S1107
73220342	2	0.169	4.3	0.709	18	47	1200	12	300	S1107
73220343	2	0.169	4.3	0.709	18	63	1600	16	400	S1107
73220344	2	0.169	4.3	0.709	18	79	2000	20	500	S1107
73220345	3	0.177	4.5	0.748	19	16	400	4	100	S1107
73220346	3	0.177	4.5	0.748	19	31	800	8	200	S1107
73220347	3	0.177	4.5	0.748	19	47	1200	12	300	S1107
73220348	3	0.177	4.5	0.748	19	63	1600	16	400	S1107
73220349	3	0.177	4.5	0.748	19	79	2000	20	500	S1107
73220350	4	0.193	4.9	0.787	20	16	400	4	100	S1107
73220351	4	0.193	4.9	0.787	20	31	800	8	200	S1107
73220352	4	0.193	4.9	0.787	20	47	1200	12	300	S1107
73220353	4	0.193	4.9	0.787	20	63	1600	16	400	S1107
73220354	4	0.193	4.9	0.787	20	79	2000	20	500	S1107
73220355	5	0.209	5.3	0.787	20	16	400	4	100	S1109
73220356	5	0.209	5.3	0.787	20	31	800	8	200	S1109
73220357	5	0.209	5.3	0.787	20	47	1200	12	300	S1109
73220358	5	0.209	5.3	0.787	20	63	1600	16	400	S1109
73220359	5	0.209	5.3	0.787	20	79	2000	20	500	S1109
73220360	6	0.213	5.4	0.787	20	16	400	4	100	S1109
73220361	6	0.213	5.4	0.787	20	31	800	8	200	S1109
73220362	6	0.213	5.4	0.787	20	47	1200	12	300	S1109
73220363	6	0.213	5.4	0.787	20	63	1600	16	400	S1109
73220364	6	0.213	5.4	0.787	20	79	2000	20	500	S1109
73220365	7	0.240	6.1	0.827	21	16	400	4	100	S1109
73220366	7	0.240	6.1	0.827	21	31	800	8	200	S1109
73220367	7	0.240	6.1	0.827	21	47	1200	12	300	S1109
73220368	7	0.240	6.1	0.827	21	63	1600	16	400	S1109
73220369	7	0.240	6.1	0.827	21	79	2000	20	500	S1109
73220370	12	0.264	6.7	0.984	25	16	400	4	100	S1111
73220371	12	0.264	6.7	0.984	25	31	800	8	200	S1111
73220372	12	0.264	6.7	0.984	25	47	1200	12	300	S1111
73220373	12	0.264	6.7	0.984	25	63	1600	16	400	S1111
73220374	12	0.264	6.7	0.984	25	79	2000	20	500	S1111
73220375	18	0.335	8.5	1.220	31	16	400	4	100	S1111
73220376	18	0.335	8.5	1.220	31	31	800	8	200	S1111
73220377	18	0.335	8.5	1.220	31	47	1200	12	300	S1111
73220378	18	0.335	8.5	1.220	31	63	1600	16	400	S1111
73220379	18	0.335	8.5	1.220	31	79	2000	20	500	S1111

Custom configurations are available. Utilize the custom cable design form on page 151 or contact your LAPP sales representative.

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

SPIRAL H07BQ-F BLACK

Retractable power supply cable with PUR jacket

SPIRAL H07BQ-F BLACK is a multi-conductor, rubber-insulated, retractable flexible power supply cable with a rugged black polyurethane jacket. It may be used in damp and wet environments, but not submerged.

Construction

Conductors: finely stranded tinned copper

Insulation: synthetic rubber; dry lubricant

Jacket: specially formulated polyurethane; black

Recommended applications

Power supply for machine tools, hand tools, cranes, and hoists

Application advantage

- Resistant to oils, greases, and chemicals
- Weather resistant
- Resistant to mechanical stress
- Special spiral designs are available, see page 151

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-05	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Length & type of tails:	8 in (200 mm), tangetial 24 in (600 mm), tangential
Minimum bend radius:	12.5 x cable diameter
Temperature range:	-25°C to +50°C
Nominal voltage:	450/750V
Test voltage:	3000V
Conductor stranding:	Class 5 fine wire
Color code:	VDE 0293-308: chart 6, page 681
Approvals:	CE & RoHS <HAR> H07BQ-F (unspiralled cable only)* based on VDE 0282-10

* <HAR> standards are not met due to the spiralling process. This is a natural and expected occurance.

Part number	Number of conductors incl. ground	Nominal outer diameter in	Nominal outer diameter mm	Nominal spiral outer diameter in	Nominal spiral outer diameter mm	Extended spiral length in	Extended spiral length mm	Retracted spiral length in	Retracted spiral length mm	Copper weight lbs/100 pcs.	Approx. weight lbs/100 pcs.	SKINTOP® SL PG thread
16 AWG (1.5 mm²)												
70002750	3	0.355	9.0	1.220	31	59	1500	20	500	46	128	S2111
70002751	3	0.355	9.0	1.220	31	118	3000	39	1000	82	231	S2111
70002752	3	0.355	9.0	1.220	31	177	4500	59	1500	119	266	S2111
70002753	3	0.355	9.0	1.220	31	236	6000	79	2000	155	435	S2111
70002754	4	0.394	10.0	1.496	38	59	1500	20	500	68	182	S2113
70002755	4	0.394	10.0	1.496	38	118	3000	39	1000	121	265	S2113
70002756	4	0.394	10.0	1.496	38	177	4500	59	1500	174	466	S2113
70002757	4	0.394	10.0	1.496	38	236	6000	79	2000	228	485	S2113
70002758	5	0.433	11.0	1.575	40	59	1500	20	500	81	167	S2113
70002759	5	0.433	11.0	1.575	40	118	3000	39	1000	145	309	S2113
70002760	5	0.433	11.0	1.575	40	177	4500	59	1500	207	411	S2113
70002761	5	0.433	11.0	1.575	40	236	6000	79	2000	272	722	S2113

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

2 UNITRONIC®

Data communication systems

Our high-quality UNITRONIC® data network cables & field bus components provide forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures, we offer a dependable cabling and connection solution for almost every situation.

Application range

- Industrial machinery & plant engineering
- Sensors & actuating elements
- Appliances
- Measurement & control technology
- Automated production processes & industrial robots
- Bus systems
- Computing & communication systems

Product range

162 Bus cable & connectors
205 Flexible data, signal & control cable
219 Continuous flex data, signal & control cable

UNITRONIC®
Bus cable & connectors

164 **Quick select chart**

166 **UNITRONIC® bus cable attributes**

DeviceNet

167 **UNITRONIC® BUS DeviceNet™ Gray**
For DeviceNet bus systems; stationary applications; 120 Ω

168 **UNITRONIC® BUS DeviceNet™ FD Gray**
For DeviceNet bus systems; continuous flex applications; 120 Ω

169 **UNITRONIC® BUS DeviceNet™ Violet**
For DeviceNet bus systems; stationary applications; 120 Ω

170 **UNITRONIC® BUS DeviceNet™ FD Violet**
For DeviceNet bus systems; continuous flex applications; 120 Ω

171 **DeviceNet™ field wireable connectors**

171 **DeviceNet™ PCB connectors**

172 **DeviceNet™ feed-through receptacles**

172 **DeviceNet™ T-connectors**

741 **DeviceNet™ cable assemblies** NEW

PROFIBUS

173 **UNITRONIC® BUS PB**
For PROFIBUS-DP/FMS/FIP bus systems; stationary applications; 150 Ω

174 **UNITRONIC® BUS PB FD**
For PROFIBUS-DP/FMS/FIP bus systems; continuous flex applications; 150 Ω

175 **UNITRONIC® BUS PB TRAY**
For PROFIBUS-DP/FMS bus systems; stationary tray applications; 150 Ω

176 **UNITRONIC® BUS PB FD HYBRID/COMBI** NEW
For PROFIBUS-DP/FMS/FIP bus systems; continuous flex applications; 150 Ω

177 **UNITRONIC® BUS PB TORSION**
For PROFIBUS-DP/FMS/FIP bus systems; torsion applications; 150 Ω

178 **UNITRONIC® BUS PB FESTOON**
For PROFIBUS-DP/FMS/FIP bus systems; festoon applications; 150 Ω

179 **EPIC® DATA PROFIBUS® connectors**

181 **PROFIBUS® field wireable M12 connectors**

179 **PROFIBUS® T-connectors**

182 **PROFIBUS® termination resistors**

CAN bus

183 **UNITRONIC® BUS CAN**
For PROFIBUS-DP/FMS/FIP bus systems; festoon applications; 150 Ω

184 **UNITRONIC® BUS CAN FD P**
For CAN bus systems; continuous flex applications; 120 Ω

185 **UNITRONIC® BUS CAN TRAY**
For CAN bus systems; stationary tray applications; 120 Ω

186 **EPIC® DATA CAN bus connectors**

UNITRONIC®

Bus cable & connectors

187 **CAN bus field wireable M12 connectors**

187 **CAN bus T-connectors**

188 **CAN bus termination resistor**

RS485/RS422

189 **UNITRONIC® BUS LD/LD FD P**
For PROFIBUS-DP/FMS/FIP bus systems; festoon applications; 150 Ω

AS-Interface

190 **UNITRONIC® BUS ASi**
For Actuator Sensor Interface (AS-i) bus systems; stationary & flexible applications; 140 Ω

191 **UNITRONIC® BUS ASi FD**
For Actuator Sensor Interface (AS-i) bus systems; continuous flex applications; 140 Ω

Data Highway

192 **UNITRONIC® BUS BlueFlex™**
For Data Highway and Data Highway+ bus systems; continuous flex applications; 78 Ω

INTERBUS

193 **UNITRONIC® BUS INTERBUS**
For INTERBUS bus systems (IBS); stationary applications; 100 Ω

194 **UNITRONIC® BUS INTERBUS FD**
For INTERBUS bus systems (IBS); continuous flex applications; 100 Ω

Genius™

195 **UNITRONIC® BUS Genius™**
Genius I/O twinaxial bus cable; continuous flex applications; 100 Ω

CC-Link

196 **UNITRONIC® BUS CC-Link**
For CC-Link bus systems; stationary applications; 110 Ω

197 **UNITRONIC® BUS CC-Link FD**
For CC-Link bus systems; continuous flex applications; 110 Ω

FOUNDATION Fieldbus

198 **UNITRONIC® BUS Foundation Fieldbus**
For Foundation Fieldbus bus systems; stationary applications; 100 Ω

SAFETY bus

199 **UNITRONIC® BUS SAFETY** NEW
For SAFETY bus systems

Sensor & actuator wiring

200 **UNITRONIC® SENSOR FD**
Multi-conductor continuous flex communication cable with PUR jacket; 300V

201 **M8 field wireable sensor/actuator connectors**

202 **M12 field wireable sensor/actuator connectors** NEW

740 **Sensor/Actuator cable assemblies** NEW

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Quick select chart

Bus system	Applications	Approvals	Jacket material	Part number	Page
DeviceNet™ 120 Ω	stationary	CL2	PVC	4001, 4002	167
		CMG	PVC	2170343	169
			halogen-free	2170341	
		CMG, PLTC	PVC	2170342	
			halogen-free	2170340	
	continuous flex	CL2	PVC	6001	168
		CL2, CMG	PVC	6002	
		CMG	PVC	2170347	170
		CMG, PLTC	PVC	2170346	
		CMX	PUR	2170344, 2170345	
PROFIBUS® 150 Ω	stationary	–	PVC	2170220, 2170223, 2170236	173
		CMX	PVC	2170219	
		CMG, fast connect	PVC	2170820	
			halogen-free	2170326, 2170853	
		CMX, fast connect	PUR	2170330, 2170330	
		CMG, PLTC, AWM	PVC	2170856	175
	flexible	CMG	PVC	2170824	173
		CMG, fast connect	PVC	2170826	
	festoon	CMG	PVC	2170331	178
	torsion	CMX	PUR	2170332	177
	continuous flex	–	PUR	2170222,	174
				2170227, 2170495	176
		CMG	PVC	2170875	176
		CMX	PUR	2170822	174
		CMG, fast connect	halogen-free	2170854	
		CMX, fast connect	PUR	2170322	
CAN bus 120 Ω	stationary	CMX	PVC	2170260, 2170261, 2170263, 2170264, 2170266, 2170267, 2170269, 2170270, 2170500	183
	flexible	CMG, PLTC, AWM	PVC	2170857	185
	continuous flex	CMX	PUR	2170272, 2170273, 2170275, 2170276, 2170278, 2170279	184

Bus system	Applications	Approvals	Jacket material	Part number	Page
RS485, RS422 100–120 Ω	stationary	–	PVC	2170203, 2170204, 2170205	189
		CMX	PVC	2170803	
	continuous flex	–	PUR	2170213, 2170214, 2170215	189
		CMX	PUR	2170813, 2170814, 2170815	
AS-Interface (AS-i) 70–140 Ω	flexible	–	rubber	2170228, 2170229 2170371, 2170372	190
			TPE	2170230, 2170231, 2170232	
		CMG	PVC	2170842, 2170843	
	continuous flex	AWM	PUR	2170357, 2170358, 2170317, 2170318	191
			TPE	2170830, 2170831	
Data Highway	continuous flex	AWM	PVC	3649FD	192
INTERBUS 100 Ω	stationary	–	PVC	2170206, 2170207, 2170217	193
			PUR	2170208	
		CMX	PVC	2170208	
	continuous flex	–	PUR	2170216, 2170218	194
		CMX	PUR	2170818	
Genius™	continuous flex	AWM	PUR	911264	195
CC-Link 110 Ω	flexible	CMG, PLTC	PVC	2170360	196
	continuous flex	AWM	PUR	2170370	197
FOUNDATION Fieldbus 100 Ω	stationary	CMG, PLTC	PVC	2170351, 2170353	198
	flexible	CMG, PLTC	PVC	2170350, 2170352	198
SAFETY bus 120 Ω	stationary	–	halogen-free	2170295	199
	continuous flex	–	PUR	2170885	199

UNITRONIC® bus cable attributes

Bus system	Product name	Part number	Cable attributes, page 648				Page
			oil resistance	flame resistance	motion type	mechanical properties	
DeviceNet™	UNITRONIC® BUS DeviceNet Gray	4001, 4002	OR-01	FR-02	FL-02	MP-01	167
	UNITRONIC® BUS DeviceNet FD Gray	6001, 6002	OR-01	FR-03	CF-02	MP-01	168
	UNITRONIC® BUS DeviceNet Violet	2170340, 2170341	OR-00	FR-03	FL-02	MP-01	169
		2170342, 2170343	OR-02	FR-03	FL-02	MP-01	
	UNITRONIC® BUS DeviceNet FD Violet	2170344, 2170345	OR-04	FR-02	CF-02	MP-05	170
		2170346, 2170347	OR-02	FR-03	CF-02	MP-01	
PROFIBUS®	UNITRONIC® BUS PB	2170220, 2170219, 2170330	OR-00	FR-02	FL-01	MP-01	173
		2170824	OR-00	FR-02	FL-02	MP-01	
		2170326, 2170820, 2170826	OR-00	FR-03	FL-01	MP-01	
		2170853	OR-04	FR-03	FL-01	MP-05	
		2170223, 2170236	OR-01	FR-00	FL-01	MP-01	
	UNITRONIC® BUS PB FD	2170222, 2170822, 2170322	OR-04	FR-02	CF-02	MP-05	174
		2170854	OR-00	FR-03	CF-02	MP-01	
	UNITRONIC® BUS PB TRAY	2170856	OR-02	FR-03	FL-01	MP-03	175
	UNITRONIC® BUS PB FD Y HYBRID	2170875	OR-02	FR-03	CF-02	MP-01	176
	UNITRONIC® BUS PB FD P HYBRID UNITRONIC® BUS PB FD P COMBI	2170227, 2170495	OR-02	FR-02	CF-02	MP-01	
	UNITRONIC® BUS PB TORSION	2170332	OR-04	FR-02	FL-02*	MP-05	177
	UNITRONIC® BUS PB FESTOON	2170331	OR-02	FR-03	FL-02**	MP-01	178
CAN bus	UNITRONIC® BUS CAN	2170260 to 2170270	OR-00	FR-02	FL-02	MP-01	183
		2170500	OR-01	FR-02	FL-00	MP-01	
	UNITRONIC® BUS CAN FD P	2170272 to 2170279	OR-04	FR-02	CF-02	MP-05	184
	UNITRONIC® BUS CAN TRAY	2170857	OR-02	FR-04	FL-02	MP-03	185
RS485/RS422	UNITRONIC® BUS LD	2170203, 2170803 2170204, 2170205	OR-00	FR-02	FL-02	MP-01	189
	UNITRONIC® BUS LD FD P	2170213, 2170813, 2170214, 2170814, 2170215, 2170815	OR-04	FR-02	CF-02	MP-05	189
AS-Interface	UNITRONIC® BUS ASi	2170842, 2170843	OR-02	FR-03	CF-02	MP-01	190
		2170228, 2170229	OR-00	FR-02	FL-02	MP-01	
		2170371, 2170372	OR-00	FR-00	FL-02	MP-01	
		2170230, 2170231, 2170232	OR-04	FR-00	FL-02	MP-02	
	UNITRONIC® BUS ASi FD	2170357, 2170358, 2170317, 2170318	OR-04	FR-02	CF-02	MP-05	191
		2170830, 2170831	OR-02	FR-02	CF-02	MP-02	
Data Highway	UNITRONIC® BUS BlueFlex	3649FD	OR-01	FR-02	CF-01	MP-01	192
INTERBUS	UNITRONIC® BUS INTERBUS	2170206	OR-00	FR-02	FL-02	MP-01	193
		2170208	OR-04	FR-02	FL-02	MP-05	
		2170209	OR-00	FR-02	FL-02	MP-01	
		2170207, 2170217	OR-00	FR-02	FL-00	MP-01	
	UNITRONIC® BUS INTERBUS FD	2170216, 2170218	OR-04	FR-02	CF-02	MP-05	194
		2170818	OR-04	FR-02	CF-02	MP-05	
Genius™	UNITRONIC® BUS Genius	911264	OR-04	FR-02	CF-01	MP-05	195
CC-Link	UNITRONIC® BUS CC-Link	2170360	OR-00	FR-03	FL-02	MP-01	196
	UNITRONIC® BUS CC-Link FD	2170370	OR-04	FR-02	CF-02	MP-05	197
FOUNDATION Fieldbus	UNITRONIC® BUS FOUNDATION Fieldbus	2170350	OR-02	FR-03	FL-02	MP-01	198
		2170351, 2170353	OR-02	FR-03	FL-00	MP-01	
		2170352	OR-02	FR-03	FL-02	MP-01	
SAFETY bus	UNITRONIC® BUS SAFETY	2170295	OR-00	FR-02	FL-01	MP-01	199
		2170885	OR-00	FR-02	FL-02	MP-01	
Sensor/ actuator wiring	UNITRONIC® SENSOR FD	7038864 to 7038887	OR-04	FR-02	CF-02	MP-05	200

* Torsion ±180°/m
** Festoon bending: 70 mm min. bending radius

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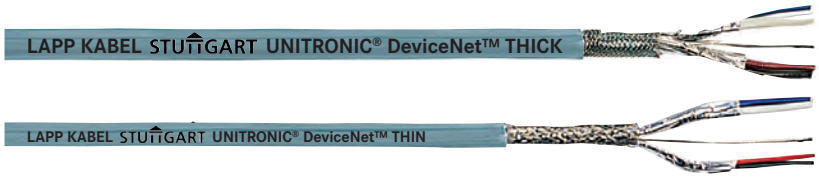
UNITRONIC® BUS DeviceNet™ Gray

For DeviceNet bus systems; stationary applications; 120 Ω



UNITRONIC® BUS DeviceNet cables provide reliable data and power transfer between industrial automation devices like sensors, actuators & PLCs. The cables are designed to perform in harsh chemical & mechanical environments and are in full compliance with ODVA specifications.

Recommended applications

DeviceNet bus systems; automation devices like sensors, actuators, PLCs, and PCs

Rate table

Communication rate	Maximum length: trunk cable				Maximum length: drop cable			
	THICK		THIN		THICK		THIN	
	ft	m	ft	m	ft	m	ft	m
125 Kbps	1640	500	328	100	512	156	20	6
250 Kbps	820	250	328	100	256	78	20	6
500 Kbps	328	100	328	100	128	39	20	6

Construction

Conductors: stranded tinned copper

Insulation: power conductors: PVC • data conductors: polyethylene

Shielding: pairs: tri-laminated foil shield (100% coverage) • tinned copper drain wire; overall foil wrap and braid (65% coverage)

Jacket: PVC; gray

Application advantage

- Cable can supply device with power and data, wiring is minimized
- Full compliance with ODVA specifications
- Communication rate up to 500 Kbps

Approvals

UL · CSA · DeviceNet · RoHS

Cable attributes page 648

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

Complete the installation

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

DeviceNet™ cordsets
page 631

Technical data

Minimum bend radius:
- for installation: 10 x cable diameter

Temperature range: -20°C to +75°C

Nominal voltage: 300V

Characteristic impedance: 120 Ω

Nominal capacitance: 12 pF/ft

Color code:
- power pair: red & black
- data pair: blue & white

Approvals: UL: CL2
Canada: CSA AWM

Part number	Type	Conductor description	Nominal outer diameter		Copper weight	Approx. weight	SKINTOP® MS-SC
			in	mm	lbs/mft	lbs/mft	PG thread
4001	Thick	18 AWG/1pr + 15 AWG/1pr	0.437	11.1	57	140	53112240
4002	Thin	24 AWG/1pr + 22 AWG/1pr	0.260	6.6	20	43	53112210

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® BUS DeviceNet™ FD Gray

For DeviceNet bus systems; continuous flex applications; 120 Ω

UNITRONIC® BUS DeviceNet FD cables provide reliable data and power transfer between industrial automation devices like sensors, actuators & PLCs. The cables are designed to perform in harsh chemical & mechanical environments and are in full compliance with ODVA specifications.

Recommended applications

DeviceNet bus systems; cable tracks and moving machine parts, automation devices like sensors, actuators, PLCs, and PCs

Rate table

Communication rate	Maximum length: trunk cable THICK ft	THICK m	THIN ft	THIN m	Maximum length: drop cable THICK ft	THICK m	THIN ft	THIN m
125 Kbps	1640	500	328	100	512	156	20	6
250 Kbps	820	250	328	100	256	78	20	6
500 Kbps	328	100	328	100	128	39	20	6

Construction

Conductors: stranded tinned copper

Insulation: power conductors: PVC • data conductors: polyethylene

Shielding: pairs: tri-laminated foil shield (100% coverage) • tinned copper drain wire; overall foil wrap and braid (65% coverage)

Jacket: PVC; gray

Application advantage

- Cable can supply device with power and data, wiring is minimized
- Full compliance with ODVA specifications
- Communication rate up to 500 Kbps
- Oil-resistant PVC jacket

Approvals

Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

DeviceNet RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-03
MOTION	CF-02*	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

DeviceNet™ cordsets
page 631

Technical data

Minimum bend radius:
- for continuous flexing: 10 x cable diameter

Temperature range: -20°C to +75°C

Nominal voltage: 300V

Characteristic 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 (6001)
CSA CMG (6002)
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Type	Conductor description	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
6001	Thick	18 AWG/1pr + 14 AWG/1pr	0.468	11.9	60	145	53112240
6002	Thin	24 AWG/1pr + 22 AWG/1pr	0.283	7.2	23	43	53112210

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UNITRONIC® BUS DeviceNet™ Violet

For DeviceNet bus systems; stationary applications; 120 Ω

UNITRONIC® BUS DeviceNet cables provide reliable data and power transfer between industrial automation devices like sensors, actuators & PLCs. The cables are designed to perform in harsh chemical & mechanical environments and are in full compliance with ODVA specifications.

Construction

Conductors: stranded tinned copper

Insulation: power conductors: PVC (PVC jacket); polyethylene (halogen-free jacket) • data conductors: polyethylene

Shielding: pairs: tri-laminated foil shield • tinned copper drain wire; overall foil wrap and braid

Jacket: PVC or halogen-free; violet

Recommended applications

DeviceNet bus systems; automation devices like sensors, actuators, PLCs, and PCs

Application advantage

- Cable can supply device with power and data, minimizing wiring
- Communication rate up to 500Kbps
- Oil-resistant PVC or halogen-free jacket options
- Full compliance with ODVA specifications

Approvals

c UL us · DeviceNet · DNV·GL · RoHS

Cable attributes	Complete the installation	ÖLFLEX® CONNECT solution
See attribute list by part number on page 166	SKINTOP® MS-SC page 522	ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for installation: 7.5 x cable diameter

Temperature range:
- PVC: -20°C to +75°C
- halogen-free: -25°C to +75°C

Nominal voltage: 300V

Characteristic impedance: 120 Ω

Nominal capacitance: 12 pF/ft

Color code:
- power pair: red & black
- data pair: blue & white

Approvals:
UL: CMG
PLTC (2170342, 2170340)
CL2 (2170343)
DNV GL Certification (2170340, 2170341)
CL2 (2170343)
Canada: c(UL) CMG

Part number	Type	Jacket material	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170342	Thick	PVC	18 AWG/1pr + 15 AWG/1pr	0.480	12.2	59	129	53112240
2170343	Thin	PVC	24 AWG/1pr + 22 AWG/1pr	0.272	6.9	22	45	53112210
2170340	Thick	halogen-free & flame retardant (FRNC)	18 AWG/1pr + 15 AWG/1pr	0.480	12.2	59	131	53112240
2170341	Thin	halogen-free & flame retardant (FRNC)	24 AWG/1pr + 22 AWG/1pr	0.272	6.9	22	47	53112210

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UNITRONIC® BUS DeviceNet™ FD Violet

For DeviceNet bus systems; continuous flex applications; 120 Ω

UNITRONIC® BUS DeviceNet FD cables provide reliable data and power transfer between industrial automation devices like sensors, actuators & PLCs. The cables are designed to perform in harsh chemical & mechanical environments and are in full compliance with ODVA specifications.

Construction

Conductors: stranded tinned copper

Insulation: power conductors: PVC (PVC jacket); polyethylene (PUR jacket) • data conductors: polyethylene

Shielding: pairs: tri-laminated foil shield • tinned copper drain wire; overall foil wrap and braid

Jacket: PVC or polyurethane; violet

Recommended applications

DeviceNet bus systems; cable tracks and moving machine parts; automation devices like sensors, actuators, PLCs, and PCs

Application advantage

- Cable can supply device with power and data, minimizing wiring
- Communication rate up to 500Kbps
- Oil-resistant PVC or abrasion-resistant PUR
- Full compliance with ODVA specifications

Approvals

c UL us · DeviceNet · RoHS

Cable attributes page 648

See attribute list by part number on page 166

Complete the installation

SKINTOP® MS-SC page 522

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for continuous flexing: 15 x cable diameter

Temperature range:
- PUR: -40°C to +75°C
- PVC: -10°C to +75°C

Nominal voltage: 300V

Characteristic impedance: 120 Ω

Nominal capacitance: 12 pF/ft

Color code:
- power pair: red & black
- data pair: blue & white

Approvals:
UL: CMG (2170346, 2170347)
CMX (2170344, 2170345)
PLTC (2170346)
CLX2 (2170344, 2170345)
CL2 (2170347)
Canada: c(UL) CMG (2170346, 2170347)
c(UL) CMX (2170344, 2170345)

Part number	Type	Jacket material	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170344	Thick	PUR	18 AWG/1pr + 15 AWG/1pr	0.480	12.2	63	124	53112240
2170345	Thin	PUR	24 AWG/1pr + 22 AWG/1pr	0.272	6.9	22	45	53112210
2170346	Thick	PVC	18 AWG/1pr + 15 AWG/1pr	0.480	12.2	63	131	53112240
2170347	Thin	PVC	24 AWG/1pr + 22 AWG/1pr	0.272	6.9	22	47	53112210

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DeviceNet™ field wireable connectors

DN4110150
DN4110151

DN4110152
DN4110153

DN4110157

DN4110156

DN4110155

DN4110154

Application advantage

- Quick & easy on-site assembly

Technical data

Temperature range: max +85 °C

Nominal voltage:
- ⅞": 250V
- M12: 125V

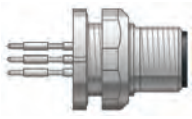
Nominal current:
- ⅞": 9A
- M12: 4A

Part number male	Part number female	Number of positions	Size	Termination	Cable diameter in	Cable diameter mm	Nominal voltage	Nominal current
⅞" straight connectors								
DN4110150	DN4110152	5	PG 9	screw	0.234 - 0.312	6 - 8	250V	9A
DN4110151	DN4110153	5	PG 13	screw	0.390 - 0.468	10 - 12	250V	9A
M12 straight connectors								
DN4110157	DN4110156	5	PG 9	screw	0.156 - 0.312	4 - 8	125V	4A
M12 90° connectors								
DN4110155	DN4110154	5	PG 9	screw	0.156 - 0.312	4 - 8	125V	4A

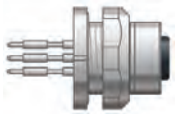
DeviceNet™ PCB connectors

DN4110007

DN4110045



DN4110044



Technical data

Temperature range: -40 °C to 105 °C

Part number	Connector	Number of positions	Nominal voltage	Nominal current
DN4110007	female ⅞"	5	300V	9A
DN4110044	female M12	5	250V	4A
DN4110045	male M12	5	250V	4A

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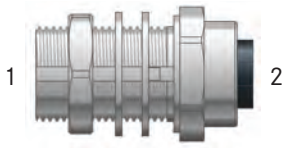
DeviceNet™ feed-through receptacles

DN4110043

DN4110051



Technical data

Temperature range: -40°C to 75°C

IP Protection rating: IP67

Part number	Connectors 1	Connectors 2	Number of positions	Nominal voltage	Nominal current
DN4110051	male 7/8"	female 7/8"	5	300V	9A
DN4110043	male M12	female M12	5	250V	4A

DeviceNet™ T-connectors

DN4110014

DN4110013

DN4110012

Technical data

Temperature range: -40°C to 75°C

Part number	Connectors 1	Connectors 2	Connectors 3	Number of positions	Nominal voltage	Nominal current
DN4110012	female 7/8"	female 7/8"	male 7/8"	5	300V	9A
DN4110013	female M12	female M12	male M12	5	250V	4A
DN4110014	male 7/8"	female M12	female 7/8"	5	250V	4A

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UNITRONIC® BUS PB

For PROFIBUS-DP/FMS/FIP bus systems; stationary applications; 150 Ω

UNITRONIC® BUS PB cables are designed for automation networks requiring fast and reliable data exchange between controllers and field devices. Additional styles are available upon request (e.g., armored, high temperature, direct burial for outdoor, PROFIBUS PA for intrinsic safety).

Recommended applications

Automation devices like sensors, actuators, PLCs, and PCs in dry or damp environments; PROFIBUS-DP/FMS/FIP bus systems

Max. cable length by bit rate for one bus segment

Communication rate	Length of cable segment ft	m
93.75 Kbps	3936	1200
187.5 Kbps	3280	1000
500 Kbps	1312	400
1.5 Mbps	656	200
12.0 Mbps	328	100

Construction

Conductors: solid and stranded bare copper

Insulation: polyethylene

Shielding: specially designed foil/tinned copper braid

Jacket: PVC, PUR, or halogen-free; violet • reinforced jacket: PVC; black

Application advantage

- Maximum EMI protection
- Fast connect style for quick installation
- Communication rate up to 12.0 Mbit/s
- LAPP is a member of the PROFIBUS User Organization (PNO)
- Call your sales representative for additional styles

Approvals

c UL us · PROFIBUS · RoHS

Cable attributes page 648

See attribute list by part number on page 166

Complete the installation

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EPIC® DATA connectors page 179

ÖLFLEX® CONNECT solution

PROFIBUS cordsets page 626

Technical data

Minimum bend radius:
- for installation: 10 x cable diameter

Temperature range:
- PVC & PUR: -40°C to +80°C
- halogen-free: -30°C to +80°C

Characteristic impedance: 150 Ω ± 15 Ω

Nominal capacitance: 9 pF/ft

Color code: red & green pair

Approvals:
UL: CMG (see table below)
CMX (see table below)
CL3 (2170824, 2170820)
Canada: c(UL) CMG (see table below)
c(UL) CMX (see table below)

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170220	PVC	22 AWG/1pr	–	0.315	8	20	50	53112220
2170219	PVC	22 AWG/1pr	UL/CSA CMX	0.315	8	20	38	53112220
2170824*	PVC	24 AWG/1pr, 7 wire	UL/CSA CMG	0.315	8	20	37	53112220
Fast connect								
2170820	PVC	22 AWG/1pr	UL/CSA CMG	0.315	8	17	56	53112220
2170853	halogen-free	22 AWG/1pr	UL/CSA CMG	0.315	8	20	50	53112220
2170326	halogen-free	22 AWG/1pr	–	0.315	8	20	50	53112220
2170330	PUR	22 AWG/1pr	UL/CSA CMX	0.315	8	20	50	53112220
2170826	PVC	24 AWG/1pr, 7 wire	UL/CSA CMG	0.315	8	20	45	53112220
Reinforced black jacket								
2170223	PVC	22 AWG/1pr	–	0.370	9.4	20	74	53112220
2170236	PVC/PVC	22 AWG/1pr	–	0.374	9.5	20	59	53112220

*For applications where vibrations occur

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UNITRONIC® BUS PB FD

For PROFIBUS-DP/FMS/FIP bus systems; continuous flex applications; 150 Ω

UNITRONIC® BUS PB FD cables are designed for automation networks requiring fast and reliable data exchange between controllers and field devices.

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: specially designed foil/tinned copper braid

Jacket: polyurethane or halogen-free; violet

Recommended applications

Highly flexible applications like cable tracks & moving machine parts; PROFIBUS-DP/FMS/FIP bus systems

Application advantage

- Oil-resistant and flame retardant outer jacket
- Fast connect style for quick installation
- Communication rate up to 12 Mbit/s
- LAPP is a member of the PROFIBUS User Organization (PNO)

Approvals

c UL us · PROFIBUS · Continuous Flex Test Method Verified (UL VERIFIED verifyUL.com A522492) · RoHS

Cable attributes page 648

See attribute list by part number on page 166 *

Complete the installation

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ÖLFLEX® CONNECT solution

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Technical data

Minimum bend radius:
- for continuous flexing:
  - 2170222 & 2170822: 9 x cable diameter
  - 2170322 & 2170854: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -30°C to +70°C

Characteristic impedance: 150 Ω ± 15 Ω

Nominal capacitance: 9 pF/ft

Color code: red & green pair

Approvals:
UL: CMX (2170822, 2170322)
CM (2170997)
Canada: c(UL) CMX (2170822, 2170322)
c(UL) CM (2170854)
Additional: Torsion rated for wind market (± 150°/m) (2170222, 2170822)
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170222	PUR	24 AWG/1pr	–	0.315	8	20	43	53112220
2170822	PUR	24 AWG/1pr	UL/CSA CMX	0.315	8	20	39	53112220
Fast connect								
2170322	PUR	24 AWG/1pr	UL/CSA CMX	0.315	8	17	53	53112220
2170997	halogen-free	24 AWG/1pr	UL CMG	0.315	8	20	50	53112220

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UNITRONIC® BUS PB TRAY

For PROFIBUS-DP/FMS bus systems; stationary tray applications; 150 Ω

UNITRONIC® BUS PB TRAY is designed for automation networks requiring fast and reliable data exchange between controllers and field devices.

Construction

Conductors: solid bare copper
Shielding: specially designed foil/tinned copper braid
Inner jacket: PVC; violet
Jacket: PVC; violet

Recommended applications

Automation devices like sensors, actuators, PLCs, and PCs in dry or damp environments; stationary tray applications for PROFIBUS-DP/FMS bus systems

Application advantage

- Designed for tray applications (PLTC-ER)
- Highly flame retardant
- Oil-resistant jacket
- Fast connect style for quick installation

Approvals

c UL us c UL us PROFIBUS RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	FL-01	MECH.	MP-03

Complete the installation

SKINTOP® MS-SC
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EPIC® DATA connectors
page 179

Technical data

Minimum bend radius: 8 x cable diameter

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

Nominal voltage: 250V (not for power applications)

Characteristic impedance: 150 Ω ± 15 Ω

Color code: red & green pair

Approvals:
UL: CMG per UL 444
PLTC-ER per UL 13
AWM 20201
Attributes: UL Oil Res I
Sunlight resistant
Canada: c(UL) CMG FT4

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170856	PVC	22 AWG/1pr	UL/CSA CMG	0.331	8.4	17	55	53112220

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UNITRONIC® BUS PB FD HYBRID/COMBI

For PROFIBUS-DP/FMS/FIP bus systems; continuous flex applications; 150 Ω

UNITRONIC® BUS PB FD HYBRID/COMBI is designed for automation networks requiring fast and reliable data exchange between controllers and field devices.

Construction

Conductors: data pairs: stranded bare copper • power conductors: stranded bare copper

Insulation: data pairs: polyethylene • power conductors: PVC

Shielding: shielded pair and 4 control conductors twisted together with yarn • data pairs: specially designed foil/tinned copper braid

Jacket: PVC or PUR; violet

Recommended applications

Highly flexible hybrid (data and power) applications like power chains & moving machine parts; PROFIBUS-DP/FMS/FIP bus systems

Application advantage

- Hybrid cable for data transmission and power supply
- Oil-resistant and flame retardant outer jacket
- Sunlight resistant
- LAPP is a member of the PROFIBUS User Organization (PNO)

Approvals

Continuous Flex Test Method Verified A522492

Cable attributes page 648

See attribute list by part number on page 166 *

Complete the installation

SKINTOP® MS-SC page 522

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for continuous flexing: 15 x cable diameter

Temperature range:
- 2170875: -5°C to +80°C
- 2170227: -5°C to +50°C
- 2170495: -30°C to +60°C

Nominal voltage: (not for power applications)
- 2170875: 600V
- 2170227 & 2170495: 100V

Characteristic impedance: 150 Ω ± 15 Ω

Nominal capacitance: 9 pF/ft

Color code:
- data pairs: red & green
- power conductors: black conductors with white numbers: 1, 2, 3, 4

Approvals:
UL: CMG*
CL3*
Canada: c(UL) CMG*
*UNITRONIC® BUS PB FD Y HYBRID
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
UNITRONIC® BUS PB FD Y HYBRID								
2170875	PVC	24 AWG/1pr + 16 AWG/4c	UL/CSA CMG	0.445	11.3	60	104	S2116
UNITRONIC® BUS PB FD P COMBI								
2170227	PUR	24 AWG/1pr + 18 AWG/3c	–	0.398	10.1	40	84	S2116
UNITRONIC® BUS PB FD P HYBRID								
2170495	PUR	24 AWG/1pr + 16 AWG/4c	–	0.445	11.3	60	100	S2116

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UNITRONIC® BUS PB TORSION

For PROFIBUS-DP/FMS/FIP bus systems; torsion applications; 150 Ω

UNITRONIC® BUS PB TORSION is designed for automation networks requiring fast and reliable data exchange between controllers and field devices.

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: specially designed foil/tinned copper braid

Jacket: halogen-free polyurethane; violet

Recommended applications

Torsion applications like robots; PROFIBUS-DP/FMS/FIP bus systems

Application advantage

- For torsional stress ± 180°/meter
- Halogen-free and flame retardant outer jacket
- Communication rate up to 12 Mbit/s
- LAPP is a member of the PROFIBUS User Organization (PNO)

Approvals

c UL us

PROFIBUS®

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® DATA connectors
page 179

Technical data

Minimum bend radius:
- for stationary use: 4 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range: -25°C to +75°C

Nominal voltage: 300V (not for power applications)

Characteristic impedance: 150 Ω ± 15 Ω

Nominal capacitance: 9 pF/ft

Color code: red & green

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

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170332	PUR	22 AWG/1pr	UL/CSA CMX	0.315	8	21	44	53112220

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® BUS PB FESTOON

For PROFIBUS-DP/FMS/FIP bus systems; festoon applications; 150 Ω

UNITRONIC® BUS PB FESTOON is designed for automation networks requiring fast and reliable data exchange between controllers and field devices.

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: specially designed foil/tinned copper braid

Jacket: PVC; violet

Recommended applications

Festoon applications like cable trolleys; PROFIBUS-DP/FMS/FIP bus systems

Application advantage

- CL3 rating for installation in trays
- Oil-resistant and flame retardant outer jacket
- Communication rate up to 12 Mbit/s
- Sunlight resistant
- LAPP is a member of the PROFIBUS User Organization (PNO)

Approvals

cULus PROFIBUS RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 4 x cable diameter
- for flexible use: 9 x cable diameter

Temperature range:
- for stationary use: -40°C to +75°C
- for flexible use: -5°C to +70°C

Nominal voltage: 600V (not for power applications)

Characteristic impedance: 150 Ω ± 15 Ω

Nominal capacitance: 9 pF/ft

Color code: red & green

Approvals: UL: CMG, CL3
Canada: c(UL) CMG

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170331	PVC	24 AWG/1pr	UL/CSA CMG	0.315	8	17	43	53112220

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EPIC® DATA PROFIBUS® connectors

35°, 90° & 180° with screw terminal

EPIC® DATA PROFIBUS connectors are screw terminal, 9 pin D-sub connectors with an integrated adjustable termination resistor. Connectors are available with additional programming/diagnostic interface. The following designs are available: 35° angled, 90° angled, 180° angled, 90° angled with LED for easy troubleshooting and visual connection control.

Usage notes

- When used as a through connector the switch must be in the “OFF” position. If used as a terminating connector the switch must be in the “ON” position.
- If the switch is in the “ON” position, the outgoing bus cable is disconnected.
- Switch is clearly visible when connector is plugged in and operational.
- LED version: 3 status LEDs indicate: bus operation (green), station transmission (blue), terminating resistor “on” (orange)
- D-sub pin assignment in accordance with PROFIBUS

Approvals

Design

Connection type: screw terminal

For cable diameter: 0.197 - 0.315 in (5 - 8 mm)

Terminating resistor: integrated resistor combination that is connected by a sliding switch

Interface: 9 pin D-sub socket

Weight: 40g

Insertion/withdrawal cycles: > 200

Application advantage

- Standardized interfaces
- Cost-saving due to quick installation
- Easy to connect
- Small design
- Fully compatible with market standard

Technical data

Temperature range:
- operating: 0°C to +60°C
- transport & storage: -25°C to +80°C
- relative humidity: max. 75% at +25°C

Protection rating: IP20

Supply voltage: 4.75 - 5.25V DC

Transmission rate: max. 12 Mbit/s

Current consumption: max. 12.5 mA

Interface:
- PROFIBUS station: 9 pin D-sub socket
- PROFIBUS cable: 4 terminal blocks for wires up to 1 mm²

Approvals:
UL: Programmable Controllers: Components
Canada: Programmable Controllers Certified: Component
Additional: CE & RoHS

Part number	Cable outlet	Programming/ diagnostics	Diagnostics LED	Dimensions (L × W × H) mm	Current consumption
21700506	35°	yes	no	54 × 40 × 17	12.5 mA
21700507	35°	no	no	54 × 40 × 17	12.5 mA
21700503	90°	yes	no	64 × 40 × 17	12.5 mA
21700504	90°	no	no	64 × 40 × 17	12.5 mA
21700529	90°	yes	yes	64 × 40 × 17	35 mA
21700530	90°	no	yes	64 × 40 × 17	35 mA
21700505	180°	no	no	68 × 39.5 × 17	12.5 mA

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If not otherwise specified, all values relating to the product are nominal values.
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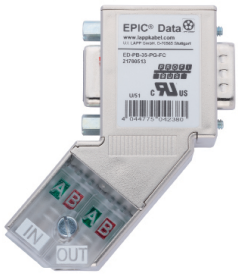
EPIC® DATA PROFIBUS® connectors

35°, 90° & 180° fast connect



Installation tools

Fast connect stripping tool
page 262

EPIC® DATA PROFIBUS connectors are screw terminal, 9 pin D-sub connectors with an integrated adjustable termination resistor. Connectors are available with additional programming/diagnostic interface. The following designs are available: 35° angled, 90° angled, 180° angled, 90° angled with LED for easy troubleshooting and visual connection control.

Usage notes

- When used as a through connector the switch must be in the “OFF” position. If used as a terminating connector the switch must be in the “ON” position.
- If the switch is in the “ON” position, the outgoing bus cable is disconnected.
- Switch is clearly visible when connector is plugged in and operational.
- LED version: 3 status LEDs indicate: bus operation (green), station transmission (blue), terminating resistor “on” (orange)
- D-sub pin assignment in accordance with PROFIBUS

Approvals

Design

Connection type: fast connect

For cable diameter: 0.197 - 0.315 in (5 - 8 mm)

Termination resistor: integrated resistor combination that is connected by a sliding switch

Interface: 9 pin D-sub socket

Weight: 40g

Insertion/withdrawal cycles: 50g

Application advantage

- Suitable for FC cables
- Standardized interfaces
- Cost-saving due to quick installation
- Easy to connect
- Fully compatible with market standard

Technical data

Temperature range:
- operating: -25°C to +60°C
- transport & storage: -25°C to +80°C
- relative humidity: max. 75% at +25°C

Protection rating: IP20

Supply voltage: 4.75 - 5.25V DC (supplied from terminal)

Transmission rate: max. 12 Mbit/s

Interface:
- PROFIBUS station: 9 pin D-sub socket
- PROFIBUS cable: FC standard cable ø 0.64 mm

Approvals:
Components
UL: Programmable Controllers:
Canada: Programmable Controllers Certified: Component
Additional: CE & RoHS

Part number	Cable outlet	Programming/ diagnostics	Diagnostics LED	Cable type	Dimensions (L × W × H) mm	Current consumption
21700511	35°	no	no	solid	95 × 70 × 17	12.5 mA
21700515	35°	yes	no	stranded	95 × 70 × 17	12.5 mA
21700514	35°	no	no	stranded	95 × 70 × 17	12.5 mA
21700501	90°	yes	no	solid or stranded	72 × 40 × 17	12.5 mA
21700502	90°	no	no	solid or stranded	72 × 40 × 17	12.5 mA
21700546	90°	yes	yes	solid or stranded	72 × 40 × 17	35 mA
21700547	90°	no	yes	solid or stranded	72 × 40 × 17	35 mA
21700544	180°	no	no	solid or stranded	70 × 35 × 17	12.5 mA

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PROFIBUS® field wireable M12 connectors

Application advantage

- Quick and easy on-site assembly
- Robust shielded design
- Space-saving compact design

Approvals

Technical data

Temperature range:	-40°C to +85°C	**Coding:**	B-inverse
Nominal voltage:	60V	**Protection rating:**	IP67
Nominal current:	4A	**Approvals:**	RoHS
Contact resistance:	3mΩ		

Part number		Number of positions	Size	Termination	Conductor cross section		Cable diameter	
male	female				AWG	mm²	in	mm
22260653	22260646	5	PG 9	screw	24 - 18	0.25 - 0.75	0.234 - 0.332	6 - 8.5
22262078	22260889	5	PG 11	screw	24 - 18	0.25 - 0.75	0.315 - 0.394	8 - 10

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PROFIBUS® termination resistors

Application advantage

- Robust design
- Standardized interfaces
- Space-saving compact design
- Female connector with shielded design

Approvals

Technical data

Temperature range:
- male: -25°C to +90°C
- female: -40°C to +85°C

Nominal voltage:
- male: 60V
- female: 32V

Nominal current: 4A

Contact resistance: 5mΩ

Coding: B-inverse

Protection rating:
- male: IP65/IP67
- female: IP67

Approvals: RoHS

Part number	Connector	Number of positions	Nominal voltage	Nominal current	Pack size
22260722	male M12	4	60V	4A	5
22261001	female M12	4	32V	4A	5

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UNITRONIC® BUS CAN

For CAN bus systems; stationary applications; 120 Ω

UNITRONIC® BUS CAN is designed to the CAN open and ISO11898 standard. It is well suited for high-speed motion control and feedback loop applications, providing high reliability and efficient use of network bandwidth.

Construction

Conductors: 7-wire strands of bare copper

Insulation: polyethylene

Shielding: foil wrap; tinned copper braid shield

Jacket: PVC; violet • reinforced jacket: PE; black

Recommended applications

Motion control systems; assembly, welding, and material handling machines; single cable wiring of multi-input sensor blocks; smart sensors; pneumatic valves; barcode readers; drives and operator interfaces

Application advantage

- Signal integrity in stationary motion applications
- Flame retardant
- Oil-resistant jacket
- Flexible for ease of routing
- Supports SAE J1939 physical layer in accordance with ISO 11898

Rate table

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

Approvals

c UL us

RoHS

Cable attributes page 648

OIL OR-00 | FLAME FR-02
MOTION FL-02 | MECH. MP-01

Complete the installation

SKINTOP® MS-SC page 522

EPIC® DATA connectors page 186

Technical data

Minimum bend radius: 10 x cable diameter

Temperature range: -30°C to +80°C

Nominal voltage: 250V (not for power applications)

Characteristic impedance: 120 Ω ± 15Ω

Nominal capacitance: 12 pF/ft

Color code: DIN 47100: chart 8, page 682
- pair 1: white & brown
- pair 2: green & yellow

Approvals:
UL: CMX
Canada: c(UL) CMX
*not for 2170500

Part Number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170260	24 AWG/1pr	0.224	5.7	11	28	53112220
2170261	24 AWG/2pr	0.299	7.6	23	46	53112220
2170263	22 AWG/1pr	0.268	6.8	17	37	53112220
2170264	22 AWG/2pr	0.335	8.5	31	59	53112220
2170266	20 AWG/1pr	0.296	7.5	28	60	53112220
2170267	20 AWG/2pr	0.382	9.7	40	71	53112230
2170269	19 AWG/1pr	0.343	8.7	35	73	53112220
2170270	19 AWG/2pr	0.453	11.5	54	95	53112230
Reinforced black jacket (outdoor/ direct burial)						
2170500	20 AWG/4c	0.354	9.0	28	61	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
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UNITRONIC® BUS CAN FD P

For CAN bus systems; continuous flex applications; 120 Ω

UNITRONIC® BUS CAN FD P is designed to the CAN open and ISO 11898 standard. It is well suited for high-speed motion control and feedback loop applications, providing high reliability and efficient use of network bandwidth.

Construction

Conductors: finely stranded bare copper

Insulation: polyethylene

Shielding: tinned copper braid shield

Jacket: halogen-free polyurethane; violet

Recommended applications

Motion control systems; assembly, welding, and material handling machines; single cable wiring of multi-input sensor blocks; smart sensors; pneumatic valves; barcode readers; drives and operator interfaces

Application advantage

- Designed for continuous flex applications
- Signal integrity in stationary motion applications
- Flame retardant
- Oil-resistant jacket
- Flexible for ease of routing
- Supports SAE J1939 physical layer in accordance with ISO 11898

Rate table

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

Approvals

Continuous Flex Test Method Verified UL VERIFIED verify.ul.com A522492

c UL us

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-05

Complete the installation

EPIC® DATA connectors
page 186

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 (not for power applications)

Characteristic impedance: 120 Ω ± 15Ω

Nominal capacitance: 18 pF/ft

Color code: DIN 47100: chart 8, page 682
- pair 1: white & brown
- pair 2: green & yellow

Approvals:
UL: CMX
Canada: c(UL) CMX
Additional:
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part Nnmber	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170272	24 AWG/1pr	0.252	6.4	16	27	53112210
2170273	24 AWG/2pr	0.331	8.4	22	44	53112220
2170275	22 AWG/1pr	0.268	6.8	22	40	53112210

Part Nnmber	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170276	22 AWG/2pr	0.378	9.6	35	59	53112230
2170278	20 AWG/1pr	0.315	8.0	28	50	53112220
2170279	20 AWG/2pr	0.426	10.8	40	67	53112230

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® BUS CAN TRAY

For CAN bus systems; stationary tray applications; 120 Ω

UNITRONIC® BUS CAN TRAY is designed to the CAN open and ISO 11898 standard. It is well-suited for high-speed motion control and feedback loop applications, providing both high reliability and efficient use of network bandwidth.

Construction

Conductors: 7-wire strands of bare copper

Inner jacket: PVC

Shielding: tinned copper braid

Jacket: PVC; violet

Recommended applications

Stationary cable tray applications; motion control systems; assembly, welding, and material handling machines; single-cable wiring for multi-input sensor blocks; smart sensors; pneumatic valves; barcode readers; operator interfaces

Application advantage

- Designed for tray applications (PLTC-ER)
- Highly flame retardant
- Oil-resistant jacket
- Maximum bit rate: 1 Mbit/s @ 40 m
- Sunlight resistant
- Supports SAE J1939 physical layer in accordance with ISO 11898

Approvals

c UL us c UL us RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-04
MOTION	FL-02	MECH.	MP-03

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® DATA connectors
page 186

Technical data

Minimum bend radius: 8 x cable diameter

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

Nominal voltage: 250V (not for power applications)

Characteristic impedance: 120 Ω ± 15Ω

Color code: DIN 47100: chart 8, page 682
- pair 1: white & brown
- pair 2: green & yellow

Approvals:
UL: CMG per UL 444
PLTC-ER per UL 13
AWM 21695
Attributes: UL Oil Res I
sunlight resistant
Canada: CSA CMG FT 4

Part number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170857	22 AWG/2pr	0.296	7.5	24	54	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® DATA CAN bus connectors

90° & 180° with screw terminal

EPIC® DATA CAN bus connectors are screw terminal, 9 pin D-sub connectors with an integrated adjustable termination resistor. Connectors are available with additional programming/diagnostic interface. The following designs are available: 90° angled or 180° angled

Usage notes

- When used as a through connector the switch must be in the “OFF” position. If used as a terminating connector, the switch must be in the “ON” position
- No loose parts
- D-sub pin assignment in accordance with CAN bus

Approvals

cULus CE RoHS

Design

Connection type: screw terminal

For cable diameter: 0.197 - 0.315 in (5 - 8 mm)

Termination resistor: 120 Ω integrated and connectable with slide switch

Interface: 9 pin D-sub socket

Weight: 40 g

Insertion/withdrawal cycles: > 200

Application advantage

- With additional 24V DC output to supply external devices (GND = pin, CAN V+ = pin 9)
- Cost-saving due to quick installation
- Easy to connect
- Standardized interfaces

Technical data

Temperature:
- operating: 0°C to +60°C
- transport & storage: -25°C to +75°C
- relative humidity: max. 75% at +25°C

Protection rating: IP20

Transmission rate: max. 1 Mbit/s

Interface:
- CAN bus station: 9 pin D-sub socket
- CAN bus cable: 6 terminal blocks for wires up to 1 mm²
- D-sub assignments: pin 2: CAN Low pin 7: CAN High pin 3: CAN Gnd pin 9*: CAN V+ pin 6*: Gnd
  * 90° version only

Approvals:
UL: Programmable Controllers: Components
Canada: Programmable Controllers Certified: Component
Additional: CE & RoHS

Part number	Cable outlet	Programming/ diagnostics	Diagnostics LED	Dimensions (L × W × H) mm
21700536	90°	yes	no	65 × 48 × 16
21700537	90°	no	no	65 × 48 × 16
21700538	180°	no	no	67.5 × 35 × 17

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

CAN bus field wireable M12 connectors

Application advantage

- Quick and easy on-site assembly
- Robust shielded design
- Space-saving compact design

Approvals

RoHS

Technical data

Temperature range:	-40°C to +85°C	**Coding:**	A-standard
Nominal voltage:	60V	**Protection rating:**	IP67
Nominal current:	4A	**Approvals:**	RoHS
Contact resistance:	3mΩ		

Part number male	Part number female	Number of positions	Size	Termination	Conductor cross section AWG	Conductor cross section mm²	Cable diameter in	Cable diameter mm
22260135	22260136	5	PG 9	screw	24 - 18	0.25 - 0.75	0.234 - 0.332	6 - 8

CAN bus T-connectors

Application advantage

- Robust shielded design
- Space-saving compact design
- Standardized interfaces

Approvals

RoHS

Technical data

Temperature range:	-20°C to +90°C	**Coding:**	A-standard
Nominal voltage:	60V	**Protection rating:**	IP65/IP67
Nominal current:	4A	**Approvals:**	RoHS
Contact resistance:	5mΩ		

Part number	Connector 1	Connector 2	Connector 3	Number of positions
22260765	female M12	male M12	female M12	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

CAN bus termination resistor

Application advantage

- Robust design
- Standardized interfaces
- Space-saving compact design

Approvals

RoHS

Technical data

Temperature range:	-25 °C to +90 °C	**Coding:**	A-standard
Nominal voltage:	60V	**Protection rating:**	IP65/IP67
Nominal current:	4A	**Approvals:**	RoHS

Part number	Connector	Number of positions	Nominal voltage	Nominal current	Pack size
22260766	male M12	5	60V	4A	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® BUS LD/LD FD P

For RS485/RS422 bus systems; stationary & continuous flex applications; 100 - 120 Ω

UNITRONIC® BUS Long Distance (LD) cables are built after the RS-422 and RS-485 standards and are robust solutions for transmitting data over long distances and noisy environments. Stranded copper conductors and high-performance insulation optimize flexing endurance. Tinned copper braid provides superior EMI protection.

Recommended applications

Bus systems such as Modbus, SUCOnet P, Modulink P, VariNet-P; dry or damp rooms; FD version suitable for continuous flex applications like cable tracks and moving machine parts

Approvals

c UL us

RoHS

Continuous Flex Test Method Verified
UL VERIFIED verify.ul.com A522492

Stationary construction

Conductors: stranded bare copper
Insulation: polyethylene
Shielding: copper braid
Jacket: PVC; violet

Continuous flex construction

Conductors: stranded bare copper
Insulation: polyethylene
Shielding: copper braid
Jacket: polyurethane; violet

Application advantage

- Maximum EMI protection
- PUR jacket resistant to tear, abrasion & mineral oils
- Flexible for ease of routing

Cable attributes page 648
See attribute list by part number on page 166

Complete the installation

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- stationary: 8 x cable diameter
- continuous flex:
  - for installation: 6 x cable diameter
  - for continuous flexing: 15 x cable diameter

Temperature range:
- stationary: -40°C to +80°C
- continuous flex:
  - for installation: -40°C to +80°C
  - for flexible use: -30°C to +70°C

Nominal voltage: 250V

Characteristic impedance: 100 - 120 Ω

Nominal capacitance: 18 pF/ft (800 Hz)

Color code: DIN 47100: chart 8, page 682
- pair 1: white & brown
- pair 2: green & yellow
- pair 3: gray & pink

Approvals: UL: CMX (see below)
Canada: CSA CMX (see below)

Continuous Flex Version (CF-01, CF-02, CF-03)
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Jacket material	Conductor description	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
Stationary								
2170203	PVC	24 AWG/1pr	–	0.225	5.7	12	25	53112210
2170803	PVC	24 AWG/1pr	UL/CSA CMX	0.225	5.7	12	26	53112210
2170204	PVC	24 AWG/2pr	–	0.280	7.1	19	30	53112210
2170205	PVC	24 AWG/3pr	–	0.284	7.2	25	48	53112210
Continuous flex*								
2170213	PUR	24 AWG/1pr	–	0.236	6.0	12	26	53112210
2170813	PUR	24 AWG/1pr	UL/CSA CMX	0.244	6.2	12	26	53112210
2170214	PUR	24 AWG/2pr	–	0.311	7.9	22	44	53112220
2170814	PUR	24 AWG/2pr	UL/CSA CMX	0.327	8.3	22	44	53112220
2170215	PUR	24 AWG/3pr	–	0.315	8.0	26	52	53112220
2170815	PUR	24 AWG/3pr	UL/CSA CMX	0.331	8.4	26	52	53112220

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UNITRONIC® BUS ASi

For Actuator Sensor Interface (AS-i) bus systems; stationary & flexible applications; 140 Ω

UNITRONIC® BUS ASi is a geometrically-coded, 2-conductor flat cable designed for data and power transfer between simple I/O devices on the sensor/actuator level. The cable is available with 3 different jackets: PVC, rubber, or TPE. The voltage drop on the long distance version is smaller due to larger conductor cross-sections.

Recommended applications

Data and power transmission between sensors, actuators, slaves, repeaters and master; TPE version suitable for wet areas and cooling lubricants

Cable attributes page 648

See attribute list by part number on page 166 *

Construction

Conductors: stranded tinned copper
Insulation: PVC, rubber, or TPE
Jacket: PVC, EPDM (rubber), or TPE

Application advantage

- Data and power transmission in one cable
- Quick connections to ASi-module due to piercing technology
- Protection against polarity reversal
- UNITRONIC® BUS ASi LD (Long Distance) allows even longer cable runs; more devices or devices with higher power demand can be connected to the network.

Approvals

Complete the installation

SKINTOP® strain relief page 492

SKINTOP® DIX-ASi page 547

Technical data

Minimum bend radius:
- for stationary use: 12 mm
- for flexible use:
  - PVC & rubber: 24 mm
  - TPE: 16 mm

Temperature range:
- PVC:
  - during use: -30°C to +90°C
  - during installation: -20°C to +90°C
- rubber & TPE:
  - during use: -40°C to +85°C
  - during installation: -30°C to +85°C
- 2170845, 2170846, 2170847, 2170848
  - during use: -40°C to +105°C
  - during installation: -30°C to +105°C

Peak voltage:
- yellow, blue & black: 300V (not for power applications)
- red: 300V

Test voltage: 2000V

Characteristic impedance: 70 - 140 Ω (@ 167 KHz)

Nominal capacitance: 24 pF/ft

Color code: blue & brown

Approvals:
UL: CMG (PVC jacket)
CL2 (PVC jacket)
AWM 2095 (PVC jacket)
AWM 21439 (2170845, 2170846, 2170847, 2170848)
Canada: c(UL) CMG (PVC jacket)
cRU AWM FT2 (2170845, 2170846, 2170847, 2170848, PVC jacket)
Additional: ASi
CE & RoHS

Part number	Jacket construction material	Jacket construction color	Conductor description	Approvals	Application	Copper weight lbs/mft	Approx. weight lbs/mft
2170842	PVC	yellow	2 x 16 AWG	UL/CSA CMG	data & power transmission	19	47
2170843	PVC	black	2 x 16 AWG	UL/CSA CMG	transmission of 30V DC auxiliary power	19	47
2170845	TPE	yellow	2 x 16 AWG	UL/CSA AWM	data & power transmission	19	43
2170846	TPE	black	2 x 16 AWG	UL/CSA AWM	transmission of 30V DC auxiliary power	19	43
2170847	TPE	blue	2 x 16 AWG	UL/CSA AWM	data and power transmission	19	43
2170848	TPE	black	2 x 14 AWG	UL/CSA AWM	transmission of 30V DC auxiliary power	32	57
2170228	EPDM rubber	yellow	2 x 16 AWG	–	data & power transmission	19	57
2170229	EPDM rubber	black	2 x 16 AWG	–	transmission of 30V DC auxiliary power	19	57
2170371	EPDM rubber	yellow	2 x 14 AWG	–	long distance data & power transmission	32	57
2170372	EPDM rubber	black	2 x 14 AWG	–	long distance transmission of 30V DC auxiliary power	32	57
2170230	TPE	yellow	2 x 16 AWG	–	data & power transmission	19	43
2170231	TPE	black	2 x 16 AWG	–	transmission of 30V DC auxiliary power	19	43
2170232	TPE	red	2 x 16 AWG	–	transmission of 230V AC auxiliary power	19	43

If not otherwise specified, all values relating to the product are nominal values.
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UNITRONIC® BUS ASi FD

For Actuator Sensor Interface (AS-i) bus systems; continuous flex applications; 140 Ω

LAPP KABEL STUTTGART UNITRONIC® BUS ASi FD

LAPP KABEL STUTTGART UNITRONIC® BUS ASi FD

UNITRONIC® BUS ASi FD is a geometrically-coded, 2-conductor flat cable designed for data and power transfer between simple I/O devices on the sensor/actuator level. This cable is suitable for continuous flex applications and has a halogen-free PUR or oil-resistant TPE jacket.

Recommended applications

Continuous flex applications e.g. cable tracks and moving machine parts; data and power transmission between sensors, actuators, slaves, repeaters and master

Approvals

Continuous Flex Test Method Verified

Cable attributes page 648

See attribute list by part number on page 166 *

Complete the installation

SKINTOP® strain relief page 492

SKINTOP® DIX-ASi page 547

Construction

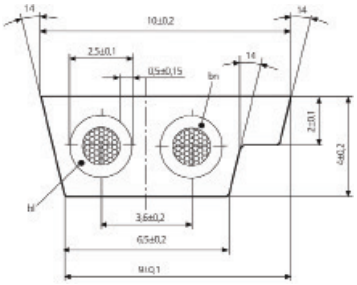
Conductors: stranded tinned copper

Insulation: polyurethane or TPE

Jacket: polyurethane or TPE

Application advantage

- Data and power transmission in one cable
- Quick connections to ASi-module due to piercing technology
- PUR-jacketed version is halogen-free and highly oil-resistant
- UNITRONIC® BUS ASi FD LD (Long Distance) allows even longer cable runs between modules



Technical data

Minimum bend radius:
- for stationary use: 12 mm
- for continuous flexing: 24 mm

Temperature range:
- PUR:
  - fixed installation: -40°C to +80°C
  - flexible without fixing: -30°C to +70°C
- TPE:
  - fixed installation: -40°C to +105°C
  - flexible without fixing: -30°C to +105°C

Peak voltage: 300V

Test voltage: 2000V

Characteristic impedance: 70 - 140 Ω (@ 167 KHz)

Nominal capacitance: 24 pF/ft

Color code: blue & brown

Approvals:
UL: AWM
Canada: cRU AWM
Additional: ASi
CE & RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Jacket construction material	Jacket construction color	Conductor description	Approvals	Application	Copper weight lbs/mft	Approx. weight lbs/mft
2170357	PUR	yellow	2 x 16 AWG	UL/CSA AWM	data & power transmission	19	43
2170358	PUR	black	2 x 16 AWG	UL/CSA AWM	transmission of 30V DC auxiliary power	19	43
2170317	PUR	yellow	2 x 14 AWG	UL/CSA AWM	long distance data & power transmission	32	50
2170318	PUR	black	2 x 14 AWG	UL/CSA AWM	long distance transmission of 30V DC auxiliary power	32	50
2170830	TPE	yellow	2 x 16 AWG	UL/CSA AWM	data & power transmission	19	43
2170831	TPE	black	2 x 16 AWG	UL/CSA AWM	transmission of 30V DC auxiliary power	19	43

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UNITRONIC® BUS BlueFlex™

For Data Highway and Data Highway+ bus systems; continuous flex applications; 78 Ω

UNITRONIC® BUS BlueFlex™ is designed for use in Rockwell Automation® Allen Bradley DH, DH+, and Remote I/O networks. BlueFlex™ is constructed to withstand continuous flex applications where EMC conditions are pervasive.

Construction

Conductors: finely stranded tinned copper

Insulation: electronic-grade flexible TPE

Shielding: overall tape shield; flexible tinned copper braid (85% coverage)

Jacket: PVC; blue

Recommended applications

Industrial automation and process control field networks; sensors; valves; gauges; barcode readers; drives and operator interfaces.

Application advantage

- Signal integrity in continuous motion applications
- Flame- and oil-resistant jacket
- Flexible for ease of routing
- UL AWM USE: external interconnection of electronic equipment

Approvals

Continuous Flex Test Method Verified VERIFIED verify.ul.com A522492

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-01*	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

Technical data

Minimum bend radius:
- for stationary use: 5 x cable diameter
- for continuous flexing: 12 x cable diameter

Temperature range: -20°C to +80°C

Nominal voltage: 300V

Test voltage: 3000V

Characteristic impedance: 78 Ω

Nominal capacitance: 17 pF/ft

Color code: blue/natural

Approvals:
UL: AWM 2661
Attributes: NFPA 79
Additional: RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part Number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
3649FD	20 AWG/1pr	0.242	6.15	14	33	53112210

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UNITRONIC® BUS INTERBUS

For INTERBUS bus systems (IBS); stationary applications; 100 Ω

UNITRONIC® BUS INTERBUS guarantees high operation security during data transmission. This shielded and flexible cable is available with a PVC or PUR jacket (INBC).

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: copper braid

Jacket: PVC or halogen-free polyurethane; violet • reinforced jacket: PVC; black

Recommended applications

Assembly, welding, and material handling machines; wiring of sensors, actuators, and other network devices

Application advantage

- High operation security during data transmission
- Oil-resistant jacket
- Halogen-free & flame retardant PUR jacket
- Certified by INTERBUS Club
- Cable allows data transmission rate of 500 kbit/s at a max. length of 400 m

Approvals

c UL us · RoHS · INTERBUS · PHOENIX CONTACT

Cable attributes page 648

See attribute list by part number on page 166

Complete the installation

SKINTOP® MS-SC page 522

EPIC® connectors page 284

Technical data

Minimum bend radius: 8 x cable diameter

Temperature range: -30°C to +80°C
- reinforced jacket: -40°C to +70°C

Nominal voltage: 250V (not for power applications)

Test voltage: 1500V

Characteristic impedance: 100 Ω ± 15%

Nominal capacitance: 18 pF/ft

Color code: DIN 47100: chart 8, page 682
- data conductors: white/brown, green/yellow, gray/pink
- power supply: red, blue, green/yellow

Approvals:
UL: CMX (2170209)
Canada: c(UL) CMX (2170209)
Additional: INTERBUS, Phoenix Contact, RoHS

Part number	Jacket material	Conductor description	Cable type	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170206	PVC	24 AWG/3pr	remote bus cable (RBC)	–	0.284	7.2	25	48	53112220
2170208	halogen-free PUR	24 AWG/3pr + 18 AWG/3c	installation remote bus cable (INBC)	–	0.311	7.9	40	57	53112220
2170209	PVC	24 AWG/3pr	remote bus cable (RBC)	UL/CSA CMX	0.284	7.2	25	48	53112220
Reinforced black jacket									
2170207	PVC	24 AWG/3pr	remote bus cable (RBC)	–	0.366	9.3	25	63	53112220
2170217	PVC	24 AWG/3pr + 18 AWG/3c	installation remote bus cable (INBC)	–	0.370	9.4	40	86	53112220

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UNITRONIC® BUS INTERBUS FD

For INTERBUS bus systems (IBS); continuous flex applications; 100 Ω

UNITRONIC® BUS INTERBUS FD is designed for continuous flex applications in harsh industrial environments. The high-performance PUR jacket provides protection against tearing, abrasion, and mineral oils when used in cable tracks.

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: copper braid

Jacket: polyurethane; violet

Recommended applications

Cable tracks, moving machinery, and linear tracks in dry and damp rooms; harsh industrial environments; RBC

Approvals

Application advantage

- High operation security for data transmission in chain
- Excellent abrasion and oil resistance
- Halogen-free
- Certified by INTERBUS Club
- Cable allows data transmission rate of 500 kbit/s at a max. length of 400 m; IRBC max. cable run is 50 m

Cable attributes page 648

See attribute list by part number on page 166 *

Complete the installation

SKINTOP® MS-SC page 522

EPIC® connectors page 284

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

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: -30°C to +70°C

Nominal voltage: 250V

Test voltage: 1500V

Characteristic impedance: 100 Ω ± 15%

Nominal capacitance: 18 pF/ft

Color code:
- 2170216: DIN 47100: chart 8, page 682
- 2170218 & 2170818:
  - data pairs: white & brown, green & yellow, gray & pink
  - power conductors: red, blue, green/yellow

Approvals:
UL: CMX (2170818)
Canada: c(UL) CMX (2170818)
Additional: INTERBUS
Phoenix Contact
RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Conductor description	Cable type	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170216	24 AWG/3pr	remote bus cable (RBC)	–	0.311	7.9	26	43	53112220
2170218	24 AWG/3pr + 18 AWG/3c	installation remote bus cable (INBC)	–	0.311	7.9	42	62	53112220
2170818	24 AWG/3pr + 18 AWG/3c	installation remote bus cable (INBC)	UL/CSA CMX	0.311	7.9	42	62	53112220

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UNITRONIC® BUS Genius™

Genius I/O twinaxial bus cable; continuous flex applications; 100 Ω

UNITRONIC® BUS Genius is designed for use in GE Fanuc's Genius I/O, Field Control™, and VersaMax® networks. Genius network flexibility allows users to deploy the most efficient combination of high-density and low-density distributed I/O for their application.

Construction

Conductors: finely stranded tinned copper

Insulation: TPE

Shielding: foil and flexible tinned copper spiral shield (92% coverage)

Jacket: polyurethane; violet

Recommended applications

Industrial automation and process control field networks; sensors; valves; gauges; barcode readers; drives and operator interfaces.

Application advantage

- Signal integrity in continuous motion applications
- Flame- and oil-resistant jacket
- Flexible for ease of routing

Approvals

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	CF-01*	MECH.	MP-05

Complete the installation	
SKINTOP® MS-SC page 522	EPIC® connectors page 284

Technical data

Minimum bend radius:
- for stationary use: 5 x cable diameter
- for continuous flexing: 10 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -20°C to +80°C

Nominal voltage: 300V

Test voltage: 3000V

Characteristic impedance: 100 Ω

Nominal capacitance: 18 pF/ft

Color code: white & brown pair

Approvals:
UL: AWM 20233
Attributes: NFPA 79
Additional: RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part Number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
911264	22 AWG/1pr	0.258	6.5	12	40	53112210

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UNITRONIC® BUS CC-Link

For CC-Link bus systems; stationary applications; 110 Ω

UNITRONIC® BUS CC-Link provides high-speed communication, linking a wide range of automation devices over a single cable. CC-Link cables can be used in long distance network configurations up to 1.2km (at 156 kbps).

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: foil and tinned copper braid

Jacket: PVC; red

Recommended applications

Digital & analog I/O; temperature controllers; variable frequency drives; servo drives; robots

Application advantage

- Signal integrity in high-EMC applications
- Passes the CC-Link conformance test in Japan
- Flame- and oil-resistant jacket
- Flexible for ease of routing
- Sunlight resistant

Approvals

c UL us RoHS CLPA

Cable attributes			page 648
OIL	OR-00	FLAME	FR-03
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC page 522

EPIC® connectors page 284

Technical data

Minimum bend radius:	5 x cable diameter	Nominal capacitance:	18 pF/ft
Temperature range:	-40°C to +70°C	Color code:	white, blue, yellow
Nominal voltage:	300V	Approvals: UL:	PLTC CM
Test voltage:	2000V	Canada:	c(UL) CM
Characteristic impedance:	110 Ω ± 15 Ω	Additional:	CC-Link RoHS

Part Number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170360	20 AWG/3c	0.303	7.7	26	51	53112220

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UNITRONIC® BUS CC-Link FD

For CC-Link bus systems; continuous flex applications; 110 Ω

UNITRONIC® BUS CC-Link FD is a continuous flex cable for field bus networks for both control and information data to provide efficient integrated factory and process automation.

Construction

Conductors: stranded bare copper

Insulation: polyethylene

Shielding: tinned copper braid

Inner jacket: FRNC

Outer Jacket: polyurethane; red

Recommended applications

Continuous flex applications like cable tracks and moving machine parts

Application advantage

- Signal integrity in high-EMC applications
- Passes the CC-Link conformance test in Japan
- Flame- and oil-resistant halogen-free jacket
- Flexible for ease of routing

Approvals

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-05

Complete the installation			ÖLFLEX® CONNECT solution	
	SKINTOP® MS-SC page 522		EPIC® connectors page 284		ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:		**Characteristic impedance:**	110 Ω ± 15 Ω
- for stationary use:	4 x cable diameter	**Nominal capacitance:**	18 pF/ft
- for continuous flexing:	8 x cable diameter	**Color code:**	white, blue, yellow
Temperature range:	-40°C to +80°C	**Approvals:**	UL: AWM 20233
Nominal voltage:	300V		Attributes: NFPA 79
Test voltage:	2000V		Additional: CC-Link, RoHS
		*UL Verified ID A522492:	Continuous Flex Test Method Verified

Part Number	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
2170370	20 AWG/3c	0.335	8.5	27	56	53112220

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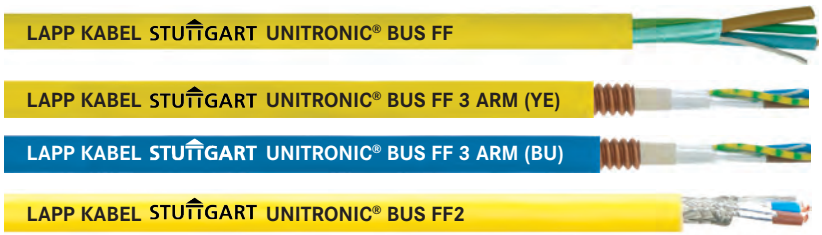
UNITRONIC® BUS Foundation Fieldbus

For Foundation Fieldbus bus systems; stationary applications; 100 Ω



UNITRONIC® BUS Foundation Fieldbus has been specifically designed to meet the demands of the hazardous industrial and process automation. Using a distributed architecture where the control is in the devices themselves, Foundation Fieldbus integrates low-speed sensors and actuators with high-speed controllers and servers in a single system.

Recommended applications

Sensors, actuators and PLCs in intrinsically safe areas like magnetic flow meters, temperature sensors, and pressure sensors.

Construction

Conductors: stranded bare copper

Insulation: pair: XLPE • conductor: PVC

Shielding: foil and tinned copper braid • armored cable: longitudinally welded spiral corrugated copper tape

Jacket: PVC; yellow or blue

Application advantage

- Can withstand temperatures up to +105°C
- Sunlight resistant
- Cables meet the requirements of ISA ISP50 and the Fieldbus Foundation for cable type A

Approvals

cULus RoHS Fieldbus

Cable attributes page 648

See attribute list by part number on page 166

Complete the installation

SKINTOP® MS-SC page 522

SKINTOP® K-M ATEX plus page 506

Technical data

Minimum bend radius: 5 x cable diameter

Temperature range:
- three-conductor cable: -25°C to +105°C
- two-conductor cable: -40°C to +105°C

Nominal voltage: 300V

Test voltage: 1500V

Characteristic impedance: 100 Ω ± 20 Ω

Nominal capacitance: 20 pF/ft

Color code:
- three-conductor cable: blue & brown twisted pair, plus green/yellow ground
- two-conductor cable: blue & brown twisted pair

Approvals:
UL: PLTC, CMG
Canada: c(UL) CMG
Additional: RoHS

Part number	Jacket color	Number of conductors	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® K-M ATEX metric thread
2170352	yellow	2	18 AWG/1pr	0.311	7.9	36	55	54115210
2170350	yellow	3	18 AWG/1pr + 18 AWG/1c	0.311	7.9	41	62	54115210
Armored cable								
2170351	yellow	3	18 AWG/1pr + 18 AWG/1c	0.484	12.3	84	122	54115245
2170353	blue	3	18 AWG/1pr + 18 AWG/1c	0.484	12.3	84	122	54115445

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UNITRONIC® BUS SAFETY

For SAFETY bus systems

UNITRONIC® BUS SAFETY is designed for data communication in terms of machinery safety

Construction

Conductors: finely stranded bare copper

Insulation: polyethylene

Shielding: tinned copper braid

Jacket: halogen-free or PUR; yellow

Recommended applications

For safety-related devices in systems such as SafetyBUS, based on the tried and tested CAN bus system, such as Factory Automation and Transport Technology

Application advantage

- For fixed installation (2170295) and highly flexible (2170885) applications
- For serial transmission of safety-oriented data
- Communication rate up to 500 kbits/sec

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius: 10 x cable diameter

Temperature range:
- for stationary use:
  - 2170295: -30°C to +80°C
  - 2170885: -40°C to +80°C
- for flexible use:
  - 2170885: -30°C to +80°C

Nominal voltage: 250V (not for power applications)

Test voltage:
- 2170295: 3000V
- 2170885: 1500V

Characteristic impedance: 120 Ω

Nominal capacitance: 14 pF/ft

Color code: white, brown, green

Approvals: CE & RoHS

Part number	Jacket material	Conductor description	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread
Stationary							
2170295	halogen-free	19 AWG/3c	0.299	7.6	33	46	53112220
Continuous flex							
2170885	PUR	19 AWG/3c	0.307	7.8	33	46	53112220

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UNITRONIC® SENSOR FD

Multi-conductor continuous flex communication cable with PUR jacket; 300V

UNITRONIC® SENSOR FD is designed for sensor and actuator wiring. Constructed with extra-fine stranding, this cable is suitable for continuous flex applications. The abrasion- and tear-resistant PUR jacket provides superior service life in harsh environments and is also resistant to most oils, solvents, and coolants.

Recommended applications

Wiring of sensors and actuators; data transmission cables to connect to M8 or M12 connectors; automation technology; plant engineering

Approvals

Unshielded construction

Conductors: super fine stranded bare copper

Insulation: polypropylene

Jacket: halogen-free polyurethane; black

Shielded construction

Conductors: super fine stranded bare copper

Insulation: polypropylene

Shielding: tinned copper braid

Jacket: halogen-free polyurethane; black

Application advantage

- Designed for continuous flexing
- Highly flexible construction for ease of routing in tight spaces
- Excellent abrasion and cut resistance
- Outstanding oil, solvent, and coolant resistance
- Round geometry facilitates liquid-tight installation

Cable attributes				page 648
OIL	OR-04	FLAME	FR-01	
MOTION	CF-02*	MECH.	MP-05	

Complete the installation

SKINTOP® strain relief
page 492

SKINTOP® MS-SC
page 522

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 5 x cable diameter
- for continuous flexing: 10 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -15°C to +80°C

Nominal voltage: 300V

Color code:
- 3 conductors: 1: brown, 2: blue, 3: black
- 4 conductors: 1: brown, 2: white, 3: blue, 4: black
- 5 conductors: 1: brown, 2: white, 3: blue, 4: black 5: gray
- 8 conductors: 1: white, 2: brown, 3: green, 4: yellow, 5: gray, 6: pink, 7: blue, 8: red

Approvals:
UL: AWM 20549
Additional: RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Number of conductors	Shielding	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread	SKINTOP® MS-SC PG thread
24 AWG (0.25 mm²)								
7038868	8	unshielded	0.232	5.9	13	34	S2107	–
22 AWG (0.34 mm²)								
7038864	3	unshielded	0.181	4.6	7	20	S2107	–
7038865	4	unshielded	0.185	4.7	8	27	S2107	–
7038893	5	unshielded	0.177	4.5	11	30	S2107	–
7038885	3	shielded	0.181	4.6	13	79	–	53112210
7038886	4	shielded	0.185	4.7	16	88	–	53112210
7038887	5	shielded	0.201	5.1	18	97	–	53112210

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

M8 field wireable sensor/actuator connectors

Application advantage

- Quick and easy on-site assembly
- Screw and fast connect design with insulation displacement (IDC) available
- Standardized interfaces

Approvals

RoHS

Technical data

Temperature range:
- screw: -40°C to +85°C
- IDC: -25°C to +80°C

Nominal voltage: 30 or 60V

Nominal current: 4A

Coding: A-standard

Protection rating:
- screw: IP67
- IDC: IP65/67

Approvals: RoHS

Part number male	Part number female	Number of positions	Conductor cross-section AWG	Conductor cross-section mm²	Cable diameter in	Cable diameter mm	Nominal voltage
Screw connection							
22260120	22260125	3	26 - 20	0.14 - 0.50	0.137 - 0.195	3.5 - 5	60V
22260121	22260126	4	26 - 20	0.14 - 0.50	0.137 - 0.195	3.5 - 5	30V
Insulation displacement							
22260985	22260986	3	24 - 20	0.25 - 0.50	0.098 - 0.195	2.5 - 5	60V
22260044	22260046	4	24 - 20	0.25 - 0.50	0.098 - 0.195	2.5 - 5	30V

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

M 12 field wireable sensor/actuator connectors

screw connection

screw connection, shielded

insulation displacement

Application advantage

- Quick and easy on-site assembly
- Screw and fast connect design with insulation displacement (IDC) available
- No special tools required with fast connect design
- Shielded styles are available

Approvals

RoHS

Technical data

Temperature range:
- screw: -40°C to +85°C
- IDC: -25°C to +80°C

Protection rating:
- screw: IP67
- IDC: IP65/67

Nominal current: 2 or 4A

Approvals: RoHS

Coding: A-standard

Part number male	Part number female	Number of positions	Size	Conductor cross-section AWG	Conductor cross-section mm²	Cable diameter in	Cable diameter mm	Nominal voltage	Nominal current
Screw connection									
22260649	22260640	4	PG 7	24 - 19	0.25 - 0.75	0.156 - 0.234	4 - 6	250V	4A
22260129	22260127	5	PG 7	24 - 19	0.25 - 0.75	0.156 - 0.234	4 - 6	60V	4A
Screw connection, shielded									
22260135	22260136	5	PG 9	24 - 19	0.25 - 0.75	0.234 - 0.312	6 - 8	60V	4A
22260825	22260826	8	PG 9	24 - 19	0.25 - 0.75	0.234 - 0.312	6 - 8	30V	2A
Insulation displacement									
22260132	22260131	4	–	26 - 22	0.14 - 0.34	0.137 - 0.234	3.5 - 6	125V	4A
22260134	22260133	4	–	22 - 19	0.34 - 0.75	0.234 - 0.312	6 - 8	250V	4A

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If not otherwise specified, all values relating to the product are nominal values.
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M12 T-coded connectors

screw connection

screw connection, 90° angled

Application advantage

- Quick and easy on-site assembly
- Compact standardized M12 design saves space and costs
- Fault-proof connection through M12 T-coded connector
- DC high-power connector: 60 V DC / 12 A

Approvals

Technical data

Temperature range:
- screw: -40°C to +85°C

Nominal current: 12A

Coding: T-power

Protection rating: IP67

Approvals: RoHS
UL cable fitting

Part number male	Part number female	Connection	Number of positions	Conductor cross-section AWG	Conductor cross-section mm²	Cable diameter in	Cable diameter mm	Nominal voltage	Nominal current
Straight									
22262010	22262011	screw	4	19 - 16	0.75 - 1.5	0.312 - 0.394	8 - 10	60V	12A
Angled									
22262012	22262013	screw	4	19 - 16	0.75 - 1.5	0.312 - 0.394	8 - 10	60V	12A

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

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UNITRONIC® BUS
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UNITRONIC®

Flexible data, signal & control cable

206 **Quick select chart**

Flexible UL/CSA electronic cable

208 **UNITRONIC® 300/300 S**
Flexible 300V multi-conductor industrial signal & control cable; unshielded & shielded

210 **UNITRONIC® 300 STP**
Flexible 300V multi-pair industrial communication & signal cable; shielded

211 **UNITRONIC® 190/190 CY/190 CY (TP)**
Flexible 300V multi-conductor & multi-pair industrial signal & control cable; unshielded & shielded

Flexible European electronic cable

213 **UNITRONIC® LiYY/LiYCY/LiYCY (TP)**
Low-voltage multi-conductor & multi-pair communication & control cable; unshielded & shielded

216 **UNITRONIC® LiHH/LiHCH/LiHCH (TP)**
Low-voltage halogen-free multi-conductor & multi-pair communication & control cable

218 **UNITRONIC® CY PiDY (TP)**
Low-voltage multi-pair communication & control cable; individually shielded pairs & overall shield

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Quick select chart

Product name	RS-232	Industrial sensors/ actuators	Stepper motor, encoder, resolver	420 mA signaling	Electronic instrumentation	Halogen-free	UL/CSA	Shielding	Jacket/insulation material	
Flexible UL/CSA electronic cable										
UNITRONIC® 300		✔			✔		✔	no	PVC	
UNITRONIC® 300 S		✔	✔		✔		✔	yes	PVC	
UNITRONIC® 300 STP	✔	✔	✔	✔	✔		✔	yes	PVC	
UNITRONIC® 190		✔			✔		✔	no	PVC	
UNITRONIC® 190 CY		✔	✔		✔		✔	yes	PVC	
UNITRONIC® 190 CY (TP)	✔	✔	✔	✔	✔		✔	yes	PVC	
Flexible European electronic cable										
UNITRONIC® LiYY			✔		✔			no	PVC	
UNITRONIC® LiYCY								yes	PVC	
UNITRONIC® LiYCY (TP)	✔		✔	✔	✔			yes	PVC	
UNITRONIC® LiHH			✔		✔	✔		no	halogen-free	
UNITRONIC® LiHCH								yes	halogen-free	
UNITRONIC® LiHCH (TP)	✔		✔	✔	✔	✔		yes	halogen-free	
UNITRONIC® CY PiDY (TP)	✔		✔	✔	✔			yes	PVC	

	AWG range	Peak working voltage	Min. bend radius (stationary)	Temperature range (stationary)	Cable attributes, see page 648		Page
					oil resistance	flame resistance	
	24 - 16 AWG	300V	4 x OD	-40°C to +105°C	OR-02	FR-03	210
	24 - 16 AWG	300V	6 x OD	-40°C to +105°C			
	24 - 18 AWG	300V	6 x OD	-40°C to +105°C	OR-02	FR-03	212
	28 - 22 AWG	300V	4 x OD	-40°C to +105°C	OR-02	FR-03	213
	28 - 22 AWG	300V	6 x OD	-40°C to +105°C			
	28 - 22 AWG	300V	6 x OD	-40°C to +105°C	OR-02	FR-03	213
	26 - 16 AWG	250V	4 x OD	-40°C to +80°C	OR-01	FR-02	215
	26 - 16 AWG	250V	6 x OD	-40°C to +80°C			
	26 - 18 AWG	250V	6 x OD	-40°C to +80°C	OR-01	FR-02	215
	24 - 18 AWG	250V	6 x OD	-30°C to +80°C	OR-01	FR-02	218
	26 - 16 AWG	250V	6 x OD	-30°C to +80°C			
	26 - 18 AWG	250V	6 x OD	-30°C to +80°C	OR-01	FR-02	218
	24 AWG	250V	6 x OD	-40°C to +80°C	OR-01	FR-02	220

UNITRONIC® 300/300 S

Flexible 300V multi-conductor industrial signal & control cable; unshielded & shielded

control cable (20 AWG - 16 AWG)

signal cable (24 AWG - 22 AWG)

UNITRONIC® 300/300 S is a rugged, multi-conductor, low voltage control and signal cable for internal and external wiring of OEM equipment for industrial applications. The jacket is very oil resistant and is pressure-extruded for improved flexibility and easier installation. UNITRONIC® 300 S has a foil tape and tinned copper braid shield for maximum RFI & EMI protection.

Unshielded construction

Conductors: finely stranded tinned copper

Insulation: blended PVC

Jacket: specially formulated PVC; gray

Shielded construction

Conductors: finely stranded tinned copper

Insulation: blended PVC

Shielding: tri-laminate foil shield and tinned copper braid (75% coverage); drain wire

Jacket: specially formulated PVC; gray

Recommended applications

Process control; electrical equipment; industrial machinery; low-voltage control interconnect

Application advantage

- Extended temperature rating of -40°C to +105°C
- Flexible design for ease of routing
- Suitable for use in cable tray
- Oil- and UV-resistant jacket (Oil Res I)
- Sequential foot marking for ease of installation

Approvals

c UL us · TÜV · FIRE PROTECTION · CSA · CE · RoHS

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	WT-02	MECH.	MP-02

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

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

Test voltage: 1500V

Conductor stranding: fine wire

Color code:
- 24 - 22 AWG: chart 4, page 681
- 20 - 16 AWG: chart 5, page 681

Approvals:

UL:	CMG per UL 444 PLTC-ER per UL 13 (18 & 16 AWG) PLTC per UL 13 (22 & 20 AWG) ITC-ER per UL 2250 (18 & 16 AWG) AWM 2464
Attributes:	UL Oil Res I -40°C cold bend; -25°C cold impact sunlight resistant direct burial NFPA 79
NEC:	meets NEC Art. 725 & 800 Class 1 Division 2 (PLTC only)
Canada:	cUL CMG FT4 CSA AWM I/II A/B FT1
Additional:	CE & RoHS

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® 300

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.24 mm²)						
302402	2	0.165	4.2	3	13	S1107
302403	3	0.172	4.4	5	15	S1107
302404	4	0.183	4.6	6	18	S1107
302406	6	0.209	5.3	9	22	S1107
302408	8	0.223	5.7	12	29	S1107
302410	10	0.253	6.4	15	35	S1109
302415	15	0.284	7.2	23	46	S1111
302420	20	0.321	8.2	30	57	S1111
302425	25	0.355	9.0	38	71	S1111
22 AWG (0.38 mm²)						
302202	2	0.179	4.5	5	15	S1107
302203	3	0.187	4.7	7	20	S1107
302204	4	0.200	5.1	10	22	S1107
302206	6	0.229	5.8	15	31	S1107
302208	8	0.245	6.2	19	37	S1107
302210	10	0.289	7.3	24	44	S1111
302215	15	0.324	8.2	36	62	S1111
302220	20	0.355	9.0	47	99	S1111
302225	25	0.414	10.5	59	126	S1113
20 AWG (0.62 mm²)						
302002	2	0.225	5.7	8	37	S1107
302003	3	0.237	6.0	12	40	S1107
302004	4	0.256	6.5	15	51	S1109
302006	6	0.308	7.8	23	66	S1111
302008	8	0.331	8.4	30	90	S1111
302010	10	0.381	9.7	38	97	S1113
302015	15	0.452	11.5	57	121	S1113
302020	20	0.497	12.6	76	174	S1116
302025	25	0.554	14.1	94	238	S1121

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
301802	2	0.241	6.1	12	42	S1107
301803	3	0.254	6.5	18	44	S1109
301804	4	0.285	7.2	24	53	S1111
301806	6	0.333	8.5	36	68	S1111
301808	8	0.358	9.1	47	95	S1111
301810	10	0.437	11.1	61	130	S1113
301815	15	0.494	12.5	91	165	S1116
301820	20	0.544	13.8	121	220	S1121
301825	25	0.629	16.0	151	276	S1121
16 AWG (1.32 mm²)						
301602	2	0.263	6.7	17	55	S1109
301603	3	0.288	7.3	25	60	S1111
301604	4	0.312	7.9	33	75	S1111
301606	6	0.366	9.3	49	110	S1111
301608	8	0.417	10.6	65	163	S1113
301610	10	0.481	12.2	82	181	S1116
301615	15	0.546	13.9	122	242	S1121
301620	20	0.603	15.3	163	331	S1121
301625	25	0.696	17.7	204	410	S1129

UNITRONIC® 300 S

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.24 mm²)						
302402S	2	0.193	4.9	10	19	53112210
302403S	3	0.201	5.1	12	22	53112210
302404S	4	0.209	5.3	14	26	53112210
302406S	6	0.236	6.0	18	31	53112210
302408S	8	0.248	6.3	22	37	53112210
302410S	10	0.288	7.3	26	44	53112210
302415S	15	0.319	8.1	35	60	53112220
302420S	20	0.346	8.8	44	71	53112220
302425S	25	0.382	9.7	53	86	53112230
22 AWG (0.38 mm²)						
302202S	2	0.202	5.1	13	22	53112210
302203S	3	0.210	5.3	16	26	53112210
302204S	4	0.223	5.7	19	31	53112210
302206S	6	0.252	6.4	25	42	53112210
302208S	8	0.278	7.1	30	48	53112210
302210S	10	0.312	7.9	37	57	53112220
302215S	15	0.347	8.8	52	77	53112220
302220S	20	0.378	9.6	64	95	53112230
302225S	25	0.445	11.3	81	117	53112240
20 AWG (0.62 mm²)						
302002S	2	0.248	6.3	19	48	53112210
302003S	3	0.260	6.6	23	51	53112210
302004S	4	0.289	7.3	27	62	53112220
302006S	6	0.331	8.4	35	79	53112220
302008S	8	0.354	9.0	46	106	53112220
302010S	10	0.426	10.8	56	115	53112230
302015S	15	0.483	12.3	77	143	53112240
302020S	20	0.528	13.4	88	203	53112240
302025S	25	0.585	14.9	104	271	53112250

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
18 AWG (1 mm²)						
301802S	2	0.266	6.8	25	53	53112210
301803S	3	0.289	7.3	33	57	53112220
301804S	4	0.310	7.9	41	68	53112220
301806S	6	0.358	9.1	55	88	53112220
301808S	8	0.383	9.7	69	115	53112230
301810S	10	0.469	11.9	88	154	53112240
301815S	15	0.525	13.3	121	196	53112240
301820S	20	0.575	14.6	157	256	53112250
301825S	25	0.660	16.8	189	311	53112250
16 AWG (1.32 mm²)						
301602S	2	0.298	7.6	34	66	53112220
301603S	3	0.313	8.0	43	79	53112220
301604S	4	0.337	8.6	52	95	53112220
301606S	6	0.413	10.5	71	141	53112230
301608S	8	0.448	11.4	91	181	53112240
301610S	10	0.512	13.0	114	209	53112240
301615S	15	0.577	14.7	157	342	53112250
301620S	20	0.654	16.6	201	401	53112250
301625S	25	0.727	18.5	247	496	53112260

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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UNITRONIC® 300 STP

Flexible 300V multi-pair industrial communication & signal cable; shielded

UNITRONIC® 300 STP is a multi-pair, low voltage communication, signal, and control cable with an overall shield for internal and external wiring of OEM equipment for industrial applications. The jacket is very oil resistant and is pressure-extruded for improved flexibility and easier installation. UNITRONIC® 300 STP has an overall foil tape and tinned copper braid shield for maximum RFI & EMI protection.

Recommended applications

Process control; electrical equipment; industrial machinery; low-voltage control interconnect

Approvals

Construction

Conductors: finely stranded tinned copper

Insulation: blended PVC

Shielding: foil tape and tinned copper braid (75% coverage); drain wire

Jacket: specially formulated PVC; gray

Application advantage

- Extended temperature rating of -40°C to +105°C
- Flexible design for ease of routing
- Suitable for use in cable tray
- Oil- and UV-resistant jacket (Oil Res I)
- Sequential foot marking for ease of installation

Cable attributes			page 648
OIL	OR-02	FLAME	FR-03
MOTION	WT-02	MECH.	MP-02

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® connectors
page 284

Technical data

Minimum bend radius: 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

Test voltage: 1500V

Conductor stranding: fine wire

Color code: chart 3, page 680
- 24 - 22 AWG single pair: black & white

Approvals:

UL:	CMG per UL 444
	PLTC-ER per UL 13 (18 & 16 AWG)
	PLTC per UL 13 (22 & 20 AWG)
	ITC-ER per UL 2250 (18 & 16 AWG)
	ITC per UL 2250 (24 - 20 AWG)
	AWM 2464
Attributes:	UL Oil Res I
	-40°C cold bend; -25°C cold impact
	sunlight resistant
	direct burial
	NFPA 79
NEC:	meets NEC Art. 725 & 800
	Class 1 Division 2 (PLTC only)
Canada:	cUL CMG FT4
	CSA AWM I/II A/B FT1
Additional:	CE & RoHS

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
24 AWG (0.24 mm²)						
302401STP*	1	0.190	4.8	10	24	53112210
302402STP	2	0.256	6.5	18	40	53112210
302403STP	3	0.268	6.8	21	44	53112210
302406STP	6	0.343	8.7	34	71	53112220
302409STP	9	0.415	10.5	46	104	53112230
302415STP	15	0.504	12.8	68	130	53112240
22 AWG (0.38 mm²)						
302201STP*	1	0.202	5.1	13	26	53112210
302202STP	2	0.278	7.1	23	35	53112210
302203STP	3	0.305	7.7	26	48	53112220
302206STP	6	0.379	9.6	47	84	53112230
302209STP	9	0.459	11.7	64	130	53112240
302215STP	15	0.553	14.0	96	165	53112250

* Pair is black & white

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.62 mm²)						
302001STP	1	0.248	6.3	18	68	53112210
302002STP	2	0.372	9.4	32	86	53112230
302003STP	3	0.412	10.5	46	108	53112230
302006STP	6	0.524	13.3	72	216	53112240
302009STP	9	0.604	15.3	97	293	53112250
302015STP	15	0.762	19.4	165	452	53112260
18 AWG (1 mm²)						
301801STP	1	0.266	6.8	26	71	53112210
301802STP	2	0.422	10.7	45	82	53112230
301803STP	3	0.452	11.5	58	101	53112240
301806STP	6	0.574	14.6	103	218	53112250
301809STP	9	0.681	17.3	147	328	53112260
301815STP	15	0.836	21.2	248	544	53112260
16 AWG (1.32 mm²)						
301601STP	1	0.298	7.6	34	68	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® 190/190 CY/190 CY (TP)

Flexible 300V multi-conductor & multi-pair industrial signal & control cable; unshielded & shielded

UNITRONIC® 190/190 CY is a multi-conductor cable for communication, signal, and control applications. It is designed for general purpose installations of electrical machinery. UNITRONIC® 190 CY has an overall foil tape & tinned copper braid for RFI & EMI protection. UNITRONIC® 190 CY (TP) is an overall shielded multi-paired version for data, communication, and signal applications.

Unshielded construction

Conductors: finely stranded tinned copper

Insulation: SR-PVC

Jacket: specially formulated PVC; gray

Shielded construction

Conductors: finely stranded tinned copper

Pairs: SR-PVC

Insulation: SR-PVC

Shielding: foil tape and tinned copper braid (85% coverage); drain wire

Jacket: specially formulated PVC; gray

Recommended applications

RS-232; data buses; process control instrumentation; low-voltage signaling and interconnect

Application advantage

- Extended temperature range of -40°C to 105°C
- UV-resistant jacket
- Sequential foot marking for ease of installation

Approvals

Cable attributes				page 648
OIL	OR-02	FLAME	FR-03	
MOTION	FL-01	MECH.	MP-01	

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
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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

Test voltage: 1500V

Conductor stranding: fine wire

Color code:
- UNITRONIC® 190/190 CY: chart 2, page 680
- UNITRONIC® 190 CY (TP): chart 3, page 680

Approvals:

UL:	CMG per UL 444 AWM 2661
Attributes:	UL Oil Res I -40°C cold bend; -25°C cold impact sunlight resistant NFPA 79
NEC:	meets NEC Art. 725 & 800
Canada:	cUL CMG FT4 CSA AWM I/II A/B FT1
Additional:	RoHS

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® 190

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
28 AWG (0.08 mm²)						
602802	2	0.143	3.6	2	10	S1107
602803	3	0.149	3.8	3	12	S1107
602804	4	0.158	4.0	3	14	S1107
602805	5	0.168	4.3	4	16	S1107
602807	7	0.178	4.5	5	18	S1107
602808	8	0.189	4.8	5	20	S1107
602810	10	0.213	5.4	6	23	S1107
602815	15	0.248	6.3	9	29	S1109
602820	20	0.269	6.8	11	36	S1109
602825	25	0.297	7.5	15	43	S1111
602850	50	0.375	9.5	28	73	S1111
26 AWG (0.14mm²)						
602603	3	0.157	4.0	4	13	S1107
602605	5	0.178	4.5	6	17	S1107
602607	7	0.190	4.8	7	21	S1107
602610	10	0.229	5.8	9	28	S1107
602620	20	0.290	7.4	18	45	S1111
602625	25	0.321	8.2	23	54	S1111
602636	36	0.366	9.3	32	72	S1111

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.25 mm²)						
602402	2	0.161	4.1	3	19	S1107
602403	3	0.168	4.3	4	22	S1107
602404	4	0.179	4.5	7	27	S1107
602405	5	0.192	4.9	8	31	S1107
602407	7	0.205	5.2	11	37	S1107
602408	8	0.219	5.6	12	42	S1107
602410	10	0.249	6.3	15	51	S1109
602415	15	0.290	7.4	22	69	S1111
22 AWG (0.34 mm²)						
602202	2	0.179	4.5	5	15	S1107
602203	3	0.187	4.7	9	19	S1107
602204	4	0.200	5.1	11	22	S1107
602205	5	0.214	5.4	14	26	S1107
602207	7	0.229	5.8	18	33	S1107
602208	8	0.245	6.2	20	37	S1107
602210	10	0.279	7.1	23	45	S1111
602212	12	0.297	7.5	29	62	S1111
602220	20	0.355	9.0	46	78	S1111
602225	25	0.409	10.4	57	95	S1113
602236	36	0.459	11.7	81	138	S1113

UNITRONIC® 190 CY

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14mm²)						
602603S	3	0.192	4.9	10	24	53112210
602604S	4	0.202	5.1	11	29	53112210
602607S	7	0.225	5.7	15	35	53112210
602608S	8	0.237	6.0	16	37	53112210
602610S	10	0.264	6.7	20	44	53112210
602615S	15	0.301	7.6	26	53	53112220
602620S	20	0.325	8.3	30	64	53112220
24 AWG (0.25 mm²)						
602403S	3	0.203	5.2	12	31	53112210
602404S	4	0.214	5.4	14	34	53112210
602405S	5	0.227	5.8	16	38	53112210
602407S	7	0.240	6.1	20	44	53112210
602408S	8	0.254	6.5	22	49	53112210
602410S	10	0.284	7.2	27	53	53112220
602415S	15	0.325	8.3	35	66	53112220
602420S	20	0.352	8.9	44	79	53112220
602425S	25	0.366	9.3	52	95	53112230

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
22 AWG (0.34 mm²)						
602202S	2	0.204	5.2	13	31	53112210
602203S	3	0.212	5.4	15	34	53112210
602204S	4	0.225	5.7	18	37	53112210
602205S	5	0.239	6.1	22	42	53112210
602207S	7	0.254	6.5	28	51	53112210
602208S	8	0.270	6.9	30	55	53112210
602210S	10	0.314	8.0	36	66	53112220
602215S	15	0.349	8.9	49	84	53112220
602216S	16	0.354	9.0	52	88	53112220
602220S	20	0.380	9.7	62	104	53112230
602225S	25	0.440	11.2	79	132	53112240
602236S	36	0.490	12.4	108	174	53112240
602240S	40	0.505	12.8	119	187	53112240

UNITRONIC® 190 CY (TP)

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
24 AWG (0.25 mm²)						
602402TP	2	0.254	6.5	17	35	53112210
602404TP	4	0.285	7.2	24	48	53112220
602405TP	5	0.305	7.7	28	55	53112220
602408TP	8	0.360	9.1	40	77	53112220

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
22 AWG (0.34 mm²)						
602202TP	2	0.270	6.9	22	42	53112210
602203TP	3	0.294	7.5	27	51	53112220
602204TP	4	0.315	8.0	33	57	53112220
602205TP	5	0.338	8.6	38	68	53112220
602206TP	6	0.363	9.2	45	79	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® LiYY/LiYCY/LiYCY (TP)

Low-voltage multi-conductor & multi-pair communication & control cable; unshielded & shielded

UNITRONIC® LiYY/LiYCY is a multi-conductor cable for communication, signal, and control applications. It is designed for general purpose installations of electrical machinery. UNITRONIC® LiYCY has a tinned copper braid for RFI & EMI protection. UNITRONIC® LiYCY (TP) is an overall-shielded multi-paired version for data, communication, and signal applications.

Unshielded construction

Conductors: stranded bare copper
Insulation: PVC
Jacket: PVC; pebble gray

Shielded construction

Conductors: stranded bare copper
Insulation: PVC
Pairs: PVC
Shielding: tinned copper braid
Jacket: PVC; pebble gray

Recommended applications

RS-232; data buses; process control instrumentation; low-voltage signaling and interconnect; broadcast; applications with European DIN 47100 color code

Application advantage

- Extended temperature range of -40°C to +80°C
- European color code DIN 47100
- Flexible for easy installation

Approvals

CE RoHS

Cable attributes				page 648
OIL	OR-01	FLAME	FR-02	
MOTION	FL-01	MECH.	MP-01	

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -5°C to +70°C

Nominal voltage: 250V

Test voltage:
- 26 AWG: 1200V
- larger than 26 AWG: 1500V

Conductor stranding: fine wire

Inductance:
- UNITRONIC® LiYY/LiYCY: nominal 0.65 mH/km
- UNITRONIC® LiYCY (TP): nominal 0.50 mH/km

Mutual capacitance:
- conductor/conductor: 37 pF/ft
- conductor/shield: 48 pF/ft

Color code:
- UNITRONIC® LiYY/LiYCY: DIN 47100: chart 8, page 682
- UNITRONIC® LiYCY (TP): DIN 47100: chart 7, page 682

Approvals: based on VDE 0812
CE & RoHS

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UNITRONIC® LiYY

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
26 AWG (0.14 mm²)						
0028202	2	0.126	3.2	2	9	S1107
0028203	3	0.134	3.4	4	11	S1107
0028204	4	0.142	3.6	5	13	S1107
0028205	5	0.154	3.9	6	15	S1107
0028207	7	0.165	4.2	8	19	S1107
0028208	8	0.193	4.9	7	24	S1107
0028210	10	0.205	5.2	10	28	S1107
0028212	12	0.220	5.6	12	32	S1107
0028214	14	0.228	5.8	14	36	S1107
0028216	16	0.240	6.1	16	40	S1107
0028220	20	0.276	7.0	19	48	S1111
0028225	25	0.307	7.8	23	58	S1111
0028236	36	0.339	8.6	33	85	S1111
0028237	37	0.350	8.9	34	79	S1111
0028240	40	0.366	9.3	37	93	S1111
0028250	50	0.409	10.4	46	115	S1113
0028256	56	0.421	10.7	53	126	S1113
24 AWG (0.25 mm²)						
0028302	2	0.150	3.8	4	12	S1107
0028303	3	0.157	4.0	5	15	S1107
0028304	4	0.169	4.3	7	17	S1107
0028305	5	0.185	4.7	9	21	S1107
0028307	7	0.201	5.1	12	28	S1107
0028308	8	0.244	6.2	13	33	S1107
0028310	10	0.268	6.8	17	39	S1109
0028312	12	0.276	7.0	20	45	S1111
0028314	14	0.287	7.3	23	50	S1111
0028316	16	0.303	7.7	26	56	S1111
0028318	18	0.319	8.1	30	62	S1111
0028320	20	0.339	8.6	33	69	S1111
0028325	25	0.378	9.6	41	90	S1113
0028330	30	0.406	10.3	49	104	S1113
0028332	32	0.421	10.7	52	110	S1113
0028336	36	0.437	11.1	59	122	S1113
0028337	37	0.449	11.4	60	124	S1113
0028340	40	0.472	12.0	65	134	S1116
0028350	50	0.508	12.9	81	173	S1116

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
22 AWG (0.34 mm²)						
0028402	2	0.165	4.2	5	17	S1107
0028403	3	0.173	4.4	7	21	S1107
0028404	4	0.189	4.8	9	29	S1107
0028405	5	0.217	5.5	12	36	S1107
0028407	7	0.232	5.9	16	42	S1107
0028408	8	0.280	7.1	18	49	S1111
0028410	10	0.299	7.6	22	55	S1111
0028412	12	0.307	7.8	27	69	S1111
0028414	14	0.323	8.2	31	73	S1111
0028416	16	0.343	8.7	35	85	S1111
0028420	20	0.378	9.6	44	107	S1113
0028421	21	0.409	10.4	47	112	S1113
0028425	25	0.441	11.2	55	128	S1113
0028430	30	0.457	11.6	66	152	S1113
0028436	36	0.492	12.5	80	191	S1116
0028440	40	0.531	13.5	89	213	S1121
0028450	50	0.591	15.0	110	274	S1121
20 AWG (0.5 mm²)						
0028502	2	0.185	4.7	7	27	S1107
0028503	3	0.197	5.0	10	32	S1107
0028504	4	0.220	5.6	13	38	S1107
0028505	5	0.240	6.1	17	44	S1107
0028507	7	0.272	6.9	23	55	S1109
0028508	8	0.315	8.0	26	60	S1111
0028510	10	0.339	8.6	33	79	S1111
0028512	12	0.350	8.9	39	89	S1111
0028516	16	0.402	10.2	52	114	S1113
0028520	20	0.449	11.4	65	144	S1113
0028525	25	0.484	12.3	81	178	S1116
0028530	30	0.520	13.2	98	204	S1116
0028540	40	0.622	15.8	130	263	S1121
18 AWG (1 mm²)						
0028702	2	0.220	5.6	13	37	S1107
0028703	3	0.232	5.9	20	47	S1107
0028705	5	0.287	7.3	33	66	S1111
16 AWG (1.5 mm²)						
0028802	2	0.268	6.8	20	50	S1109
0028803	3	0.283	7.2	30	60	S1111
0028804	4	0.307	7.8	40	71	S1111

UNITRONIC® LiYCY

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0034302	2	0.154	3.9	9	13	53112210
0034303	3	0.161	4.1	9	19	53112210
0034304	4	0.169	4.3	10	22	53112210
0034305	5	0.181	4.6	11	26	53112210
0034306	6	0.193	4.9	13	26	53112210
0034307	7	0.193	4.9	13	33	53112210
0034308	8	0.228	5.8	15	38	53112210
0034310	10	0.240	6.1	20	44	53112210
0034312	12	0.248	6.3	21	52	53112210
0034314	14	0.264	6.7	22	54	53112210
0034315	15	0.272	6.9	26	58	53112210
0034316	16	0.276	7.0	29	60	53112210
0034318	18	0.287	7.3	33	70	53112220
0034320	20	0.303	7.7	37	78	53112220
0034321	21	0.311	7.9	38	81	53112220
0034325	25	0.331	8.4	43	100	53112220
0034328	28	0.335	8.5	45	103	53112220
0034330	30	0.343	8.7	47	106	53112220
0034332	32	0.354	9.0	50	110	53112220
0034336	36	0.366	9.3	56	123	53112230
0034340	40	0.409	10.4	59	141	53112230
0034344	44	0.421	10.7	75	151	53112230
0034350	50	0.437	11.1	83	170	53112230

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
24 AWG (0.25 mm²)						
0034402	2	0.177	4.5	11	22	53112210
0034403	3	0.185	4.7	15	25	53112210
0034404	4	0.197	5.0	17	28	53112210
0034405	5	0.220	5.6	20	34	53112210
0034406	6	0.236	6.0	21	39	53112210
0034407	7	0.236	6.0	25	44	53112210
0034408	8	0.280	7.1	29	49	53112210
0034410	10	0.295	7.5	31	55	53112220
0034412	12	0.303	7.7	36	66	53112220
0034414	14	0.315	8.0	40	67	53112220
0034415	15	0.327	8.3	41	75	53112220
0034416	16	0.331	8.4	44	83	53112220
0034418	18	0.346	8.8	56	96	53112220
0034420	20	0.366	9.3	60	102	53112230
0034421	21	0.378	9.6	63	108	53112230
0034425	25	0.421	10.7	77	116	53112230
0034428	28	0.425	10.8	85	122	53112230
0034430	30	0.433	11.0	89	127	53112230
0034432	32	0.449	11.4	93	136	53112240
0034436	36	0.465	11.8	100	148	53112240
0034440	40	0.500	12.7	106	167	53112240
0034450	50	0.543	13.8	120	214	53112250
0034461	61	0.591	15.0	138	245	53112250

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® LiYCY

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
22 AWG (0.34 mm²)						
0034502	2	0.193	4.9	15	25	53112210
0034503	3	0.201	5.1	19	33	53112210
0034504	4	0.224	5.7	19	40	53112210
0034505	5	0.244	6.2	21	44	53112210
0034506	6	0.268	6.8	31	53	53112210
0034507	7	0.268	6.8	33	56	53112210
0034508	8	0.307	7.8	35	63	53112220
0034510	10	0.327	8.3	50	87	53112220
0034512	12	0.335	8.5	54	95	53112220
0034514	14	0.350	8.9	58	103	53112220
0034515	15	0.362	9.2	61	104	53112220
0034516	16	0.370	9.4	64	108	53112230
0034518	18	0.402	10.2	70	116	53112230
0034520	20	0.421	10.7	76	129	53112230
0034521	21	0.437	11.1	78	134	53112230
0034525	25	0.469	11.9	91	174	53112240
0034528	28	0.472	12.0	103	188	53112240
0034530	30	0.484	12.3	107	196	53112240
0034532	32	0.512	13.0	111	205	53112240
0034536	36	0.528	13.4	121	222	53112240
0034540	40	0.583	14.8	135	245	53112250
0034550	50	0.626	15.9	158	290	53112250
20 AWG (0.5 mm²)						
0034602	2	0.220	5.6	20	36	53112210
0034603	3	0.232	5.9	26	45	53112210
0034604	4	0.248	6.3	29	52	53112210
0034605	5	0.276	7.0	35	60	53112210

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0034606	6	0.299	7.6	40	70	53112220
0034607	7	0.299	7.6	44	75	53112220
0034608	8	0.343	8.7	48	91	53112220
0034610	10	0.366	9.3	60	108	53112230
0034612	12	0.378	9.6	67	119	53112230
0034618	18	0.465	11.8	91	161	53112240
0034620	20	0.476	12.1	101	185	53112240
0034625	25	0.539	13.7	142	237	53112250
0034630	30	0.571	14.5	155	267	53112250
18 AWG (1 mm²)						
0034802	2	0.248	6.3	29	48	53112210
0034803	3	0.268	6.8	38	60	53112210
0034804	4	0.287	7.3	46	73	53112220
0034805	5	0.315	8.0	54	85	53112220
0034807	7	0.339	8.6	80	115	53112220
0034810	10	0.437	11.1	95	153	53112230
0034812	12	0.449	11.4	113	174	53112240
0034818	18	0.528	13.4	170	261	53112240
0034825	25	0.638	16.2	226	347	53112250
16 AWG (1.5 mm²)						
0034902	2	0.295	7.5	39	60	53112220
0034903	3	0.311	7.9	50	77	53112220
0034904	4	0.335	8.5	73	103	53112220
0034905	5	0.366	9.3	87	118	53112230
0034907	7	0.413	10.5	111	148	53112230
0034912	12	0.539	13.7	171	253	53112250
0034918	18	0.642	16.3	236	349	53112250
0034925	25	0.783	19.9	370	605	53112260

UNITRONIC® LiYCY (TP)

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0035131	2	0.224	5.7	13	26	53112210
0035141	3	0.228	5.8	16	32	53112210
0035132	4	0.244	6.2	18	36	53112210
0035133	6	0.280	7.1	33	57	53112210
0035150	8	0.323	8.2	37	65	53112220
0035134	10	0.343	8.7	40	74	53112220
0035135	12	0.350	8.9	45	95	53112220
0035136	16	0.402	10.2	54	103	53112230
0035142	20	0.445	11.3	66	124	53112240
0035137	25	0.492	12.5	76	160	53112240
24 AWG (0.25 mm²)						
0035800	2	0.248	6.3	19	36	53112210
0035801	3	0.280	7.1	27	46	53112210
0035802	4	0.299	7.6	31	54	53112220
0035803	6	0.335	8.5	47	77	53112220
0035804	8	0.406	10.3	52	87	53112230
0035805	10	0.433	11.0	69	106	53112230
0035806	12	0.445	11.3	81	128	53112240
0035807	16	0.492	12.5	99	160	53112240
0035808	25	0.634	16.1	138	231	53112250

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0035810	2	0.339	8.6	33	62	53112220
0035811	3	0.343	8.7	50	87	53112220
0035812	4	0.370	9.4	56	98	53112230
0035813	6	0.437	11.1	74	133	53112230
0035814	8	0.516	13.1	94	174	53112240
0035816	12	0.587	14.9	134	238	53112250
0035817	16	0.650	16.5	162	308	53112250
18 AWG (1 mm²)						
0035830	2	0.354	9.0	57	95	53112220
0035831	3	0.409	10.4	65	116	53112230
0035832	4	0.445	11.3	82	142	53112240
0035836	5	0.465	11.8	109	179	53112240

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® LiHH/LiHCH/LiHCH (TP)

Low-voltage halogen-free multi-conductor & multi-pair communication & control cable

UNITRONIC® LiHH/LiHCH is a halogen-free multi-conductor cable for communication, signal, and control applications. It is designed for general purpose installations of electrical machinery where human safety is a concern in case of a fire. UNITRONIC® LiHCH has a tinned copper braid for RFI & EMC protection. UNITRONIC® LiHCH (TP) is an overall-shielded multi-paired version for data, communication, and signal applications.

Unshielded construction

Conductors: stranded bare copper

Insulation: special halogen-free compound

Jacket: special halogen-free compound; pebble gray

Shielded construction

Conductors: stranded bare copper

Pairs: special halogen-free compound

Insulation: special halogen-free compound

Shielding: tinned copper braid

Jacket: special halogen-free compound; pebble gray

Recommended applications

RS-232; data buses; process control instrumentation; low-voltage signaling and interconnect; broadcast; applications with European DIN 47100 color code where human safety is a concern

Application advantage

- Low Smoke, Zero Halogen
- European color code DIN 47100
- Extended temperature range of -30°C to +80°C
- Low smoke density and low amount of corrosive gases if on fire

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-02

Complete the installation

SKINTOP® strain relief
page 492

EPIC® connectors
page 284

Technical data

Minimum bend radius:
- for installation: 6 x cable diameter
- shielded: 6 x cable diameter

Temperature range:
- for stationary use: -30°C to +80°C
- for flexible use: -5°C to +70°C

Nominal voltage: 250V

Test voltage: 1200V

Conductor stranding: fine wire

Inductance: nominal 0.65 mH/km

Mutual capacitance:
- conductor/conductor: 24 pF/ft
- conductor/shield: 37 pF/ft

Color code:
- UNITRONIC® LiHH/LiHCH: DIN 47100: chart 8, page 682
- UNITRONIC® LiHCH (TP): DIN 47100: chart 7, page 682

Approvals: based on VDE 0812
CE & RoHS

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® LiHH

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.25 mm²)						
0037120	2	0.157	4.0	4	15	S1107
0037121	3	0.165	4.2	5	17	S1107
0037122	4	0.177	4.5	7	19	S1107
0037124	6	0.209	5.3	10	26	S1107
0037125	7	0.209	5.3	12	28	S1107
0037126	8	0.252	6.4	13	34	S1109
0037128	12	0.283	7.2	20	45	S1111
22 AWG (0.34 mm²)						
0037140	2	0.173	4.4	5	19	S1107
0037141	3	0.181	4.6	7	20	S1107
0037142	4	0.197	5.0	9	27	S1107
0037143	5	0.224	5.7	11	30	S1107
0037147	12	0.315	8.0	27	65	S1111

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
20 AWG (0.5 mm²)						
0037150	2	0.193	4.9	7	21	S1107
0037151	3	0.205	5.2	10	25	S1107
0037152	4	0.228	5.8	13	30	S1107
0037153	5	0.248	6.3	17	39	S1109
0037154	7	0.276	7.0	23	48	S1111
18 AWG (1 mm²)						
0037171	3	0.240	6.1	20	38	S1107
0037172	4	0.260	6.6	26	45	S1109

UNITRONIC® LiHCH

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0037302	2	0.161	4.1	9	15	53112210
0037304	4	0.177	4.5	11	19	53112210
0037308	8	0.236	6.0	18	28	53112210
0037312	12	0.256	6.5	21	52	53112210
0037325	25	0.343	8.7	43	100	53112220
24 AWG (0.25 mm²)						
0037402	2	0.185	4.7	11	17	53112210
0037403	3	0.193	4.9	13	20	53112210
0037404	4	0.205	5.2	15	24	53112210
0037406	6	0.244	6.2	21	33	53112210
0037407	7	0.244	6.2	22	35	53112210
0037408	8	0.287	7.3	24	39	53112220
0037410	10	0.303	7.7	29	54	53112220
0037425	25	0.429	10.9	77	116	53112230
22 AWG (0.34 mm²)						
0037502	2	0.201	5.1	12	20	53112210
0037503	3	0.209	5.3	15	24	53112210
0037504	4	0.232	5.9	17	28	53112210
0037507	7	0.276	7.0	29	49	53112210
0037508	8	0.315	8.0	31	56	53112220
0037510	10	0.335	8.5	43	68	53112220
0037516	16	0.378	9.6	64	108	53112230
0037525	25	0.476	12.1	97	174	53112240

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0037602	2	0.228	5.8	20	26	53112210
0037603	3	0.240	6.1	24	32	53112210
0037604	4	0.256	6.5	31	45	53112210
0037605	5	0.283	7.2	34	51	53112220
0037606	6	0.307	7.8	40	56	53112220
0037607	7	0.307	7.8	46	61	53112220
0037608	8	0.350	8.9	51	70	53112220
0037610	10	0.374	9.5	63	88	53112230
0037612	12	0.386	9.8	67	119	53112230
0037618	18	0.461	11.7	91	161	53112240
18 AWG (1 mm²)						
0037802	2	0.256	6.5	29	48	53112210
0037803	3	0.276	7.0	38	60	53112210
0037804	4	0.295	7.5	46	73	53112220
0037807	7	0.346	8.8	80	115	53112220
16 AWG (1.5 mm²)						
0037902	2	0.303	7.7	39	60	53112220
0037903	3	0.319	8.1	50	77	53112220

UNITRONIC® LiHCH (TP)

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0038302	2	0.232	5.9	13	26	53112210
0038303	3	0.236	6.0	16	32	53112210
0038304	4	0.252	6.4	18	36	53112210
0038308	8	0.331	8.4	37	65	53112220
0038312	12	0.358	9.1	45	95	53112220
0038316	16	0.409	10.4	54	103	53112230
0038325	25	0.500	12.7	76	160	53112240
24 AWG (0.25 mm²)						
0038402	2	0.283	7.2	19	36	53112220
0038403	3	0.287	7.3	27	44	53112220
0038404	4	0.307	7.8	31	54	53112220
0038406	6	0.343	8.7	47	77	53112220
0038408	8	0.413	10.5	52	87	53112230
0038412	12	0.453	11.5	81	128	53112240
0038416	16	0.500	12.7	99	160	53112240

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
20 AWG (0.5 mm²)						
0038602	2	0.346	8.8	33	62	53112220
0038603	3	0.350	8.9	50	87	53112220
0038604	4	0.378	9.6	56	98	53112230
0038606	6	0.445	11.3	74	133	53112240
0038608	8	0.524	13.3	94	174	53112240
0038612	12	0.594	15.1	134	238	53112250
0038616	16	0.657	16.7	162	308	53112250
18 AWG (1 mm²)						
0038802	2	0.413	10.5	57	95	53112230
0038803	3	0.417	10.6	65	116	53112230
0038804	4	0.453	11.5	82	142	53112240

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

UNITRONIC® CY PiDY (TP)

Low-voltage multi-pair communication & control cable; individually shielded pairs & overall shield

UNITRONIC® CY PiDY (TP) is a multi-pair cable with individually shielded pairs for communication, signal, and control applications. It is designed for general purpose installations of electrical machinery. UNITRONIC® CY PiDY (TP) has a tinned copper braid for additional RFI & EMI protection.

Construction

Conductors: stranded bare copper

Pairs: PVC; tinned copper braid; PVC jacket over braid

Shielding: overall tinned copper braid

Jacket: PVC; pebble gray

Recommended applications

RS-232; data buses; process control instrumentation; low-voltage signaling and interconnect; broadcast; applications with the European DIN 47100 color code

Application advantage

- Outstanding EMC protection against signal coupling
- European color code DIN 47100
- Extended temperature range of -30°C to +70°C

Approvals

CE RoHS

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-01	MECH.	MP-01

Complete the installation	
SKINTOP® MS-SC page 522	EPIC® connectors page 284

Technical data

Minimum bend radius:	
- for installation:	6 x cable diameter
Temperature range:	
- for stationary use:	-40°C to +80°C
- for flexible use:	-5°C to +50°C
Nominal voltage:	250V
Test voltage:	1200V
Conductor stranding:	fine wire
Insulation resistance:	20 GΩ x cm
Inductance:	nominal 0.65 mH/km
Loop resistance:	< 160 Ω x km
Characteristic impedance:	approx. 65 Ω
Mutual capacitance:	
- conductor/conductor:	37 pF/ft
- conductor/shield:	48 pF/ft
Color code:	DIN 47100: chart 7, page 682
Approvals:	based on VDE 0812 RoHS

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
24 AWG (0.25 mm²)						
0034250	2	0.367	9.3	41	75	53112230
0034251	3	0.386	9.8	49	91	53112230
0034252	4	0.438	11.1	60	113	53112230
0034253	5	0.465	11.8	70	135	53112240
0034254	6	0.504	12.8	85	164	53112240

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0034256	8	0.607	15.4	109	218	53112250
0034257	10	0.674	17.1	126	230	53112260
0034258	12	0.721	18.3	161	280	53112260
0034259	16	0.800	20.3	213	364	53112260

UNITRONIC®

Continuous flex data, signal & control cable

220 **Quick select chart**

222 **UNITRONIC® FD 890**
Continuous flex 300V multi-conductor PVC industrial communication cable; unshielded

223 **UNITRONIC® FD**
Continuous flex 350V multi-conductor PVC industrial communication cable; unshielded

224 **UNITRONIC® FD CY**
Continuous flex 350V multi-conductor PVC industrial communication cable; shielded

225 **UNITRONIC® FD P plus**
Continuous flex 250V multi-conductor PUR industrial communication cable; unshielded

226 **UNITRONIC® FD CP plus**
Continuous flex 250V multi-conductor PUR industrial communication cable; shielded

227 **UNITRONIC® FD CP (TP) plus**
Continuous flex 250V multi-pair PUR industrial communication cable; shielded

Quick select chart

Product	Construction			AWG range	Conductor count	
	shielding	insulation	jacket			
UNITRONIC® FD 890	no	PVC	PVC	24 - 22 AWG	3, 5, 7 10, 14, 18, 25	
UNITRONIC® FD	no	PVC	PVC	26 - 22 AWG	2, 3, 4, 5, 7, 10, 14, 18, 25	
UNITRONIC® FD CY	yes	PVC	PVC	26 - 22 AWG	2, 3, 4, 5, 7, 10, 14, 18, 25	
UNITRONIC® FD P plus	no	polyolefin	PUR	26 - 22 AWG	2, 3, 4, 5, 7, 10, 14, 18, 25	
UNITRONIC® FD CP plus	yes	polyolefin	PUR	26 - 22 AWG	2, 3, 4, 5, 7, 10, 14, 18, 25	
UNITRONIC® FD CP (TP) plus	yes	polyolefin	PUR	26 - 18 AWG	1, 2, 3, 4, 5, 6, 8, 10, 14 (pairs)	

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	Nominal voltage	Temperature range		Approvals	Cable attributes, see page 648			Page
		low	high		oil resistance	flame resistance	mechanical properties	
	300V	-5°C	90°C		OR-03	FR-02	MP-01	222
	350V	-5°C	70°C		OR-01	FR-02	MP-01	223
	350V	-5°C	70°C		OR-01	FR-02	MP-01	224
	250V	-40°C	80°C		OR-05	FR-02	MP-05	225
	250V	-40°C	80°C		OR-05	FR-02	MP-05	226
	250V	-40°C	80°C		OR-05	FR-02	MP-05	227

UNITRONIC® FD 890

Continuous flex 300V multi-conductor PVC industrial communication cable; unshielded

UNITRONIC® FD 890 is designed for continuous flexing signal and low voltage control applications. The specially blended PVC jacket is resistant to most oils, solvents, and water-based coolants.

Construction

Conductors: finely stranded bare copper

Insulation: specially blended PVC; non-woven wrapping

Jacket: specially formulated PVC; gray

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Application advantage

- Designed for high flexing applications
- Flexible for ease of routing in tight spaces
- Resistant to oils, solvents, and coolants

Approvals

Continuous Flex Test Method Verified

Cable attributes			page 648
OIL	OR-03	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC page 522

EPIC® connectors page 279

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +90°C
- for stationary use: -40°C to +90°C

Nominal voltage: 300V (not for power)

Test voltage: 2000V

Conductor stranding: Class 6 super fine wire

Color code: DIN 47100: chart 8, page 682

Approvals:

UL:	AWM 20132
Attributes:	-25°C cold bend NFPA 79
Canada:	CSA AWM I/II A/B FT1
Additional:	RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
24 AWG (0.24 mm²)						
892405	5	0.242	6.1	8	40	S1107
892407	7	0.281	7.1	11	50	S1111
892410	10	0.349	8.9	15	65	S1111
892414	14	0.350	18.9	21	83	S1111
892425	25	0.485	12.3	38	138	S1116

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
22 AWG (0.34 mm²)						
892203	3	0.210	5.3	8	33	S1107
892205	5	0.254	6.5	12	50	S1109
892207	7	0.293	7.4	14	66	S1111
892210	10	0.377	9.6	24	91	S1113
892214	14	0.376	9.6	34	140	S1113
892218	18	0.416	10.6	43	161	S1113
892225	25	0.519	13.2	60	194	S1116

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD

Continuous flex 350V multi-conductor PVC industrial communication cable; unshielded

UNITRONIC® FD is a DIN-style communication cable designed for continuous flexing industrial signal and low voltage control applications. The specially blended PVC jacket is resistant to most oils, solvents, and water-based coolants.

Construction

Conductors: finely stranded bare copper

Insulation: specially blended PVC; non-woven wrapping

Jacket: specially formulated PVC; gray

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Application advantage

- Designed for high flexing applications
- Flexible for ease of routing in tight spaces
- Resistant to oils, solvents, and coolants

Approvals

CE RoHS

Continuous Flex Test Method Verified UL VERIFIED verify.ul.com A522492

Cable attributes				page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

EPIC® connectors
page 279

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for continuous flexing: 5 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +70°C
- for stationary use: -40°C to +80°C

Nominal voltage: 350V (not for power)

Test voltage: 1500V

Mutual capacitance:
- conductor/conductor: approx. 30 pF/ft

Inductance: approx. 0.65 mH/km

Conductor stranding: extra fine wire per VDE 0295

Color code: DIN 47100: chart 8, page 682

Approvals: based on VDE 0812
CE & RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
26 AWG (0.14 mm²)						
0027841	3	0.161	4.1	3	17	S1107
0027842	4	0.173	4.4	4	21	S1107
0027843	5	0.185	4.7	5	24	S1107
0027844	7	0.213	5.4	7	34	S1107
0027845	10	0.252	6.4	9	42	S1109
0027846	14	0.256	6.5	13	52	S1109
0027847	18	0.280	7.1	17	61	S1111
0027848	25	0.339	8.6	24	84	S1111
24 AWG (0.25 mm²)						
0027855	2	0.181	4.6	3	18	S1107
0027856	3	0.185	4.7	5	22	S1107
0027857	4	0.201	5.1	7	27	S1107
0027858	5	0.220	5.6	8	30	S1107
0027859	7	0.252	6.4	12	40	S1109

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
0027860	10	0.303	7.7	17	56	S1111
0027861	14	0.307	7.8	24	73	S1111
0027863	18	0.346	8.8	30	87	S1111
0027865	25	0.425	10.8	42	120	S1113
22 AWG (0.34 mm²)						
0027870	2	0.193	4.9	5	20	S1107
0027871	3	0.205	5.2	7	29	S1107
0027872	4	0.224	5.7	9	38	S1107
0027873	5	0.244	6.2	11	44	S1107
0027874	7	0.280	7.1	16	57	S1111
0027875	10	0.346	8.8	23	79	S1111
0027876	14	0.350	8.9	32	101	S1111
0027877	18	0.394	10.0	41	122	S1113
0027878	25	0.484	12.3	57	168	S1116

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD CY

Continuous flex 350V multi-conductor PVC industrial communication cable; shielded

UNITRONIC® FD CY is a DIN-style communication cable designed for continuous flexing industrial signal and communication applications. It has a tinned copper braid shield for EMI resistance.

Construction

Conductors: finely stranded bare copper

Insulation: specially blended PVC; non-woven wrapping

Shielding: tinned copper braid (85% coverage)

Jacket: specially formulated PVC; gray

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Application advantage

- Designed for high flexing applications
- Flexible for ease of routing in tight spaces
- Resistant to oils, solvents, and coolants

Approvals

CE RoHS

Continuous Flex Test Method Verified UL VERIFIED verify.ul.com A522492

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	CF-02*	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC page <?>

EPIC® connectors page <?>

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -5°C to +70°C
- for stationary use: -40°C to +80°C

Nominal voltage: 350V (not for power)

Test voltage: 1500V

Mutual capacitance:
- conductor/conductor & conductor/shield: approx. 33 pF/ft

Inductance: approx. 0.65 mH/km

Conductor stranding: extra fine wire per VDE 0295

Color code: DIN 47100: chart 8, page 682

Approvals: based on VDE 0812
CE & RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0027411	3	0.185	4.7	9	25	53112210
0027412	4	0.197	5.0	10	28	53112210
0027413	5	0.213	5.4	12	32	53112210
0027414	7	0.236	6.0	19	47	53112210
0027416	10	0.276	7.0	26	60	53112210
0027418	14	0.280	7.1	30	71	53112210
0027420	18	0.303	7.7	36	83	53112220
0027422	25	0.362	9.2	46	110	53112220
24 AWG (0.25 mm²)						
0027425	2	0.201	5.1	10	26	53112210
0027426	3	0.213	5.4	13	31	53112210
0027427	4	0.228	5.8	14	36	53112210
0027428	5	0.244	6.2	20	48	53112210
0027429	7	0.276	7.0	27	50	53112210

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0027431	10	0.335	8.5	36	77	53112220
0027434	14	0.339	8.6	43	95	53112220
0027436	18	0.370	9.4	53	112	53112230
0027438	25	0.449	11.4	68	149	53112240
22 AWG (0.34 mm²)						
0027440	2	0.220	5.6	11	32	53112210
0027441	3	0.232	5.9	19	42	53112210
0027442	4	0.248	6.3	24	54	53112210
0027443	5	0.268	6.8	26	60	53112210
0027444	7	0.303	7.7	35	79	53112220
0027446	10	0.370	9.4	45	104	53112230
0027448	14	0.374	9.5	57	130	53112230
0027450	18	0.421	10.7	67	151	53112230
0027452	25	0.508	12.9	104	220	53112240

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD P plus

Continuous flex 250V multi-conductor PUR industrial communication cable; unshielded

UNITRONIC® FD P plus is a communication cable designed for continuous flexing industrial signal and low voltage control applications. The tear-resistant polyurethane jacket provides excellent service life in harsh environments against most oils, solvents, and coolants.

Construction

Conductors: finely stranded bare copper

Insulation: polyolefin; non-woven wrapping

Jacket: specially formulated polyurethane; gray

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Application advantage

- Designed for high flexing applications
- Flexible at -40°C
- Resistant to oils, solvents, and coolants
- Abrasion-resistant & halogen-free jacket
- Resistant to microbes and hydrolysis

Approvals

Continuous Flex Test Method Verified, UL VERIFIED, verifyUL.com, A522492

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-02*	MECH.	MP-05	

Complete the installation

SKINTOP® MS-SC
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EPIC® connectors
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for continuous flexing: 5 x cable diameter

Temperature range:
- for continuous flexing: -40°C to +80°C

Nominal voltage: 250V (not for power)
- UL AWM: 1000V

Test voltage: 1500V

Mutual capacitance:
- conductor/conductor: approx. 18 pF/ft

Inductance: approx. 0.65 mH/km

Conductor stranding: extra fine wire per VDE 0295

Color code: DIN 47100: chart 8, page 682

Approvals:
UL: AWM 21576
Canada: cRU AWM I/II A/B FT2
Additional: CE & RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
26 AWG (0.14 mm²)						
0028647	2	0.146	3.7	2	13	S1107
0028650	3	0.154	3.9	3	17	S1107
0028651	4	0.165	4.2	4	20	S1107
0028652	5	0.177	4.5	5	23	S1107
0028677	6	0.189	4.8	6	28	S1107
0028653	7	0.201	5.1	7	32	S1107
0028654	10	0.240	6.1	9	40	S1109
0028678	12	0.248	6.3	11	45	S1109
0028656	18	0.268	6.8	17	56	S1111
0028657	25	0.327	8.3	24	81	S1111
24 AWG (0.25 mm²)						
0028658	2	0.169	4.3	3	18	S1107
0028659	3	0.177	4.5	5	22	S1107
0028660	4	0.193	4.9	7	24	S1107
0028661	5	0.209	5.3	8	33	S1107
0028679	6	0.240	6.1	10	37	S1109

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® SL PG thread
0028662	7	0.240	6.1	12	29	S1109
0028663	10	0.291	7.4	17	48	S1111
0028680	12	0.295	7.5	20	58	S1111
0028664	14	0.295	7.5	24	49	S1111
0028665	18	0.335	8.5	30	70	S1111
0028666	25	0.409	10.4	42	89	S1113
22 AWG (0.34 mm²)						
0028667	2	0.185	4.7	5	22	S1107
0028668	3	0.197	5.0	7	26	S1107
0028669	4	0.213	5.4	9	28	S1107
0028670	5	0.232	5.9	11	30	S1107
0028671	7	0.268	6.8	16	37	S1111
0028672	10	0.335	8.5	23	57	S1111
0028673	14	0.339	8.6	32	63	S1111
0028674	18	0.382	9.7	41	88	S1113
0028675	25	0.469	11.9	57	134	S1116

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD CP plus

Continuous flex 250V multi-conductor PUR industrial communication cable; shielded

UNITRONIC® FD CP plus is a Type CMX approved communication cable designed for continuous flexing industrial signal and low voltage applications. The tear-resistant polyurethane jacket provides excellent service life in harsh environments against most oils, solvents, and coolants. It has a tinned copper braid shield for EMI resistance.

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Approvals

Construction

Conductors: finely stranded bare copper

Insulation: polyolefin; non-woven wrapping

Shielding: tinned copper braid (85% coverage)

Jacket: specially formulated polyurethane; gray

Application advantage

- UL/c(UL) CMX approved
- Flexible at -40°C
- Resistant to oils, solvents, and coolants
- Abrasion-resistant & halogen-free jacket
- Resistant to microbes and hydrolysis
- Designed for high flexing applications

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-02*	MECH.	MP-05	

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EPIC® connectors
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ÖLFLEX® CONNECT solution

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Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -40°C to +80°C
  - AWM: up to +80°C
  - CMX: up to +75°C

Nominal voltage: 250V (not for power)
- UL AWM: 1000V

Test voltage:
- conductor/conductor: 1500V
- conductor/shield: 500V

Mutual capacitance:
- conductor/conductor: approx. 18 pF/ft

Inductance: approx. 0.65 mH/km

Conductor stranding: extra fine wire per VDE 0295

Color code: DIN 47100: chart 8, page 682

Approvals:
UL: AWM 21576
CMX
Canada: c(UL) CMX
cRU AWM I/II A/B FT2
Additional: CE & RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Number of conductors	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0028880	2	0.169	4.3	8	22	53112210
0028881	3	0.177	4.5	9	24	53112210
0028882	4	0.189	4.8	10	27	53112210
0028883	5	0.201	5.1	12	30	53112210
0028884	7	0.224	5.7	19	45	53112210
0028885	10	0.264	6.7	26	58	53112210
0028886	14	0.268	6.8	30	69	53112210
0028887	18	0.291	7.4	36	79	53112220
0028888	25	0.350	8.9	46	106	53112220
24 AWG (0.25 mm²)						
0028889	2	0.185	4.7	10	26	53112210
0028890	3	0.193	4.9	13	30	53112210
0028891	4	0.209	5.3	14	35	53112210
0028892	5	0.220	5.6	21	46	53112210
0028893	7	0.252	6.4	27	56	53112210
0028894	10	0.299	7.6	36	73	53112220
0028895	14	0.311	7.9	43	91	53112220
0028896	18	0.339	8.6	53	108	53112230
0028897	25	0.409	10.4	68	143	53112240
22 AWG (0.34 mm²)						
0028898	2	0.201	5.1	12	30	53112210
0028899	3	0.213	5.4	19	41	53112210
0028900	4	0.228	5.8	24	52	53112210
0028901	5	0.244	6.2	26	56	53112210
0028902	7	0.280	7.1	35	73	53112220
0028903	10	0.339	8.6	45	99	53112230
0028904	14	0.346	8.8	58	125	53112230
0028905	18	0.386	9.8	67	145	53112230
0028906	25	0.465	11.8	104	211	53112240

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD CP (TP) plus

Continuous flex 250V multi-pair PUR industrial communication cable; shielded

UNITRONIC® FD CP (TP) plus is a Type CMX approved multi-pair communication cable designed for continuous flexing industrial signal and data applications. The tear-resistant polyurethane jacket provides excellent service life in harsh environments against most oils, solvents, and coolants. It has a tinned copper braid shield for EMI resistance.

Recommended applications

High-speed automated equipment; robotics; CNC and multi-axis cutting equipment; other cable track applications

Approvals

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 polyurethane; gray

Application advantage

- UL/c(UL) CMX approved
- Flexible at -40°C
- Resistant to oils, solvents, and coolants
- Abrasion-resistant & halogen-free jacket
- Resistant to microbes and hydrolysis

Cable attributes				page 648
OIL	OR-05	FLAME	FR-02	
MOTION	CF-02*	MECH.	MP-05	

Complete the installation

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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
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Technical data

Minimum bend radius:
- for continuous flexing: 7.5 x cable diameter

Temperature range:
- for continuous flexing: -40°C to +80°C
  - AWM: up to +80°C
  - CMX: up to +75°C

Nominal voltage: 250V (not for power)

Test voltage:
- conductor/conductor: 1500V
- conductor/shield: 500V

Mutual capacitance:
- up to 0.5 mm²: 18 pF/ft
- up to 1.0 mm²: 21 pF/ft

Inductance: approx. 0.65 mH/km

Conductor stranding: extra fine wire per VDE 0295

Color code: DIN 47100: chart 7, page 682

Approvals:

UL:	AWM 21576 CMX
Canada:	c(UL) CMX cRU AWM I/II A/B FT2
Additional:	CE & RoHS
*UL Verified ID A522492:	Continuous Flex Test Method Verified

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

UNITRONIC® FD CP (TP) plus

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
26 AWG (0.14 mm²)						
0030910	2	0.232	5.9	13	28	53112210
0030911	3	0.244	6.2	16	36	53112210
0030912	4	0.264	6.7	18	40	53112210
0030913	5	0.287	7.3	25	50	53112220
0030914	6	0.295	7.5	33	61	53112220
0030915	8	0.346	8.8	37	73	53112220
0030916	10	0.398	10.1	40	81	53112230
24 AWG (0.25 mm²)						
0030962	1	0.185	4.7	9	18	53112210
0030919	2	0.260	6.6	22	40	53112220
0030920	3	0.276	7.0	26	48	53112220
0030921	4	0.299	7.6	29	57	53112220
0030922	5	0.335	8.5	35	69	53112230
0030923	6	0.346	8.8	48	88	53112230
0030924	8	0.406	10.3	50	104	53112240
0030925	10	0.465	11.8	60	125	53112240
0030926	14	0.472	12.0	75	147	53112240
22 AWG (0.34 mm²)						
0030963	1	0.201	5.1	13	24	53112210
0030928	2	0.287	7.3	28	54	53112220

Part number	Number of pairs	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
0030929	3	0.315	8.0	35	68	53112220
0030930	4	0.343	8.7	40	80	53112230
0030932	6	0.394	10.0	58	111	53112230
0030934	10	0.539	13.7	88	184	53112250
20 AWG (0.5 mm²)						
0030964	1	0.232	5.9	15	32	53112210
0030937	2	0.327	8.3	34	67	53112230
0030938	3	0.346	8.8	48	87	53112230
0030939	4	0.386	9.8	50	99	53112230
0030940	5	0.421	10.7	57	113	53112240
0030941	6	0.445	11.3	67	130	53112240
0030942	8	0.520	13.2	97	191	53112250
0030943	10	0.598	15.2	118	230	53112260
0030944	14	0.610	15.5	145	269	53112260
18 AWG (1 mm²)						
0030955	1	0.248	6.3	28	48	53112210
0030956	2	0.390	9.9	49	87	53112230
0030957	3	0.413	10.5	63	114	53112240
0030958	4	0.465	11.8	79	137	53112240
0030959	5	0.516	13.1	93	159	53112250

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.

3 ETHERLINE®

Data communication systems for Ethernet technology

Our ETHERLINE® data products open up a secure, fast, and reliable path to the future of Ethernet applications like PROFINET®. The systems are made up of durable, robust cable and connection components for passive and active network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

Application range

- Industry and building networks
- Industrial machinery and plant engineering
- Automation technology
- Control engineering

ETHERLINE®

Data communication systems for Ethernet technology

232 **Quick select chart & cable attributes**
2 pair cable

234 **Quick select chart & cable attributes**
4 pair cable

2 pair cable

236 **ETHERLINE® 2 pair: CAT.5/CAT.5e; stationary**
Industrial Ethernet cable for stationary applications

237 **ETHERLINE® 2 pair: CAT.5/CAT.5e; flexible**
Industrial Ethernet cable for flexible applications

238 **ETHERLINE® 2 pair: CAT.5/CAT.5e; continuous flex**
Industrial Ethernet cable for continuous flex applications

239 **ETHERLINE® 2 pair: CAT.5 TORSION**
Industrial Ethernet cable suitable for torsion stress

240 **ETHERLINE® 2 pair: CAT.5e 105C Plus; flexible**
Industrial Ethernet cable for high temperature flexible applications

241 **ETHERLINE® 2 pair: CAT.5 ARMORED**
2-pair CAT.5 extension cordsets with two 8-wire RJ45 connectors

242 **ETHERLINE® 2 pair: CAT.5 HYBRID**
Industrial Ethernet cable for power with Ethernet applications

4 pair cable

243 **ETHERLINE® 4 pair: CAT.5e; stationary**
Industrial Ethernet cable for stationary applications

244 **ETHERLINE® 4 pair: CAT.5e; flexible**
Industrial Ethernet cable for flexible applications

245 **ETHERLINE® 4 pair: CAT.5e; continuous flex**
Industrial Ethernet cable for continuous flex applications

246 **ETHERLINE® 4 pair: CAT.6; continuous flex**
Industrial Ethernet cable for continuous flex applications

247 **ETHERLINE® 4 pair: CAT.6A/CAT.7; stationary**
Industrial Ethernet cable for stationary applications

248 **ETHERLINE® 4 pair: CAT.6A; continuous flex**
Industrial Ethernet cable for continuous flex applications

249 **ETHERLINE® 4 pair: CAT.6A TORSION**
Industrial Ethernet cable for torsion stress

250 **ETHERLINE® 4 pair: CAT.7; flexible**
Industrial Ethernet cable for flexible applications

251 **ETHERLINE® 4 pair: CAT.7 TORSION**
Industrial Ethernet cable for torsion stress

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ETHERLINE®

Data communication systems for Ethernet technology

Industrial Ethernet cable for special applications

252 **ETHERLINE® HEAT 6722**
Flexible special Ethernet cable for high-temperature applications

253 **ETHERLINE® TRAY CAT.5e; flexible**
Tray-rated industrial Ethernet cable for flexible applications

734 **ETHERLINE® TRAY CAT.7; stationary**
Tray-rated industrial Ethernet cable for stationary applications

254 **ETHERLINE® FIRE CAT.5e PH120**
Halogen-free industrial Ethernet cable for harsh flame conditions

255 **ETHERLINE® ROBUST**
2-pair CAT.5 extension cordsets with two 8-wire RJ45 connectors

256 **ETHERLINE® ROBUST FR**
Chemical-resistant industrial Ethernet cable for flexible applications

Connectors

257 **RJ45 CAT.5 Hirose TM11connectors**

258 **RJ45 CAT.5e for PROFINET®**

258 **RJ45 CAT.6 Hirose TM21/CAT.6A connectors**

259 **RJ45 CAT.6A Industry 10G connectors**

259 **RJ45 90° CAT.6Aconnectors**

260 **M12 field wireable connectors**

261 **M12 field wireable connectors for PROFINET®**

261 **M12 FT IE**

262 **CCR FA cable coupler**

Tools

262 **RJ45 crimping tools**

262 **Fast connect stripping tool**

Cordsets & Assemblies

263 **Continuous flex Industrial Ethernet cordsets**
4-pair CAT.5e extension cordsets with two 8-wire RJ45 connectors

264 **Continuous flex PROFINET® cordsets**
2-pair CAT.5 extension cordsets with two 8-wire RJ45 connectors

739 **ETHERLINE® Industrial Ethernet cable assemblies** NEW

Active network components

737 **ETHERLINE® GUARD** NEW
Device for monitoring cable status

Quick select chart & cable attributes

2 pair cable

Application	Product	Page	Category	Part number	Jacket material	Size	Outer diameter in	
Stationary	ETHERLINE® CAT.5/5e	236	CAT.5	2170893	PVC	22 AWG	0.256	
			CAT.5e	2170891	PVC	22 AWG	0.252	
				2170933	PVC/PVC	22 AWG	0.307	
				2170280	halogen-free	24 AWG	0.229	
				2170281	PUR	24 AWG	0.229	
	ETHERLINE® ARMORED	241	CAT.5	2170496	PVC/PE	22 AWG	0.366	
Flexible	ETHERLINE® CAT.5/5e	237	CAT.5	2170886	PVC	22 AWG	0.256	
			CAT.5e	2170901	PVC	22 AWG	0.244	
				2170283	halogen-free	26 AWG	0.213	
				2170284	PUR	26 AWG	0.228	
	ETHERLINE® 105C Plus	240	CAT.5e	2170636	TPE	22 AWG	0.244	
	ETHERLINE® HYBRID	242	CAT.5	2170887	halogen-free	22 AWG + 16 AWG/4c	0.406	
	ETHERLINE® ROBUST	255	CAT.5e	2170451	TPE	22 AWG	0.268	
	ETHERLINE® ROBUST FR	256	CAT.5e	2170454	TPE	22 AWG	0.268	
Continuous flex	ETHERLINE® CAT.5/5e	238	CAT.5	2170894	PUR	22 AWG	0.256	
			CAT.5e	2170289	PUR	26 AWG	0.240	
				2170289NA	PUR	26 AWG	0.228	
Torsion	ETHERLINE® TORSION	239	CAT.5	2170888	PUR	22 AWG	0.256	

	Approvals	Special features	Cable attributes, see page 648			
			oil resistance	flame resistance	motion type	mechanical protection
	PROFINET®, EtherCAT®, UL AWM, UL/CSA CMG	fast connect, 600V	OR-00	FR-03	FL-01	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMX	–	OR-00	FR-02	FL-01	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMG	for outdoor use and direct burial	OR-00	FR-03	FL-01	MP-01
	–	–	OR-00	FR-01	FL-01	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-01	MP-05
	PROFINET®, EtherCAT®	steel armored, for outdoor use and direct burial	OR-00	FR-00	FL-00	MP-01
	PROFINET®, EtherCAT®, UL AWM, UL/CSA CMG, ECOLAB	fast connect, 600V	OR-00	FR-03	FL-02	MP-01
	PROFINET®, EtherCAT®,	–	OR-00	FR-01	FL-02	MP-01
	UL/CSA AWM	–	OR-00	FR-01	FL-02	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-02	MP-05
	PROFINET®, EtherCAT®,	high temperature (105°C)	OR-04	FR-00	FL-02	MP-05
	PROFINET®, EtherCAT®, UL AWM	hybrid cable for power with Ethernet applications	OR-00	FR-01	FL-02	MP-01
	PROFINET®	UV & chemical resistance	OR-01	FR-01	FL-02	MP-01
	PROFINET®, EtherCAT®	UV & chemical resistance	OR-01	FR-02	FL-02	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMX	fast connect	OR-04	FR-02	CF-01	MP-05
	UL/CSA AWM	tested for 2.5 million flex cycles; 1000V	OR-04	FR-00	CF-02	MP-05
	UL/CSA AWM	tested for 2.5 million flex cycles; 1000V	OR-04	FR-00	CF-02	MP-05
	PROFINET®, EtherCAT®, UL AWM	–	OR-04	FR-01	FL-02*	MP-05

* Torsion ± 180°/m

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EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

Quick select chart & cable attributes

4 pair cable

Application	Product	Page	Category	Part number	Jacket material	Size	Outer diameter in	
Stationary	ETHERLINE® CAT.5e	243	CAT.5e	2170296	halogen-free	24 AWG	0.248	
				2170297	PUR	24 AWG	0.248	
				2170298	halogen-free + inner jacket	24 AWG	0.296	
	ETHERLINE® CAT.6A/CAT.7	247	CAT.6A	2170464	PVC	22 AWG	0.343	
				2170465	PUR	22 AWG	0.343	
				2170466	halogen-free	22 AWG	0.343	
			CAT.7	2170474	PVC	22 AWG	0.343	
				2170475	PUR	22 AWG	0.343	
				2170476	halogen-free	22 AWG	0.343	
Flexible	ETHERLINE® CAT.5e	244	CAT.5e	2170299	halogen-free	26 AWG	0.240	
				2170300	PUR	26 AWG	0.240	
	ETHERLINE® HEAT 6722	252	CAT.5e	2170850	PUR	24 AWG	0.303	
			CAT.6A	2170581	PUR	24 AWG	0.319	
			CAT.7	2170582	PUR	24 AWG	0.319	
	ETHERLINE® TRAY	253	CAT.5e	2170450	PVC	22 AWG	0.380	
	ETHERLINE® FIRE PH120	254	CAT.5e	2170905	halogen-free FRNC	23 AWG	0.327	
	ETHERLINE® ROBUST	255	CAT.7	2170452	TPE	23 AWG	0.355	
				2170453	TPE	26 AWG	0.256	
	ETHERLINE® ROBUST FR	256	CAT.7	2170455	TPE	24 AWG	0.355	
				2170456	TPE	26 AWG	0.256	
	ETHERLINE® CAT.7	250	CAT.7	2170934	PUR	26 AWG	0.250	
Continuous flex	ETHERLINE® CAT.5e	245	CAT.5e	2170489	PUR	26 AWG	0.248	
	ETHERLINE® CAT.6	246	CAT.6	2170488	PUR	26 AWG	0.307	
	ETHERLINE® CAT.6A	248	CAT.6A	2170484	PUR	24 AWG	0.355	
				2170485	PVC	24 AWG	0.355	
Torsion	ETHERLINE® TORSION	249	CAT.6A	2170482	PVC	24 AWG	0.355	
				2170483	PUR	24 AWG	0.355	

Approvals	Special features	Cable attributes, see page 648			
		oil resistance	flame resistance	motion type	mechanical protection
–	–	OR-00	FR-01	FL-01	MP-01
UL/CSA AWM	1000V	OR-04	FR-01	FL-01	MP-05
–	halogen-free inner jacket for extra protection	OR-00	FR-01	FL-01	MP-01
–	PiMF construction: pairs are individually shielded with foil tape	OR-00	FR-03	FL-01	MP-01
		OR-04	FR-01	FL-01	MP-05
		OR-00	FR-03	FL-01	MP-01
		OR-00	FR-03	FL-01	MP-01
		OR-04	FR-01	FL-01	MP-05
		OR-00	FR-03	FL-01	MP-01
–	–	OR-00	FR-01	FL-02	MP-01
UL/CSA AWM	1000V	OR-04	FR-01	FL-02	MP-05
PROFINET®	high temperature (105 °C)	OR-04	FR-01	FL-02	MP-05
EtherCAT®, UL CMR, UL AWM	600V, PLTC	OR-02	FR-05	FL-02	MP-01
PROFINET®	–	OR-00	FR-03	FL-01	MP-01
PROFINET®	UV & chemical resistance	OR-01	FR-01	FL-02	MP-01
–					
PROFINET®, EtherCAT®	UV & chemical resistance	OR-01	FR-02	FL-02	MP-01
–					
cRUus	–	OR-04	FR-01	FL-02	MP-05
UL/CSA AWM	tested for 2.5 million flex cycles, 1000V	OR-04	FR-00	CF-02	MP-05
UL/CSA CMX	–	OR-04	FR-02	CF-01	MP-05
PROFINET®, UL/CSA AWM, CMX	1000V	OR-04	FR-02	CF-01	MP-05
PROFINET®, UL/CSA CMG	–	OR-00	FR-03	CF-01	MP-01
PROFINET®, UL/CSA CMG	–	OR-00	FR-03	FL-02*	MP-01
PROFINET®, UL/CSA AWM, CMX	1000V	OR-04	FR-02	FL-02*	MP-05

* Torsion ± 180°/m

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ETHERLINE® 2 pair: CAT.5/CAT.5e; stationary

Industrial Ethernet cable for stationary applications

ETHERLINE® CAT.5/5e cables provide reliable network communication in demanding industrial environments. The high quality foil and braid shield assure protection from EMI. Cables meet the transmission requirements for Category 5 or 5e.

Recommended applications

Stationary applications; industrial field and cell level networking; PLCs, sensors, and other network devices; dry and damp rooms; transmission rates up to 10/100 Mbit/sec

Approvals

Construction

Conductors: solid bare copper

Pairs: 2 twisted pairs or star quad

Insulation: polyethylene

Shielding: foil and copper braid

Jacket: PVC; green or black • polyurethane or halogen-free; teal

Application advantage

- Double screening ensures high transmission reliability in areas with EMI
- Flame retardant
- Highly oil- and abrasion-resistant PUR jacket
- Conforms to PROFINET® standard
- Suitable for EtherCAT® & EtherNet/IP applications
- Fast connect style allows for quick installation
- **Suitable for PoE per IEEE 802.3at**

Cable attributes page 648

See attribute list by part number on page 232

Complete the installation

Fast connect stripping tool page 262

RJ45 connectors page 257

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for stationary use:
  - 2170893: 10 x cable diameter
  - 2170891: 3 x cable diameter
  - 2170494: 4 x cable diameter
  - 2170280, 2170281: 8 x cable diameter

Temperature range:
- 2170893, 2170281: -40°C to +80°C
- 2170891: -40°C to +75°C
- 2170494: -25°C to +80°C
- 2170280: -30°C to +80°C

Nominal voltage: (not for power applications)
- 2170893: 600V (UL AWM)
- 2170281: 1000V
- all other P/Ns: 125V

Characteristic impedance: 100Ω ± 15Ω

Color code:
- 2170893, 2170891, 2170494: white, yellow, blue, orange
- 2170280, 2170281: white/orange & orange, white/green & green

Approvals:
UL: AWM 21576 (2170281), AWM 21694 (2170893), PLTC (2170893), CMG (2170893, 2170494), CMX (2170891)
Canada: c(UL) CMG (2170893, 2170494), c(UL) CMX (2170891), cRU AWM I/II A/B FT2 (2170281)
Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5											
2170893	22 AWG/2pr	solid	PVC	green	PROFINET®, UL/CSA CMG, UL AWM, 600V	yes	yes	0.256	6.5	47	53112210
CAT.5e											
2170891	22 AWG/2pr	solid	PVC	green	PROFINET®, UL/CSA CMX	no	yes	0.252	6.4	38	53112210
2170933	22 AWG/2pr	solid	PVC*	black	PROFINET®, UL/CSA CMG	no	yes	0.307	7.8	42	53112220
2170280	24 AWG/2pr	solid	halogen-free	teal	–	no	yes	0.229	5.8	30	53112210
2170281	24 AWG/2pr	solid	PUR	teal	UL/CSA AWM, 1000V	no	yes	0.229	5.8	36	53112210

* Inner and outer jacket

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ETHERLINE® 2 pair: CAT.5/CAT.5e; flexible

Industrial Ethernet cable for flexible applications

Flexible ETHERLINE® CAT.5/5e cables are constructed with a high-quality foil and copper braid shield for reliable data transfer in areas where EMI is pervasive. The different jacket materials provide excellent protection against oil, flame, or sunlight. A Low Smoke Zero Halogen (LSZH) jacketed cable is available for applications where human safety and damage to electronic components are a concern.

Construction

Conductors: stranded bare copper • 2170886: stranded tinned copper

Pairs: 2 twisted pairs or star quad

Insulation: polyethylene • 2170901: polyolefin

Shielding: foil and copper braid

Jacket: PVC; green or black • polyurethane or halogen-free; teal

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
- Suitable for EtherCAT® & EtherNet/IP applications
- Fast connect style allows for quick installation
- **Suitable for PoE per IEEE 802.3at** (see table below)

Approvals

c UL us c UL us RoHS PROFINET EtherCAT Technology Group EtherNet/IP ECOLAB

Cable attributes page 648

See attribute list by part number on page 232

Complete the installation

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ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

Technical data

Minimum bend radius:
- for flexible use: 15 x cable diameter

Temperature range:
- 2170886: -20°C to +60°C
- 2170901: -10°C to +70°C
- 2170283, 2170284: -5°C to +60°C

Nominal voltage: (not for power applications)
- 2170886: 600V (UL AWM)
- 2170284: 1000V
- all other P/Ns: 125V

Characteristic impedance: 100Ω ± 15Ω

Color code:
- 2170886, 2170901: white, yellow, blue, orange
- 2170283, 2170284: white/orange & orange; white/green & green

Approvals:
- UL: AWM 21576 (2170284); AWM 21694 (2170886); PLTC (2170886); CMG (2170886)
- **NEC: Class 1 Division 2 per NEC Article 501
- Canada: c(UL) CMG (2170886); cRU AWM I/II A/B FT2 (2170284)
- Additional: ECOLAB (2170886); RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5											
2170886**	22 AWG/2pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG, UL AWM, 600V, ECOLAB	yes	yes	0.256	6.5	45	53112210
CAT.5e											
2170901	22 AWG/2pr	7 wire	PVC	black	PROFINET®	no	yes	0.244	6.2	40	53112210
2170283*	26 AWG/2pr	7 wire	halogen-free	teal	–	no	no	0.213	5.4	29	53112210
2170284*	26 AWG/2pr	7 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.228	5.8	30	53112210

* Max cable run: 196 ft (60 m)

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ETHERLINE® 2 pair: CAT.5/CAT.5e; continuous flex

Industrial Ethernet cable for continuous flex applications

ETHERLINE® CAT.5/5e cables are suitable for cable track applications and other moving machinery parts. The special cable design allows easy cable routing, yet provides excellent protection from EMI. The polyurethane outer jacket is halogen-free and resistant against oil, abrasion, and UV light.

Construction

Conductors: stranded bare copper • 2170894: tinned copper

Pairs: 2 twisted pairs or star quad

Insulation: polyolefin • 2170894: polyethylene

Shielding: copper braid • 2170894: foil and copper braid

Jacket: polyurethane; green or teal

Recommended applications

Continuous flex applications; cable tracks; cordsets; wiring of network devices; dry or damp environments

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Easy cable routing
- Protection from EMI
- Fast connect style allows for quick installation
- **Suitable for PoE per IEEE 802.3at** (see table below)

Approvals

c UL us · c CSA us · RoHS · Continuous Flex Test Method Verified (UL VERIFIED verifyUL.com A522492) · PROFINET® · EtherCAT® Technology Group · EtherNet/IP

Cable attributes page 648

See attribute list by part number on page 232*

Complete the installation

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ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

Technical data

Minimum bend radius:
- for stationary use: 8 x cable diameter
- for continuous flexing: 15 x cable diameter

Temperature range:
- 2170894 & 2170289:
  - for continuous flexing: -20°C to +60°C
  - for stationary use: -30°C to +70°C
- 2170289NA:
  - for continuous flexing: -5°C to +50°C
  - for stationary use: -40°C to +70°C

Nominal voltage: (not for power applications)
- 2170894: 100V
- 2170289 & 2170289NA: 1000V

Characteristic impedance: 100Ω ± 15Ω

Color code:
- 2170894: white, yellow, blue, orange
- 2170289: white/orange & orange; white/green & green
- 2170289NA: white/orange & orange; white/blue & blue

Approvals:
- UL: CMX (2170894); AWM 21576 (2170289, 2170289NA)
- Canada: c(UL) CMX (2170894); cRU AWM I/II A/B FT2 (2170289, 2170289NA)
- Additional: RoHS
- *UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5											
2170894	22 AWG/2pr	7 wire	PUR	green	PROFINET®, UL/CSA CMX	yes	yes	0.256	6.5	42	53112210
CAT.5e											
2170289*	26 AWG/2pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.240	6.1	32	53112210
2170289NA*	26 AWG/2pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.228	5.8	32	53112210

* Max cable run: 196 ft (60 m)

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ETHERLINE® 2 pair: CAT.5 TORSION

Industrial Ethernet cable suitable for torsion stress

ETHERLINE® TORSION is a 2 pair industrial Ethernet cable designed for high-torsion stress applications. It is tested with more than 1 million bending cycles and a right/left movement of 180° per meter.

Construction

Conductors: stranded tinned copper

Pairs: star quad

Insulation: foamed polyethylene

Shielding: tinned copper braid; non-woven wrap

Jacket: halogen-free polyurethane; green

Recommended applications

Stationary, flexible, continuous flex, and torsion applications; recommended for drip loop applications, e.g., in wind turbines

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Suitable for high torsion stress
- High-quality shield provides excellent EMI protection
- Highly abrasion-resistant PUR jacket
- Halogen-free and flame retardant
- **Suitable for PoE per IEEE 802.3at**

Approvals

Cable attributes			page 648
OIL	OR-04	FLAME	FR-01
MOTION	FL-02*	MECH.	MP-05

* Torsion ± 180°/m

Complete the installation			
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	ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:	5 x cable diameter	**Characteristic impedance:**	100Ω ± 15Ω
Temperature range:	-40°C to +80°C	**Color code:**	white, yellow, blue, orange
Nominal voltage:	100V (not for power applications)	**Approvals:**	UL: AWM 21161 Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5											
2170888	22 AWG/2pr	19 wire	PUR	green	PROFINET®, UL AWM	no	yes	0.256	6.5	35	53112210

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ETHERLINE® 2 pair: CAT.5e 105C Plus; flexible

Industrial Ethernet cable for high temperature flexible applications

ETHERLINE® 105C is designed to perform in high temperature applications. The 2 pair construction includes foil and braid shielding and a TPE-based jacket.

Construction

Conductors: bare copper wire

Insulation: polyethylene

Shielding: foil and copper braid

Jacket: TPE; green

Recommended applications

Flexible high temperature applications; installation in hollow shaft between gear units and pitch system; PLCs, sensors, and other network devices

Approvals

RoHS, PROFINET®, EtherCAT® Technology Group, EtherNet/IP

Application advantage

- Highly temperature resistant (105°C permanent, 120°C temporary)
- No need for additional protection against high temperatures
- Suitable for EtherCAT® & EtherNet/IP applications
- Conforms to PROFINET® standard
- Optimum EMC
- **Suitable for PoE per IEEE 802.3at**

Cable attributes			page 648
OIL	OR-04	FLAME	FR-00
MOTION	FL-02	MECH.	MP-05

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ÖLFLEX® CONNECT solution

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page 605

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +105°C (up to +120°C for temporary loads)
- for flexible use: -30°C to +105°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code: white, yellow, blue, orange

Approvals: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e											
2170636	22 AWG/2pr	7 wire	TPE	green	PROFINET®	no	yes	0.244	6.2	36	53112210

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ETHERLINE® 2 pair: CAT.5 ARMORED

Industrial Ethernet cable for harsh industrial environments

ETHERLINE® ARMORED has a foil and braid shield and comes with two layers of galvanized steel tape. This allows the cable to provide reliable data transmission in even the roughest industrial environments.

Construction

Conductors: solid bare copper

Pairs: star quad

Insulation: polyethylene

Shielding: PVC inner jacket; foil and braid; two layers of galvanized steel tape

Jacket: polyethylene; black

Recommended applications

Harsh industrial environments; stationary applications

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Rodent protection
- High transmission reliability
- UV-resistant jacket
- **Suitable for PoE per IEEE 802.3at**

Approvals

RoHS, PROFINET®, EtherCAT® Technology Group, EtherNet/IP

Cable attributes			page 648
OIL	OR-00	FLAME	FR-00
MOTION	FL-00	MECH.	MP-01

Complete the installation

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ÖLFLEX® CONNECT solution

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page 605

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +70°C
- for flexible use: -20°C to +60°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code: white, yellow, blue, orange

Approvals: RoHS

Part number	Construction	Stranding	Jacket material inner	Jacket material outer	Jacket color inner	Jacket color outer	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5													
2170496	22 AWG/2pr	solid	PVC	PE	green	black	PROFINET®	no	yes	0.366	9.3	83	53112230

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ETHERLINE® 2 pair: CAT.5 HYBRID

Industrial Ethernet cable for power with Ethernet applications

ETHERLINE® HYBRID is a CAT.5 hybrid data cable for data transmission and power supply for industrial usage. The cable is designed for stationary installation and occasional movement. The separately screened core pairs ensure transmission reliability in areas with a high load of electromagnetic capacity.

Construction

Conductors: stranded bare copper

Pairs: data and power pairs each twisted together

Insulation: power pairs: halogen-free compound • data pairs: polyethylene

Shielding: data pairs: foil and copper braid

Jacket: halogen-free; green

Recommended applications

Flexible power with Ethernet applications

Application advantage

- Data and power transmission with one cable
- Suitable for EtherCAT® & EtherNet/IP applications
- Halogen-free
- Flame retardant
- Sunlight resistant
- **Suitable for PoE per IEEE 802.3at**

Approvals

Cable attributes			page 648
OIL	OR-00	FLAME	FR-01
MOTION	FL-02	MECH.	MP-01

Complete the installation

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ÖLFLEX® CONNECT solution

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page 605

Technical data

Minimum bend radius:
- for stationary use: 5 x cable diameter
- for flexible use: 10 x cable diameter

Temperature range: -20°C to +70°C

Nominal voltage: (not for power applications)
- power pairs: 100V
- data pairs: 150V

Test voltage:
- power pairs: 1000V
- data pairs: 700V

Characteristic impedance: 100Ω ± 15Ω

Color code:
- power pairs: black with white numbers
- data pairs: white & blue; yellow & orange

Approvals: UL: AWM 21282
Additional: RoHS

Part number	Construction	Stranding data pair	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5											
2170887	22 AWG/2pr + 16 AWG/4c	7 wire	halogen-free	green	PROFINET®, UL AWM	no	yes	0.406	10.3	103	53112230

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ETHERLINE® 4 pair: CAT.5e; stationary

Industrial Ethernet cable for stationary applications

ETHERLINE® 4 pair cables for stationary applications are suitable for CAT.5e data transmission. Designed with a foil and braid shield, the cable is protected against EMI and can be used in areas where reliable data transmission is key. The cable is available with a PUR or halogen-free jacket, or with a double halogen-free inner and outer jacket.

Construction

Conductors: solid bare copper

Pairs: 4 pairs twisted together

Insulation: foam skin

Shielding: foil and tinned copper braid

Jacket: polyurethane or halogen-free; teal • 2170298: halogen-free inner & outer jackets

Recommended applications

Stationary applications; industrial field and cell level networking; PLCs, sensors, and other network devices; dry and damp rooms

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Flame retardant
- **Suitable for PoE per IEEE 802.3at**

Approvals

cULus RoHS EtherCAT Technology Group EtherNet/IP

Cable attributes page 648

See attribute list by part number on page 234

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Technical data

Minimum bend radius:
- for stationary use: 8 x cable diameter

Temperature range: -30°C to +80°C

Nominal voltage: (not for power applications)
- 2170297: 1000V
- 2170296, 2170298: 125V

Test voltage: 1000V

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals:
UL: AWM 21576 (2170297)
Canada: cRU AWM I/II A/B FT2 (2170297)
Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e											
2170296	24 AWG/4pr	solid	halogen-free	teal	–	no	yes	0.248	6.3	36	53112210
2170297	24 AWG/4pr	solid	PUR	teal	UL/CSA AWM, 1000V	no	yes	0.248	6.3	42	53112210
2170298	24 AWG/4pr	solid	halogen-free*	teal	–	no	yes	0.296	7.5	54	53112220

* Inner and outer jacket

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ETHERLINE® 4 pair: CAT.5e; flexible

Industrial Ethernet cable for flexible applications

ETHERLINE® 4 pair CAT.5e cables designed for flexible applications come with a foil and braid shield for EMI protection. Jacket options include polyurethane and a Low Smoke Zero Halogen (LSZH) compound for applications where human safety and damage to electronic components are a concern.

Construction

Conductors: stranded bare copper

Pairs: 4 pairs twisted together

Insulation: polyethylene

Shielding: foil and tinned copper braid

Jacket: polyurethane or halogen-free; teal

Recommended applications

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

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- High-quality foil and braid protect against EMI
- Flame retardant
- LSZH jacket available

Approvals

cULus RoHS EtherCAT Technology Group EtherNet/IP

Cable attributes page 648

See attribute list by part number on page 234

Complete the installation

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ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

Technical data

Minimum bend radius:
- for stationary use: 8 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- 2170299:
  - for stationary use: -20°C to +75°C
  - for flexible use: -5°C to +50°C
- 2170300:
  - for stationary use: -40°C to +80°C
  - for flexible use: -5°C to +60°C

Nominal voltage: (not for power applications)
- 2170299: 125V
- 2170300: 1000V

Test voltage:
- 2170299: 700V

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown,

Approvals:
UL: AWM 21576 (2170300)
Canada: cRU AWM I/II A/B FT2 (2170300)
Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e cable											
2170299	26 AWG/4pr	7 wire	halogen-free (LSZH)	teal	–	no	no	0.240	6.1	32	53112210
2170300	26 AWG/4pr	7 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.240	6.1	36	53112210

Max cable run: 196 ft (60 m)

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ETHERLINE® 4 pair: CAT.5e; continuous flex

Industrial Ethernet cable for continuous flex applications

This ETHERLINE® 4 pair cable is suitable for CAT.5e continuous flex applications in harsh industrial environments where EMI is pervasive. The rugged polyurethane jacket offers excellent protection against oils and abrasion, and is also halogen-free.

Construction

Conductors: stranded bare copper

Pairs: 4 pairs twisted together

Insulation: polyolefin

Shielding: tinned copper braid

Jacket: polyurethane; teal

Recommended applications

Continuous flex applications; cable tracks; cordsets; wiring of network devices in dry or damp rooms

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Tested for 2.5 million flex cycles
- Shield provides reliable data transmission
- Easy routing
- PUR jacket is resistant to oil and abrasion

Approvals

c UL us · RoHS · EtherCAT Technology Group · Continuous Flex Test Method Verified UL VERIFIED A522492 · EtherNet/IP

Cable attributes			page 648
OIL	OR-04	FLAME	FR-00
MOTION	CF-02*	MECH.	MP-05

Complete the installation

SKINTOP® MS-SC page 522

RJ45 connectors page 257

ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

Technical data

Minimum bend radius:
- for stationary use: 8 x cable diameter
- for continuous flexing: 15 x cable diameter

Temperature range:
- for stationary use: -30°C to +80°C
- for continuous flexing: -20°C to +70°C

Nominal voltage: 1000V (not for power applications)

Test voltage: 1000V

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals:
UL: AWM 21576
Canada: cRU AWM I/II A/B FT2
Additional: RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e											
2170489	26 AWG/4pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.248	6.3	36	53112210

Max cable run: 196 ft (60 m)

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ETHERLINE® 4 pair: CAT.6; continuous flex

Industrial Ethernet cable for continuous flex applications

Designed with 4 pairs, a foil and braid shield, and a rugged PUR jacket, this ETHERLINE® cable meets CAT.6 requirements. It can be used in continuous flex applications.

Construction

Conductors: stranded tinned copper

Pairs: 4 pairs divided by central filler element

Insulation: polypropylene

Shielding: FRNC inner jacket; foil and braid

Jacket: polyurethane; green

Recommended applications

Continuous flex applications; cable tracks; cordsets

Application advantage

- PUR outer jacket is highly resistant to oils, abrasion, and UV radiation
- Premium screening against EMI
- Suitable for EtherCAT® & EtherNet/IP applications

Approvals

EtherCAT Technology Group · EtherNet/IP · RoHS · Continuous Flex Test Method Verified (UL VERIFIED A522492) · c UL us

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	CF-01*	MECH.	MP-05

Complete the installation

SKINTOP® MS-SC page 522

RJ45 connectors page 258

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

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 applications)

Test voltage: 700V

Characteristic impedance: 100Ω ± 15Ω

Color code: white & blue, white & orange, white & green, white & brown

Approvals:
UL: CMX
Canada: c(UL) CMX
Additional: RoHS
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.6											
2170488	26 AWG/4pr	19 wire	PUR	green	UL/CSA CMX	no	no	0.307	7.8	42	53112220

Max cable run: 196 ft (60 m)

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ETHERLINE® 4 pair: CAT.6A/CAT.7; stationary

Industrial Ethernet cable for stationary applications

ETHERLINE® CAT.6A and CAT.7 cables are suitable for stationary applications. The 4 pairs are individually wrapped in metal foil and the overall braid provides additional protection against EMI. Three different jacket options are available.

Construction

Conductors: solid bare copper

Pairs: 4 pairs, individually shielded with foil tape

Insulation: polyethylene

Shielding: overall copper braid

Jacket: PVC, polyurethane, or halogen-free; green

Recommended applications

Stationary applications in harsh industrial environments; dry or damp rooms; CAT.6A = 500 MHz; CAT.7 = 600 MHz

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- PUR jacket is highly resistant to mineral oils and abrasion
- Suitable for PoE per IEEE 802.3at

Approvals

RoHS

EtherCAT Technology Group

EtherNet/IP

Cable attributes page 648

See attribute list by part number on page 234

Complete the installation

SKINTOP® MS-SC page 522

ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

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 applications)

Test voltage: 700V

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.6A											
2170464	22 AWG/4pr	solid	PVC	green	–	no	yes	0.343	8.7	66	53112220
2170465	22 AWG/4pr	solid	PUR	green	–	no	yes	0.343	8.7	61	53112220
2170466	22 AWG/4pr	solid	halogen-free	green	–	no	yes	0.343	8.7	67	53112220
CAT.7											
2170474	22 AWG/4pr	solid	PVC	green	–	no	yes	0.343	8.7	66	53112220
2170475	22 AWG/4pr	solid	halogen-free PUR	green	–	no	yes	0.343	8.7	61	53112220
2170476	22 AWG/4pr	solid	halogen-free FRNC	green	–	no	yes	0.343	8.7	67	53112220

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ETHERLINE® 4 pair: CAT.6A; continuous flex

Industrial Ethernet cable for continuous flex applications

This ETHERLINE® 4 pair cable meets CAT.6A requirements and is suitable for continuous flex applications. Individually shielded pairs and an overall braid shield protect the cable from EMI and allow reliable, high-speed data transfer. The cable is available with a PVC or halogen-free polyurethane jacket.

Construction

Conductors: stranded tinned copper

Pairs: 4 pairs individually shielded with aluminum compound foil

Insulation: foam skin

Shielding: overall copper braid

Jacket: PVC or polyurethane; green

Recommended applications

Continuous flex applications; cable tracks; moving machine parts; harsh environments; qualified for CAT.6A = 10 Gbits/s

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Qualified for 10 Gigabit Ethernet
- Premium shielding against EMI
- Oil-resistant jacket
- Conforms to PROFINET® standard
- **Suitable for PoE per IEEE 802.3at**

Approvals

Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

Cable attributes page 648

See attribute list by part number on page 234 *

Complete the installation

SKINTOP® MS-SC page 522

RJ45 CAT.6A connectors page 258

ÖLFLEX® CONNECT solution

Industrial Ethernet cordsets page 620

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: (not for power applications)
- 2170484: 1000V
- 2170485: 125V

Characteristic impedance: 100Ω ± 15Ω

Color code: white & blue, white & orange, white & green, white & brown

Approvals:

UL: AWM 21576 (2170484)
CMX per UL 444 (2170484)
RU AWM 80°C 1000V (2170484)
CMG per UL 444 (2170485)

Canada: c(UL) CMX (2170484)
cRU AWM I/II A/B FT2 (2170484)
c(UL) CMG FT4 (2170485)

Additional: RoHS

*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.6A											
2170484	24 AWG/4pr	7 wire	PUR	green	PROFINET®, UL/CSA AWM, CMX	no	yes	0.355	9.0	60	53112220
2170485	24 AWG/4pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG (75°C)	no	yes	0.355	9.0	59	53112220

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ETHERLINE® 4 pair: CAT.6A TORSION

Industrial Ethernet cable for torsion stress

ETHERLINE® 4 Pair: CAT.6A TORSION cable meets CAT.6A requirements and can be used in torsion applications. The premium shielding allows reliable, high-speed data transfer. Jacket options include PVC and halogen-free polyurethane.

Construction

Conductors: stranded tinned copper

Pairs: 4 pairs individually shielded with aluminum compound foil

Insulation: foam skin

Shielding: overall copper braid

Jacket: PVC or polyurethane; green

Recommended applications

High-torsion stress applications; harsh industrial environments

Approvals

Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Suitable for high-torsion stress
- Qualified for 10 Gigabit Ethernet
- Excellent EMI protection
- Oil-resistant jacket
- Conforms to PROFINET® standard
- **Suitable for PoE per IEEE 802.3at**

Cable attributes page 648

See attribute list by part number on page 234

Complete the installation

SKINTOP® MS-SC page 522

RJ45 CAT.6A connectors page 258

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

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: (not for power applications)
- 2170482: 125V
- 2170483: 1000V

Characteristic impedance: 100Ω ± 15Ω

Color code: white & blue, white & orange, white & green, white & brown

Approvals:

UL: CMG per UL 444 (2170482)
AWM 21576 (2170483)
CMX per UL 444 (2170483)
RU AWM 80°C 1000V (2170483)

Canada: c(UL) CMG FT4 (2170482)
c(UL) CMX (2170483)
cRU AWM I/II A/B FT2 (2170483)

Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.6A											
2170482	24 AWG/4pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG	no	yes	0.355	9.0	59	53112220
2170483	24 AWG/4pr	7 wire	PUR	green	PROFINET®, UL/CSA AWM, CMX, 1000V	no	yes	0.355	9.0	60	53112220

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ETHERLINE® 4 pair: CAT.7; flexible

Industrial Ethernet cable for flexible applications

ETHERLINE® CAT. 7 flexible cables are designed for flexible applications and come with an overall foil and braid shield and individually shielded pairs for EMI protection.

Construction

Conductors: stranded bare copper

Pairs: 4 pairs individually shielded with aluminum compound foil

Insulation: polyethylene

Shielding: foil & tinned copper braid

Jacket: halogen-free polyurethane; green

Recommended applications

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

Application advantage

- Can be used in dry or damp rooms
- Qualified for 10 Gigabit Ethernet
- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Space-saving due to small cable diameter
- Robust halogen-free outer jacket

Approvals

cULus EtherCAT Technology Group EtherNet/IP

Cable attributes			page 648
OIL	OR-04	FLAME	FR-01
MOTION	FL-02	MECH.	MP-05

Complete the installation

SKINTOP® MS-SC page 522

RJ45 connectors page 258

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for installation: 4 x cable diameter
- for torsion & flexing: 10 x cable diameter

Temperature range:
- for installation: -50°C to +80°C
- for flexible use: -40°C to +80°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals: UL: AWM 21576; Canada: cRU AWM I/II A/B FT2

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.7											
2170934	26 AWG/4pr	7 wire	PUR	green	UL AWM, CMX	no	no	0.250	6.4	31	53112210

Max cable run: 196 ft (60 m)

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ETHERLINE® 4 pair: CAT.7 TORSION

Industrial Ethernet cable for torsion stress

ETHERLINE® CAT. 7 TORSION meets CAT. 7 requirements and can be used in torsion applications. The premium shielding allows reliable, high-speed data transfer.

Construction

Conductors: stranded tinned copper

Pairs: 4 pairs individually shielded with aluminum compound foil

Insulation: polyethylene

Shielding: overall copper braid

Jacket: halogen-free polyurethane; green

Recommended applications

High-torsion stress applications; harsh industrial environments

Application advantage

- Suitable for high-torsion stress
- Qualified for 10 Gigabit Ethernet
- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Halogen-free & oil resistant
- **Suitable for PoE per IEEE 802.3at**

Approvals

c UL us · PROFINET® · EtherCAT® Technology Group · EtherNet/IP

Cable attributes			page 648
OIL	OR-04	FLAME	FR-02
MOTION	T-01	MECH.	MP-05

Complete the installation

SKINTOP® MS-SC page 522

RJ45 connectors page 257

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for installation: 8 x cable diameter
- for torsion & flexing: 15 x cable diameter

Temperature range:
- for installation: -40°C to +80°C
- for flexible use: -30°C to +70°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code: white & blue, white & orange, white & green, white & brown

Approvals: UL: CMX, AWM 21576; Canada: c(UL) CMX

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.7											
2170481	24 AWG/4pr	7 wire	PUR	green	UL AWM, CMX	no	yes	0.367	9.4	64	53112220

Max cable run: 279 ft (85 m)

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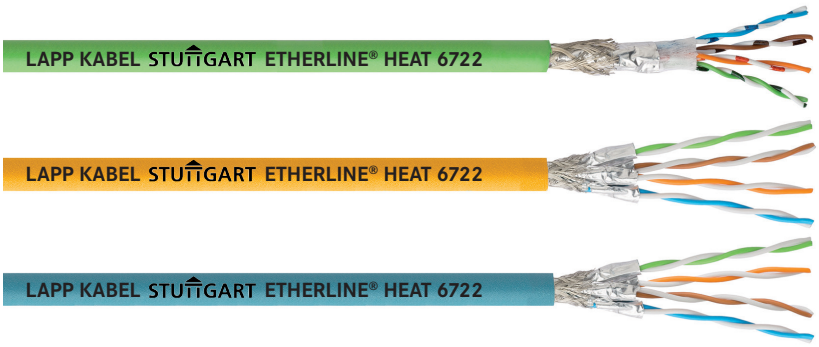
ETHERLINE® HEAT 6722

Flexible special Ethernet cable for high-temperature applications



ETHERLINE® HEAT 6722 CAT.5e, CAT.6A, and CAT.7 cables are suitable for flexible applications. They are heat resistant up to 105°C and are also suitable for outdoor applications.

Recommended applications

connecting camera, info/entertainment, and ticketing systems in transportation environments

Approvals

RoHS

PROFINET®

Construction

Conductors: stranded bare copper

Pairs: 4 pairs twisted together

Insulation: polyolefin wrapped with special fire-retardant tape

Shielding: CAT.5e: overall foil & tinned copper braid • CAT.6A/CAT.7: overall copper braid with foil-shielded pairs

Jacket: halogen-free polyurethane; green, yellow, or blue

Application advantage

- ISO 6722 compliant
- Good resistance to oil, petrol, acids, and alkalis
- Halogen-free jacket is resistant to abrasion, cuts, and oil
- Easy to strip and dismantle
- Tested according to ECE-R 118.01
- **Suitable for PoE per IEEE 802.3at**

Cable attributes				page 648
OIL	OR-04	FLAME	FR-01	
MOTION	FL-02	MECH.	MP-05	

Complete the installation

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page 522

RJ45 connectors
page 257

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +105°C
- for flexible use: -30°C to +105°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code:
- CAT.5e: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
- CAT.6A/7: white & blue, white & orange, white & green, white & brown

Approvals: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e										
2170850	24 AWG/4pr	7 wire	PUR	green	PROFINET®	yes	0.303	7.7	48	53112220
CAT.6A										
2170581	24 AWG/4pr	7 wire	PUR	yellow	PROFINET®	yes	0.319	8.1	52	53112220
CAT.7										
2170582	24 AWG/4pr	7 wire	PUR	blue	PROFINET®	yes	0.319	8.1	52	53112220

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ETHERLINE® TRAY CAT.5e; flexible

Tray-rated industrial Ethernet cable for flexible applications

ETHERLINE® TRAY CAT.5e cables are designed for flexible applications. Designed with a foil and braid shield, the cable is protected against EMI and can be used in areas where reliable transmission is key.

Construction

Conductors: stranded bare copper

Pairs: 4 pairs twisted together

Insulation: thermoplastic-based insulation

Shielding: foil and tinned copper braid

Jacket: PVC; green

Recommended applications

Flexible applications, cable trays, industrial machinery, plant infrastructure

Application advantage

- Wide application range due to multiple certifications
- Designed for tray applications (PLTC-ER)
- Suitable for EtherNet/IP applications
- **Suitable for PoE per IEEE 802.3at**

Approvals

c UL us | RoHS | EtherCAT Technology Group | EtherNet/IP

Cable attributes			page 648
OIL	OR-02	FLAME	FR-05
MOTION	FL-02	MECH.	MP-01

Complete the installation

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page 522

90° RJ45 connectors
page 259

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -25°C to +80°C

Nominal voltage: 600V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω (1 – 100 MHz)

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals:
UL: CMR per UL 444, CMG per UL 444, Designed for tray applications (PLTC-ER), AWM 2570 80°C 600V
NEC: Class 1 Division 2 per NEC Article 501
Canada: c(UL) CMG
Additional: RoHS 2

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e										
2170450	22 AWG/4pr	7 wire	PVC	green	UL CMR, UL AWM, PLTC-ER, 600V	yes	0.380	9.6	77	53112230

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ETHERLINE® FIRE CAT.5e PH 120

Halogen-free industrial Ethernet cable for harsh flame conditions

ETHERLINE® FIRE for stationary applications is suitable for CAT.5e data transmission. The halogen-free and flame-retardant (FRNC) jacket allows for this cable to perform in harsh fire conditions for at least 120 minutes.

Construction

Conductors: solid bare copper

Pairs: 4 pairs twisted together

Insulation: polyolefin; special fire-retardant tape

Shielding: foil tape

Jacket: halogen-free FRNC; red

Recommended applications

Industrial areas that use fire as a tool; highly combustible and/or fire-prone areas

Application advantage

- Flame retardant acc. to IEC 60332-1 & IEC 60332-3-24
- Double shielded for ensured EMI effectiveness
- Maintains integrity for a minimum of 120 minutes in the event of fire (PH 120 Classification acc. to EN50200)
- **Suitable for PoE per IEEE 802.3at**

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-03
MOTION	FL-01	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
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ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius: 15 x cable diameter

Temperature range: -20°C to +70°C

Nominal voltage: 125V (not for power applications)

Characteristic impedance: 100Ω ± 15Ω

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e										
2170905	23 AWG/4pr	solid	FRNC	red	–	yes	0.327	8.3	50	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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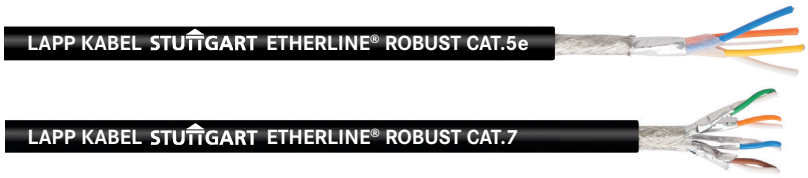
ETHERLINE® ROBUST

Chemical-resistant industrial Ethernet cable for flexible applications



ETHERLINE® ROBUST flexible cables are suitable for CAT.5e and CAT.7 applications that require a higher level of chemical, UV, and weather resistance. They are designed with a foil and braid shield to protect against EMI and ensure reliable data transmission.

Construction

Conductors: stranded bare copper

Pairs: CAT.5e: 2 pair • CAT.7: 4 pair

Insulation: polyolefin

Shielding: CAT 5: overall foil and copper braid
CAT 7: foiled pairs and overall copper braid

Jacket: TPE; black

Recommended applications

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

Application advantage

- Halogen-free materials
- Ozone-, UV-, and weather-resistant jacket
- Low smoke density
- **Suitable for PoE per IEEE 802.3at** (see table below)

Approvals

PROFINET® ECOLAB®

Cable attributes			page 648
OIL	OR-01	FLAME	FR-01
MOTION	FL-02	MECH.	MP-01

Complete the installation			
	SKINTOP® MS-SC page 522		RJ45 connectors page 257

ÖLFLEX® CONNECT solution	
	ÖLFLEX® CONNECT CABLES page 605

Technical data

Minimum bend radius:
- for stationary use: 8 x cable diameter
- for flexible use: 10 x cable diameter

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

Characteristic impedance: 100Ω ± 15Ω

Color code:
- 2 pair: white & yellow, blue & orange
- 4 pair: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e										
2170451	22 AWG/2pr	7 wire	TPE	black	PROFINET®	yes	0.268	6.8	34	53112210
CAT.7										
2170452	23 AWG/4pr	7 wire	TPE	black	PROFINET®	yes	0.355	9.0	50	53112220
2170453	26 AWG/4pr	7 wire	TPE	black	–	no	0.256	6.5	24	53112210

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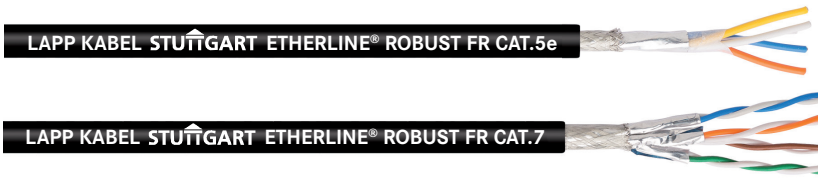
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ETHERLINE® ROBUST FR

Chemical-resistant 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.

Construction

Conductors: stranded bare copper

Pairs: CAT.5e: 2 pair • CAT.7: 4 pair

Insulation: polyolefin

Shielding: CAT 5: overall foil and copper braid
CAT 7: foiled pairs and overall copper braid

Jacket: TPE; black

Recommended applications

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

Application advantage

- Flame-retardant jacket
- Suitable for indoor and outdoor applications
- Suitable for EtherCAT® and EtherNet/IP applications
- **Suitable for PoE per IEEE 802.3at** (see table below)

Approvals

PROFINET® | EtherNet/IP | EtherCAT® Technology Group | ECOLAB®

Cable attributes			page 648
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the installation

SKINTOP® MS-SC
page 522

RJ45 connectors
page 258

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 4 x cable diameter
- for flexible use: 10 x cable diameter

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)

Color code:
- 2 pair: white & yellow, blue & orange
- 4 pair: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e										
2170454	22 AWG/2pr	7 wire	TPE	black	PROFINET®	yes	0.268	6.8	37	53112220
CAT.7										
2170455	24 AWG/4pr	7 wire	TPE	black	PROFINET®	yes	0.355	9.0	54	53112230
2170456	26 AWG/4pr	7 wire	TPE	black	–	no	0.256	6.5	27	53112220

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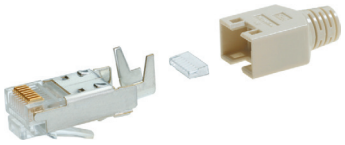
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

RJ45 CAT.5 Hirose TM11



Application advantage

- Suitable for 26 AWG stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

Approvals

RoHS

Contact tools

Hirose crimp tool
page 262

Part number	Conductor	Conductor size	Max. cable outer diameter in	Max. cable outer diameter mm	Pack size
CE6321	4	26 AWG	0.228	5.8	50

RJ45 CAT.5 Stewart SS37

Application advantage

- Suitable for 26 AWG stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

Approvals

RoHS

Contact tools

Stewart crimp tool
page 262

Part number	Conductor	Conductor size	Max. cable outer diameter in	Max. cable outer diameter mm	Pack size
CE6323	4	26 AWG	0.255	5.7	50

RJ45 CAT.5e FM45, field wireable

Application advantage

- 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

Approvals

RoHS

Part number	Conductor	Conductor size	Max. cable outer diameter in	Max. cable outer diameter mm	Pack size
21700540	8	26 - 23 AWG*	0.315	8.0	1

* 22 AWG is possible, with restrictions.

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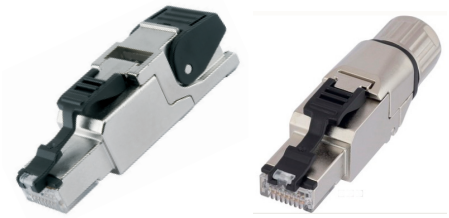
RJ45 CAT.5e for PROFINET®



Application advantage

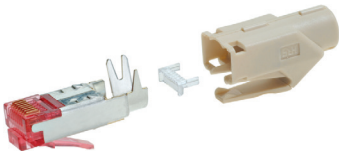
- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Color coded to PROFINET® standards
- Conforms to IEC 60603-7-51

Approvals

RoHS

Part number	Conductors	Design style	Conductor size		Cable outer diameter		Pack size
			stranded	solid	in	mm	
21700605	4	Clamp	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700651	4	Round	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1

RJ45 CAT.6 Hirose TM21



Application advantage

- Suitable for solid and stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

Approvals

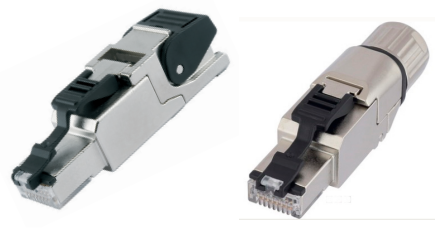
RoHS

Contact tools

Hirose crimp tool
page 262

Part number	Conductors	Conductor size	Max. cable outer diameter		Pack Size
			in	mm	
CE6324	8	26 - 24 AWG	0.26	6.6	50

RJ45 CAT.6A, field wireable



Application advantage

- 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
- Suitable for PROFINET® applications

Approvals

RoHS

Part number	Conductors	Design style	Color code	Conductor size		Cable outer diameter		Pack size
				stranded	solid	in	mm	
21700600	8	Clamp	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700601	8	Clamp	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700615	8	Clamp	T568A	27 - 24 AWG (19 wire)	26 - 24 AWG	0.197 - 0.354	5.0 - 9.0	10
21700616	8	Clamp	T568B	27 - 24 AWG (19 wire)	26 - 24 AWG	0.197 - 0.354	5.0 - 9.0	10
21700652	8	Round	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700653	8	Round	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700654	8	Round	T568A	27 - 24 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1
21700655	8	Round	T568B	27 - 24 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1

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RJ45 CAT.6A Industry 10G connectors

Application advantage

- Suitable for solid and stranded conductors
- Nickel-plated brass housing
- Supports 10 Gigabit Ethernet
- Provides IP68 protection
- Conforms to IEC 60603-7-51

Approvals

RoHS

Part number	Conductors	Color code	Description	Conductor size stranded	Conductor size solid	Cable outer diameter in	Cable outer diameter mm	Pa si
Plug								
21700630	8	T568A	inclusive RJ45 connector plug	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.355	5 - 9	1
21700631		–	dust cap	–	–	–	–	10
Receptacle								
21700632	8	T568B	inclusive RJ45 connector receptacle	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.355	5 - 9	1
21700633		–	dust cap	–	–	–	–	10

RJ45 90° CAT.5e

Application advantage

- Die-cast zinc housing
- Suitable for PROFINET® applications
- Suitable for solid and stranded conductors
- Configurable in 4 90° positions

Approvals

RoHS

Part number	Conductors	Conductor size stranded	Conductor size solid	Cable outer diameter in	Cable outer diameter mm	Pack size
21700638	4	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10	1

RJ45 90° CAT.6A

Application advantage

- Die-cast zinc housing
- Suitable for PROFINET® applications
- Suitable for solid and stranded conductors
- Configurable in 4 90° positions

Approvals

RoHS

Part number	Conductors	Color code	Conductor size stranded	Conductor size solid	Cable outer diameter in	Cable outer diameter mm	Pack size
21700636	8	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700639	8	T568A	26 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1
21700637	8	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1

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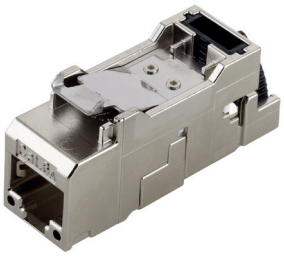
RJ45F CAT.6A



Application advantage

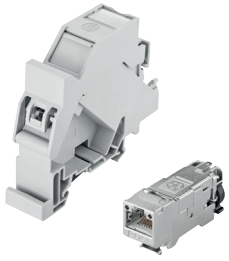
- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Color-coded to PROFINET® standards
- Supports 10 Gigabit Ethernet
- Conforms to IEC 60603-7-51

Approvals

RoHS

Part number	Color code	Conductor size		Max. cable outer diameter	
		stranded	solid	in	mm
21700611	T568A	27 - 22 AWG (7 wire)	26 - 22 AWG	0.354	9.0
21700612	T568B	27 - 22 AWG (7 wire)	26 - 22 AWG	0.354	9.0

HS RJ45F CAT.6A



Application advantage

- Suitable for solid and stranded conductors
- Color-coded to PROFINET® standards
- Integrated strain relief for cables (OD up to 9 mm)
- Supports 10 Gigabit Ethernet
- Conforms to IEC 60603-7-51

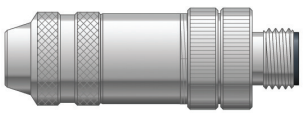
Approvals

RoHS

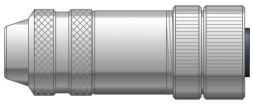
Part number	Color code	Conductor size		Cable outer diameter	
		stranded	solid	in	mm
21700613	T568A	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.354	5.0 - 9.0
21700614	T568B	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.354	5.0 - 9.0

M12 field wireable connectors

male



female



Application advantage

- Shielded design
- IP67 protection

Part number		Number of positions	Thread size	Max. conductor size	Cable outer diameter	
male	female				in	mm
C5E201C	C5E200C	8	PG 9	18 AWG	0.234 - 0.312	6 - 8

Technical data

Temperature range:	max. 85°C
Nominal voltage:	up to 60V
Nominal current:	up to 4A

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M12 CAT.6A field wireable connectors

Application advantage

- Easy on-site assembly
- For 10 Gbit/sec data transmission acc. to CAT.6A
- Can be used for Power over Ethernet applications
- Robust and vibration resistant

Technical data

Temperature range:	-40°C to +85°C
Nominal voltage:	48V
Nominal current:	0.5A
Contact resistance:	100 mΩ

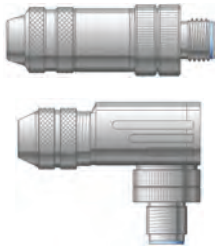
Part number	Connector	Number of positions	Coding	Fast connect	Conductor size stranded	Conductor size solid	Cable outer diameter in	Cable outer diameter mm
21700602	male M12	8	X-coded	yes	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.382	5.0 - 9.7

Approvals

RoHS

M12 field wireable connectors for PROFINET®

male



female

Technical data

Temperature range:	-40°C to +85°C
Nominal voltage:	250V
Nominal current:	4A
Coding:	D-coded

Part number male	Part number female	Connector design	Number of positions	Thread size	Fast connect
C5E203C	C5E202C	straight	4	PG 9	yes
C5E205C	C5E204C	90°	4	PG 9	yes

M12 FT IE

22262022

21700617

21700618

Application advantage

- Designs for front and rear wall mounting
- Die-cast zinc housing
- IP67 protection

Part number	Description	Number of positions	Coding
22262022	feed through connector	4	D-coded
21700617	front panel mount connector	8	X-coded
21700618	rear panel mount connector	8	X-coded

Approvals

RoHS

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CCR FA cable coupler

Application advantage

- Die-cast zinc housing
- Supports 10 Gigabit Ethernet

Approvals

RoHS

Part number	Conductor size		Cable outer diameter		Pack size
	stranded	solid	in	mm	
21700623	24 AWG - 22 AWG (7 wire)	24 AWG - 22 AWG	0.197 - 0.382	5 - 9.7	1

RJ45 crimping tools

RJ45 Hirose

RJ45 Stewart

Part number	For RJ45 connectors	Pack size
RJ45 Hirose		
CE5091	TM11/TM12, 8-pole	1
RJ45 Stewart		
CE5093	SS378, 8-pole	1
CE5092	RJ plug: 4-, 6-, 6-DEC, & 8-pole	1

Fast connect stripping tool

Part number	Description	Cable outer diameter		Pack size
		in	mm	
21124030	stripping tool kit with blade	0.098 - 0.315	2.5 - 8.0	1
21124040	stripping tool without blade	0.098 - 0.315	2.5 - 8.0	1
21124041	blade cartridge	–	–	1

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

Industrial Ethernet Data Cable Assemblies

ETHERLINE® Industrial Ethernet cable assemblies by LAPP

In today's fast-paced industrial environment, efficiency and reliability are not just goals – they are necessities. LAPP understands these demands and offers cable assemblies with connectors pre-attached on one or both sides.

The plug-and-play nature of these assemblies can significantly reduce installation time, so your machinery can be up and running faster, minimizing downtime and boosting productivity.

Cables with connectors also reduce, or eliminate, the potential for errors during on-site installations.

LAPP's robust ETHERLINE® Industrial Ethernet cable is engineered to maintain optimal data communication performance in harsh industrial conditions.

Cable catagories available:

CAT.5: 2 pair
- UL Listed

CAT.5e: 2 pair, 4 pair
- UL Recognized

CAT.7: 4 pair
- UL Recognized

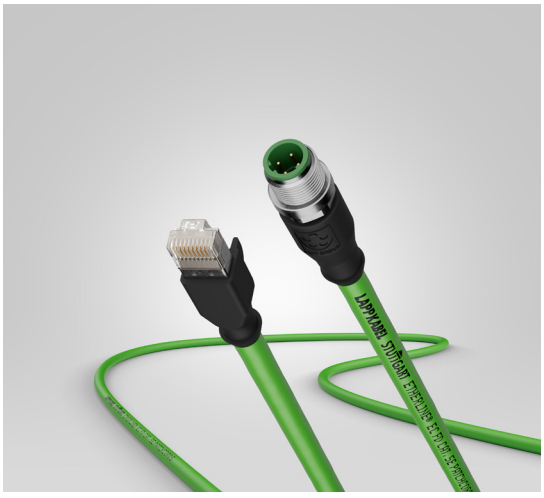
Connectors available:

M12
RJ45

In-stock assembled cables & connectors are available in standard lengths (in meters): 1, 2, 3, 5, 10. *

Our Industrial Cable Assemblies will be a valuable addition to your factory operations, enhancing efficiency and productivity.

See our complete range of ETHERLINE® Industrial Ethernet cable assemblies on page 739 of our digital catalog.



* Custom cable assemblies are also available, designed to meet your specific needs, by ÖLFLEX CONECT.

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Industrial Communication for the highest productivity.

Smart factories are the key to staying competitive. The growing data streams in production facilities require reliable and high-quality connection solutions. Manufactured for all kinds of stress such as torsion or bending, our products withstand even harsh environments – whatever your protocol. Trust in our decades of experience as a connection solutions specialist with manufacturing expertise.
Connect with us: www.lapp.com

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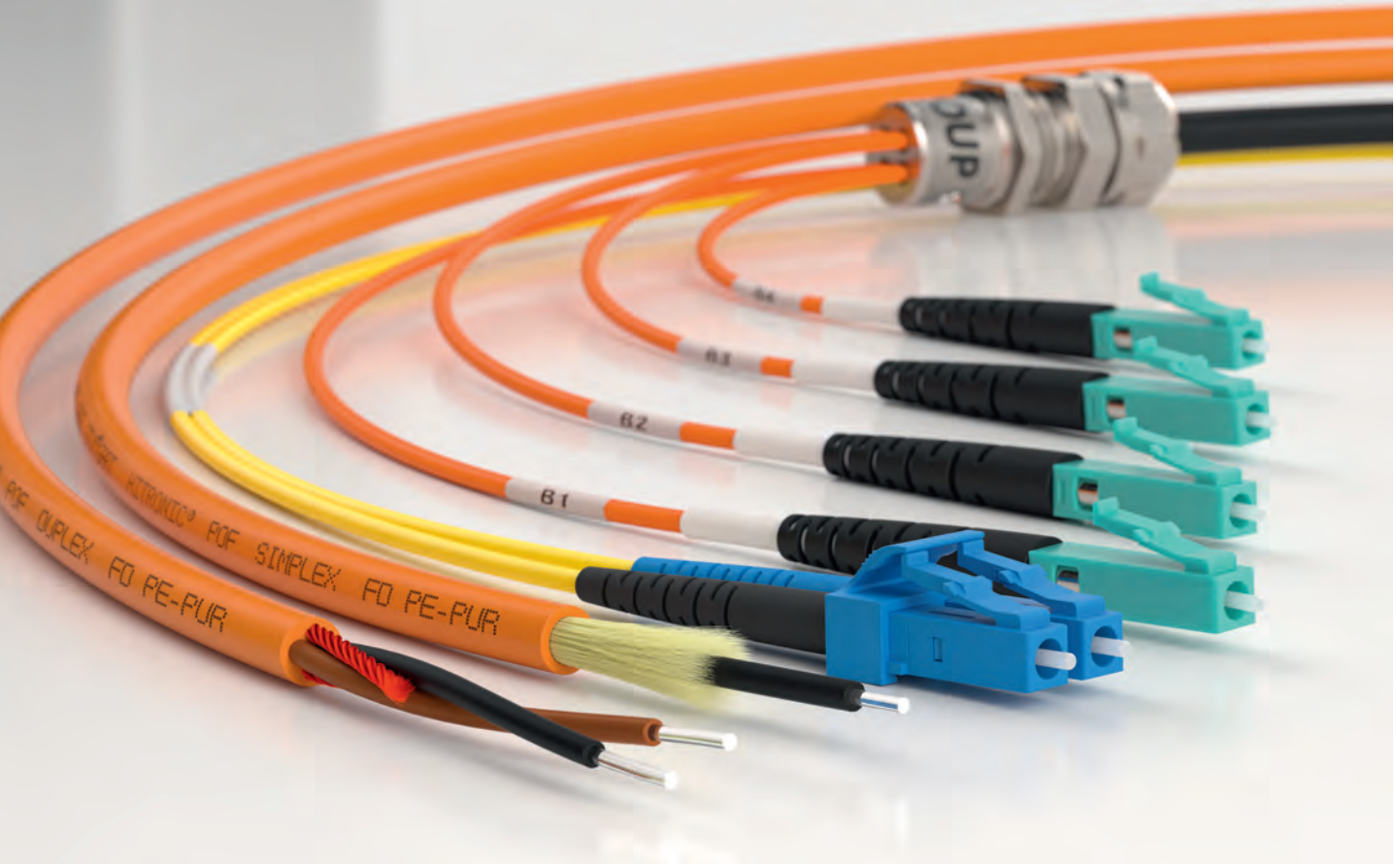

4 HITRONIC®

Optical transmission systems

HITRONIC® fiber optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation doesn't interfere with transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.

Application range

- Telecommunications and network techology
- Industrial cabling and automation level
- Industrial machinery and plant engineering
- Data transmission under harsh conditions (mining and tunnel construction, oil and gas platforms, wind power plants)

HITRONIC®

Optical transmission cable

POF: polymer optical fiber

267 **HITRONIC® POF SIMPLEX PE**
Simplex buffered polymer optical fiber cable

268 **HITRONIC® POF SIMPLEX PE-PUR**
Simplex buffered polymer optical fiber cable with strain relief & PUR outer jacket

269 **HITRONIC® POF DUPLEX PE**
Duplex buffered polymer optical fiber cable

270 **HITRONIC® POF DUPLEX PE-PUR/HEAVY PE-PUR**
Duplex buffered polymer optical fiber cable with strain relief & PUR outer jacket

PCF: plastic-clad fiber

271 **HITRONIC® PCF DUPLEX**
Duplex buffered plastic-clad fiber cable for stationary applications

272 **HITRONIC® PCF DUPLEX FD**
Duplex buffered plastic-clad fiber cable for continuous flex applications

GOF: glass optical fiber

273 **HITRONIC® HQN**
Single-mode & multi-mode glass optical fiber cable for outdoor applications

274 **HITRONIC® HUN**
Single-mode & multi-mode glass optical fiber cable for indoor & outdoor applications

275 **HITRONIC® HDM**
Multi-mode glass optical fiber cable for frequent reeling and unreeling

276 **HITRONIC® TORSION**
Single-mode & multi-mode glass optical fiber cable for torsion applications

277 **HITRONIC® FIRE**
Single-mode & multi-mode glass optical fiber cable with fire-resistant design

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HITRONIC® POF SIMPLEX PE

Simplex buffered polymer optical fiber cable

HITRONIC® POF SIMPLEX PE is a simplex buffered fiber optic cable for transmission lengths up to 230 ft (70 m). The flexible and lightweight design allows easy handling. The cable is suitable for direct connector assembly.

Construction

Core: polymethyl methacrylate (PMMA)

Cladding: fluoropolymers

Buffer tube: halogen-free polyethylene; black

Recommended applications

Stationary indoor applications in control cabinets, cable ducts, or pipes with low mechanical stress

Application advantage

- Transmission lengths up to 230 ft (70 m)
- Suitable for direct connector assembly
- Easy to handle
- No crosstalk
- Protected against EMI

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-00
MOTION	FL-01	MECH.	MP-01

Technical data

Minimum bend radius: 10 x cable diameter

Temperature range:
- operating temperature: -55°C to +85°C
- installation temperature: -10°C to +50°C

Permissible tensile force:
- stationary installation: 5 N
- short-term: 15 N

Cable designation: J-V2Y 1P 980/1000

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
28000001	980/1000 POF	1	0.087	2.2	3

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HITRONIC® POF SIMPLEX PE-PUR

Simplex buffered polymer optical fiber cable with strain relief & PUR outer jacket

HITRONIC® POF SIMPLEX PE-PUR is a simplex buffered fiber optic cable. The cable design includes aramid yarns for strain relief and a rugged PUR outer jacket, which makes the cable highly resistant to oil and abrasion.

Construction

Core: polymethyl methacrylate (PMMA)

Cladding: fluoropolymers

Buffer tube: polyethylene; black

Outer jacket: halogen-free polyurethane; orange

Strain relief: aramid yarns

Recommended applications

Indoor optical signal transmission in industrial applications with high mechanical stress

Application advantage

- Transmission lengths up to 230 ft (70 m)
- Suitable for direct connector assembly
- Resistant to abrasion, oil, microbes, and hydrolysis
- Flame-retardant & halogen-free jacket

Approvals

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-01
MOTION	FL-01	MECH.	MP-05

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- short-term: 6 x cable diameter

Permissible tensile force:
- for stationary use: 100 N
- short-term: 350 N

Temperature range:
- operating: -20°C to +70°C
- installation: -10°C to +50°C

Cable designation: J-V2Y(ZN) 1P 980/1000

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
28020001	980/1000 POF	1	0.217	5.5	17

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HITRONIC® POF DUPLEX PE

Duplex buffered polymer optical fiber cable

HITRONIC® POF DUPLEX PE is a duplex buffered fiber optic cable with a twin-cable design. This easy to handle cable is suitable for direct connector assembly and is protected against crosstalk and EMI.

Construction

Core: polymethyl methacrylate (PMMA)

Cladding: fluoropolymers

Buffer tube: halogen-free polyethylene; black

Recommended applications

Indoor stationary optical signal transmission applications in control cabinets, cable ducts, and tubes

Application advantage

- Transmission lengths up to 230 ft (70 m)
- Suitable for direct connector assembly
- Easy to handle
- No crosstalk
- Protected against EMI

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-00
MOTION	FL-01	MECH.	MP-01

Technical data

Minimum bend radius: 10 x cable diameter

Temperature range:
- operating: -55°C to +85°C
- installation: -10°C to +50°C

Permissible tensile force:
- for stationary use: 10 N
- short-term: 30 N

Cable designation: J-V2Y 2P 980/1000

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
28000002	980/1000 POF	2	0.087 x 0.173	2.2 x 4.4	5

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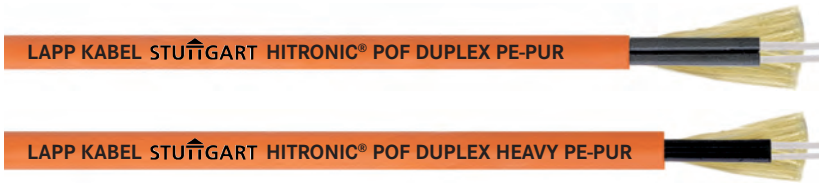
HITRONIC® POF DUPLEX PE-PUR/HEAVY PE-PUR

Duplex buffered polymer optical fiber cable with strain relief & PUR outer jacket



HITRONIC® POF DUPLEX PE-PUR/HEAVY PE-PUR is a duplex buffered fiber optic cable. The cable design includes aramid yarns for strain relief. The jacket can be standard PUR or heavy duty PUR, which make the cable highly resistant against oil and abrasion.

Recommended applications

Indoor stationary applications in industrial environments with high mechanical stress.

Approvals

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-01
MOTION	FL-01	MECH.	MP-05

Construction

Core: polymethyl methacrylate (PMMA)

Cladding: fluoropolymers

Buffer tube: polyethylene; black

Outer jacket: halogen-free polyurethane; orange

Strain relief: aramid yarns

Application advantage

- Transmission lengths up to 230 ft (70 m)
- Suitable for direct connector assembly
- Resistant to abrasion, oil, microbes, and hydrolysis
- Flame-retardant & halogen-free jacket

Technical data

Minimum bend radius:

- for stationary use:	
- PE-PUR:	6 x cable diameter
- HEAVY PE-PUR	7 x cable diameter
- for dynamic use:	10 x cable diameter

Permissible tensile force:

- for stationary use:	
- PE-PUR:	100 N
- HEAVY PE-PUR:	130 N
- short-term:	400 N

Temperature range:

- operating:	-40°C to +70°C
- installation:	-10°C to +50°C

Cable designation: J-V2Y(ZN)11Y 2P 980/1000

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
HITRONIC® POF DUPLEX PE-PUR					
28020002	980/1000 POF	2	0.217	5.5	19
HITRONIC® POF DUPLEX HEAVY PE-PUR					
28030002	980/1000 POF	2	0.315	8.0	19

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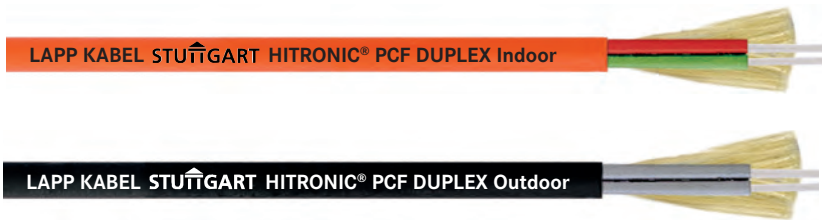
HITRONIC® PCF DUPLEX

Duplex buffered plastic-clad fiber cable for stationary applications



HITRONIC® PCF DUPLEX is a duplex, buffered, plastic-clad fiber optic cable and is available in indoor and outdoor versions. The outdoor version is UV-resistant, watertight, and provides rodent protection.

Indoor construction

Core: polymer-clad fiber (PCF)
Cladding: fluoropolymers
Buffer tube: ETFE
Inner jacket: FRNC; red and green
Outer jacket: halogen-free polyurethane; orange
Strain relief: aramid yarns

Outdoor construction

Core: polymer-clad fiber (PCF)
Cladding: fluoropolymers
Buffer tube: ETFE
Inner jacket: FRNC; red and green
Outer jacket: polyethylene; black
Strain relief: glass yarns

Recommended applications

Indoor or outdoor applications in harsh industrial environments

Application advantage

- Transmission lengths up to 1,640 ft (500 m)
- Complies with requirements for all field bus systems
- Suitable for direct connector assembly
- Highly resistant against oil and chemicals
- EMI protection

Approvals

RoHS

Cable attributes: indoor				page 648
OIL	OR-04	FLAME	FR-01	
MOTION	FL-01	MECH.	MP-05	

Cable attributes: outdoor				page 648
OIL	OR-00	FLAME	FR-00	
MOTION	CF-01	MECH.	MP-01	

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- operating: -20°C to +70°C
- installation: -10°C to +50°C

Permissible tensile force:
- for stationary use:
  - indoor: 400 N
  - outdoor: 500 N
- short-term:
  - indoor: 1200 N
  - outdoor: 1500 N

Cable designation:
- indoor: J-V(ZN)H11Y 2K 200/230
- outdoor: A-V(ZN)HB2Y 2K 200/230

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Indoor					
28020702	200/230 PCF	2	0.315	8.0	37
Outdoor					
28620702	200/230 PCF	2	0.414	10.5	60

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HITRONIC® PCF DUPLEX FD

Duplex buffered plastic-clad fiber cable for continuous flex applications

HITRONIC® PCF DUPLEX FD is a plastic-clad fiber optic cable designed for use in continuous flex applications such as cable tracks. The cable has a highly oil-resistant PUR jacket and is suitable for direct connector assembly. The maximum transmission length is 1,640 ft (500 m).

Construction

Core: polymer-clad fiber (PCF)
Cladding: fluoropolymers
Buffer tube: ETFE
Inner jacket: FRNC; red and green
Outer jacket: halogen-free polyurethane; orange
Strain relief: aramid yarns

Recommended applications

Indoor and outdoor use; stationary and continuous flex applications in harsh industrial environments; cable tracks; as a link between moving machine parts

Application advantage

- Designed for use in cable tracks
- Highly resistant against oil and chemicals
- Complies with requirements for all field bus systems
- Suitable for direct connector assembly
- Transmission lengths of up to 1,640 ft (500 m)

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-00
MOTION	FL-01	MECH.	MP-01

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Permissible tensile force:
- for stationary use: 800 N
- short-term: 2000 N

Temperature range:
- operating: -20°C to +70°C
- installation: -10°C to +50°C

Cable designation: A/J-V(ZN)H11Y

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
28320702	200/230 PCF	2	0.347	8.8	37

HITRONIC® HQN

Single-mode & multi-mode glass optical fiber cable for outdoor applications

HITRONIC® HQN is an outdoor glass fiber optic cable available with up to 24 fibers. The cable design includes a loose central tube, water-blocking reinforced glass yarns which act as strain relief, and a UV-resistant, halogen-free PE outer jacket.

Construction

Core: glass

Cladding: glass

Tube: gel-filled loose tube

Outer jacket: halogen-free polyethylene; black

Strain relief: reinforced glass yarns

Recommended applications

Outdoor use; direct burial; campus backbone; WAN applications; industrial environments; empty plastic pipes, ducts, and trays

Application advantage

- Easy to install due to compact and flexible design
- Suitable for direct burial (rodent protected)
- Rugged halogen-free PE outer jacket
- UV and water resistant

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-00
MOTION	FL-01	MECH.	MP-01

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- operating: -20°C to +70°C
- installation: 0°C to +50°C

Permissible tensile force:
- for stationary use: 1500 N
- short-term: 3000 N

Identification of fibers: red, green, blue, yellow, gray, violet, brown, orange, white, pink, black, turquoise

Cable designation: A-DQ(ZN)B2Y

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM3					
27600304	50/125 OM3	4	0.288	7.3	27
27600308	50/125 OM3	8	0.288	7.3	27
27600312	50/125 OM3	12	0.288	7.3	27
27600324	50/125 OM3	24	0.327	8.3	44
Multi-mode G 50 OM2					
27600204	50/125 OM2	4	0.288	7.3	27
27600208	50/125 OM2	8	0.288	7.3	27
27600212	50/125 OM2	12	0.288	7.3	27
27600224	50/125 OM2	24	0.327	8.3	44

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 62.5 OM1					
27600104	62.5/125 OM1	4	0.288	7.3	27
27600108	62.5/125 OM1	8	0.288	7.3	27
27600112	62.5/125 OM1	12	0.288	7.3	27
27600124	62.5/125 OM1	24	0.327	8.3	44
Single-mode E 9 OS2					
27600904	9/125 OS2	4	0.288	7.3	27
27600908	9/125 OS2	8	0.288	7.3	27
27600912	9/125 OS2	12	0.288	7.3	27
27600924	9/125 OS2	24	0.327	8.3	44

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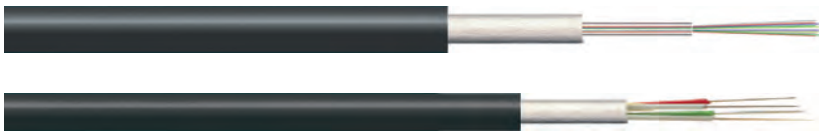
HITRONIC® HUN

Single-mode & multi-mode glass optical fiber cable for indoor & outdoor applications



HITRONIC® HUN is a glass fiber optic cable designed for indoor and outdoor applications. The outer jacket is highly flame retardant and halogen-free. The cable comes with a loose single tube for up to 24 fibers and multiple tubes for 24 fibers and more.

Recommended applications

Indoor and outdoor use; campus backbone; industrial environments; WAN applications; empty plastic pipes, ducts, and trays

Cable attributes			page 648
OIL	OR-00	FLAME	FR-03
MOTION	FL-01	MECH.	MP-01

Construction

Core: glass

Cladding: glass

Tube: gel-filled loose tube(s): single tube design (up to 24 fibers) • multi-tube design (24 fibers and more)

Outer jacket: LSZH compound; black

Strain relief: reinforced glass yarns

Application advantage

- Suitable for indoor and outdoor applications
- Easy to install due to compact and flexible design
- Flame-retardant & halogen-free outer jacket
- UV and water resistant

Approvals

RoHS

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- operating: -30°C to +70°C
- installation: 0°C to +50°C

Permissible tensile force:
- for stationary use: 1500 N
- short-term: 2000 N

Identification of fibers: red, green, blue, yellow, gray, violet, brown, orange, white, pink, black, turquoise

Cable designation: A/J-DQ(ZN)BH

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM3					
27400304	50/125 OM3	4	0.288	7.3	36
27400308	50/125 OM3	8	0.288	7.3	36
27400312	50/125 OM3	12	0.288	7.3	36
27400324	50/125 OM3	24	0.327	8.3	40
26400324	50/125 OM3	24	0.366	9.3	56
26400348	50/125 OM3	48	0.433	11	73
Multi-mode G 50 OM2					
27400204	50/125 OM2	4	0.288	7.3	36
27400208	50/125 OM2	8	0.288	7.3	36
27400212	50/125 OM2	12	0.288	7.3	36
27400224	50/125 OM2	24	0.327	8.3	40

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 62.5 OM1					
27400104	62.5/125 OM1	4	0.288	7.3	36
27400108	62.5/125 OM1	8	0.288	7.3	36
27400112	62.5/125 OM1	12	0.288	7.3	36
27400124	62.5/125 OM1	24	0.327	8.3	40
Single-mode E 9 OS2					
27400904	9/125 OS2	4	0.288	7.3	36
27400908	9/125 OS2	8	0.288	7.3	36
27400912	9/125 OS2	12	0.288	7.3	36
27400924	9/125 OS2	24	0.327	8.3	40
26400924	9/125 OS2	24	0.366	9.3	56
26400948	9/125 OS2	48	0.433	11	73
26400972	9/125 OS2	72	0.496	12.6	99
26400996	9/125 OS2	96	0.563	14.3	128
26400944	9/125 OS2	144	0.670	17	149

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HITRONIC® HDM

Multi-mode glass optical fiber cable for frequent reeling and unreeling

HITRONIC® HDM is a glass fiber optic cable with a highly flexible design suitable for frequent reeling and unreeling. The cable comes with up to 8 tight-buffered fibers, aramid yarns which provide strain relief, and a halogen-free outer jacket.

Construction

Core: tight-buffered glass fibers

Cladding: glass

Outer jacket: halogen-free polyurethane; black

Strain relief: aramid yarns

Recommended applications

Indoor and outdoor use; highly flexible applications; temporary installations such as event management; industrial environments

Application advantage

- Designed for highly flexible applications
- For direct connector assembly
- Easy to coil for mobile use
- Based on military spec MIL-C-85045
- Flame-retardant & halogen-free jacket

Approvals

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-00
MOTION	FL-02	MECH.	MP-05

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- for stationary use: -40°C to +70°C
- for flexible use: -20°C to +60°C

Identification of fibers: blue, orange, green, brown, gray, white, red, black

Cable designation: A/J-V(ZN)11Y

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM4					
26610404	50/125 OM4	4	0.217	5.5	16
26610406	50/125 OM4	6	0.221	5.6	19
26610408	50/125 OM4	8	0.244	6.2	24
Multi-mode G 50 OM3					
26610304	50/125 OM3	4	0.217	5.5	16
26610306	50/125 OM3	6	0.221	5.6	19
26610308	50/125 OM3	8	0.244	6.2	24

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM2					
26610204	50/125 OM2	4	0.217	5.5	16
26610206	50/125 OM2	6	0.221	5.6	19
26610208	50/125 OM2	8	0.244	6.2	24
Multi-mode G 62.5 OM1					
26610104	50/125 OM1	4	0.217	5.5	16
26610106	50/125 OM1	6	0.221	5.6	19
26610108	50/125 OM1	8	0.244	6.2	24

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HITRONIC® TORSION

Single-mode & multi-mode glass optical fiber cable for torsion applications

HITRONIC® TORSION is a fiber optic cable suitable for torsion applications in industrial environments. The cable is available with up to 12 tight-buffered fibers and allows direct connector assembly.

Construction

Core: tight-buffered glass fibers

Cladding: glass

Inner jacket: LSZH

Outer jacket: halogen-free polyurethane; black

Strain relief: aramid yarns

Recommended applications

Indoor and outdoor use; torsion applications in industrial environments; as a link between moving machinery parts

Application advantage

- Torsion-resistant and very flexible
- For direct connector assembly
- Based on military spec MIL-C-85045
- Flame-retardant & halogen-free jacket

Approvals

RoHS

Cable attributes			page 648
OIL	OR-04	FLAME	FR-00
MOTION	FL-02	MECH.	MP-05

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- for stationary use: -40°C to +70°C
- for flexible use: 0°C to +50°C

Identification of fibers: blue, orange, green, brown, gray, white, red, black, yellow, violet, pink, turquoise

Cable designation: A/J-V(ZN)H11Y

Part number	Fiber type	Number of fibers	Nominal outer diameter		Approx. weight	Permitted tensile force (N)	
			in	mm	lbs/mft	installation	short term
Multi-mode G 50 OM3							
26310302	50/125 OM3	2	0.331	8.4	36	600	1,000
26310304	50/125 OM3	4	0.331	8.4	36	800	1,350
26310308	50/125 OM3	8	0.457	11.6	64	1,600	2,700
26310312	50/125 OM3	12	0.489	12.4	82	2,400	3,500
Multi-mode G 50 OM2							
26310202	50/125 OM2	2	0.331	8.4	36	600	1,000
26310204	50/125 OM2	4	0.331	8.4	36	800	1,350
26310208	50/125 OM2	8	0.457	11.6	64	1,600	2,700
26310212	50/125 OM2	12	0.489	12.4	82	2,400	3,500
Multi-mode G 62.5 OM1							
26310102	62.5/125 OM1	2	0.331	8.4	36	600	1,000
26310104	62.5/125 OM1	4	0.331	8.4	36	800	1,350
26310108	62.5/125 OM1	8	0.457	11.6	64	1,600	2,700
26310112	62.5/125 OM1	12	0.489	12.4	82	2,400	3,500
Single-mode E 9 OS2							
26310902	9/125 OS2	2	0.331	8.4	36	600	1,000
26310904	9/125 OS2	4	0.331	8.4	36	800	1,350
26310908	9/125 OS2	8	0.457	11.6	64	1,600	2,700
26310912	9/125 OS2	12	0.489	12.4	82	2,400	3,500

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HITRONIC® FIRE

Single-mode & multi-mode glass optical fiber cable with fire-resistant design

HITRONIC® FIRE is a universal (indoor/outdoor) fire-resistant loose-tube fiber optic cable with a corrugated steel tape armor, a strain relief element, and a halogen-free outer jacket. The cable is water-tight and provides excellent rodent protection.

Recommended applications

Indoor and outdoor use; can be installed in highly combustible or fire-prone areas and harsh environments such as tunnels

Approvals

RoHS

Cable attributes			page 648
OIL	OR-00	FLAME	FR-04
MOTION	FL-01	MECH.	MP-01

Construction

Core: glass

Cladding: glass

Tube: gel-filled loose tube

Inner jacket: LSZH; black

Outer jacket: LSZH; black

Strain relief: reinforced glass yarns

Armoring: corrugated steel tape

Application advantage

- Fire-resistant design: data transmission even in event of fire for up to 90 minutes (IEC 60331-25)
- Steel armor provides excellent protection against mechanical stress and rodents
- UV and water resistant

Technical data

Minimum bend radius:
- for stationary use: 15 x cable diameter
- for dynamic use: 20 x cable diameter

Temperature range:
- operating: -30°C to +70°C
- installation: 0°C to +50°C

Permissible tensile force:
- for stationary use: 1500 N
- short-term: 2200 N

Identification of fibers: blue, orange, green, brown, gray, white, red, black, yellow, violet, pink, turquoise

Cable designation: A/J-DQ(ZN)BH(SR)H or U-DQ(ZN)BH(SR)H

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM3					
27560304	50/125 OM3	4	0.386	9.8	83
27560308	50/125 OM3	8	0.386	9.8	83
27560312	50/125 OM3	12	0.504	12.8	126
27560324	50/125 OM3	24	0.504	12.8	126
Multi-mode G 50 OM2					
27560204	50/125 OM2	4	0.386	9.8	83
27560208	50/125 OM2	8	0.386	9.8	83
27560212	50/125 OM2	12	0.504	12.8	126
27560224	50/125 OM2	24	0.504	12.8	126

Part number	Fiber type	Number of fibers	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft
Multi-mode G 50 OM1					
27560104	62.5/125 OM1	4	0.386	9.8	83
27560108	62.5/125 OM1	8	0.386	9.8	83
27560112	62.5/125 OM1	12	0.504	12.8	126
27560124	62.5/125 OM1	24	0.504	12.8	126
Single-mode E 9 OS2					
27560904	9/125 OS2	4	0.386	9.8	83
27560908	9/125 OS2	8	0.386	9.8	83
27560912	9/125 OS2	12	0.504	12.8	126
27560924	9/125 OS2	24	0.504	12.8	126

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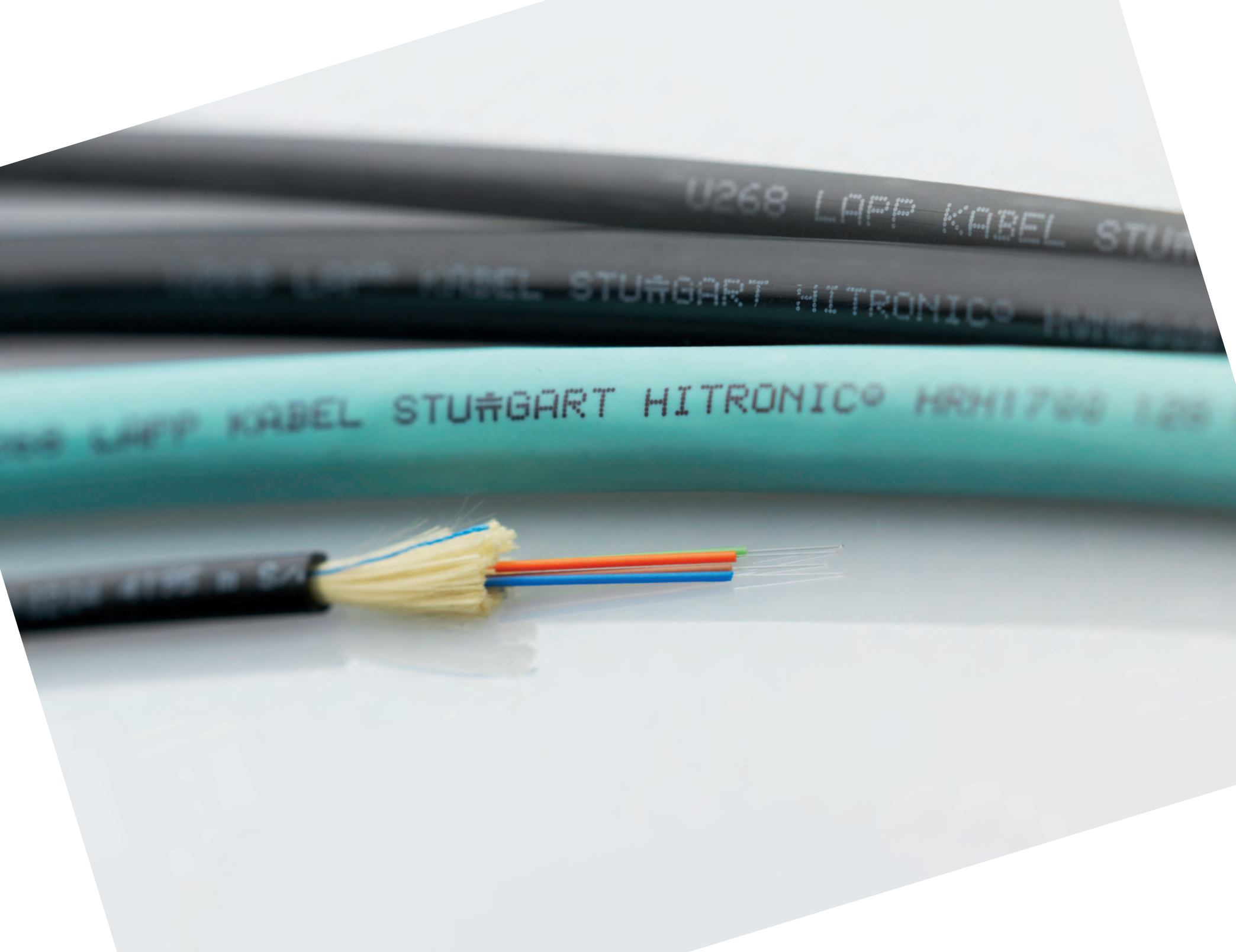
U268 LAPP KABEL STU
STUTTGART HITRONIC
LAPP KABEL STUTTGART HITRONIC

5

EPIC®
Industrial connectors

EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control, and drives. EPIC® is a flexible system of housings, inserts, and contacts: all extremely robust, absolutely safe, and simplicity itself to assemble.

Application range

- Electronics and telecommunications
- Measurement, testing, and control technology
- Industrial machinery and appliances
- Drive technology and industrial automation
- Photovoltaic plants

Product range

290 Rectangular connector inserts
377 Rectangular connector housing
425 Rectangular connector accessories
437 Circular connectors
455 Pin & sleeve connectors

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EPIC® brand overview

Rectangular connectors

	HBE	HA	HQ	STA	HEE	HBS	Power HS	HBVE	HD	HDD	MC	MH	Power K
Power	■	■	■		■	■	■	■			■	■	■
Control/ signal	■	■	■	■	■				■	■	■	■	■
Data											■	■	
Number of contacts	6, 10, 16, 24, 32, 48 (+PE)	3, 4, 10, 16, 32, 48, 64 (+PE)	5, 12 (+PE)	6, 14, 20, 40	10, 18, 32, 46, 64, 92 (+PE)	6, 12 (+PE)	4 (+PE)	3+2, 6+2, 10+2 (+PE)	7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)	24, 42, 72, 108, 144, 216 (+PE)	1 - 280, Data Bus (+PE), pneumatic	2 - 60, Data (+PE)	4/0, 4/2, 4/8 (+PE)
Rated voltage	600V	600V	600V	48V	600V	600V	1000V	600V	600V	600V	30 - 1000V	50 - 1000V	600V
Rated current	16A	10A, 14A	14A, 16A	10A	16A	35A	65A	16A	10A	8.5A	1 - 220A	10 - 100A	16A, 80A
Termination type*	SC, CR, CC	SC	CR	SC, SOL	CR	SC	ASC	SC	CR	CR	SC, CR, CC, HO	CR	SC
Wire size (AWG)	20 - 14, 20 - 12	20 - 14	20 - 12, 26 - 14	20 - 16	20 - 12	20 - 10	14 - 8	20 - 14	26 - 14	26 - 14	28 - 4/0	26 - 8	12 - 6, 20 - 14
Housing	HB, ULTRA HB	HA	HA	HA	HB, ULTRA HB	HB, ULTRA HB	HB	HB, ULTRA HB	HA, HB, ULTRA HB	HB, ULTRA HB	HB, ULTRA HB	HB	HB, ULTRA HB
IP rating**	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65
UL 50E**	Type 4, 4X, 12	Type 4, 12	Type 4, 12	Type 4, 12	Type, 4, 4X, 12	Type 4, 4X, 12	Type 4, 12	Type 4, 4X, 12	Type 4, 4X, 12	Type 4, 4X, 12	Type 4, 4X, 12	Type 4, 12	Type 4, 4X, 12
Approvals***													

* Termination type: SC = screw, CR = crimp, CC = cage clamp, ASC = axial screw, SOL = solder, HO = hose
** When properly installed with EPIC® housing
*** See product page for individual approvals

Circular connectors

	POWER M12	POWER LS1	SIGNAL M23	SIGNAL R3.0
Power	■	■	■	
Control/ signal			■	■
Number of contacts	3+PE	5+PE, 3+PE+4	6, 7, 8+1, 9, 12, 16, 17	21, 26
Rated voltage	600V	600V	50V, 100V, 150V	24V AC, 60V DC
Rated current	12A	26A, 27A	7A, 14A	7.5A
Termination type*	SC	CR	CR, SOL	SOL
Wire size (AWG)	18 - 16	20 - 12, 24 - 18	18 - 14, 26 - 18	up to 18
IP rating	IP67	IP67, IP68	IP67, IP68	IP65/67
Approvals**				–

Pin & sleeve connectors

	MULTIMAX	CEE	ULYSSE	ALUPRES
	■	■	■	■
Number of contacts	1+N+PE, 2+PE, 3+PE, 3+N+PE	1+N+PE, 2+PE, 3+PE, 3+N+PE	1+N+PE, 2+PE, 3+PE, 3+N+PE	1+N+PE, 2+PE, 2+N+PE, 3+PE, 3+N+PE
Rated voltage	125V - 600V	125V - 500V	125V - 500V	125V - 500V
Rated current	16A - 32A	16A - 125A	16A - 63A	16A - 63A
Termination type*	SC	SC	SC	SC
Wire size (AWG)	16 - 12, 12 - 8	16 - 12, 12 - 8, 10 - 6, 4 - 1	16 - 12, 12 - 8, 10 - 6	16 - 12, 12 - 8, 10 - 6
IP rating	IP44	IP44, IP67	IP44, IP67	IP67, IP55
Approvals**				

EPIC® rectangular housing

Strain relief
Strain relief provides a seal between the cable and the connector housing. It may also be used to offer additional functions like strain relief and braid continuity for EMC protection.

Hood
The connector housing allows for cable entry and protects the contact terminations from physical and environmental damage. EPIC® rectangular hoods are available as top-entry or side-entry in a variety of sizes and entry thread types (PG, NPT, or metric). PG entry hoods include gland.

Inserts
The male and female inserts house and insulate the contacts.
- Screw termination
- Crimp termination (stamped & formed or machined)
  * crimp contacts must be purchased separately
- Cage clamp (screwless spring)
- Push-in

Base
Mates with the hood to complete the connection.
- Panel mount: cable entry through cut out in panel.
- Surface mount: cable entry through a gland into the side of the connector base.
- Cable coupler hood: for cable-to-cable connection; the cable connector mates with a top-entry hood. This is frequently used to extend cables.

Technical data

Specifications:	DIN 43652
Temperature range:	
- EPIC® HB & HA:	-40°C to +125°C
- EPIC® ULTRA:	-40°C to +100°C
Protection class*:	IP65, UL 50E Type 4, 4X, 12 or IP65 (consult for availability)

* EPIC® connectors meet protection class standards only when in the mated condition. Please refer to individual product pages for applicable class ratings

Material:	
- EPIC® ULTRA:	nickel-plated zinc; stainless steel locking levers & bolts
- EPIC® HB 6-48 & EPIC® HA 10-64:	aluminum alloy; powder-coated (gray RAL 9006); zinc-plated steel locking levers & bolts
- EPIC® HA 3/4:	die-cast zinc; powder-coated or thermoplastic flame-retardant material rated UL 94 V-0 (gray or black plastic)

EPIC® rectangular connectors shall comply with all applicable requirements of Underwriters Laboratory (UL) Standards 1977 & 498, VDE Standard 0110 for creepage and clearance distances and VDE Standard 0627 for the connector design. The EPIC® HD and HDD series are developed according to DIN Standard 43652.

Approvals

UL File Number: E75770

CSA File Number: 053004

EPIC® insert series

292 EPIC® HBE series

# of contacts:	6, 10, 16, 24, 32, 48 (+PE)
Rated voltage:	600V
Rated current	16A
Termination:	screw, crimp, cage clamp, push-in
Wire size:	20–14 AWG (0.5–2.5 mm²) crimp available in 12 AWG (4 mm²)

300 EPIC® HA series

# 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)

304 EPIC® HQ series

# of contacts:	5, 12 (+PE)
Rated voltage:	600V
Rated current:	14A, 16A
Termination:	crimp
Wire size:	20–14 AWG (0.5–2.5 mm²) 26–14 AWG (0.14–2.5 mm²)

307 EPIC® STA series

# 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)

310 EPIC® HEE series

# 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)

314 EPIC® HBS series

# of contacts:	6, 12 (+PE)
Rated voltage:	600V
Rated current	35A
Termination:	screw
Wire size:	20–10 AWG (0.5–6 mm²)

316 EPIC® Power HS series

# of contacts:	4 (+PE)
Rated voltage:	1000V
Rated current:	65A
Termination:	axial screw
Wire size:	14–8 AWG (2.5–10 mm²)

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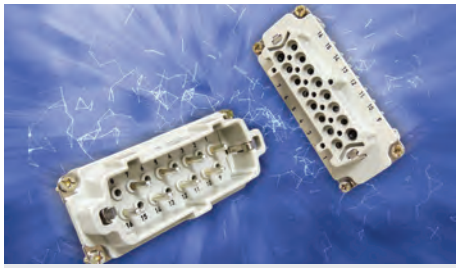
317 EPIC® HBVE series

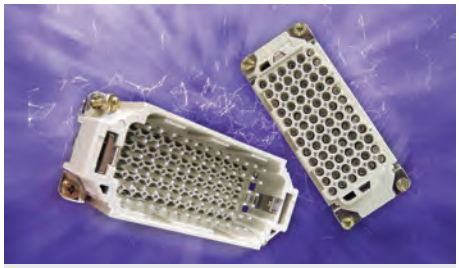


# of contacts:	3, 6, 10 (+PE)
Rated voltage:	600V
Rated current:	16A
Termination:	screw
Wire size:	20–14 AWG (0.5–2.5 mm²)

319 EPIC® HD series

# of contacts:	7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)
Rated voltage:	250V
Rated current	10A
Termination:	crimp
Wire size:	22–14 AWG (0.14–2.5 mm²)

337 EPIC® HDD series



# 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)

341 EPIC® MH series

# of contacts:	2 - 60 (+PE)
Rated voltage:	50 - 1000V
Rated current	10 - 100A
Termination:	crimp
Wire size:	26–8 AWG (0.14–10 mm²)

351 EPIC® MC series

# of contacts:	1 - 280 (+PE)
Rated voltage:	30 - 1000V
Rated current	1 - 220A
Termination:	screw, crimp, coax, cage clamp
Wire size:	28–4/0 AWG (0.08–95 mm²)

374 EPIC® Power K series

# of contacts:	4 pwr + 0 sig, 4 pwr + 2 sig, 4 pwr + 8 sig
Rated voltage:	600V
Rated current	16A, 80A
Termination:	screw
Wire size:	
- power:	12–6 AWG (4–16 mm²)
- signal:	20–14 AWG (0.5–2.5 mm²)

EPIC® inserts overview

Insert series / page	HBE 292	HA 300	HQ 304	STA 307	HEE 310	HBS 314	Power HS 316	HBVE 317	HD 319	HDD 337	MH 341	MC 351	Power K 374
3		✓						✓ + 2 signal					
4		✓					✓						
5			✓										
6	✓			✓*		✓		✓ + 2 signal					
7									✓				
8									✓*				
10	✓	✓			✓			✓ + 2 signal					
12			✓			✓							
14				✓*									
15									✓				
16	✓	✓											
18					✓								
20				✓*									
24	✓									✓			
25									✓				
32	✓	✓			✓								
40				✓*					✓				
42										✓			
46					✓								
48	✓	✓											
50									✓				
64		✓			✓				✓				
72										✓			
80									✓				
92					✓								
108										✓			
128									✓				
144										✓			
216										✓			
1 – 280												✓	
2 – 60											✓		
4 power + 0 signal													✓
4 power + 2 signal													✓
4 power + 8 signal													✓

Number of conductors (+PE)

* marked inserts do not include a dedicated ground terminal

	Insert series	HBE	HA	HQ	STA	HEE	HBS	Power HS	HBVE	HD	HDD	MH	MC	Power K
UL rated voltage	48V				✓									
	250V									✓				
	600V	✓	✓	✓		✓	✓		✓		✓			
	1000V							✓				✓ min. 50V		
	30 – 1000V												✓	
	380 – 600V													✓
Rated current	8.5A										✓			
	10A		✓ (3/4)	✓	✓					✓				
	14A		✓											
	16A	✓		✓		✓			✓					
	35A						✓							
	65A							✓						
	1 – 220A												✓	
	10 – 100A											✓		
	16 – 80A													✓
Termination type	cage clamp	✓											✓	
	crimp	✓		✓		✓				✓	✓	✓	✓	
	screw	✓	✓		✓		✓		✓				✓	✓
	solder				✓									
Wire size	28 – 4/0 AWG												✓	
	26 – 14 AWG			✓						✓	✓			
	20 – 16 AWG				✓					✓				
	20 – 14 AWG	✓	✓	✓					✓					✓ (signal)
	20 – 12 AWG	✓ (crimp)				✓								
	20 – 10 AWG						✓							
	14 – 8 AWG							✓						
	12 – 6 AWG													✓ (power)

1 mm contacts

Stamped & formed contacts for EPIC® MC 20

Contact size		Stripping length	Reel of 500 gold contacts: left-hand feed	
mm²	AWG*	mm	pin	socket
0.08-0.2	28-26	2.5 ± 0.5	44429013	44429009
0.2-0.52	26-20	2.5 ± 0.5	44429014	44429010

* AWG conversion is approximate

Contact tools

Crimp tool:
11158400

Removal tool:
11132500

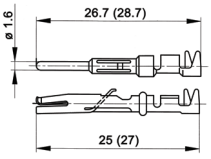
for thermocouple applications

Contact size		Stripping length	Material	Polarity	Color	Type	Strip of 25 contacts	
mm²	AWG*	mm					pin	socket
0.25-0.52	24-20	2.5 ± 0.5	chromel	(+)	white	type K	TC-CH-P	TC-CH-S
0.25-0.52	24-20	2.5 ± 0.5	alumel	(-)	green	type K	TC-AL-P	TC-AL-S
0.25-0.52	24-20	2.5 ± 0.5	iron	(+)	black	type J	TC-IR-P	TC-IR-S
0.25-0.52	24-20	2.5 ± 0.5	constantan	(-)	yellow	type J	TC-CO-P	TC-CO-S

1.6 mm contacts

Stamped & formed contacts

contacts sold in
bags of 100 or 1 reel

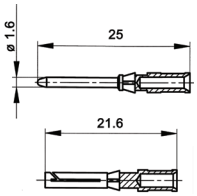


Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14-0.5	26-20	2.5-0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5-1.5	20-16	3.5-0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5-2.5	16-14	3.5-0.5	11223500	11228500	–	–	11223000	11228000	–	–

Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14-0.5	26-20	2.5-0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5-1.5	20-16	3.5-0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5-2.5	16-14	3.5-0.5	–	–	–	–	11222700	11227700	–	–

Machined contacts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14-0.37	26-22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75-1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	5.8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Removal tool:
11161000

Locator
for machined contacts: 11147200
for stamped contacts: 11147300

Crimp dies
for machined contacts: 11147100
for stamped contacts:
0.14-0.5 mm²: 11147170
0.5-1.5 mm²: 11147180
1.5-2.5 mm²: 11147190

Crimp tool, die & locator
for stamped contacts:
0.14-0.5 mm²: 11147004
0.5-1.5 mm²: 11147005
1.5-2.5 mm²: 11147006

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For current information go to our website.

2.5 mm contacts

Stamped & formed contacts for EPIC® MC 4+PE

contacts sold in
bags of 100 or 1 reel

Contact size		Bag of 100 silver contacts		Reel of 100 silver contacts		Reel of 200 silver contacts	
mm²	AWG	pin	socket	pin	socket	pin	socket
0.5 - 1.5	20 - 16	11201000	11205000	–	–	11208000	11209000
1.5 - 2.5	16 - 14	11202000	11206000	11208500	11209500	–	–

Contact tools

Crimp tool:
11147000

Locator:
11147300

Removal tool:
11160000

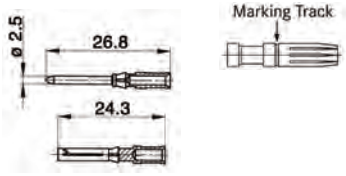
Crimp tool
for reel:
11153500

Crimp dies:
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp dies for reel:
0.5 - 1.5 mm²: 11153700
1.5 - 2.5 mm²: 11153800

Machined contacts

contacts sold in bags of 100



Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–
Machined contacts for EPIC® MC 5								
0.5	20	7.8	7.8	–	1121300C	1121800C	–	–
0.75 - 1.0	18	7.8	7.8	1	1121310C	1121810C	–	–
1.5	16	7.8	7.8	2	1121320C	1121820C	–	–
2.5	14	7.8	7.8	3	1121330C	1121830C	–	–
4.0	12	7.8	7.8	–	1121340C	1121840C	–	–

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

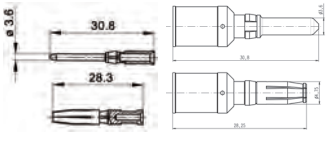
Removal tool: 11171000
(required for EPIC® MC 5)

For removal of contacts, use a slotted screwdriver; no special tool is necessary. EPIC® MC 5 requires a removal tool.

3.6 mm contacts

Machined contacts

contacts sold in bags of 100



1.5 - 10 mm² 16 mm²

Contact size		Stripping length	Bag of 100 silver contacts	
mm²	AWG	mm	pin	socket
1.5	16	10	1121070C	1121570C
2.5	14	10	1121060C	1121560C
4.0	12	10	1121000C	1121500C
6.0	10	10	1121010C	1121510C
10.0	8	10	1121020C	1121520C
16	6	10	44424014	44424015

Contact tools

Crimp tool:
11147000

Crimp dies:
1.5 - 2.5 mm²: 11147110
4.0 - 10 mm²: 11147120
16 mm²: 11147111

Locator:
11147210

Removal tool:
11171100

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4 mm contacts

Machined contacts for EPIC® MH 3 & MH 4

contacts sold in bags of 10

Contact size		Stripping length	Bag of 10 silver contacts	
mm²	AWG	mm	pin	socket
1.5	16	10	44423250	44423255
2.5	14	10	44423251	44423256
4	12	10	44423252	44423257*
6	10	10	44423253	44423258
10	8	10	44423254	44423259

* contact 44423257 requires crimp die 11174101

Contact tools

Crimp tool: 11147000

Crimp dies:
16 - 12 AWG: 11147100
10 - 8 AWG: 11147101

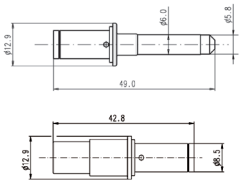
Locator: 11147201

Removal tool: 44423268

6 mm contacts

Machined contacts for EPIC® MC HHC2

contacts sold in bags of 20



Contact size		Bag of 20 silver-plated contacts	
mm²	AWG	pin	socket
16	6	44424019	44424022
25	4	44424020	44424023
35	1	44424021	44424024

Contact tools

Crimp dies:
16 mm²: 44424025
25 mm²: 44424026
35 mm²: 44424027

Use hydraulic crimp tool:
Klauke type FK 60/22-L

8 mm contacts

Machined contacts for EPIC® MH2

contacts sold in bags of 10

Contact size		Stripping length	Bag of 10 silver contacts	
mm²	AWG	mm	pin	socket
10	8	18	44423242	44423246
16	6	18	44423243	44423247
25	4	18	44423244	44423248
35	2	18	44423245	44423249

Contact tools

Crimp dies:
10 mm²: 44423270
16 mm²: 44423271
25 mm²: 44423272
35 mm²: 44423273

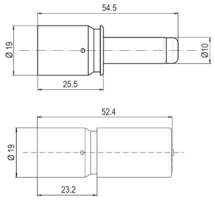
Removal tool: 44423269

Use with hydraulic crimp tool

10 mm contacts

Machined contacts for EPIC® MC HHC1

part number = 1 contact



Contact size		Silver-plated contact		Pack size
mm²	AWG	pin	socket	
50	1/0	44424032	44424035	1
70	2/0	44424033	44424036	1
95	3/0	44424034	44424037	1

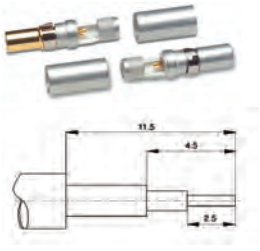
Contact tools

Crimp dies:
50 mm²: 44424038
70 mm²: 44424039
95 mm²: 44424040

Use hydraulic crimp tool:
Klauke type FK 60/22-L

Coax contacts

Contacts for EPIC® MC 3 Coax



Cable type	Impedance	Pin	Socket
Solder contacts			
RG58 CU	50Ω	44429018	44429017
RG180 BU	75Ω	44429020	44429019
RG187 AU	75Ω	44429022	44429021
Solder/crimp contacts			
RG58	50Ω	11214200	11219200

Contact tools

Crimp tool: 11147000

Crimp dies: 11147130

Removal tool: 11171100

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

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Contact tools

crimp tool

crimp die

locator

removal tool

Description	Crimp tool	Crimp dies	Locator	Removal tool
1 mm contacts				
1 mm stamped on reel	11158400	crimp dies included	–	11132500
1.6 mm contacts				
1.6 mm machined	11147000	11147100	11147200	11161000
1.6 mm stamped	11147000	0.14 - 0.5 mm²: 11147170 0.5 - 1.5 mm²: 11147180 1.5 - 2.5 mm²: 11147190	11147300	11161000
1.6 mm stamped on reel	crimp kit (includes tool, dies, and locator) 0.14 - 0.5 mm²: 11147004 0.5 - 1.5 mm²: 11147005 1.5 - 2.5 mm²: 11147006			11161000
2.5 mm contacts				
2.5 mm machined	11147000	11147100	111147200	HBE series: use slotted screwdriver MC series: 11171000
2.5 mm stamped	11147000	0.5 - 1.5 mm²: 11147180 1.5 - 2.5 mm²: 11147190	11147300	11160000
2.5 mm stamped on reel	11153500	0.5 - 1.5 mm²: 11153700 1.5 - 2.5 mm²: 11153800	–	11160000
3.6 mm contacts				
3.6 mm machined	11147000	1.5 - 2.5 mm²: 11147110 4 - 10 mm²: 11147120 16 mm²: 11147111	11147210	11171100
4 mm contacts				
4 mm machined	11147000	1.5 - 4 mm²: 11147100 6 - 10 mm²: 11147101	11147201	44423268
6 mm contacts				
6 mm machined	use hydraulic crimp tool	16 mm²: 44424025 25 mm²: 44424026 35 mm²: 44424027	–	–
8 mm contacts				
8 mm machined	use hydraulic crimp tool	10 mm²: 44423270 16 mm²: 44423271 25 mm²: 44423272 35 mm²: 44423273	–	44423269
10 mm contacts				
10 mm machined	use hydraulic crimp tool	50 mm²: 44424038 70 mm²: 44424039 95 mm²: 44424040	–	–
Coax contacts				
Coax	11147000	11147130	–	11171100

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

EPIC®

Rectangular connector inserts

EPIC® HBE series *

Inserts for medium power & control applications

294 EPIC® HBE 6
295 EPIC® HBE 10
296 EPIC® HBE 16
297 EPIC® HBE 24
298 EPIC® HBE 32
299 EPIC® HBE 48

* NEW EPIC® HBE inserts with push-in termination

EPIC® HA series

Compact screw-terminated inserts for medium power & control applications

301 EPIC® HA 3
301 EPIC® HA 4
301 EPIC® HA 10
302 EPIC® HA 16
302 EPIC® HA 32
303 EPIC® HA 48
303 EPIC® HA 64

EPIC® HQ series

Compact crimp-terminated inserts for power & control applications

305 EPIC® HQ 5
306 EPIC® HQ 12

EPIC® STA series

Inserts with solid spring-designed contacts for low voltage control applications

308 EPIC® STA 6
308 EPIC® STA 14
309 EPIC® STA 20
309 EPIC® STA 40

EPIC® HEE series

Inserts with high crimp contact density for power & control applications

311 EPIC® HEE 10
311 EPIC® HEE 18
312 EPIC® HEE 32
312 EPIC® HEE 46
313 EPIC® HEE 64
313 EPIC® HEE 92

EPIC® HBS series

Screw-terminated inserts for high-current power applications

315 EPIC® HBS 6
315 EPIC® HBS 12

EPIC® Power HS series

Compact axial screw-terminated inserts for high-current power applications

316 EPIC® Power HS 4

EPIC® HBVE series

High-voltage screw-terminated inserts with two switch contacts for power applications

318 EPIC® HBVE 3
318 EPIC® HBVE 6
318 EPIC® HBVE 10

EPIC®

Rectangular connector inserts

EPIC® HD series
Compact high-density crimp-terminated inserts for control applications

320 EPIC® HD 7
322 EPIC® HD 8
323 EPIC® HD 15
325 EPIC® HD 25
327 EPIC® HD 40
329 EPIC® HD 50
331 EPIC® HD 64
333 EPIC® HD 80
335 EPIC® HD 128

EPIC® HDD series
Ultra high-density crimp-terminated inserts for control applications

338 EPIC® HDD 24
338 EPIC® HDD 42
339 EPIC® HDD 72
339 EPIC® HDD 108
340 EPIC® HDD 144
340 EPIC® HDD 216

EPIC® MH series
Modular system for power, signal & data

342 EPIC® MH 2
343 EPIC® MH 3
343 EPIC® MH 4
344 EPIC® MH 6
344 EPIC® MH 8
345 EPIC® MH 12
345 EPIC® MH 17
346 EPIC® MH 20
347 EPIC® MH 36
347 EPIC® MH 0
348 EPIC® MH BUS/MH Coax
349 EPIC® MH 6 multi frame
349 EPIC® MH 10 multi frame
350 EPIC® MH 16 multi frame
350 EPIC® MH 24 multi frame

EPIC® MC series
Modular inserts for custom configurations

353 EPIC® MC 2
354 EPIC® MC HC2
355 EPIC® MC HHC2
356 EPIC® MC HHC1
357 EPIC® MC 3 Coax
358 EPIC® MC 3
359 EPIC® MC 3 High Voltage
360 EPIC® MC 4 HE
361 EPIC® MC 4+PE High Voltage
362 EPIC® MC 5
363 EPIC® MC 10
365 EPIC® MC 20
366 EPIC® MC 0
366 EPIC® MC Cage Clamp
367 EPIC® MC PROFIBUS® DP
367 EPIC® MC Universal Bus
368 EPIC® MC BUS
369 EPIC® MC Ethernet
370 EPIC® MC Pneumatic
371 EPIC® MC 2 module frame
371 EPIC® MC 3 module frame
372 EPIC® MC 5 module frame
372 EPIC® MC 7 module frame
373 EPIC® MC 10 module frame
373 EPIC® MC 14 module frame

EPIC® Power K series
Screw-terminated inserts for combination power & control applications

376 EPIC® Power K 4/0
376 EPIC® Power K 4/2
376 EPIC® Power K 4/8

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EPIC® HBE series

Inserts for medium power & control applications

EPIC® HBE series inserts provide reliable termination and performance in the vast majority of medium power and control applications. Methods of termination include screw, crimp, screwless cage clamp, and push-in.

Technical data

Number of contacts:	6, 10, 16, 24, 32, 48 (+PE)
Temperature range:	-40°C to +100°C
- short-term:	up to +125°C
Rated voltage:	
- UL/CSA:	600V
- IEC:	500V
Pollution level:	3
Dimensioning transient:	6 kV
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service in excess of 500 cycles is possible at rated voltage and current*

Screw termination:

Rated current:	
- UL/CSA; IEC:	16A
Wire size:	20 - 14 AWG (0.5 - 2.5 mm²)
Contact material:	silver-plated copper alloy
Contact resistance:	< 2 mΩ

Crimp termination:

Rated current:	
- UL/CSA; IEC:	16A
Wire size:	20 - 12 AWG (0.5 - 4 mm²)
Contact material:	silver- or gold-plated copper alloy
Contact resistance:	< 2 mΩ

Cage clamp termination:

Rated current:	
- UL/CSA; IEC:	16A
Wire size:	20 - 14 AWG (0.5 - 2.5 mm²)
Contact material:	silver-plated copper alloy
Contact resistance:	1.5 - 4 mΩ

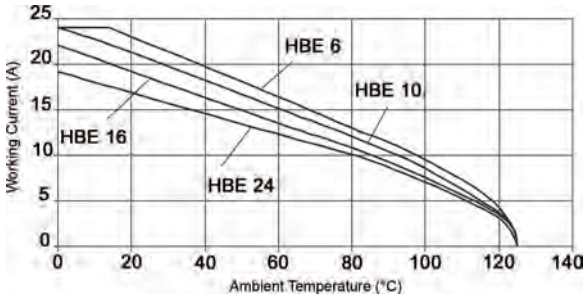
Push-in termination:

Rated current:	
- UL/CSA:	13A
- IEC:	16A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)
Contact material:	silver-plated copper alloy
Contact resistance:	< 2 mΩ

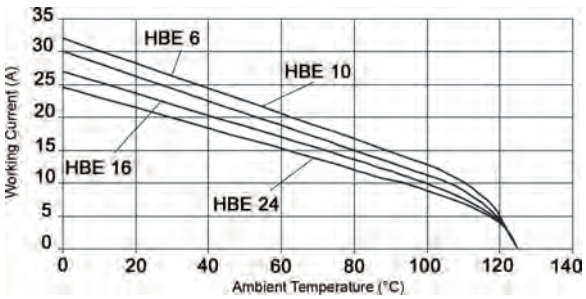
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HBE derating curves

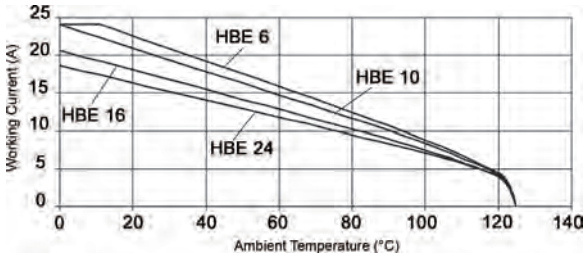
16 AWG (1.5 mm²) screw termination



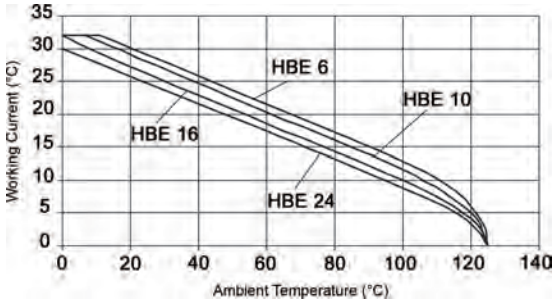
14 AWG (2.5 mm²) screw termination



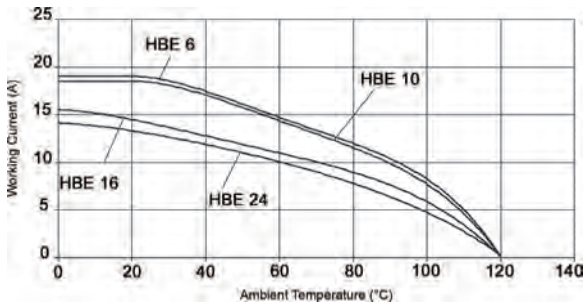
16 AWG (1.5 mm²) crimp termination



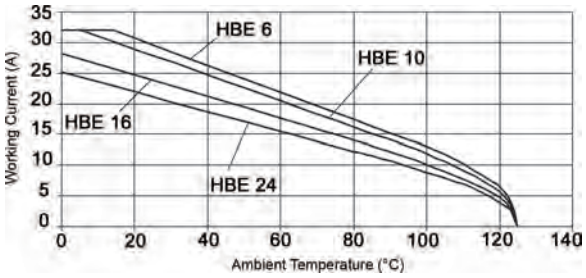
14 AWG (2.5 mm²) crimp termination



16 AWG (1.5 mm²) cage clamp



14 AWG (2.5 mm²) cage clamp



2.5 mm contacts

Machined contacts for EPIC® HBE crimp termination inserts

Contact tools

Crimp tool: 11147000

Crimp dies: 11147100

Locator: 11147200

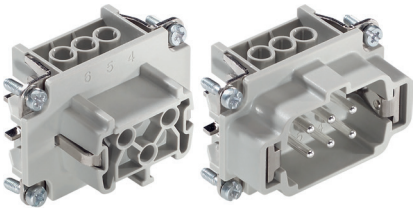
for removal of contacts, use a slotted screwdriver; no special tool is necessary

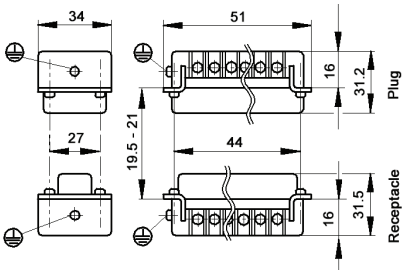
Contact size		Stripping length (mm)		# of marking tracks	Silver contacts		Gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

contacts sold in bags of 100

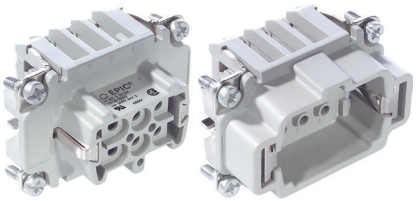
EPIC® HBE 6

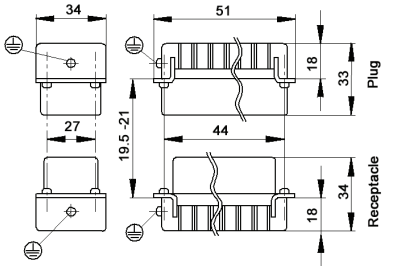
Screw termination: 600V, 16A





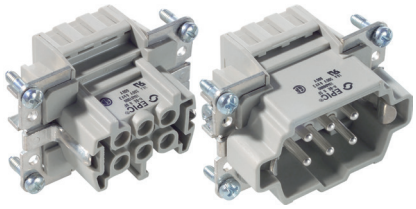
Crimp termination: 600V, 16A

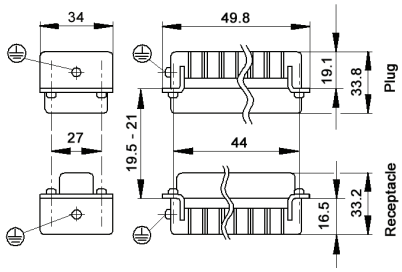




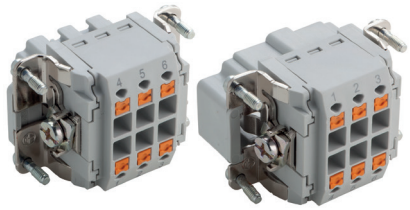
crimp contacts sold separately, see page 293

Screwless cage clamp: 600V, 16A

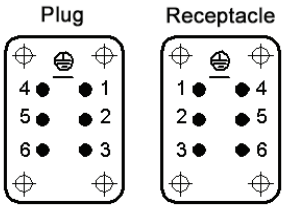




Push-in termination: 600V, 13A



NEW



view from cable side

all dimensions are in mm

Approvals

screw, crimp & push-in:

cage clamp:

Compatible housing

HB 6
page 379

Termination	Wire protection	Plug	Receptacle
screw	yes	10190000	10191000
screw	no	10190100	10191100
crimp	–	10180002	10181002
cage clamp	yes	10400000	10401000
push-in	yes	44423200	44423201

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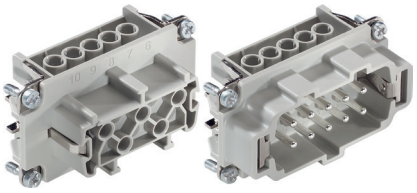
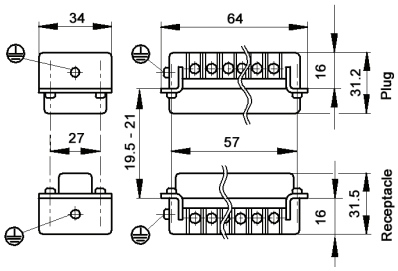
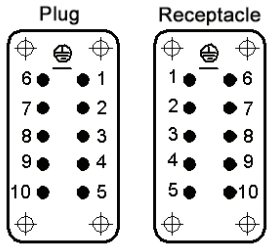
EPIC® HBE 10

Screw termination: 600V, 16A



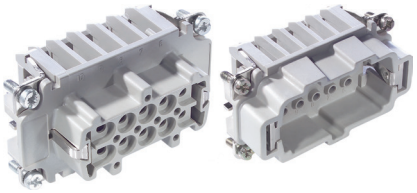


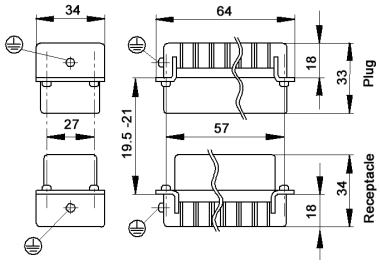


view from cable side

all dimensions are in mm

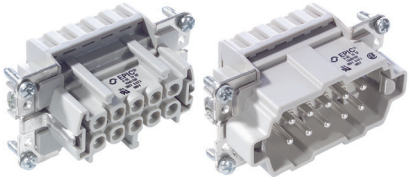
Crimp termination: 600V, 16A

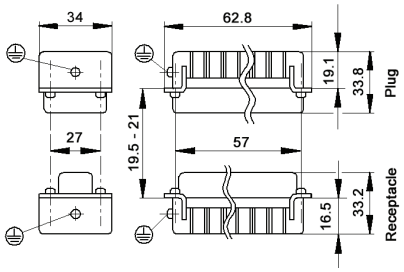




crimp contacts sold separately, see page 293

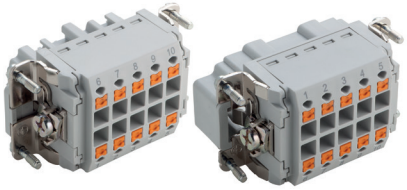
Screwless cage clamp: 600V, 16A





Push-in termination: 600V, 13A

NEW



Approvals

screw, crimp & push-in:

cage clamp:

Compatible housing

HB 10
page 382

Termination	Wire protection	Plug	Receptacle
screw	yes	10192000	10193000
screw	no	10192100	10193100
crimp	–	10182002	10183002
cage clamp	yes	10400100	10401100
push-in	yes	44423202	44423203

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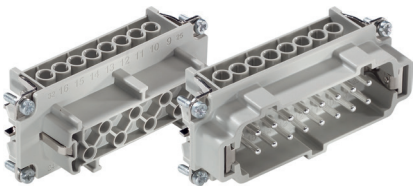
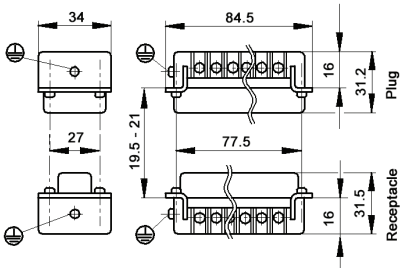
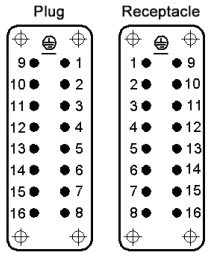
EPIC® HBE 16

Screw termination: 600V, 16A



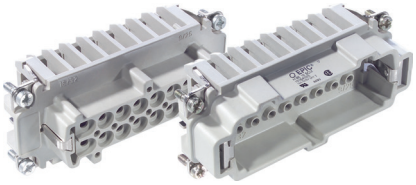


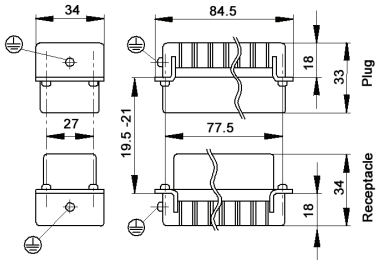


view from cable side

all dimensions are in mm

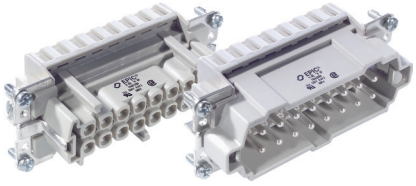
Crimp termination: 600V, 16A

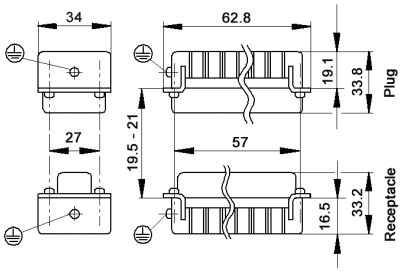




crimp contacts sold separately, see page 293

Screwless cage clamp: 600V, 16A





Push-in termination: 600V, 13A

NEW

Approvals

screw, crimp & push-in:

cULus RoHS

cage clamp:

RoHS

Compatible housing

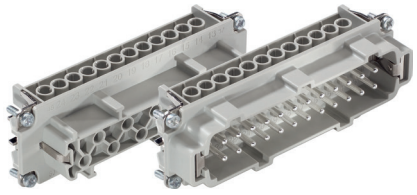
HB 16
page 388

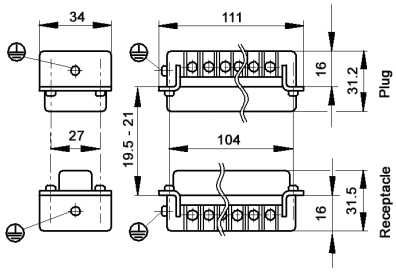
Termination	Wire protection	Plug	Receptacle
screw	yes	10194000	10195000
screw	no	10194100	10195100
crimp	–	10184002	10185002
cage clamp	yes	10400200	10401200
push-in	yes	44423204	44423205

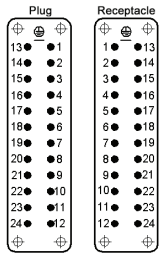
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HBE 24

Screw termination: 600V, 16A



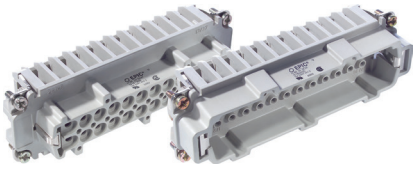


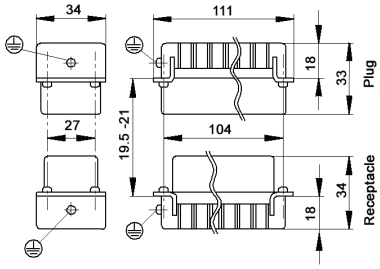


view from cable side

all dimensions are in mm

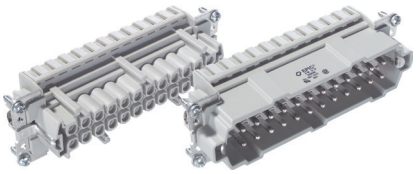
Crimp termination: 600V, 16A

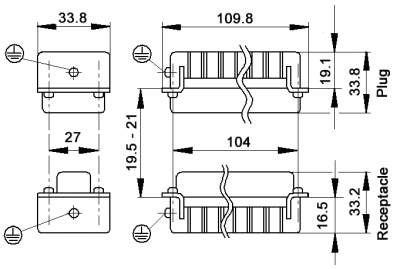




crimp contacts sold separately, see page 293

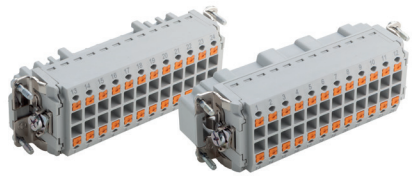
Screwless cage clamp: 600V, 16A





Push-in termination: 600V, 13A

NEW



Approvals

screw, crimp & push-in:

cage clamp:

Compatible housing

HB 24
page 394

Termination	Wire protection	Plug	Receptacle
screw	yes	10196000	10197000
screw	no	10196100	10197100
crimp	–	10186002	10187002
cage clamp	yes	10400300	10401300
push-in	yes	44423206	44423207

If not otherwise specified, all values relating to the product are nominal values.
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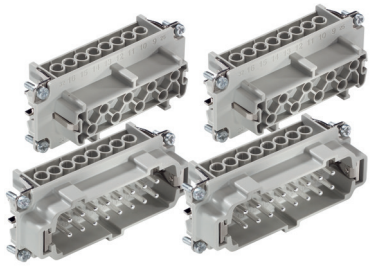
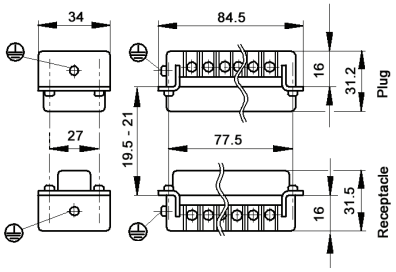
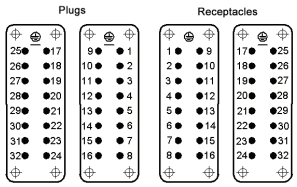
EPIC® HBE 32

Screw termination: 600V, 16A



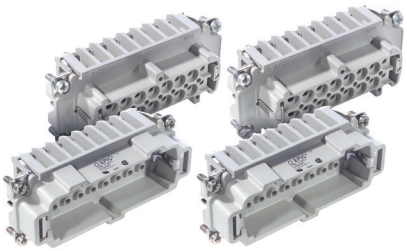


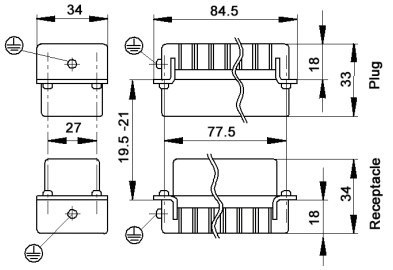


view from cable side

all dimensions are in mm

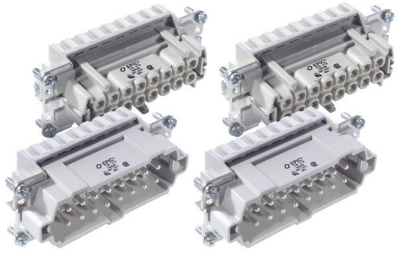
Crimp termination: 600V, 16A

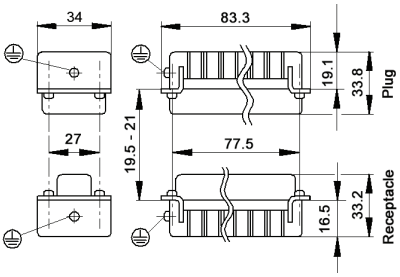




crimp contacts sold separately, see page 293

Screwless cage clamp: 600V, 16A





Push-in termination: 600V, 13A

NEW

Approvals

screw, crimp & push-in:

cULus RoHS

cage clamp:

UL CSA RoHS

Compatible housing

HB 32
page 400

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw	yes	#1-16	10194000	10195000
		#17-32	10202000	10203000
screw	no	#1-16	10194100	10195100
		#17-32	10202100	10203100
crimp	–	#1-16	10184002	10185002
		#17-32	10184202	10185202
cage clamp	yes	#1-16	10400200	10401200
		#17-32	10400400	10401400
push-in	yes	#1-16	44423204	44423205
		#17-32	44423208	44423209

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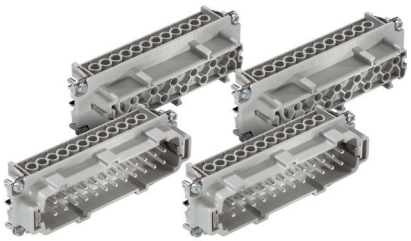
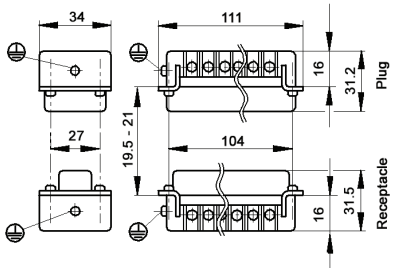
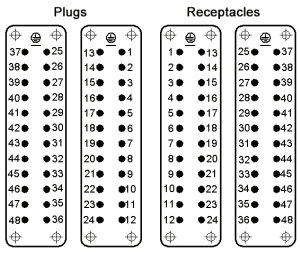
EPIC® HBE 48

Screw termination: 600V, 16A



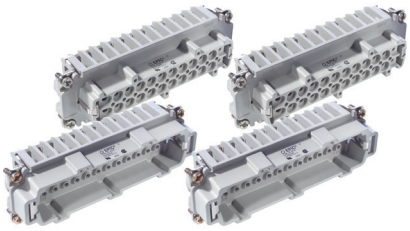


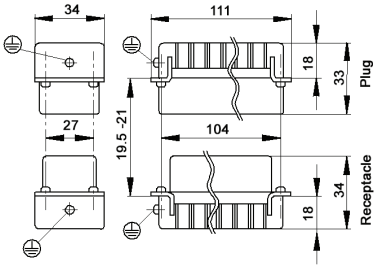


view from cable side

all dimensions are in mm

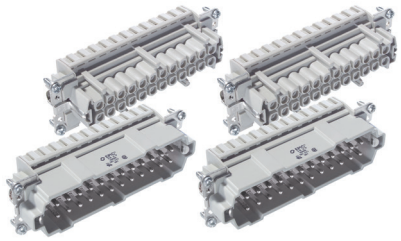
Crimp termination: 600V, 16A

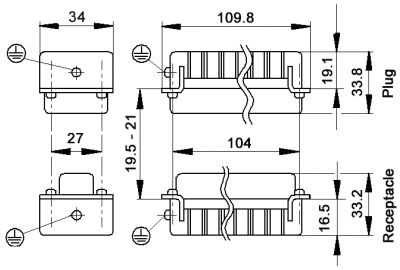




crimp contacts sold separately, see page 293

Screwless cage clamp: 600V, 16A





Push-in termination: 600V, 13A

NEW

Approvals

screw, crimp & push-in:

cULus RoHS

cage clamp:

UL CSA RoHS

Compatible housing

HB 48
page 402

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw	yes	#1-24	10196000	10197000
		#25-48	10204000	10205000
screw	no	#1-24	10196100	10197100
		#25-48	10204100	10205100
crimp	–	#1-24	10186002	10187002
		#25-48	10186202	10187202
cage clamp	yes	#1-24	10400300	10401300
		#25-48	10400500	10401500
push-in	yes	#1-24	44423206	44423207
		#25-48	44423210	44423211

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® HA series

Compact screw-terminated inserts for medium power & control applications

Similar to the HBE series inserts but more compact, EPIC® HA series inserts are used whenever space is limited. EPIC® HA 3/4 inserts and housings provide the smallest possible footprint in a 10A power connector. HA 10-48 inserts are unique because of their shortened ground straps, which still allow for a wire cross-section up to 2.5 mm². HA 3-48 screw-terminated inserts fit into EPIC® HA series housings. A modified EPIC® HB 48 housing can fit 64 contacts.

Technical data

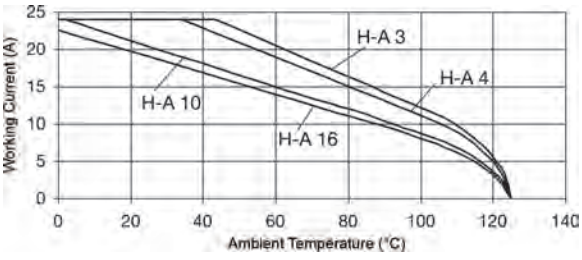
Number of contacts:	3, 4, 10, 16, 32, 48, 64 (+PE)
Temperature range:	-40°C to +100°C
- short-term:	up to +125°C
Pollution level:	3
Dimensioning transient:	4 kV
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*
Test voltage:	4 kV
Rated voltage:	
- UL:	600V
- CSA:	600V
- IEC:	
- EPIC® HA 3/4:	400V
- EPIC® HA 10 - 64:	250V
- SEV:	250V

Rated current:	
- UL:	
- EPIC® HA 3/4:	10A
- EPIC® HA 10 - 64:	14A
- CSA:	
- EPIC® HA 3/4:	10A
- EPIC® HA 10 - 64:	16A
- IEC:	
- EPIC® HA 3/4:	23A
- EPIC® HA 10 -64:	16A
- SEV:	16A
Wire size:	
- EPIC® HA 3/4:	
- solid or stranded wire with ferrule:	20 - 14 AWG (0.5 - 2.5 mm²)**
- EPIC® HA 10 - 64:	
- solid or stranded wire with ferrule:	20 - 14 AWG (0.5 - 2.5 mm²)**
- for stranded wire without ferrule:	18 - 14 AWG (0.75 - 2.5 mm²)
(requires insert with wire protection)	
Contact material:	silver-plated copper alloy
Contact resistance:	1.5 - 4 mΩ

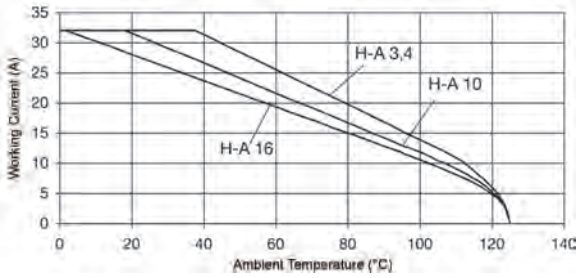
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.
** May be limited, depending on the ferrule crimp profile.

EPIC® HA derating curves

16 AWG (1.5 mm²)

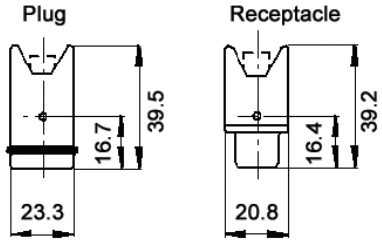


14 AWG (2.5 mm²)

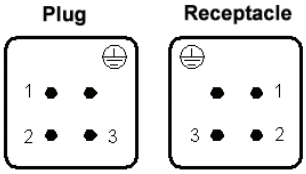


EPIC® HA 3

screw termination: 600V, 10A



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
screw termination	10420000	10421000

Complete the installation

Coding pin: 10451400

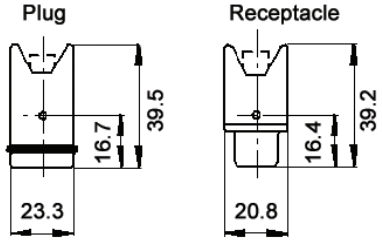
Compatible housing

HA 3/4 page 413

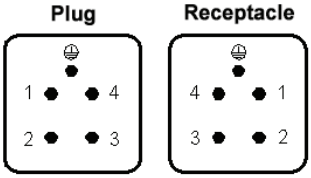
Approvals

EPIC® HA 4

screw termination: 600V, 10A



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
screw termination	10431000	10432000

Complete the installation

Coding pin: 10451400

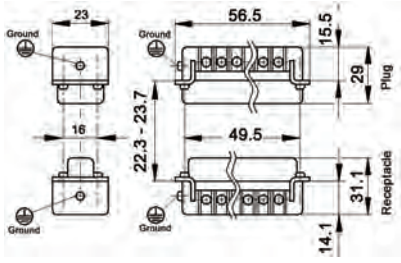
Compatible housing

HA 3/4 page 413

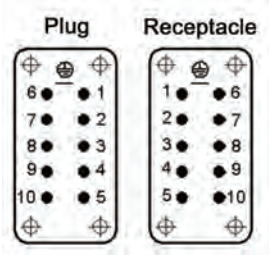
Approvals

EPIC® HA 10

screw termination: 600V, 14A



all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10440100	10441100
screw termination	no	10440000	10441000

Compatible housing

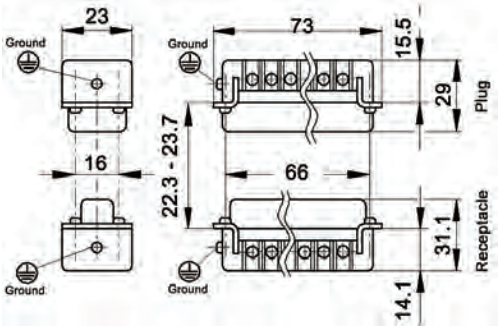
HA 10 page 415

Approvals

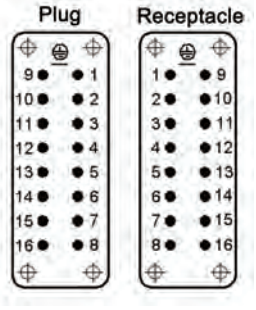
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HA 16

screw termination: 600V, 14A



all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10530000	10531000
screw termination	no	10532000	10533000

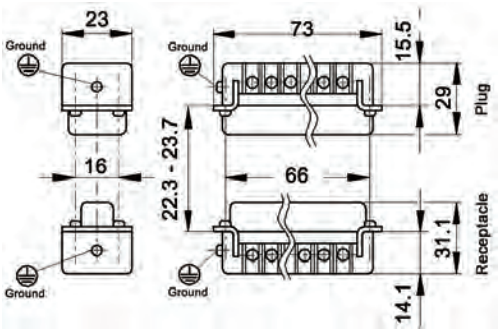
Compatible housing

HA 16
page 417

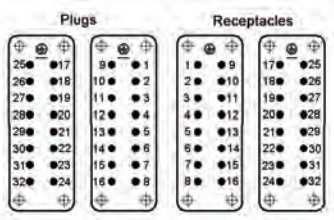
Approvals

EPIC® HA 32

screw termination: 600V, 14A



all dimensions are in mm



view from cable side

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw termination	yes	#1 - 16	10530000	10531000
		#17 - 32	10540000	10541000
screw termination	no	#1 - 16	10532000	10533000
		#17 - 32	10542000	10543000

Compatible housing

HA 32
page 419

Approvals

If not otherwise specified, all values relating to the product are nominal values.
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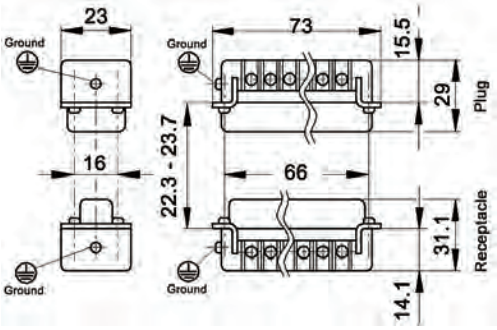
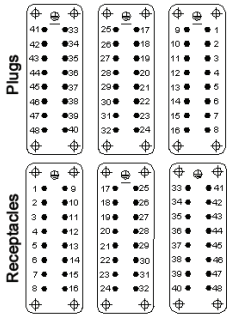
EPIC® HA 48

screw termination: 600V, 14A



all dimensions are in mm



view from cable side

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw termination	yes	#1-16	10530000	10531000
		#17-32	10540000	10541000
		#33-48	10540100	10541100
screw termination	no	#1-16	10532000	10533000
		#17-32	10542000	10543000
		#33-48	10542100	10543100

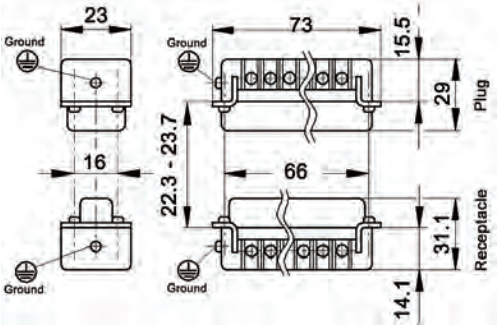
Compatible housing

HA 48
page 421

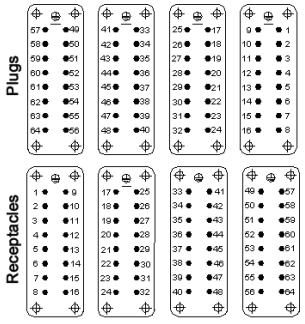
Approvals

EPIC® HA 64

screw termination: 600V, 14A



all dimensions are in mm



view from cable side

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw termination	yes	#1-16	10530000	10531000
		#17-32	10540000	10541000
		#33-48	10540100	10541100
		#49-64	105300LE64	105310LE64

Compatible housing

HA 64
page 422

Approvals

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® HQ series

Compact crimp-terminated inserts for power & control applications

The EPIC® HQ insert series fills the gap between the smallest-configuration HA series and HD series inserts. The HQ 5 insert provides more contacts (5+PE and 12+PE) in the same size housing as the HA 3 and HA 4 inserts, with higher current and voltage capability than the HD 7 and HD 8 inserts. The HQ 12 insert provides 50% more contacts than the HD 8 insert in the same compact size. They are ideal for applications in the transportation and automotive industries, and in many others where a compact, rugged industrial connector is needed.

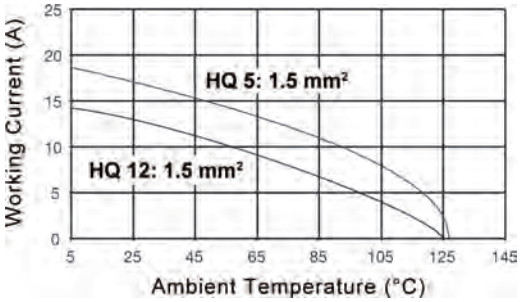
Technical data

Number of contacts:	5, 12 (+PE)	**Rated voltage:**	
		- UL/CSA:	600V
Temperature range:	-40°C to +100°C	- IEC:	400V
- short-term:	up to +125°C		
		Rated current:	
Pollution level:	3	- UL/CSA:	
		- 5-pole:	16A
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed	- 12-pole:	14A (UL) 10A (CSA)
	- per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	**Wire size:**	
		- 5-pole:	20 - 14 AWG (0.5 - 2.5 mm²)
		- 12-pole:	26 - 14 AWG (0.14 - 2.5 mm²)
Test voltage:		**Contact material:**	silver- or gold-plated copper alloy
- 5-pole:	4 kV		
- 12-pole:	6 kV	**Contact resistance:**	≤ 2 mΩ

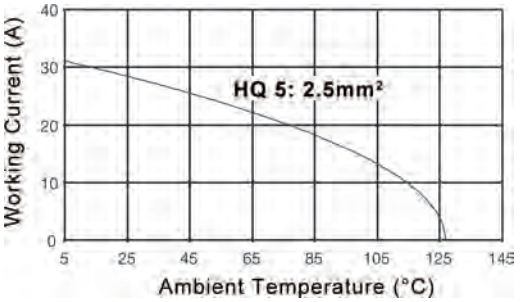
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HQ derating curves

16 AWG (1.5 mm²)



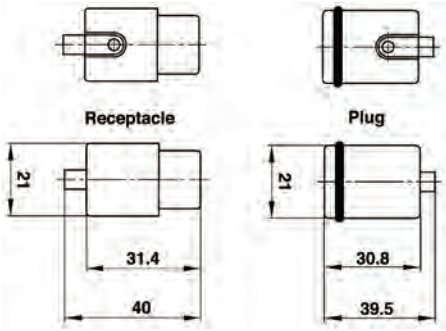
14 AWG (2.5 mm²)



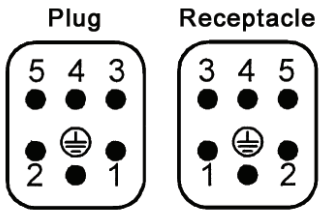
EPIC® HQ 5

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	10431500	10432500

Complete the installation

Coding pin: 10436500

Compatible housing

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Approvals

2.5 mm contacts

Machined contacts for EPIC® HQ series inserts

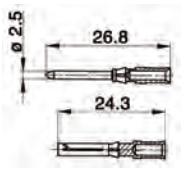
Contact tools

Crimp tool: 11147000

Crimp dies: 11147100

Locator: 11147200

for removal of contacts, use a slotted screwdriver; no special tool is necessary



contacts sold in bags of 100

Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

If not otherwise specified, all values relating to the product are nominal values.
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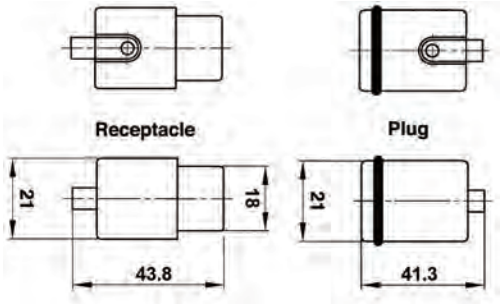
EPIC® HQ 12

crimp termination: 600V, 14A

contacts sold separately, see below



all dimensions are in mm

view from cable side

Termination	Plug	Receptacle
crimp termination	44424049	44424050

Complete the installation

Coding pin: 44424052

Compatible housing

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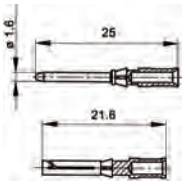
Approvals

1.6 mm contacts

Machined contacts for EPIC® HQ series inserts

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool: 11147000

Crimp dies: 11147100

Locator: 11147200

Removal tool: 11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® STA series

Inserts with solid spring-designed contacts for low voltage control applications

EPIC® STA series inserts with solid spring-designed contacts are used extensively in the construction of devices and in control units, laboratories, and withdrawable unit design. These inserts are available with screw or solder termination, and fit into EPIC® HA series housings.

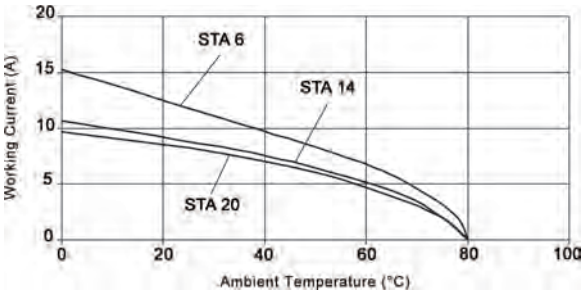
Technical data

Number of contacts:	6, 14, 20, 40
Temperature range:	-40°C to +80°C
Pollution level:	2
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed
Test voltage:	1 kV
Rated voltage:	
- UL/CSA:	48V
- IEC:	60V
Rated current:	
- UL/CSA; IEC:	10A
Wire size:	
- solder termination:	up to 16 AWG (1.5 mm²)
- screw termination:	20 - 16 AWG (0.5 - 1.5 mm²)
Contact material:	silver-plated copper alloy
Contact resistance:	< 2 mΩ

* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

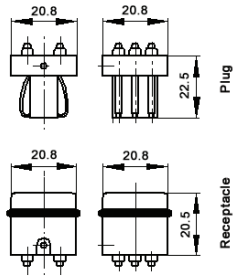
EPIC® STA derating curves

18 AWG (1 mm²)



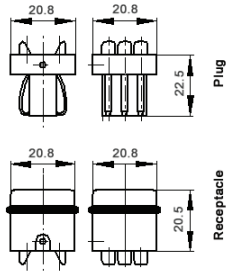
EPIC® STA 6

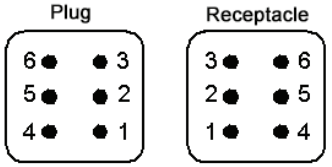
Screw termination: 48V, 10A



all dimensions are in mm

Solder termination: 48V, 10A





view from cable side

Termination	Plug	Receptacle
screw termination	10488100	10486100
solder termination	10487200	10485200

Compatible housing

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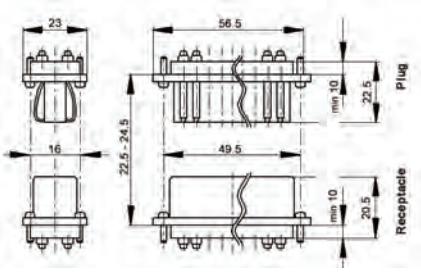
page 413

Approvals

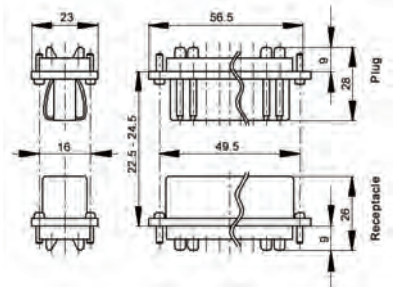
EPIC® STA 14

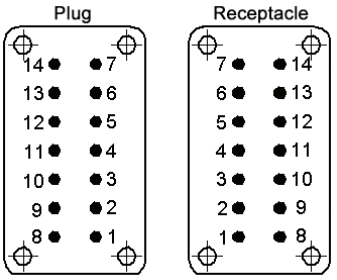
Screw termination: 48V, 10A



all dimensions are in mm

Solder termination: 48V, 10A





view from cable side

Termination	Plug	Receptacle
screw termination	10493100	10491100
solder termination	10492200	10490200

Compatible housing

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Approvals

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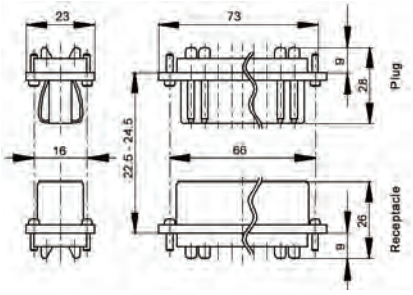
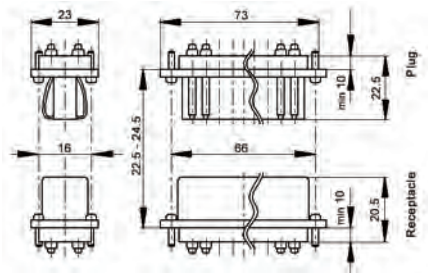
EPIC® STA 20

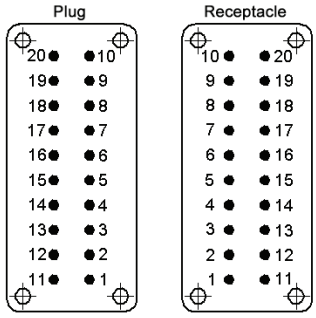
Screw termination: 48V, 10A



all dimensions are in mm

Solder termination: 48V, 10A





view from cable side

Termination	Plug	Receptacle
screw termination	10503100	10501100
solder termination	10502200	10500200

Compatible housing

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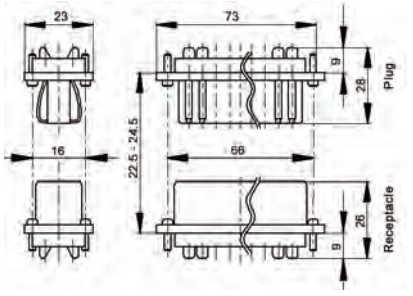
Approvals

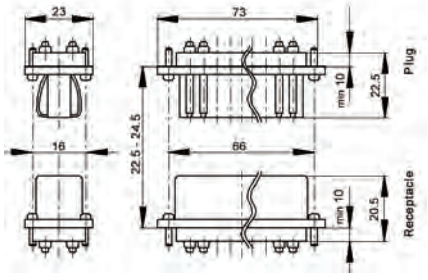
EPIC® STA 40

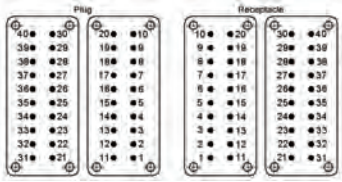
Screw termination: 48V, 10A



all dimensions are in mm

Solder termination: 48V, 10A





view from cable side

Termination	Plug	Receptacle
screw termination	10503100 (x2)	10501100 (x2)
solder termination	10502200 (x2)	10500200 (x2)

x2 STA 20 inserts, use two part numbers

Compatible housing

HA 32
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Approvals

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® HEE series

Inserts with high crimp contact density for power & control applications

The EPIC® HEE series of crimp-terminated inserts is a high-density companion to the popular EPIC® HBE series. Offering the same voltage and current ratings (600V AC; 16A), it provides a significant increase in contact density (a 67%- 100% increase) within the same footprint dimensions as an equivalent-sized HBE insert. EPIC® HEE inserts are ideal for applications in the automotive industry and any other industrial application requiring high density contacts and immunity to vibration.

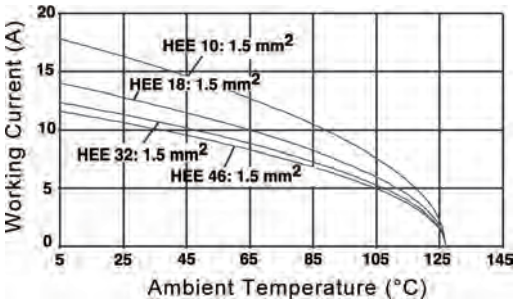
Technical data

Number of contacts:	10, 18, 32, 46, 64, 92 (+PE)	**Test voltage:**	6 kV
Temperature range:	-40°C to +100°C	**Rated voltage:**	
- short-term:	up to +125°C	- UL/CSA:	600V
		- IEC:	500V
Pollution level:	3		
		Rated current:	16A
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed	**Wire size:**	20 - 12 AWG (0.5 - 4 mm²)
	- per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	**Contact material:**	silver- or gold-plated copper alloy
		Contact resistance:	≤ 2 mΩ

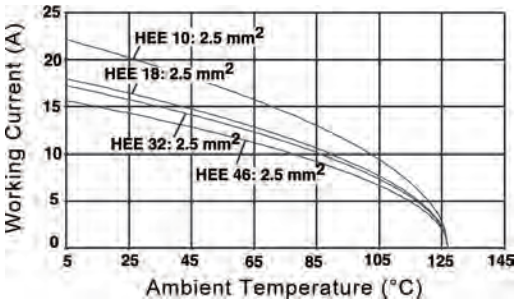
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HEE derating curves

16 AWG (1.5 mm²)



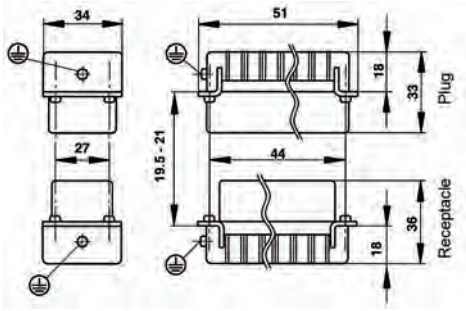
14 AWG (2.5 mm²)



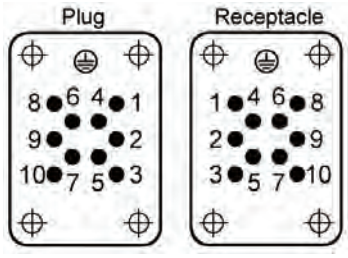
EPIC® HEE 10

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	10180400	10181400

Compatible housing

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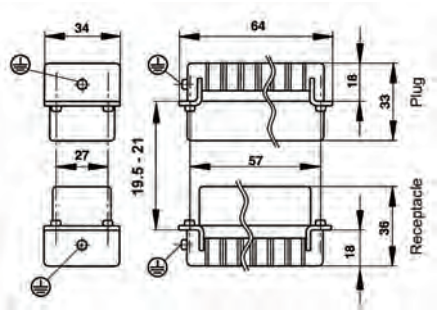
Approvals

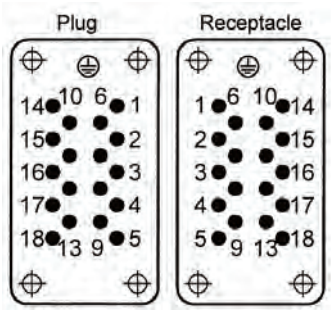
EPIC® HEE 18

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	10182400	10183400

Compatible housing

HB 10
page 382

Approvals

2.5 mm contacts

Machined contacts for EPIC® HEE series inserts

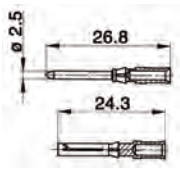
Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

for removal of contacts, use a slotted screwdriver; no special tool is necessary



contacts sold in bags of 100

Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

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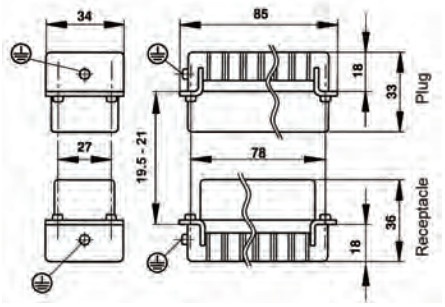
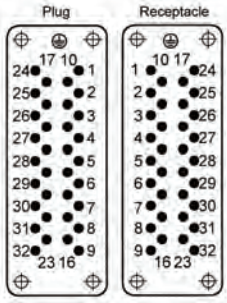
EPIC® HEE 32

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	10184400	10185400

Compatible housing

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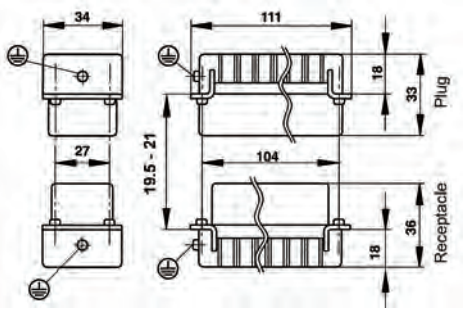
Approvals

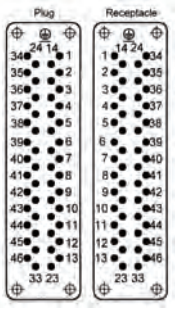
EPIC® HEE 46

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	10186400	10187400

Compatible housing

HB 24
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Approvals

2.5 mm contacts

Machined contacts for EPIC® HEE series inserts

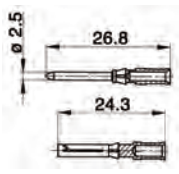
Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

for removal of contacts, use a slotted screwdriver; no special tool is necessary



contacts sold in bags of 100

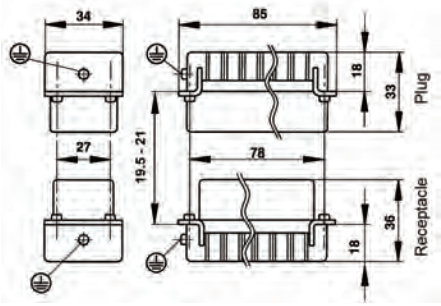
Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

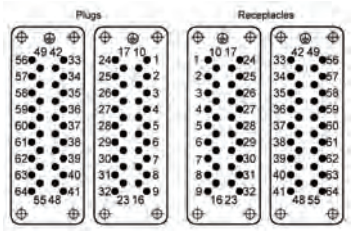
EPIC® HEE 64

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact numbering	Plug	Receptacle
crimp termination	#1-32	10184400	10185400
	#33-64	10184500	10185500

Compatible housing

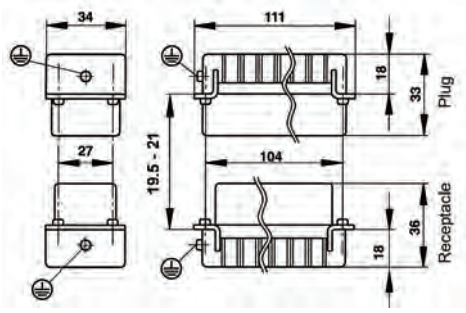
HB 32
page 400

Approvals

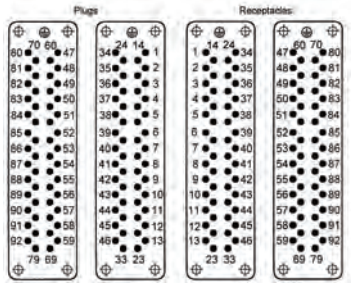
EPIC® HEE 92

crimp termination: 600V, 16A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact numbering	Plug	Receptacle
crimp termination	#1-46	10186400	10187400
	#47-92	10186500	10187500

Compatible housing

HB 48
page 402

Approvals

2.5 mm contacts

Machined contacts for EPIC® HEE series inserts

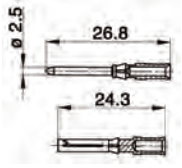
Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

for removal of contacts, use a slotted screwdriver; no special tool is necessary



contacts sold in bags of 100

Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HBS series

Screw-terminated inserts for high-current power applications

EPIC® HBS series inserts are characterized by their higher current-carrying capacity: a little more than twice the capacity of the EPIC® HBE series. A secure electrical connection can be made by simple screw termination for cables up to 10 AWG.

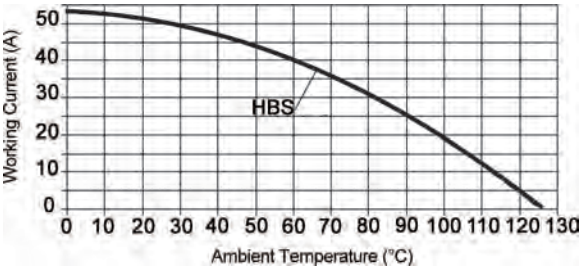
Technical data

Number of contacts:	6, 12 (+PE)	**Test voltage:**	6 kV
Temperature range:	-40°C to +100°C	**Rated voltage:**	
- short-term:	up to +125°C	- UL/CSA:	600V
		- IEC:	500V
Pollution level:	3		
		Rated current:	
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed	- UL/CSA; IEC:	35A
		Wire size:	20 - 10 AWG (0.5 - 6 mm²)
	- per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	**Contact material:**	silver-plated copper alloy
		Contact resistance:	< 2 mΩ

* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

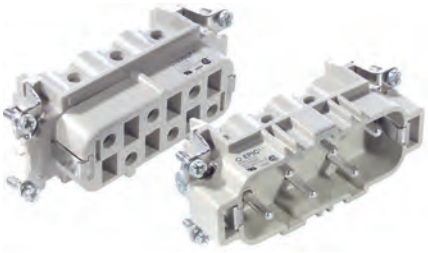
EPIC® HBS derating curves

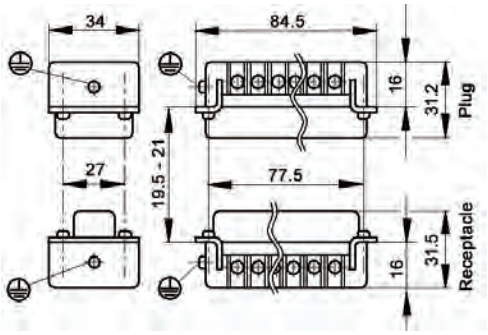
10 AWG (6 mm²)



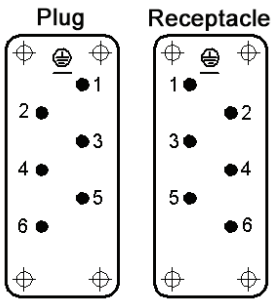
EPIC® HBS 6

screw termination: 600V, 35A





all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10170000	10171000

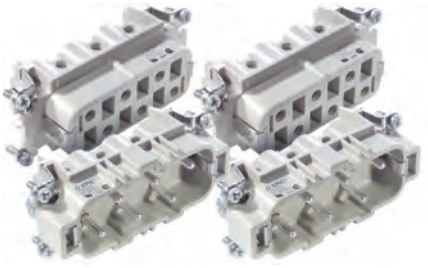
Compatible housing

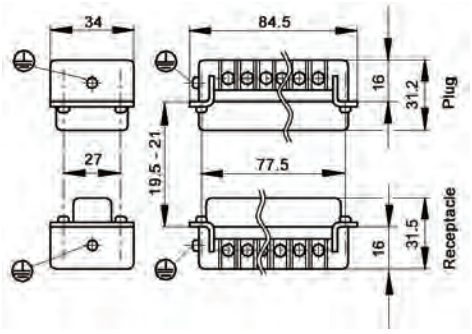
HB 16
page 388

Approvals

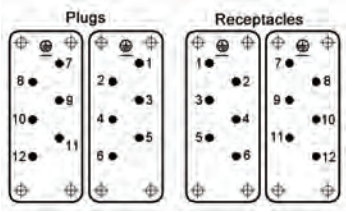
EPIC® HBS 12

screw termination: 600V, 35A





all dimensions are in mm



view from cable side

Termination	Wire protection	Contact numbering	Plug	Receptacle
screw termination	yes	#1 - 6	10170000	10171000
		#7 - 12	10170600	10171600

Compatible housing

HB 32
page 400

Approvals

EPIC® Power HS series

Compact axial screw-terminated inserts for high-current power applications

EPIC® Power HS series inserts are characterized by their very high current-carrying capacity in a compact design. A secure electrical connection can be made by simple axial screw termination for cables up to 8 AWG.

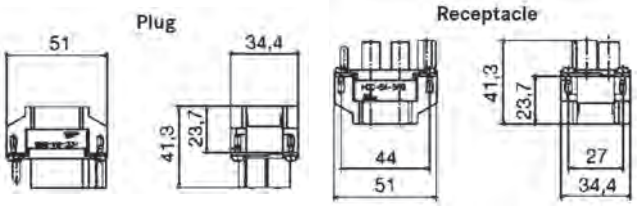
Technical data

Number of contacts:	4 (+PE)	**Test voltage:**	8 kV
Temperature range:	-40°C to +125°C	**Rated voltage:**	
		- UL/CSA:	1000V
Pollution level:	3	**Rated current:**	
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	- UL/CSA; IEC:	65A
		Wire size:	14 - 8 AWG (2.5 - 10 mm²)
		Contact material:	silver-plated copper alloy
		Contact resistance:	< 1 mΩ

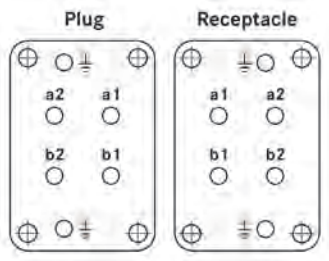
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® Power HS 4

axial screw termination: 1000V, 65A



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
axial screw termination	10407910	10407900

#2 hex wrench is required for axial termination of wire.

Contact tools

Axial screw: 44424028

Compatible housing

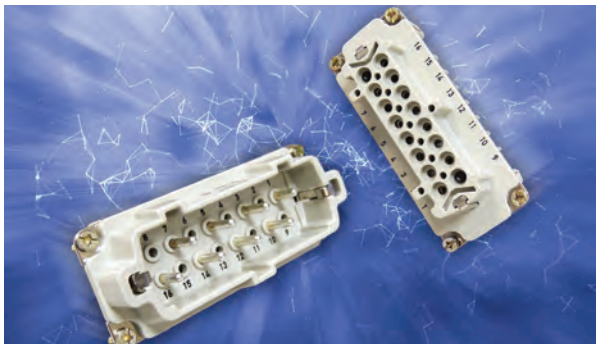
HB 6
page 379

Approvals

RoHS

EPIC® HBVE series

High-voltage screw-terminated inserts with two switch contacts for power applications



EPIC® HBVE series inserts handle higher voltage and are equipped with two switch contacts. These contacts “make” after the working contacts are engaged and “break” before the working contacts disengage. They can be wired as part of an electrical interlock circuit to ensure that power to the working contacts is turned off during connector mating and unmating.

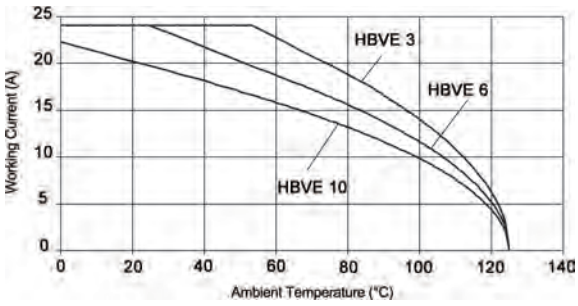
Technical data

Number of contacts:	3+2+PE, 6+2+PE, 10+2+PE	**Test voltage:**	6 kV
Temperature range:	-40°C to +100°C	**Rated voltage:**	
- short-term:	up to +125°C	- UL/CSA:	600V
		- IEC:	630V
Pollution level:	3		
		Rated current:	
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	- UL/CSA; IEC:	16A
		Wire size:	20 - 14 AWG (0.5 - 2.5 mm²)
		Contact material:	silver-plated copper alloy
		Contact resistance:	< 2 mΩ

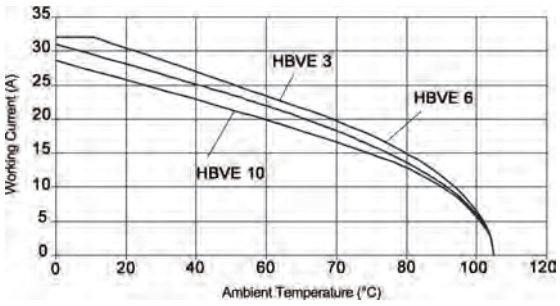
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HBVE derating curves

16 AWG (1.5 mm²)

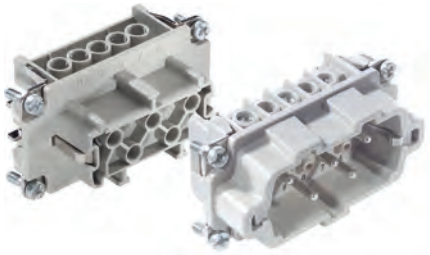


14 AWG (2.5 mm²)

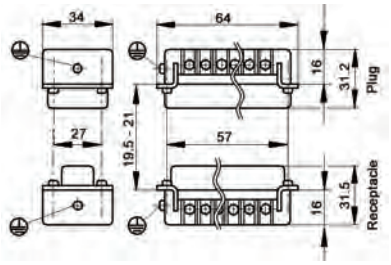


EPIC® HBVE 3

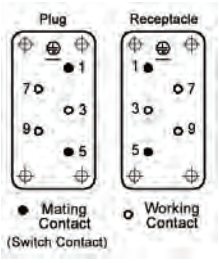
screw termination: 600V, 16A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10210010	10211010
screw termination	no	10210110	10211110

Compatible housing

HB 10
page 382

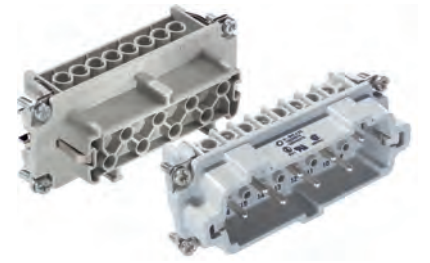
Approvals

c UL us

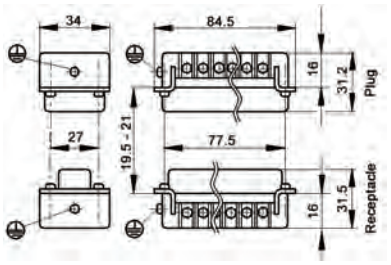
RoHS

EPIC® HBVE 6

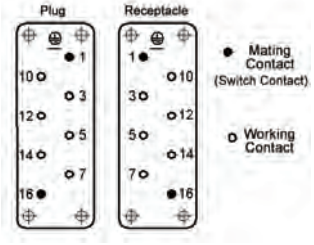
screw termination: 600V, 16A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10239010	10240010
screw termination	no	10239110	10240110

Compatible housing

HB 16
page 388

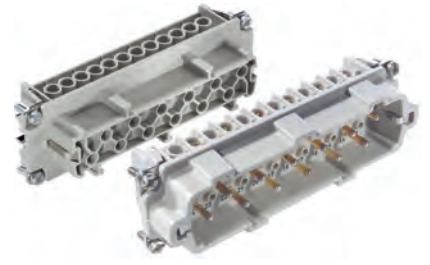
Approvals

c UL us

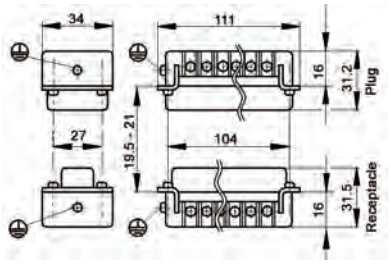
RoHS

EPIC® HBVE 10

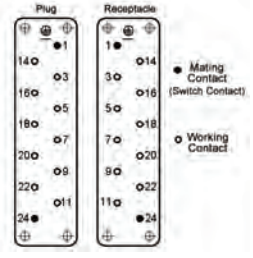
screw termination: 600V, 16A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Wire protection	Plug	Receptacle
screw termination	yes	10270010	10271010
screw termination	no	10270110	10271110

Compatible housing

HB 24
page 394

Approvals

c UL us

RoHS

LAPP

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HD series

Compact high-density crimp-terminated inserts for control applications

EPIC® HD series inserts are designed for use in industries where large numbers of contacts are required and limited space is available. These high-density crimp inserts are available with stamped & formed or machined contacts and fit into EPIC® HA & HB series housings.

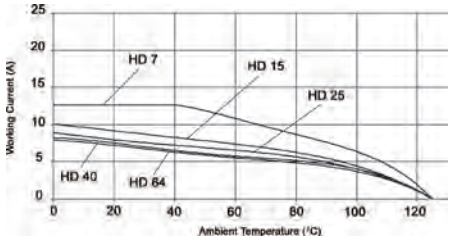
Technical data

Number of contacts:	7, 8, 15, 25, 40, 50, 64, 80, 128 (+PE)
Temperature range:	-40°C to +100°C
- short-term:	up to +125°C
Pollution level:	3
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*
Rated current:	
- UL/CSA, IEC:	10A
Rated voltage:	
- UL/CSA:	250V
- IEC EPIC® HD 7 - 8:	
- in metal housing:	24V AC/60V DC
- in plastic housing:	250V
- IEC EPIC® HD 15 - 128:	250V
Test voltage:	2.5 kV
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)
Contact material:	silver- or gold-plated copper alloy
Contact resistance:	< 2 mΩ
- EPIC® HD 40, 64 - 128 (machined contacts):	< 3 mΩ

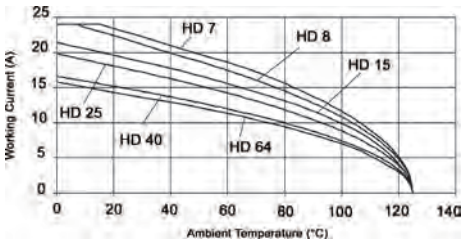
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HD derating curves

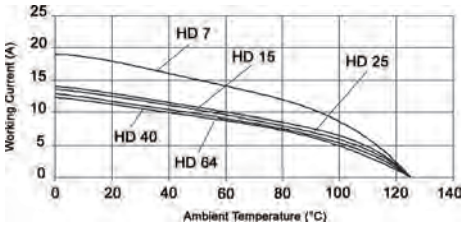
20 AWG (0.5 mm²) machined contacts



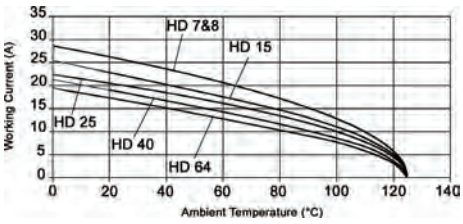
16 AWG (1.5 mm²) machined contacts



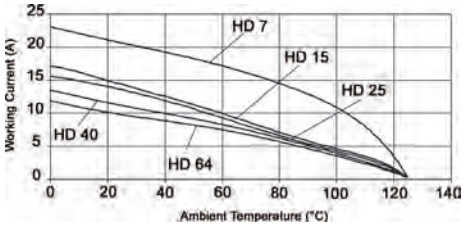
16 AWG (1.5 mm²) stamped & formed contacts



14 AWG (2.5 mm²) machined contacts



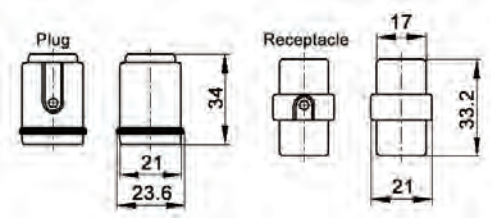
14 AWG (2.5 mm²) stamped & formed contacts



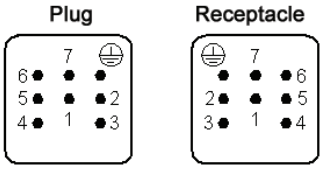
EPIC® HD 7

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11250500	11251500

Compatible housing

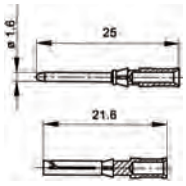
HA 3/4
page 413

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

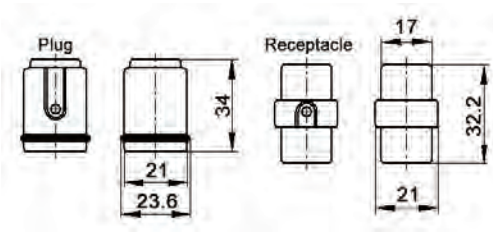
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

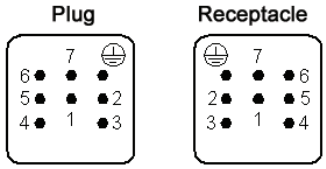
EPIC® HD 7

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11250000	11251000

Compatible housing

HA 3/4
page 413

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

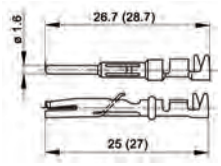
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14-0.5 mm²: 11147170
0.5-1.5 mm²: 11147180
1.5-2.5 mm²: 11147190

Crimp tool, die & locator:
0.14-0.5 mm²: 11147004
0.5-1.5 mm²: 11147005
1.5-2.5 mm²: 11147006



Contact size mm²	Contact size AWG	Stripping length mm	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket	Reel of 100 silver contacts: left-hand feed pin	Reel of 100 silver contacts: left-hand feed socket	Reel of 200 silver contacts: left-hand feed pin	Reel of 200 silver contacts: left-hand feed socket
0.14-0.5	26-20	2.5-0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5-1.5	20-16	3.5-0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5-2.5	16-14	3.5-0.5	11223500	11228500	–	–	11223000	11228000	–	–

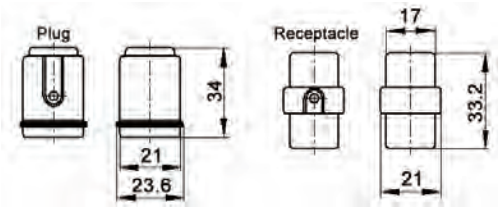
Contact size mm²	Contact size AWG	Stripping length mm	Reel of 2000 silver contacts: right-hand feed pin	Reel of 2000 silver contacts: right-hand feed socket	Reel of 2000 gold contacts: right-hand feed pin	Reel of 2000 gold contacts: right-hand feed socket	Reel of 2000 silver contacts: left-hand feed pin	Reel of 2000 silver contacts: left-hand feed socket	Reel of 2000 gold contacts: left-hand feed pin	Reel of 2000 gold contacts: left-hand feed socket
0.14-0.5	26-20	2.5-0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5-1.5	20-16	3.5-0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5-2.5	16-14	3.5-0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in questio

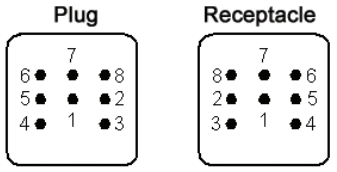
EPIC® HD 8

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11252500	11253500

Compatible housing

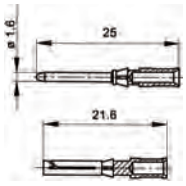
HA 3/4
page 413

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

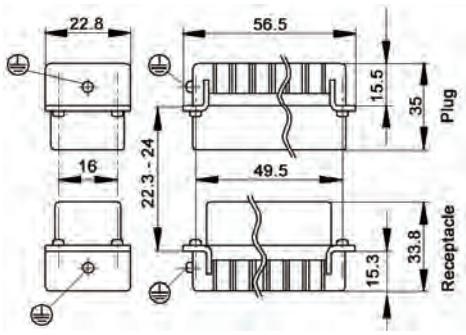
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

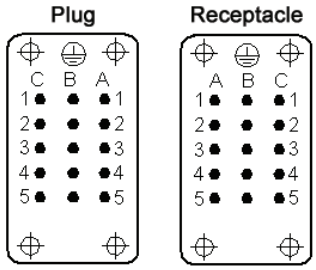
EPIC® HD 15

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11283200	11282200

Compatible housing

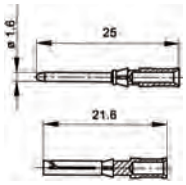
HA 10
page 415

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

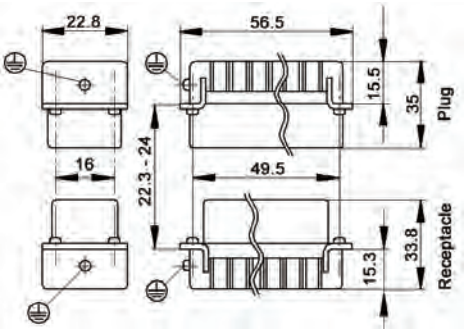
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

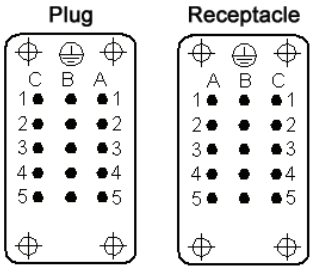
EPIC® HD 15

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11255000	11256000

Compatible housing

HA 10
page 415

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

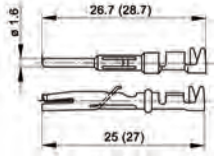
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

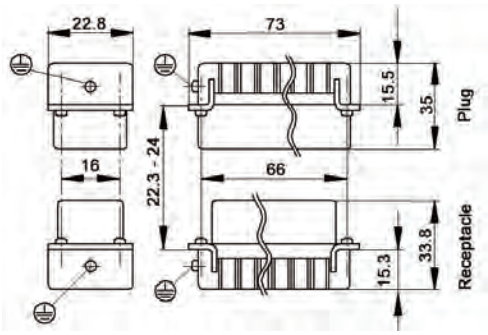
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

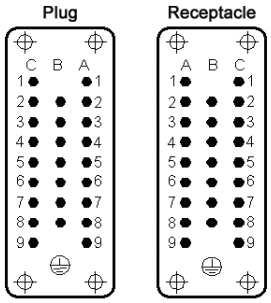
EPIC® HD 25

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11283300	11282300

Compatible housing

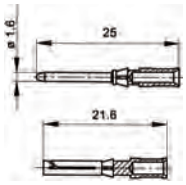
HA 16
page 417

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

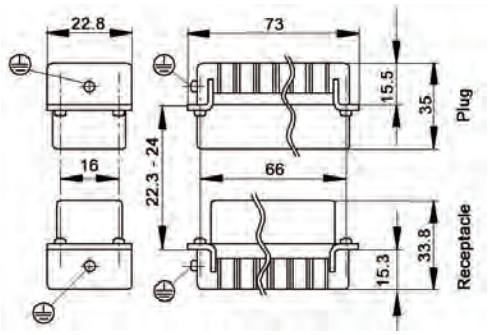
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

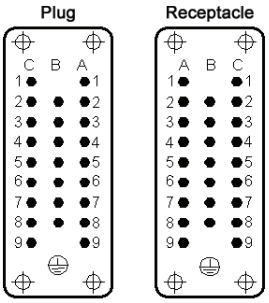
EPIC® HD 25

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11260000	11261000

Compatible housing

HA 16
page 417

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

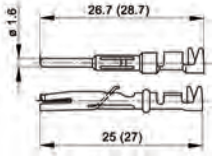
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

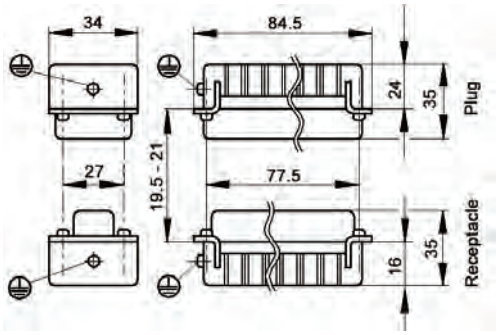
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

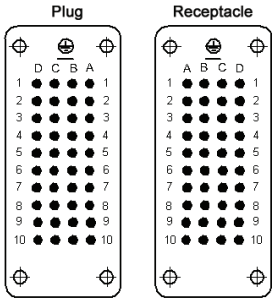
EPIC® HD 40

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11265200	11266200

Compatible housing

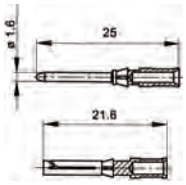
HB 16
page 388

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

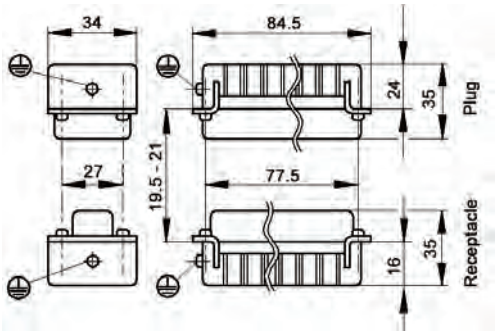
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

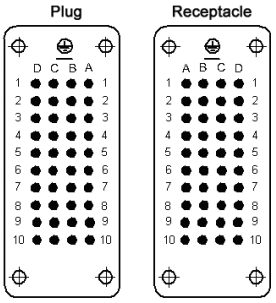
EPIC® HD 40

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11265000	11266000

Compatible housing

HB 16
page 388

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

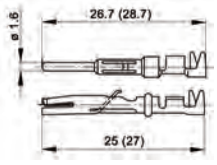
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

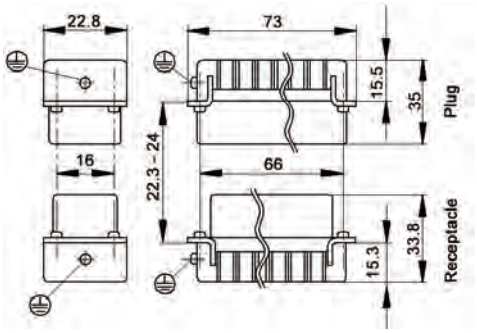
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

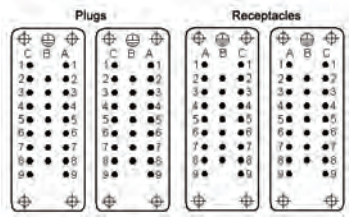
EPIC® HD 50

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11283300 x2	11282300 x2

x2 HD 25 inserts, use two part numbers

Compatible housing

HA 32
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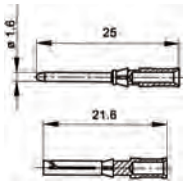
Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

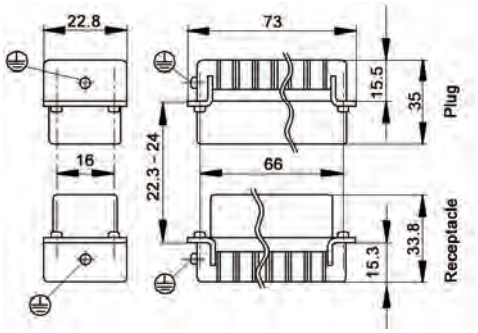
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

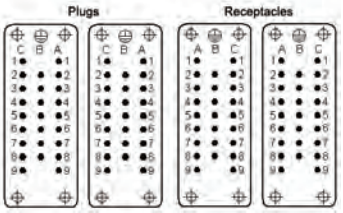
EPIC® HD 50

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11260000 x2	11261000 x2

x2 HD 25 inserts, use two part numbers

Compatible housing

HA 32
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Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

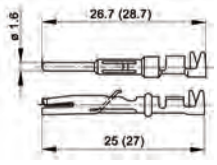
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

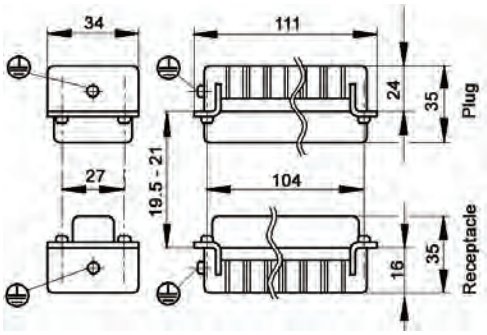
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

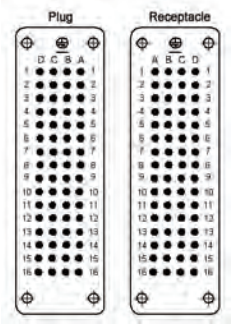
EPIC® HD 64

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11272000	11273000

Compatible housing

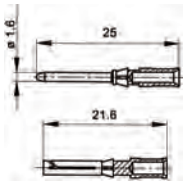
HB 24
page 394

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

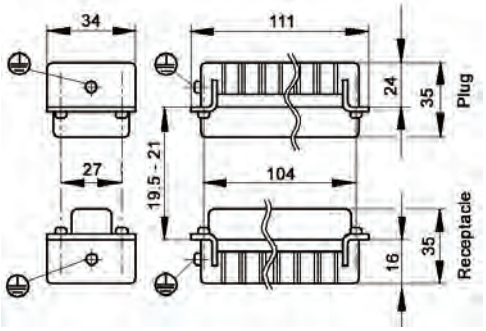
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

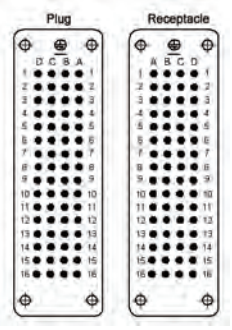
EPIC® HD 64

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11270000	11271000

Compatible housing

HB 24
page 394

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

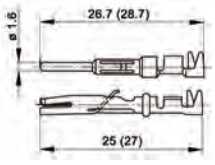
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

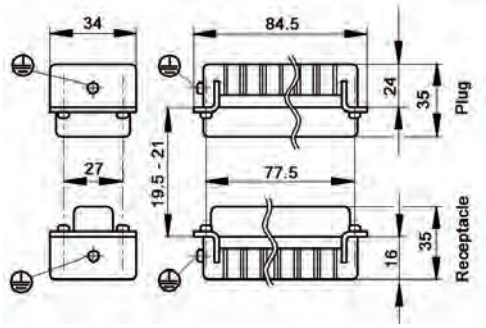
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

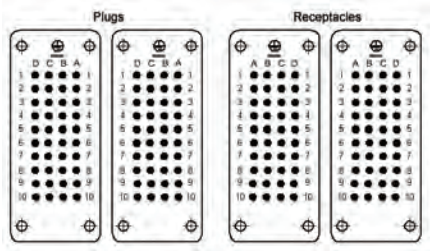
EPIC® HD 80

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11265200 x2	11266200 x2

x2 HD 40 inserts, use two part numbers

Compatible housing

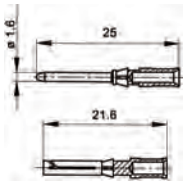
HB 32
page 400

Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

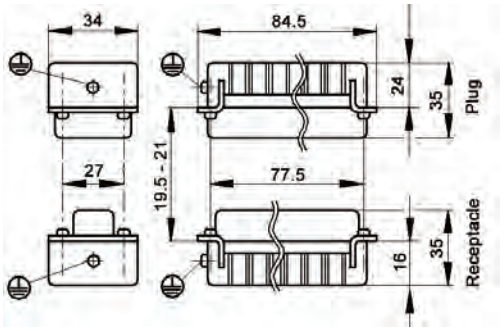
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

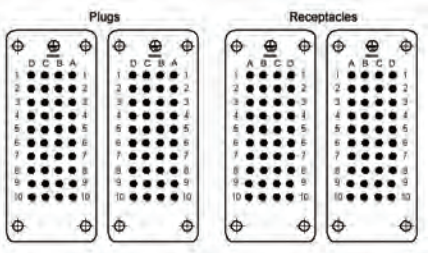
EPIC® HD 80

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	11265000 x2	11266000 x2

x2 HD 40 inserts, use two part numbers

Compatible housing

HB 32
page 400

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

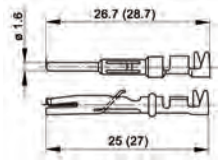
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

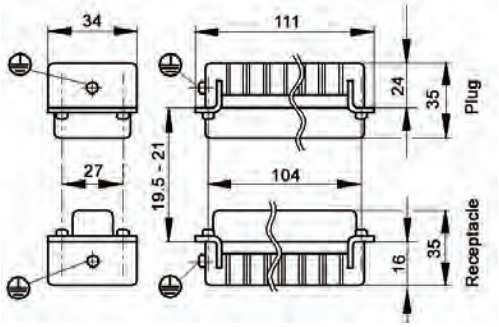
Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

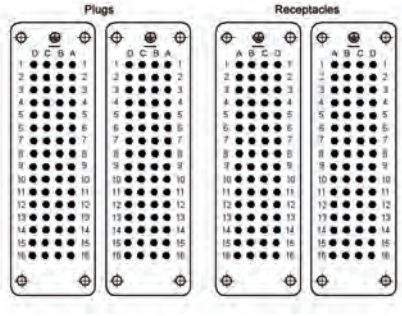
EPIC® HD 128

Crimp termination for machined contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	machined	11272000 x2	11273000 x2

x2 HD 64 inserts, use two part numbers

Compatible housing

HB 48
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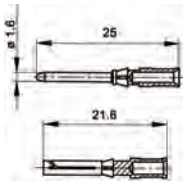
Approvals

1.6 mm contacts

Machined contacts for EPIC® HD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

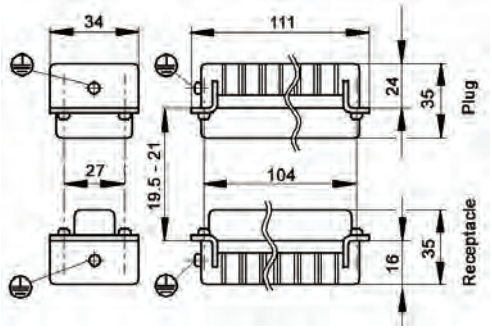
Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

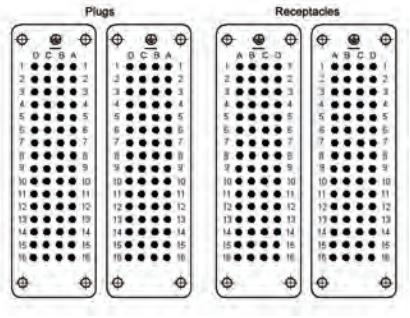
EPIC® HD 128

Crimp-terminated for stamped & formed contacts: 250V, 10A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact type	Plug	Receptacle
crimp termination	stamped & formed	1127000 x2	1127100 x2

x2 HD 64 inserts, use two part numbers

Compatible housing

HA 48
page 421

Approvals

1.6 mm contacts

Stamped & formed contacts for EPIC® HD series inserts

contacts sold in bags of 100 or 1 reel

Contact tools

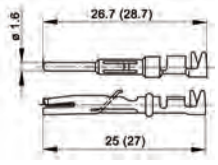
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size		Stripping length	Bag of 100 silver contacts		Bag of 100 gold contacts		Reel of 100 silver contacts: left-hand feed		Reel of 200 silver contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

Contact size		Stripping length	Reel of 2000 silver contacts: right-hand feed		Reel of 2000 gold contacts: right-hand feed		Reel of 2000 silver contacts: left-hand feed		Reel of 2000 gold contacts: left-hand feed	
mm²	AWG	mm	pin	socket	pin	socket	pin	socket	pin	socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HDD series

Ultra high-density crimp-terminated inserts for control applications

EPIC® HDD series inserts offer the highest possible machined contact density in a compact insert design. With more contacts available in a single insert, smaller connector housings can be used to provide significant panel space savings.

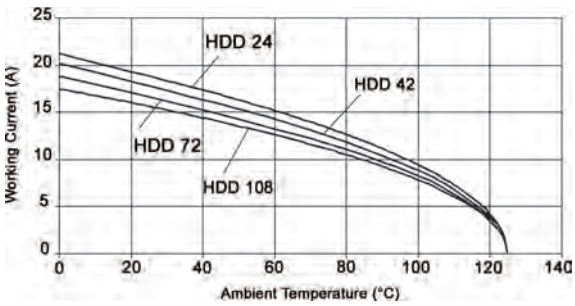
Technical data

Number of contacts:	24, 42, 72, 108, 144, 216 (+PE)	**Rated voltage:**	
		- UL/CSA:	600V
Temperature range:	-40°C to +100°C	- IEC:	250V
- short-term:	up to +125°C		
		Rated current:	
Pollution level:	2	- UL:	8.5A
		- CSA:	10A
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed	- IEC:	10A
		Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)
	- per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*	**Contact material:**	silver- or gold-plated copper alloy
		Contact resistance:	< 3 mΩ
Test voltage:	2.5 kV		

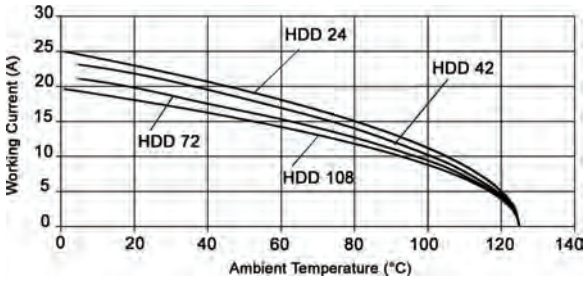
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® HDD derating curves

16 AWG (1.5 mm²)



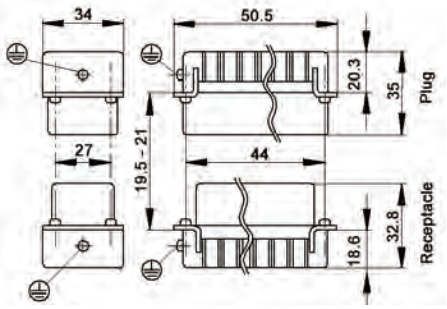
14 AWG (2.5 mm²)



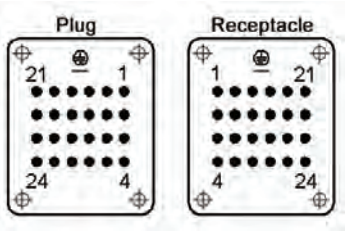
EPIC® HDD 24

Crimp termination: 600V, 8.5A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	11285000	11286000

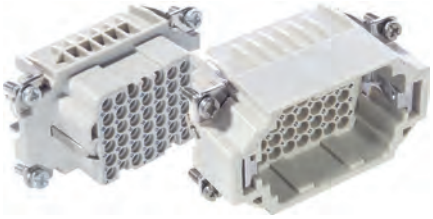
Compatible housing

HB 6
page 379

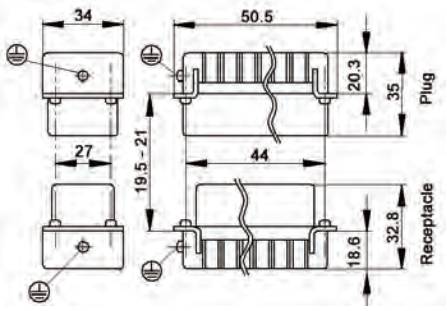
Approvals

EPIC® HDD 42

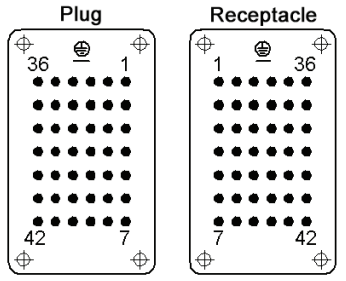
Crimp termination: 600V, 8.5A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	11285100	11286100

Compatible housing

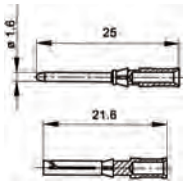
HB 10
page 382

Approvals

1.6 mm contacts

Machined contacts for EPIC® HDD series inserts

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

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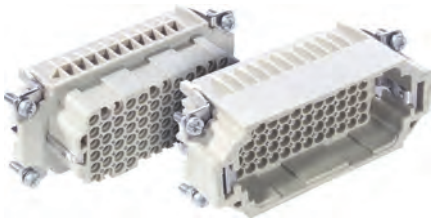
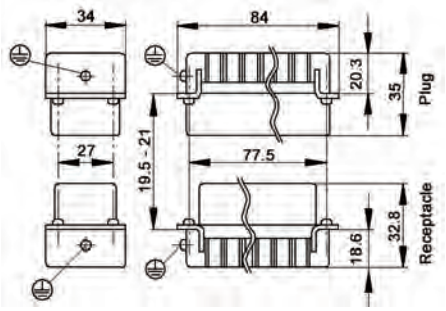
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HDD 72

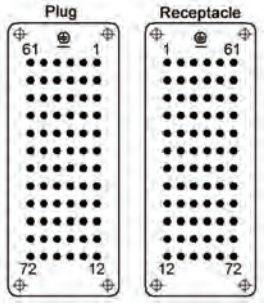
Crimp termination: 600V, 8.5A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	11285200	11286200

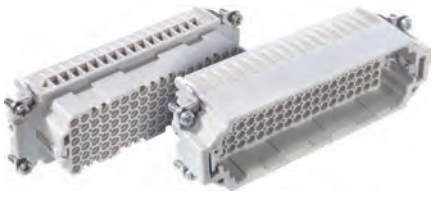
Compatible housing

HB 16
page 388

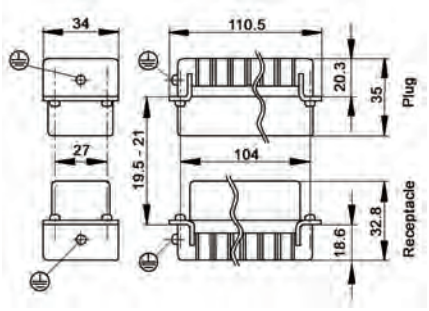
Approvals

EPIC® HDD 108

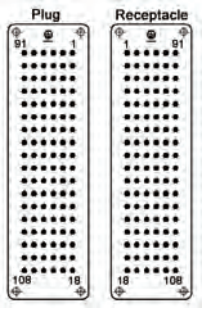
Crimp termination: 600V, 8.5A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Plug	Receptacle
crimp termination	11285300	11286300

Compatible housing

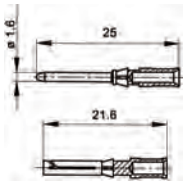
HB 24
page 394

Approvals

1.6 mm contacts

Machined contacts for EPIC® HDD series inserts

contacts sold in bags of 100



Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	mm		pin	socket	pin	socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

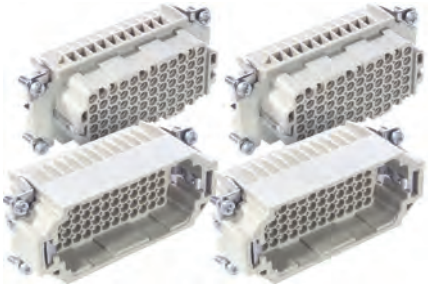
Locator:
11147200

Removal tool:
11161000

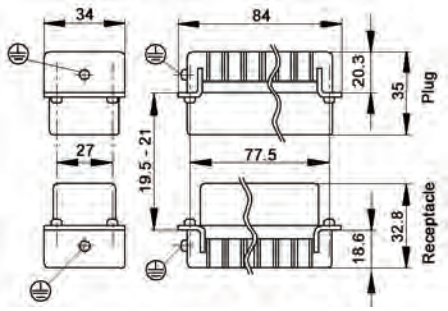
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HDD 144

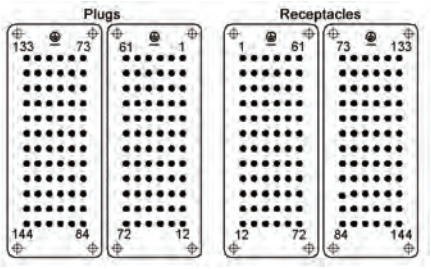
Crimp termination: 600V, 8.5A



contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact numbering	Plug	Receptacle
crimp termination	#1-72	11285200	11286200
	#73-144	11285400	11286400

Compatible housing

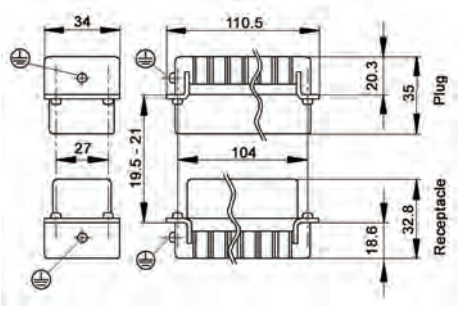
HB 32
page 400

Approvals

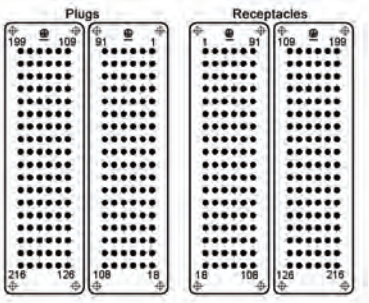
EPIC® HDD 216

Crimp termination: 600V, 8.5A

contacts sold separately, see below



all dimensions are in mm



view from cable side

Termination	Contact numbering	Plug	Receptacle
crimp termination	#1-108	11285300	11286300
	#109-216	11285500	11286500

Compatible housing

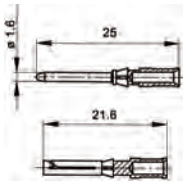
HB 48
page 402

Approvals

1.6 mm contacts

Machined contacts for EPIC® HDD series inserts

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14-0.37	26-22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75-1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH series

Modular system for power, signal & data

The EPIC® MH series is a modular connector system capable of transmitting power, signal and data in a single connector. The series is designed to be assembled with ease and is compatible with other standard modular systems in the market.

Technical data

Number of contacts:	
- power:	2, 3, 4, 6
- signal:	8, 12, 17, 20
- data:	2x2, 36-pole
Temperature range:	see product page
Pollution level:	3
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 500 cycles and passed
Test voltage:	0.8 kV - 8 kV, depending on module
Rated voltage:	50 - 1000V
Rated current:	10 - 100A
Wire size:	26 - 8 AWG (0.14 - 10 mm²)
Contact material:	silver-plated copper alloy
Contact resistance:	< 5 mΩ
Approvals:	UL File Number: E75770 (where applicable)

EPIC® MH 2

2-position module for power transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	2	44423212	44423213	8 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	1000V
Rated current:	100A
Wire size:	8 - 1 AWG (10 - 35 mm²)

Complete the installation

MH frames
page 349

Approvals

c UL us

8 mm contacts

Machined contacts for EPIC® MH series modules

Contact size		Stripping length	Bag of 10 silver contacts		Pack size
mm²	AWG	mm	pin	socket	
10	8	18	44423242	44423246	10
16	6	18	44423243	44423247	10
25	4	18	44423244	44423248	10
35	2	18	44423245	44423249	10

Contact tools

Crimp dies:
10 mm²: 44423270
16 mm²: 44423271
25 mm²: 44423272
35 mm²: 44423273

Removal tool:
44423269

Use with hydraulic crimp tool

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 3

3-position module for power transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423214	44423215	4 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	
- conductor/ground:	400V
- conductor/conductor:	690V
Rated current:	40A
Wire size:	16 - 8 AWG (1.5 - 10 mm²)

Complete the installation

MH frames
page 349

Approvals

EPIC® MH 4

4-position module for power transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423216	44423217	4 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	830V
Rated current:	40A
Wire size:	16 - 8 AWG (1.5 - 10 mm²)

Complete the installation

MH frames
page 349

Approvals

4 mm contacts

Machined contacts for EPIC® MH series modules

Contact size mm²	Contact size AWG	Stripping length mm	Bag of 10 silver contacts pin	Bag of 10 silver contacts socket	Pack size
1.5	16	10	44423250	44423255	10
2.5	14	10	44423251	44423256	10
4	12	10	44423252	44423257*	10
6	10	10	44423253	44423258	10
10	8	10	44423254	44423259	10

* contact 44423257 requires crimp die 11174101

Complete the installation

Crimp tool:
11147000

Crimp dies:
16 - 12 AWG: 11147100
10 - 8 AWG: 11147101

Locator:
11147201

Removal tool:
44423268

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 6

6-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423218	44423219	2.5 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	500V
Rated current:	16A
Wire size:	26 - 12 AWG (0.14 - 4 mm²)

Complete the installation

MH frames
page 349

Approvals

EPIC® MH 8

8-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423220	44423221	2.5 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	400V
Rated current:	16A
Wire size:	26 - 12 AWG (0.14 - 4 mm²)

Complete the installation

MH frames
page 349

Approvals

2.5 mm contacts

Machined contacts for EPIC® MH series modules

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

for removal of contacts, use a slotted screwdriver; no special tool is necessary

Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 12

12-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	250V
Rated current:	10A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423222	44423223	1.6 mm

Complete the installation

MH frames
page 349

Approvals

c UL us

EPIC® MH 17

17-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	160V
Rated current:	10A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44423224	44423225	1.6 mm

Complete the installation

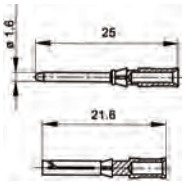
MH frames
page 349

Approvals

c UL us

1.6 mm contacts

Machined contacts for EPIC® MH series modules



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	5.8	5	13162400	13163400	13162900	13163900

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 20

20-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	2	44423226	44423227	2.5 mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	500V
Rated current:	16A
Wire size:	26 - 12 AWG (0.14 - 4 mm²)

Complete the installation

MH frames
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Approvals

c UL us

2.5 mm contacts

Machined contacts for EPIC® MH series modules

Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

contacts sold in bags of 100

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11182500

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 36

36-position module for signal transmission

mount in high profile housings only
contacts sold separately, see below

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	250V
Rated current:	10A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	2	44423266	44423267	1.6 mm

Both plug and receptacle modules accept male and female contacts

Complete the installation

MH frames
page 349

Approvals

cULus

EPIC® MH 0

Dummy module

mount in high profile housings only
contacts sold separately, see below

The EPIC® MH 0 dummy module is a placeholder for future expansion. All open slots in the frame must be closed with a dummy module if they are not in use.

Description	# of slots in frame	Part Number	Pack size
blind module	1	44423232	10
blind module with centering plug	1	44423233	10

Complete the installation

MH frames
page 349

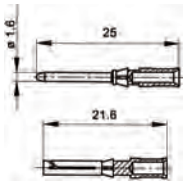
Approvals

cULus

1.6 mm contacts

Machined contacts for EPIC® MH series modules

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH BUS/MH Coax

2x4-position shielded module for data & signal transmission

NEW

EPIC® MH BUS module

EPIC® MH Bus PIN contact holder

EPIC® MH Coax contact holder

Technical data

Rated voltage: 50V

Rated current:
- EPIC® MH Bus PIN: 10A
- EPIC® MH Coax: 16A

Complete the installation

MH frames
page 349

MH
Potential set:
44423265

mount in high profile housings only
contacts sold separately, see below

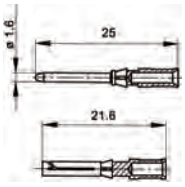
Approvals

c UL us

Description	Number of contacts	# of slots in frame	Plug	Receptacle	Contact size
BUS module	–	2	44423228	44423230	–
Bus PIN contact holder	4 + shield	–	44423229	44423231	1.6 mm
Coax contact holder	1	–	44423260	44423261	1.6 mm
	1	–	44423262	44423263	2.5 mm

1.6 mm / 2.5 mm contacts

contacts sold in bags of 100



1.6 mm machined contacts

Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14-0.37	26-22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75-1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	5.8	5	13162400	13163400	13162900	13163900

contacts sold in bags of 100

2.5 mm machined contacts

Contact size mm²	Contact size AWG	Stripping length (mm) pin	Stripping length (mm) socket	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75-1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
1.6 mm: 11161000
2.5 mm: 11182500

If not otherwise specified, all values relating to the product are nominal values.
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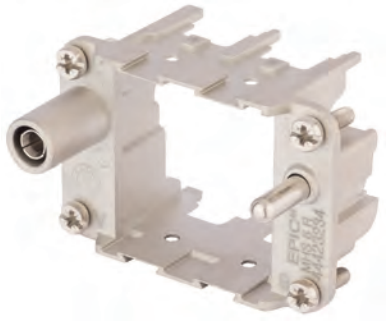
EPIC® MH 6 multi frame

Modular frame with 2 slots



Technical data

Temperature range:	-40°C to +125°C
Material:	die-cast zinc

Complete the installation

MH clip:
44423264

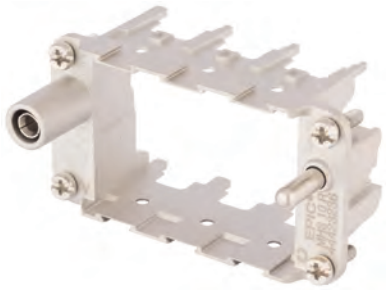
Compatible housing

HB 6
page 379

Part number	Description	Number of slots	Slot marking
44423234	plug	2	A, B
44423235	receptacle	2	a, b

EPIC® MH 10 multi frame

Modular frame with 3 slots



Technical data

Temperature range:	-40°C to +125°C
Material:	die-cast zinc

Complete the installation

MH clip:
44423264

Compatible housing

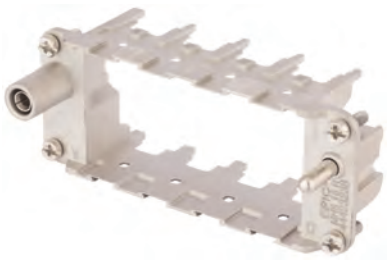
HB 10
page 382

Part number	Description	Number of slots	Slot marking
44423236	plug	3	A, B, C
44423237	receptacle	3	a, b, c

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MH 16 multi frame

Modular frame with 4 slots



Technical data

Temperature range:	-40°C to +125°C
Material:	die-cast zinc

Complete the installation

MH clip:
44423264

Compatible housing

HB 16
page 388

Part number	Description	Number of slots	Slot marking
44423238	plug	4	A, B, C, D
44423239	receptacle	4	a, b, c, d

EPIC® MH 24 multi frame

Modular frame with 6 slots

Technical data

Temperature range:	-40°C to +125°C
Material:	die-cast zinc

Complete the installation

MH clip:
44423264

Compatible housing

HB 24
page 394

Part number	Description	Number of slots	Slot marking
44423240	plug	6	A, B, C, D, E, F
44423241	receptacle	6	a, b, c, d, e, f

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MC series

Modular inserts for custom configurations

The EPIC® MC modular series connector can be custom-configured to meet application requirements by combining a variety of standard plug-and-play modules within various size support frames. Configurations include contacts for power and control, thermocouple contacts, data modules for PROFIBUS® and Ethernet, and pneumatic modules.

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

Technical data

Number of contacts:	1 - 280 (+PE)
Temperature range:	-40°C to +100°C
- short-term:	up to +125°C
Pollution level:	3
Mating cycles:	- per DIN EN 61984:2008 Service Life Test: Tested to 100 cycles and passed - per Contact Thermal Test: Useful service up to 500 cycles is possible at rated voltage and current*

Rated voltage:	
- UL/CSA:	100 - 600V
- IEC:	30 - 1000V
Rated current:	
- UL/CSA:	4 - 82A
- IEC:	1 - 220A
Wire size:	
- screw termination:	8 - 4 AWG (10 - 25 mm²)
- crimp termination:	30 - 4/0 AWG (0.06 - 95 mm²)
- cage clamp:	20 - 14 AWG (0.5 - 2.5 mm²)
Contact material:	silver- or gold-plated copper alloy
Contact resistance:	< 1 mΩ - < 5 mΩ

* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

Assembly Instructions

EPIC® MC modular inserts are composed of two parts: one or more modules and a frame, which are then installed in an EPIC® housing unit.

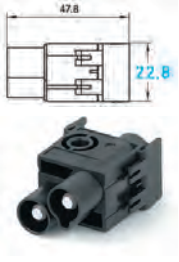
MC modules occupy either one or two slots in an MC frame. Single-slot modules are 11.4 mm wide. Double-slot modules are 22.8 mm wide. Most modules require a removal tool to remove from the frame. EPIC® MC 2 modules can be removed manually.

example:

MC 3 module
1 slot

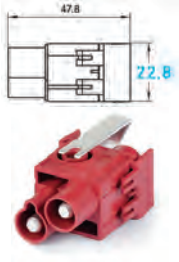
+

MC 2 module
2 slots



+

MC 2 module
2 slots



→

MC 5 frame
5 slots

→

EPIC® housing
HB 6

EPIC® MC quick select

Number of contacts	Module	Description	Plug	Receptacle	Rated voltage	Rated current	Removal tool needed	Page
1	EPIC® MC HHC1	high current	44424030	44424031	1000V	220A	no	356
2	EPIC® MC HC2		44424012	44424013	1000V	65A	no	354
2	EPIC® MC HHC2	high current	44424017	44424018	1000V	150A	no	355
2	EPIC® MC 2	2 working contacts	10344100	10345100	1000V	82A	no	353
2	EPIC® MC 2	1 working contact + 1 ground	10344600	10345600	1000V	82A	no	353
3	EPIC® MC 3 Coax	coax module	10399200	10399300	250V	–	yes	357
3	EPIC® MC 3	3 contacts	10382000	10382100	630V	40A	yes	358
3	EPIC® MC 3 High Voltage	high voltage	10399800	10399900	1000V	50A	yes	359
4	EPIC® MC 4 HE	HE module	10399000	10399100	630V	25A	no	360
4+PE	EPIC® MC 4+PE High Voltage	high voltage + ground	10383200	10383300	1000V	16A	yes	361
5	EPIC® MC 5	5 contacts	10382200	10382300	400V	20A	yes	362
10	EPIC® MC 10	with machined contacts	10382400	10382500	250V	10A	yes	363
10	EPIC® MC 10	with stamped & formed contacts	10383400	10383500	250V	10A	yes	363
20	EPIC® MC 20	low voltage	10383600	10383700	100V	4A	yes	365
0	EPIC® MC Dummy	dummy module	10399400	10399500	–	–	yes	366
4	EPIC® MC Cage Clamp	cage clamp module	10399600	10399700	400V	14A	yes	366
2 + shield	EPIC® MC PROFIBUS DP	for PROFIBUS® DP	10390400	10390500	30V	1A	no	367
4 + RJ45	EPIC® MC Ethernet	RJ45 connector + 4 power contacts	10344300	10345300	600V	10A	yes	369
4 + shield	EPIC® MC Universal Bus	universal bus	10390600	10390700	30V	1A	no	367
8 + shield	EPIC® MC BUS	universal bus	10390410	10390411	50V	10A	no	368
1	EPIC® MC Pneumatic	pneumatic hose with 2.5 mm diameter	44424004	44424005	145 psi	–	yes	370
1	EPIC® MC Pneumatic	pneumatic hose with 4 mm diameter	44424006	44424007	145 psi	–	yes	370
2	EPIC® MC Pneumatic	pneumatic hose with 2.5 mm diameter	44424008	44424009	145 psi	–	yes	370
2	EPIC® MC Pneumatic	pneumatic hose with 4 mm diameter	44424010	44424011	145 psi	–	yes	370

EPIC® MC frames

Number of modules	Plug	Receptacle	Housing	Page
2	10381000	10381100	HB 6	371
3	10381200	10381300	HB 10	371
5	10381400	10381500	HB 16	372

Number of modules	Plug	Receptacle	Housing	Page
7	10381600	10381700	HB 24	372
10	10381400 (x2)	10381500 (x2)	HB 32	373
14	10381600 (x2)	10381700 (x2)	HB 48	373

EPIC® MC module removal tool

For removing certain EPIC® MC series modules from module mounting frames: MC 3, 4+PE, 5, 10 & 20 contact modules; dummy; cage clamp; Ethernet & pneumatic modules. Other modules can be removed manually.

Part number
11171200

Approvals

RoHS

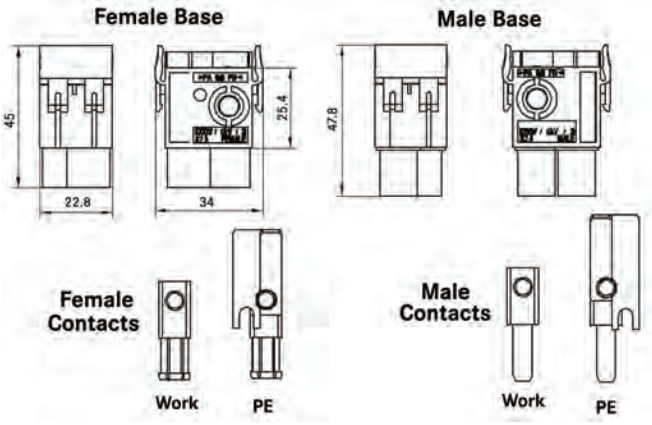
PROFIBUS® is a registered trademark of the PNO (PROFIBUS User Organization).

EPIC® MC 2

2-position module with protected ground for high power transmission

2 working contacts

1 working contact + 1 ground



all dimensions are in mm

Complete the installation

MC frames
page 371

Usage notes

- Module can be inserted into the standard EPIC® modular frames
- Module can be inserted or removed from the frame without a tool, due to snap hooks
- Module takes up two slots in the modular frame
- High current modules require the usage of high profile EPIC® HB 16 & 24 housings
- Wire end ferrules are recommended for use with 6 & 8 AWG stranded wire

Application advantage

- Screw contact modules can be wired easily with a standard screwdriver
- Flexibility of the modular series allows the arrangement of modules to fit requirements

Approvals

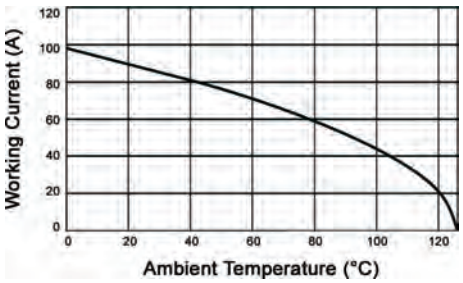
Technical data

Temperature range:	-40°C to + 100°C	**Termination:**	screw
Mating cycles:	100 (higher mating cycles depending on the application)	**Wire size:**	8 - 4 AWG (10 - 25 mm²) (crimped terminal ends required for 4 AWG wire)
Rated voltage:			
- UL/CSA:	600V	**Contact material:**	brass; 2µ nickel & 2 - 3µ silver
- IEC:	1000V	**Contact resistance:**	1.5 - 4 mΩ
Rated current:	82A		

Description	Wire protection	# of slots in frame	Plug	Receptacle
2 working contacts	no	2	10344100	10345100
1 working contact + 1 ground	no	2	10344600	10345600

Derating curve

10 AWG (6 mm²)



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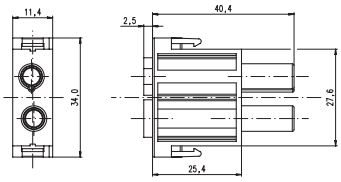
EPIC® MC HC2

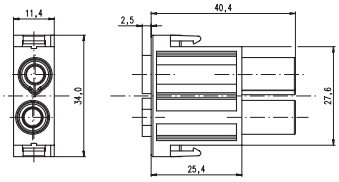
Compact 2-position module for high current transmission

contacts sold separately, see below

Plug



Receptacle



all dimensions are in mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	1000V
Rated current:	65A
Wire size:	6 AWG (16 mm²)

Complete the installation

MC frames
page 371

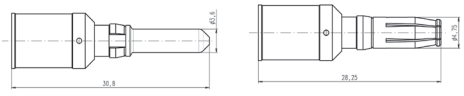
Approvals

RoHS

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	44424012	44424013	3.6 mm

3.6 mm contacts 6 AWG

Machined contacts for EPIC® MC series modules



Contact size		Bag of 100 silver contacts	
mm²	AWG	pin	socket
16	6	44424014	44424015

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147111

Locator:
11147210

Removal tool:
11171100

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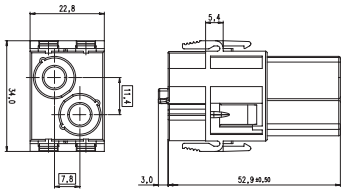
EPIC® MC HHC2

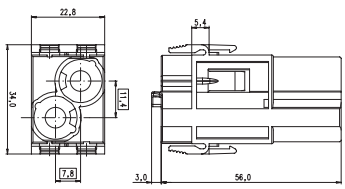
2-position module for high current transmission

contacts sold separately, see below

Plug



Receptacle



all dimensions are in mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	1000V
Rated current:	150A
Wire size:	6 - 1 AWG (16 - 35 mm²)

Complete the installation

MC frames
page 371

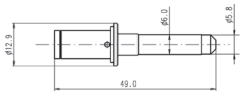
Approvals

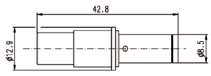
RoHS

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	2	44424017	44424018	6 mm

6 mm contacts

Machined contacts for EPIC® MC series modules





Contact size		Bag of 20 silver-plated contacts		Pack size
mm²	AWG	pin	socket	
16	6	44424019	44424022	20
25	4	44424020	44424023	20
35	1	44424021	44424024	20

Complete the installation

Crimp dies:
16 mm²: 44424025
25 mm²: 44424026
35 mm²: 44424027

use with hydraulic crimp tool Klauke type EK 60/22-L

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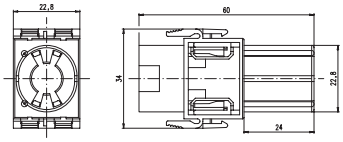
EPIC® MC HHC 1

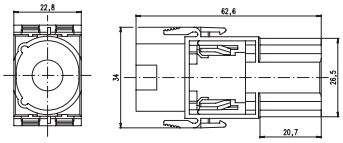
1-position module for extremely high current transmission

NEW

Plug



Receptacle



contacts sold separately, see below

all dimensions are in mm

Technical data

Temperature range:	-40°C to +125°C
Rated voltage:	1000V
Rated current:	220A
Wire size:	1/0 - 4/0 AWG (50 - 95 mm²)

Complete the installation

MC frames
page 371

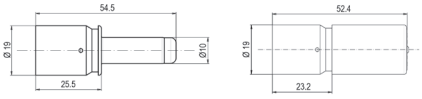
Approvals

RoHS

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	2	44424030	44424031	10 mm

10 mm contacts

Machined contacts for EPIC® MC series modules



Contact size		Silver-plated contacts		Pack size
mm²	AWG	pin	socket	
50	1/0	44424032	44424035	1
70	2/0	44424033	44424036	1
95	3/0	44424034	44424037	1

Complete the installation

Crimp dies:

50 mm²:	44424038
70 mm²:	44424039
95 mm²:	44424040

use with hydraulic crimp tool Klauke type EK 60/22-L

LAPP
LAPP TANNEHILL
800.633.6339 • www.lapptannehill.com

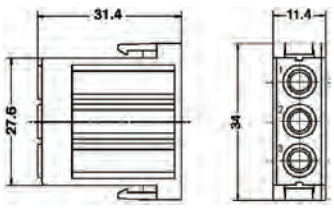
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MC 3 Coax

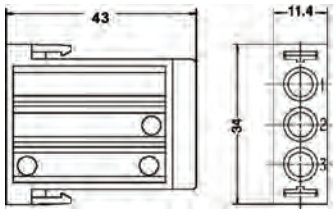
3-position module with coax contacts

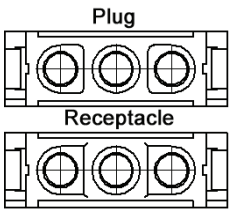
contacts sold separately, see below

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	250V

Complete the installation

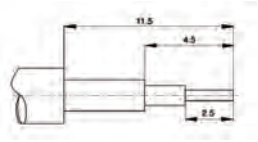
MC frames
page 371

Approvals

RoHS

Termination	# of slots in frame	Plug	Receptacle
solder & crimp termination	1	10399200	10399300

Coax contacts



Cable type	Impedance	Pin	Socket
Solder contacts			
RG58 CU	50Ω	44429018	44429017
RG180 BU	75Ω	44429020	44429019
RG187 AU	75Ω	44429022	44429021
Solder/crimp contacts			
RG58	50Ω	11214200	11219200

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147130

Removal tool:
11171100

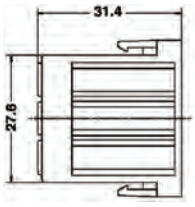
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

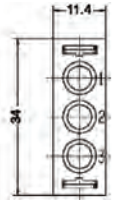
EPIC® MC 3

3-position module for high current transmission

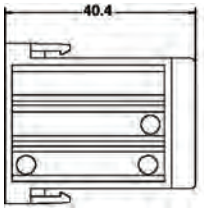
contacts sold separately, see below

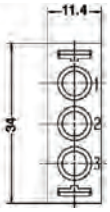
Plug

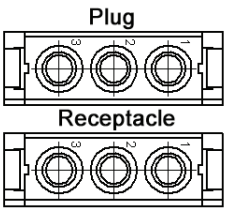




Receptacle







all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	630V
Rated current:	40A
Wire size:	16 - 8 AWG (1.5 - 10 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10382000	10382100	3.6 mm

Complete the installation

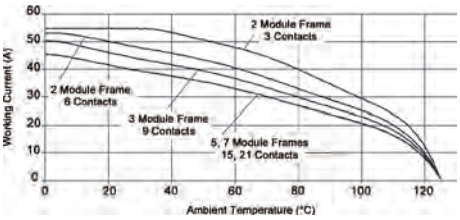
MC frames
page 371

Module removal tool
11171200

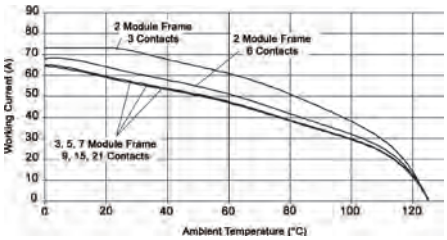
Approvals

Derating curve

10 AWG (6 mm²)



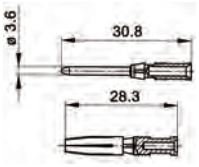
8 AWG (10 mm²)



3.6 mm contacts

Machined contacts for EPIC® MC series modules

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket
1.5	16	10	1121070C	1121570C
2.5	14	10	1121060C	1121560C
4.0	12	10	1121000C	1121500C
6.0	10	10	1121010C	1121510C
10.0	8	10	1121020C	1121520C

Complete the installation

Crimp tool:
11147000

Crimp dies:
1.5 - 2.5 mm²: 11147110
4.0 - 10 mm²: 11147120

Locator:
11147210

Removal tool:
11171100

If not otherwise specified, all values relating to the product are nominal values.
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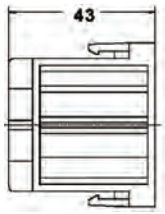
EPIC® MC 3 High Voltage

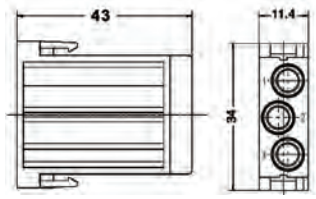
3-position module for high voltage transmission

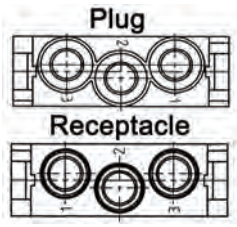
contacts sold separately, see below

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	1000V
Rated current:	50A
Wire size:	16 - 8 AWG (1.5 - 10 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10399800	10399900	3.6 mm

Complete the installation

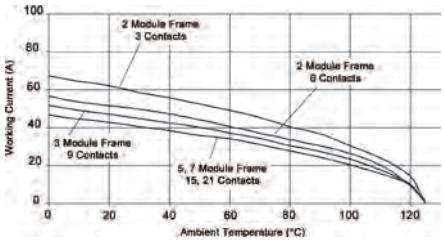
MC frames
page 371

Approvals

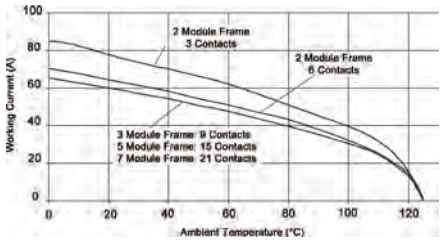
c UL us RoHS

Derating curve

10 AWG (6 mm²)



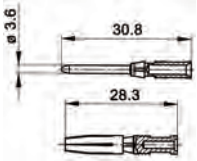
8 AWG (10 mm²)



3.6 mm contacts

Machined contacts for EPIC® MC series modules

contacts sold in bags of 100



Contact size		Stripping length	Bag of 100 silver contacts	
mm²	AWG	mm	pin	socket
1.5	16	10	1121070C	1121570C
2.5	14	10	1121060C	1121560C
4.0	12	10	1121000C	1121500C
6.0	10	10	1121010C	1121510C
10.0	8	10	1121020C	1121520C

Complete the installation

Crimp tool:
11147000

Crimp dies:
1.5 - 2.5 mm²: 11147110
4.0 - 10 mm²: 11147120

Locator:
11147210

Removal tool:
11171100

If not otherwise specified, all values relating to the product are nominal values.
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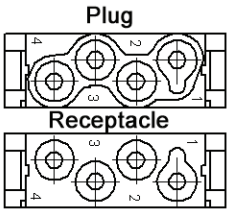
EPIC® MC 4 HE

4-position module for medium current transmission



contacts sold separately, see below

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	630V
Rated current:	25A
Wire size:	20 - 12 AWG (0.5 - 4 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10399000	10399100	2.5 mm

Complete the installation

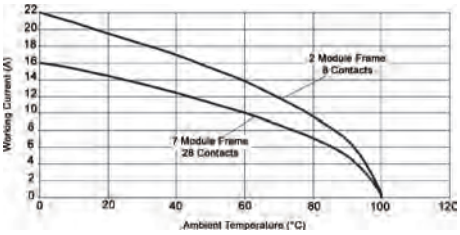
MC frames
page 371

Approvals

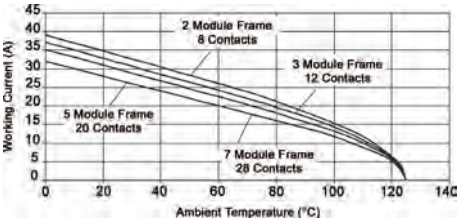
RoHS ✓

Derating curve

14 AWG (2.5 mm²)

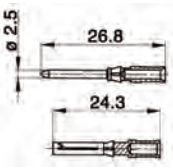


12 AWG (4 mm²)



2.5 mm contacts

Machined contacts for EPIC® MC series modules



Contact size		Stripping length (mm)		# of marking tracks	Bag of 100 silver contacts		Bag of 100 gold contacts	
mm²	AWG	pin	socket		pin	socket	pin	socket
0.5	20	7.4	7.3	–	11190000	11195000	11192000	11197000
0.75 - 1.0	18	7.4	7.3	1	11190100	11195100	11192100	11197100
1.5	16	7.4	7.3	2	11190200	11195200	11192200	11197200
2.5	14	7.4	7.3	3	11190300	11195300	–	–
4.0	12	7.4	7.3	–	11190400	11195400	–	–

contacts sold in bags of 100

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

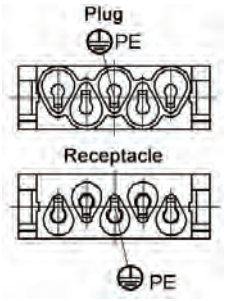
Removal tool:
11182500

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MC 4+PE High Voltage

4-position module with ground for high voltage applications

contacts sold separately, see below



Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	1000V
Rated current:	16A
Wire size:	20 - 14 AWG (0.5 - 2.5 mm²)

Complete the installation

MC frames
page 371

Module removal tool
11171200

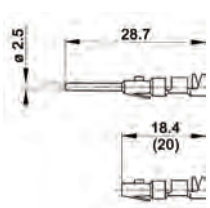
Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10383200	10383300	2.5 mm

Approvals

c UL us RoHS

2.5 mm contacts

Stamped & formed contacts for EPIC® MC series modules



contacts sold in bags of 100 or 1 reel

Complete the installation

Crimp tool:
11147000

Locator:
11147300

Crimp dies:
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool for reel:
11153500

Removal tool:
11160000

Crimp dies for reel:
0.5 - 1.5 mm²: 11153700
1.5 - 2.5 mm²: 11153800

Contact size		Bag of 100 silver contacts		Reel of 100 silver contacts		Reel of 200 silver contacts	
mm²	AWG	pin	socket	pin	socket	pin	socket
0.5 - 1.5	20 - 16	11201000	11205000	–	–	11208000	11209000
1.5 - 2.5	16 - 14	11202000	11206000	11208500	11209500	–	–

If not otherwise specified, all values relating to the product are nominal values.
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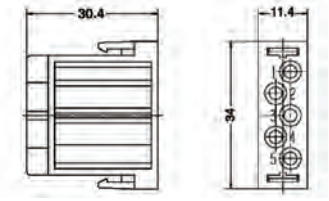
EPIC® MC 5

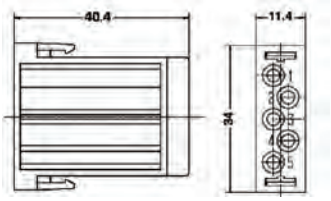
5-position module for medium current transmission

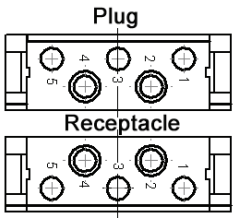
contacts sold separately, see below

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	400V
Rated current:	20A
Wire size:	20 - 12 AWG (0.5 - 4 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10382200	10382300	2.5 mm

Complete the installation

MC frames
page 371

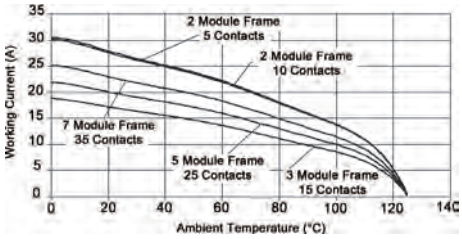
Module removal tool
11171200

Approvals

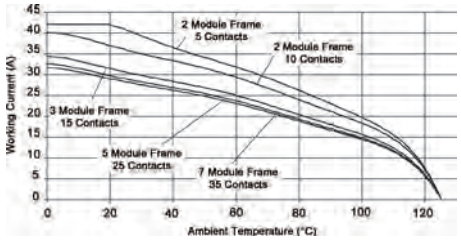
c UL us RoHS

Derating curve

14 AWG (2.5 mm²)



12 AWG (4 mm²)



2.5 mm contacts

Machined contacts for EPIC® MC series modules

contacts sold in bags of 100

Contact size		Stripping length	# of marking tracks	Bag of 100 silver contacts	
mm²	AWG	mm		pin	socket
0.5	20	7.8	–	1121300C	1121800C
0.75 - 1.0	18	7.8	1	1121310C	1121810C
1.5	16	7.8	2	1121320C	1121820C
2.5	14	7.8	3	1121330C	1121830C
4.0	12	7.8	–	1121340C	1121840C

Complete the installation

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11171000

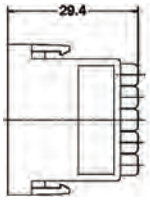
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® MC 10

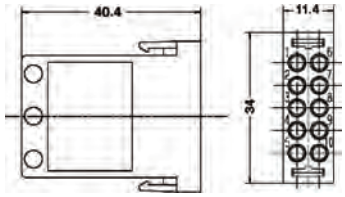
10-position module for signal transmission

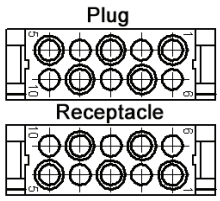
contacts sold separately, see below

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	400V
Rated current:	10A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10382400	10382500	1.6 mm

Complete the installation

MC frames
page 371

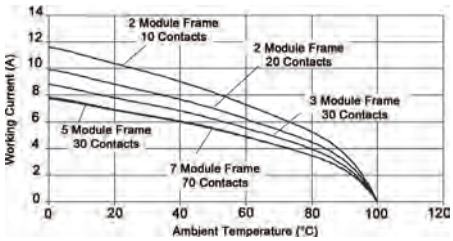
Module removal tool
11171200

Approvals

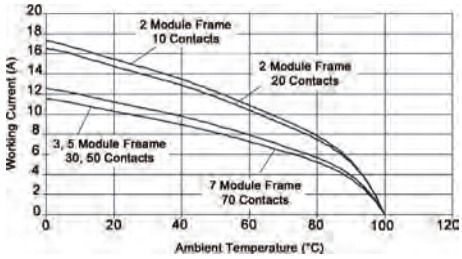
c UL us RoHS

Derating curve

20 AWG (0.5 mm²)



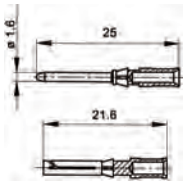
16 AWG (1.5 mm²)



1.6 mm contacts

Machined contacts for EPIC® MC series modules

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

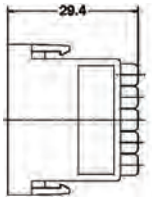
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

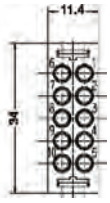
EPIC® MC 10

10-position module for signal transmission with stamped contacts

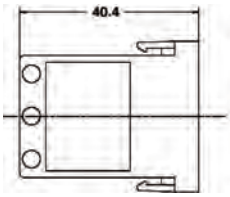
contacts sold separately, see below

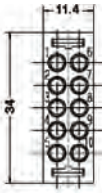
Plug

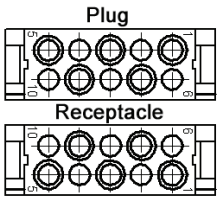




Receptacle







all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	250V
Rated current:	10A
Wire size:	26 - 14 AWG (0.14 - 2.5 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10383400	10383500	1.6 mm

Complete the installation

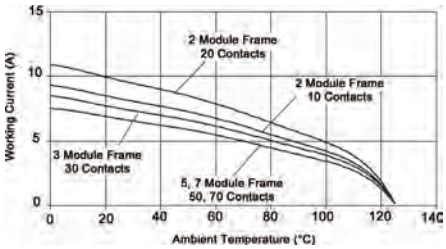
MC frames
page 371

Module removal tool
11171200

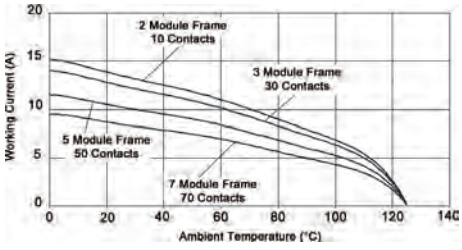
Approvals

Derating curve

20 AWG (0.5 mm²)



16 AWG (1.5 mm²)



1.6 mm contacts

Stamped & formed contacts for EPIC® MC series modules

contacts sold in bags of 100 or 1 reel

Contact tools

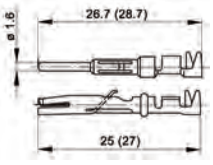
Crimp tool:
11147000

Locator:
11147300

Removal tool:
11161000

Crimp dies:
0.14 - 0.5 mm²: 11147170
0.5 - 1.5 mm²: 11147180
1.5 - 2.5 mm²: 11147190

Crimp tool, die & locator:
0.14 - 0.5 mm²: 11147004
0.5 - 1.5 mm²: 11147005
1.5 - 2.5 mm²: 11147006



Contact size mm²	Contact size AWG	Stripping length mm	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket	Reel of 100 silver contacts: left-hand feed pin	Reel of 100 silver contacts: left-hand feed socket	Reel of 200 silver contacts: left-hand feed pin	Reel of 200 silver contacts: left-hand feed socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11241100	11231100	11243100	11233100	–	–	11240700	11230700
0.5 - 1.5	20 - 16	3.5 - 0.5	11221000	11236100	11221300	11238100	–	–	11220700	11235700
1.5 - 2.5	16 - 14	3.5 - 0.5	11223500	11228500	–	–	11223000	11228000	–	–

Contact size mm²	Contact size AWG	Stripping length mm	Reel of 2000 silver contacts: right-hand feed pin	Reel of 2000 silver contacts: right-hand feed socket	Reel of 2000 gold contacts: right-hand feed pin	Reel of 2000 gold contacts: right-hand feed socket	Reel of 2000 silver contacts: left-hand feed pin	Reel of 2000 silver contacts: left-hand feed socket	Reel of 2000 gold contacts: left-hand feed pin	Reel of 2000 gold contacts: left-hand feed socket
0.14 - 0.5	26 - 20	2.5 - 0.5	11240000	11230000	–	–	11240400	11230400	11240500	11230500
0.5 - 1.5	20 - 16	3.5 - 0.5	11220000	11235000	11220100	11235200	11226000	11226500	–	–
1.5 - 2.5	16 - 14	3.5 - 0.5	–	–	–	–	11222700	11227700	–	–

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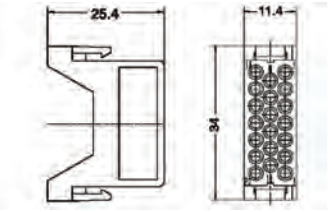
EPIC® MC 20

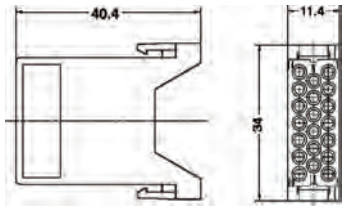
20-position module for signal transmission

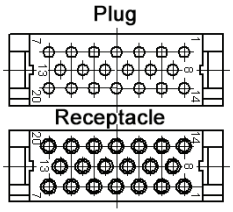
contacts sold separately, see below

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	100V
Rated current:	4A
Wire size:	28 - 20 AWG (0.08 - 0.56 mm²)

Termination	# of slots in frame	Plug	Receptacle	Contact size
crimp termination	1	10383600	10383700	1 mm

Complete the installation

MC frames
page 371

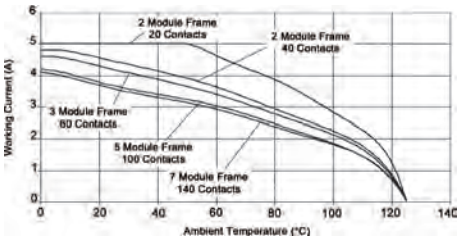
Module removal tool
11171200

Approvals

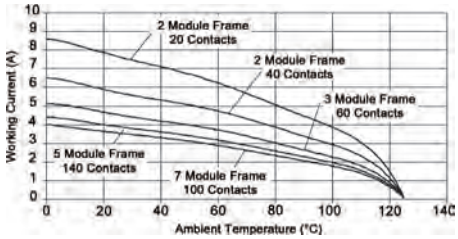
c UL us RoHS

Derating curve

24 AWG (0.25 mm²)



20 AWG (0.5 mm²)



1 mm contacts

Stamped & formed contacts for EPIC® MC series modules

Contact size mm²	Contact size AWG*	Stripping length mm	Reel of 500 gold contacts: left-hand feed pin	Reel of 500 gold contacts: left-hand feed socket
0.08-0.2	28-26	2.5 ± 0.5	44429013	44429009
0.2-0.52	26-20	2.5 ± 0.5	44429014	44429010

* AWG conversion is approximate

Complete the installation

Crimp tool:
11158400

Removal tool:
11132500

for thermocouple applications

Contact size mm²	Contact size AWG*	Stripping length mm	Material	Polarity	Color	Type	Strip of 25 contacts pin	Strip of 25 contacts socket
0.25-0.52	24-20	2.5 ± 0.5	chromel	(+)	white	type K	TC-CH-P	TC-CH-S
0.25-0.52	24-20	2.5 ± 0.5	alumel	(-)	green	type K	TC-AL-P	TC-AL-S
0.25-0.52	24-20	2.5 ± 0.5	iron	(+)	black	type J	TC-IR-P	TC-IR-S
0.25-0.52	24-20	2.5 ± 0.5	constantan	(-)	yellow	type J	TC-CO-P	TC-CO-S

* AWG conversion is approximate

Alumel is a registered trademark of Concept Alloys, Inc.
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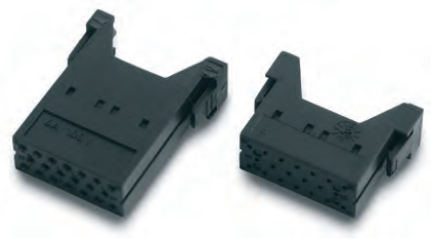
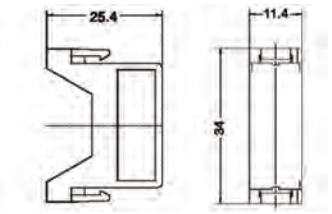
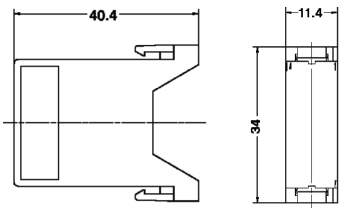
EPIC® MC 0
Dummy module



Plug



Receptacle



all dimensions are in mm

Termination	# of slots in frame	Plug	Receptacle
no termination	1	10399400	10399500

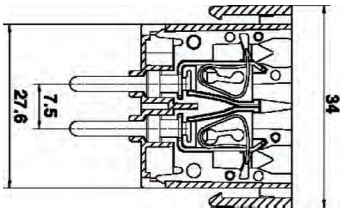
Complete the installation

MC frames
page 371

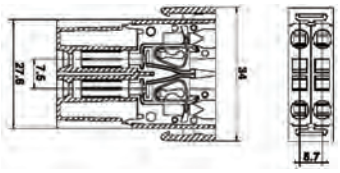
Module removal tool
11171200

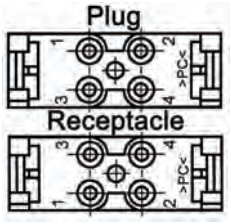
EPIC® MC Cage Clamp
4-position clamp termination module

Plug



Receptacle





all dimensions are in mm

Technical data

Temperature range:	-40°C to +100°C
Rated voltage:	400V
Rated current:	14A
Wire size:	20 - 14 AWG (0.5 - 2.5 mm²)

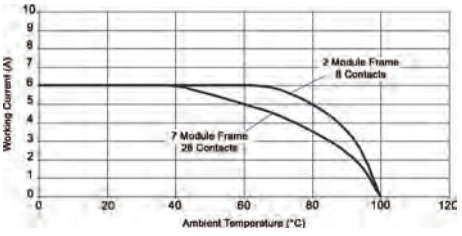
Wire size mm²	Wire size AWG	# of slots in frame	Plug	Receptacle
0.5-2.5	20-14	1	10399600	10399700

Complete the installation

MC frames
page 371

Module removal tool
11171200

Derating curve
20 AWG (0.5 mm²)



Approvals

RoHS

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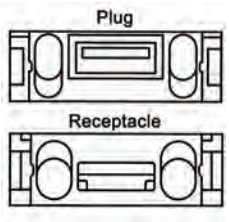
EPIC® MC PROFIBUS® DP

2 contacts + shield



mount in high profile housings only

Technical data

Temperature range:	-20°C to +85°C
Rated voltage:	30V
Rated current:	1A
Transmission rate:	12 Mbit/s

Termination	# of slots in frame	Plug	Receptacle
screw	1	10390400	10390500

Complete the installation

MC frames
page 371

Approvals

RoHS

EPIC® MC Universal Bus

4 contacts + shield

mount in high profile housings only

Technical data

Temperature range:	-20°C to +85°C
Rated voltage:	30V
Rated current:	1A
Max. transfer rate:	1.5 MB/s (bus feed-through)

Termination	Wire size mm²	Wire size AWG	# of slots in frame	Plug	Receptacle
screw	0.08 - 1.5	28 - 16	1	10390600	10390700

Complete the installation

MC frames
page 371

Approvals

RoHS

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® MC BUS
8 contacts + shield

module

contacts sold separately, see below

contact holder

Complete the installation

MC frames
page 371

Approvals

RoHS

Technical data

Temperature range:	-40°C to +125°C	**Wire size:**	26 - 14 AWG (0.14 - 2.5 mm²)
Rated voltage:	50V	**Cable clamping range:**	3 - 9 mm
Rated current:	10A	**Communication rate:**	1 Gbit/s

Description	Number of contacts	# of slots in frame	Plug	Receptacle	Contact size
module only	–	2	10390410	10390411	1.6 mm
contact holder	4 + shield	–	10390412	10390413	1.6 mm

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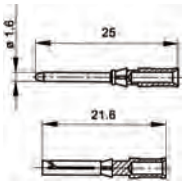
1.6 mm contacts
Machined contacts for EPIC® MC series modules

contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool:
11147000

Crimp dies:
11147100

Locator:
11147200

Removal tool:
11161000

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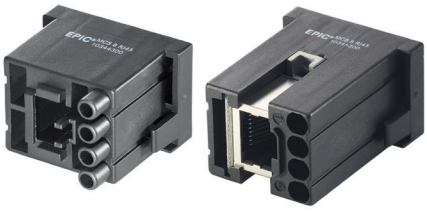
EPIC® MC Ethernet

RJ45 + 4 power contacts



contacts & RJ45 connector separately, see below

Technical data

Temperature range:	-20°C to +85°C
Rated voltage:	600V (power contacts)
Rated current:	10A (power contacts)
Wire size	
- data contacts:	26 - 24 AWG (0.14 - 0.25 mm²)
- power contacts:	26 - 14 AWG (0.14 - 2.5 mm²)

Description	# of slots in frame	Plug	Receptacle	Contact size
module only	2	10344300	10345300	1.6 mm

Complete the installation

MC frames
page 371

CAT.5 RJ45 connector: CE6326

Module removal tool 11171200

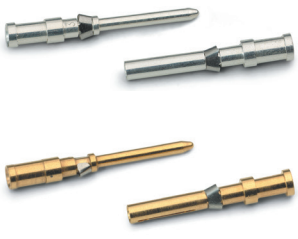
RJ45 crimp tool: CE5092

Approvals

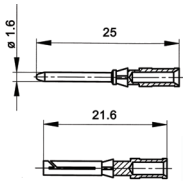
RoHS

1.6 mm contacts

Machined contacts for EPIC® series inserts



contacts sold in bags of 100



Contact size mm²	Contact size AWG	Stripping length mm	# of marking tracks	Bag of 100 silver contacts pin	Bag of 100 silver contacts socket	Bag of 100 gold contacts pin	Bag of 100 gold contacts socket
0.14 - 0.37	26 - 22	8	1	13162000	13163000	13162500	13163500
0.5	20	8	2	13162100	13163100	13162600	13163600
0.75 - 1.0	18	8	3	13162200	13163200	13162700	13163700
1.5	16	8	4	13162300	13163300	13162800	13163800
2.5	14	8	5	13162400	13163400	13162900	13163900

Contact tools

Crimp tool: 11147000

Crimp dies: 11147100

Locator: 11147200

Removal tool: 11161000

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EPIC® MC Pneumatic

Pneumatic modules for 1 or 2 hoses

These modules are used for easy and fast connection of compressed air hoses. Applications include machine building, mini pneumatics, measurement, and control technology.

Application advantage

- For compressed air hoses with inner diameters of 2.5 mm or 4 mm and a maximum outer diameter of 8 mm.
- Typically used with 4 x 2.5 mm or 6 x 4 mm metric tubing.
- Receptacles include built-in valve.

Technical data

Number of ports:	1, 2
Max. air pressure:	10 bar (145 psi)
Temperature range:	-20°C to +100°C
Mechanical mating cycles:	100

Complete the installation

MC frames
page 371

Module removal tool
11171200

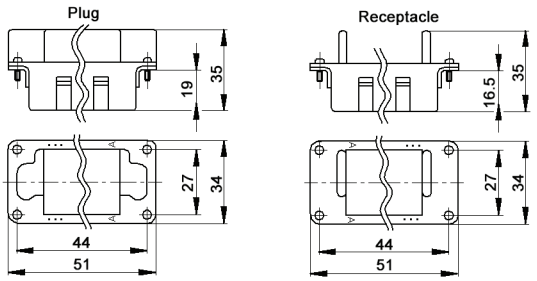
Approvals

RoHS

Hose inner diameter	# of slots in frame	1 port plug	1 port receptacle	2 ports plug	2 ports receptacle
2.5 mm	1	44424004	44424005	44424008	44424009
4.0 mm	1	44424006	44424007	44424010	44424011

EPIC® MC 2 module frame

Modular frame with 2 positions



all dimensions are in mm

Positions	Plug	Receptacle
2	10381000	10381100

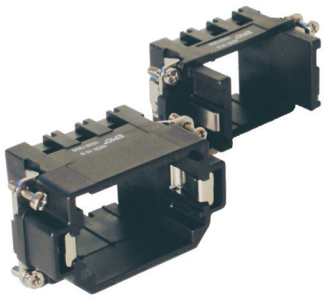
Compatible housing

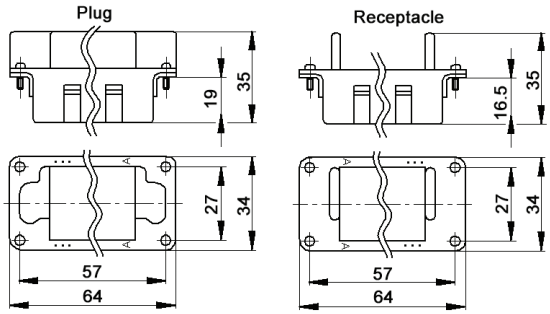
HB 6
page 379

Approvals

EPIC® MC 3 module frame

Modular frame with 3 positions





all dimensions are in mm

Positions	Plug	Receptacle
3	10381200	10381300

Compatible housing

HB 10
page 382

Approvals

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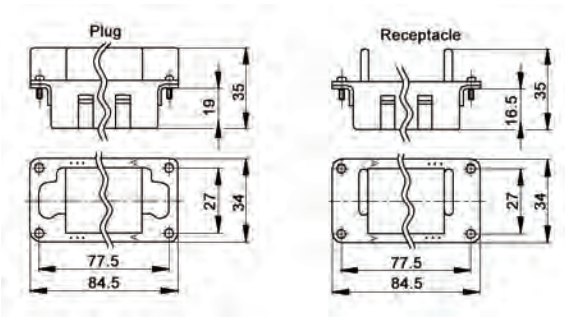
EPIC® MC 5 module frame

Modular frame with 5 positions



all dimensions are in mm

Positions	Plug	Receptacle
5	10381400	10381500

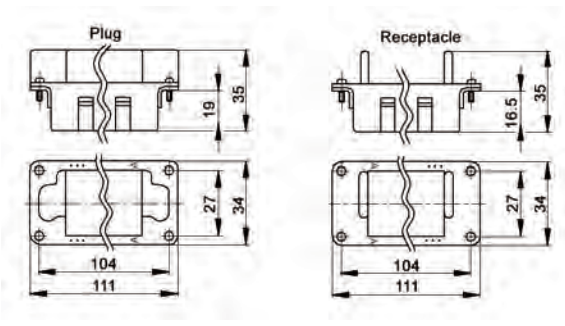
Compatible housing

HB 16
page 388

Approvals

EPIC® MC 7 module frame

Modular frame with 7 positions



all dimensions are in mm

Positions	Plug	Receptacle
7	10381600	10381700

Compatible housing

HB 24
page 394

Approvals

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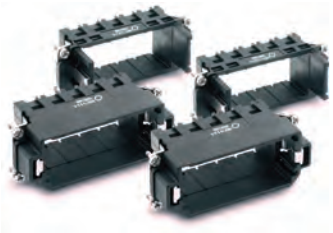
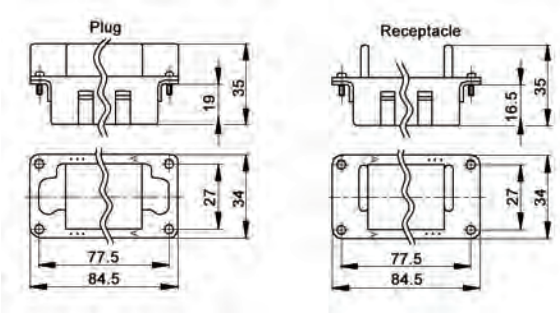
EPIC® MC 10 module frame

Modular frames with 10 positions





all dimensions are in mm

Positions	Plug	Receptacle
5 x2	10381400 (x2)	10381500 (x2)

x2 MC 5 frames, order two frames

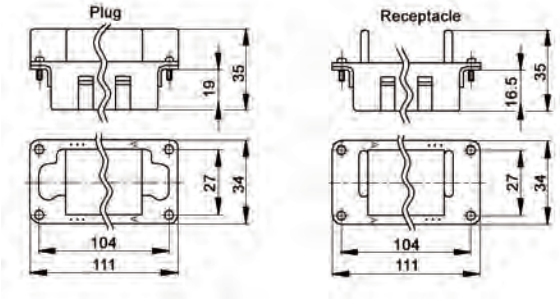
Compatible housing

HB 32
page 400

Approvals

EPIC® MC 14 module frame

Modular frames with 14 positions



all dimensions are in mm

Positions	Plug	Receptacle
7 x2	10381600 (x2)	10381700 (x2)

x2 MC 7 frames, order two frames

Compatible housing

HB 48
page 402

Approvals

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® Power K series

Screw-terminated inserts for combination power & control applications

EPIC® Power K series inserts provide a combination of power contacts (up to 80A) and signal contacts (up to 16A) in a single insert package. This can save valuable panel space by allowing one connector to do the job of two. These inserts fit into EPIC® HB series housings.

Technical data

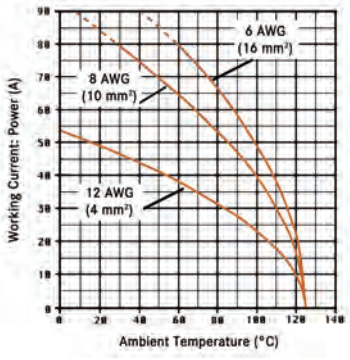
Number of contacts:	4 power + 0, 2, 8 signal
Temperature range:	-40°C to +125°C
Pollution level:	3
Rated voltage:	
- UL/CSA:	
- power:	830V
- signal:	400V
Test voltage:	
- 4 power + 0 signal:	6 kV
- 4 power + 2 signal:	6 kV / 4 kV
- 4 power + 8 signal:	4 kV
Rated current:	
- 4 power + 0 signal:	80A; 830V
- 4 power + 2 signal:	80A, 16A; 830/400V
- 4 power + 8 signal:	80A, 16A; 400V

Wire size:		
- screw termination:		
- power contacts:		16 - 6 AWG (1.5 - 16 mm²)
- signal contacts:		20 - 14 AWG (0.5 - 2.5 mm²)
Material:		
- molding:		fiberglass-reinforced thermoplastic resin
- contacts:		hard silver-plated copper alloy
Contact resistance:		
- principal contacts:		< 0.3 mΩ
- auxiliary contacts:		< 1 mΩ
Approvals:	UL:	File #E115072 File #E75770
	CSA:	File #LR82270

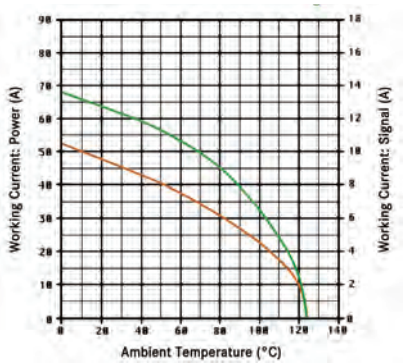
* In dry, non-conductive, non-corrosive environments when protected in a housing rated at least IP54 and disconnected for cycling and maintenance only.

EPIC® Power K derating curves

EPIC® Power K 4/0
12 - 6 AWG (4 - 16 mm²) power
0 signal

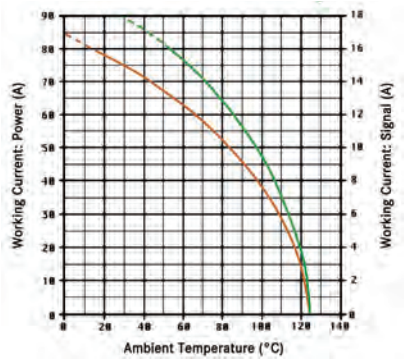


EPIC® Power K 4/2
12 AWG (4 mm²) power
18 AWG (1 mm²) signal

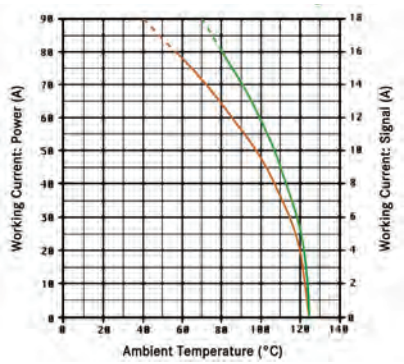


EPIC® Power K derating curves

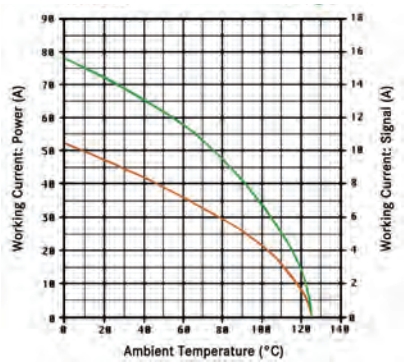
EPIC® Power K 4/2
8 AWG (10 mm²) power
16 AWG (1.5 mm²) signal



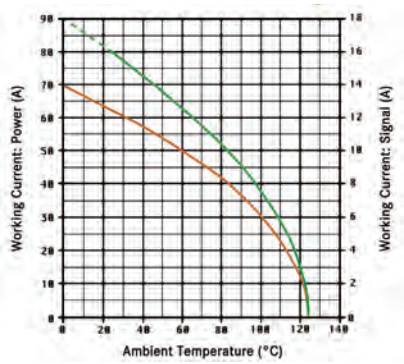
EPIC® Power K 4/2
6 AWG (10 mm²) power
14 AWG (2.5 mm²) signal



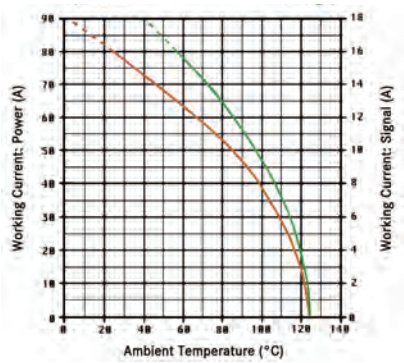
EPIC® Power K 4/8
12 AWG (4 mm²) power
18 AWG (1 mm²) signal



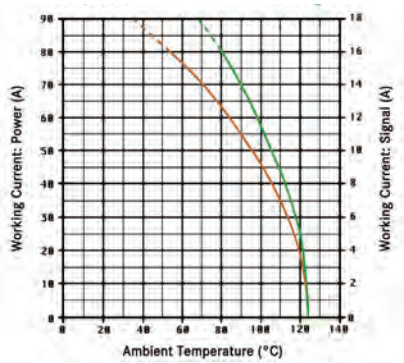
EPIC® Power K 4/8
10 AWG (6 mm²) power
18 AWG (1 mm²) signal



EPIC® Power K 4/8
8 AWG (10 mm²) power
16 AWG (1.5 mm²) signal

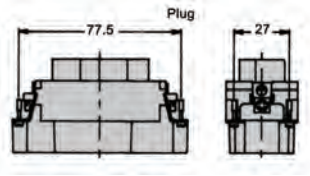


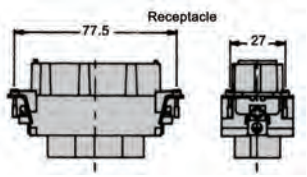
EPIC® Power K 4/8
6 AWG (16 mm²) power
14 AWG (2.5 mm²) signal



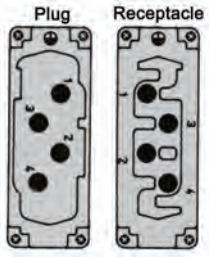
EPIC® Power K 4/0

4 power + 0 signal contacts





all dimensions are in mm



view from cable side

Description	Plug	Receptacle
4/0	44424041	44424042

Compatible housing

HB 16
page 388

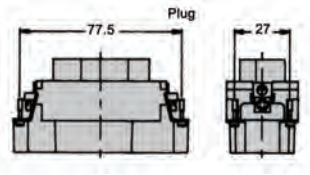
Approvals

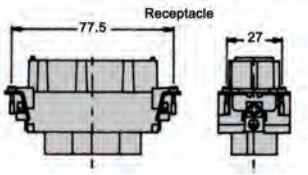
c UL us

RoHS

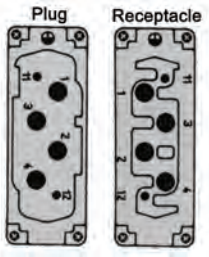
EPIC® Power K 4/2

4 power + 2 signal contacts





all dimensions are in mm



view from cable side

Description	Plug	Receptacle
4/2	44424043	44424044

Compatible housing

HB 16
page 388

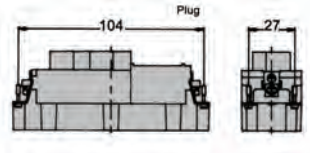
Approvals

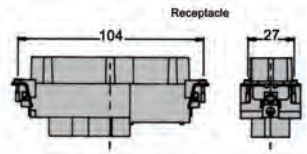
c UL us

RoHS

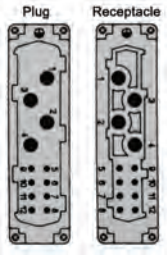
EPIC® Power K 4/8

4 power + 8 signal contacts





all dimensions are in mm



view from cable side

Description	Plug	Receptacle
4/8	11/2408	11/1408

Compatible housing

HB 24
page 394

Approvals

c UL us

RoHS

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If not otherwise specified, all values relating to the product are nominal values.
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EPIC®

Rectangular connector housing

HB series

379 **EPIC® HB 6**
Hoods, bases & couplers with single lever & bolts

382 **EPIC® HB 10 with single lever**
Hoods, bases & couplers with single lever & bolts

385 **EPIC® HB 10 with double levers**
Hoods, bases & couplers with double levers & bolts

388 **EPIC® HB 16 with single lever**
Hoods, bases & couplers with single lever & bolts

391 **EPIC® HB 16 with double levers**
Hoods, bases & couplers with double levers & bolts

394 **EPIC® HB 24 with single lever**
Hoods, bases & couplers with single lever & bolts

397 **EPIC® HB 24 with double levers**
Hoods, bases & couplers with double levers & bolts

400 **EPIC® HB 32**
Hoods, bases & couplers with double levers & bolts

402 **EPIC® HB 48**
Hoods & bases with single lever & bolts

ULTRA series

405 **EPIC® ULTRA HA 3**
Hoods, bases & couplers with single lever & bolts

407 **EPIC® ULTRA HB 6**
Hoods & bases with single lever & bolts

409 **EPIC® ULTRA HB 10**
Hoods & bases with double levers & bolts

410 **EPIC® ULTRA HB 16**
Hoods & bases with double levers & bolts

411 **EPIC® ULTRA HB 24**
Hoods & bases with double levers & bolts

HA series

413 **EPIC® HA 3/4**
Hoods, bases & couplers with single lever & bolts

415 **EPIC® HA 10**
Hoods, bases & couplers with single lever & bolts

417 **EPIC® HA 16**
Hoods, bases & couplers with single lever & bolts

419 **EPIC® HA 32**
Hoods, bases & couplers with double levers & bolts

421 **EPIC® HA 48**
Hoods & bases with double levers & bolts

422 **EPIC® HA 64**
Hoods & bases with single lever & bolts

EPIC® HB series

EPIC® HB 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 UL 50 E Type 4 & 12, and provide IP65 protection only when in the mated condition.

HB housing	EPIC® insert series									
	HBE	HEE	HBS	Power HS	HBVE	HD	HDD	MH	MC	Power K
HB 6	HBE 6	HEE 10	–	HS 4	–	–	HDD 24	MH 6	MC 2	–
HB 10	HBE 10	HEE 18	–	–	HBVE 3	–	HDD 42	MH 10	MC 3	–
HB 16	HBE 16	HEE 32	HBS 6	–	HBVE 6	HD 40	HDD 72	MH 16	MC 5	4+0, 4+2
HB 24	HBE 24	HEE 46	–	–	HBVE 10	HD 64	HDD 108	MH 24	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	–

Technical data

Specifications: DIN 43652

Protection class: see individual product page

Temperature range:
- short-term: up to +125 °C

-40 °C to +100 °C

Material:
- body: powder-coated aluminum alloy
- levers & bolts: zinc-plated steel
- seal: NBR

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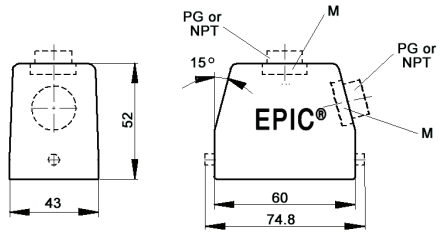
EPIC® HB 6 standard hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 13	10011000	53015030	52015700
PG 16	10021000	53015040	52015740
Side entry			
PG 13	10012000	53015030	52015740
PG 16	10022000	53015040	52015740

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
½"	100110NP	S1112	53112024
½"	100210NP*	S1112	53112024
Side entry			
½"	100120NP	S1112	53112024
½"	100220NP*	S1112	53112024

NPT hood provided with NPT fitting
* Internal entry is wider for ease of assembly

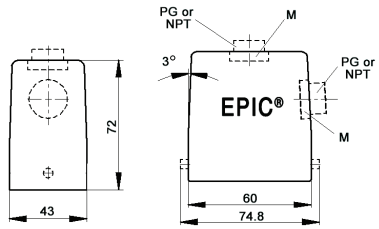
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M20	19011000	53111020	53112020
M25	19021000	53111030	53112030
Side entry			
M20	19012000	53111030	53112030
M25	19022000	53111030	53112030

* Metric top-entry hoods do not come with a neck

EPIC® HB 6 high profile hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70020200	53015050	52015750
PG 29	70020400	53015060	52015760
Side entry			
PG 21	70022200	53015050	52015750
PG 29	70022400	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	700202NP	S1134	53112034
1"	700204NP	S1101	53112044
Side entry			
¾"	700222NP	S1134	53112034
1"	700224NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M25	79020200	53111030	53112030
M32	79020400	53111040	53112040
Side entry			
M25	79022200	53111030	53112030
M32	79022400	53111040	53112040

* Metric hoods do not come with a neck

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
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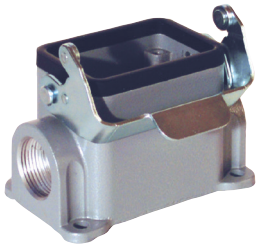
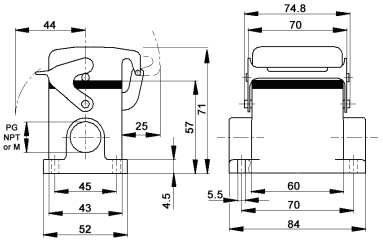
EPIC® HB 6 standard surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
16	10005000	no	53015040	52015740
16	10007000	yes	53015040	52015740
Two entries				
16	10006000	no	53015040	52015740
16	10009000	yes	53015040	52015740

PG base provided with EPIC® SM/SP gland

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
½"	100050NP	no	S1112	53112024
½"	100070NP	yes	S1112	53112024
Two entries				
½"	100060NP	no	S1112	53112024
½"	100090NP	yes	S1112	53112024

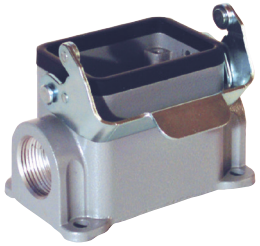
NPT base provided with NPT fitting

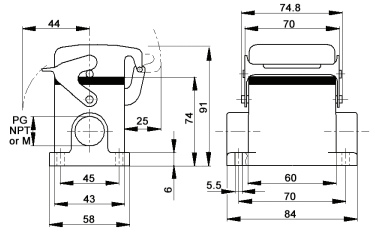
metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
20	19005000	no	53111020	53112020
20	19007000	yes	53111020	53112020
25	79005600	no	53111030	53112030
25	79015600	yes	53111030	53112030
Two entries				
20	19006000	no	53111020	53112020
20	19009000	yes	53111020	53112020
25	79006600	no	53111030	53112030
25	79016600	yes	53111030	53112030

EPIC® HB 6 high profile surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	700052	no	53015050	52015750
21	700152	yes	53015050	52015750
29	700054	no	53015060	52015760
Two entries				
21	700062	no	53015050	52015750
21	700162	yes	53015050	52015750

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	700052NP	no	S1134	53112034
¾"	700152NP	yes	S1134	53112034
1"	700054NP	no	S1101	53112044
Two entries				
¾"	700062NP	no	S1134	53112034
¾"	700162NP	yes	S1134	53112034

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	79005200	no	53111030	53112030
25	79015200	yes	53111030	53112030
32	79005400	no	53111040	53112040
32	79015400	yes	53111040	53112040
Two entries				
25	79006200	no	53111030	53112030
25	79016200	yes	53111030	53112030
29	79006400	no	53111040	53112040
29	79015400	yes	53111040	53112040

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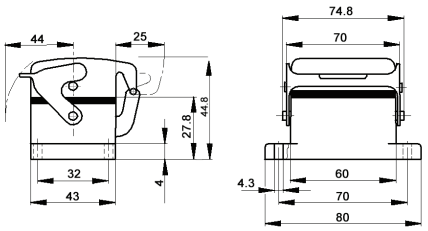
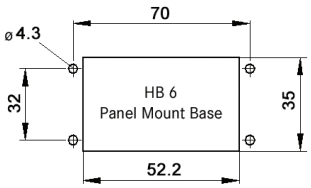
EPIC® HB 6 panel mount base

Panel mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
page <?>

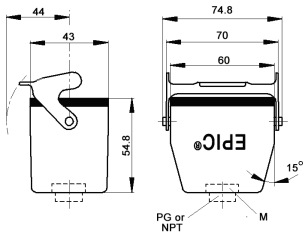
Approvals

Dust cover included	Part number
no	100030C0
yes	100040C0

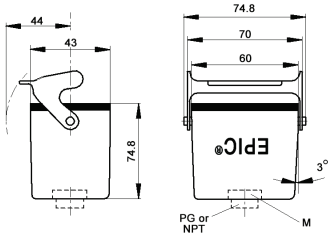
EPIC® HB 6 cable coupler hood

Cable coupler with single lever

standard profile



high profile



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 13	10014000	53015030	52015700
PG 16	10024000	53015040	52015740
High profile			
PG 21	700102	53015050	52015750
PG 29	700104	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
½"	100140NP	S1112	53112024
½"	100240NP*	S1112	53112024
High profile			
¾"	700102NP	S1134	53112034
1"	700104NP	S1101	53112044

NPT coupler provided with NPT fitting
* Internal entry is wider for ease of assembly

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M20	19014000	53111020	53112020
M25	19024000	53111030	53112030
High profile			
M25	79010200	53111030	53112020

* Metric couplers do not come with a neck

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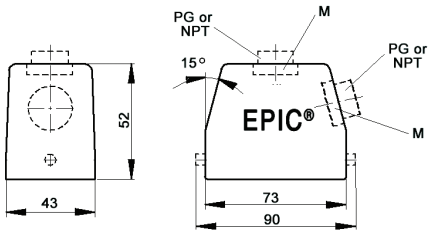
EPIC® HB 10 standard hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
NEMA 4
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 16	10040900	53015040	52015740
PG 21	10040700	53015050	52015750
Side entry			
PG 16	10042900	53015040	52015740
PG 21	10042800	53015050	52015750

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
½"	100409NP	S1112	53112024
¾"	100407NP	S1134	53112034
Side entry			
½"	100429NP	S1112	53112024
¾"	100428NP	S1134	53112034

NPT hood provided with NPT fitting

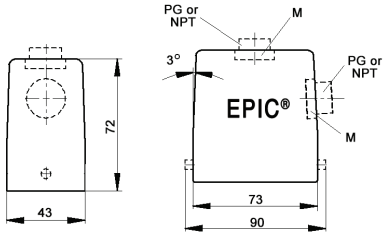
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M20	19040900	53111020	53112020
M25	19040700	53111030	53112030
Side entry			
M20	19042900	53111030	53112030
M25	19042800	53111030	53112030

* Metric top-entry hoods do not come with a neck

EPIC® HB 10 high profile hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70044200	53015050	52015750
PG 29	70044400	53015060	52015760
Side entry			
PG 21	70054200	53015050	52015750
PG 29	70054400	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	700442NP	S1134	53112034
1"	700444NP	S1101	53112044
Side entry			
¾"	700542NP	S1134	53112034
1"	700544NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	79044200	53111030	53112030
M32	79044400	53111040	53112040
Side entry			
M25	79054200	53111030	53112030
M32	79054400	53111040	53112040

* Metric hoods do not come with a neck

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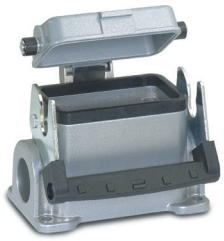
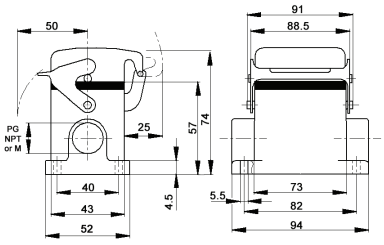
EPIC® HB 10 standard surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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IP65

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HB dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
16	100349	no	53015040	52015740
16	100369	yes	53015040	52015740
21	100347	no	53015050	52015750
Two entries				
16	100359	no	53015040	52015740
16	100389	yes	53015040	52015740

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
½"	100349NP	no	S1112	53112024
½"	100369NP	yes	S1112	53112024
¾"	100347NP	no	S1134	53112034
Two entries				
½"	100359NP	no	S1112	53112024
½"	100389NP	yes	S1112	53112024

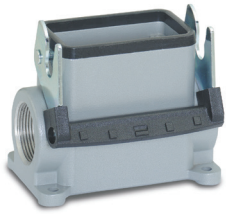
NPT base provided with NPT fitting

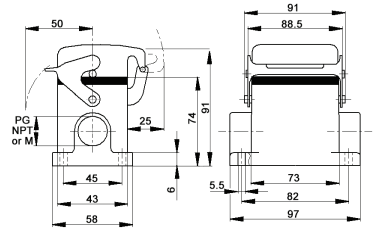
metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
20	19034900	no	53111020	53112020
20	19036900	yes	53111020	53112020
25	19034700	no	53111030	53112030
25	79064600	yes	53111030	53112030
Two entries				
20	19035900	no	53111020	53112020
20	19038900	yes	53111020	53112020
25	79061600	no	53111030	53112030

EPIC® HB 10 high profile surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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Complete the installation

HB dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	700602	no	53015050	52015750
21	700642	yes	53015050	52015750
29	700604R	no	53015060	52015760
29	700644	yes	53015050	52015750
Two entries				
21	700612	no	53015050	52015750
21	700652	yes	53015050	52015750
29	700614	no	53015060	52015760
29	700654	yes	53015060	52015760

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	700602NP	no	S1134	53112034
¾"	700642NP	yes	S1134	53112034
1"	700604NP	no	S1101	53112044
1"	700644NP	yes	S1101	53112044
Two entries				
¾"	700612NP	no	S1134	53112034
¾"	700652NP	yes	S1134	53112034
1"	700614NP	no	S1101	53112044
1"	700654NP	yes	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	79060200	no	53111030	53112030
25	79064200	yes	53111030	53112030
32	79060400	no	53111040	53112040
32	79064400	yes	53111040	53112040
Two entries				
25	79061200	no	53111030	53112030
25	79065200	yes	53111030	53112030
32	79061400	no	53111030	53112030
32	79065400	yes	53111030	53112030

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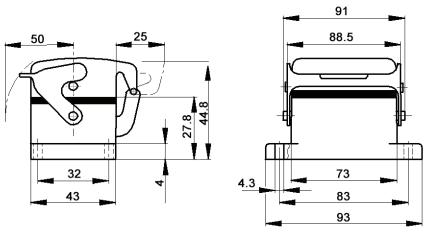
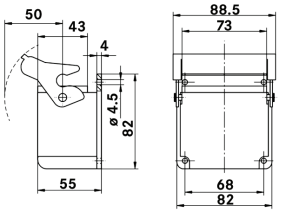
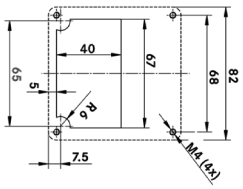
EPIC® HB 10 panel mount base

Panel mount base with single lever



all dimensions are in mm





right angle panel mount base

Technical data

IP Protection class:	UL 50E Type 12 NEMA 4 IP65

Complete the installation

HB dust covers
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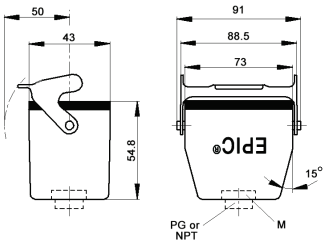
Approvals

Description	Dust cover included	Part number
standard	no	10032900
standard	yes	10033900

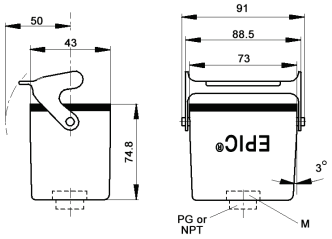
EPIC® HB 10 cable coupler hood

Cable coupler with single lever

standard profile



high profile



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 12 NEMA 4 IP65

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HB dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 16	100469	53015040	52015740
PG 21	700422	53015050	52015750
High profile			
PG 21	700424	53015050	52015750
PG 29	700426	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
½"	100469NP	S1112	53112024
¾"	700422NP	S1134	53112034
High profile			
¾"	700424NP	S1134	53112034
1"	700426NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M20	19046900	53111020	53112030
M25	79042200	53111030	53112030
High profile			
M25	79042400	53111030	53112030
M32	79042600	53111040	53112040

* Metric couplers do not come with a neck

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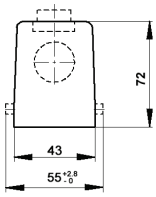
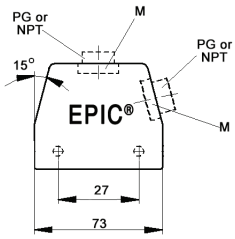
EPIC® HB 10 standard hood

Single-entry hood with double lever bolts





all dimensions are in mm

Technical data

IP **Protection class:**	UL 50E Type 4, 12 IP65

Complete the installation

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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 16	10040000	53015040	52015740
PG 21	10040100	53015050	52015750
Side entry			
PG 16	10042000	53015040	52015740
PG 21	10042100	53015050	52015750

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
½"	—	S1112	53112024
¾"	100401NP	S1134	53112034
Side entry			
½"	100420NP	S1112	53112024
¾"	100421NP	S1134	53112034

NPT hood provided with NPT fitting

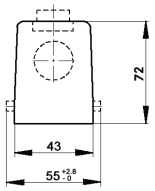
metric

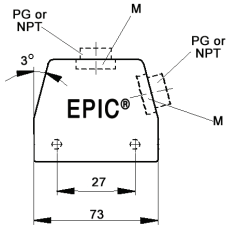
Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M20	19040000	53111020	53112020
M25	19040100	53111030	53112030
Side entry			
M20	19042000	53111030	53112030
M25	19042100	53111030	53112030

* Metric top-entry hoods do not come with a neck

EPIC® HB 10 high profile hood

Single-entry hood with double lever bolts





all dimensions are in mm

Technical data

IP **Protection class:**	UL 50E Type 4, 12 IP65

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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70050400	53015050	52015750
PG 29	70050600	53015060	52015760
Side entry			
PG 21	70052400	53015050	52015750
PG 29	70052600	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	700504NP	S1134	53112034
1"	700506NP	S1101	53112044
Side entry			
¾"	700524NP	S1134	53112034
1"	700526NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	79050400	53111030	53112030
M32	79050600	53111040	53112040
Side entry			
M25	79052400	53111030	53112030
M32	79052600	53111040	53112040

* Metric hoods do not come with a neck

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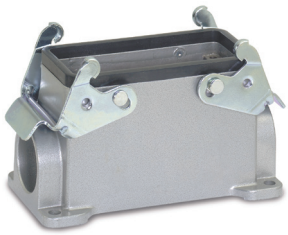
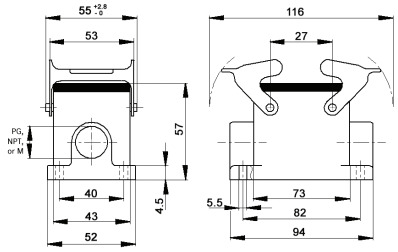
EPIC® HB 10 standard surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
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Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 16	10034000	53015040	52015740
Two entries			
PG 16	10035000	53015040	52015740

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
½"	100340NP	S1112	53112024
Two entries			
½"	100350NP	S1112	53112024

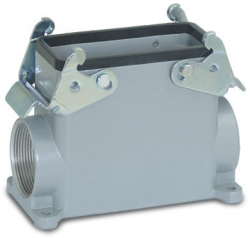
NPT base provided with NPT fitting

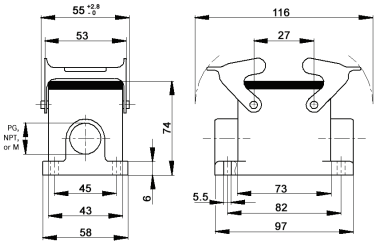
metric

Metric base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M20	19034000	53111020	53112020
M25	19034100	53111030	53112030
Two entries			
M20	19035000	53111020	53112020
M25	19035100	53111030	53112030

EPIC® HB 10 high profile surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
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Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 21	700352	53015050	52015750
PG 29	700354	53015060	52015760
Two entries			
PG 21	700362	53015050	52015750
PG 29	700364	53015060	52015760

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
¾"	700352NP	S1134	53112034
1"	700354NP	S1101	53112044
Two entries			
¾"	700362NP	S1134	53112034
1"	700364NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M21	79035200	53111030	53112030
M32	79035400	53111040	53112040
Two entries			
M21	79036200	53111030	53112030
M32	79036400	53111040	53112040

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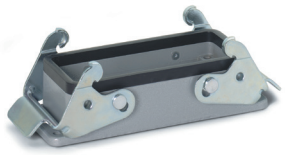
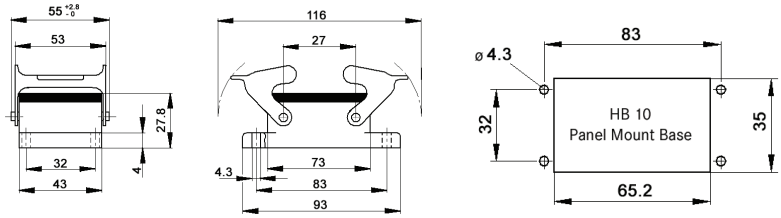
EPIC® HB 10 panel mount base

Panel mount base with double levers





all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
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Approvals

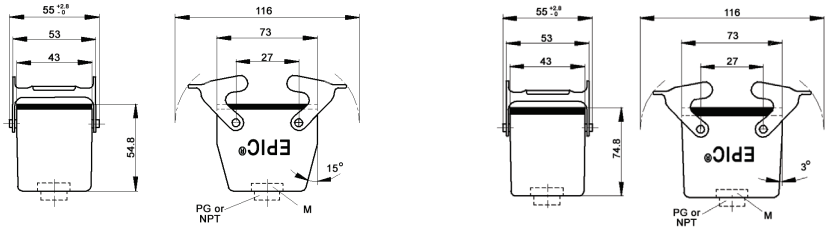
Dust cover included	Part number
no	10032000

EPIC® HB 10 cable coupler hood

Cable coupler with double levers

standard profile

high profile



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 16	10046000	53015040	52015740
PG 21	700402	53015050	52015750
High profile			
PG 21	700404R	53015050	52015750
PG 29	700406	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
½"	100460NP	S1112	53112024
¾"	700402NP	S1134	53112034
High profile			
¾"	700404NP	S1134	53112034
1"	700406NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M20	19046000	53111020	53112020
M25	79040200	53111030	53112030
High profile			
M25	79040400	53111030	53112030
M32	79040600	53111040	53112040

* Metric couplers do not come with a neck

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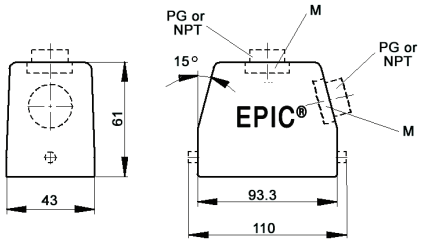
EPIC® HB 16 standard hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
NEMA 4
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	10080900	53015050	52015750
Side entry			
PG 21	10082900	53015050	53015750
PG 29	10092900	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	100809NP	S1134	53112034
Side entry			
¾"	100829NP	S1134	53112034
1"	100929NP	S1101	53112044

NPT hood provided with NPT fitting

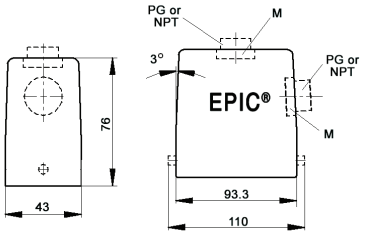
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	19080900	53111030	53112030
Side entry			
M25	19082900	53111030	53112030
M32	19092900	53111040	53112040

* Metric top-entry hoods do not come with a neck

EPIC® HB 16 high profile hood

Single-entry hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70094200	53015050	52015750
PG 29	70094400	53015060	52015760
Side entry			
PG 21	70104200	53015050	52015750
PG 29	70104400	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	700942NP	S1134	53112034
1"	700944NP	S1101	53112044
Side entry			
¾"	701042NP	S1134	53112034
1"	701044NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	79094200	53111030	53112030
M32	79094400	53111040	53112040
M40	79094600	53111050	53112050
Side entry			
M25	79104200	53111030	53112030
M32	79104400	53111040	53112040
M40	79104800	53111050	53112050

* Metric hoods do not come with a neck

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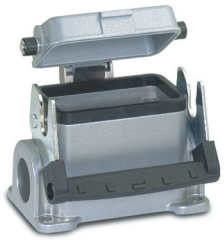
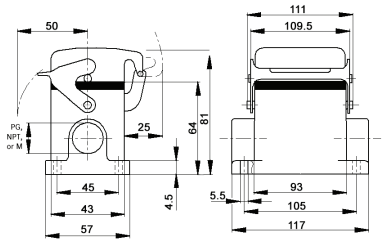
EPIC® HB 16 standard surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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Complete the installation

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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	100749	no	53015050	52015750
21	100769	yes	53015050	52015750
Two entries				
21	100759	no	53015050	52015750
21	100789	yes	53015050	52015750

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	100749NP	no	S1134	53112034
¾"	100769NP	yes	S1134	53112034
Two entries				
¾"	100759NP	no	S1134	53112034
¾"	100789NP	yes	S1134	53112034

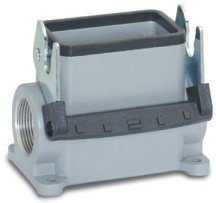
NPT base provided with NPT fitting

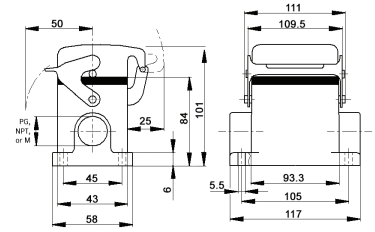
metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	19074900	no	53111030	53112030
25	19076900	yes	53111030	53112030
Two entries				
25	19075900	no	53111030	53112030
25	19078900	yes	53111030	53112030

EPIC® HB 16 high profile surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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IP65

Complete the installation

HB dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	701102	no	53015050	52015750
21	701142	yes	53015050	52015750
29	701104	no	53015060	52015760
29	701144	yes	53015060	52015760
Two entries				
21	701112	no	53015050	52015750
21	701152	yes	53015050	52015750
29	701114	no	53015060	52015760
29	701154	yes	53015060	52015760

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	701102NP	no	S1134	53112034
¾"	701142NP	yes	S1134	53112034
1"	701104NP	no	S1101	53112044
1"	701144NP	yes	S1101	53112044
Two entries				
¾"	701112NP	no	S1134	53112034
¾"	701152NP	yes	S1134	53112034
1"	701114NP	no	S1101	53112044
1"	701154NP	yes	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	79110200	no	53111030	53112030
25	79114200	yes	53111030	53112030
32	79110400	no	53111040	53112040
32	79114400	yes	53111040	53112040
Two entries				
25	79111200	no	53111030	53112030
25	79115200	yes	53111030	53112030
32	79111400	no	53111040	53112040
32	79115400	yes	53111040	53112040

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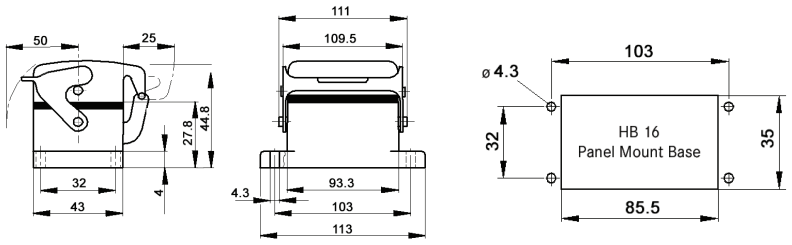
EPIC® HB 16 panel mount base

Panel mount base with single lever



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 12 NEMA 4 IP65

Complete the installation

HB dust covers
page <?>

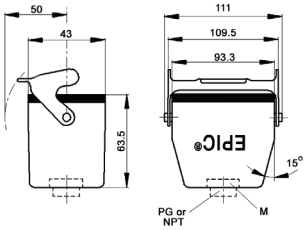
Approvals

Dust cover included	Part number
no	10072900
yes	10073900

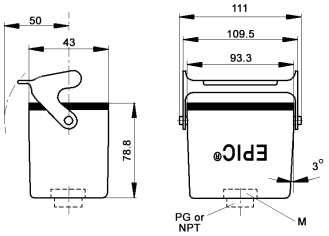
EPIC® HB 16 cable coupler hood

Cable coupler with single lever

standard profile



high profile



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 12 NEMA 4 IP65

Complete the installation

HB dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 21	100869	53015050	52015750
High profile			
PG 21	700922	53015050	52015750
PG 29	700924	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
¾"	100869NP	S1134	53112034
High profile			
¾"	700922NP	S1134	53112034
1"	700924NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M25	19086900	53111030	53112030
High profile			
M25	79092200	53111030	53112030
M32	79092400	53111040	53112040

* Metric couplers do not come with a neck

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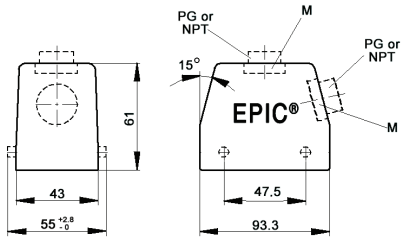
EPIC® HB 16 standard hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	10080000	53015050	52015750
PG 29	10090000	53015060	52015760
Side entry			
PG 21	10082000	53015050	52015750
PG 29	10092000	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	100800NP	S1134	53112034
1"	100900NP	S1101	53112044
Side entry			
¾"	100820NP	S1134	53112034
1"	100920NP	S1101	53112044

NPT hood provided with NPT fitting

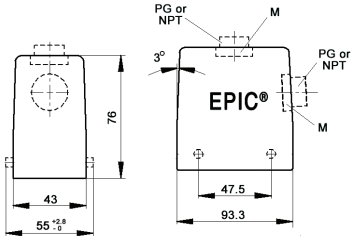
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M25	19080000*	53111030	53112030
M25x2	19080500	53111030	53112030
M32	19090000*	53111040	53112040
Side entry			
M25	19082000	53111030	53112030
M32	19092000	53111040	53112040

* Metric top-entry hoods do not come with a neck

EPIC® HB 16 high profile hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70100200	53015050	52015750
PG 29	70100400	53015060	52015760
Side entry			
PG 21	70102200	53015050	52015750
PG 29	70102400	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	701002NP	S1134	53112034
1"	701004NP	S1101	53112044
Side entry			
¾"	701022NP	S1134	53112034
1"	701024NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood* size	Metric hood* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M25	79100200	53111030	53112030
M25x2	44422018	53111030	53112030
M32	79100400	53111040	53112040
M32x2	79128600	53111040	53112040
M40	79100800	53111050	53112050
Side entry			
M25	79102200	53111030	53112030
M32	79102400	53111040	53112040
M40	79102800	53111050	53112050

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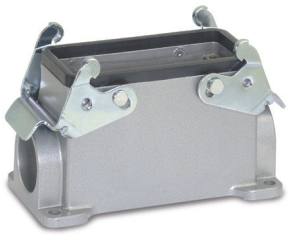
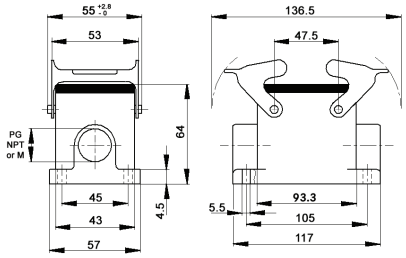
EPIC® HB 16 standard surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

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Approvals

PG

PG base size	PG base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
PG 21	10074000	53015050	52015750
Two entries			
PG 21	10075000	53015050	52015750

NPT

NPT base size	NPT base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
¾"	100740NP	S1134	53112034
Two entries			
¾"	100750NP	S1134	53112034

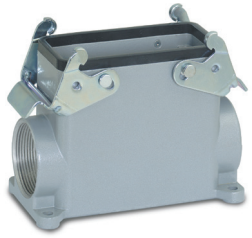
NPT base provided with NPT fitting

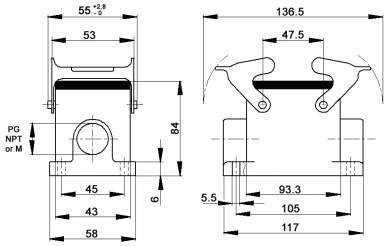
metric

Metric base size	Metric base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
M25	19074000	53111030	53112030
Two entries			
M25	19075000	53111030	53112030

EPIC® HB 16 high profile surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

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Approvals

PG

PG base size	PG base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
PG 21	700852	53015050	52015750
PG 29	70085400	53015060	52015760
Two entries			
PG 21	70086200	53015050	52015750
PG 29	70086400	53015060	52015760

NPT

NPT base size	NPT base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
¾"	700852NP	S1134	53112034
1"	700854NP	S1101	53112044
Two entries			
¾"	700862NP	S1134	53112034
1"	700864NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
M25	79085200	53111030	53112030
M32	79085400	53111040	53112040
Two entries			
M25	79086200	53111030	53112030
M32	79086400	53111040	53112040

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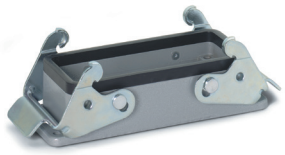
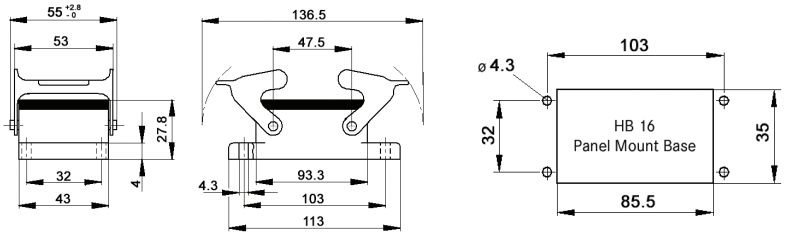
EPIC® HB 16 panel mount base

Panel mount base with double levers





all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
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Complete the installation

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Approvals

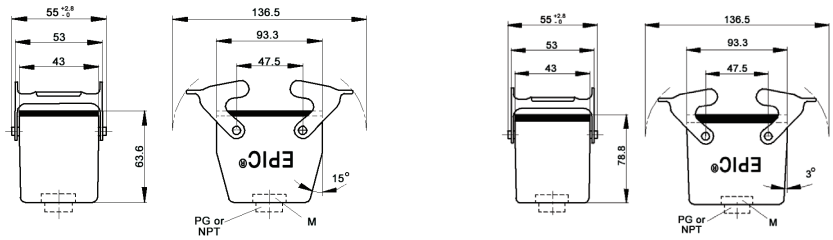
Dust cover included	Part number
no	100720C0

EPIC® HB 16 cable coupler hood

Cable coupler with double levers

standard profile

high profile



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 21	100860	53015050	52015750
High profile			
PG 29	700904	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
¾"	100860NP	S1134	53112034
High profile			
¾"	700902NP	S1134	53112034
1"	700904NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M25	19086000	53111030	53112030
High profile			
M25	79090200	53111030	53112030
M32	79090400	53111040	53112040

* Metric couplers do not come with a neck

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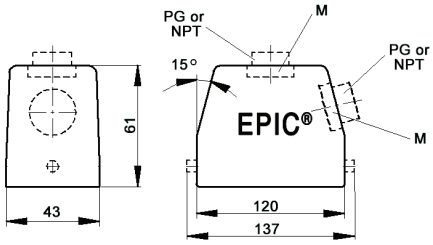
EPIC® HB 24 standard hood

Hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	10121900	53015050	52015750
PG 29	10111900	53015060	52015760
Side entry			
PG 21	10113900	53015050	52015750
PG 29	10123900	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	101219NP	S1134	53112034
1"	101119NP	S1101	53112044
Side entry			
¾"	101139NP	S1134	53112034
1"	101239NP	S1101	53112044

NPT hood provided with NPT fitting

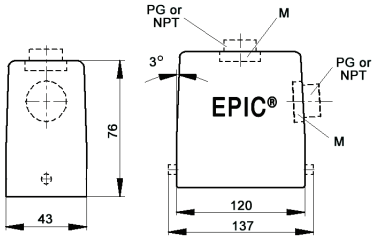
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	19121900	53111030	53112030
M32	19111900	53111040	53112040
Side entry			
M25	19113900	53111030	53112030
M32	19123900	53111040	53112040

* Metric top-entry hoods do not come with a neck

EPIC® HB 24 high profile hood

Hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
NEMA 4
IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70144400	53015050	52015750
PG 29	70144600	53015060	52015760
Side entry			
PG 21	70154400	53015050	52015750
PG 29	70154600	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	701444NP	S1134	53112034
1"	701446NP	S1101	53112044
Side entry			
¾"	701544NP	S1134	53112034
1"	701546NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	79144400	53111030	53112030
M32	79144600	53111040	53112040
M40	79144800	53111050	53112050
Side entry			
M25	79154400	53111030	53112030
M32	79154600	53111040	53112040
M40	79154800	53111050	53112050

* Metric hoods do not come with a neck

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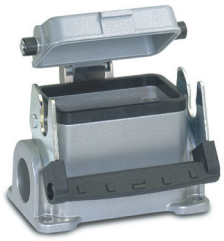
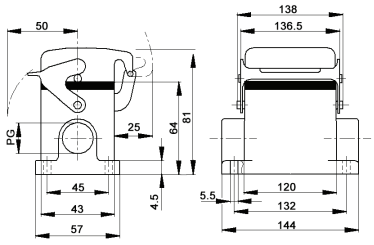
EPIC® HB 24 standard surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
NEMA 4
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	101049	no	53015050	52015750
21	101079	yes	53015050	52015750
Two entries				
21	101059	no	53015050	52015750
21	101099	yes	53015050	52015750

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	101049NP	no	S1134	53112034
¾"	101079NP	yes	S1134	53112034
Two entries				
¾"	101059NP	no	S1134	53112034
¾"	101099NP	yes	S1134	53112034

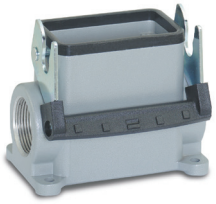
NPT base provided with NPT fitting

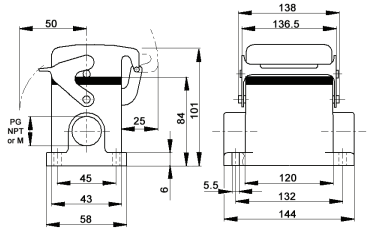
metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	19104900	no	53111030	53112030
25	19107900	yes	53111030	53112030
Two entries				
25	19105900	no	53111030	53112030
25	19109900	yes	53111030	53112030

EPIC® HB 24 high profile surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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Complete the installation

HB dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
21	701602	no	53015050	52015750
21	701642	yes	53015050	52015750
29	701604R	no	53015060	52015760
29	701644	yes	53015060	52015760
Two entries				
21	701112	no	53015050	52015750
21	701152	yes	53015050	52015750
29	701114	no	53015060	52015760
29	701154	yes	53015060	52015760

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
¾"	701602NP	no	S1134	53112034
¾"	701642NP	yes	S1134	53112034
1"	701604NP	no	S1101	53112044
1"	701644NP	yes	S1101	53112044
Two entries				
¾"	701612NP	no	S1134	53112034
¾"	701652NP	yes	S1134	53112034
1"	701614NP	no	S1101	53112044
1"	701654NP	yes	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
25	79160200	no	53111030	53112030
25	79164200	yes	53111030	53112030
32	79160400	no	53111040	53112040
32	79164400	yes	53111040	53112040
Two entries				
25	79161200	no	53111030	53112030
25	79165200	yes	53111030	53112030
32	79161400	no	53111030	53112030
32	79165400	yes	53111030	53112030

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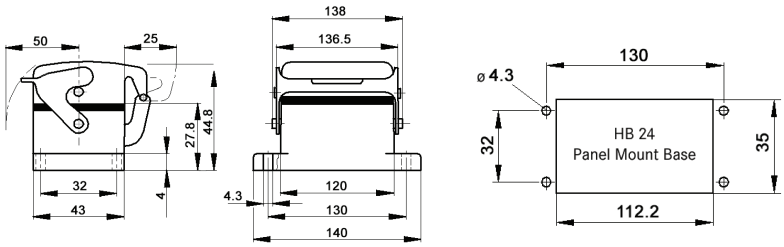
EPIC® HB 24 panel mount base

Panel mount base with single lever



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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IP65

Complete the installation

HB dust covers
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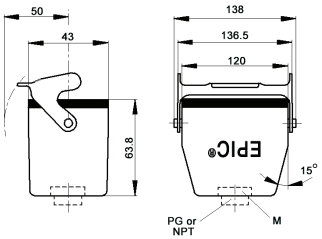
Approvals

Dust cover included	Part number
no	10102900
yes	10103900

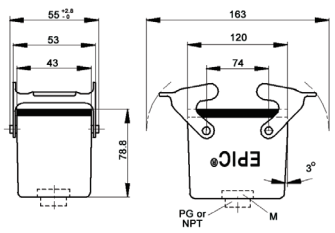
EPIC® HB 24 cable coupler hood

Cable coupler with single lever

standard profile



high profile



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 12
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Complete the installation

HB dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 21	101279	53015050	52015750
PG 29	101179	53015060	52015760
High profile			
PG 21	701424	753015050	52015750
PG 29	701426	75015060	72015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
¾"	101279NP	S1134	53112034
1"	101179NP	S1101	53112044
High profile			
¾"	701424NP	S1134	53112034
1"	701426NP	S1101	53112044

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M25	19127900	53111030	53112030
M32	19117900	53111040	53112040
High profile			
M25	79142400	53111030	53112030
M32	79142600	53111040	53112040

* Metric couplers do not come with a neck

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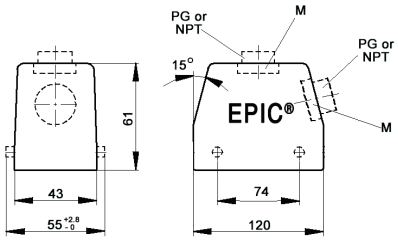
EPIC® HB 24 standard hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	10121000	53015050	52015750
PG 29	10111000	53015060	52015760
Side entry			
PG 21	10113000	53015050	52015750
PG 29	10123000	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	101210NP	S1134	53112034
1"	101110NP	S1101	53112044
Side entry			
¾"	101130NP	S1134	53112034
1"	101230NP	S1101	53112044

NPT hood provided with NPT fitting

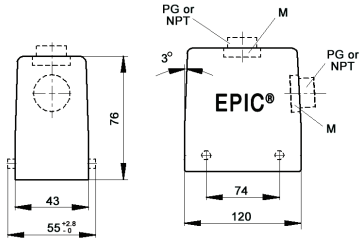
metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M25	19121000*	53111030	53112030
M25x2	44422019	53111030	53112030
M32	19111000*	53111040	53112040
M32x2	44422020	53111040	53112040
Side entry			
M25	19113000	53111030	53112030
M32	19123000	53111040	53112040

* Metric top-entry hoods do not come with a neck

EPIC® HB 24 high profile hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	70150400	53015050	52015750
PG 29	70150600	53015060	52015760
Side entry			
PG 21	70152400	53015050	52015750
PG 29	70152600	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	701504NP	S1134	53112034
1"	701506NP	S1101	53112044
Side entry			
¾"	701524NP	S1134	53112034
1"	701526NP	S1101	53112044

NPT hood provided with NPT fitting

metric

Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25	79150400	53111030	53112030
M25x2	44422021	53111030	53112030
M32	79150600	53111040	53112040
M32x2	79178500	53111040	53112040
M40	79150800	53111050	53112050
Side entry			
M25	79152400	53111030	53112030
M32	79152600	53111040	53112040
M40	79152800	53111050	53112050

* Metric hoods do not come with a neck

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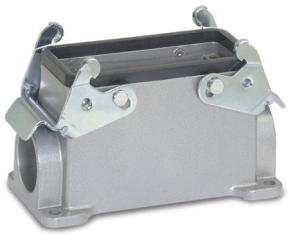
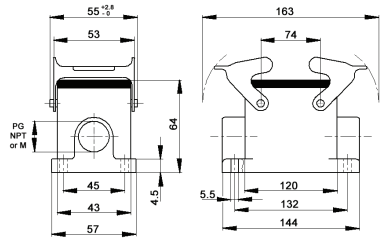
EPIC® HB 24 standard surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
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Complete the installation

HB dust covers
page <?>

Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 21	101040	53015050	52015750
Two entries			
PG 21	101050	53015050	52015750

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
¾"	101040NP	S1134	53112034
Two entries			
¾"	101050NP	S1134	53112034

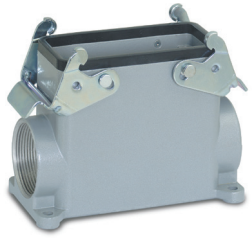
NPT base provided with NPT fitting

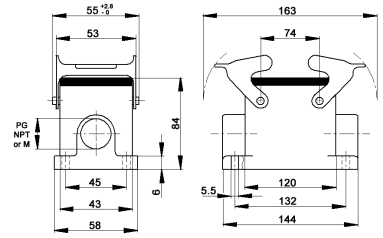
metric

Metric base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M25	19104000	53111030	53112030
Two entries			
M25	19105000	53111030	53112030

EPIC® HB 24 high profile surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

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HB dust covers
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Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 29	70135400	53015060	52015760
Two entries			
PG 21	70136200	53015050	52015750
PG 29	70136400	53015060	52015760

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
¾"	701352NP	S1134	53112034
1"	701354NP	S1101	53112044
Two entries			
¾"	701362NP	S1134	53112034
1"	701364NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M25	79135200	53111030	53112030
M32	79135400	53111040	53112040
Two entries			
M25	79136200	53111030	53112030
M32	79136400	53111040	53112040

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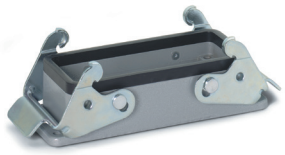
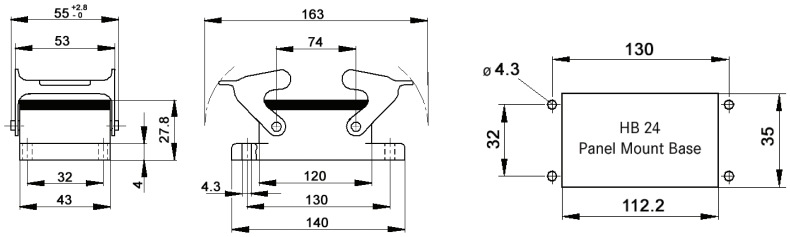
EPIC® HB 24 panel mount base

Panel mount base with double levers





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HB dust covers
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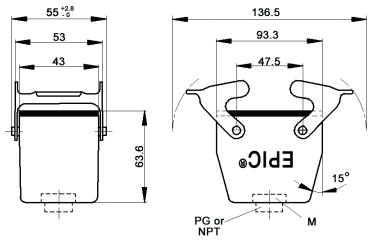
Approvals

Dust cover included	Part number
no	10102000

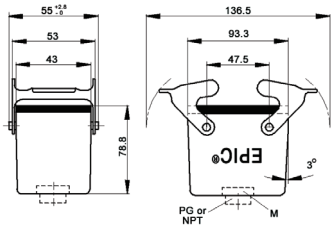
EPIC® HB 24 cable coupler hood

Cable coupler with double levers

standard profile



high profile



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HB dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 21	10127000	53015050	52015750
PG 29	10117000	53015060	52015760
High profile			
PG 21	701404R	53015050	52015750

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
¾"	101270NP	S1134	53112034
1"	101170NP	S1101	53112044
High profile			
¾"	701404NP	S1134	53112034
1"	701406NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M25	19127000	53111030	53112030
M32	19117000	53111040	53112040
High profile			
M25	79140400	53111030	53112030
M32	79140600	53111040	53112040

* Metric couplers do not come with a neck

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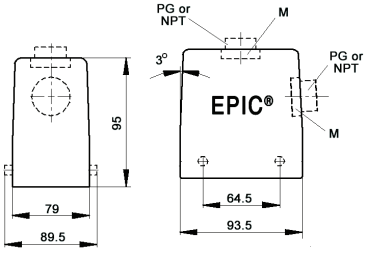
EPIC® HB 32 standard hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 21	10133000	53015050	52015750
PG 29	10134000	53015060	52015760
Side entry			
PG 21	10135000	53015050	52015750
PG 29	10136000	53015060	52015760

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
¾"	101330NP	S1134	53112034
1"	101340NP	S1101	53112044
1¼"	101343NP	–	53112054
Side entry			
¾"	101350NP	S1134	53112034
1"	101360NP	S1101	53112044

NPT hood provided with NPT fitting

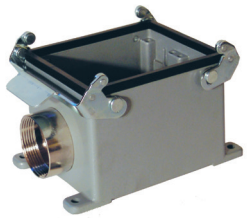
metric

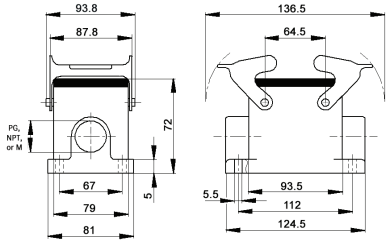
Metric hood size	Metric hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry*			
M25x2	44422022	53111030	53112030
M32	19134000	53111040	53112040
M32x2	44422023	53111040	53112040
M40	19134400	53111050	53112050
Side entry			
M25	19135000	53111030	53112030
M32	19136000	53111040	53112040
M40	19136200	53111050	53112050

* Metric top-entry hoods do not come with a neck

EPIC® HB 32 surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
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Approvals

PG

PG base size	PG base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
PG 29	10137000	53015060	52015760
Two entries			
PG 29	10138000	53015060	52015760

NPT

NPT base size	NPT base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
1"	101370NP	S1101	53112044
Two entries			
1"	101380NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	SKINTOP® gland plastic	SKINTOP® gland metal
One entry			
M32	19137000	53111040	53112040
M40	19145400	53111050	53112050
Two entries			
M32	19138000	53111040	53112040
M40	19146400	53111050	53112050

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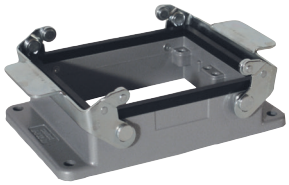
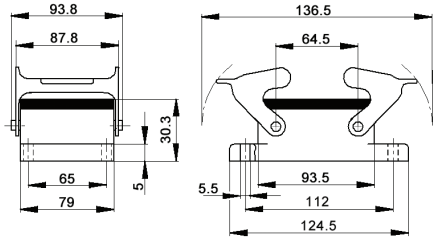
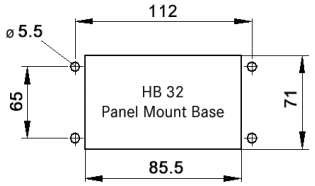
EPIC® HB 32 panel mount base

Panel mount base with double levers







all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

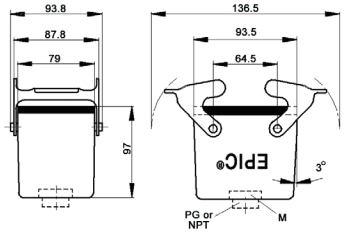
HB dust covers
page <?>

Approvals

Dust cover included	Part number
no	10132000

EPIC® HB 32 cable coupler hood

Cable coupler with double levers



all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
PG 21	101390	53015050	52015750
PG 29	101395	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
¾"	101390NP	S1134	53112034
1"	101395NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler size	Metric coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
M32	19139500	53111040	53112040

Metric couplers do not come with a neck

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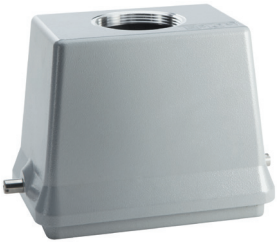
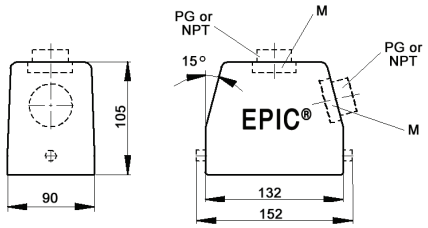
EPIC® HB 48 standard hood

Hood with single lever bolts





all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

RoHS

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 29	10155000	53015060	52015760
PG 36	10156000	53015070	52015765
PG 42	10157000	53015080	52015766
Side entry			
PG 29	10158000	53015060	52015760
PG 36	10159000	53015070	52015765
PG 42	10160000	53015080	52015766

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
1"	101550NP	S1101	53112044
1¼"	101560NP	–	53112054
Side entry			
1"	101580NP	S1101	53112044
1¼"	101590NP	–	53112054

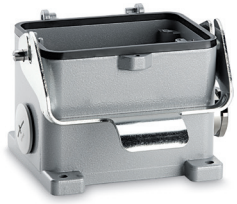
metric

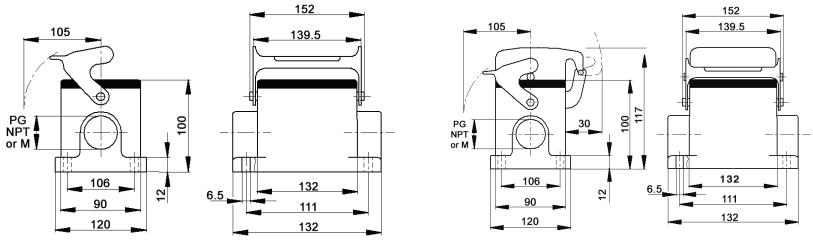
Metric hood* size	Metric hood* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M32	19155000	53111040	53112040
M40	19156000	53111050	53112050
M50	19157000	53111060	53112060
Side entry			
M32	19158000	53111040	53112040
M40	19159000	53111050	53112050
M50	19160000	53111060	53112060

* Metric hoods do not come with a neck

EPIC® HB 48 surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
page <?>

Approvals

RoHS

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
29	101650	no	53015060	52015760
29	101670	yes	53015060	52015760
36	101651	no	53015070	52015765
36	101671	yes	53015070	52015765
Two entries				
29	101660	no	53015060	52015760
29	101680	yes	53015060	52015760
36	101661	no	53015070	52015765
36	101681	yes	53015070	52015765

PG base provided with EPIC® SM/SP gland

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
1"	101650NP	no	S1101	53112044
1"	101670NP	yes	S1101	53112044
1¼"	101651NP	no	–	53112054
1¼"	101671NP	yes	–	53112054
Two entries				
1"	101660NP	no	S1101	53112044
1"	101680NP	yes	S1101	53112044
1¼"	101661NP	no	–	53112054
1¼"	101681NP	yes	–	53112054

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
32	19165000	no	53111040	53112040
32	19167000	yes	53111040	53112040
40	19165100	no	53111050	53112050
40	19167100	yes	53111050	53112050
Two entries				
32	19166000	no	53111040	53112040
32	19168000	yes	53111040	53112040
40	19166100	no	53111050	53112050
40	19168100	yes	53111050	53112050

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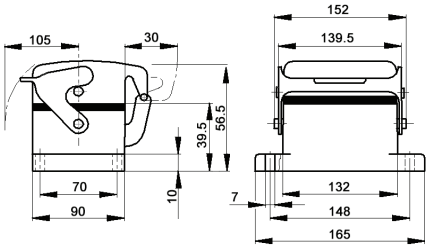
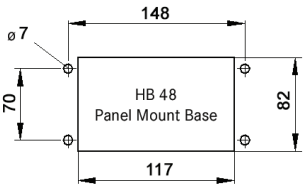
EPIC® HB 48 panel mount base

Panel mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HB dust covers
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Approvals

RoHS

Dust cover included	Hardware	Part number
no	–	10161000
yes	dust cover bolts	10152500
yes	dust cover hold screw	10152000

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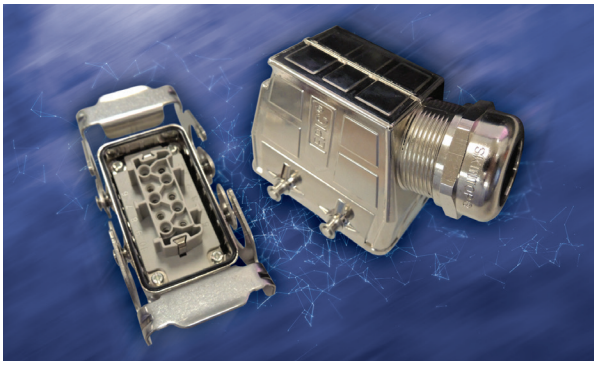
EPIC® ULTRA series



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.

ULTRA housing	EPIC® insert series											
	HBE	HA	HQ	STA	HEE	HBS	HBVE	HD	HDD	MH	MC	Power K
HA 3/4	–	HA 3, HA 4	HQ 5, HQ 12	STA 6	–	–	–	HD 7, HD 8	–	–	–	–
HB 6	HBE 6	–	–	–	HEE 10	–	–	–	HDD 24	MH 6	MC 2	–
HB 10	HBE 10	–	–	–	HEE 18	–	HBVE 3	–	HDD 42	MH 10	MC 3	–
HB 16	HBE 16	–	–	–	HEE 32	HBS 6	HBVE 6	HD 40	HDD 72	MH 16	MC 5	4/0, 4/2
HB 24	HBE 24	–	–	–	HEE 46	–	HBVE 10	HD 64	HDD 108	MH 24	MC 7	4/8

Technical data

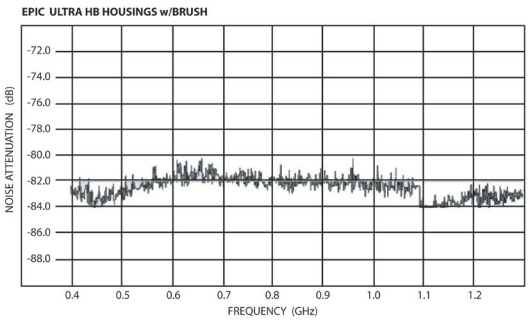
Specifications: DIN EN 60529, DIN EN 6988

Protection class: UL 50E Type 4, 4X, 12; IP65

Temperature range: -40°C to +100°C

Material:

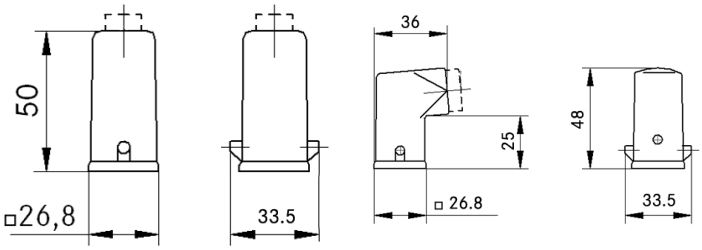
- housing:	nickel-plated die-cast zinc
- lever & bolts:	stainless steel
- sealing:	NBR
- gland cap nut:	nickel-plated brass
- gland insert:	PA thermoplastic
- gland seal:	special chloroprene elastomer



EPIC® ULTRA HA 3/4 hood

Hood with single lever bolts

NEW



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 4X, 12 IP65

Approvals

RoHS

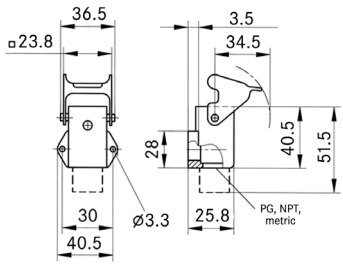
metric

Size	Part number		SKINTOP® MS-M
	top entry	side entry	
M20	10423300	10423201	53112020

EPIC® ULTRA HA 3/4 surface mount base

Surface mount with single lever

NEW



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 4X, 12 IP65

Approvals

RoHS

metric

Size	Part number
M20	10423203

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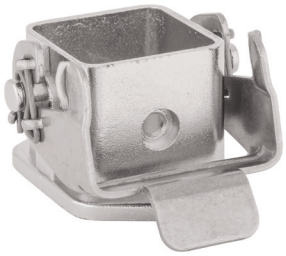
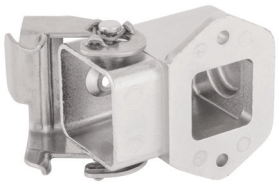
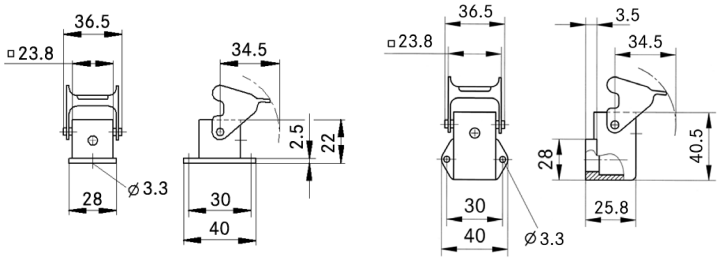
EPIC® ULTRA HA 3/4 panel mount base

Panel mount base with single lever







all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 4X, 12 IP65

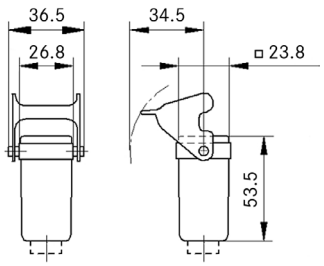
Approvals

RoHS

Description	Part number
standard	10423200
right angle	10423202

EPIC® HA 3/4 cable coupler hood

Cable coupler with single lever



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 4X, 12 IP65

Approvals

RoHS

metric

Size	Part number	SKINTOP® MS-M
M20	10423204	53112020

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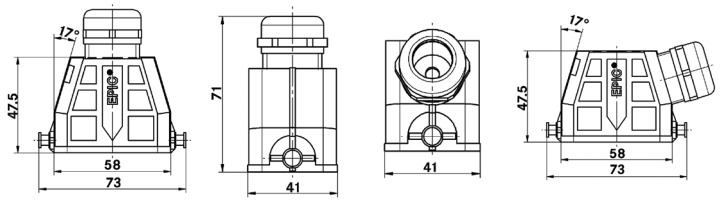
EPIC® ULTRA HB 6 hood

Hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 4X, 12
IP65

Part number	Brush included	Cable OD mm	Min. OD for braided shield mm
Top entry			
70250200	no	6 - 13	–
70250201	no	9 - 17	–
70250202	yes	9 - 17	6
Side entry			
70250203	no	6 - 13	–
70250204	no	9 - 17	–
70250205	yes	9 - 17	6

Complete the installation

ULTRA HB covers
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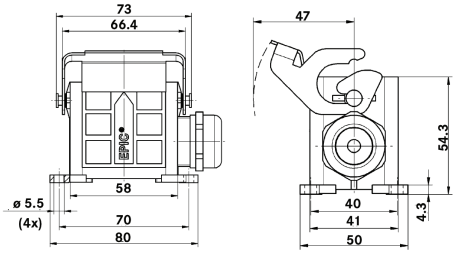
not for use with inserts requiring high profile housing

Approvals

RoHS ✓

EPIC® ULTRA HB 6 surface mount base

Surface mount base with single lever



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 4X, 12
IP65

Part number	Brush included	Cable OD mm	Min. OD for braided shield mm
70250207	no	6 - 13	–
70250208	no	9 - 17	–
70250209	yes	9 - 17	6

Complete the installation

ULTRA HB covers
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not for use with inserts requiring high profile housing

Approvals

RoHS ✓

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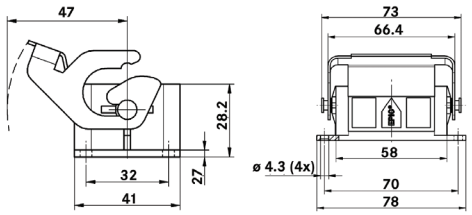
EPIC® ULTRA HB 6 panel mount base

Panel mount base with single lever



all dimensions are in mm

Technical data

IP **Protection class:**	UL 50E Type 4, 4X, 12 IP65

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ULTRA HB covers
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Approvals

RoHS

Dust cover included	Part number
no	70250206

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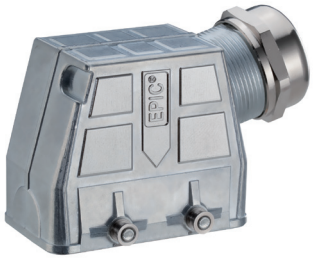
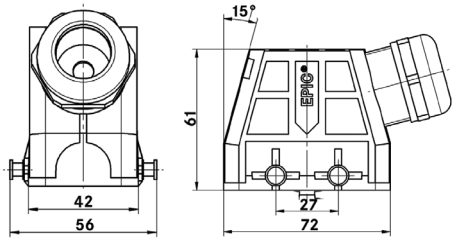
EPIC® ULTRA HB 10 hood

Hood with double lever bolts





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 4X, 12
IP65

Complete the installation

ULTRA HB covers
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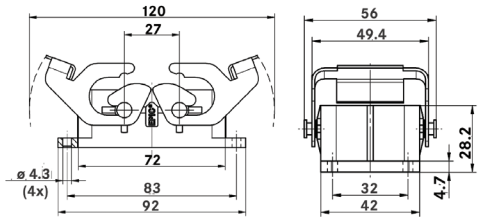
Approvals

RoHS ✓

Part number	Brush included	Cable OD mm	Min. OD for braided shield mm
Side entry			
70250210	no	6 - 13	–
70250211	no	9 - 17	–
70250212	yes	9 - 17	6

EPIC® ULTRA HB 10 panel mount base

Panel mount base with double levers



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 4X, 12
IP65

Complete the installation

ULTRA HB covers
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Approvals

RoHS ✓

Dust cover included	Part number
no	70250213

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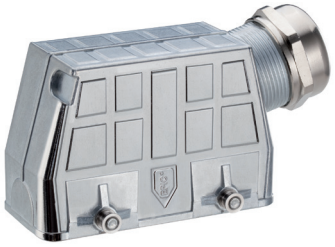
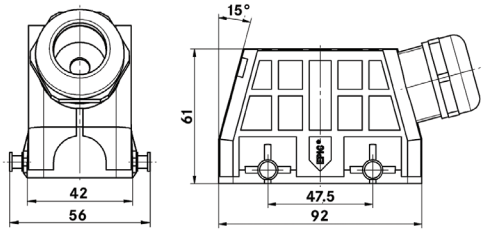
EPIC® ULTRA HB 16 hood

Hood with double lever bolts





all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 4X, 12
IP65

Complete the installation

ULTRA HB covers
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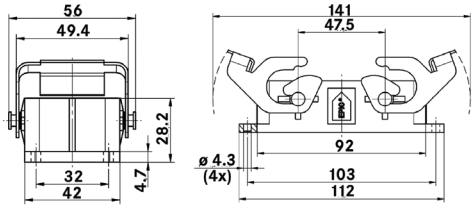
Approvals

RoHS

Part number	Brush included	Cable OD mm	Min. OD for braided shield mm
Side entry			
70250214	no	7 - 15	–
70250215	no	11 - 21	–
70250216	yes	11 - 21	8

EPIC® ULTRA HB 16 panel mount base

Panel mount base with double levers



all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 4X, 12
IP65

Complete the installation

ULTRA HB covers
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Approvals

RoHS

Dust cover included	Part number
no	70250217

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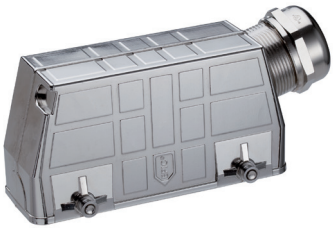
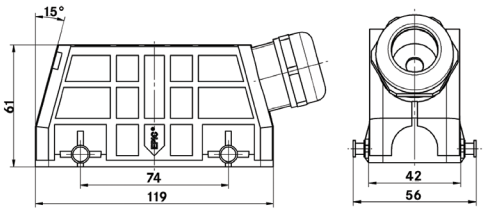
EPIC® ULTRA HB 24 hood

Hood with double lever bolts





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 12 IP65

Complete the installation

ULTRA HB covers
page <?>

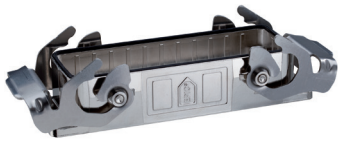
Approvals

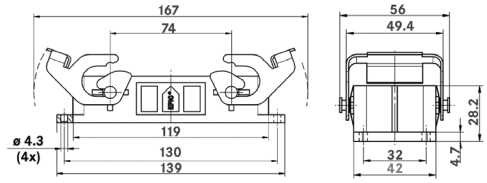
RoHS ✓

Part number	Brush included	Cable OD mm	Min. OD for braided shield mm
Side entry			
70250219	no	7 - 15	–
70250220	no	11 - 21	–
70250221	yes	11 - 21	8

EPIC® ULTRA HB 24 panel mount base

Panel mount base with double levers





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 12 IP65

Complete the installation

ULTRA HB covers
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Approvals

RoHS ✓

Dust cover included	Part number
no	70250222

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® HA series

EPIC® HA 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, UL 50E, and NEMA standards only when in the mated condition.

HA housing	EPIC® insert series			
	HA	HQ	STA	HD
HA 3/4	HA 3, HA 4	HQ 5, HQ 12	STA 6	HD 7, HD 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	–	–	–

Technical data

Specifications: DIN 43652
- metric housing: DIN 50262

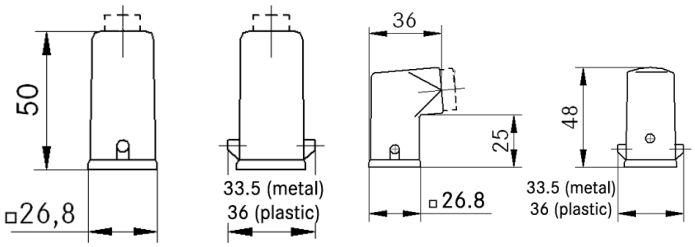
Protection class: UL 50E Type 4, 12
IP65

Temperature range: -40°C to +125°C

Material:
- EPIC® HA 3/4:
  - metal: powder-coated die-cast zinc
  - plastic: thermoplastic flame-retardant material rated UL 94 V-0
- EPIC® HA 10-64: powder-coated aluminum alloy with zinc-plated steel locking levers and bolts

EPIC® HA 3/4 hood

Hood with single lever bolts



all dimensions are in mm

Complete the installation

HA dust covers
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Replacement gland kits
page <?>

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Approvals

PG

Size	Material	Part number with gland	Part number without gland
Top entry			
PG 11	die-cast zinc	10426500	10512100
PG 11	black plastic	10426700	10425500
PG 11	gray plastic	10426400	10426000
Side entry			
PG 11	die-cast zinc	10427500	10512300
PG 11	black plastic	10620600	10427300
PG 11	gray plastic	10427100	10427000

NPT

Size	Material	Part number without gland
Top entry		
½"	die-cast zinc	105121NP
½"	black plastic	104255NP
½"	gray plastic	104260NP
Side entry		
½"	die-cast zinc	105123NP
½"	black plastic	104273NP
½"	gray plastic	104270NP

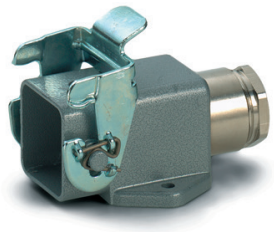
NPT hood provided with NPT fitting

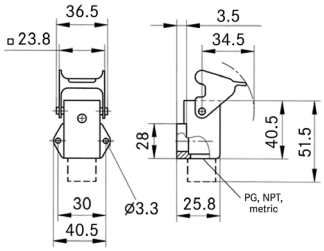
metric

Size	Material	Part number with gland	Part number without gland
Top entry			
M20	die-cast zinc	19426500	19512100
M20	black plastic	–	19425500
M20	gray plastic	–	19426000
Side entry			
M20	die-cast zinc	19427500	19512300
M20	black plastic	–	19427300
M20	gray plastic	–	19427000

EPIC® HA 3/4 surface mount base

Surface mount base with single lever





all dimensions are in mm

Complete the installation

HA dust covers
page <?>

Replacement gland kits
page <?>

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Approvals

PG

Size	Material	Part number with gland	Part number without gland
PG 11	die-cast zinc	10424500	10512700
PG 11	gray plastic	10424200	10424000

NPT

Size	Material	Part number without gland
½"	die-cast zinc	105127NP
½"	gray plastic	104240NP

NPT base provided with NPT fitting

metric

Size	Material	Part number with gland	Part number without gland
M20	die-cast zinc	19424500	19512700
M20	gray plastic	19421900	–

If not otherwise specified, all values relating to the product are nominal values.
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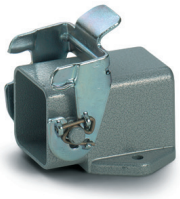
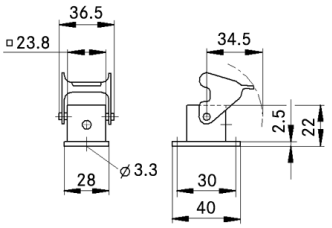
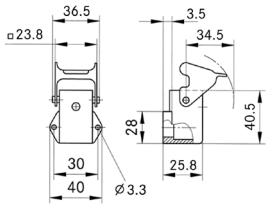
EPIC® HA 3/4 panel mount base

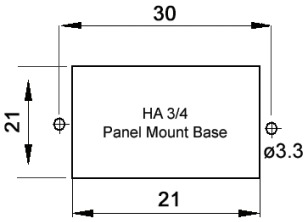
Panel mount base with single lever





all dimensions are in mm





Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Complete the installation

HA dust covers
page <?>

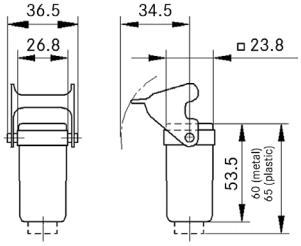
Approvals

RoHS

Description	Dust cover included	Part number die-cast zinc	black plastic	gray plastic
standard base	no	10422500	10422200	10422000
standard base	yes	44429015	–	–
right-angle base	no	10423500	10423100	10423000

EPIC® HA 3/4 cable coupler hood

Cable coupler with single lever



all dimensions are in mm

Complete the installation

HA dust covers
page <?>

Replacement gland kits
page <?>

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Approvals

c UL us RoHS DVE

PG

Size	Material	Part number with gland	without gland
PG 11	die-cast zinc	10429500	10512900
PG 11	black plastic	10620300	10429200
PG 11	gray plastic	10429100	10429000

NPT

Size	Material	Part number without gland
½"	die-cast zinc	105129NP
½"	black plastic	104292NP
½"	gray plastic	104290NP

NPT coupler provided with NPT fitting

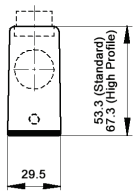
metric

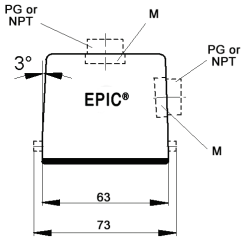
Size	Material	Part number without gland
M20	die-cast zinc	19512900
M20	black plastic	19429200
M20	gray plastic	19429000

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® HA 10 standard & high profile hood

Hood with single lever bolts





all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

c UL us RoHS VDE

PG

PG hood size	PG hood part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
13	10446000	std	53015030	52015730
16	10446100	std	53015040	52015740
16	70460200	high	53015040	52015740
21	70460400	high	53015040	52015750
Side entry				
16	10445000	std	53015040	52015740
16	70462200	high	53015040	52015740
21	10445500	std	53015050	52015750
21	70462400	high	53015050	52015750

NPT

NPT hood size	NPT hood part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
½"	104460NP	std	S1112	53112024
½"	704602NP	high	S1112	53112024
½"	104461NP	std	S1134	53112024
¾"	704604NP	high	S1134	53112034
Side entry				
½"	104450NP	std	S1112	53112024
½"	704622NP	high	S1112	53112024
¾"	104455NP	std	S1134	53112034
¾"	704624NP	high	S1134	53112034

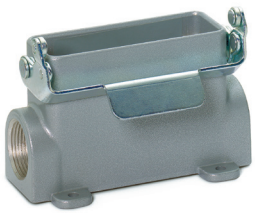
metric

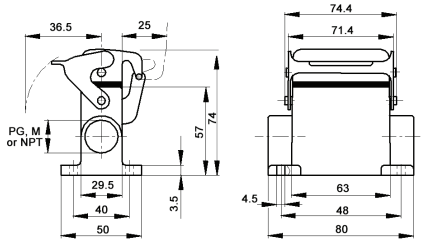
Metric hood* size	Metric hood* part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
20	19446000	std	53111020	53112020
20	79460200	high	53111020	53112020
25	19446100	std	53111030	53112030
25	79460400	high	53111030	53112030
Side entry				
20	19445000	std	53111020	53112020
20	79462200	high	53111020	53112020
25	19445500	std	53111030	53112030
25	79462400	high	53111030	53112030

* Top-entry and high profile hoods do not come with a neck

EPIC® HA 10 surface mount base

Surface mount base with single lever





all dimensions are in mm

Technical data

IP **Protection class:** UL 50E Type 4, 12
IP65

Complete the installation

HA dust covers
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Approvals

c UL us RoHS VDE

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
16	10448100	no	53015040	52015740
16	704552	yes	53015040	52015740
21	10448000	no	53015050	52015750
21	704554	yes	53015050	52015750
Two entries				
16	10450100	no	53015040	52015740
16	704562	yes	53015040	52015740
21	104500	no	53015050	52015750
21	704564	yes	53015050	52015750

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
½"	104481NP	no	S1112	53112024
½"	704552NP	yes	S1112	53112024
¾"	104480NP	no	S1134	53112034
¾"	704554NP	yes	S1134	53112034
Two entries				
½"	104501NP	no	S1112	53112024
½"	704562NP	yes	S1112	53112024
¾"	104500NP	no	S1134	53112034
¾"	704564NP	yes	S1134	53112034

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
20	19448100	no	53111020	53112020
20	79455200	yes	53111020	53112020
25	19448000	no	53111030	53112030
25	79455400	yes	53111030	53112030
Two entries				
20	19450100	no	53111020	53112020
20	79456200	yes	53111020	53112020
25	19450000	no	53111030	53112030
25	79456400	yes	53111030	53112030

If not otherwise specified, all values relating to the product are nominal values.
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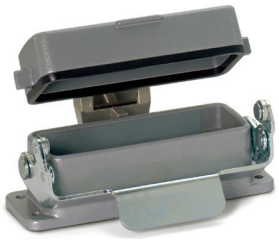
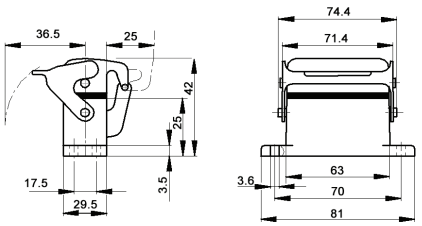
EPIC® HA 10 panel mount base

Panel mount base with single lever





all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Complete the installation

HA dust covers
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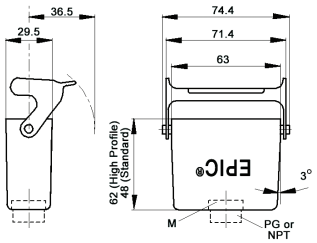
Approvals

Dust cover included	Part number
no	10442000
yes	70444000

EPIC® HA 10 cable coupler hood

Standard & high profile cable coupler with single lever



all dimensions are in mm

Technical data

IP Protection class: UL 50E Type 4, 12
IP65

Complete the installation

HA dust covers
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Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 13	104390	53015030	52015730
PG 16	70450000	53015040	52015740
High profile			
PG 21	70450400	53015050	52015750

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
½"	104390NP	S1112	53112024
½"	704500NP	S1112	53112024
High profile			
¾"	704504NP	S1134	53112034

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M20	19439000	53111020	53112020
M25	79450000	53111030	53112030
High profile			
M25	79450400	53111030	53112030

* Metric couplers do not come with a neck

If not otherwise specified, all values relating to the product are nominal values.
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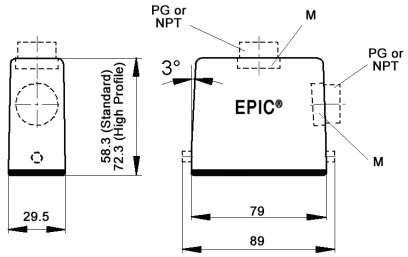
EPIC® HA 16 standard & high profile hood

Hood with single lever bolts



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HA dust covers
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Approvals

PG

PG hood size	PG hood part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
16	10565000	std	53015040	52015740
16	70490200	high	53015040	52015740
21	10565200	std	53015050	52015750
21	70490400	high	53015050	52015750
Side entry				
16	10564000	std	53015040	52015740
16	70492200	high	53015040	52015740
21	10564500	std	53015050	52015750
21	70492400	high	53015050	52015750

NPT

NPT hood size	NPT hood part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
½"	105650NP	std	S1112	53112024
½"	704902NP	high	S1112	53112024
¾"	105652NP	std	S1134	53112034
¾"	704904NP	high	S1134	53112034
Side entry				
½"	105640NP	std	S1112	53112024
½"	704922NP	high	S1112	53112024
¾"	105645NP	std	S1134	53112034
¾"	704924NP	high	S1134	53112034

NPT hood provided with NPT fitting

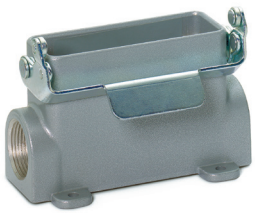
metric

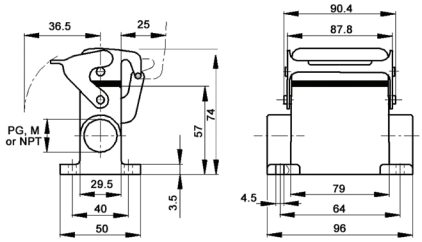
Metric hood* size	Metric hood* part number	Profile	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry				
20	19565000	std	53111020	53112020
20	79490200	high	53111020	53112020
25	19565300	std	53111030	53112030
25	79490400	high	53111030	53112030
Side entry				
20	19564000	std	53111020	53112020
20	79492200	high	53111020	53112020
25	19564500	std	53111030	53112030
25	79492400	high	53111030	53112030

* Top-entry and high profile hoods do not come with a neck

EPIC® HA 16 surface mount base

Surface mount with single lever





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HA dust covers
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Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
16	10567100	no	53015040	52015740
16	704852	yes	53015040	52015740
21	10567000	no	53015050	52015750
21	70485400	yes	53015050	52015750
Two entries				
16	704862	yes	53015040	52015740
21	10568000	no	53015050	52015750

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
½"	105671NP	no	S1112	53112024
½"	704852NP	yes	S1112	53112024
¾"	105670NP	no	S1134	53112034
¾"	704854NP	yes	S1134	53112034
Two entries				
½"	704862NP	yes	S1112	53112024
¾"	105680NP	no	S1134	53112034

NPT base provided with NPT fitting

metric

Metric base size	Metric base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
20	19567100	no	53111020	53112020
20	79485200	yes	53111020	53112020
25	19567000	no	53111030	53112030
25	79485400	yes	53111030	53112030
Two entries				
25	19568000	no	53111030	53112030
25	79486400	yes	53111030	53112030

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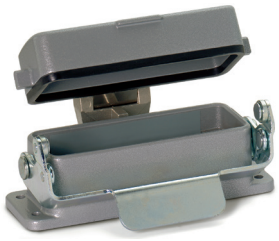
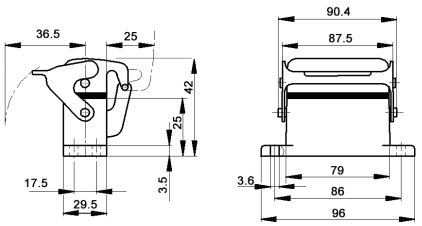
EPIC® HA 16 panel mount base

Panel mount base with single lever





all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

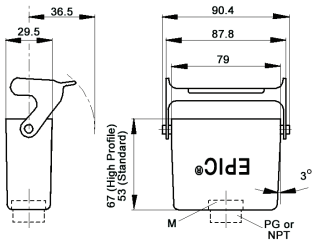
HA dust covers
page <?>

Approvals

Dust cover included	Part number
no	10462000
yes	70474000

EPIC® HA 16 cable coupler hood

Cable coupler with single lever



all dimensions are in mm

Technical data

IP Protection class:	UL 50E Type 4, 12 IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 16	10563000	53015040	52015740
High profile			
PG 16	704802	53015040	52015740
PG 21	70480400	53015050	52015750

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
½"	105630NP	S1112	53112024
High profile			
½"	704802NP	S1112	53112024
¾"	704804NP	S1134	53112034

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M20	19563000	53111020	53112020
M25	19563200	53111030	53112030
High profile			
M20	79480200	53111030	53112030
M25	79480400	53111030	53112030

* Metric couplers do not come with a neck

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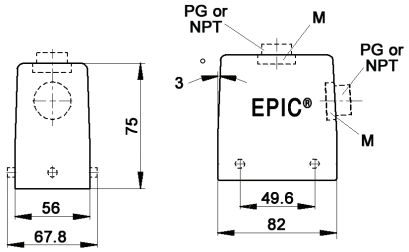
EPIC® HA 32 standard hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG hood		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
PG 21	10582000	53015050	52015750
PG 29	10583000	53015060	52015760
Side entry			
PG 21	10576000	53015050	52015750
PG 29	10577000	53015060	52015760

NPT

NPT hood		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
¾"	105820NP	S1134	53112034
1"	105830NP	S1101	53112044
Side entry			
¾"	105760NP	S1134	53112034
1"	105770NP	S1101	53112044

NPT hood provided with NPT fitting

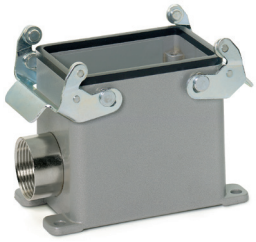
metric

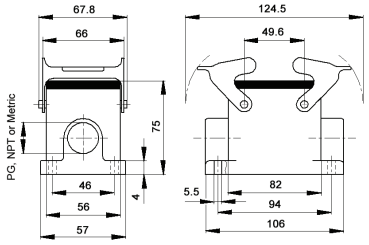
Metric hood*		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
M25	19582000	53111030	53112030
M32	19583000	53111040	53112040
M40	79520600	53111050	53112050
Side entry			
M25	19576000	53111030	53112030
M32	19577000	53111040	53112040
M40	19577500	53111050	53112050

* Metric hoods do not come with a neck

EPIC® HA 32 surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 21	10474000	53015050	52015750
PG 29	10474100	53015060	52015760
Two entries			
PG 21	104820	53015050	52015750
PG 29	10482100	53015060	52015760

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
¾"	104740NP	S1134	53112034
1"	104741NP	S1101	53112044
Two entries			
¾"	104820NP	S1134	53112034
1"	104821NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base*		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M25	19474000	53111030	53112030
M32	19474100	53111040	53112040
Two entries			
M25	19482000	53111030	53112030
M32	19482100	53111040	53112040
M40	79506800	53111050	53112050

* Metric bases do not come with a neck

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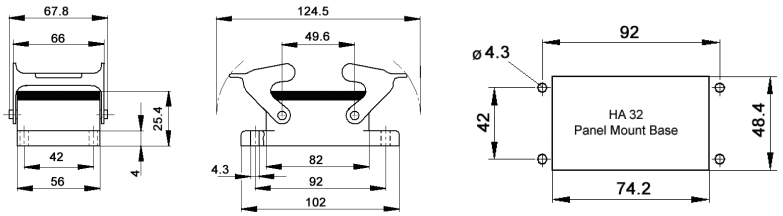
EPIC® HA 32 panel mount base

Panel mount base with double levers



all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

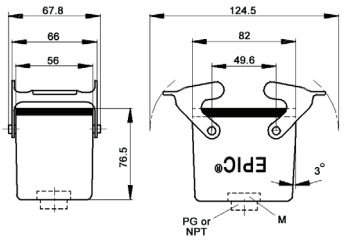
HA dust covers
page <?>

Approvals

Dust cover included	Part number
no	10472000

EPIC® HA 32 cable coupler hoods

Cable coupler with double levers



all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG coupler size	PG coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
PG 21	105880	53015050	52015750
PG 29	10588500	53015060	52015760

NPT

NPT coupler size	NPT coupler part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
¾"	105880NP	S1134	53112034
1"	105885NP	S1101	53112044

NPT coupler provided with NPT fitting

metric

Metric coupler* size	Metric coupler* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Standard profile			
M25	19588000	53111030	53112030
M32	19588500	53112030	53112040

* Metric couplers do not come with a neck

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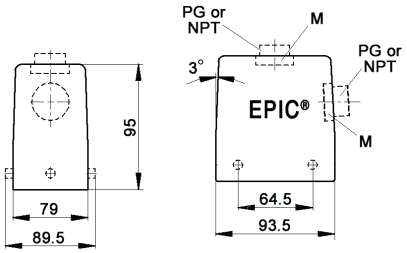
EPIC® HA 48 standard hood

Hood with double lever bolts



all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG hood		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
PG 29	10631800	53015060	52015760
Side entry			
PG 29	10630800	53015060	52015760

NPT

NPT hood		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
1"	106318NP	S1101	53112044
Side entry			
1"	106308NP	S1101	53112044

NPT hood provided with NPT fitting

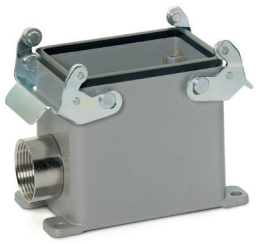
metric

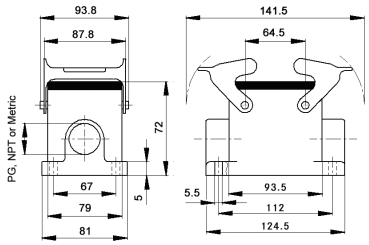
Metric hood*		SKINTOP® gland	
size	part number	plastic	metal
Top entry			
M32	19631800	53111040	53112040
M40	19636600	53111050	53112050
Side entry			
M32	19630800	53111040	53112040
M40	19635600	53111050	53112050

* Metric hoods do not come with a neck

EPIC® HA 48 surface mount base

Surface mount base with double levers





all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
PG 29	10633800	53015060	52015760

NPT

NPT base		SKINTOP® gland	
size	part number	plastic	metal
One entry			
1"	106338NP	S1101	53112044

NPT base provided with NPT fitting

metric

Metric base*		SKINTOP® gland	
size	part number	plastic	metal
One entry			
M32	19633800	53111040	53112040
M40	19638600	53111050	53112050
Two entries			
M40	19639600	53111050	53112050

* Metric bases do not come with a neck

If not otherwise specified, all values relating to the product are nominal values.
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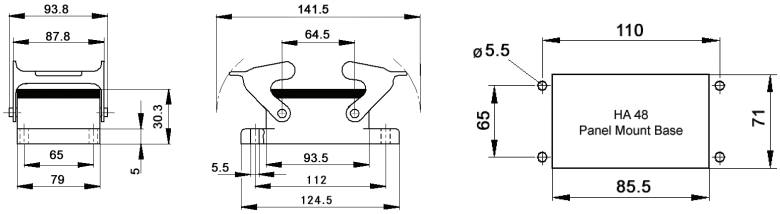
EPIC® HA 48 panel mount base

Panel mount base with double levers



all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

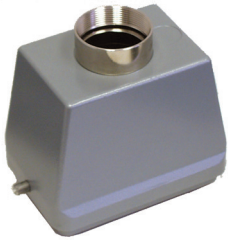
HA dust covers
page <?>

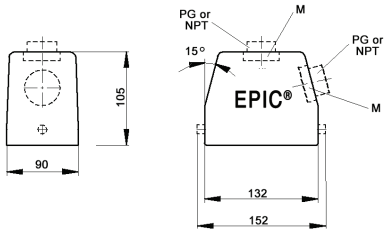
Approvals

Dust cover included	Part number
no	10625500

EPIC® HA 64 standard hood

Hood with single lever bolts





all dimensions are in mm

Technical data

IP Protection class: NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG hood size	PG hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
PG 29	10155000	53015060	52015760
PG 36	10156000	53015070	52015765
PG 42	10157000	53015080	52015766
Side entry			
PG 29	10158000	53015060	52015760
PG 36	10159000	53015070	52015765
PG 42	10160000	53015080	52015766

NPT

NPT hood size	NPT hood part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
1"	101550NP-HA	S1101	53112044
1¼"	101560NP-HA	–	53112054
Side entry			
1"	101580NP-HA	S1101	53112044
1¼"	101590NP-HA	–	53112054

NPT hood provided with NPT fitting

metric

Metric hood* size	Metric hood* part number	SKINTOP® gland plastic	SKINTOP® gland metal
Top entry			
M32	191550HA	53111040	53112040
M40	191560HA	53111050	53112050
M50	191570HA	53111060	53112060
Side entry			
M32	191580HA	53111040	53112040
M40	191590HA	53111050	53112050
M50	191600HA	53111060	53112060

* Metric hoods do not come with a neck

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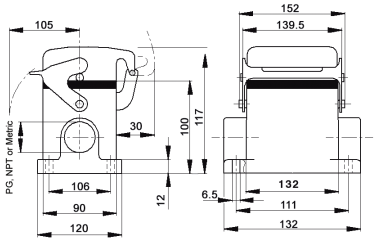
EPIC® HA 64 surface mount base

Surface mount base with single lever



all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

PG

PG base size	PG base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
29	101650HA	no	53015060	52015760
29	101670HA	yes	53015060	52015760
36	101651HA	no	53015070	52105765
36	101671HA	yes	53015070	52015765
Two entries				
29	101660HA	no	53015060	52015760
29	101680HA	yes	53015060	52015760
36	101661HA	no	53015070	52105765
36	101681HA	yes	53015070	52015765

NPT

NPT base size	NPT base part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
1"	101650NP-HA	no	S1101	53112044
1"	101670NP-HA	yes	S1101	53112044
1¼"	101651NP-HA	no	–	53112054
1¼"	101671NP-HA	yes	–	53112054
Two entries				
1"	101660NP-HA	no	S1101	53112044
1"	101680NP-HA	yes	S1101	53112044
1¼"	101661NP-HA	no	–	53112054
1¼"	101681NP-HA	yes	–	53112054

NPT base provided with NPT fitting

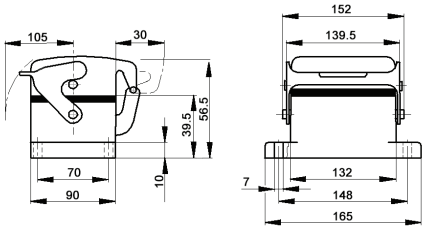
metric

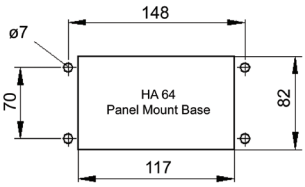
Metric base* size	Metric base* part number	Dust cover	SKINTOP® gland plastic	SKINTOP® gland metal
One entry				
32	191650HA	no	53111040	53112040
32	191670HA	yes	53111040	53112040
40	191651HA	no	53111050	53112050
40	191671HA	yes	53111050	53112050
Two entries				
32	191660HA	no	53111040	53112040
32	191680HA	yes	53111040	53112040
40	191661HA	no	53111050	53112050
40	191681HA	yes	53111050	53112050

* Metric bases do not come with a neck

EPIC® HA 64 panel mount base

Panel mount base with single lever





all dimensions are in mm

Technical data

IP **Protection class:** NEMA 4, NEMA 12
IP65

Complete the installation

HA dust covers
page <?>

Approvals

Dust cover included	Hardware	Part number
no	–	101610HA
yes	dust cover bolts	101525HA
yes	dust cover bolts	101520HA

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EPIC®

Rectangular connector accessories

Glands, seal rings & adapters

426 **EPIC® SM/SP/CM gland kits**

427 **D series pressure screws**

427 **U series washers**

427 **E series neoprene concentric sealing rings**

427 **EV series Viton® concentric sealing rings**

428 **PG/NPT/metric adapters**

428 **PG & metric reducers**

428 **PG & metric enlargers**

428 **Metal hole plugs**

Dust covers

429 **EPIC® HA dust covers**

429 **EPIC® HB dust covers**

429 **EPIC® ULTRA dust covers** NEW

Tools

430 **EPIC® rectangular hole punch**
For EPIC® HB panel mount bases and SKINTOP® multi-cable bushing systems

431 **Easy Strip 2**
Stripping & cutting tool

431 **Crimp tool & case**

431 **Module removal tool**
For EPIC® MC series inserts

431 **Adjustable torque screwdriver**

Replacement parts

432 **Flat gaskets**

432 **Replacement parts**
For EPIC® rectangular inserts

432 **Replacement parts**
For EPIC® rectangular housings

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EPIC®

Rectangular connector accessories

Coding pins

433 **Coding with key pin**

433 **Coding with guide pin & socket**
For screw, crimp & cage clamp termination

433 **Coding with contact loss**

Split hoods

434 **HB split hoods with double latch bolts**
For EPIC® HB 16 & HB 24 housings

434 **Split hood grommets**

Adapter plates

435 **Cover plates for panel cutouts**

435 **Adapters for D-sub connectors**

DIN rail mounting system

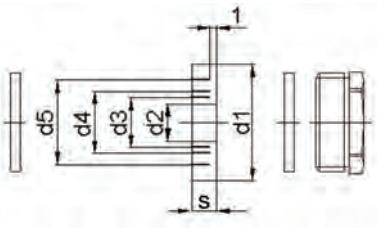
436 **EPIC® QUICK & EASY DIN rail mounting system**

EPIC® SM/SP/CM gland kits

EPIC® SM

EPIC® SP

EPIC® CM



Technical data

Material:
- EPIC® SM & CM: nickel-plated brass
- EPIC® SP: polystyrol

Temperature range:
- EPIC® SM & CM: -40°C to +125°C
- EPIC® SP: -20°C to +55°C

Protection class:
- EPIC® CM: IP54 (DIN 46320)

EPIC® SM

Part number	Size	d1 mm	d2 mm	d2 cable OD	d3 mm	d3 cable OD	d4 mm	d4 cable OD	d5 mm	d5 cable OD	s mm	Wrench size mm	Pack size
PG thread													
12954200	PG 11	16.5	7.5	6.5 - 8.5	10	9 - 11	12.5	11.5 - 13.5	–	–	6	18	5
12954300	PG 13	18.3	7.5	6.5 - 8.5	10	9 - 11	12.5	11.5 - 13.5	–	–	6	20	5
12954400	PG 16	20.4	7.5	6.5 - 8.5	10	9 - 11	12.5	11.5 - 13.5	15	14 - 16	7	22	5
12954500	PG 21	25.9	10	9 - 11	13	12 - 14	16	15 - 17	19	18 - 20	8	28	5
12954600	PG 29	34.7	18	17 - 19	21	20 - 22	24	23 - 25	27	26 - 28	9.5	37	5
12954700	PG 36	44.7	24	23 - 25	27	26 - 28	30	29 - 31	33	32 - 34	12	47	5
12954800	PG 42	51.7	30	29 - 31	33	32 - 34	36	35 - 37	39	38 - 40	14	54	5
Metric thread													
71200000	M12	10	5	4 - 6	–	–	–	–	–	–	5	12	5
71200200	M20	17.6	4	3 - 5	7	6 - 8	10	9 - 11	13	12 - 14	6	20	5
71200300	M25	22.6	8.5	7.5 - 9.5	11.5	10.5 - 12.5	14.5	13.5 - 15.5	17.5	16.5 - 18.5	7.5	25	5
71200400	M32	29.6	16	15 - 17	19	18 - 20	22	21 - 23	25	24 - 26	9.5	32	5
71200500	M40	37.6	23	22 - 24	26	25 - 27	29	23 - 28	32	31 - 33	12	40	5

EPIC® SP

Part number	Size	d1 mm	d2 mm	d2 cable OD	d3 mm	d3 cable OD	d4 mm	d4 cable OD	d5 mm	d5 cable OD	s mm	Wrench size mm	Pack size
PG thread													
12957100	PG 11	16.5	7.5	6.5 - 8.5	10	9 - 11	12.5	11.5 - 13.5	–	–	6	19	5

EPIC® CM

Part number	Size	d1 mm	d2 mm	d2 cable OD	d3 mm	d3 cable OD	d4 mm	d4 cable OD	d5 mm	d5 cable OD	s mm	Wrench size mm	Pack size
Metric thread													
71201200	M20	17.6	4	3 - 5	7	6 - 8	10	9 - 11	13	12 - 14	6	23	5
71201300	M25	22.6	8.5	7.5 - 9.5	11.5	10.5 - 12.5	14.5	13.5 - 15.5	17.5	16.5 - 18.5	7.5	28	5
71201400	M32	29.6	16	15 - 17	19	18 - 20	22	21 - 23	25	24 - 26	9.5	36	5
71201500	M40	37.6	23	22 - 24	26	25 - 27	29	23 - 28	32	31 - 33	12	46	5

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D series pressure screws

Technical data

Material: nickel-plated brass

Specifications: DIN 46320

Part number	Size	Wrench size mm	Pack size
52100200	PG 7	13	100
52100220	PG 11	18	100
52100240	PG 16	22	50
52100250	PG 21	28	50
52100260	PG 29	37	25
52100270	PG 36	47	10

U series washers

Technical data

Material: galvanized steel

Specifications: DIN 46320

Part number	Size	External diameter mm	Internal diameter mm	Thickness mm	Pack size
52010170	PG 7	11	8	0.8	100
52010180	PG 9	13.5	10	0.8	100
52010190	PG 11	17	12	0.8	100
52010200	PG 13	18.5	14	0.8	100
52010210	PG 16	20.5	16	0.8	50
52010220	PG 21	26	21	0.8	50
52010230	PG 29	35	30	0.8	25
52010240	PG 36	45	38	0.8	10

E series neoprene concentric sealing rings

These rings can be individually adapted to various cable diameters by removing the appropriate sizes. They are also suitable for half glands.

Technical data

Material: neoprene

Part number	Size	External diameter mm	Concentric bores mm	Pack size
52005780	PG 9	13.5	5 • 8	500
52003690	PG 11	16.5	7 • 10 • 12.5	500
52003700	PG 13	18.5	7 • 10.5 • 13 • 16	500
52003710	PG 16	20.5	8 • 10.5 • 13.5 • 16	500
52003720	PG 21	26	11 • 15 • 18 • 20	100
52003730	PG 29	35	19 • 23 • 27 • 31	100
52003740	PG 36	45	25 • 28 • 31 • 35	50

EV series Viton® concentric sealing rings

These rings can be individually adapted to various cable diameters by removing the appropriate sizes. They are also suitable for half glands.

Technical data

Material: Viton®

Temperature range: up to +165 °C

Part number	Size	External diameter mm	Concentric bores mm	Pack size
52010340	PG 11	16.5	7 • 10 • 12.5	50
52010350	PG 13	18.5	7 • 10.5 • 13 • 16	50
52010370	PG 21	26	11 • 15 • 18 • 20	25
52010380	PG 29	35	19 • 23 • 27 • 31	25

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PG/NPT/metric adapters

Technical data

Material:	nickel-plated brass brass
Specifications:	DIN 46320

For product information and part numbers, see page 552

PG & metric reducers

Technical data

Material:	nickel-plated brass
Specifications:	DIN 46320

For product information and part numbers, see page 550

PG & metric enlargers

Technical data

Material:	nickel-plated brass
Specifications:	DIN 46320

For product information and part numbers, see page 551

Metal hole plugs

Hole plugs are for use when existing PG-threaded holes are not yet or no longer required. For product information and part numbers, see page 549.

Technical data

Material:	nickel-plated brass

Complete the installation

Blind hood plug: 10053010

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EPIC® HA dust covers

EPIC® HA series protective covers are made of impact-resistant plastic, which provides effective protection against environmental influences. Inserts are easily protected when not in use. EPIC® HA 3/4 covers are for use with surface mount bases, panel mount bases, and cable coupler hoods.

Technical data

Material: thermoplastic resin
aluminum

Temperature range: -40°C to +125°C

Part number with string	Part number without string	Material	Description	Gasket
HA 3/4				
10430400	10430000	plastic	for housing with plug	no
10430100	10430300	plastic	for housing with receptacle	yes
10513000	–	metal	for housing with plug	no
10513100	–	metal	for housing with receptacle	yes
HA 10				
10457600	10457800	plastic	for hoods	no
10457500	10457700	plastic	for bases & couplers	yes

Part number with string	Part number without string	Material	Description	Gasket
HA 16				
10469600	10469800	plastic	for hoods	no
10469500	10469700	plastic	for bases & couplers	yes
HA 32				
10481600	10481800	plastic	for hoods	yes
10481500	10481700	plastic	for bases & couplers	no
HA 48				
10118020	–	plastic	for bases & couplers	no

EPIC® HB dust covers

EPIC® HB series protective covers are made of impact-resistant plastic, which provides effective protection against environmental influences. Inserts are easily protected when not in use. Attachment string is included with all dust covers.

Technical data

Material: thermoplastic resin

Part number	Lever or bolts	Description	Gasket
HB 6			
10016500	single lever	for hoods	yes
10015000	single lever bolts	for bases & couplers	no
HB 10			
10048600	single lever	for hoods	no
10048700	single lever bolts	for bases & couplers	no
10048500	double levers	for hoods	yes
10047000	double lever bolts	for bases & couplers	no
HB 16			
10088600	single lever	for hoods	no
10088700	single lever bolts	for bases & couplers	no
10088500	double levers	for hoods	yes
10087000	double lever bolts	for bases & couplers	no

Part number	Lever or bolts	Description	Gasket
HB 24			
10118600	single lever	for hoods	no
10118700	single lever bolts	for bases & couplers	no
10119500	double levers	for hoods	yes
10118000	double lever bolts	for bases & couplers	no
HB 32			
10118020	double lever bolts	for bases & couplers	no

EPIC® ULTRA dust covers

NEW

Technical data

Material:
- cover: FDA-approved plastic
- bolts & levers: stainless steel

Part number	Lever or bolts	Description
ULTRA HB 6		
70250254	single lever	for hoods
70250250	single lever bolts	for bases
ULTRA HB 10		
70250255	double levers	for hoods
70250251	double lever bolts	for bases

Part number	Lever or bolts	Description
ULTRA HB 16		
70250256	double levers	for hoods
70250252	double lever bolts	for bases
ULTRA HB 24		
70250257	double levers	for hoods
70250253	double lever bolts	for bases

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EPIC® rectangular hole punch

For EPIC® HB panel mount bases and SKINTOP® multi-cable bushing systems

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/CUBE MULTI 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.

Requirements for manual operation: One draw stud set and one punch & die set in the required size

Requirements for hydraulic operation: One punch & die set in the required size and if needed, one ¾" draw stud

¾" × 7" draw stud

Part number
61U00198

¾" × 7" draw stud set

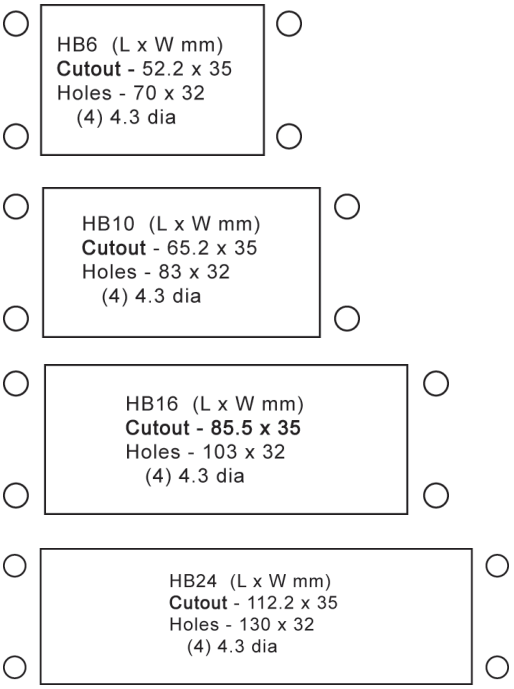
Set includes: draw stud, drive nut, counter nut, ball bearing, and spacer

Part number
61U00197

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	

Panel cutouts



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Easy Strip 2
Stripping & cutting tool

For PVC and similarly insulated conductors.
Includes “X” blade cartridge.

Size range	Part number
up to 8 AWG (10 mm²)	61735800

Crimp tool & case

Contact tools

Crimp dies
page 289

Locators
page 289

Removal tools
page 289

Crimp range	Part number
26 - 8 AWG (0.14 - 10 mm²)	11147000

Module removal tool
For EPIC® MC series inserts

For removing EPIC® MC series modules from module mounting frames
Required for 3, 4+PE, 5, 10 & 20 contact modules; dummy, cage clamp, Ethernet & pneumatic modules

Part number
11171200

Approvals

RoHS

Adjustable torque screwdriver

Torque settings	Part number
0.3 - 1.2 Nm (2.7 - 10.6 in-lbs)	61813958

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Flat gaskets
For EPIC® HB & HA panel mount bases

HB series

Part number	For EPIC® housing
10051000	HB 6
10051200	HB 10
10051400	HB 16
10051600	HB 24
10052000	HB 32
10052200	HB 48

HA series

Part number	For EPIC® housing
10607100	HA 3/4
10607200	HA 10
10607300	HA 16
10607600	HA 32
10052000	HA 48
10052200	HA 64

Approvals

RoHS

Replacement parts
For EPIC® rectangular inserts

Description	Part number	For EPIC® inserts	Pack size
Screw with O-ring	44423017	HD 7, HD 8	10
Replacement screw	44423018	STA	10
Male switch contact	44423021	HBVE	1

Approvals

RoHS

Replacement parts
For EPIC® rectangular housings

Description	Part number	For EPIC® housings
Lever + 2x threaded lever-mounting bolts	10017101	HB 48, HA 64 panel mount bases
Black plastic roller	10055000	HB single lever housings
Plated steel clip	10056014	HB single lever housings
Heavy duty stainless steel roller	10055100	HB single lever housings
Heavy duty stainless steel clip	10056013	HB single lever housings

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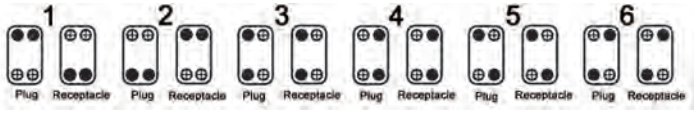
Coding with key pin

Coding is used when several connectors are mounted next to one another. This helps prevent incorrect connections.

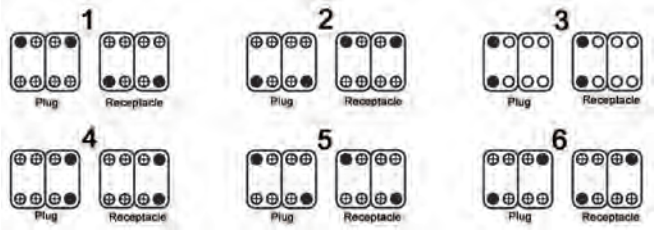
Part number	For EPIC® inserts	Pack size
10019000	HA, HBE, HEE, HBS, HBVE, HD, HDD, MC, Power K	50
10509000	STA	10

key positions for 1 insert



● key pin ⊕ fixing screw

key positions for 2 inserts

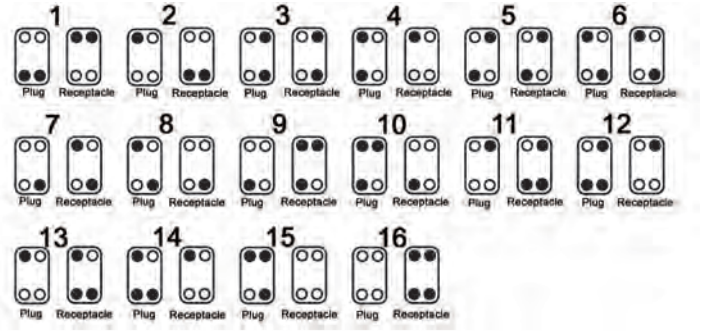


Coding with guide pin & socket

For screw, crimp & cage clamp termination

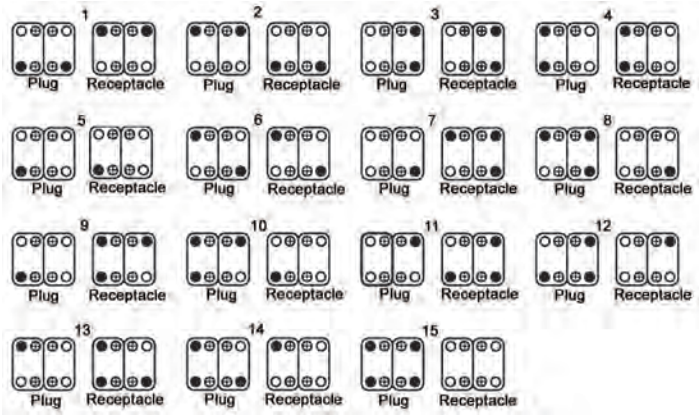
Part number	For EPIC® inserts	Pack size
Guide pin		
11280000	HA, HBE, HBS, HBVE, HEE, HD, HDD, MC, Power K	50
Guide socket		
11281000	HA, HBE, HBS, HBVE, HEE, HD, HDD, MC, Power K	50

key positions for 1 insert



● guide pin ◯ guide socket ⊕ fixing screw

key positions for 2 inserts



Coding with contact loss

HA 3/4

HQ 5

HQ 12

Part number	For EPIC® inserts	Pack size
10451400	HA 3/4	50
10436500	HQ 5	10
44424052	HQ 12	10

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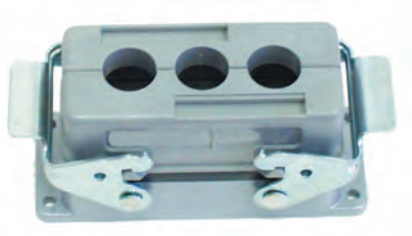
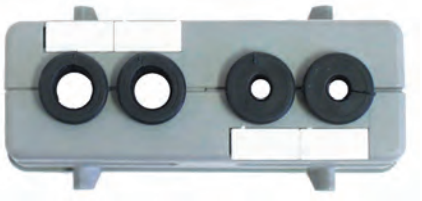
HB split hoods with double latch bolts

For EPIC® HB 16 & HB 24 housings





Split hoods allow three or four cable assemblies to pass through one hood, providing a convenient way to pass finished cables into a panel without having to re-terminate the assembly. A maximum of four cables ranging in size from 3 mm to 16 mm each may pass through a single hood.

Both the HBSH 16 and HBSH 24 hoods can accommodate any combination of the grommets listed below. When used with the grommets, the split hood provides an IP54 environmental seal.

Part number	Gland openings	Cable outer diameter	EPIC® HB panel mount base
HBSH16	3 openings	3 mm - 16 mm	100720C0
HBSH24	4 openings	3 mm - 16 mm	101020C0

Split hood grommets

Thermoplastic rubber split grommets are available in a range of sizes. The grommets seal around the cables and provide IP54 protection as well as strain relief in the mated and assembled position. The HBSH 16 housing is capable of accommodating 3 glands; the HBSH 24 housing can accommodate 4 glands.

Technical data

Material:	thermoplastic rubber (UL approved)
Temperature range:	-40°C to +140°C

Part number	Clamp range mm	Pack size
SHG 3	3 - 4	10
SHG 4	4 - 5	10
SHG 5	5 - 6	10
SHG 6	6 - 7	10
SHG 7	7 - 8	10
SHG 8	8 - 9	10
SHG 9	9 - 10	10

Part number	Clamp range mm	Pack size
SHG10	10 - 11	10
SHG11	11 - 12	10
SHG12	12 - 13	10
SHG13	13 - 14	10
SHG14	14 - 15	10
SHG15	15 - 16	10
SHG 0	blank	10

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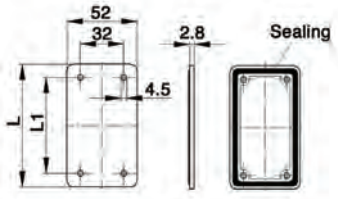
Cover plates for panel cutouts

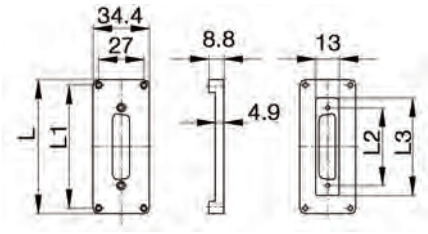


Part number	Size	Dimensions (mm)	
		L	L1
10018920	HB 6	90.5	70.0
10018921	HB 10	103.0	83.3
10018922	HB 16	123.5	103.0
10018923	HB 24	150.0	130.0

Plates do not include mounting screws

Adapters for D-sub connectors

Single D-sub connectors

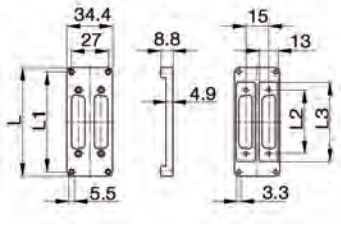


Part number	Size	DB cutout	Dimensions (mm)			
			L	L1	L2	L3
11764200	HB 6	DB 9	51.3	44.0	25.0	31.4
11764202	HB 6	DB 15	51.3	44.0	33.3	39.2

Includes mounting screws

Part number	Size	DB cutout	Dimensions (mm)			
			L	L1	L2	L3
11764300	HB 10	DB 25	64.2	57.0	47.1	53.1
11764400	HB 16	DB 25	85.0	77.5	47.1	53.6

Double D-sub connectors



Part number	Size	DB cutout	Dimensions (mm)			
			L	L1	L2	L3
11764201	HB 6	DB 9 (x2)	51.3	44.0	25.0	31.4
11764203	HB 6	DB 15 (x2)	51.3	44.0	33.3	39.2

Includes mounting screws

Part number	Size	DB cutout	Dimensions (mm)			
			L	L1	L2	L3
11764301	HB 10	DB 25 (x2)	64.2	57.0	47.1	53.1
11764401	HB 16	DB 25 (x2)	85.0	77.5	47.1	53.6

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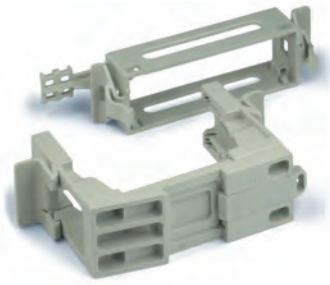
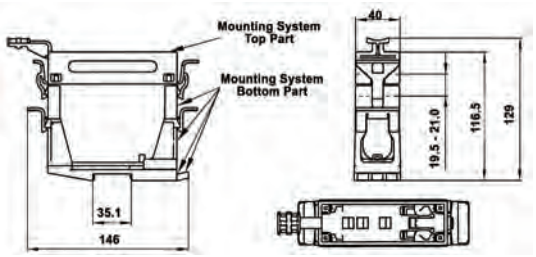
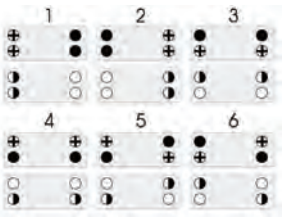
EPIC® QUICK & EASY DIN rail mounting system





all dimensions are in mm

The EPIC® QUICK & EASY system greatly simplifies mounting a wide range of EPIC® connectors onto standard DIN rail without the added cost of housings. The system can be purchased as one complete unit or the upper and lower portions can be purchased separately. The upper portions come in 4 different sizes to accommodate EPIC® HBE, HEE, HBS, HDVE, HD, HDD & Modular (MC) contact inserts. The bottom portion of the system adjusts to accommodate 4 sizes. The system components lock in place via snap hooks and are directly mateable with existing systems. The slider latch allows for quick removal and attachment of the base from the DIN rail for wiring. Also, the unit can be labeled in three places with printed or handwritten labels. A special coding set with key pin allows for coding of the inserts to prevent mismatching side-by-side connectors.



- guide pin
- fixing screw
- coding plug
- open

Complete the installation

Coding set (pack of 50): 10028000

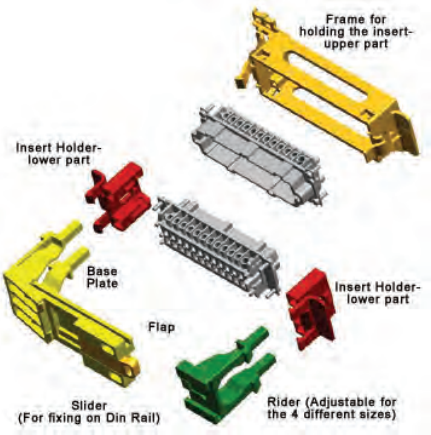
Insert removal tool: 10028100

Technical data

Locking device:	for DIN rail acc. to DIN EN 50022	**Temperature range:**	-40°C to +125°C
Material:	gray phosphorus- & halogen-free polycarbonate	**Combustibility class:**	V-0 per UL 94

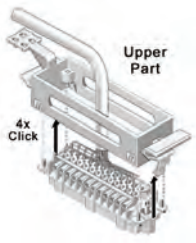
Part number	Size
Complete system	
10027000	HB 6
10027100	HB 10
10027200	HB 16
10027300	HB 24
Upper part only	
10027410	HB 6
10027510	HB 10
10027610	HB 16
10027710	HB 24
Lower part only	
10027810	HB 6 - 24

Size	For EPIC® inserts						
	HBE	HEE	HBS	HBVE	HD	HDD	MC
HB 6	HBE 6	HEE 10	–	–	–	HDD 24	MC 2
HB 10	HBE 10	HEE 18	–	HBVE 3	–	HDD 42	MC 3
HB 16	HBE 16	HEE 32	HBS 6	HBVE 6	HD 40	HDD 72	MC 5
HB 24	HBE 24	HEE 46	–	HBVE 10	HD 64	HDD 108	MC 7



six easy steps: click – snap – ready!

1.



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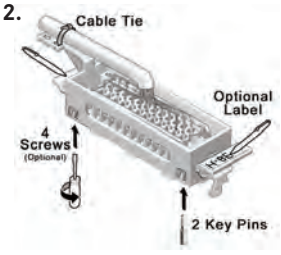

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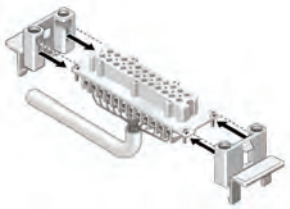

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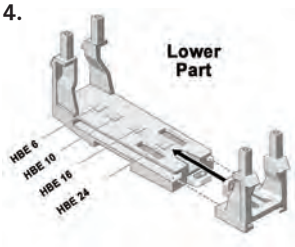

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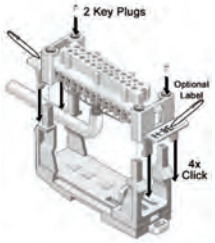

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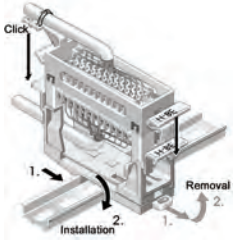

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EPIC®
Circular connectors

438 **Quick select chart**

EPIC® POWER M12
Compact screw-terminated circular connectors for power spplications

439 **EPIC® POWER M12 connectors**

440 **EPIC® POWER M12 panel mount bases**

EPIC® POWER LS1
Rugged nickel-plated zinc connectors for power applications

441 **EPIC® POWER LS1 connectors**

445 **EPIC® POWER LS1 accessories & tools**

445 **Replacement contacts**

EPIC® SIGNAL M23
Rugged nickel-plated zinc connectors for signal applications

446 **EPIC® SIGNAL M23 connectors**

447 **EPIC® SIGNAL M23 contacts**

451 **EPIC® SIGNAL M23 accessories & tools**

EPIC® SIGNAL R3.0
High-density circular connectors for signal applications

452 **EPIC® SIGNAL R3.0 connectors**

452 **EPIC® SIGNAL R3.0 accessories & tools**

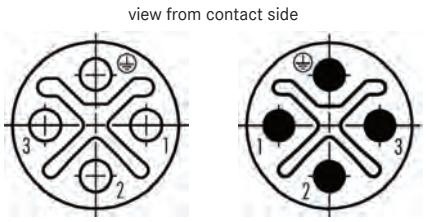
Quick select chart

			EPIC® POWER M12 page 439	EPIC® POWER LS1 page 441	EPIC® SIGNAL M23 page 446	EPIC® SIGNAL R3.0 page 452
Contacts/configuration	4	3+PE	✔			
	6	5+PE		✔		
	6	6			✔	
	7	7			✔	
	8	3+PE+4		✔		
	9	8+1			✔	
	9	9			✔	
	12	12			✔	
	16	16			✔	
	17	17			✔	
	21	21				✔
	26	26				✔
Max. rated voltage	24V					✔ (AC)
	50V				✔	
	60V					✔ (DC)
	100V				✔	
	150V				✔	
	600 - 630V		✔	✔		
Max. rated current	7A			✔	✔	
	7.5A					✔
	12A		✔			
	14A				✔	
	26A			✔		
Termination type/ wire size	screw termination		✔			
	solder termination				✔	✔
	crimp termination			✔	✔	
	26 - 18 AWG			✔	✔	✔
	18 - 16 AWG		✔			
	20 - 14 AWG			✔		
	18 - 14 AWG				✔	
	12 AWG			✔		

Refer to the specific connector series page for more detail

EPIC® POWER M12

Compact screw-terminated circular connectors for power spplications



Approvals

cULus RoHS

Application advantage

- M12 3+PE screw-terminated connector
- Voltage up to 630V and current up to 12A
- Reliable connection in a compact form factor
- Coded connector face eliminates connection errors
- IP67 high protection rating

EPIC® POWER M12 connectors are available in six housing styles and two M16 harness panel mounts. Common to all arrangements is a tough polyamide housing, integral strain relief, environmental protection, and gold-plated contacts. The inherent properties of PA provide good wear resistance and ease of connection.

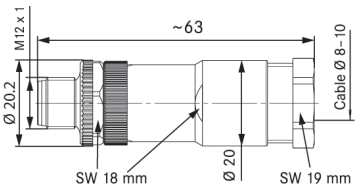
The connector is S-coded and is designed not to accept other devices with different coding. Contacts are gold-plated for improved conductivity and assembly is made easy with screw-in terminals.

Technical data

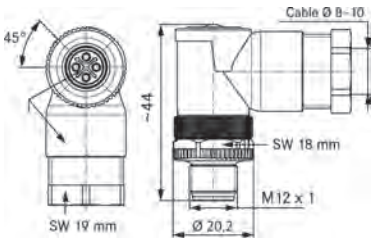
Number of contacts:	3+PE, S-coded	**Protection class:**	IP67
Temperature range:	-40°C to +85°C	**Cable diameter:**	8-10 mm
Rated voltage:	630V	**Mating cycles:**	100
Rated Impulse voltage:	6kV	**Contact material:**	
		- housing:	PA
Rated current:	12A	- contacts:	gold-plated copper alloy
Wire size:	19-16 AWG		

EPIC® POWER M12 connectors

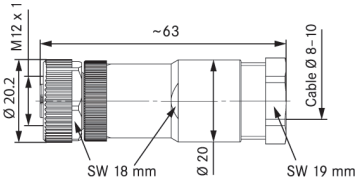
male cable coupler



male 90° cable coupler

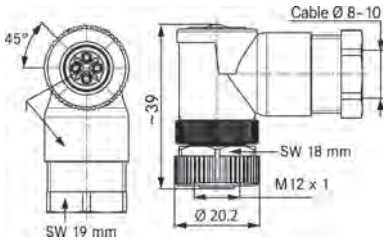


female cable connector



all dimensions are in mm

female 90° cable connector



all dimensions are in mm

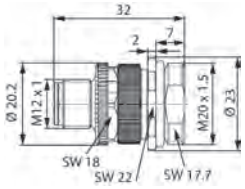
Part number male	Part number female	Contact configuration
M12 straight connectors		
44423140	44423141	3+PE

Part number male	Part number female	Contact configuration
M12 90° connectors		
44423142	44423143	3+PE

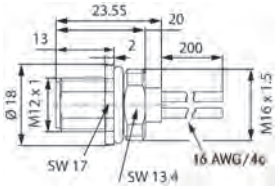
The contact carrier can be fixed in four different 90° positions

EPIC® POWER M12 panel mount bases

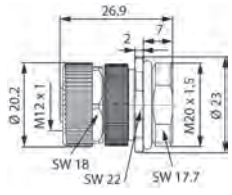
male panel mount base



male pre-wired panel mount base

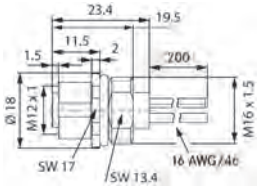


female panel mount base



all dimensions are in mm

female pre-wired panel mount base



all dimensions are in mm

Part number male	Part number female	Contact configuration
M12 field wireable		
44423144	44423145	3+PE

Part number male	Part number female	Contact configuration	Cable incl. ground	Cable length in
M12 pre-wired				
44423146	44423147	3+PE	16 AWG/4c	7.8

If not otherwise specified, all values relating to the product are nominal values.
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EPIC® POWER LS1

Rugged nickel-plated zinc connectors for power applications

Approvals

Application advantage

- Rugged nickel-plated, die-cast zinc body
- Positive vibration protection for use with motor drives and moving assemblies
- Integral EMC cable gland provides strain-relief, IP67/68 protection, and 360° shielding

EPIC® POWER LS1 connectors are available in seven housing styles and two contact configurations. Common to all arrangements are a rugged nickel-plated zinc body, plastic contact insulation body and sleeve, and gold-plated electrical contacts (included with the connector part number). Cable-mounted arrangements also include an integral EMC shield ring, cable clamp, and seal. The figure above shows the general construction of these connectors.

These connectors are offered with two contact configurations. The 5+PE contact configuration for power distribution has 5 contacts plus ground, and is rated at 630V and 25A. For feedback and servo motor with brake applications, the 3+PE+4 contact configuration handles mixed power and signal requirements with 3 contacts plus ground, rated 630V and 26A, and 4 contacts rated 250V and 7A. When used in combination, they connect one flexible cable with another (cable coupler) or one flexible cable to fixed wiring on a machine (appliance coupler).

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:	IP68 (10h/1m)
- style A3:	IP65

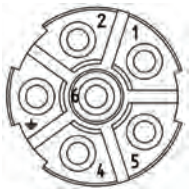
Wire gauge (crimp termination)**:**	
- 2 mm contacts:	
- styles A1, A3, G5:	20 - 14 AWG (0.5 - 2.5 mm²)
- styles D, F:	20 - 12 AWG (0.5 - 4.0 mm²)
- 1 mm contacts:	26 - 18 AWG (0.14 - 1.0 mm²)
Cable diameter:	7.5 - 15.5 mm
- styles D & F:	14 - 17 mm
Mating cycles:	500
Material:	
- housing:	nickel-plated 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

EPIC® POWER LS1

5+PE

view from contact side

male insert

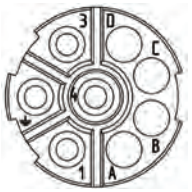


female insert

3+PE+4

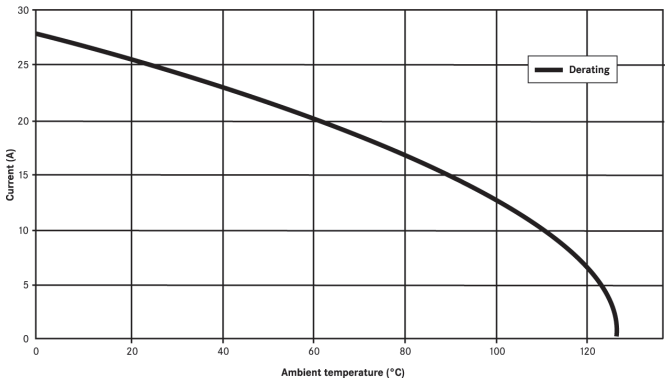
view from contact side

male insert



female insert

Basic and derating curve LS-1. 5+PE, 2,5 mm²
Female hyper boloid



Contact size mm²	Contact size AWG	Max. current according to UL 5+PE	Max. current according to UL 3+PE+4
2 mm contacts			
0.34	22	5A	5A
0.50	20	9A	9A
1.00	18	13A (11A*)	13A (11A*)
1.50	16	12A	12A
2.50	14	22A	22A
4.00	12	25A	26A
1 mm contacts			
up to 0.14	up to 26	–	1A
1.00	18	–	7A

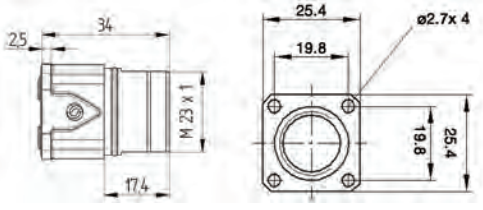
* c UL

EPIC® POWER LS1 style A1

Straight panel mount inlet with male contacts

5+PE

3+PE+4



all dimensions are in mm

Contact configuration	Part number
5+PE	76003000
3+PE+4	76004000

Contact tools

Crimp tool:
11148000

Locator:
11148300

Removal tool:
1 mm contacts: 75017400
2 mm contacts: 75017500

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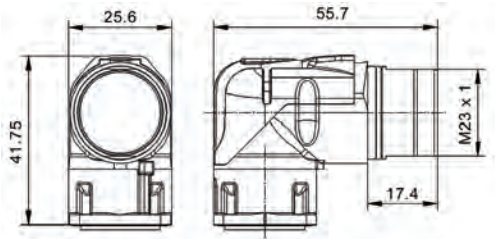
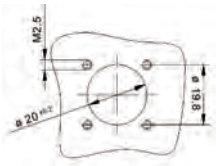
EPIC® POWER LS1 style A3

Angled rotatable panel mount inlet with male contacts

5+PE

3+PE+4





all dimensions are in mm

Contact configuration	Part number
5+PE	24420058
3+PE+4	24420056

Contact tools

Crimp tool: 11148000

Locator: 11148300

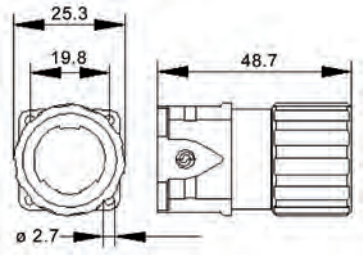
Removal tool:
1 mm contacts: 75017400
2 mm contacts: 75017500

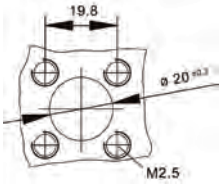
EPIC® POWER LS1 style A6

Panel mount receptacle with female contacts

5+PE

3+PE+4





all dimensions are in mm

Contact configuration	Part number
5+PE	76083000
3+PE+4	76084000

Contact tools

Crimp tool: 11148000

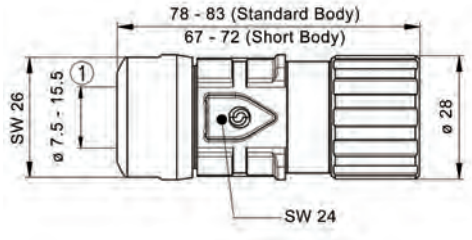
Locator: 11148300

EPIC® POWER LS1 style D6

Cable connector with female contacts

standard body

short body



all dimensions are in mm

Contact tools

Contacts
page 445

Crimp tool: 11148000

Locator: 11148300

Part number	Contact configuration	Wire size	Clamping range mm	Contacts included
Standard body				
76123000	5+PE	20 - 14 AWG	7.5 - 15.5	yes
76124000	3+PE+4	20 - 14 AWG	7.5 - 15.5	yes
44420091	5+PE	12 AWG	14 - 17	yes
44420089	3+PE+4	12 AWG	14 - 17	yes

Part number	Contact configuration	Wire size	Clamping range mm	Contacts included
44420090	5+PE	20 - 14 AWG	14 - 17	no
44420088	3+PE+4	20 - 14 AWG	14 - 17	no
Short body				
76123100	5+PE	20 - 14 AWG	7.5 - 15.5	yes
76124100	3+PE+4	20 - 14 AWG	7.5 - 15.5	yes

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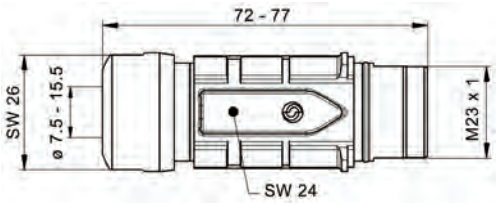
EPIC® POWER LS1 style F6

Cable coupler with male contacts

5+PE

3+PE+4



all dimensions are in mm

Contact tools

Contacts
page 445

Crimp tool:
11148000

Locator:
11148300

Part number	Contact configuration	Wire size	Clamping range mm	Contacts included
76133000	5+PE	20 - 14 AWG	7.5 - 15.5	yes
76134000	3+PE+4	20 - 14 AWG	7.5 - 15.5	yes
44420094	5+PE	20 - 14 AWG	14 - 17	no

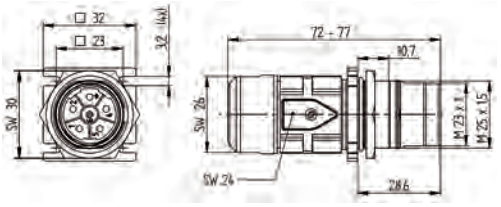
Part number	Contact configuration	Wire size	Clamping range mm	Contacts included
44420092	3+PE+4	20 - 14 AWG	14 - 17	no
44420095	5+PE	12 AWG	14 - 17	yes
44420093	3+PE+4	12 AWG	14 - 17	yes

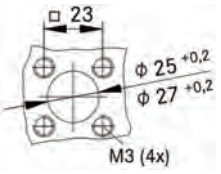
EPIC® POWER LS1 style F7

Cable coupler with male contacts

5+PE

3+PE+4





all dimensions are in mm

Contact configuration	Part number	Clamping range mm
5+PE	76143000	7.5 - 15.5
3+PE+4	76144000	7.5 - 15.5

Contact tools

Crimp tool:
11148000

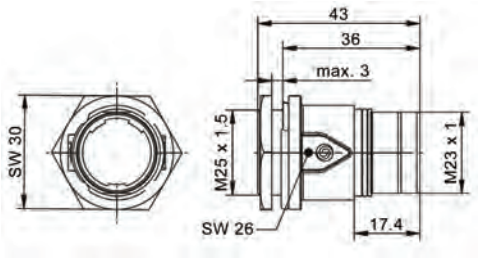
Locator:
11148300

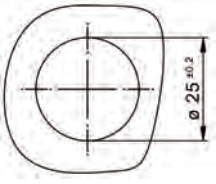
EPIC® POWER LS1 style G5

Straight panel mount inlet with male contacts & locknut

5+PE

3+PE+4





all dimensions are in mm

Contact configuration	Part number
5+PE	76153000
3+PE+4	76154000

Contact tools

Crimp tool:
11148000

Locator:
11148300

Removal tool:
1 mm contacts: 75017400
2 mm contacts: 75017500

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EPIC® POWER LS1 accessories

metal screw cap

Connector style	Part number
A1, A3, F6, F7, G5	75018310

plastic protection cap

Connector style	Part number
A6, D6	75007710
A1, F6, F7, G5	75007810

SILVYN® adapter

Size	Part number
M25 x 1.5	55001310

Adapter allows connection to jacketed cable run in SILVYN® conduit.

EPIC® POWER LS1 tools

crimp tool

Part number
11148000

locator

Part number
11148300

removal tool

Contact size	Part number
1 mm	75017400
2 mm	75017500

Replacement contacts

style A1, A3 & G5

style F6 & F7

style D6 & A6

Part number	Wire size mm²	Wire size AWG	Contact type	Connector style	Strip length mm	Pack size
1 mm contacts						
74033001	0.14 - 1.0	26 - 18	male	A1, A3, G5	8	10
74033000	0.14 - 1.0	26 - 18	male	A1, A3, G5	8	100
74034001	0.14 - 1.0	26 - 18	male	F6, F7	6	10
74034000	0.14 - 1.0	26 - 18	male	F6, F7	6	100
74034501	0.14 - 1.0	26 - 18	female*	D6, A6	6.5	10
74034500	0.14 - 1.0	26 - 18	female*	D6, A6	6.5	100
2 mm contacts						
74033101	0.50 - 2.5	20 - 14	male	A1, A3, G5	7	10
74033100	0.50 - 2.5	20 - 14	male	A1, A3, G5	7	100
74034101	0.50 - 2.5	20 - 14	male	F6, F7	8	10
74034100	0.50 - 2.5	20 - 14	male	F6, F7	8	100
44429371	0.50 - 2.5	20 - 14	female*	D6, A6	8	10
44429370	0.50 - 2.5	20 - 14	female*	D6, A6	8	100
44420103	4.0	12	male	F6, F7	8	100
44420104	4.0	12	female*	D6	8	10
44420105	4.0	12	female*	D6	8	100

* Hyper boloid

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EPIC® SIGNAL M23

Rugged nickel-plated zinc connectors for power applications

Approvals

c UL us · VDE · RoHS

Application advantage

- Rugged nickel-plated, die-cast zinc body
- Positive vibration protection for use with motor drives and moving assemblies
- Integral EMC cable gland provides strain relief, IP67/68 protection, and 360° shielding
- Coding rings ensure correct mating selection in multiple connector installations

EPIC® SIGNAL M23 connectors are available in 11 housing styles that can accommodate 3 different insert keying positions. Inserts are offered in 7 contact configurations for mounting male or female, crimp, or solder contacts. Common to all arrangements are a rugged nickel-plated zinc body, plastic contact insulation body and sleeve, and gold-plated electrical contacts. Cable mounted arrangements also include an integral EMC shield ring and cable clamp and seal. The figure above shows the general construction of these connectors.

The connectors are offered with insert configurations for 6, 7, 8+1, 9, 12, 16 & 17 crimp or solder contacts in either a clockwise or counter-clockwise orientation. Used in combination, they connect one cable to another (cable coupler) or a cable to fixed wiring in a control enclosure or on a machine, instrument, encoder or servo motor.

Technical data

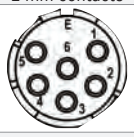
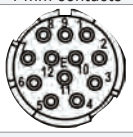
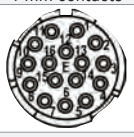
Number of contacts:	6, 7, 8+1, 9, 12, 16, 17
Temperature range:	-25°C to +125°C
Rated voltage:	
- 6, 7, 8+1 & 9 poles:	150V
- 12 & 16 poles:	100V
- 17 poles:	50V
Rated current:	
- 6 & 7 poles:	14A
- 8+1, 9, 12, 16 & 17 poles:	7A
Impulse voltage:	
- 6 & 7 poles:	4kV
- 8+1 poles:	2.5kV
- 9, 12 & 16 poles:	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 mm²)
- 2 mm contacts:	18 - 14 AWG (1.0 - 2.5 mm²)
- solder termination:	
- 1 mm contacts:	up to 18 AWG (1.0 mm²)
- 2 mm contacts:	up to 14 AWG (2.5 mm²)
Cable diameter:	7.0 - 13.5 mm
Mating cycles:	100 minimum
Material:	
- 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

EPIC® SIGNAL M23 inserts

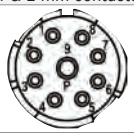
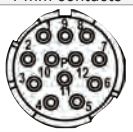
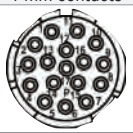
Connector inserts will accept both male and female contacts. A complete connection requires one E-type insert and one P-type insert.

E-type inserts

Description	6 contacts	7 contacts	8+1 contacts	9 contacts	12 contacts	16 contacts	17 contacts
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
insert configurations	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						

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

P-type inserts

Description	6 contacts	7 contacts	8+1 contacts	9 contacts	12 contacts	16 contacts	17 contacts
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
insert configurations	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						

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

EPIC® SIGNAL M23 contacts

Size AWG	Size mm²	Description	Termination type	Part number
1 mm contacts				
26 - 18	0.14 - 1.0	gold male contacts	crimp	72400000
26 - 18	0.14 - 1.0	gold female contacts	crimp	74200600
26 - 18	0.14 - 1.0	HYP gold female contacts	crimp	74034500
up to 18	up to 1.0	gold male contacts	solder	72402000
up to 18	up to 1.0	gold female contacts	solder	72402600

Size AWG	Size mm²	Description	Termination type	Part number
2 mm contacts				
18 - 14	1.0 - 2.5	gold male contacts	crimp	72401000
18 - 14	1.0 - 2.5	gold female contacts	crimp	72401600
up to 14	up to 2.5	gold male contacts	solder	72403000
up to 14	up to 2.5	gold female contacts	solder	72404000

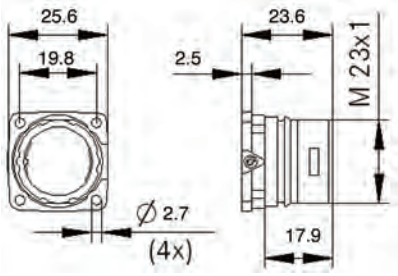
EPIC® SIGNAL M23 style A1

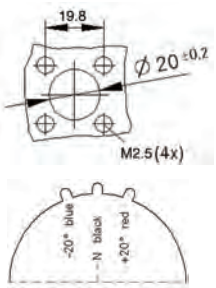
Straight panel mount base

keying: N

keying: -20°

keying: +20°





all dimensions are in mm

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

Contact tools

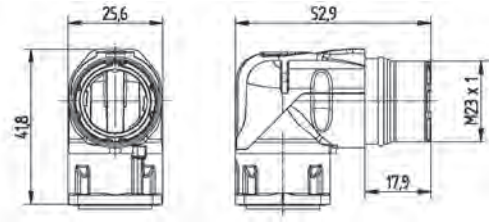
Crimp tool: 11148000

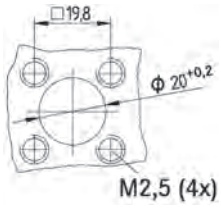
Locator: 11148300

Removal tool: 44420078

EPIC® SIGNAL M23 style A3

Angled panel mount base





all dimensions are in mm

Part number
24420055

Contact tools

Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

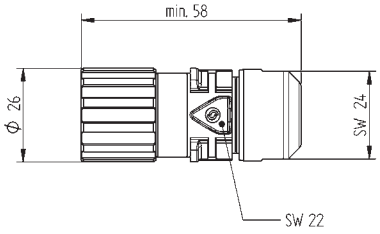
EPIC® SIGNAL M23 style D6

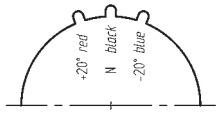
Cable connector

keying: N

keying: -20°

keying: +20°





all dimensions are in mm

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

Contact tools

Crimp tool: 11148000

Locator: 11148300

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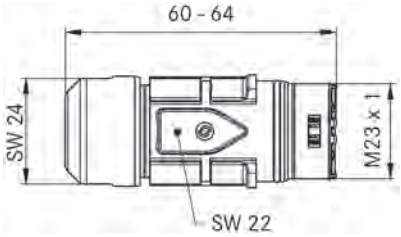
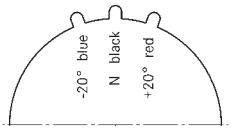
EPIC® SIGNAL M23 style F6

Cable coupler

keying: N keying: -20° keying: +20°





all dimensions are in mm

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

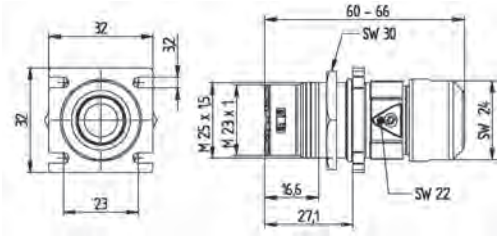
Contact tools

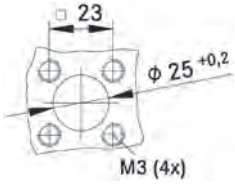
Crimp tool: 11148000

Locator: 11148300

EPIC® SIGNAL M23 style F7

Cable coupler with flange





all dimensions are in mm

Max. cable outer diameter	Part number
7 - 10 mm	44420009
9.5 - 13.5 mm	44420011

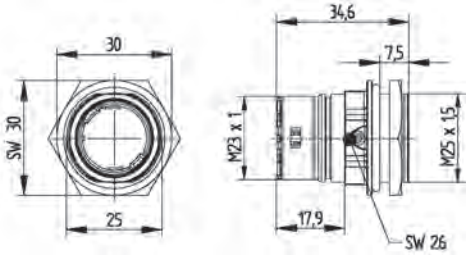
Contact tools

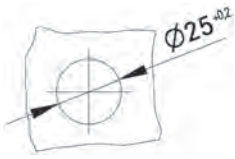
Crimp tool: 11148000

Locator: 11148300

EPIC® SIGNAL M23 style G5

Front wall mounting with locknut or M25 x 1.5 thread mount





all dimensions are in mm

Keying	Part number
N	44420046
-20°	44420044
+20°	44420048

Contact tools

Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

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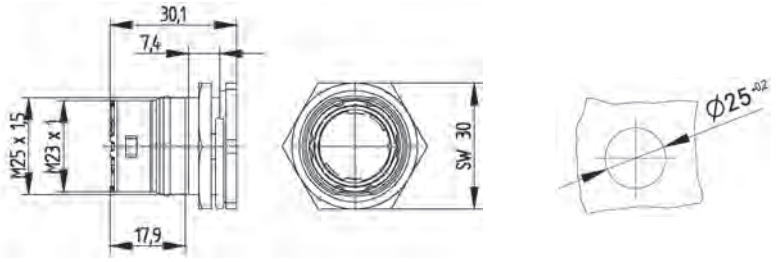
EPIC® SIGNAL M23 style G6

Rear wall mounting



all dimensions are in mm

Part number
44420071

Contact tools

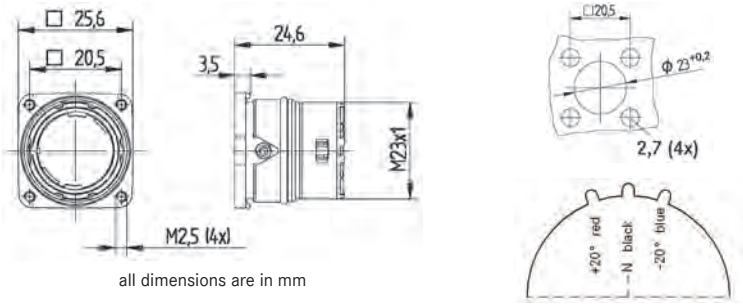
Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

EPIC® SIGNAL M23 style B1

Rear wall mounting



all dimensions are in mm

Keying	Part number
N	44420024
-20°	44420022
+20°	44420026

Contact tools

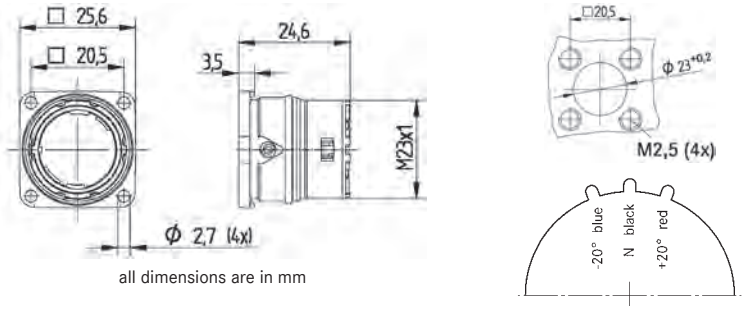
Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

EPIC® SIGNAL M23 style B2

Rear wall mounting



all dimensions are in mm

Keying	Part number
N	44420050
-20°	44420052
+20°	44420035

Contact tools

Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

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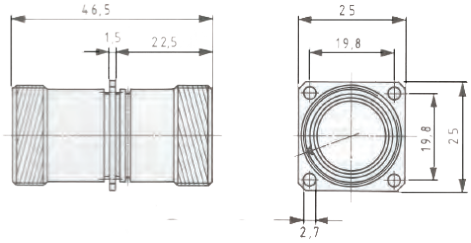
EPIC® SIGNAL M23 style C2

Panel mount feed-through



all dimensions are in mm

Number of contacts	Part number
12	00010108
17	00010521

Contact tools

Crimp tool: 11148000

Locator: 11148300

Removal tool: 44420078

EPIC® SIGNAL M23 accessories & tools

metal screw cap

Style 1 Style 2

Style	Connector Style	Part number
1	A, F6, G	75018110
2	A, B, F7, O	75018010

plastic protection cap

Size	Part number
D6	75007710
A, B, F, G, O	75007810

SILVYN® adapter

Adapter allows connection to jacketed cable run in SILVYN® conduit.

Size	Part number
M20 x 1.5	55001312

removal tool

Part number
44420078

EPIC® SIGNAL R3.0

High-density circular connectors for signal applications

The EPIC® SIGNAL R3.0 series of circular connectors is an extension to the EPIC® SIGNAL M23 series when additional contacts are required.

Parts are specified separately but sold assembled. Always use combination part number when ordering.

Technical data

Number of contacts:	21, 26
Temperature range:	-40°C to +100°C
- short term:	up to +125°C
Rated voltage:	24V AC / 60V DC
Rated current:	7.5A
Test voltage:	1.5 kV AC
Protection class:	IP65/67 when mated DIN 40050 (depending on cable gland used)
Wire gauge	
- solder contacts:	up to 18 AWG (1 mm²)
Cable diameter:	6.5 - 16 mm

Mating cycles:	500 (higher mating cycles depends on the application)
Insulation:	B: corresponds to equipment used primarily in precision engineering workshops, laboratories, testing centers, hospitals, etc.
Material:	
- housing:	nickel-plated copper alloy
- insulation body:	thermoplastic, V-0 per UL 94
- contacts:	gold-plated copper alloy
- gaskets:	neoprene
Contact resistance:	< 3 mΩ

Combination part numbers

Always use combination part number when ordering.

Example:

20.2040AF (housing) + 40.200121 (insert) =

00009045 (combination)

Housing part number	21 contact inserts		26 contact inserts	
	male 40.200121	female 40.250121	male 40.200126	female 40.250126
	Connectors			
202040AF	00009045	00008749	00008899	00008829
202050AF	00008854	00008779	00008822	00008979
	Panel mount sockets			
202010AA	00008747	00008867	00008825	00008746
202020AA	00009082	00009135	–	00008978
202030AA	–	–	–	00009470
202060AA	00009371	00009057	00009894	00009005

EPIC® SIGNAL R3.0 accessories & tools

metal screw cap

Size	Part number
A	50201120

flat gasket

Size	Part number
A	50201203
B1, B2	50202203

sealing ring

Size	Part number
G1	50206204

assembly tool

Size	Part number
D6, F6	50200800

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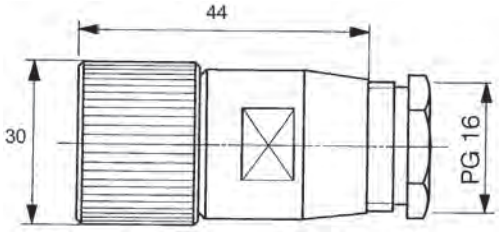
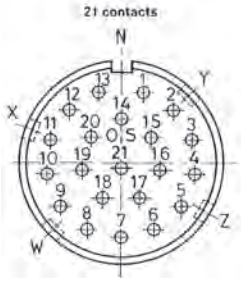
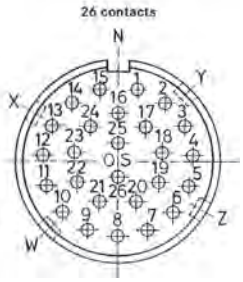
EPIC® SIGNAL R3.0 style D6

Cable connector; 202040AF



all dimensions are in mm





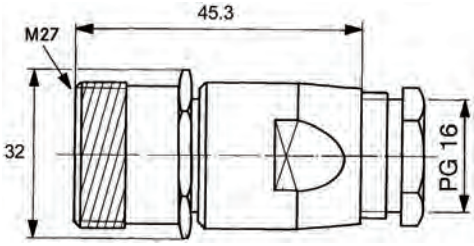
Number of contacts	Part number male (E)	Part number female (P)
21	00009045	00008749
26	00008899	00008829

Complete the installation

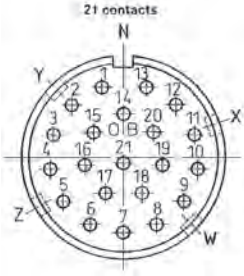
Assembly tool: 50200800

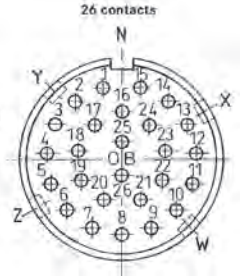
EPIC® SIGNAL R3.0 style F6

Cable connector; 202050AF



all dimensions are in mm





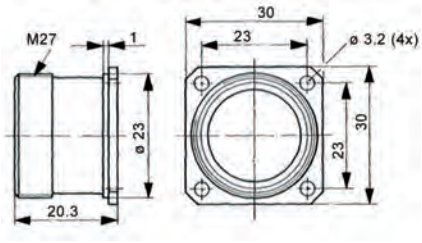
Number of contacts	Part number male (E)	Part number female (P)
21	00008854	00008779
26	00008822	00008979

Complete the installation

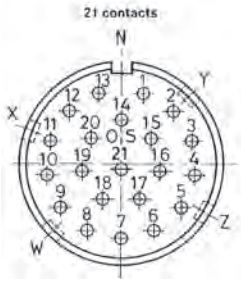
Assembly tool: 50200800

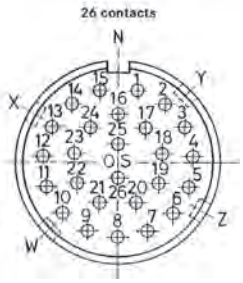
EPIC® SIGNAL R3.0 style A

Front wall mounting; 202010AA



all dimensions are in mm





Number of contacts	Part number male (E)	Part number female (P)
21	00008747	00008867
26	00008825	00008746

Complete the installation

Screw cap: 50201120

Flat gasket: 50201203

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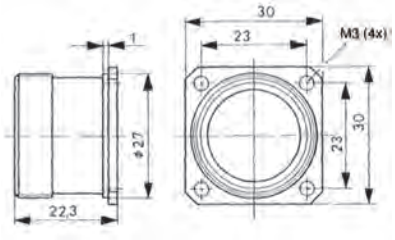
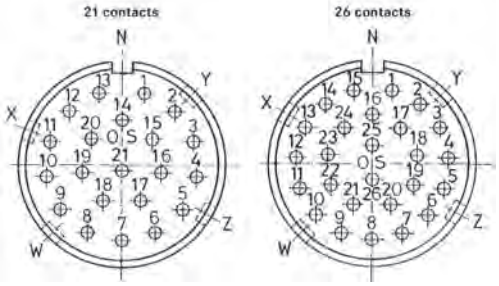
EPIC® SIGNAL R3.0 style B1

Inside of panel mounting; 202020AA



all dimensions are in mm



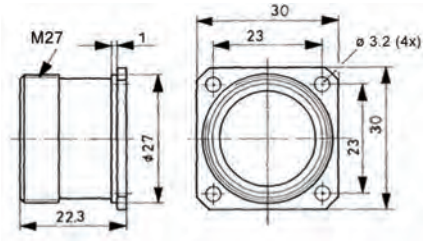
Number of contacts	Part number male (E)	Part number female (P)
21	00009082	00009135
26	–	00008978

Complete the installation

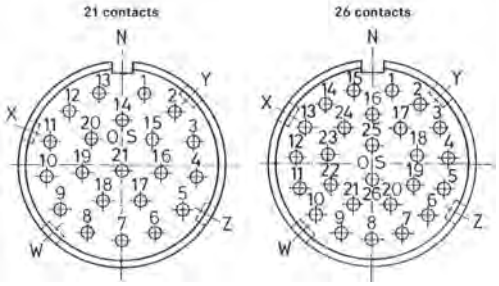
Flat gasket: 50202203

EPIC® SIGNAL R3.0 style B2

Inside of panel mounting; 202030AA



all dimensions are in mm



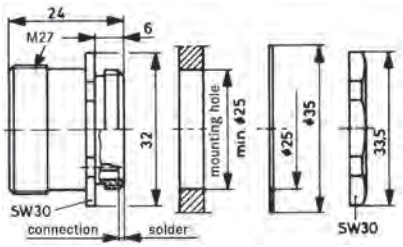
Number of contacts	Part number male (E)	Part number female (P)
21	–	–
26	–	00009470

Complete the installation

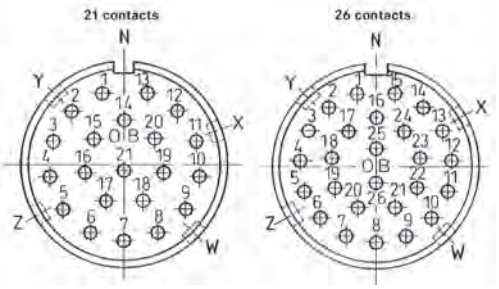
Flat gasket: 50202203

EPIC® SIGNAL R3.0 style G1

Inside of panel with locknut; 202060AA



all dimensions are in mm



Number of contacts	Part number male (E)	Part number female (P)
21	00009371	00009057
26	00009894	00009005

Complete the installation

Sealing ring: 50206204

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC®
Pin & sleeve connectors

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Mining

Airport

Commercial port

Hydroelectric power plant

Hospital

Railway tunnel

Food & beverage

Quarry

EPIC® CEE & MULTIMAX pin & sleeve connectors

EPIC® CEE

EPIC® MULTIMAX

EPIC® pin & sleeve connectors are designed to meet the power connectivity needs and requirements of your business. Whether you are designing machinery for that important international customer, specifying mobile power solutions on the factory floor, or planning outdoor power distribution systems, EPIC® pin & sleeve connectors and interlocked switched-socket outlets can provide a safe, cost-effective solution for your industrial wiring requirements.

EPIC® pin & sleeve connectors conform to IEC 60309-1 and -2 standards and are UL approved. North American devices are available for 20, 30, 60, and 100A. International-rated devices are available for 16, 32, 63, and 125A. Both North American and international devices are available in splash-proof (IP44) and watertight (IP67) configurations.

EPIC® ULYSSE interlocked socket outlets

The revolutionary, fully-patented ULYSSE range of interlocked switched-socket outlets offers several unique features:

- Outlets comes prewired, saving time and money.
- Outlets have been tested and rated to both IP66 and IP67, and provide an environmental seal from high-pressure jets of water and temporary immersion.
- Disconnect-rated cam switches allow direct switching of induction motor loads.
- Safety interlocks incorporate numerous safety precautions: power is prevented from being turned on unless a plug has been inserted in the outlet, plugs cannot be removed while the power is turned on, and the enclosure interior is prevented from being accessed while the device is energized.
- Double insulation eliminates electrical paths from the inside of the enclosure to the exterior.
- Outlets have a tough, reinforced thermoset plastic enclosure, which passes a 960°C glow wire test and provides outstanding resistance to extremes of heat and chemical agents.
- UL 508 approved as a manual motor starter.

Quality & certification

LAPP is ISO 9001-2000 certified, and as such all North American products carry the c UL us mark and are certified for use in the US and Canada in accordance with UL 1682 & UL 1686 standards and CSA standard C22.2 No. 182.1-02. The UL file number for EPIC® pin & sleeve connectors is E223777. All products comply with IEC 60309-1, -2, and carry the CE mark.

EPIC® pin & sleeve connectors

EPIC® MULTIMAX plugs

Protected straight plug with rapid wiring (IP44)

Characteristics: Patented click-lock housing eliminates screws and speeds up assembly. Patented self-locking cable grip is vibration-proof and eliminates external stress to the cable seal and contact terminals. Available in 20 & 30A North American configurations and 16 & 32A international versions. International 16, 32 & 63A connectors are rated IP67.

Uses: Indoor cable-to-cable connections & cable-to-power outlet connections

EPIC® CEE plugs

High-performance protected straight plug (IP44)

Characteristics: Nickel-plated rounded pins provide easy insertion. Incorporates a non-slip grip, cable entry with a screw-in cable gland, an internal saddle-clamp strain relief, and a very thick self-extinguishing body and grip. Available in 20 & 30A North American and 16 & 32A international configurations.

Uses: Indoor cable-to-cable connections & cable-to-power outlet connections

High-performance watertight straight plug (IP67)

Characteristics: Nickel-plated rounded pins provide easy insertion. Incorporates a non-slip grip, cable entry with a screw-in cable gland, an internal saddle-clamp strain relief, a very thick self-extinguishing body and grip, and a gasketed locking ring for watertight connections.

Uses: Indoor cable-to-cable connections & cable-to-power outlet connections

High-performance 90° angled protected plug (IP44)

Characteristics: Nickel-plated rounded pins provide easy insertion. Incorporates cable entry with a screw-in cable gland, an internal saddle-clamp strain relief, and a very thick self-extinguishing body and grip. Available in 20A North American and 16A international configurations.

Uses: Indoor cable-to-power outlet connections

High-performance 90° angled watertight plug (IP67)

Characteristics: Nickel-plated rounded pins provide easy insertion. Incorporates cable entry with a screw-in cable gland, an internal saddle-clamp strain relief, a very thick self-extinguishing body and grip, and a gasketed locking ring for watertight connections. Available in 20A North American and 16A international configurations.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor cable-to-power outlet connections

EPIC® CEE inlets

90° angled protected wall mounting appliance inlet (IP44)

Characteristics: Suitable for both wall mounting and mounting on machines. Incorporates a smooth upper wall for drilling a cable entry hole and a very thick self-extinguishing plug body and case. Available in 20 & 30A North American and 16 & 32A international configurations.

Uses: Indoor equipment-to-cable connections

90° angled watertight wall mounting appliance inlet (IP67)

Characteristics: Suitable for both wall mounting and mounting on machines. Incorporates a smooth upper wall for drilling a cable entry hole, a very thick self-extinguishing plug body and case, and a gasketed locking ring for watertight connections. Available in 20 & 30A North American and 16 & 32A International configurations.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor equipment-to-cable connections

High-performance watertight straight flush mounting appliance inlet (IP67)

Characteristics: Nickel-plated rounded pins provide easy insertion. Incorporates a thermoset plastic contact holder, a very thick self-extinguishing plug body, and a gasketed locking ring for watertight connections. Available in 60 & 100A North American and 63 & 125A international configurations.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres, outdoor equipment-to-cable connections

EPIC® MULTIMAX connectors

Protected straight connector with rapid wiring (IP44)

Characteristics: Patented click-lock housing eliminates screws and speeds up assembly. Patented self-locking cable grip is vibration-proof and eliminates external stress to the cable seal and contact terminals. Available in 20 & 30A North American and 16 & 32A international configurations. International 16, 32 & 63A connectors are rated IP67.

Uses: Indoor cable-to-cable connections & cable-to-equipment inlet connections

EPIC® CEE connectors

High-performance watertight straight connector (IP67)

Characteristics: Solid brass rounded socket contacts provide easy insertion. Incorporates a very thick self-extinguishing body and non-slip grip, cable entry with a screw-in cable gland, an internal saddle-clamp strain relief, and a gasketed locking ring for watertight connections.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor cable-to-cable connections & cable-to-equipment inlet connections

EPIC® CEE panel mount receptacles

Straight flush mounting protected sockt outlet (IP44)

Characteristics: Solid brass rounded socket contacts provide easy insertion. Incorporates a very thick self-extinguishing body and cover and non-aging elastomer gaskets. Available in 20 & 30A North American and 16 & 32A international configurations.

Uses: Indoor fixed power source-to-cable plug connections

Watertight angled flush mounting socket outlet (IP67)

Characteristics: Solid brass rounded socket contacts provide easy insertion. Incorporates a very thick self-extinguishing body and cover, non-aging elastomer gaskets, and a gasketed locking ring for watertight connections.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor fixed power source-to-cable plug connections

Angled wall mounting protected socket outlet (IP44)

Characteristics: Suitable for both wall mounting and mounting on machines. Solid brass rounded socket contacts provide easy insertion. Incorporates outer cable entry through screw-type cable gland and a very thick self-extinguishing body and cover. Available in 20 & 30A North American and 16 & 32A international configurations.

Uses: Indoor fixed power source-to-cable plug connections

EPIC® ULYSSE mechanical interlock

Wall mounting interlocked socket outlet with fuse holder base (IP66/67)

Characteristics: Heavy duty reinforced thermoset plastic modular enclosure for superior heat & chemical resistance. Incorporates a heavy duty safety interlocked disconnect-rated switch for direct switching of motor loads. Available in 20, 30 & 60A North American and 16, 32 & 63A international configurations. UL 508 approved as a manual motor controller.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor fixed source disconnect-to-cable plug connections

EPIC® ALUPRES mechanical interlock

Wall mounting interlocked socket outlet in aluminum alloy (IP55/67)

Characteristics: Heavy duty aluminum alloy modular enclosure for superior strength and heat resistance. Incorporates a heavy duty safety interlocked disconnect-rated switch for direct switching of motor loads. IP67 for 20 & 30A outlets (16 & 32 A international) and IP55 for 60A outlets (63A international). UL 508 approved as a manual motor controller.

Uses: Indoor wash-down/corrosive & heavy dust atmospheres; outdoor fixed source disconnect-to-cable plug connections

Pin & sleeve construction

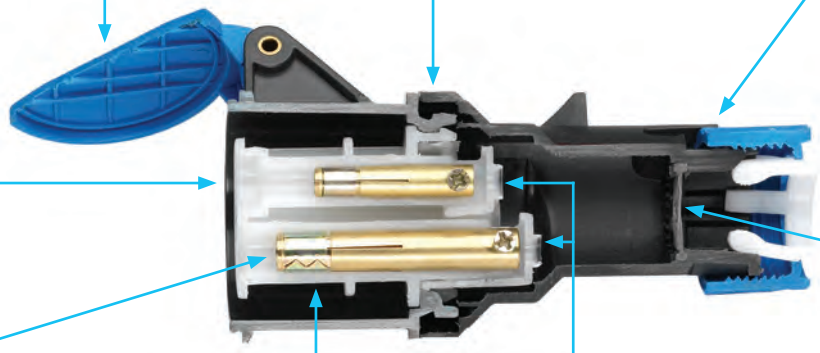
MULTIMAX IP44 connectors

The spring-loaded cover automatically protects against dirt and splashed water when the connector is not engaged. Color-coding identifies voltage.

The patented click-lock housing locks and unlocks in 1/16 turn, eliminating assembly screws and speeding up overall assembly.

The patented self-locking cable grip is vibration-proof and prevents accidental loosening.

The contact carrier protects recessed contacts and orients the ground contact position based on voltage rating, preventing connector mis-mating.



The 4-finger cable grip secures cable, prevents pullout, and eliminates strain on contact terminals.

A patented universal neoprene membrane seal accommodates a wide range of cable diameters and cable surface irregularities. It seals out dirt, splashed water, and contaminants.

High-copper solid brass, self-adjusting contacts provide easy insertion & withdrawal and minimize heat buildup.

A longer ground contact assures a first-make, last-break connection.

All of the contact terminal screws face in the same direction to simplify wiring.

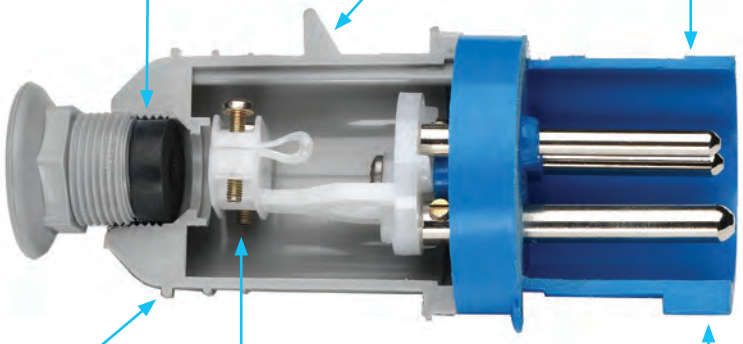
CEE IP44 plugs

A neoprene onion-skin grommet accommodates a wide range of cable diameters. It seals out dirt and contaminants and is watertight.

A retaining tab engages with the mating connector's cover to prevent unintentional withdrawal.

The high-impact non-conductive thermoplastic housing enhances electrical safety and provides excellent chemical resistance.

A threaded cable gland protects the cable jacket and accepts a variety of SKINTOP® strain reliefs and cable glands.



Nickel-plated high-copper solid brass contacts provide easy insertion & withdrawal, improved chemical resistance, and minimal heat buildup.

The ribbed body provides a secure hand grip.

An internal saddle-style cable clamp secures cable, prevents pullout, and eliminates strain on contact terminals.

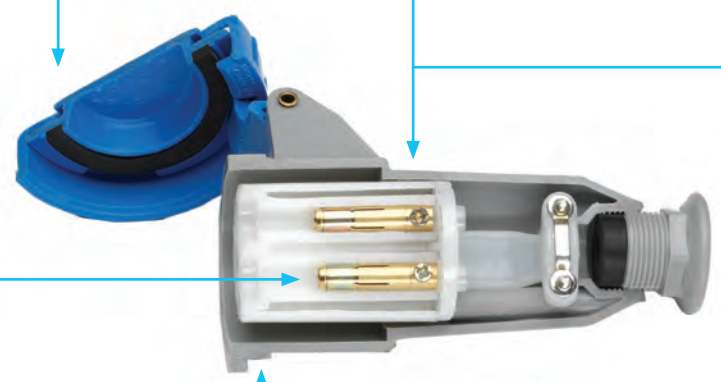
The molded housing keyway aligns mating devices and prevents connector mis-mating.

CEE IP67 connectors

The spring-loaded gasketed, locking cover automatically protects against dirt and splashed water when the connector is not engaged. Color-coding identifies voltage.

The contact carrier protects recessed contacts and orients the ground contact position based on voltage rating, preventing connector mis-mating.

For connectors rated 60A and above, a thermoset plastic contact carrier provides increased flame and arcing resistance in high-current, high-temperature applications.



High-copper solid brass, self-adjusting contacts provide easy insertion & withdrawal and minimize heat buildup.

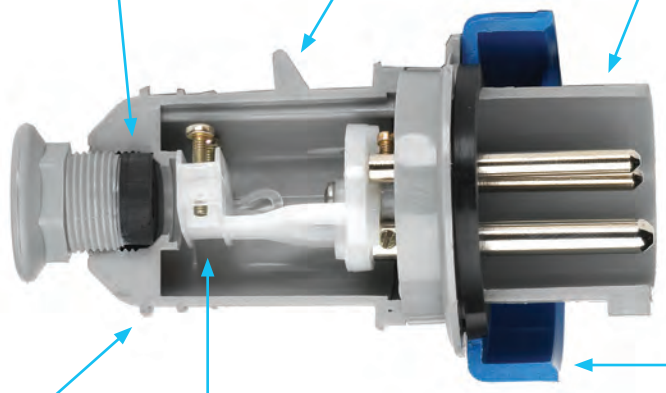
The molded housing keyway aligns mating devices and prevents connector mis-mating.

CEE IP67 plugs

A neoprene onion-skin grommet accommodates a wide range of cable diameters. It seals out dirt and contaminants and is watertight.

A retaining tab engages with the mating connector's cover to prevent unintentional withdrawal.

The high-impact non-conductive thermoplastic housing enhances electrical safety and provides excellent chemical resistance.



A threaded cable gland protects the cable jacket and accepts a variety of SKINTOP® strain reliefs and cable glands.

Nickel-plated high-copper solid brass contacts provide easy insertion & withdrawal, improved chemical resistance, and minimal heat buildup.

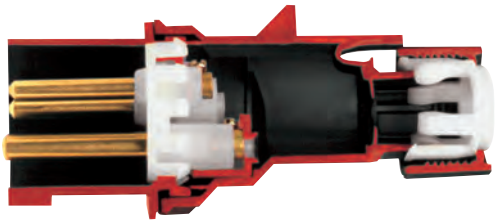
The locking ring and gasket provide an IP67 watertight seal when mated with a connector.

The ribbed body provides a secure hand grip.

An internal saddle-style cable clamp secures cable, prevents pullout, and eliminates strain on contact terminals.

EPIC® MULTIMAX installation

Assembly In 20 seconds



Snaplock function provides speed in assembling

The grip is assembled without any tools with 1/16 turn.

Guaranteed cable clamping over time

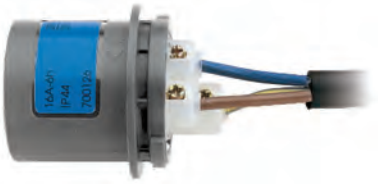
The cord grip and shade ring locking device prevent accidental cable loosening.

Protection rating even with the cable stressed

The radial clamping cord grip is located external to the universal membrane seal and does not compromise the seal's environmental rating.

1. Insert the prepared cable into the grip.

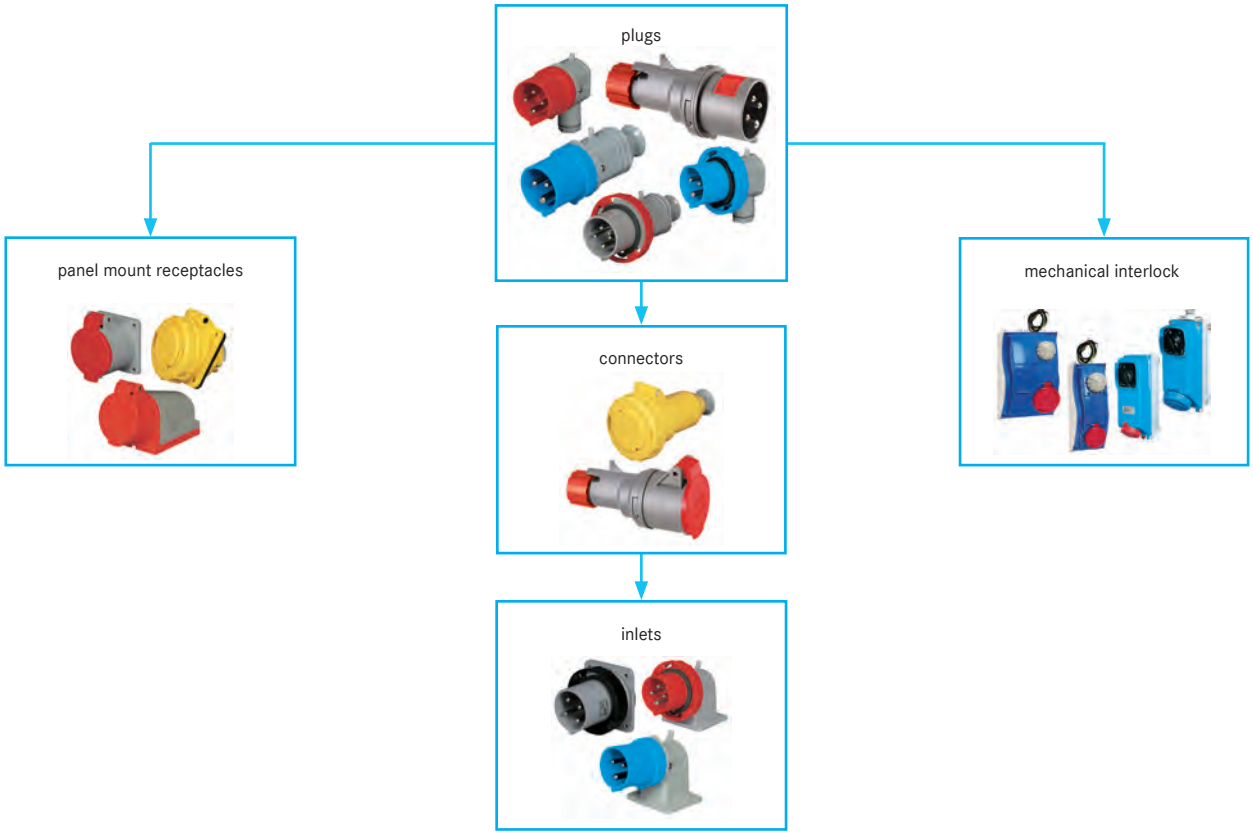
2. Tighten the terminal screws, which are unscrewed in advance and positioned on the same side.



3. Close the grip until it clicks (1/16 turn).

4. Lock the cable by turning the shade ring until it is locked.

Connector mating configurations



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EPIC® ULYSSE

High-performance mechanical interlocks; IP66/67

The EPIC® ULYSSE series of interlocked switched-socket outlets are ideal for indoor and outdoor power service on/off control. The range consists of North American (20, 30 & 60A) and international (16, 32 & 63A) models. These interlocked outlets can be mounted individually by using the integral mounting feet or as part of a multiple-unit distribution board assembly by utilizing the patented quick-mount support plate and a selection of wire connection junction boxes. The rugged, double-insulated thermoset plastic enclosure, internal fuse holder, and zinc-plated steel interlocking mechanism contribute to long-term operator safety. The rotary switches used in the EPIC® ULYSSE series socket outlets are AC23A-AC3 category devices suitable for direct-switching of motor and other highly inductive electrical loads. They have a conditional short circuit rating of 10,000A. EPIC® ULYSSE devices meet or exceed compliance with the following standards:

- CEI EN 60309
- CEI EN 60742
- IEC 529
- UL 1686
- CEI EN 60947
- IEC 60309
- IEC 742
- UL 508
- CEI EN 60529
- IEC 947
- UL 1682

Application advantage

- **Quick & easy installation:** Used individually, surface mounting is quickly accomplished using the four integral mounting feet. A patented quick-mount support plate (optional) allows multiple units to be assembled into a distribution panel. All devices are provided pre-wired with stripped and numbered cables 70 cm long, eliminating the need to open the enclosure. This reduces installation time by up to 30%.
- **Thermoset plastic enclosure:** The use of low smoke, low toxicity, halogen-free reinforced thermoset plastic ensures the highest possible dimensional stability and resistance to heat, chemical, and mechanical stress. A double-insulated design ensures that no electrical path exists from internal components to the outside of the enclosure.
- **Double environmental protection (watertight):** All EPIC® ULYSSE devices carry both IP66 and IP67 protection ratings for watertight service against violent water jets as well as accidental immersion.
- **Mechanical interlock:** The zinc-plated steel interlock mechanism guarantees electrical operation only when a plug is inserted into the outlet. Plug removal is blocked while power is turned on, eliminating arc-flash hazards
- **Ergonomic control with lockout:** The unique semi-spherical control knob is easily operated even with a gloved hand. To prevent unauthorized operation, the knob can be padlocked in either the “on” or “off” position.
- **Direct motor control:** Use of AC23A-AC3 category cam switches allows direct switching of motor and other highly inductive electrical loads and have a conditional short circuit rating of 10,000A. UL 508 approved as a manual motor controller.

Safety features

EPIC® ULYSSE devices are made of reinforced thermoset plastic. These products are ideal for outdoor applications. Their rugged industrial design ensures high impact resistance (20 joules) at both low and high temperature extremes, electrical insulation, outstanding resistance to extremes of heat and fire (960°C glow wire test; self-extinguishing in acc. with UL 94: V-0), as well as resistance to chemical agents, humidity, prolonged UV exposure, and atmospheric agents. Fuse holders and receptacle contacts are finger safe.

EPIC® ULYSSE devices use standard IEC-60269 cylindrical fuses. Fuse selection is application-specific and typically based on providing short circuit line protection (gL-gG fast-acting type) or motor protection (aM slow-acting type). Consult with a fuse manufacturer for proper selection and to place an order. LAPP does not carry fuses. The table here shows general fuse information for each EPIC® ULYSSE outlet size. Order one fuse for each outlet pole.

Recommended applications

Manufacturing facilities; food processing; breweries & distilleries; amusement parks; marinas; ski facilities; machine power distribution; boiler room locations

Specifications

	North American	International
Number of contacts	3, 4, 5	3, 4, 5
Contact configurations	1+N+PE, 2+PE, 3+PE, 3+N+PE	2+PE, 3+PE, 3+N+PE
Rated voltage (others available)	125V, 250V, 480V, 120/208V	110-130V, 200-250V, 380-415V
Rated current	20A, 30A, 60A	16A, 32A, 63A
Switched category	AC23A	AC23A
Wire gauge **20/16A:** **30/32A:** **60/63A:**	 12 AWG 8 AWG 6 AWG	 12 AWG 8 AWG 6 AWG
Cable OD range	11 - 25 mm	11 - 25 mm
Protection class	IP66 & IP67	IP66 & IP67
Housing material	UV-stabilized thermoset plastic	UV-stabilized thermoset plastic
Flammability	self-extinguishing: V-0 per UL 94	self-extinguishing: V-0 per UL 94
Standards of conformity	UL 508, UL 1682, UL 1686	IEC 60309-1 and -2, IEC 60529, IEC60947-3
Approvals	CE, cULus, E330239	CE, IMQ

Fuses

EPIC® ULYSSE devices use standard IEC-60209 cylindrical fuses. Fuse selection is application-specific and typically based on providing short circuit line protection (gL-gG fast-acting type) or motor protection (aM slow-acting type). Consult with a fuse manufacturer for proper selection and to place an order. LAPP does not carry fuses.

The table here shows general fuse information for each device outlet size. Order one fuse for each outlet pole.

Device rating	Fuse size A x B mm	Fuse current	Fuse voltage
20/16A	10 x 38	0.5 - 32A	500V
30/32A	14 x 51	2 - 50A	500V
63A	22 x 58	16 - 100A	500V

EPIC® ALUPRES

High-performance mechanical interlocks; IP55/67

The EPIC® ALUPRES series of interlocked switched-socket outlets are ideal for indoor and outdoor power service on/off control. The range consists of North American (20, 30 & 60A) and international (16, 32 & 63A) models. These devices can be mounted individually by using the integral mounting tabs or as a part of a multiple-unit distribution board assembly. The rugged aluminum alloy enclosure and zinc-plated steel interlocking mechanism contribute to long service life and long-term operator safety. The rotary switches used in EPIC® ALUPRES are AC23A-AC3 category devices suitable for direct switching of motor and other highly inductive electrical loads. They have a conditional short circuit rating of 10,000A. EPIC® ALUPRES devices comply with the following standards:

- CEI EN 60309
- CEI EN 60742
- IEC 529
- UL 1686
- CEI EN 60947
- IEC 60309
- IEC 742
- UL 508
- CEI EN 60529
- IEC 947
- UL 1682

Application advantage

- **Quick & easy installation:** Used individually, surface mounting is quickly accomplished using the four integral mounting tabs. An optional support plate allows multiple units to be assembled into a distribution panel.
- **Rugged aluminum alloy enclosure:** The powder-painted aluminum alloy enclosure provides excellent resistance to heat and corrosive agents. Resistance to impact and mechanical stress is over 50% greater than outlets constructed using standard thermoplastics. It is made with low smoke, low toxicity, and halogen-free materials.
- **Environmental protection (watertight):** 20/16A & 30/32A devices are IP67 rated for watertight service against violent water jets. The 60/63A devices are IP55 rated for watertight service in lower pressure wash-down applications.
- **Mechanical interlock:** The zinc-plated steel interlock mechanism guarantees electrical operation only when a plug is inserted into the outlet. Plug removal is blocked while power is turned on, eliminating arc-flash hazard.
- **Direct motor control:** Use of AC23A-AC3 category cam switches allows direct switching of motor and other highly inductive electrical loads and has a conditional short circuit rating of 10,000A.

Construction

EPIC® ALUPRES devices are made of a die-cast aluminum alloy and are powder-painted with polymerized non-scratch paint at 180°C. This makes them ideally suited for abrasive environments. Their rugged industrial design ensures high impact resistance (30 joules) at both low and high temperature extremes, and outstanding resistance to extremes of fire and heat. A special chrome treatment applied prior to painting ensures protection from corrosion.

Recommended applications

Steelworks; foundries; rolling mills; tunnels; abrasive areas near metal removal machinery and carpentry machines

Motor horsepower & full load

Switch outlet maximum current / power		
20A / 10kW	30A / 15kW	60A / 30kW
120V, 1ph HP/FLA		
1.5 hp/20A	2 hp/24A	5 hp/56A
240V, 1ph HP/FLA		
3 hp/17A	5 hp/28A	10 hp/50A
240V, 3ph HP/FLA		
5 hp/15.2A	10 hp/28A	15 hp/42A
480V, 3ph HP/FLA		
10 hp/14A	15 hp/21A	30 hp/40A

Horsepower rating per UL 508 approval listing for ULYSSE & ALUPRES devices: Manual Motor Controller. FLA per NFPA 70 Table 430.148 (single phase AC motors) and Table 420.150 (three phase AC motors).

Specifications

	North American	International
Number of contacts	3, 4, 5	3, 4, 5
Contact configurations	1+N+PE, 2+PE, 3+PE, 3+N+PE	2+PE, 3+PE, 3+N+PE
Rated voltage (others available)	125V, 250V, 480V, 120/208V	110-130V, 200-250V, 380-415V
Rated current	20A, 30A, 60A	16A, 32A, 63A
Switched category	AC23A	AC23A
Wire gauge **20/16A:** **30/32A:** **60/63A:**	 12 AWG 8 AWG 6 AWG	 12 AWG 8 AWG 6 AWG
Cable OD range (entry flange w/gland)	depending on entry flange selection: 9–20 mm (20/16A), 9–26 mm (all others)	depending on entry flange selection: 9–20 mm (20/16A), 9–26 mm (all others)
Protection class	IP67 (20/16A & 30/32A), IP55 (60/63A)	IP67 (20/16A & 30/32A), IP55 (60/63A)
Housing material	die-cast aluminum alloy	die-cast aluminum alloy
Flammability	self-extinguishing: V-0 per UL 94	self-extinguishing: V-0 per UL 94
Standards of conformity	UL 508, UL 1682, UL 1686	IEC 60309-1 and -2, IEC 60529, IEC60947-3
Approvals	CE, cULus, E330239	CE, IMQ

North American standard

Dimensional drawings can be found on the indicated pages. Circuit wiring diagrams can be found on page 479. Additional configurations are available: see www.lappusa.com for a complete listing.

Complete the installation

Covers for IP67 plugs
page 479

Approvals

c UL us

IP44 splash-proof connectors

Voltage / current rating	# of poles	Ground-clock position	Color code	MULTIMAX plug	CEE 90° plug	MULTIMAX connector	CEE flush mount receptacle	CEE surface mount receptacle	ULYSSE mechanical interlock	ALUPRES mechanical interlock
20A										
125	1+N+PE	4		700124FX	6100216316	720124FX	6100510316	6100111316	400124FX	460124FX
250	2+PE	6		700126FX	6100216306	720126FX	6100510306	6100111306	400126FX	460126FX*
3Ø 250	3+PE	9		700139FX	6100216409	720139FX	6100410409	6100111409	400139FX	460139FX*
3Ø 480	3+PE	7		700137FX	6100216419	720137FX	6100410419	6100111419	400137FX	460137FX*
30A										
125	1+N+PE	4		700224FX	–	720224FX	6100430316	6100131316	400224FX	460224FX
250	2+PE	6		700226FX	–	720226FX	6100430306	6100131306	400226FX	460226FX
3Ø 250	3+PE	9		700239FX	–	720239FX	6100430409	6100131409	400239FX	460239FX
3Ø 480	3+PE	7		700237FX	–	720237FX	6100430419	6100131419	400237FX	460237FX
3Ø Y 120/208	3+N+PE	9		700249FX	–	720249FX	6100430509	6100131509	400249FX	460249FX

* Includes flat flange & NPT ½" gland

IP67 watertight connectors

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*
20A											
125	1+N+PE	4		6100219316	6100319316	6100519316	–	6100619316	–	400124FX	460124FX
250	2+PE	6		6100219306	6100319306	6100519306	–	6100619306	–	400126FX	460126FX*
3Ø 250	3+PE	9		6100218409	6100318409	6100519409	–	6100619409	–	400139FX	460139FX*
3Ø 480	3+PE	7		6100218419	6100318419	6100519419	–	6100619319	–	400137FX	460137FX*
30A											
125	1+N+PE	4		6100239316	6100339316	6100529316	–	6100639316	–	400224FX	460224FX
250	2+PE	6		6100239306	6100339306	6100539306	–	6100639306	–	400226FX	460226FX
3Ø 250	3+PE	9		6100238409	6100338409	6100539409	–	6100639409	–	400239FX	460239FX
3Ø 480	3+PE	7		6100239319	6100338419	6100539419	–	6100639419	–	400237FX	460237FX
3Ø Y 120/208	3+N+PE	9		6100238509	6100338509	6100539509	–	6100639509	–	400249FX	460249FX
60A											
3Ø 250	3+PE	9		6100269409	6100369409	6100569409	6100469409	–	–	408339FX	460339FX**
3Ø 480	3+PE	7		6100369419	6100369419	6100569419	6100469419	–	–	408337FX	460337FX**
3Ø 120/208	3+N+PE	9		6100269509	6100369509	6100569509	6100469509	–	–	408349FX	460349FX**
100A											
3Ø 250	3+PE	9		6100279421	6100379421	6100579421	6100479421	–	6100679421	–	–
3Ø 480	3+PE	7		6100279419	6100379419	6100579419	6100479419	–	6100479419	–	–
3Ø 120/208	3+N+PE	9		6100279521	6100379521	6100579521	6100479521	–	6100479521	–	–

* Includes flat flange & NPT ½" gland
** Rated IP55

International standard

Dimensional drawings can be found on the indicated pages. Circuit wiring diagrams can be found on page 479. Additional configurations are available: see www.lappusa.com for a complete listing.

Complete the installation

Covers for IP67 plugs
page 479

Approvals

CE

IP44 splash-proof connectors

Voltage / current rating	# of poles	Ground-clock position	Color code	MULTIMAX plug	MULTIMAX connector	CEE flush mount receptacle	CEE surface mount receptacle	ULYSSE mechanical interlock	ALUPRES mechanical interlock
16A									
110 - 130	2+PE	4		700124	720124	431611	471262	400124	460124*
200 - 250	2+PE	6		700126	720126	431622	471362	400126	460126*
200 - 250	3+PE	9		700139	720139	441622	471372	400139	460139*
380 - 415	3+PE	6		700136	720136	441638	471472	400136	460136*
200 - 250	3+N+PE	9		700149	720149	451622	471332	400149	–
380 - 415	3+N+PE	6		700146	720146	451638	471482	400146	460146*
32A									
110 - 130	2+PE	4		700224	720224	433211	471266	400224	460224
200 - 250	2+PE	6		700226	720226	433222	471366	400226	460226
200 - 250	3+PE	9		700239	720239	443222	471376	400239	460239
380 - 415	3+PE	6		700236	720236	443238	471476	400236	460236
200 - 250	3+N+PE	9		700249	720249	453222	471386	400249	460249
380 - 415	3+N+PE	6		700246	720246	453238	471486	400246	460246
Connector dimensions				page 467	page 469	page 472	page 474	page 477	page 478

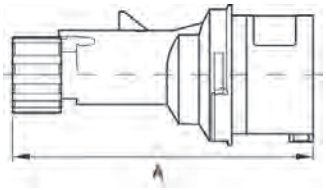
* Includes flat flange & NPT ½" gland

IP67 watertight connectors

Voltage / current rating	# of poles	Ground-clock position	Color code	MULTIMAX plug	MULTIMAX connector	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
16A													
110 - 130	2+PE	4		710124	730124	477203	473203	471263	–	476203	–	400124	460124*
200 - 250	2+PE	6		710126	730126	477303	473303	471363	–	476303	–	400126	460126*
200 - 250	3+PE	9		–	–	477313	473313	471373	–	476313	–	400139	460139*
380 - 415	3+PE	6		710136	730136	477413	473413	471473	–	476413	–	400136	460136*
200 - 250	3+N+PE	9		–	–	477323	473323	471333	–	476323	–	400149	–
380 - 415	3+N+PE	6		710146	730146	477423	473423	471483	–	476423	–	400146	460146*
32A													
110 - 130	2+PE	4		710224	730224	477206	473206	471267	–	476206	–	400224	460224
200 - 250	2+PE	6		710226	730226	477306	473306	471367	–	476306	–	400226	460226
200 - 250	3+PE	9		–	–	477316	473316	471377	–	476316	–	400239	460239
380 - 415	3+PE	6		710236	730236	477416	473416	471477	–	476416	–	400236	460236
200 - 250	3+N+PE	9		–	–	477326	473326	471387	–	476326	–	400249	460249
380 - 415	3+N+PE	6		710246	730246	477426	473426	471487	–	476426	–	400246	460246
63A													
200 - 250	3+PE	9		–	–	477317	473317	546322	446322	–	476317	400339	460339**
380 - 415	3+PE	6		710336	730336	477417	346338	546338	446338	–	746338	400336	–
200 - 250	3+N+PE	9		–	–	477327	473327	556322	456322	–	476327	400349	460349**
380 - 415	3+N+PE	6		710346	730346	477427	356338	556338	456338	–	756338	400346	–
125A													
200 - 250	3+PE	9		–	–	477318	473318	549322	449322	–	476318	–	–
380 - 415	3+PE	6		–	–	249538	349538	549538	449538	–	749538	–	–
200 - 250	3+N+PE	9		–	–	477328	473328	559322	459322	–	476328	–	–
380 - 415	3+N+PE	6		–	–	259538	359538	559538	459538	–	759538	–	–
Connector dimensions				page 467	page 469	page 468	page 470	page 471	page 473	page 475	page 476	page 477	page 478

* Includes flat flange & NPT ½" gland
** Rated IP55

EPIC® MULTIMAX plugs (IP44)



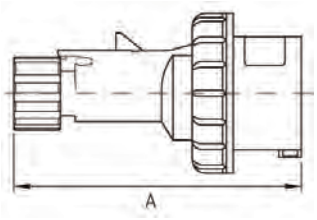
North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
20A						
700124FX	3	125	1+N+PE	4		5.00
700126FX	3	250	2+PE	6		
700139FX	4	3Ø 250	3+PE	9		5.28
700137FX	4	3Ø 480	3+PE	7		
30A						
700224FX	3	125	1+N+PE	4		6.06
700226FX	3	250	2+PE	6		
700239FX	4	3Ø 250	3+PE	9		
700237FX	4	3Ø 480	3+PE	7		
700249FX	5	3Ø Y 120/208	3+N+PE	9		6.81

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
16A						
700124	3	110 - 130	2+PE	4		5.00
700126	3	200 - 250	2+PE	6		
700139	4	200 - 250	3+PE	9		5.28
700136	4	380 - 415	3+PE	6		
700149	5	200 - 250	3+N+PE	9		5.59
700146	5	380 - 415	3+N+PE	6		
32A						
700224	3	110 - 130	2+PE	4		6.06
700226	3	200 - 250	2+PE	6		
700239	4	200 - 250	3+PE	9		
700236	4	380 - 415	3+PE	6		
700249	5	200 - 250	3+N+PE	9		6.81
700246	5	380 - 415	3+N+PE	6		

EPIC® MULTIMAX plugs (IP67)

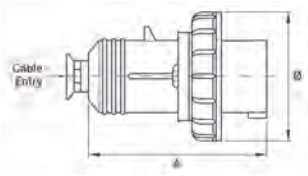


International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
16A						
710124	3	110 - 130	2+PE	4		5.31
710126	3	200 - 250	2+PE	6		
710136	4	380 - 415	3+PE	6		5.52
710146	5	380 - 415	3+N+PE	6		5.91
32A						
710224	3	110 - 130	2+PE	4		6.50
710226	3	200 - 250	2+PE	6		
710236	4	380 - 415	3+PE	6		
710246	5	380 - 415	3+N+PE	6		6.69
63A						
710336	4	380 - 415	3+PE	6		9.84
710346	5	380 - 415	3+N+PE	6		

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® CEE plugs (IP67)



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	Ø in	Cable entry	SKINTOP® SL PG thread
20A									
477203FX	3	125	1+N+PE	4		4.41	2.87	PG 13	53015030
477303FX	3	250	2+PE	6					
477313FX	4	3Ø 250	3+PE	9		4.61	3.15	PG 16	53015040
477513FX	4	3Ø 480	3+PE	7					
30A									
477206FX	3	125	1+N+PE	4		5.55	3.70	PG 21	53015050
477306FX	3	250	2+PE	6					
477316FX	4	3Ø 250	3+PE	9					
477516FX	4	3Ø 480	3+PE	7					
477326FX	5	3Ø Y 120/208	3+N+PE	9		5.55	3.98	PG 21	53015050
60A									
477317FX	4	3Ø 250	3+PE	9		8.19	4.33	PG 29	53015060
477517FX	4	3Ø 480	3+PE	7					
477327FX	5	3Ø 120/208	3+N+PE	9					
100A									
477318FX	4	3Ø 250	3+PE	9		11.14	4.96	NP 2"	–
249550FX	4	3Ø 480	3+PE	7					
477328FX	5	3Ø 120/208	3+N+PE	9					

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	Ø in	Cable entry	SKINTOP® SL PG thread
16A									
477203	3	110 - 130	2+PE	4		4.41	2.87	PG 13	53015030
477303	3	200 - 250	2+PE	6					
477313	4	200 - 250	3+PE	9		4.61	3.15	PG 16	53015040
477413	4	380 - 415	3+PE	6					
477323	5	200 - 250	3+N+PE	9		4.88	3.46	PG 16	53015040
477423	5	380 - 415	3+N+PE	6					
32A									
477206	3	110 - 130	2+PE	4		5.55	3.70	PG 21	53015050
477306	3	200 - 250	2+PE	6					
477316	4	200 - 250	3+PE	9					
477416	4	380 - 415	3+PE	6					
477326	5	200 - 250	3+N+PE	9		5.55	3.98	PG 21	53015050
477426	5	380 - 415	3+N+PE	6					
63A									
477317	4	200 - 250	3+PE	9		8.19	4.33	PG 29	53015060
477417	4	380 - 415	3+PE	6					
477327	5	200 - 250	3+N+PE	9					
477427	5	380 - 415	3+N+PE	6					
125A									
477318	4	200 - 250	3+PE	9		11.14	4.96	NPT 2"	–
249538	4	380 - 415	3+PE	6					
477328	5	200 - 250	3+N+PE	9					
259538	5	380 - 415	3+N+PE	6					

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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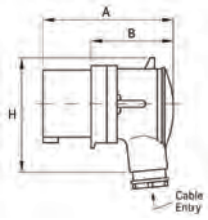
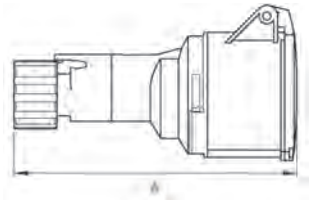
EPIC® CEE 90° plugs (IP44)



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	H in	Cable entry	SKINTOP® SL PG thread
20A										
475202FX	3	125	1+N+PE	4		3.50	2.05	2.87	PG 13	53015030
475302FX	3	250	2+PE	6						
475312FX	4	3Ø 250	3+PE	9		3.82	2.36	3.31	PG 16	53015040
475512FX	4	3Ø 480	3+PE	7						

EPIC® MULTIMAX connectors (IP44)



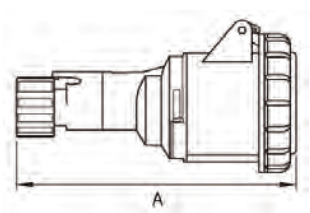
North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
20A						
720124FX	3	125	1+N+PE	4		5.28
720126FX	3	250	2+PE	6		
720139FX	4	3Ø 250	3+PE	9		5.63
720137FX	4	3Ø 480	3+PE	7		
30A						
720224FX	3	125	1+N+PE	4		6.42
720226FX	3	250	2+PE	6		
720239FX	4	3Ø 250	3+PE	9		
720237FX	4	3Ø 480	3+PE	7		
720249FX	5	3Ø Y 120/208	3+N+PE	9		7.17

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
16A						
720124	3	110 - 130	2+PE	4		5.28
720126	3	200 - 250	2+PE	6		
720139	4	200 - 250	3+PE	9		5.63
720136	4	380 - 415	3+PE	6		
720149	5	200 - 250	3+N+PE	9		5.94
720146	5	380 - 415	3+N+PE	6		
32A						
720224	3	110 - 130	2+PE	4		6.42
720226	3	200 - 250	2+PE	6		
720239	4	200 - 250	3+PE	9		
720236	4	380 - 415	3+PE	6		
720249	5	200 - 250	3+N+PE	9		7.17
720246	5	380 - 415	3+N+PE	6		

EPIC® MULTIMAX connectors (IP67)



International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in
16A						
730124	3	110 - 130	2+PE	4		5.71
730126	3	200 - 250	2+PE	6		
730136	4	380 - 415	3+PE	6		5.91
730146	5	380 - 415	3+N+PE	6		6.50
32A						
730224	3	110 - 130	2+PE	4		7.09
730226	3	200 - 250	2+PE	6		
730236	4	380 - 415	3+PE	6		
730246	5	380 - 415	3+N+PE	6		7.28
63A						
730336	4	380 - 415	3+PE	6		10.63
730346	5	380 - 415	3+N+PE	6		

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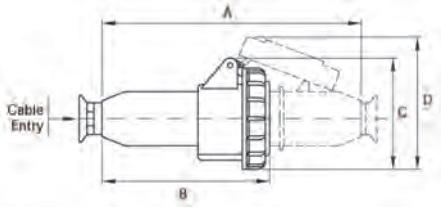
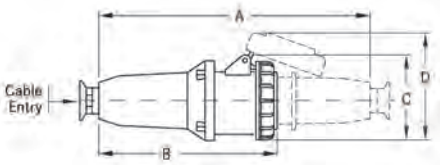
EPIC® CEE connectors (IP67)

16A, 20A, 30A, 32A



60A, 63A, 100A, 125A



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	Cable entry	SKINTOP® SL PG thread
20A											
473203FX	3	125	1+N+PE	4		7.28	4.72	3.23	3.93	PG 13	53015030
473303FX	3	250	2+PE	6							
473313FX	4	3Ø 250	3+PE	9		7.68	4.88	3.54	4.21	PG 16	53015040
473513FX	4	3Ø 480	3+PE	7							
30A											
473206FX	3	125	1+N+PE	4		9.37	6.02	4.13	4.92	PG 21	53015050
473306FX	3	250	2+PE	6							
473316FX	4	3Ø 250	3+PE	9							
473516FX	4	3Ø 480	3+PE	7							
473326FX	5	3Ø Y 120/208	3+N+PE	9		9.37	6.02	4.33	5.12	PG 21	53015050
60A											
473317FX	4	3Ø 250	3+PE	9		14.76	9.76	4.72	5.91	PG 29	53015060
346350FX	4	3Ø 480	3+PE	7							
473327FX	5	3Ø 120/208	3+N+PE	9							
100A											
473318FX	4	3Ø 250	3+PE	9		19.02	11.42	5.12	6.61	NPT 2"	–
349550FX	4	3Ø 480	3+PE	7							
473328FX	5	3Ø 120/208	3+N+PE	9							

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	Cable entry	SKINTOP® SL PG thread
16A											
473203	3	110 - 130	2+PE	4		7.28	4.72	3.23	3.93	PG 13	53015030
473303	3	200 - 250	2+PE	6							
473313	4	200 - 250	3+PE	9		7.68	4.88	3.54	4.21	PG 16	53015040
473413	4	380 - 415	3+PE	6							
473323	5	200 - 250	3+N+PE	9		7.87	4.88	3.93	4.61	PG 16	53015040
473423	5	380 - 415	3+N+PE	6							
32A											
473206	3	110 - 130	2+PE	4		9.37	6.02	4.13	4.92	PG 21	53015050
473306	3	200 - 250	2+PE	6							
473316	4	200 - 250	3+PE	9							
473416	4	380 - 415	3+PE	6							
473326	5	200 - 250	3+N+PE	9		9.37	6.02	4.33	5.12	PG 21	53015050
473426	5	380 - 415	3+N+PE	6							
63A											
473317	4	200 - 250	3+PE	9		14.76	9.76	4.72	5.91	PG 29	53015060
346338	4	380 - 415	3+PE	6							
473327	5	200 - 250	3+N+PE	9							
356338	5	380 - 415	3+N+PE	6							
125A											
473318	4	200 - 250	3+PE	9		19.02	11.42	5.12	6.61	NPT 2"	–
349538	4	380 - 415	3+PE	6							
473328	5	200 - 250	3+N+PE	9							
359538	5	380 - 415	3+N+PE	6							

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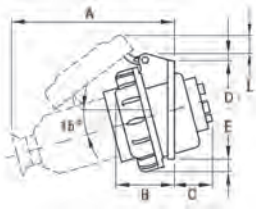
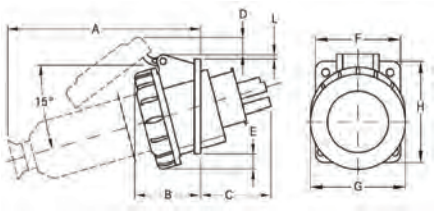
EPIC® CEE angled panel mount receptacles (IP67)

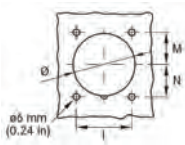
16A, 20A, 30A, 32A



60A, 63A, 100A, 125A



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	L in	I in	M in	N in	Ø in
20A																		
471263FX	3	125	1+N+PE	4		4.84	1.81	1.22	0.28	0.35	2.44	3.03	2.76	0.59	1.85	1.02	1.14	2.09
471363FX	3	250	2+PE	6														
471373FX	4	3Ø 250	3+PE	9		5.24	1.89	1.18	0.24	0.39	2.76	3.15	3.03	0.59	2.09	1.18	1.18	2.36
471573FX	4	3Ø 480	3+PE	7														
30A																		
471267FX	3	125	1+N+PE	4		6.18	2.20	1.54	0.12	0.24	3.35	3.70	3.82	0.79	2.36	1.38	1.46	2.76
471367FX	3	250	2+PE	6														
471377FX	4	3Ø 250	3+PE	9														
471577FX	4	3Ø 480	3+PE	7														
471387FX	5	3Ø Y 120/208	3+N+PE	9		6.22	2.28	1.50	0.12	0.30	3.54	3.98	4.13	0.79	2.56	1.50	1.65	2.95
60A																		
546322FX	4	3Ø 250	3+PE	9		8.90	3.15	3.15	0.91	0.39	3.94	4.29	4.25	0.31	3.03	1.54	1.81	3.39
546350FX	4	3Ø 480	3+PE	7														
556322FX	5	3Ø 120/208	3+N+PE	9														
100A																		
549322FX	4	3Ø 250	3+PE	9		12.60	3.98	3.23	1.38	0.79	4.49	5.03	4.49	0.31	3.54	1.69	1.85	3.78
549550FX	4	3Ø 480	3+PE	7														
559322FX	5	3Ø 120/208	3+N+PE	9														

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	L in	I in	M in	N in	Ø in
16A																		
471263	3	110 - 130	2+PE	4		4.84	1.81	1.22	0.28	0.35	2.44	3.03	2.76	0.59	1.85	1.02	1.14	2.09
471363	3	200 - 250	2+PE	6														
471373	4	200 - 250	3+PE	9		5.24	1.89	1.18	0.24	0.39	2.76	3.15	3.03	0.59	2.09	1.18	1.18	2.36
471473	4	380 - 415	3+PE	6														
471333	5	200 - 250	3+N+PE	9		5.51	2.01	0.94	0.30	0.35	3.03	3.46	3.35	0.59	2.24	1.22	1.34	2.60
471483	5	380 - 415	3+N+PE	6														
32A																		
471267	3	110 - 130	2+PE	4		6.18	2.20	1.54	0.12	0.28	3.35	3.70	3.82	0.79	2.36	1.38	1.46	2.76
471367	3	200 - 250	2+PE	6														
471377	4	200 - 250	3+PE	9		6.18	2.20	1.54	0.12	0.24	3.35	3.70	3.82	0.79	2.36	1.38	1.46	2.76
471477	4	380 - 415	3+PE	6														
471387	5	200 - 250	3+N+PE	9		6.22	2.28	1.50	0.12	0.30	3.54	3.98	4.13	0.79	2.56	1.50	1.65	2.95
471487	5	380 - 415	3+N+PE	6														
63A																		
546322	4	200 - 250	3+PE	9		8.90	3.15	3.15	0.91	0.39	3.94	4.29	4.25	0.31	3.03	1.54	1.81	3.39
546338	4	380 - 415	3+PE	6														
556322	5	200 - 250	3+N+PE	9														
556338	5	380 - 415	3+N+PE	6														
125A																		
549322	4	200 - 250	3+PE	9		12.60	3.98	3.23	1.38	0.79	4.49	5.03	4.49	0.31	3.54	1.69	1.85	3.78
549538	4	380-415	3+PE	6														
559322	5	200 - 250	3+N+PE	9														
559538	5	380 - 415	3+N+PE	6														

If not otherwise specified, all values relating to the product are nominal values.
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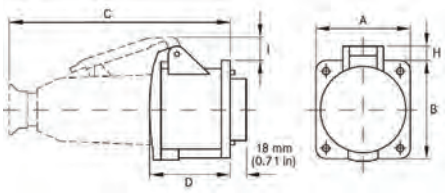
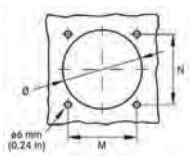
EPIC® CEE flush mount receptacles (IP44)



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	H in	I in	M in	N in	Ø in
20A														
431611FX	3	125	1+N+PE	4		2.44	2.44	5.12	1.85	0.31	0.71	1.85	1.85	1.97
431622FX	3	250	2+PE	6										
441622FX	4	3Ø 250	3+PE	9		2.95	2.95	5.12	1.85	0.31	0.71	2.36	2.36	2.48
441650FX	4	3Ø 480	3+PE	7										
30A														
433211FX	3	125	1+N+PE	4		2.95	2.95	6.69	2.44	0.47	0.79	2.36	2.36	2.49
433222FX	3	250	2+PE	6										
443222FX	4	3Ø 250	3+PE	9										
443250FX	4	3Ø 480	3+PE	7										
453222FX	5	3Ø Y 120/208	3+N+PE	9		2.95	2.95	6.69	2.44	0.59	1.02	2.36	2.36	2.49

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	H in	I in	M in	N in	Ø in
16A														
431611	3	110 - 130	2+PE	4		2.44	2.44	5.12	1.85	0.31	0.71	1.85	1.85	1.97
431622	3	200 - 250	2+PE	6										
441622	4	200 - 250	3+PE	9		2.95	2.95	5.12	1.85	0.31	0.71	2.36	2.36	2.48
441638	4	380 - 415	3+PE	6										
451622	5	200 - 250	3+N+PE	9		2.95	2.95	5.51	1.85	0.39	0.79	2.36	2.36	2.48
451638	5	380 - 415	3+N+PE	6										
32A														
433211	3	110 - 130	2+PE	4		2.95	2.95	6.69	2.44	0.47	0.79	2.36	2.36	2.49
433222	3	200 - 250	2+PE	6										
443222	4	200 - 250	3+PE	9										
443238	4	380 - 415	3+PE	6										
453222	5	200 - 250	3+N+PE	9		2.95	2.95	6.69	2.44	0.59	1.02	2.36	2.36	2.49
453238	5	380 - 415	3+N+PE	6										

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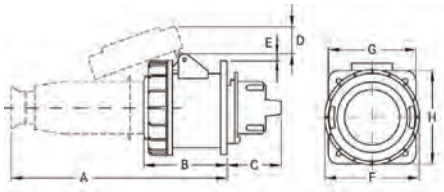
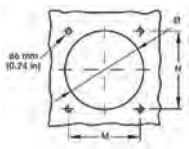
EPIC® CEE flush mount receptacles (IP67)



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	M in	N in	Ø in
60A																
446322FX	4	3Ø 250	3+PE	9		9.84	3.78	2.52	1.26	0.35	4.33	3.94	4.25	3.03	3.35	3.35
446350FX	4	3Ø 480	3+PE	7												
456322FX	5	3Ø 120/208	3+N+PE	9												
100A																
449322FX	4	3Ø 250	3+PE	9		13.78	4.45	3.07	1.50	0.39	4.96	4.49	4.49	3.54	3.54	3.86
449550FX	4	3Ø 480	3+PE	7												
459322FX	5	3Ø 120/208	3+N+PE	9												

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	M in	N in	Ø in
63A																
446322	4	200 - 250	3+PE	9		9.84	3.78	2.52	1.26	0.35	4.33	3.94	4.25	3.03	3.35	3.35
446338	4	380 - 415	3+PE	6												
456322	5	200 - 250	3+N+PE	9												
456338	5	380 - 415	3+N+PE	6												
125A																
449322	4	200 - 250	3+PE	9		13.78	4.45	3.07	1.50	0.39	4.96	4.49	4.49	3.54	3.54	3.78
449538	4	380 - 415	3+PE	6												
459322	5	200 - 250	3+N+PE	9												
459538	5	380 - 415	3+N+PE	6												

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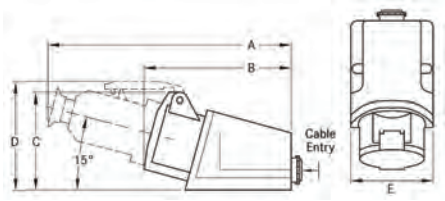
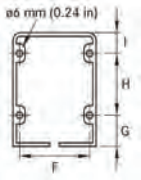
EPIC® CEE surface mount receptacles (IP44)



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	I in	Cable entry	SKINTOP® SL PG thread
20A																
471262FX	3	125	1+N+PE	4		5.66	4.92	3.15	3.54	2.56	2.13	0.98	1.73	0.63	PG 13	53015030
471362FX	3	250	2+PE	6												
471372FX	4	3Ø 250	3+PE	9		5.66	5.28	3.46	3.90	2.95	2.52	1.10	2.05	0.63	PG 16	53015040
471572FX	4	3Ø 480	3+PE	7												
30A																
471266FX	3	125	1+N+PE	4		10.08	6.06	3.94	4.53	3.31	2.83	1.24	2.20	0.89	PG 21	53015050
471366FX	3	250	2+PE	6												
471376FX	4	3Ø 250	3+PE	9												
471576FX	4	3Ø 480	3+PE	7												
471386FX	5	3Ø Y 120/208	3+N+PE	9		10.18	6.10	4.06	4.72	3.31	2.83	1.24	2.20	0.89	PG 21	53015050

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	I in	Cable entry	SKINTOP® SL PG thread
16A																
471262	3	110 - 130	2+PE	4		5.66	4.92	3.15	3.54	2.56	2.13	0.98	1.73	0.63	PG 13	53015030
471362	3	200 - 250	2+PE	6												
471372	4	200 - 250	3+PE	9		5.66	5.28	3.46	3.9	2.95	2.52	1.10	2.05	0.63	PG 16	53015040
471472	4	380 - 415	3+PE	6												
471332	5	200 - 250	3+N+PE	9		5.66	5.28	3.62	4.13	2.95	2.52	1.10	2.05	0.63	PG 16	53015040
471482	5	380 - 415	3+N+PE	6												
32A																
471266	3	110 - 130	2+PE	4		10.08	6.06	3.94	4.53	3.31	2.83	1.24	2.20	0.89	PG 21	53015050
471366	3	200 - 250	2+PE	6												
471376	4	200 - 250	3+PE	9												
471476	4	380 - 415	3+PE	6												
471386	5	200 - 250	3+N+PE	9		10.18	6.10	4.06	4.72	3.31	2.83	1.24	2.20	0.89	PG 21	53015050
471486	5	380 - 415	3+N+PE	6												

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
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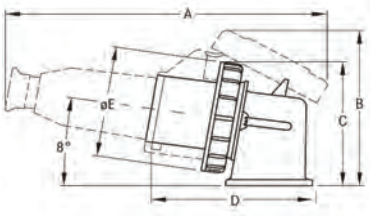
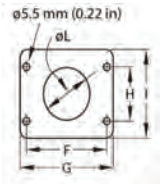
EPIC® CEE 90° wall mount inlets (IP67)



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	øE in	F in	G in	H in	I in	øL in
20A															
476203FX	3	125	1+N+PE	4		4.68	4.33	3.39	3.82	2.97	2.16	2.56	1.118	2.05	1.18
476303FX	3	250	2+PE	6											
476313FX	4	3Ø 250	3+PE	9		8.07	4.72	3.74	4.17	3.15	2.36	2.76	1.38	2.24	1.30
476513FX	4	3Ø 480	3+PE	7											
30A															
476206FX	3	125	1+N+PE	4		9.76	5.35	4.25	4.92	3.70	2.68	3.15	1.57	2.60	1.57
476306FX	3	250	2+PE	6											
476316FX	4	3Ø 250	3+PE	9											
476516FX	4	3Ø 480	3+PE	7											
476326FX	5	3Ø Y 120/208	3+N+PE	9		10.04	5.83	4.72	5.24	3.98	3.07	3.54	1.77	2.95	1.77

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	øE in	F in	G in	H in	I in	øL in
16A															
476203	3	110 - 130	2+PE	4		4.68	4.33	3.39	3.82	2.97	2.56	2.05	2.16	1.18	1.18
476303	3	200 - 250	2+PE	6											
476313	4	200 - 250	3+PE	9		8.07	4.72	3.74	4.17	3.15	2.76	2.24	2.36	1.38	1.30
476413	4	380 - 415	3+PE	6											
476323	5	200 - 250	3+N+PE	9		8.46	5.12	4.13	4.61	3.46	3.15	2.60	2.69	1.57	1.57
476423	5	380 - 415	3+N+PE	6											
32A															
476206	3	110 - 130	2+PE	4		9.76	5.35	4.25	4.92	3.70	3.15	2.60	2.68	1.57	1.57
476306	3	200 - 250	2+PE	6											
476316	4	200 - 250	3+PE	9											
476416	4	380 - 415	3+PE	6											
476326	5	200 - 250	3+N+PE	9		10.04	5.83	4.72	5.24	3.98	3.54	2.95	3.07	1.77	1.77
476426	5	380 - 415	3+N+PE	6											

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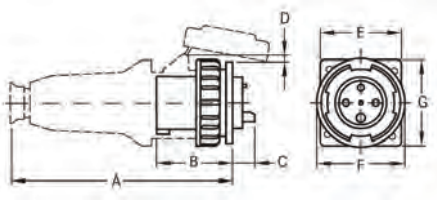
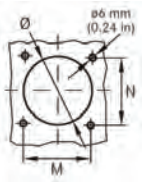
EPIC® CEE flush mount inlets (IP67)



drilling pattern



North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	M in	N in	Ø in
60A															
476317FX	4	3Ø 250	3+PE	9		11.22	3.74	1.02	0.39	3.94	4.33	4.25	3.03	3.35	3.35
476517FX	4	3Ø 480	3+PE	7											
476327FX	5	3Ø 120/208	3+N+PE	9											
100A															
476318FX	4	3Ø 250	3+PE	9		13.98	4.65	2.64	0.39	4.49	4.96	4.49	3.54	3.54	3.90
749550FX	4	3Ø 480	3+PE	7											
476328FX	5	3Ø 120/208	3+N+PE	9											

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	M in	N in	Ø in
63A															
476317	4	200 - 250	3+PE	9		11.22	3.74	1.02	0.39	3.94	4.33	4.25	3.03	3.35	3.35
746338	4	380 - 415	3+PE	6											
476327	5	200 - 250	3+N+PE	9											
756338	5	380 - 415	3+N+PE	6											
125A															
476318	4	200 - 250	3+PE	9		13.98	4.65	2.64	0.39	4.49	4.96	4.49	3.54	3.54	3.90
749538	4	380 - 415	3+PE	6											
476328	5	200 - 250	3+N+PE	9											
759538	5	380 - 415	3+N+PE	6											

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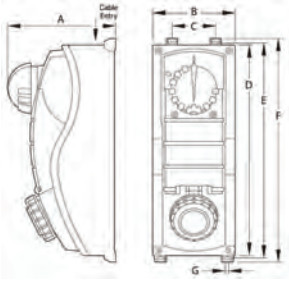
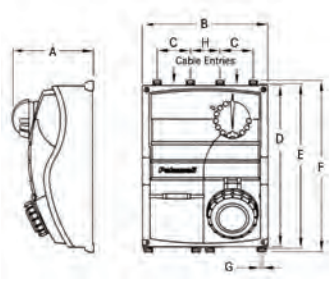
EPIC® ULYSSE mechanical interlocks (IP66/67)

16A, 20A, 30A, 32A



60A, 63A



North American standard

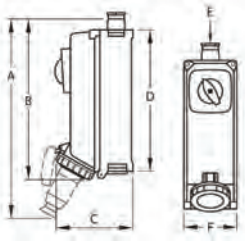
Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	Cable entry (unthreaded)
20A														
400124FX	3	125	1+N+PE	4		6.50	4.92	2.60	12.60	12.87	13.39	0.20	–	PG 29
400126FX	3	250	2+PE	6										
400139FX	4	3Ø 250	3+PE	9										
400137FX	4	3Ø 480	3+PE	7										
30A														
400224FX	3	125	1+N+PE	4		6.50	4.92	2.60	12.60	12.87	13.39	0.20	–	PG 29
400226FX	3	250	2+PE	6										
400239FX	4	3Ø 250	3+PE	9										
400237FX	4	3Ø 480	3+PE	7										
400249FX	5	3Ø Y 120/208	3+N+PE	9										
60A														
408339FX	4	3Ø 250	3+PE	9		6.50	9.84	2.60	12.60	12.87	13.39	0.20	2.32	2x PG 29
408337FX	4	3Ø 480	3+PE	7										
408349FX	5	3Ø Y 120/208	3+N+PE	9										

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E in	F in	G in	H in	Cable entry (unthreaded)
16A														
400124	3	110 - 130	2+PE	4		6.50	4.92	2.60	12.60	12.87	13.39	0.20	–	PG 29
400126	3	200 - 250	2+PE	6										
400139	4	200 - 250	3+PE	9										
400136	4	380 - 415	3+PE	6										
400149	5	200 - 250	3+N+PE	9										
400146	5	380 - 415	3+N+PE	6										
32A														
400224	3	110 - 130	2+PE	4		6.50	4.92	2.60	12.60	12.87	13.39	0.20	–	PG 29
400226	3	200 - 250	2+PE	6										
400239	4	200 - 250	3+PE	9										
400236	4	380 - 415	3+PE	6										
400249	5	200 - 250	3+N+PE	9										
400246	5	380 - 415	3+N+PE	6										
63A														
400339	4	200 - 250	3+PE	9		6.50	2.60	2.60	12.60	12.87	13.39	0.20	2.32	2x PG 29
400349	4	380 - 415	3+PE	6										
400349	5	200 - 250	3+N+PE	9										
400346	5	380 - 415	3+N+PE	6										

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

EPIC® ALUPRES mechanical interlocks (IP55/67)



drilling pattern

North American standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E* in	F in	G in	H in
20A: IP67													
460124FX	3	125	1+N+PE	4		11.61	9.84	11.81	8.66	0.50	3.60	3.01	8.07
460126FX*	3	250	2+PE	6									
460139FX*	4	3Ø 250	3+PE	9		12.01	9.84	12.01	8.66	0.50	3.60	3.01	8.07
460137FX*	4	3Ø 480	3+PE	7									
30A: IP67													
460224FX	3	125	1+N+PE	4		16.54	13.19	8.19	12.40	6.61	4.92	4.33	11.81
460226FX	3	250	2+PE	6									
460239FX	4	3Ø 250	3+PE	9									
460237FX	4	3Ø 480	3+PE	7									
460249FX	5	3Ø Y 120/208	3+N+PE	9		16.54	13.29	8.28	12.40	6.69	4.92	4.33	11.81
60A: IP55													
460339FX	4	3Ø 250	3+PE	9		20.39	15.04	9.84	13.98	7.40	4.92	4.33	13.39
460337FX	4	3Ø 480	3+PE	7									
460349FX	5	3Ø Y 120/208	3+N+PE	9									

* Includes flat flange

International standard

Part number	Number of wires	Voltage / current rating	Number of poles	Ground-clock position	Color code	A in	B in	C in	D in	E* in	F in	G in	H in
16A: IP67													
460124*	3	110 - 130	2+PE	4		11.61	9.84	11.81	8.66	0.50	3.60	3.01	8.07
460126*	3	200 - 250	2+PE	6									
460139*	4	200 - 250	3+PE	9		12.01	9.84	12.01	8.66	0.50	3.60	3.01	8.07
460136*	4	380 - 415	3+PE	6									
460146*	5	380 - 415	3+N+PE	6		12.40	9.92	12.40	8.66	0.50	3.60	3.01	8.07
32A: IP67													
460224	3	110 - 130	2+PE	4		16.54	13.19	8.19	12.40	6.61	4.92	4.33	11.81
460226	3	200 - 250	2+PE	6									
460239	4	200 - 250	3+PE	9									
460236	4	380 - 415	3+PE	6									
460249	5	200 - 250	3+N+PE	9		16.54	13.29	8.28	12.40	6.69	4.92	4.33	11.81
460246	5	380 - 415	3+N+PE	6									
63A: IP55													
460339	4	200 - 250	3+PE	9		20.39	15.04	9.84	13.98	7.40	4.92	4.33	13.39
460349	5	200 - 250	3+N+PE	9									

* Includes flat flange

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

Watertight covers for IP67 plugs & inlets

North American & international devices

Part number	Device rating	Plug type
476903	20/16A	2+PE
476913	20/16A	3+PE
476923	20/16A	3+N+PE
476905	30/32A	2+PE
476905	30/32A	3+PE
476925	30/32A	3+N+PE
476907	60/63A	all
476909	100/125	all

Long thread plastic cable gland for EPIC® ULYSSE

Part number		Cable outer diameter		Thread size	Thread length	
gland	locknut	in	mm		in	mm
571129	571229	0.70 - 0.98	18 - 25	PG 29	0.59	15

Flanges with cable gland for EPIC® ALUPRES

raised flange

flat flange

Part number	Window size	Cable outer diameter		Thread
		in	mm	
F0 flat flange				
541080FX*	20/16A	0.35 - 0.47	9 - 12	NPT ½”
541090FX**	20/16A	0.47 - 0.63	12 - 16	NPT ¾”
541030FX	20/16A	0.67 - 0.79	17 - 20	NPT 1”
F1 flat flange				
541011FX	30/32A, 60/63A	0.35 - 0.47	9 - 12	NPT ½”
541021FX	30/32A, 60/63A	0.55 - 0.63	14 - 16	NPT ¾”
F1 raised flange				
540151FX	30/32A, 60/63A	0.63 - 0.87	16 - 22	NPT 1”
540141FX	30/32A, 60/63A	0.98 - 1.02	25 - 26	NPT 1¼”

* Supplied with 20/16A EPIC® ALUPRES: 2+PE, 3+PE
** Supplied with 20/16A EPIC® ALUPRES: 3+N+PE

Pin & sleeve cordsets

Harmonized or UL cordsets

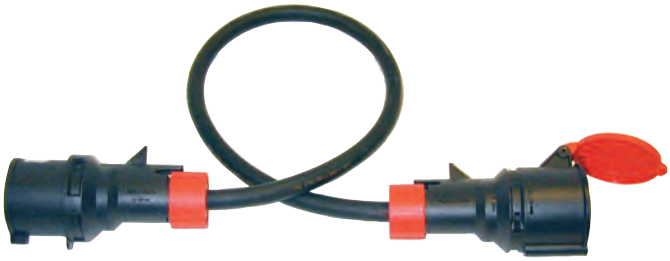
These pre-assembled and tested cable connector cordsets are easy to order and stock. They speed up initial installation and replacement, minimizing installation cost and downtime. They are available in both North American and international voltage and current configurations using LAPP's wide offering of pin & sleeve connectors and cables. Please contact a representative with your specific requirements for a custom cordset.

IP44 cordsets

type A: plug to flying leads

type B: connector to flying leads

type C: plug to connector



IP67 cordsets

type A: plug to flying leads

type B: connector to flying leads

type C: plug to connector

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IEC & UL standards

Founded in 1906, the International Electrotechnical Commission (IEC) is the global organization that prepares and publishes international standards for all electrical, electronic, and related technologies. The IEC was founded as a result of a resolution passed at the International Electrical Congress held in St. Louis, Missouri in 1904. The membership consists of more than 60 participating countries, including all the world's major trading nations, and a growing number of industrialized countries.

The IEC's mission is to promote international cooperation on all electrotechnical standardization questions and related matters in the fields of electricity, electronics, and related technologies. IEC's international standards ensure that a component or system manufactured in one country to IEC specifications can be sold to and used in any other country using the same standards.

IEC 60309-1 (1999-02)

Plugs, socket-outlets, and couplers for industrial purposes

Part 1: General Requirements

Applies to plugs and socket-outlets, cable couplers, and appliance couplers with a rated operating voltage not exceeding 690V DC or AC, 500Hz AC, and a rated current not exceeding 250A, primarily intended for industrial use, either indoors or outdoors, when the ambient temperature does not normally exceed 40°C.

Part 2: Dimensional Interchangeability Requirements for Pin and Contact-tube Accessories

Applies to plugs and socket-outlets, cable couplers, and appliance couplers with a rated operating voltage not exceeding 690V, 500Hz, and a rated current not exceeding 125A, primarily intended for industrial use, either indoors or outdoors. Together, the IEC 60309 standards provide industrial pin and sleeve connectors that are coded to provide positive voltage and frequency matching. Physical characteristics of these connectors make it virtually impossible to mis-match plugs and receptacles of different voltage and current ratings. The size of the device is determined by its amperage rating. Devices with different amperage ratings cannot be coupled due to the size variance used.

Pin & sleeve devices conforming to IEC 309-2 are single-rated with their voltage determined by the location of the oversized female ground contact relative to a keyway molded into the bottom of the housing. Twelve positions are possible (conforming to the positions of a clock face) to represent the ground pin location for specific voltages. Mis-matched voltage devices are impossible to couple. In addition, each device is clearly marked and color-coded to indicate the voltage for which it is intended to be used.

As a result of this standardization, all manufacturers' devices that conform to these standards are intermateable and interchangeable.

All North American products in this catalog are designed, tested, and approved by Underwriters Labs in accordance with UL 1682 and UL 1686 standards:

UL 1682

Plugs, receptacles, and cable connectors of the pin & sleeve type
Describes the electrical and mechanical characteristics.

UL 1686

Pin & sleeve configurations
Describes contact location and other requirements relative to voltage rating for interchangeability.

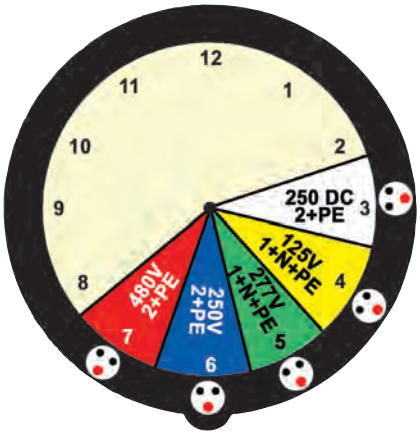
The charts on the following page show the ground pin location (referenced to the female connector) and color coding for both the North American and international product configurations.

Ground pin location & voltage

Ground pin location is specified for the female connector referenced to the hour positions on the face of a clock.
The keyway is always at the 6 o'clock position. Color slices represent voltages. Voltage is represented by the color of the connector.

North American standard

3 wires: 2+PE & 1+N+PE

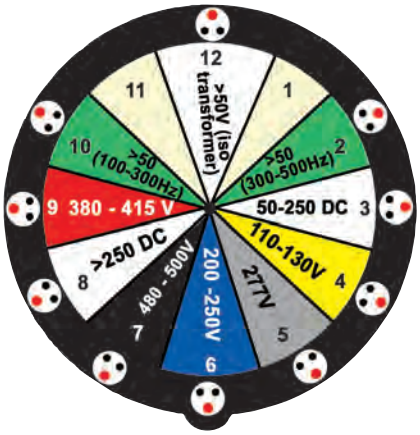


4 wires: 2+N+PE & 3+PE

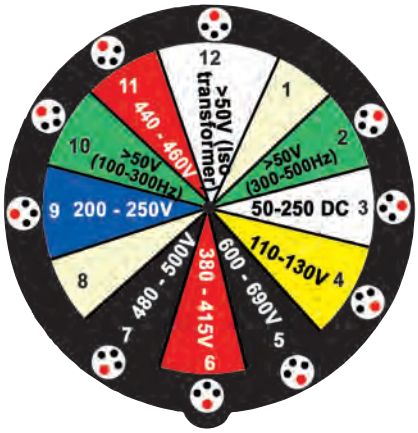
5 wires: 3+N+PE

International standard

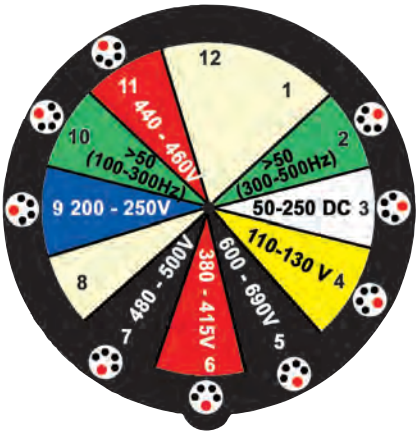
3 wires: 2+PE



4 wires: 3+PE



5 wires: 3+N+PE



Key features

EPIC® MULTIMAX

- Patented click-lock housing
- Patented integral cable grip with shade ring locking device
- Patented universal membrane seal
- High-copper solid brass contacts

EPIC® CEE series

- Integral cable clamp
- Peelable neoprene grommet
- PG-threaded cable gland
- Stainless steel assembly screws
- High-copper solid brass contacts with nickel-plated male pins for IP67 plugs:
  - North American: 20A & 30A plugs
  - International: all plugs

Common features

- Tough type 6 nylon housing
- Mate first/break last ground contact
- Voltage-polarized contacts and color-coded housings
- Conforms to IEC 60309-1 & -2
- UL 1682 & 1686 approved

Electrical features

Dielectric voltage withstand	up to 3000V for 1 minute
Maximum working voltage	600V (North American), 690V (International)
Insulation resistance	5 mΩ minimum
Overload	150% rated current at rated voltage for 50 make/break cycles
Current interrupting/load breaking	tested to 125% rated current at 110% rated voltage per IEC 60309-1, clause 20
Conditional short circuit current	10,000A at rated voltage per IEC 60309-1, clause 29
Endurance, connect & disconnect cycles	see Table 2 on next page
Ground path current	see Table 1 on next page

Mechanical features

Impact resistance (-25°C for 6 hours)	per UL 1682, section 34 & IEC 60309-1, clause 24
Crush resistance (-25°C for 6 hours)	250 lbs for 1 minute
Withdrawal force	see Table 4 on next page
Cable security	see Table 3 on next page
Polarization integrity	maintained by oversized ground pin and clock key
Wire size accommodation	see Table 6 on next page
Cable outer diameter accommodation	see Table 5 on next page

Environmental features

Operating temperature range	-25°C to +50°C	
Flammability (self-extinguishing)	**20/16A & 30/32A contact holders:**	Glow Wire 850°C (V-2 per UL 94)
	60/63A & 100/125A contact holders:	Glow Wire 960°C (V-0 per UL 94)
	other components:	Glow Wire 650°C
	EPIC® ULYSSE series:	Glow Wire 960°C (V-0 per UL 94)
Moisture resistance	**EPIC® MULTIMAX series:**	IP44 (indoor splash-proof)
	EPIC® CEE series:	IP44 (indoor splash-proof) & IP67 (indoor/outdoor watertight)
	EPIC® ULYSSE series:	IP66/67 (indoor/outdoor watertight)
	EPIC® ALUPRES series:	IP65/67 (indoor/outdoor watertight)
Corrosion resistance	**external screws & cover springs:**	stainless steel
	EPIC® CEE series contact pins: (North American: 20A & 30A; Int'l: all)	nickel-plated brass
Chemical resistance	resists standard industrial hydrocarbons, acids, bases, and solvents	
UV resistance	exposed plastic materials are UV-stabilized	

Test data & cable outer diameter accommodation

Table 1: ground path current test

A test current that far exceeds the device rating is passed through the mating device and grounding wires.

Device rating	Grounding conductor min. size AWG	mm²	Time sec	Test current A
20/16A	12	3.3	4	470
30/32A	10	5.3	4	750
60/63A	10	5.3	4	750
100/125A	8	8.4	4	1180

Table 2: endurance test

The test sequence is conducted using a no-load, followed by a loading sequence. The power factor of the load is 0.75 - 0.80.

Device rating	Cycles with load @ rated current & voltage	No-load cycles	Sequence
20/16A	5000	0	–
30/32A	1000	1000	alternating
60/63A	1000	1000	alternating
100/125A	250	250	alternating

Table 3: cable security test

The flexible cord or cable is simultaneously twisted and pulled. Values for the applied twisting torque and force of pull are shown. In all cases, the cord displacement is less than $^{3}/_{32}$"

Device rating	Force lb	N	Torque ft/lb	N/m	Max. displacement in	mm
20/16A	30	133	0.4	0.54	3/32	2.38
30/32A	75	333	0.5	0.68	3/32	2.38
60/63A	150	667	1.0	1.4	3/32	2.38
100/125A	150	667	2.0	2.7	3/32	2.38

Table 4: withdrawal force test

The pressure exerted by mating contacts of a plug and a connector must be sufficient to prevent unintentional withdrawal during normal use. During the test any locked rings or retaining means are not engaged.

Device rating	Min. withdrawal force lb	N
20/16A	5	22
30/32A	6	27
60/63A	15	67
100/125A	20	89

Table 5: cable outer diameter accommodation

Device rating & configuration	Sleeve/ cable gland	Cable diameter range: 2+PE in	mm	Cable diameter range: 3+PE in	mm	Cable diameter range: 3+N+PE in	mm
EPIC® MULTIMAX							
20/16A	–	0.32 - 0.55	8.1 - 14.0	0.33 - 0.55	8.5 - 14.0	0.39 - 0.60	10.0 - 15.3
30/32A	–	0.45 - 0.68	11.5 - 17.3	0.49 - 0.76	12.5 - 19.3	0.55 - 0.84	14.0 - 21.3
63A	–	0.67 - 1.02	17.0 - 26.0	0.75 - 1.13	19.0 - 28.6	0.83 - 1.24	21.0 - 31.5
EPIC® CEE							
20/16A: 2P+PE	PG 13	0.32 - 0.53	8.1 - 13.5	–	–	–	–
20/16A: 3P+PE	PG 16	–	–	0.35 - 0.60	8.8 - 15.3	–	–
20/16A: 3P+N+PE	PG 16	–	–	–	–	0.35 - 0.60	8.8 - 15.3
30/32A	PG 21	0.45 - 0.84	11.5 - 21.3	0.45 - 0.84	11.5 - 21.3	0.45 - 0.84	11.5 - 21.3
60/63A	PG 29	0.63 - 1.12	16.0 - 28.5	0.63 - 1.12	16.0 - 28.5	0.63 - 1.12	16.0 - 28.5
100/125A	NPT 2"	1.02 - 1.93	26.0 - 49.0	1.02 - 1.93	26.0 - 49.0	1.02 - 1.93	26.0 - 49.0
EPIC® ULYSSE							
20/16A	PG 29*	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0
30/32A	PG 29*	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0
60/63A	2x PG 29*	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0	0.71 - 0.98	18.0 - 25.0
EPIC® ALUPRES							
20/16A: 2+PE, 3+PE	FO-NPT ½"	0.35 - 0.47	9.0 - 12.0	0.35 - 0.47	9.0 - 12.0	–	–
20/16A: 3+N+PE	FO-NPT ¾"	–	–	–	–	0.47 - 0.63	12.0 - 16.0
30/32A & 60/63A (order flanges separately)	F1-NPT ½"	0.35 - 0.47	9.0 - 12.0	0.35 - 0.47	9.0 - 12.0	0.35 - 0.47	9.0 - 12.0
	F1-NPT ¾"	0.55 - 0.63	14.0 - 160	0.55 - 0.63	14.0 - 160	0.55 - 0.63	14.0 - 160
	F1-NPT 1"	0.63 - 0.87	16.0 - 22.0	0.63 - 0.87	16.0 - 22.0	0.63 - 0.87	16.0 - 22.0
	F1-NPT 1¼"	0.98 - 1.02	25.0 - 26.0	0.98 - 1.02	25.0 - 26.0	0.98 - 1.02	25.0 - 26.0

* unthreaded entry hole. Cable ODs are based on switched-socket accessory strain relief (ordered separately). See page 479 for required strain relief and locknut.

Table 6: wire size accommodation

Device rating	Max. wire size* AWG	mm²	Recommended torque for CEE contact set screws ft/lb	N/m	Recommended torque for MULTIMAX contact set screws ft/lb	N/m
20/16A	12	4	0.60	0.8	0.60	0.8
30/32A	8	10	2x 0.60	2x 0.8	1.48	2.0
60/63A	6	16	2x 1.48	2x 2.0	–	–
100/125A	1	50	2x 2.95	2x 4.0	–	–

* subject to stranding configuration.

Construction materials

Plugs, connectors, receptacles & inlets

Component	Material
housing	thermoplastic
cable grip	thermoplastic
cover (splash-proof)	thermoplastic
locking ring / cover (watertight)	thermoplastic
contact carrier (20/16A & 30/32A)	thermoplastic
contact carrier (60/63A & 100/125A)	thermoset plastic
cable grommet / seal	neoprene
locking ring gasket	neoprene
flange seal gasket	neoprene
EPIC® MULTIMAX contact pins	high-copper brass
EPIC® CEE contact pins	nickel-plated high-copper brass
contact sleeves	high-copper brass
terminal screws (splash-proof)	brass
terminal screws (watertight)	nickel-plated brass
assembly screws	stainless steel
cover spring	stainless steel

Interlocked switched-socket outlets

Component	Material	
	EPIC® ULYSSE	EPIC® ALUPRES
housing	thermoset plastic	aluminum alloy with baked polymerized paint finish
control grip	thermoset plastic	thermoplastic
locking ring / cover	thermoplastic	thermoplastic
entry gland	thermoplastic	–
contact carrier (20/16A & 30/32A)	thermoplastic	thermoplastic
contact carrier (60/63A)	thermoset plastic	thermoset plastic
cable grommet	neoprene	neoprene
locking ring gasket	neoprene	neoprene
contact sleeves	high-copper brass	high-copper brass
terminal screws	brass	brass
mechanical interlock	tropicalized steel	tropicalized steel
switch lock-out device	stainless steel	–
assembly screws	stainless steel	stainless steel
cover spring	stainless steel	stainless steel

Reference data
Connectors

Reference standards

• General characteristics:	CEI EN 60309-1	IEC 309	CEI 23-12/1
• Standardization:	CEI EN 60309-2	IEC 309-2	CEI 23-12/2
• Protection ratings:	CEI EN 60529	IEC 529	CEI 70-1

Construction characteristics

IP44 & IP67 rated products

- Pins and plug contacts are made of solid brass bars with a high level of copper.
- External screws, where present, and spring clasps for lids are made of stainless steel.
- The cable clamp is designed to prevent strain from torque and/or traction on the wires in the terminals and also assures that the wire covering stays in good condition
- Elements holding live parts (for 20A & 30A North American or 16A & 32A international standards) are made of self-exterminating thermoplastic technopolymer (V-2 per UL 94), with Glow Wire resistance to 850°C and resistance to tracking of > 600V.
  For products to 60A & 100A North American and 63A & 125A international standards, they are made of self-exterminating thermoset technopolymer (V-0 per UL 94), with Glow Wire resistance to 960°C and resistance to tracking of > 600V.
- Body and lids are made of technopolymer with high impact resistance and excellent dimensional stability.

IP67 rated products

- Pins are subject to a thick nickel-plating treatment to increase their resistance to oxidation and wear even under the worst operating conditions.
- In products to 60A & 100A North American and 63A & 125A international standards, a standard pilot contact is included.
- Cable glands have parts in peelable rubber for adapting to a variety of cable sizes.
- For plug and socket-outlets to 60A & 100A North American and 63A & 125A international standards, bodies are made of extra-durable thermoplastic technopolymer to assure improved impact resistance even under extreme conditions.

Resistance & testing

Resistance to excess heat and fire

Glow Wire test (according to IEC Publication 695-2-1): This test checks the reaction of a given insulation after overheating of adjacent metallic parts caused by bad connections or faults in the system. A glow wire coil is pressed into the specimen for 30 seconds, penetrating up to 7 mm. A sheet of tissue paper is put under the point of contact. The temperature of the wire required by the standard is 850°C for items used for holding parts that carry current and 650°C for other insulations. The test is considered to have a positive outcome if the specimen does not catch fire or if it self-extinguishes within 30 seconds of the wire being removed without burning entirely and causing continuous burning of the tissue paper beneath.

All plugs and connector components meet or exceed the temperature test requirements set by IEC.

UL 94: self-extinguishing test

A Bunsen burner is twice brought into contact with an insulation specimen in a vertical position, each time lasting 10 seconds. Cotton wool is placed under the point of contact.

Classification	Reaction of specimen
V-0	Extinguishes within 5 seconds. The cotton beneath does not ignite.
V-1	Extinguishes within 25 seconds. The cotton beneath does not ignite.
V-2	Extinguishes within 25 seconds. The cotton beneath ignites.
HB	Does not extinguish within 25 seconds. When testing the specimen horizontally, burns at a speed lower than 38 mm/min (at a thickness greater than 3 mm) and less than 76 mm/min (at a thickness of up to 3 mm).

Testing for resistance to tracking (in compliance with IEC 112)

The surfaces of the insulated item being tested are arranged horizontally and two platinum electrodes are placed on them at a distance of 4 mm. The electrodes are connected to a 50 Hz supply source. Every 30 seconds a drop of 0.1% ammonium chloride in distilled water falls between the two electrodes. The test is passed if there are no electrical charges between the two electrodes before 50 drops have fallen. Results depend on the level of voltage applied to the electrodes, and this is taken as the index of resistance to tracking.

All plugs and connectors comply with the tracking resistance requirement of IEC.

Reference data
Mechanical interlocks

Reference standards

• Socket outlets:	CEI EN 60309-1	IEC 309	CEI 23-12/1	CEI EN 60309-2	IEC 309-2	CEI 23-12/2
• Enclosures:	CEI EN 60529	IEC 309-2	CEI 70-1			
• Safety transformer:	CEI EN 60742	IEC 742	CEI 96-2			
• Switches:	CEI EN 60974-3	IEC 947-3	CEI 17-11			

Construction characteristics

Socket outlets with mechanical interlock

- Socket outlets that are interlocked, both mechanically & electrically, make it possible to create electricity distribution systems in maximum safety. They also meet specific requirements of system regulations for special system configurations, as described in the following:
  - "socket outlets with a power load over 16A must be the interlocking type." (CEI 64-8/7, sect. 752.55.1: In electrical systems for public entertainment places)
  - "in C2 sites the socket outlets must be of the interlocking type." (CEI 64-2, chap. XII, sect. 3, para. 12.3.03: Socket outlet in making an operating safety system (AD-FT))
- The interlock device prevents the switch from being closed if the plug has not been inserted into the socket-outlet and thereafter stops it from being taken out if the switch is in the "closed" position. In addition to this safety feature, the switch knob is connected to a door lock that only allows the enclosure to be opened for maintenance purposes if the switch is in the "open" position.
- The complete functional unit is assembled onto the light alloy frame, which is in turn coupled to the thermoset plastic enclosure. The entire functional structure thus makes up a rigid sub-assembly that is mechanically defined, guaranteeing that the regulations and original functions are maintained in the long term.
- The parts making up the mechanical interlocking device are made in tropicalized steel plate, which guarantees the necessary rigidity and strength even if forced through incorrect use.
- The fuse-holder bases, where included, are in thermoset plastic (EPIC® ULYSSE) or ceramic-mounted (EPIC® ALUPRES) and wired in the switched outlet. Unless specifically requested, the fuses are not normally included with the equipment.
- The interlocked socket-outlets are available with a rotary control switch, with or without a fuse-holder base as indicated.

EPIC® ULYSSE interlocked socket-outlets in thermoset plastic

- Bottom boxes and covers are made of very thick reinforced thermoset plastic (SMC or CMC or BMC, according to use) with excellent dimensional stability, non-deformability, and resistance to extremes of heat and fire, to the action of chemical and atmospheric agents, and to mechanical stress even at very low temperatures. All these characteristics in the enclosure material ensures maximum performance in any environment, even when chemically aggressive, and represents perfection in terms of insulating material.
- The transparent covers are made of thick polycarbonate with a long-chain molecular structure. They are self-extinguishing and UV stabilized for maximum resistance to atmospheric and chemical agents.
- Captive screws for closing the covers are made of stainless steel, with gaskets in non-aging elastomer.
- All the enclosures in the EPIC® ULYSSE series are suitable for creating systems in compliance with standards CEI 64-8 and particularly for installation in places at "greater risk in case of fire" (64-8/7, sect. 751). They also permit the fitting out of distribution boards with protection through complete insulation (CEI EN 60439-1) and meet the requirements of the IEC 670 publication.
- The entire EPIC® ULYSSE series is completely modular and ideal for making even complex distribution boards using predefined configurations and standard accessories.

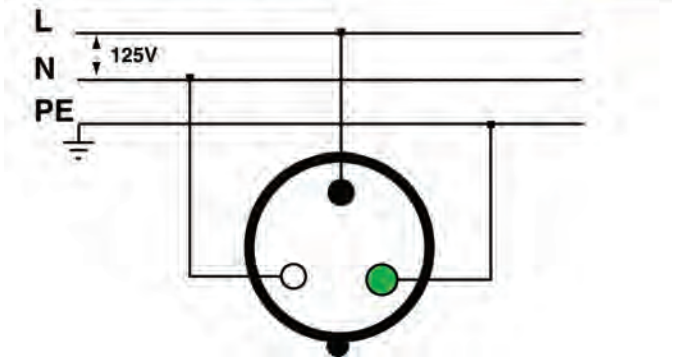
EPIC® ALUPRES interlocked socket-outlets in light alloy

- Bottom boxes and covers are made of UNI-5076 light alloy with a high aluminum content, oven-painted internally and externally over a pretreatment of chromate galvanizing for a maximum resistance to corrosion. The heavy thickness of the material used for making these enclosures assures maximum results in any environment, even when chemically aggressive, and represents perfection in terms of metal structures due to the very high impact resistance.
- Captive screws for closing the covers are made of stainless or tropicalized steel with gaskets in non-aging elastomer.
- Internal and external earth connection screws.
- All the enclosures in the EPIC® ALUPRES series are suitable for creating systems in compliance with CEI 64/8 standards, and particularly for installation in places with "greater risk in case of fire" (64-8/7, sect. 751).
- The entire EPIC® ALUPRES series is completely modular and ideal for making even complex distribution boards using predefined configurations and standard accessories.

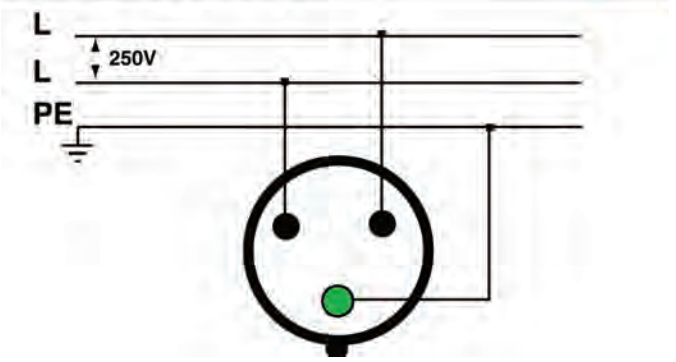
Circuit wiring diagrams

North American standard female devices

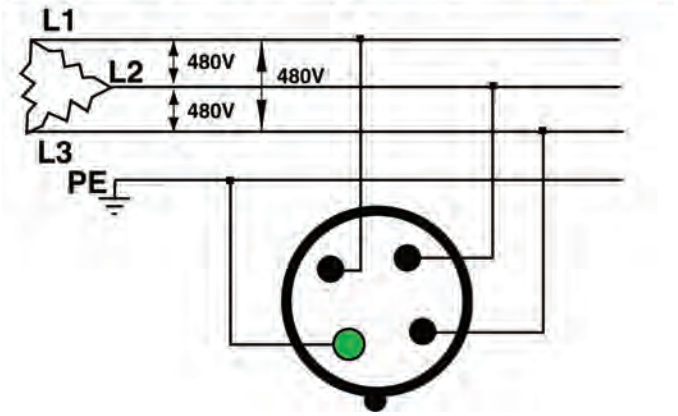
125V; 1+N+PE, 3-wire, 4h



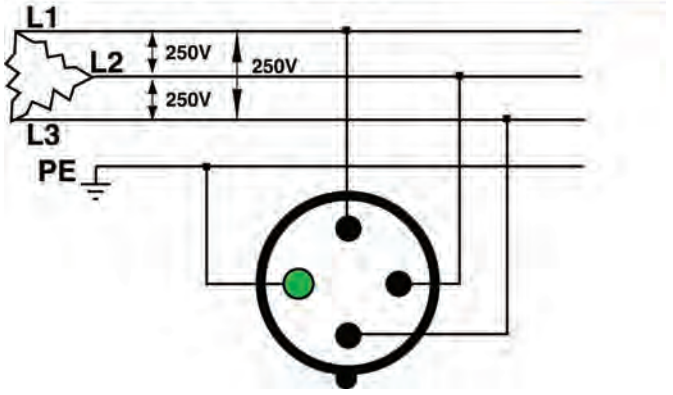
250V; 2+PE, 3-wire, 6h



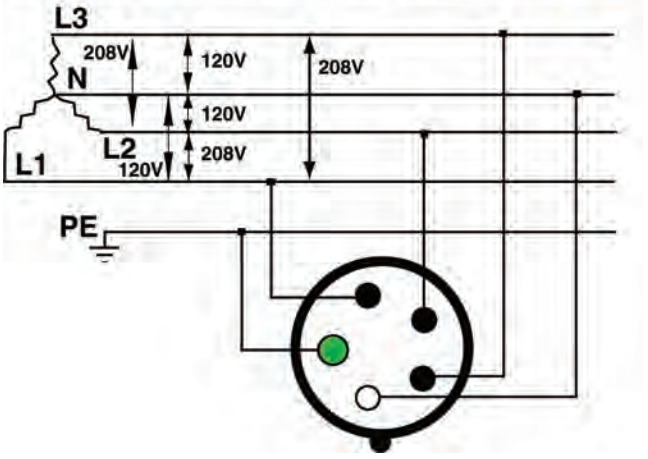
480V; 3+PE, 4-wire, 7h, 3phase



250V; 3+PE, 4-wire, 9h, 3phase



120/208V; 3+N+PE, 5-wire, 9h, 3phY



6

SKINTOP®
Cable glands

Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and center your cable, hermetically seal it, and guarantee optimum strain relief.

Application range

- Industrial machinery and plant engineering
- Drive systems
- Measurement and control technology
- Renewable energies
- Wherever cables need to be fastened securely and quickly

SKINTOP®

Strain relief cable glands

Non-metallic cable glands

497 **SKINTOP® SLN/SLRN**
Strain relief with NPT thread

498 **SKINTOP® SL/SLR**
Strain relief with PG thread

499 **SKINTOP® SLM/SLRM**
Strain relief with metric thread

500 **SKINTOP® CLICK/CLICK-R**
Strain relief with quick ”click” insertion system

501 **SKINTOP® ST-HF-M**
Halogen-free strain relief with metric thread

502 **SKINTOP® SOLAR/SOLAR (plus)**
Strain relief for photovoltaic applications with metric thread

503 **SKINTOP® FLEX**
Spiral strain relief with NPT, PG & metric thread

504 **SKINTOP® CLICK FLEX**
Spiral strain relief with quick ”click” insertion system

505 **SKINTOP® BT/BT-M**
Bell-shaped strain relief with PG & metric thread

506 **SKINTOP® K-M/KR-M ATEX plus**
Strain relief according to ATEX for hazardous areas with metric thread

Cable bushing systems

507 **SKINTOP® MULTI** NEW!
High-density multi-cable bushing system

735 **SKINTOP® MULTI-M** NEW!
Cable bushing system with metric thread

508 **SKINTOP® CUBE MULTI**
High-density multi-cable bushing system

510 **SKINTOP® CUBE**
Modular multi-cable bushing system

Metallic cable glands

512 **SKINTOP MS-NPT/MSR-NPT**
Nickel-plated brass strain relief with NPT thread

513 **SKINTOP® MS/MSR**
Nickel-plated brass strain relief with PG thread

514 **SKINTOP® MS-XL/MSR-XL**
Nickel-plated brass strain relief with extended PG thread

515 **SKINTOP® MS-M/MSR-M**
Nickel-plated brass strain relief with metric thread

516 **SKINTOP® MS-M-XL/MSR-M-XL**
Nickel-plated brass strain relief with extended metric thread

517 **SKINTOP® MS-M ATEX/MSR-M ATEX**
Nickel-plated brass strain relief according to ATEX for hazardous areas with metric thread

SKINTOP®
Strain relief cable glands

518 **SKINTOP® INOX/INOX-R**
Hygienic stainless steel strain relief with NPT & metric thread

519 **SKINTOP® HYGIENIC/HYGIENIC-R**
Hygienic stainless steel strain relief with FDA-approved sealing material with metric thread

520 **SKINTOP® COLD/COLD-R**
Nickel-plated brass strain relief for extreme sub-zero temperatures with metric thread

521 **SKINTOP® GRIP-M** NEW
Nickel-plated brass strain relief for high strain applications with metric thread

EMC cable glands

522 **SKINTOP® MS-SC**
Nickel-plated strain relief for EMC applications with NPT, PG & metric thread

524 **SKINTOP® MS-NPT BRUSH/MS-M BRUSH**
Nickel-plated brass strain relief for EMC applications with NPT & metric thread

525 **SKINTOP® MS-M ATEX BRUSH**
Nickel-plated brass strain relief according to ATEX for EMC applications in hazardous areas

526 **SKINTOP® INOX SC**
Hygienic stainless steel strain relief for EMC applications

527 **SKINTOP® HYGIENIC SC** NEW
Hygienic stainless steel strain relief with FDA-approved sealing material for EMC applications

SKINDICHT® cable glands & clamps

528 **SKINDICHT® SVFK**
Polystyrene strain relief connectors for flat & festoon cable with PG thread

529 **SKINDICHT® SVF**
Brass strain relief connectors for flat & festoon cable with PG thread

530 **SKINDICHT® CN/CN-M**
Chromium-nickel steel strain relief with PG & metric thread

531 **SKINDICHT® SVRE/SVRE-M**
Nickel-plated brass cable clamp with PG & metric thread

532 **SKINDICHT® SH**
Nickel-plated brass cable clamp with single saddle clamp and PG thread

533 **SKINDICHT® SK**
Nickel-plated brass strain relief with double saddle clamp and PG thread

534 **SKINDICHT® SKZ/SKZ-M**
Nickel-plated brass strain relief with double saddle clamp & additional sealing, PG & metric thread

535 **SKINDICHT® SHV-M**
Nickel-plated brass strain relief with sealing capability up to 300 ft (10 bar) and metric thread

536 **SKINDICHT® SR/SR-M**
Nickel-plated strain relief with single saddle clamp & special neoprene bushing, PG & metric thread

538 **SKINDICHT® RWV**
Nickel-plated die cast zinc 90° elbow strain relief with PG thread

Non-metallic cable glands

SKINTOP® SL
• NPT • PG • metric
page 497

SKINTOP® CLICK
• metric
page 500

SKINTOP® FLEX
• NPT • PG • metric
page 503

SKINTOP® CLICK FLEX
• metric
page 504

SKINTOP® halogen-free
• metric
page 501

SKINTOP® SOLAR
• metric
page 502

SKINTOP® BT
• metric
page 505

SKINTOP® K-M ATEX plus
• metric
page 506

non-metallic locknuts
• NPT • PG • metric
page 541

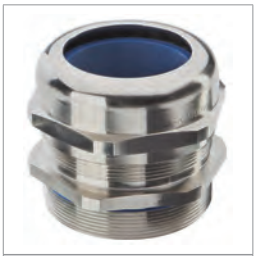
Metallic cable glands

SKINTOP® MS
• NPT • PG • metric
page 512

SKINTOP® MS-M ATEX
• metric
page 517

SKINTOP® INOX
• NPT • metric
page 518

SKINTOP® HYGIENIC
• metric
page 519



SKINTOP® COLD
• metric
page 520

SKINTOP® GRIP-M
• metric
page 521

metallic locknuts
• NPT • PG • metric
page 542

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

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Multi-cable bushing systems

SKINTOP® MULTI
page 507

SKINTOP® CUBE MULTI
page 508

SKINTOP® CUBE
page 510

EMC cable glands

SKINTOP® MS-SC
• NPT • PG • metric
page 522

SKINTOP® BRUSH
• NPT • metric
page 524

SKINTOP® ATEX BRUSH
• metric
page 525

SKINTOP® INOX SC
• metric
page 526

SKINTOP® HYGIENIC SC
• metric
page 527

SKINTOP® BRUSH Add-on
• metric
page 544

SKINDICHT® cable glands & clamps

SKINDICHT® SVFK
• PG
page 528

SKINDICHT® SVF
• PG
page 529

SKINDICHT® CN
• PG • metric
page 530

SKINDICHT® SVRE
• PG • metric
page 531

SKINDICHT® SH
• PG
page 532

SKINDICHT® SK
• PG
page 533

SKINDICHT® SKZ
• PG • metric
page 534

SKINDICHT® SR
• PG • metric
page 536

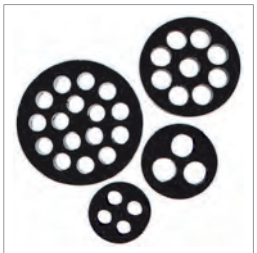
SKINDICHT® RWV
• PG
page 538

If not otherwise specified, all val
Photographs are not to scale an

Accessories

non-metallic locknuts
• NPT • PG • metric
page 541

metallic locknuts
• PG • metric
page 542



SKINTOP® DIX bushing
• NPT • PG • metric
page 545

plugs
• NPT • PG • metric
page 548

hole plugs
• PG • metric
page 549

SKINTOP® CLICK BLK
• metric
page 550

reducers & enlargers
• PG • metric
page 550

adapters
• NPT • PG • metric
page 552

sealing rings
• PG • metric
page 554

O-rings
• PG • metric
page 555

Tools

SKINMATIC® RZ wrench
page 557

SKINMATIC® MH-Set
page 557

PTS4 wire stripper
page 557

KS 15 cable shears
page 558

thread-cutting tools
page 558

SKINMATIC® QUICK set
page 558

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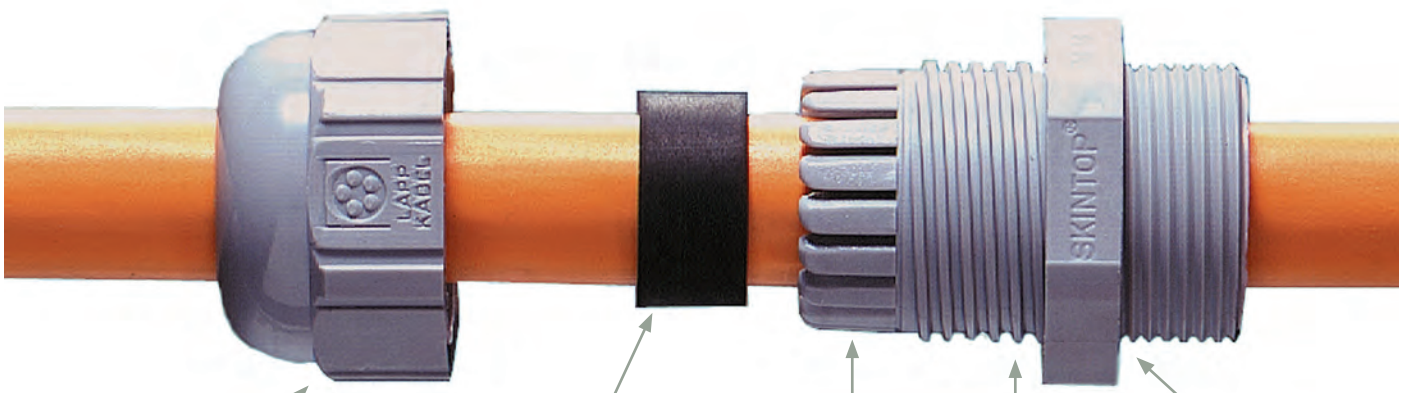
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® strain relief cable glands



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

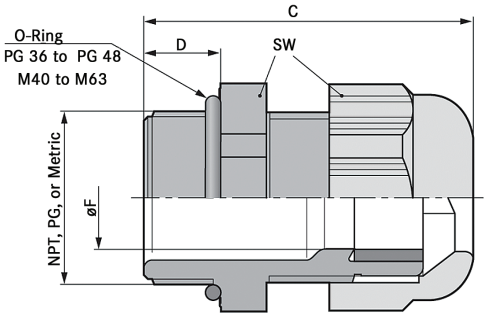
Chemical resistance:*

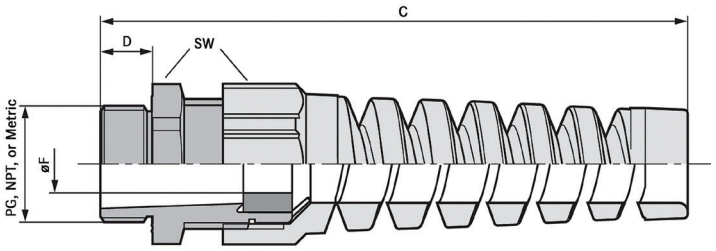
+: resistant
o: limited resistance
-: not resistant

+	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

* More detailed information on chemical resistance of plastics can be found in the Technical section on page 698.

SKINTOP® strain relief cable glands





Technical data

Material: polyamide: flame retardant, self-extinguishing nylon with CR bushing

Temperature range:
- NPT & PG: -20°C to +80°C, up to +100°C (short term)
- metric: -20°C to +100°C

Protection:
- seal*: up to 70 PSI, IP68 (Ingress Protection), comparable to NEMA 6 classification
- metric: IP69

* All IP ratings are dependent on proper installation by the user

Resistance: salt water, weak acids, weak alkalis, alcohol, ester, ketones, ether, benzene, gas, mineral oil, animal and vegetable oils, gasoline, oil, grease, and common solvents

SKINTOP® meets the most stringent demands of safety and operational reliability. SKINTOP® products can be used in panels, switches, control boxes, submersible pumps, appliances, and many other machine tool applications.

SKINTOP® glands provide both strain relief and a liquid-tight seal – all in one connector.

Patented Security:
Patent # P-2631996

International Approvals:
UL, c(UL) # E146370
SEV # 100989
Metric: VDE # 57986

Unique design

SKINTOP® outperforms traditional connectors because the design consists of three parts, which do not require dismantling before use.

The internal ratchet mechanism allows the cap to be tightened without twisting the cord as it compresses. In tightening the cap, the lamellar fingers are pushed together to form a liquid-tight seal with the neoprene compression bushing.

Optimum seal

Complete liquid-tightness is achieved with a uniquely designed molded sealing ring and flange nut combined with a neoprene bushing and domed sealing cap.

Vibration-proof protection

An integrated locking mechanism includes an internal ratchet inside the sealing portion of the cord grip. This provides a self-locking and vibration-proof element that prevents the cap from loosening even when subjected to severe vibration.

Quick installation

The multi-trapezoidal thread requires just one twist to tighten the dome cap, automatically adjusting to the size of the cable and providing optimum strain relief and a liquid-tight seal.

Durability

SKINTOP® incorporates a heavy duty design that provides greater pullout strength and very reliable strain relief.

Easier handling

Larger ergonomic design and ridges in the dome cap provide easy gripping and mounting by hand or wrench.

Larger variable clamping range

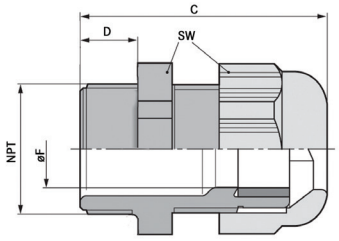
The uniquely designed lamellar fingers, combined with the optional reducer bushing, accommodates a broad range of cord and cable diameters. This results in a lower number of connectors required in inventory.

Resistant to impact at low temperatures

SKINTOP® cable glands can withstand impact at low temperatures of -20°C.

SKINTOP® SLN/SLRN

Strain relief with NPT thread



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
page 522

SKINTOP® GMP locknuts
page 541

SKINTOP® SLN/SLRN is a durable, liquid-tight, easy-to-assemble strain relief cable gland with NPT thread that is universally suited for all types of machinery & equipment, including automation, motion control, process control, and robotics. SKINTOP® SLRN includes reducer bushing.

Application advantage

- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten
- Generous high-quality neoprene bushing provides a liquid-tight and dust-proof hermetic seal

Approvals

Technical data

Material:
- body: polyamide
- bushing: CR

Locknuts: add SKINTOP® GMP, page 541

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +80°C

Color: black (RAL 9005), UV resistant
gray (RAL 7001)

Protection: 70 PSI
- seal: IP68, 5 bar
NEMA 1, 12

Part number black	Part number gray	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard									
S2138	S1138	NPT ⅜"	Recognized	0.138 - 0.315	3.5 - 8	0.748	1.693	0.591	100
S2112	S1112	NPT ½"	Listed	0.197 - 0.472	5 - 12	0.945	1.772	0.591	100
S2134	S1134	NPT ¾"	Listed	0.512 - 0.709	13 - 18	1.299	2.087	0.591	50
S2101	S1101	NPT 1"	Listed	0.748 - 1.000	19 - 25.4	1.654	2.362	0.591	25
Reducer bushing									
S2238	S1238	NPT ⅜"	Recognized	0.079 - 0.236	2 - 6	0.748	1.693	0.591	100
S2212	S1212	NPT ½"	Listed	0.157 - 0.354	4 - 9	0.945	1.772	0.591	100
S2234	S1234	NPT ¾"	Listed	0.354 - 0.630	9 - 16	1.299	2.087	0.591	50
S2201	S1201	NPT 1"	Listed	0.551 - 0.984	14 - 25	1.654	2.362	0.591	25

Orders of 2000 pieces or more per item will be bulk packaged unless otherwise requested

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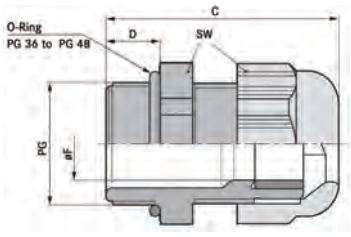
SKINTOP® SL/SLR

Strain relief with PG thread



SKINTOP® SL/SLR is a durable, liquid-tight, easy-to-assemble strain relief cable gland with PG thread that is universally suited for all types of machinery & equipment, including automation, motion control, process control and robotics. SKINTOP® SLR includes reducer bushing.

Application advantage

- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten
- Generous high-quality neoprene bushing provides a liquid-tight and dust-proof hermetic seal

Approvals

Technical data

Material:
- body: polyamide
- bushing: CR

Color: black (RAL 9005), UV resistant
gray (RAL 7001)

Locknuts: included

Temperature range:
- static: -40°C to +100°C
- dynamic: -20°C to +80°C

Protection: 70 PSI
- seal: IP68, 5 bar
NEMA 1, 12

Part number with locknut		Part number without locknut*		Thread	UL status	Clamping range (øF)		Wrenching flats (SW)	Overall length (C)	Thread length (D)	Pack size
black	gray	black	gray			in	mm	in	in	in	
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 - 10	0.866	1.496	0.315	100
S2113	S1113	53015230	53015030	PG 13	Listed	0.236 - 0.472	6 - 12	0.945	1.614	0.354	100
S2116	S1116	53015240	53015040	PG 16	Listed	0.354 - 0.551	9 - 14	1.063	1.732	0.394	50
S2121	S1121	53015250	53015050	PG 21	Listed	0.512 - 0.709	13 - 18	1.299	1.929	0.433	50
S2129	S1129	53015260	53015060	PG 29	Recognized	0.551 - 0.984	14 - 25	1.654	2.205	0.433	25
S2136	S1136	53015270	53015070	PG 36	Listed	0.945 - 1.260	24 - 32	2.087	2.598	0.512	10
S2142	S1142	53015280	53015080	PG 42	Recognized	1.378 - 1.496	35 - 38	2.362	2.677	0.512	5
S2148	S1148	53015290	53015090	PG 48	Listed	1.535 - 1.732	39 - 44	2.559	2.717	0.551	5
Reducer bushing											
S2207	S1207	53015300	53015100	PG 7	Recognized	0.059 - 0.197	1.5 - 5	0.591	1.260	0.315	100
S2209	S1209	53015310	53015110	PG 9	Recognized	0.079 - 0.236	2 - 6	0.748	1.417	0.315	100
S2211	S1211	53015320	53015120	PG 11	Recognized	0.079 - 0.276	2 - 7	0.866	1.496	0.315	100
S2213	S1213	53015330	53015130	PG 13	Listed	0.157 - 0.354	4 - 9	0.945	1.614	0.354	100
S2216	S1216	53015340	53015140	PG 16	Listed	0.236 - 0.472	6 - 12	1.063	1.732	0.394	50
S2221	S1221	53015350	53015150	PG 21	Listed	0.354 - 0.630	9 - 16	1.299	1.929	0.433	50
S2229	S1229	53015360	53015160	PG 29	Recognized	0.433 - 0.787	11 - 20	1.654	2.205	0.433	25
S2236	S1236	53015370	53015170	PG 36	Listed	0.669 - 1.024	17 - 26	2.087	2.598	0.512	10
S2242	S1242	53015380	53015180	PG 42	Recognized	0.866 - 1.220	22 - 31	2.362	2.677	0.512	5
S2248	S1248	53015390	53015190	PG 48	Listed	1.024 - 1.378	26 - 35	2.559	2.717	0.551	5

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

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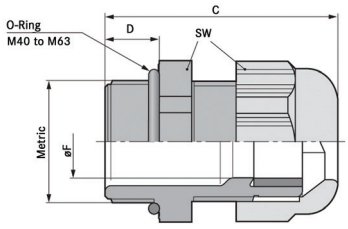
SKINTOP® SLM/SLRM

Strain relief with metric thread



SKINTOP® SLM/SLRM is a durable, liquid-tight, easy-to-assemble strain relief cable gland with metric thread that is universally suited for all types of machinery & equipment, including automation, motion control, process control, and robotics. SKINTOP® SLRM includes reducer bushing.

Application advantage

- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten
- Generous high-quality neoprene bushing provides a liquid-tight and dust-proof hermetic seal

Approvals

Technical data

Material:
- body: polyamide
- bushing: CR

Color: black (RAL 9005), UV resistant
gray (RAL 7001)

Locknuts: included

Temperature range:
- static: -40°C to +100°C
- dynamic: -20°C to +100°C

Protection: 70 PSI
- seal: IP68, 5 bar
IP69
NEMA 1, 12

Part number with locknut		Part number without locknut*		Thread	UL status	Clamping range (øF)		Wrenching flats (SW)	Overall length (C)	Thread length (D)	Pack size
black	gray	black	gray			in	mm	in	in	in	
Standard											
S2507	S1507	53111200	53111000	M12 x 1.5	Recognized	0.138 - 0.276	3.5 - 7	0.591	1.181	0.315	100
S2509	S1509	53111210	53111010	M16 x 1.5**	Recognized	0.157 - 0.394	4 - 10	0.748	1.339	0.315	100
S2513	S1513	53111220	53111020	M20 x 1.5**	Listed	0.236 - 0.512	6 - 13	0.984	1.457	0.354	100
S2516	S1516	53111230	53111030	M25 x 1.5**	Listed	0.315 - 0.669	8 - 17	1.181	1.575	0.394	50
S2521	S1521	53111240	53111040	M32 x 1.5	Listed	0.354 - 0.827	9 - 21	1.417	1.850	0.394	25
S2529	S1529	53111250	53111050	M40 x 1.5	Listed	0.630 - 1.102	16 - 28	1.811	2.047	0.394	10
S2536	S1536	53111260	53111060	M50 x 1.5	Listed	1.063 - 1.339	27 - 34	2.165	2.441	0.472	5
S2542	S1542	53111270	53111070	M63 x 1.5	Listed	1.339 - 1.772	34 - 45	2.598	2.795	0.472	5
Reducer bushing											
S2607	S1607	53111300	53111100	M12 x 1.5	Recognized	0.079 - 0.197	2 - 5	0.591	1.181	0.315	100
S2609	S1609	53111310	53111110	M16 x 1.5**	Recognized	0.138 - 0.276	3.5 - 7	0.748	1.339	0.315	100
S2613	S1613	53111320	53111120	M20 x 1.5**	Listed	0.157 - 0.394	4 - 10	0.984	1.457	0.354	100
S2616	S1616	53111330	53111130	M25 x 1.5**	Listed	0.197 - 0.512	5 - 13	1.181	1.575	0.394	50
S2621	S1621	53111340	53111140	M32 x 1.5	Listed	0.236 - 0.591	6 - 15	1.417	1.850	0.394	25
S2629	S1629	53111350	53111150	M40 x 1.5	Listed	0.354 - 0.906	9 - 23	1.811	2.047	0.394	10
S2636	S1636	53111360	53111160	M50 x 1.5	Listed	0.945 - 1.142	24 - 29	2.165	2.441	0.472	5
S2642	S1642	53111370	53111170	M63 x 1.5	Listed	1.102 - 1.535	28 - 39	2.598	2.795	0.472	5

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

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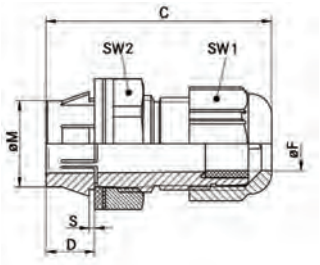
SKINTOP® CLICK/CLICK-R

Strain relief with quick "click" insertion system



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
page 522

Removal tool

SKINTOP® CLICK is an innovative cable insertion system that provides fast, highly flexible assembly. Easy snap-in-place installation results in fixed, centered, strain relief with maximum protection in seconds. Mounting hole is based on metric thread. SKINTOP® CLICK-R includes reducer bushing.

Recommended applications

Applications where locknut installation is difficult to reach or to secure, such as dual wall enclosures and temperature controlled assemblies where insulation is used

Application advantage

- Up to 70% installation time savings due to innovative CLICK system
- Ideal for hard-to-reach dual wall enclosures and limited access spaces
- Reduced inventory as no locknuts are required
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection

Approvals

Accessories

1 removal tool included per pack.
Additional tools are available; see table for part numbers.

Technical data

Material:
- body: special polyamide
- seal: special elastomer

Color: black (RAL 9005), UV resistant gray (RAL 7001)

Temperature range:
- static: -40°C to +100°C
- dynamic: -20°C to +100°C

Protection:
- M12: IP68, 4 bar
- M16 - M25: IP68, 5 bar
- M32: IP68, 1 bar

Part number* black	Part number* gray	Mounting hole size	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW1/SW2) in	Overall length (C) in	Thread length (D) in	Hole (øM) in	Pack size	Removal tool
Standard											
53112923	53112921	M12	Recognized	0.177–0.276	4.5–7	0.591/0.709	1.576	0.315	0.484 (-.008)	50	53112696
53112882	53112876	M16	Recognized	0.197–0.394	5–9	0.748/0.866	1.654	0.315	0.642 (-.008)	50	53112697
53112883	53112877	M20	Listed	0.276–0.512	7–13	0.985/1.063	1.792	0.315	0.799 (-.008)	25	53112698
53112884	53112878	M25	Listed	0.354–0.669	9–17	1.182/1.339	1.910	0.315	0.996 (-.008)	25	53112699
53112924	53112922	M32	Listed	0.433–0.787	11–20	1.417/1.576	2.167	0.315	1.272 (-.008)	25	53112797
Reducer bushing											
53112929	53112927	M12	Recognized	0.1385–0.197	3.5–5	0.591/0.709	1.576	0.315	0.484 (-.008)	50	53112696
53112885	53112879	M16	Recognized	0.157–0.276	4–7	0.748/0.866	1.654	0.315	0.642 (-.008)	50	53112697
53112886	53112880	M20	Listed	0.197–0.394	5–10	0.985/1.063	1.792	0.315	0.799 (-.008)	25	53112698
53112887	53112881	M25	Listed	0.236–0.512	6–13	1.182/1.339	1.910	0.315	0.996 (-.008)	25	53112699
53112931	53112928	M32	Listed	0.276–0.591	7–15	1.417/1.576	2.167	0.315	1.272 (-.008)	25	53112797

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

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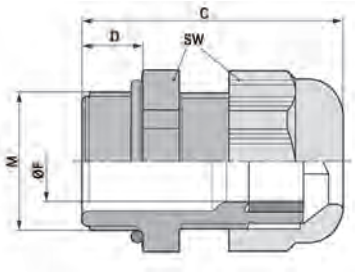
SKINTOP® ST-HF-M

Halogen-free strain relief with metric thread



Complete the installation

SKINTOP® GMP-HF:
page 541

SKINTOP® ST-HF-M is an easy-to-assemble, halogen-free, metric cable gland for use when personal and property protection is a priority such as public buildings, underground railways, mass transportation systems, ventilation systems, and industrial plants.

Approvals

Application advantage

- Completely halogen-free providing safe LSZH performance
- Extremely flame-retardant and self-extinguishing with no dripping
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten

Technical data

Material:
- body: halogen-free polyamide, V-0 per UL 94
- bushing: halogen-free
- O-ring: halogen-free

Color: light gray (RAL 7035)

Temperature range:
- static: -40°C to +100°C
- dynamic: -20°C to +100°C

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

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
53111407	M12 x 1.5	0.157 - 0.216	4 - 5.5	0.591	1.182	0.315	100
53111417	M16 x 1.5	0.177 - 0.354	4.5 - 9	0.748	1.339	0.315	100
53111427	M20 x 1.5	0.276 - 0.512	7 - 13	0.985	1.457	0.354	100
53111437	M25 x 1.5	0.354 - 0.669	9 - 17	1.182	1.576	0.394	50
53111447	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	1.851	0.394	25
53111457	M40 x 1.5	0.748 - 1.103	19 - 28	1.812	2.048	0.394	10
53111467	M50 x 1.5	1.063 - 1.379	27 - 35	2.167	2.442	0.472	5
53111477	M63 x 1.5	1.339 - 1.773	34 - 45	2.600	2.797	0.472	5

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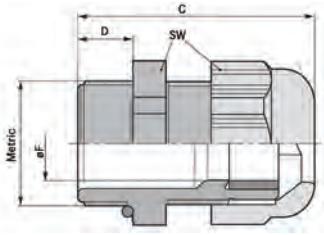
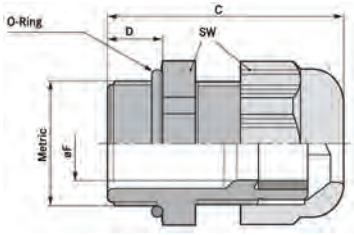
SKINTOP® SOLAR/SOLAR (plus)

Strain relief for photovoltaic applications with metric thread

SKINTOP® SOLAR



SKINTOP® SOLAR (plus)



Complete the installation

SKINTOP® DIX bushing
page 545

SKINTOP® SOLAR cable glands are designed to meet the increasingly strict requirements for solar equipment. The glands are made of a specially-developed polycarbonate compound, guaranteeing excellent weather resistance in hot conditions, rain, snow or ice. SKINTOP® glands can also save space whenever multiple cables are routed to the combiner box.

Application advantage

- UV and weather resistant per UL F1 for outdoor use
- Passes cold impact test per UL 1703/UL 746C
- Excellent strain relief
- Permanent vibration protection
- Extremely flame-retardant: V-0 per UL 94/94-5VA

Approvals

c UL us CE RoHS

Technical data

Material:
- SKINTOP® SOLAR:
  - body: polycarbonate
  - seal: CR
- SKINTOP® SOLAR (plus):
  - body: polycarbonate
  - seal: silicone
  - O-ring: silicone

Temperature range:
- SKINTOP® SOLAR: -40 °C to +100 °C
- SKINTOP® SOLAR (plus): -40 °C to +125 °C

Color: black (RAL 9005), UV resistant

Protection: IP68, 5 bar
NEMA 1, 12

Approvals: passes cold impact test per UL 1703/ UL 746C

Part number SKINTOP® SOLAR	Part number SKINTOP® SOLAR (plus)	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
53113300	53113321	M12 x 1.5	0.137 - 0.276	3.5 - 7	0.591	1.418	0.591	100
53113310*	53113331	M16 x 1.5	0.276 - 0.354	7 - 9	0.748	1.339	0.315	100

* UL Recognized only when used with an O-ring

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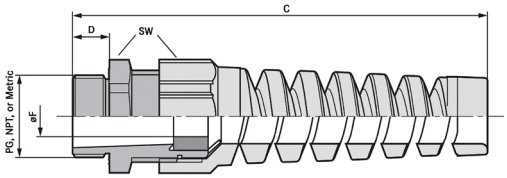
SKINTOP® FLEX

Spiral strain relief with NPT, PG & metric thread



Complete the installation

SKINTOP® GMP locknuts page 541

SKINTOP® FLEX is a liquid-tight, spiral strain relief that offers additional safety against overstress and conductor breakage. It is ideally suited for hand held equipment, moving machinery, and robotics.

Approvals: NPT & PG

Approvals: metric

Application advantage

- Superior bending protection for cable conservation and functional reliability
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten
- Generous high-quality neoprene bushing provides a liquid-tight and dust-proof hermetic seal

Technical data

Material:
- body: polyamide
- bushing: CR

Color: black (RAL 9005), UV resistant
gray (RAL 7001)

Locknuts: included with PG & metric sizes, NPT locknuts available, page 541

Temperature range:
- NPT & PG: -20°C to +80°C
- metric: -20°C to +100°C

Protection: 70 PSI
- seal: IP68, 5 bar
NEMA 1, 12

Part number with locknut		Part number without locknut*		Thread	UL status	Clamping range (øF)		Wrenching flats (SW)	Overall length (C)	Thread length (D)	Pack size
black	gray	black	gray			in	mm	in	in	in	
Standard NPT											
–	–	S2338	S1338	NPT ⅜”	Recognized	0.137 - 0.315	3.5 - 8	0.748	3.230	0.591	100
–	–	S2312	S1312	NPT ½”	Listed	0.197 - 0.472	5 - 12	0.945	4.097	0.591	100
–	–	S2334	S1334	NPT ¾”	Listed	0.512 - 0.709	13 - 18	1.300	5.240	0.591	50
Reducer NPT											
–	–	S2438	–	NPT ⅜”	Recognized	0.079 - 0.236	2 - 6	0.748	3.228	0.591	100
–	–	S2412	S1412	NPT ½”	Listed	0.157 - 0.354	4 - 9	0.945	4.094	0.591	50
–	–	S2434	S1434	NPT ¾”	Listed	0.354 - 0.630	9 - 16	1.299	5.236	0.591	25
Standard PG											
S2307	S1307	53015800	53015600	PG 7	Recognized	0.098 - 0.256	2.5 - 6.5	0.591	2.442	0.315	100
S2309	S1309	53015810	53015610	PG 9	Recognized	0.137 - 0.315	3.5 - 8	0.748	2.895	0.315	100
S2311	S1311	53015820	53015620	PG 11	Recognized	0.157 - 0.394	4 - 10	0.866	3.388	0.315	100
S2313	S1313	53015830	53015630	PG 13	Listed	0.236 - 0.472	6 - 12	0.945	3.861	0.354	50
S2316	S1316	53015840	53015640	PG 16	Listed	0.354 - 0.551	9 - 14	1.063	4.393	0.394	25
S2321	S1321	53015850	53015650	PG 21	Listed	0.512 - 0.709	13 - 18	1.300	5.082	0.433	25
Reducer PG											
S2407	S1407	53015900	53015700	PG 7	Recognized	0.059 - 0.197	1.5 - 5	0.591	2.441	0.315	100
S2409	S1409	53015910	53015710	PG 9	Recognized	0.079 - 0.236	2 - 6	0.748	2.894	0.315	100
S2411	S1411	53015920	53015720	PG 11	Recognized	0.079 - 0.276	2 - 7	0.866	3.386	0.315	100
S2413	S1413	53015930	53015730	PG 13	Listed	0.157 - 0.354	4 - 9	0.945	3.858	0.354	50
S2416	S1416	53015940	53015740	PG 16	Listed	0.236 - 0.472	6 - 12	1.063	4.399	0.394	25
S2421	S1421	53015950	53015750	PG 21	Listed	0.354 - 0.630	9 - 16	1.299	5.079	0.433	25
Standard metric											
S2707	S1707	53111700	53111600	M12 x 1.5	Recognized	0.137 - 0.276	3.5 - 7	0.591	2.521	0.315	100
S2709	S1709	53111710	53111610	M16 x 1.5	Recognized	0.177 - 0.394	4.5 - 10	0.748	3.388	0.315	100
S2713	S1713	53111720	53111620	M20 x 1.5	Listed	0.276 - 0.512	7 - 13	0.985	3.979	0.315	50
S2716	S1716	53111730	53111630	M25 x 1.5	Listed	0.354 - 0.669	9 - 17	1.182	4.925	0.354	25
S2721	S1721	53111740	53111640	M32 x 1.5	Listed	0.433 - 0.827	11 - 21	1.418	5.870	0.394	25

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

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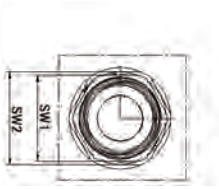
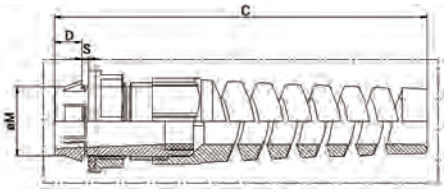
SKINTOP® CLICK FLEX

Spiral strain relief with quick "click" insertion system





Complete the installation

Removal tool

SKINTOP® CLICK FLEX is an innovative cable insertion system that provides fast, highly flexible assembly. Easy snap-in-place installation results in fixed, centered, strain relief with maximum protection in seconds. Liquid-tight spiral strain relief offers additional safety against overstress and conductor breakage for applications such as hand-held equipment, moving machinery, and robotics. Mounting hole is based on metric thread.

Approvals

Accessories

1 disassembly tool included per pack.
Additional tools are available; see table for part numbers.

Application advantage

- Up to 70% installation time savings due to innovative CLICK system
- Ideal for hard-to-reach dual wall enclosures and limited access spaces
- Reduced inventory as no locknuts are required
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection

Technical data

Material:
- body: special polyamide
- seal: special elastomer

Color: black (RAL 9005), UV resistant gray (RAL 7001)

Temperature range: -20°C to +100°C

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

Part number black	Part number gray	Mounting hole size	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW1) in	Wrenching flats (SW2) in	Overall length (C) in	Thread length (D) in	Hole (øM) in	Pack size	Removal tool
53112936	53112934	M12	Recognized	0.138 - 0.276	3.5 - 7	0.591	0.709	2.915	0.315	0.484 (-.008)	50	53112696
53112909	53112906	M16	Recognized	0.197 - 0.354	5 - 9	0.748	0.866	3.703	0.315	0.642 (-.008)	50	53112697
53112911	53112907	M20	Listed	0.276 - 0.512	7 - 13	0.985	1.063	4.255	0.315	0.799 (-.008)	25	53112698
53112912	53112908	M25	Listed	0.354 - 0.669	9 - 17	1.182	1.339	5.003	0.315	0.996 (-.008)	25	53112699
53112937	53112935	M32	Listed	0.433 - 0.787	11 - 20	1.418	1.576	6.107	0.315	1.272 (-.008)	25	53112797

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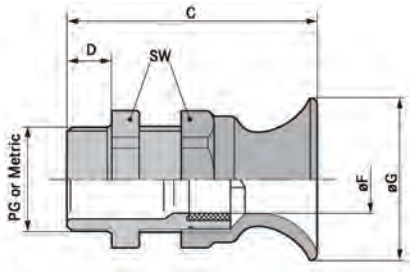
SKINTOP® BT/BT-M

Bell-shaped strain relief with PG & metric thread



The SKINTOP® BT/BT-M bell-shape provides protection against excessive bending of flexible cables and wires used on hand-held equipment, flexing machine parts, and apparatus engineering.

Application advantage

- Excellent bending protection for cable protection and functional reliability
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten

Approvals

Technical data

Material:
- body: polyamide
- bushing: CR

Color: gray (RAL 7001)

Temperature range: -20°C to +80°C

Protection: IP68, 5 bar
NEMA 1, 12

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
PG								
53015410	PG 9	Listed	0.137 - 0.315	3.5 - 8	0.748	1.690	0.315	100
53015420	PG 11	Listed	0.157 - 0.394	4 - 10	0.866	1.879	0.315	100
53015430	PG 13	Listed	0.236 - 0.472	6 - 12	0.945	2.048	0.354	50
53015440	PG 16	Listed	0.354 - 0.551	9 -14	1.063	2.202	0.394	50
53015450	PG 21	Listed	0.512 - 0.709	13 - 18	1.300	2.537	0.433	50
Metric								
53017420	M16 x 1.5	Recognized	0.137 - 0.315	3.5 - 8	0.748	1.773	0.472	100
53017430	M20 x 1.5	Listed	0.197 - 0.472	5 - 12	0.945	2.127	0.512	50
53017440	M25 x 1.5	Listed	0.354 - 0.551	9 - 14	1.063	2.245	0.512	50

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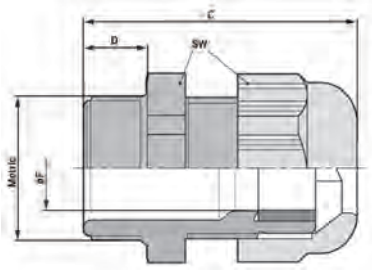
SKINTOP® K-M/KR-M ATEX plus

Strain relief according to ATEX for hazardous areas with metric thread



SKINTOP® K-M/KR-M ATEX plus was developed for use in areas with risk of explosion and cables used with fail-safe circuits in housings and devices that require class "e" security. It is recommended for use in the chemical and petrochemical industry, mobile offshore, and marine applications.

Application advantage

- Equipment Group II, Category 2G + 1D
- The heavy duty SKINTOP® design provides great pullout strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten

Approvals

CE RoHS DNV·GL Ex IECEx

Technical data

Material:
- body: special polyamide
- seal: special elastomer
- O-ring: CR

Color: black (RAL 9005), UV resistant
blue (RAL 5015)

Locknuts: not permitted

Temperature range: -20°C to +80°C

Protection: IP68, 10 bar

Part number black	Part number blue	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard								
54115200	54115400	M12 x 1.5	0.118 - 0.216	3 - 5.5	0.591	1.182	0.315	50
54115210	54115410	M16 x 1.5	0.276 - 0.354	7 - 9	0.748	1.339	0.315	50
54115220	54115420	M20 x 1.5	0.276 - 0.512	7 - 13	0.985	1.496	0.354	50
54115230	54115430	M25 x 1.5	0.433 - 0.669	11 - 17	1.182	1.576	0.394	25
54115240	54115440	M32 x 1.5	0.472 - 0.827	12 - 21	1.418	1.851	0.394	25
54115250	54115450	M40 x 1.5	0.748 - 1.103	19 - 28	1.812	2.048	0.394	10
54115260	54115460	M50 x 1.5	1.063 - 1.379	27 - 35	2.167	2.442	0.472	5
54115270	54115470	M63 x 1.5	1.457 - 1.773	37 - 45	2.600	2.797	0.472	5
Reducer bushing								
54115205	54115405	M12 x 1.5	0.078 - 0.157	2 - 4	0.591	1.182	0.315	50
54115215	54115415	M16 x 1.5	0.157 - 0.236	4 - 6	0.748	1.339	0.315	50
54115225	54115425	M20 x 1.5	0.197 - 0.394	5 - 10	0.984	1.496	0.354	50
54115235	54115435	M25 x 1.5	0.236 - 0.512	6 - 13	1.181	1.576	0.394	25
54115245	54115445	M32 x 1.5	0.354 - 0.591	9 - 15	1.417	1.851	0.394	25
54115255	54115455	M40 x 1.5	0.630 - 0.906	16 - 23	1.811	2.048	0.394	10
54115265	54115465	M50 x 1.5	0.866 - 1.142	22 - 29	2.165	2.442	0.472	5
54115275	54115475	M63 x 1.5	1.142 - 1.536	29 - 39	2.598	2.797	0.472	5

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SKINTOP® MULTI

High-density multi-cable bushing system

version 1

version 2

version 3

version 4

version 5

version 6

SKINTOP® MULTI

SKINTOP® MULTI provides the highest degree of protection (IP68) of LAPP's range of multi-cable bushing systems while providing a frameless, low profile design. The adhesive effect of the gel allows for very easy positioning at the housing during assembly.

Application advantage

- Easy assembly with high packing density
- Optimum strain relief of the entire cable bundle
- Large clamping range: 4 mm and AS-i bus entry system due to gel technology with innovative membrane technology
- UV, ozone, and oil resistant
- Fits 24-pole connector mounting cutouts (36 x 112 mm)

Recommended applications

Areas where many cables and wires need to be inserted into housing with minimum space requirements; with cables that have not been assembled and media conduits; control systems; control cabinet and apparatus construction.

Approvals

c UL us · CE · RoHS

Complete the installation

Rectangular hole punch
page 430

Technical data

Material:
- frame: polycarbonate
- seal: gel

Color: black

Temperature range: -30°C to +110°C

Protection: IP68

Part number	Number of bushings	Number of entries x cable diameter in	Number of entries x cable diameter mm
Version 1			
52220065	22	6 x 0.315 - 0.472 16 x 0.118 - 0.276	6 x 8 - 12 16 x 3 - 7
Version 2			
52220073	21	5 x 0.079 - 0.236 8 x 0.157 - 0.315 3 x 0.197 - 0.354 2 x 0.315 - 0.472 1 x 0.472 - 0.630 2 x AS-i bus (also fits 0.079 - 0.157 in)	5 x 2 - 6 8 x 4 - 8 3 x 5 - 9 2 x 8 - 12 1 x 12 - 16 2 x AS-i bus (also fits 2 - 4 mm)
Version 3			
52220080	30	30 x 0.079 - 0.236	30 x 2 - 6

Part number	Number of bushings	Number of entries x cable diameter in	Number of entries x cable diameter mm
Version 4			
52220085	11	8 x 0.315 - 0.472 2 x 0.472 - 0.630 1 x 0.630 - 0.787	8 x 8 - 12 2 x 12 - 16 1 x 16 - 20
Version 5			
52220101	27	27 x 0.157 - 0.315	27 x 4 - 8
Version 6			
52220104	24	10 x 0.079 - 0.236	10 x 2 - 6
		8 x 0.157 - 0.315	8 x 4 - 8
		4 x 0.276 - 0.433	4 x 7 - 11
		2 x 0.394 - 0.551	2 x 10 - 14

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SKINTOP® CUBE MULTI

High-density multi-cable bushing system

SKINTOP® CUBE MULTI

21-cable insert

23-cable insert

frame

SKINTOP® CUBE MULTI provides optimum sealing and strain relief, and maximum packing density. The high-strength gel bushing insert allows for easy installation and simplified cable removal. Cables are simply routed through the gel membrane; the static friction between the gel and the cable jacket ensures a secure grip and provides a reliable seal. It is not necessary to remove individual inserts to install cables, elminating several work steps and saving time. The gel technology allows large variable clamping ranges and a very high packing density.

Approvals

c UL us · CE · RoHS

Complete the installation

Rectangular hole punch
page 430

Application advantage

- Easy installation and simplified cable removal
- Cable diameters ranging from 3 - 16 mm are covered with just two SKINTOP® CUBE MULTI inserts, greatly reducing inventory
- Optimum strain relief due to high-strength gel insert
- Materials are oil, grease, UV, and ozone resistant; the perfect solution for industrial applications where harnessed cables need to be installed
- The SKINTOP® CUBE frame accommodates up to 23 cables and fits within standard 24-pole industrial connector entry holes

Technical data

Material:
- frame: glass fiber reinforced polyamide
- frame seal: CR
- insert: polycarbonate and gel

Color: black

Temperature range: -30 °C to +100 °C

Protection: IP66

individual frame & inserts

Part number	Description	Number of entries x cable diameter in	Number of entries x cable diameter mm	Number of bushings
52220001	frame only (36 x 112 mm)	–	–	–
52220050	21-cable insert	9 x 0.118 - 0.236 9 x 0.236 - 0.354 2 x 0.354 - 0.512 1 x 0.512 - 0.630	9 x 3 - 6 9 x 6 - 9 2 x 9 - 13 1 x 13 - 16	21
52220053	23-cable insert	23 x 0.197 - 0.315	23 x 5 - 8	23

complete SKINTOP® MULTI system (frame + insert)

Part number	Description	Number of entries x cable diameter in	Number of entries x cable diameter mm	Number of bushings
52220056	21-cable insert and frame	9 x 0.118 - 0.236 9 x 0.236 - 0.354 2 x 0.354 - 0.512 1 x 0.512 - 0.630	9 x 3 - 6 9 x 6 - 9 2 x 9 - 13 1 x 13 - 16	21
52220057	23-cable insert and frame	23 x 0.197 - 0.315	23 x 5 - 8	23

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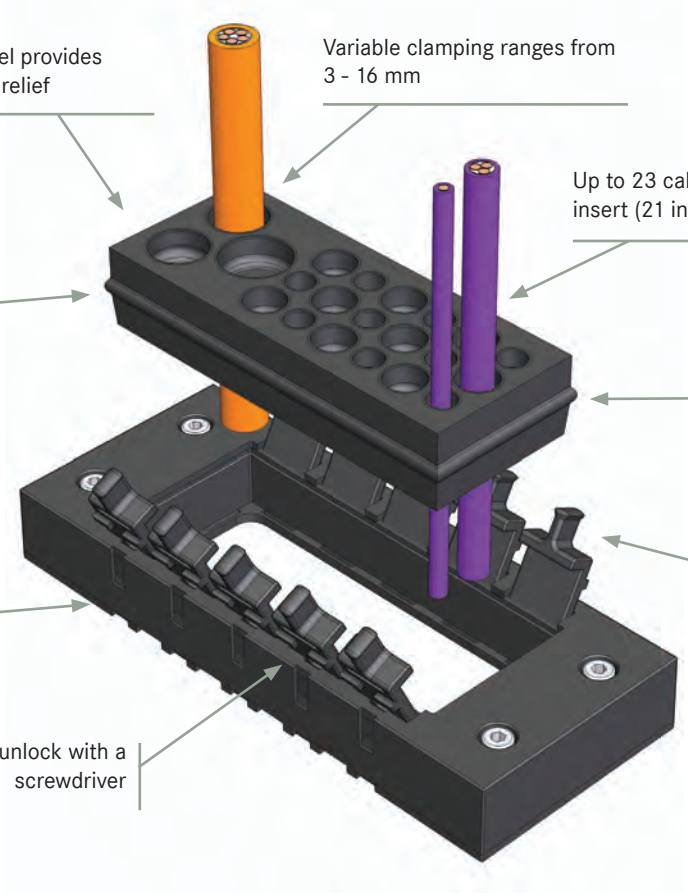
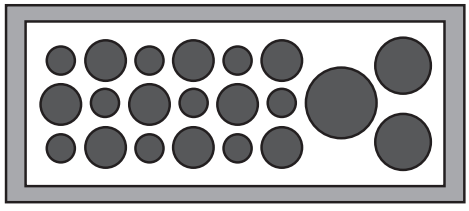
SKINTOP® CUBE MULTI

High-density multi-cable bushing system



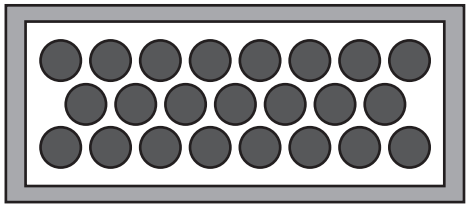
Insert configurations

21-cable insert



9x 3 - 6 mm
9x 6 - 9 mm
2x 9 - 13 mm
1x 13 - 16 mm

23-cable insert



23x 6 - 9 mm

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SKINTOP® CUBE

Modular multi-cable bushing system

SKINTOP® CUBE

frame

module

SKINTOP® CUBE provides an innovative approach to traditional multi-cable bushing systems, providing many great improvements and advancements including increased simplicity, ease of use, and safety.

The patented SKINTOP® CUBE flexible clip modules provide extremely quick and easy installation with far better sealing and clamping capabilities. Additionally, service to the cables is greatly simplified, as removing the frame from the enclosure is not necessary when replacing cables.

Approvals

c UL us CE RoHS

Complete the installation

Rectangular hole punch
page 430

Application advantage

- Faster and easier assembling and disassembling than other multi-cable bushing systems
- Cable diameters ranging from 4 - 16 mm are covered with just four SKINTOP® CUBE modules, greatly reducing inventory
- Securely fixed SKINTOP® CUBE modules can be assembled with the cable before installation in the frame
- Materials are oil, grease, UV, and ozone resistant; the perfect solution for industrial applications where harnessed cables need to be installed
- The SKINTOP® CUBE frame accommodates up to 10 cables and fits within standard 16- and 24-pole industrial connector entry holes

Technical data

Material:		**Color:**	black
- frame:	glass fiber reinforced polyamide		
- frame seal:	CR	**Temperature range:**	-20°C to +80°C
- clip module:	special polypropylene		
- clip module seal:	LSE 2	**Protection:**	IP64

Frames

Part number	Size	Dimensions mm	Max. number of inserts	Pack size
52220000	16 panel cut-out	36 x 86	8	1
52220001	24 panel cut-out	36 x 112	10	1

Modules

Part number	Description	Clamping range in	Clamping range mm	Pack size
20 x 20 mm modules				
52220002	small module	0.157 - 0.236	4 - 6	5
52220003	large module	0.236 - 0.354	6 - 9	5
52220004	blank module	0.039 - 0.118	1 - 3	5
52220040	AS-i module	AS-i bus cable		5
40 x 40 mm modules				
52220005	small module	0.354 - 0.472	9 - 12	5
52220006	large module	0.472 - 0.630	12 - 16	5
52220007	blank module	–	–	5

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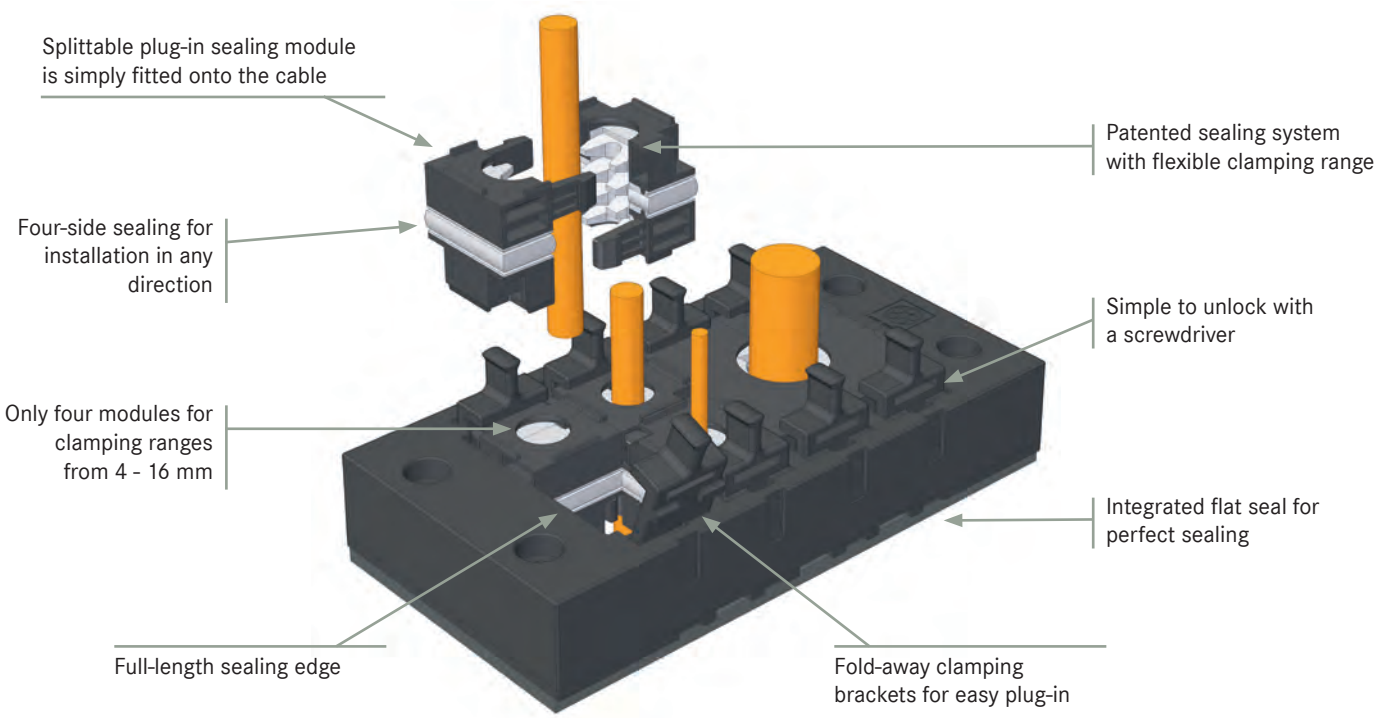
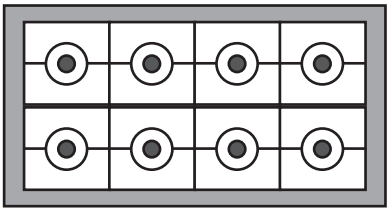
SKINTOP® CUBE

Modular multi-cable bushing system

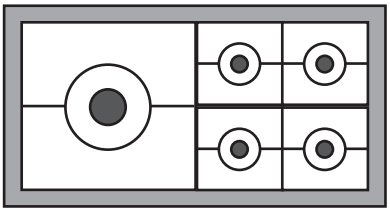


Possible module combinations

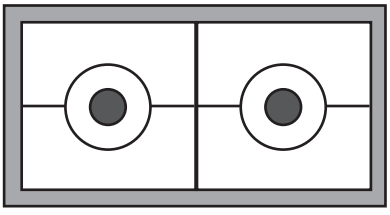
16 frame module



8x (20x20) modules

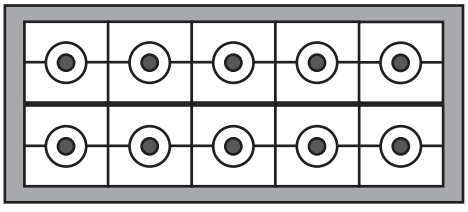


4x (20x20)
1x (40x40)
modules

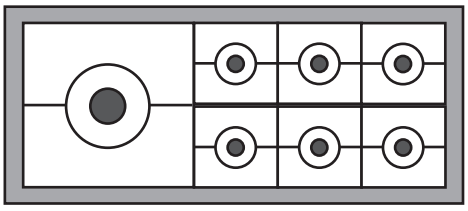


2x (40x40) modules

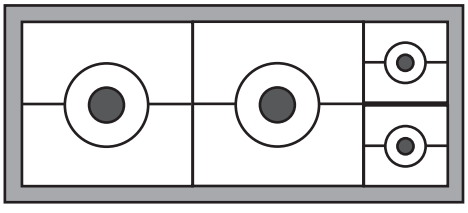
24 frame module



10x (20x20) modules



6x (20x20)
1x (40x40)
modules



2x (20x20)
2x (40x40)
modules

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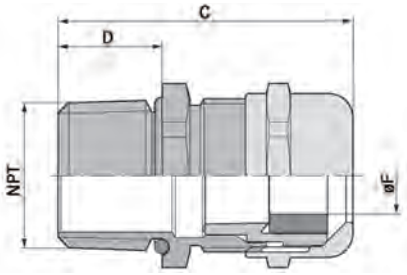
SKINTOP® MS-NPT/MSR-NPT

Nickel-plated brass strain relief with NPT thread



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
page 522

SKINDICHT® SM locknuts
page 542

SKINTOP® MS-NPT/MSR-NPT is a superior quality, liquid-tight, metallic cable gland intended for applications where ruggedness and durability are required. These cable glands are suitable for a wide range of applications, from manufacturing machinery to measurement and control equipment, including automation and robotics. SKINTOP® MSR-NPT includes reducer bushing.

Approvals

c UL us c UL us CE RoHS

Application advantage

- Suitable for use in areas with high demands on mechanical and chemical stability
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Extended temperature range due to the nickel-plated brass body
- Generous high-quality neoprene bushing and NBR O-ring provide a liquid-tight and dust-proof hermetic seal

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +100°C

Protection: IP68, 10 bar
NEMA 1, 4X, 6, 12
(does not apply to NPT 2")

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
53112004	NPT ¼"	0.137 - 0.276	3.5 - 7.0	0.630	1.418	0.591	100
53112014	NPT ⅜"	0.177–0.354	4.5 - 9.0	0.788	1.564	0.591	100
53112024	NPT ½"	0.276–0.492	7.0 - 12.5	0.945	1.674	0.591	50
53112034	NPT ¾"	0.354–0.650	9.0 - 16.5	1.142	1.753	0.591	25
53112044	NPT 1"	0.433–0.827	11 - 21	1.418	1.930	0.591	25
53112054	NPT 1¼"	0.748–1.103	19 - 28	1.773	2.265	0.669	10
53112064	NPT 1½"	1.063 - 1.379	27 - 35	2.127	2.423	0.669	5
53112074	NPT 2"	1.339 - 1.773	34 - 45	2.639	2.501	0.669	5
Reducer bushing							
53112006	NPT ¼"	0.039 - 0.197	1 - 5	0.630	1.418	0.591	100
53112016	NPT ⅜"	0.078 - 0.276	2 - 7	0.788	1.564	0.591	100
53112026	NPT ½"	0.197 - 0.394	5 - 10	0.945	1.674	0.591	50
53112036	NPT ¾"	0.236 - 0.512	6 - 13	1.142	1.753	0.591	25
53112046	NPT 1"	0.276 - 0.591	7 - 15	1.418	1.930	0.591	25
53112056	NPT 1¼"	0.591 - 0.906	15 - 23	1.773	2.265	0.669	10
53112066	NPT 1½"	0.866 - 1.142	22 - 29	2.127	2.423	0.669	5
53112076	NPT 2"	1.103 - 1.536	28 - 39	2.639	2.501	0.669	5

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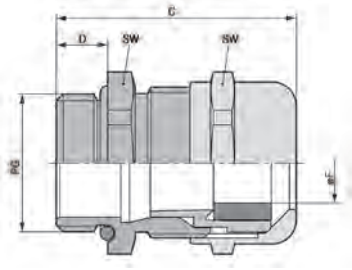
SKINTOP® MS/MSR

Nickel-plated brass strain relief with PG thread



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
page 522

SKINDICHT® SM locknuts
page 542

SKINTOP® MS/MSR is a superior quality, liquid-tight, metallic cable gland intended for applications where ruggedness and durability are required. These cable glands are suitable for a wide range of applications, from manufacturing machinery to measurement and control equipment, including automation and robotics. SKINTOP® MSR includes reducer bushing.

Approvals

CE RoHS

Application advantage

- Suitable for use in areas with high demands on mechanical and chemical stability
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Extended temperature range due to the nickel-plated brass body
- Generous high-quality neoprene bushing and NBR O-ring provide a liquid-tight and dust-proof hermetic seal

Technical data

Material:

- body:	nickel-plated brass
- insert:	polyamide
- bushing:	CR
- O-ring:	NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range:

- static:	-40°C to +100°C
- dynamic:	-25°C to +100°C

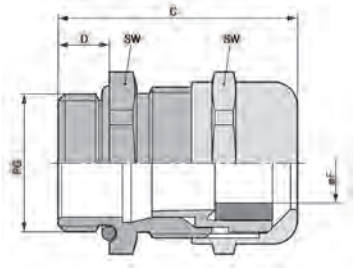
IP Protection: IP68, 10 bar when used with O-ring (exceeds NEMA 6/6P pressure rating)

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
52015700	PG 7	0.078 - 0.256	2 - 6.5	0.551	0.985	0.197	100
52015710	PG 9	0.157 - 0.315	4 - 8	0.669	1.142	0.236	100
52015720	PG 11	0.157 - 0.394	4 - 10	0.788	1.260	0.236	50
52015730	PG 13	0.197 - 0.472	5 - 12	0.866	1.339	0.256	50
52015740	PG 16	0.315 - 0.551	8 - 14	0.945	1.379	0.256	50
52015750	PG 21	0.433 - 0.709	11 - 18	1.182	1.576	0.276	25
52015760	PG 29	0.630 - 0.985	16 - 25	1.576	1.891	0.315	25
52015765	PG 36	0.748 - 1.260	19 - 32	1.970	2.442	0.591	10
52015766	PG 42	1.103 - 1.497	28 - 38	2.245	2.442	0.591	5
52015767	PG 48	1.339 - 1.733	34 - 44	2.521	2.442	0.591	5
Reducer bushing							
52015770	PG 7	0.078 - 0.197	2 - 5	0.551	0.985	0.197	100
52015780	PG 9	0.078 - 0.236	2 - 6	0.669	1.142	0.236	100
52015790	PG 11	0.118 - 0.276	3 - 7	0.787	1.260	0.236	50
52015800	PG 13	0.157 - 0.354	4 - 9	0.866	1.339	0.256	50
52015810	PG 16	0.236 - 0.512	6 - 13	0.945	1.379	0.256	50
52015820	PG 21	0.315 - 0.630	8 - 16	1.182	1.576	0.276	25
52015830	PG 29	0.413 - 0.788	10.5 - 20	1.576	1.891	0.315	25
52015831	PG 36	0.748 - 1.024	19 - 26	1.970	2.442	0.591	10
52015832	PG 42	0.945 - 1.221	24 - 31	2.245	2.442	0.591	5
52015833	PG 48	1.103 - 1.379	28 - 35	2.521	2.442	0.591	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® MS-XL/MSR-XL

Nickel-plated brass strain relief with extended PG thread



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
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SKINDICHT® SM locknuts
page 542

SKINTOP® MS-XL/MSR-XL is a superior quality, liquid-tight, metallic cable gland intended for applications where ruggedness, durability and long threads are required. These cable glands are suitable for a wide range of applications, from manufacturing machinery to measurement and control equipment, including automation and robotics. SKINTOP® MSR-XL includes reducer bushing.

Approvals

CE RoHS

Application advantage

- Ideal for heavy wall applications or for use with locknuts where tapped holes cannot be provided
- Suitable for use in areas with high demands on mechanical and chemical stability
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Extended temperature range due to the nickel-plated brass body
- Generous high-quality neoprene bushing and NBR O-ring provide a liquid-tight and dust-proof hermetic seal

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +100°C

Protection: 70 PSI
- seal: IP68, 5 bar when used with an O-ring NEMA 1, 4X, 6, 12

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
52115700	PG 7	0.078 - 0.256	2 - 6.5	0.551	1.260	0.472	100
52115710	PG 9	0.157 - 0.315	4 - 8	0.669	1.379	0.472	100
52115720	PG 11	0.157 - 0.394	4 - 10	0.788	1.497	0.472	50
52115730	PG 13	0.197 - 0.472	5 -12	0.866	1.556	0.472	50
52115740	PG 16	0.315 - 0.551	8 - 14	0.945	1.595	0.472	50
52115750	PG 21	0.433 - 0.709	11 - 18	1.182	1.773	0.472	25
52115760	PG 29	0.630 - 0.985	16 - 25	1.576	2.048	0.591	25
Reducer bushing							
52115770	PG 7	0.078 - 0.197	2 - 5	0.551	1.260	0.472	100
52115780	PG 9	0.078 - 0.236	2 - 6	0.669	1.379	0.472	100
52115790	PG 11	0.118 - 0.276	3 - 7	0.788	1.497	0.472	50
52115800	PG 13	0.157 - 0.354	4 - 9	0.866	1.556	0.472	50
52115810	PG 16	0.236 - 0.512	6 - 13	0.945	1.595	0.472	50
52115820	PG 21	0.315 - 0.630	8 - 16	1.182	1.773	0.472	25
52115830	PG 29	0.413 - 0.788	10.5 - 20	1.576	2.048	0.591	25

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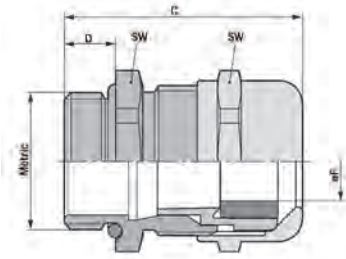
SKINTOP® MS-M/MSR-M

Nickel-plated brass strain relief with metric thread



Complete the installation

SKINTOP® DIX bushing
page 545

Plugs
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SKINDICHT® SM locknuts
page 542

SKINTOP® MS/MSR is a superior quality, liquid-tight, metallic cable gland intended for applications where ruggedness and durability are required. These cable glands are suitable for a wide range of applications, from manufacturing machinery to measurement and control equipment, including automation and robotics. SKINTOP® MSR includes reducer bushing.

Application advantage

- Suitable for use in areas with high demands on special mechanical and chemical stability
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Extended temperature range due to the nickel-plated brass body
- Generous high-quality neoprene bushing and NBR O-ring provide a liquid-tight and dust-proof hermetic seal

Approvals

* DNV pending for size M75; UL, CSA, DNV & VDE pending for sizes M90 & M110

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts: add SKINDICHT® SM-M, page 542

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +100°C

IP Protection: 70 PSI
- M12 - M50: IP68, 10 bar
- M12 - M63: IP68, 5 bar
  IP69
  NEMA 1, 4X, 6, 12
- M12 - M75: IP68, 1 bar

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard								
53112000	M12 x 1.5	Recognized	0.138 - 0.276	3.5 - 7	0.630	1.044	0.256	100
53112010	M16 x 1.5	Recognized	0.177 - 0.394	4.5 - 10	0.788	1.260	0.276	100
53112020	M20 x 1.5	Listed	0.276 - 0.512	7 - 13	0.945	1.398	0.315	50
53112030	M25 x 1.5	Listed	0.354 - 0.669	9 - 17	1.142	1.477	0.315	25
53112040	M32 x 1.5	Listed	0.433 - 0.827	11 - 21	1.418	1.662	0.354	25
53112050	M40 x 1.5	Listed	0.748 - 1.103	19 - 28	1.773	1.950	0.354	10
53112060	M50 x 1.5	Listed	1.063 - 1.379	27 - 35	2.127	2.048	0.394	5
53112070	M63 x 1.5	Listed	1.339 - 1.773	34 - 45	2.639	2.415	0.591	5
53112080	M63 x 1.5, plus	Listed	1.733 - 2.167	44 - 55	2.955	2.580	0.591	5
53112510	M75 x 1.5	Listed	2.285 - 2.679	58 - 68	3.743	4.137	0.591	1
53112512	M90 x 2.0	Listed	2.600 - 3.073	66 - 78	4.531	5.358	0.788	1
53112514	M110 x 2.0	Listed	3.388 - 3.861	86 - 98	5.319	6.067	0.985	1
Reducer bushing								
53112100	M12 x 1.5	Recognized	0.078 - 0.197	2 - 5	0.630	1.044	0.256	100
53112110	M16 x 1.5	Recognized	0.078 - 0.276	2 - 7	0.788	1.260	0.276	100
53112120	M20 x 1.5	Listed	0.197 - 0.394	5 - 10	0.945	1.398	0.315	50
53112130	M25 x 1.5	Listed	0.236 - 0.512	6 - 13	1.142	1.477	0.315	25
53112140	M32 x 1.5	Listed	0.276 - 0.591	7 - 15	1.418	1.662	0.354	25
53112150	M40 x 1.5	Listed	0.591 - 0.906	15 - 23	1.773	1.950	0.354	10
53112160	M50 x 1.5	Listed	0.866 - 1.142	22 - 29	2.127	2.048	0.394	5
53112170	M63 x 1.5	Listed	1.103 - 1.536	28 - 39	2.639	2.415	0.591	5
53112511	M75 x 1.5	Listed	2.088 - 2.482	53 - 63	3.743	4.137	0.591	1
53112515	M110 x 2.0	Listed	2.994 - 3.467	76 - 88	5.319	6.067	0.985	1

If not otherwise specified, all values relating to the product are nominal values.
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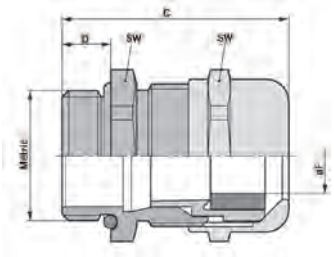
SKINTOP® MS-M-XL/MSR-M-XL

Nickel-plated brass strain relief with extended metric thread



Complete the installation

SKINTOP® DIX bushing
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SKINDICHT® SM locknuts
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SKINTOP® MS-M-XL/MSR-M-XL is a superior quality, liquid-tight, metallic cable gland intended for applications where ruggedness, durability, and long threads are required. SKINTOP® MSR-M-XL includes reducer bushing.

Approvals

Application advantage

- Ideal for heavy wall applications or for use with locknuts where tapped holes cannot be provided
- Suitable for use in areas with high demands on special mechanical and chemical stability
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Extended temperature range due to the nickel-plated brass body
- Generous high-quality neoprene bushing and NBR O-ring provide a liquid-tight and dust-proof hermetic seal

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts: add SKINDICHT® SM-M, page 542

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +100°C

Protection: 70 PSI
- seal: IP68, 10 bar
IP69
NEMA 1, 4X, 6, 12

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
53112005	M12 x 1.5	0.138 - 0.276	3.5 - 7	0.630	1.292	0.472	100
53112015	M16 x 1.5	0.177 - 0.394	4.5 - 10	0.788	1.457	0.472	50
53112025	M20 x 1.5	0.276 - 0.512	7 - 13	0.945	1.556	0.472	50
53112035	M25 x 1.5	0.354 - 0.669	9 - 17	1.142	1.635	0.472	25
53112045	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	1.899	0.591	25
53112055	M40 x 1.5	0.748 - 1.103	19 - 28	1.773	2.107	0.591	10
53112065	M50 x 1.5	1.063 - 1.379	27 - 35	2.127	2.245	0.591	5
Reducer bushing							
53112105	M12 x 1.5	0.078 - 0.197	2 - 5	0.630	1.292	0.472	100
53112115	M16 x 1.5	0.078 - 0.276	2 - 7	0.788	1.457	0.472	50
53112125	M20 x 1.5	0.197 - 0.394	5 - 10	0.945	1.556	0.472	50
53112135	M25 x 1.5	0.236 - 0.512	6 - 13	1.142	1.635	0.472	25
53112145	M32 x 1.5	0.276 - 0.591	7 - 15	1.418	1.899	0.591	25
53112155	M40 x 1.5	0.591 - 0.906	15 - 23	1.773	2.107	0.591	10
53112165	M50 x 1.5	0.866 - 1.142	22 - 29	2.127	2.245	0.591	5

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If not otherwise specified, all values relating to the product are nominal values.
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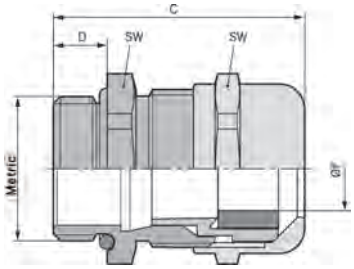
SKINTOP® MS-M ATEX/MSR-M ATEX

Nickel-plated brass strain relief according to ATEX for hazardous areas with metric thread



Complete the installation

SKINTOP® DIX bushing
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SKINDICHT® SM locknuts
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SKINTOP® MS-M ATEX and MSR-M ATEX were developed for use in areas with risk of explosion and for cables used with fail-safe circuits in housings and devices which require class "e" security. They are recommended for use in the chemical and petrochemical industry, mobile offshore, and marine applications. SKINTOP® MSR-M ATEX includes reducer bushing.

Approvals

Application advantage

- Equipment Group II, Category 2G + 1D
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- Superior integrated locking mechanism includes an internal ratchet for vibration-proof protection
- Multi-trapezoidal thread requires just one twist to tighten
- Provide clamping range of 44 - 55 mm while maintaining protection, stability, and safety

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts: add SKINDICHT® SM-M, page 542

Temperature range: -30°C to +90°C

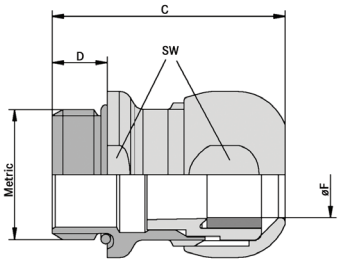
Protection: IP68, 10 bar when used with an O-ring
NEMA 1, 4X, 6, 12

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard							
53112700	M12 x 1.5	0.118 - 0.276	3 - 7	0.630	1.044	0.256	100
53112710	M16 x 1.5	0.177 - 0.394	4.5 - 10	0.788	1.300	0.276	100
53112720	M20 x 1.5	0.276 - 0.512	7 - 13	0.945	1.457	0.315	50
53112730	M25 x 1.5	0.354 - 0.669	9 - 17	1.142	1.516	0.315	25
53112740	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	1.792	0.354	25
53112750	M40 x 1.5	0.748 - 1.103	19 - 28	1.773	1.891	0.354	10
53112760	M50 x 1.5	1.024 - 1.379	26 - 35	2.127	2.186	0.394	5
53112770	M63 x 1.5	1.339 - 1.773	34 - 45	2.639	2.639	0.591	5
53112779	M63 x 1.5	1.733 - 2.167	44 - 55	2.955	2.580	0.591	1
Reducer bushing							
53112705	M12 x 1.5	0.078 - 0.197	2 - 5	0.630	1.044	0.256	100
53112715	M16 x 1.5	0.157 - 0.276	4 - 7	0.788	1.300	0.276	100
53112725	M20 x 1.5	0.197 - 0.394	5 - 10	0.945	1.457	0.315	50
53112735	M25 x 1.5	0.236 - 0.512	6 - 13	1.142	1.516	0.315	25
53112745	M32 x 1.5	0.276 - 0.591	7 - 15	1.418	1.792	0.354	25
53112755	M40 x 1.5	0.630 - 0.906	16 - 23	1.773	1.891	0.354	10
53112765	M50 x 1.5	0.748 - 1.142	19 - 29	2.127	2.186	0.394	5
53112775	M63 x 1.5	1.260 - 1.536	32 - 39	2.639	2.639	0.591	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® INOX/INOX-R

Hygienic stainless steel strain relief with NPT & 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 IP68/69 rating and withstands high pressure and high-temperature wash downs. Typical applications can be found in the food & beverage and pharmaceutical industry. SKINTOP® INOX-R includes reducer bushing.

Approvals

Application advantage

- Highly corrosion-resistant
- Smooth surface
- No edges
- IP68/69 protection
- Wide variable clamping ranges
- NSF 169 for use in splash zone or non-food zone

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: IP69
- M12 - M20: IP68, 10 bar
- M25 - M50 & NPT: IP68, 5 bar

NEMA 1, 2, 4X, 6, 12

Approvals: according to DIN EN ISO 14 159
according to DIN EN 1672-2
NSF 169

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard NPT								
53806780	NPT ½"	Recognized	0.276 - 0.512	7 - 13	0.945	1.673	0.591	5
53806781	NPT ¾"	Recognized	0.354 - 0.669	9 - 17	1.142	1.819	0.591	5
53806782	NPT 1"	Recognized	0.433 - 0.827	11 - 21	1.417	1.992	0.591	5
53806783	NPT 1¼"	Listed	0.748 - 1.102	19 - 28	1.772	2.331	0.669	5
53806784	NPT 1½"	Listed	1.063 - 1.378	27 - 35	2.126	2.488	0.669	5
Standard metric								
53806739	M12 x 1.5	Recognized	0.157 - 0.276	4 - 7	0.630	1.154	0.256	5
53806740	M16 x 1.5	Recognized	0.236 - 0.394	6 - 10	0.788	1.276	0.276	5
53806741	M20 x 1.5	Recognized	0.276 - 0.512	7 - 13	0.945	1.398	0.315	5
53806742	M25 x 1.5	Recognized	0.354 - 0.669	9 - 17	1.142	1.544	0.315	5
53806743	M32 x 1.5	Recognized	0.433 - 0.827	11 - 21	1.418	1.757	0.354	5
53806744	M40 x 1.5	Listed	0.748 - 1.102	19 - 28	1.772	2.016	0.354	5
53806745	M50 x 1.5	Listed	1.063 - 1.378	27 - 35	2.126	2.213	0.394	5
Reducer bushing								
53806749	M12 x 1.5	Recognized	0.118 - 0.197	3 - 5	0.630	1.154	0.256	5
53806750	M16 x 1.5	Recognized	0.197 - 0.276	5 - 7	0.788	1.276	0.276	5
53806751	M20 x 1.5	Recognized	0.236 - 0.394	6 - 10	0.945	1.398	0.315	5
53806752	M25 x 1.5	Recognized	0.276 - 0.512	7 - 13	1.142	1.544	0.315	5
53806753	M32 x 1.5	Recognized	0.315 - 0.591	8 - 15	1.418	1.757	0.354	5
53806754	M40 x 1.5	Recognized	0.591 - 0.906	15 - 23	1.772	2.016	0.354	5
53806755	M50 x 1.5	Listed	0.866 - 1.142	22 - 29	2.126	2.213	0.394	5

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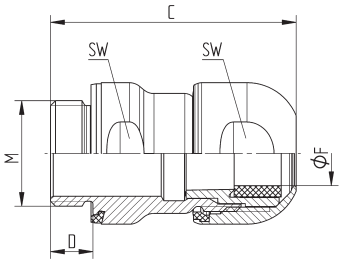
SKINTOP® HYGIENIC/HYGIENIC-R

Hygienic stainless steel strain relief with FDA-approved sealing material with metric thread



SKINTOP® HYGIENIC is a stainless steel cable gland that uses FDA-approved material and is designed with special features which prevent micro-organisms and bacteria from sticking to the surface. It has an IP68/69 rating and withstands high pressure and high temperature washdowns. SKINTOP® HYGIENIC-R includes a reducer bushing.

Application advantage

- Special sealing element for food & beverage and pharmaceutica industries
- FDA-approved sealing material
- IP68/69 protection
- NSF 169 for use in food zone

Approvals

c UL us · CE · RoHS · ECOLAB · EHEDG

Technical data

Material:
- body: stainless steel: V4A (1.4404/316L)
- insert: polyamide
- sealing element: special elastomer

Temperature range: -20°C to +100°C

IP Protection: IP68, 10 bar
IP69
NEMA 1, 2, 4X, 6, 12

Approvals: according to DIN EN ISO 14 159
according to DIN EN 1672-2
according to EHEDG
NSF 169

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard								
53105100	M12 x 1.5	Recognized	0.158 - 0.236	4 - 6	0.630	1.572	0.256	5
53105110	M16 x 1.5	Recognized	0.256 - 0.355	6.5 - 9.0	0.788	1.710	0.276	5
53105120	M20 x 1.5	Recognized	0.355 - 0.473	9 - 12	0.946	1.828	0.315	5
53105130	M25 x 1.5	Recognized	0.453 - 0.611	11.5 - 15.5	1.143	1.927	0.315	5
Reducer bushing								
53105200	M12 x 1.5	Recognized	0.118 - 0.177	3.0 - 4.5	0.630	1.572	0.256	5
53105210	M16 x 1.5	Recognized	0.177 - 0.276	4.5 - 7.0	0.788	1.710	0.276	5
53105220	M20 x 1.5	Recognized	0.276 - 0.394	7 - 10	0.946	1.828	0.315	5
53105230	M25 x 1.5	Recognized	0.355 - 0.493	9.0 - 12.5	1.143	1.927	0.315	5

If not otherwise specified, all values relating to the product are nominal values.
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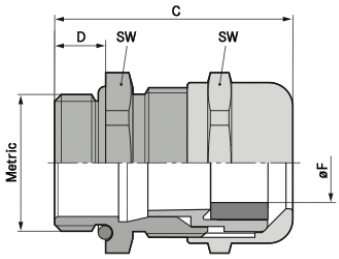
SKINTOP® COLD/COLD-R

Nickel-plated brass strain relief for extreme sub-zero temperatures with metric thread



Complete the installation

SKINDICHT® SM locknuts
page 542

SKINTOP® COLD strain relief cable glands are designed for areas where mechanical stability and cold resistance are critical. Typical applications include cold storage facilities, offshore areas, and plant engineering. SKINTOP® COLD-R includes reducer bushing.

Application advantage

- Excellent cold resistance
- Cold impact resistant
- Heavy duty design offers mechanical stability, pull-out protection and reliable strain relief

Approvals

Technical data

Material:
- body: nickel-plated brass
- insert: special polyamide
- sealing ring: silicone
- O-ring: silicone

Locknuts: add SKINDICHT® SM-M, page 542

Temperature range: -70°C to +100°C

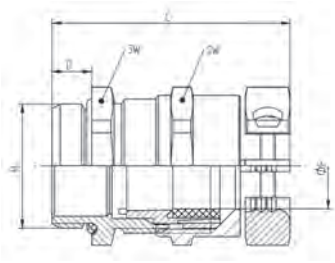
Protection:
- M12 - M20: IP68, 10 bar
- M25 - M63: IP68, 5 bar
  NEMA 1, 2, 4X, 6, 12

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
Standard								
53113500	M12 x 1.5	Recognized	0.138 - 0.276	3.5 - 7	0.630	1.044	0.256	100
53113510	M16 x 1.5	Recognized	0.177 - 0.394	4.5 - 10	0.788	1.261	0.276	100
53113520	M20 x 1.5	Recognized	0.276 - 0.512	7 - 13	0.946	1.399	0.315	50
53113530	M25 x 1.5	Recognized	0.355 - 0.670	9 - 17	1.143	1.478	0.315	25
53113540	M32 x 1.5	Listed	0.433 - 0.827	11 - 21	1.418	1.663	0.355	25
53113550	M40 x 1.5	Listed	0.749 - 1.103	19 - 28	1.773	1.950	0.355	10
53113560	M50 x 1.5	–	1.064 - 1.379	27 - 35	2.128	2.049	0.394	5
53113570	M63 x 1.5	–	1.340 - 1.773	34 - 45	2.640	2.415	0.591	5
Reducer bushing								
53113600	M12 x 1.5	Recognized	0.039 - 0.197	1 - 5	0.630	1.044	0.256	100
53113610	M16 x 1.5	Recognized	0.079 - 0.276	2 - 7	0.788	1.261	0.276	100
53113620	M20 x 1.5	Recognized	0.197 - 0.394	5 - 10	0.946	1.399	0.315	50
53113630	M25 x 1.5	Recognized	0.236 - 0.512	6 - 13	1.143	1.478	0.315	25
53113640	M32 x 1.5	Recognized	0.276 - 0.591	7 - 15	1.418	1.663	0.355	25
53113650	M40 x 1.5	Recognized	0.591 - 0.906	15 - 23	1.773	1.950	0.355	10
53113660	M50 x 1.5	Recognized	0.867 - 1.143	22 - 29	2.128	2.049	0.394	5
53113670	M63 x 1.5	Recognized	1.103 - 1.537	28 - 39	2.640	2.415	0.591	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® GRIP-M

Nickel-plated brass strain relief for high strain applications with metric thread



SKINTOP® GRIP-M is a double-strap strain relief cable gland with a high level of strain relief for harsh environmental conditions. Is is appropriate for portable equipment, cranes, conveying machinery, and systems on building sites.

Application advantage

- Protects cable in environments with high pull strain
- Reliable bending and anti-kink protection
- For high mechanical stress

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- sealing: CR/NBR
- O-ring: NBR

Temperature range: -40°C to +100°C

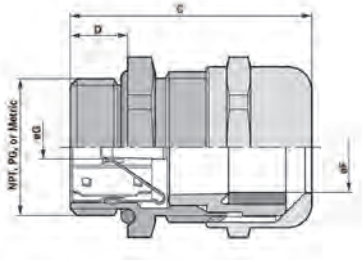
Protection: IP68, 10 bar
IP69

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
53113180	M16 x 1.5	0.177 - 0.394	4.5 - 10	0.787	1.614	0.276	25
53113200	M20 x 1.5	0.276 - 0.512	7 - 13	0.945	1.811	0.335	25
53113210	M25 x 1.5	0.355 - 0.670	9 - 17	1.142	1.909	0.315	25
53113220	M32 x 1.5	0.433 - 0.827	11 - 21	1.417	2.224	0.354	25

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® MS-SC

Nickel-plated strain relief for EMC applications with NPT, PG & metric thread



SKINTOP® MS-SC is uniquely designed to address EMI concerns with its simplified grounding feature. In a few easy steps the cable is grounded, strain relieved, and sealed from moisture and dust in accordance with IP68. The cable glands' contact springs establish a continuous electrical path from the shield of the cable to the equipment ground, creating a secure shield connection.

Application advantage

- Optimal EMC protection
- Suitable for braid-shielded cable
- Minimal assembly steps
- The contact springs' unique design can accept cable diameters with wide dimensional tolerances
- Available in both standard and long length threads for heavy wall applications

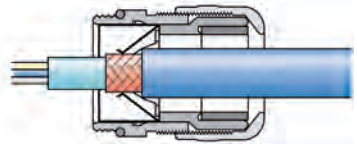
Approvals: NPT

Approvals: PG

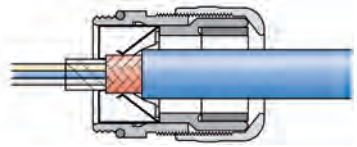
Approvals: metric

Assembly instructions

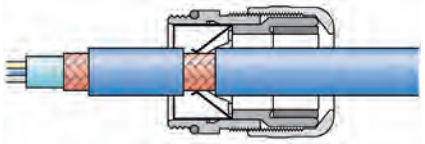
for standard contacting



for thin wires without an inner sheath



when routing cable screen to another connection



Complete the installation

SKINDICHT® SM-PE locknuts
page 543

Technical data

Material:
- body: nickel-plated brass
- insert: polyamide
- bushing: CR
- O-ring: NBR

Locknuts:
- PG & metric: add SKINDICHT® SM-PE, page 543

Temperature range:
- static: -40°C to +100°C
- dynamic: -25°C to +100°C

Protection: IP68, 10 bar
- metric: IP69
- NPT & metric: NEMA 1, 4X, 6, 12

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If not otherwise specified, all values relating to the product are nominal values.
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SKINTOP® MS-SC NPT

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Min ø above braiding in	Pack size
Standard								
53112910	NPT ⅜"	0.177 - 0.394	4.5 - 10	0.788	1.564	0.591	0.158	100
53112920	NPT ½"	0.276 - 0.512	7 - 13	0.945	1.674	0.591	0.197	50
53112930	NPT ¾"	0.354 - 0.669	9 - 17	1.142	1.753	0.591	0.296	25
53112940	NPT 1"	0.433 - 0.827	11 - 21	1.418	1.930	0.591	0.355	25
53112950	NPT 1¼"	0.748 - 1.103	19 - 28	1.773	2.264	0.669	0.591	10
53112960	NPT 1½"	1.063 - 1.379	27 - 35	2.127	2.423	0.669	0.827	5

SKINTOP® MS-SC & MS-SCL

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Min ø above braiding in	Pack size
Standard								
53112210	PG 9	0.118 - 0.315	3 - 8	0.669	1.142	0.236	0.158	50
53112220	PG 11	0.157 - 0.394	4 - 10	0.787	1.260	0.236	0.158	50
53112230	PG 13	0.197 - 0.472	5 - 12	0.866	1.339	0.256	0.158	25
53112240	PG 16	0.315 - 0.551	8 - 14	0.945	1.378	0.256	0.236	25
53112250	PG 21	0.433 - 0.709	11 - 18	1.181	1.575	0.276	0.315	25
53112260	PG 29	0.630 - 0.985	16 - 25	1.575	1.890	0.315	0.512	10
53112270	PG 36	0.748 - 1.260	19 - 32	1.969	2.441	0.591	0.630	5
Long thread								
53112310	PG 9	0.118 - 0.315	3 - 8	0.669	1.378	0.472	0.158	50
53112320	PG 11	0.157 - 0.394	4 - 10	0.787	1.496	0.472	0.158	50
53112330	PG 13	0.197 - 0.472	5 - 12	0.866	1.555	0.472	0.158	25
53112340	PG 16	0.315 - 0.551	8 - 14	0.945	1.594	0.472	0.236	25
53112350	PG 21	0.433 - 0.709	11 - 18	1.181	1.772	0.472	0.315	25
53112360	PG 29	0.630 - 0.985	16 - 25	1.575	2.047	0.591	0.512	10

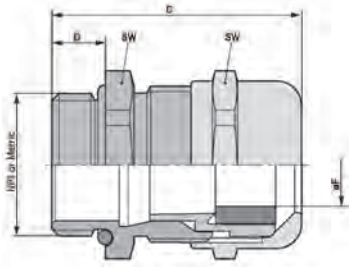
SKINTOP® MS-M-SC & MS-M-SCL

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Min ø above braiding in	Pack size
Standard								
53112610	M12 x 1.5	0.137 - 0.276	3.5 - 7	0.630	1.043	0.256	0.079	50
53112620	M16 x 1.5	0.177 - 0.354	4.5 - 9	0.788	1.299	0.276	0.158	50
53112630	M20 x 1.5	0.276 - 0.512	7 - 13	0.945	1.457	0.315	0.197	25
53112640	M25 x 1.5	0.354 - 0.669	9 - 17	1.142	1.516	0.315	0.296	25
53112650	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	1.791	0.354	0.355	25
53112660	M40 x 1.5	0.748 - 1.103	19 - 28	1.773	1.890	0.354	0.591	10
53112670	M50 x 1.5	1.063 - 1.379	27 - 35	2.127	2.185	0.394	0.827	5
Long thread								
53112615	M12 x 1.5	0.137 - 0.276	3.5 - 7	0.630	1.260	0.472	0.039	50
53112625	M16 x 1.5	0.177 - 0.354	4.5 - 9	0.788	1.496	0.472	0.158	50
53112635	M20 x 1.5	0.276 - 0.512	7 - 13	0.945	1.614	0.472	0.197	25
53112645	M25 x 1.5	0.354 - 0.669	9 - 17	1.142	1.673	0.472	0.296	25
53112655	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	2.028	0.591	0.355	25
53112665	M40 x 1.5	0.748 - 1.103	19 - 28	1.773	2.126	0.591	0.591	10
53112675	M50 x 1.5	1.063 - 1.379	27 - 35	2.127	2.382	0.591	0.827	5

If not otherwise specified, all values relating to the product are nominal values.

SKINTOP® MS-NPT BRUSH/MS-M BRUSH

Nickel-plated brass strain relief for EMC applications with NPT & metric thread



Complete the installation

SKINDICHT® SM-PE locknuts
page 543

The SKINTOP® MS-NPT/MS-M BRUSH provides centered, fixed strain relief with a liquid-tight and dust-proof seal, all in one step. Simply insert the cable, push the braid shield under the innovative EMC brush, tighten the cap, and the connection is made. Plus sizes offer extra large clamping ranges.

Approvals: NPT

Approvals: metric

Application advantage

- Faster, easier, reliable cable shield contact
- Maximum assembly and adjustment possibilities
- 360° contact area allows for optimal low-resistance current return ground path
- M75 - M110 feature an innovative double lamellar gasket for easier assembling of cables with large diameters.

Technical data

Material:

- body:	nickel-plated brass
- brush:	brass
- insert:	polyamide
- bushing:	special elastomer
- O-ring:	special elastomer

Locknuts: add SKINDICHT® SM-PE-M for metric glands, page 543

Temperature range:

- static:	-40°C to +100°C
- dynamic:	-25°C to +100°C

Protection:

- NPT:	IP68, 10 bar
	IP69 (does not apply to NPT 2" plus)
	NEMA 1, 4X, 6, 12 (does not apply to NPT 2" & 2" plus)
- metric:	IP68, 10 bar
	IP69 (does not apply to M63 plus & larger)
	NEMA 1, 4X, 6, 12 (does not apply to M75 & larger)

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Min ø above braiding in	Pack size
NPT								
53112037	NPT ¾"	0.354 - 0.669	9 - 17	1.142	1.694	0.591	0.236	10
53112047	NPT 1"	0.433 - 0.827	11 - 21	1.418	1.891	0.591	0.315	1
53112057	NPT 1¼"	0.748 - 1.103	19 - 28	1.773	2.265	0.669	0.394	1
53112067	NPT 1½"	1.063 - 1.379	27 - 35	2.127	2.323	0.669	0.551	1
53112077	NPT 2"	1.339 - 1.773	34 - 45	2.639	2.482	0.669	0.787	1
53112087	NPT 2", plus	1.733 - 2.167	44 - 55	2.955	2.836	0.669	0.984	1
Metric								
53112676	M25 x 1.5	0.354 - 0.669	9 - 17	1.142	1.418	0.315	0.236	10
53112677	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	1.663	0.354	0.315	1
53112678	M40 x 1.5	0.748 - 1.103	19 - 28	1.773	2.344	0.354	0.394	1
53112679	M50 x 1.5	1.063 - 1.379	27 - 35	2.127	2.049	0.394	0.551	1
53112680	M63 x 1.5	1.339 - 1.773	34 - 45	2.639	2.415	0.591	0.788	1
53112681	M63 x 1.5, plus	1.733 - 2.167	44 - 55	2.955	2.719	0.591	0.985	1
53112501	M75 x 1.5	2.088 - 2.482	53 - 63	3.743	4.137	0.591	1.379	1
53112500	M75 x 1.5, plus	2.285 - 2.679	58 - 68	3.743	4.137	0.591	1.379	1
53112503	M90 x 2.0	2.600 - 3.073	66 - 78	4.531	5.339	0.788	1.773	1
53112505	M110 x 2.0	2.994 - 3.467	76 - 88	5.319	6.068	0.985	2.167	1
53112504	M110 x 2.0, plus	3.388 - 3.861	86 - 98	5.319	6.068	0.985	2.167	1

If not otherwise specified, all values relating to the product are nominal values.
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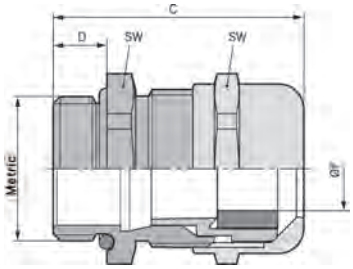
SKINTOP® MS-M ATEX BRUSH

Nickel-plated brass strain relief according to ATEX for EMC applications in hazardous areas



Complete the installation

SKINDICHT® SM-PE locknuts
page 543

SKINTOP® MS-M ATEX BRUSH was developed for safe use in areas with risk of explosion and for cables used with fail-safe circuits in housings and devices which require class “e” security. Simply insert the cable, push the braid shield under the innovative EMC brush, tighten the cap, and the connection is made.

Approvals

CE · Ex · IECEx · DNV·GL · RoHS

Application advantage

- Equipment Group II, Category 2G + 1D
- The heavy duty SKINTOP® design provides great pull-out strength and very reliable strain relief
- 360° contact area allows for optimal low-resistance current return ground path
- Faster, easier, reliable cable shield contact
- Anti-static, safe, and impact resistant at cold temperatures

Technical data

Material:
- body: nickel-plated brass
- brush: brass
- insert: polyamide
- bushing: special elastomer
- O-ring: special elastomer

Locknuts: add SKINDICHT® SM-PE-M, page 543

Temperature range: -30°C to +90°C

IP Protection: IP68, 10 bar

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Thread length (D) in	Min ø above braiding in	Pack size
52110023	M25 x 1.5	0.355 - 0.670	9 - 17	1.143	0.315	0.236	10
52110024	M32 x 1.5	0.433 - 0.827	11 - 21	1.418	0.355	0.315	1
52110025	M40 x 1.5	0.749 - 1.103	19 - 28	1.773	0.355	0.394	1
52110026	M50 x 1.5	1.064 - 1.379	27 - 35	2.128	0.394	0.552	1
52110027	M63 x 1.5	1.340 - 1.773	34 - 45	2.640	0.591	0.788	1
52110028	M63 x 1.5, plus	1.734 - 2.167	44 - 55	2.955	0.591	0.985	1

If not otherwise specified, all values relating to the product are nominal values.
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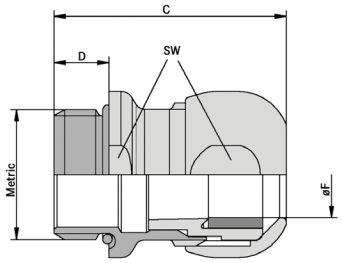
SKINTOP® INOX SC

Hygienic 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 IP68/69 rating and withstands high-pressure and high-temperature washdowns. Typical applications can be found in the food & beverage and pharmaceutical industries.

Application advantage

- Highly corrosion resistant
- Smooth surface
- No hard edges
- IP68/69 protection
- NSF 169 for use in splash zone or non-food zone

Approvals

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:
- M12 - M20: IP68, 10 bar
- M25 - M32: IP68, 5 bar

NEMA 1, 2, 4X, 6, 12

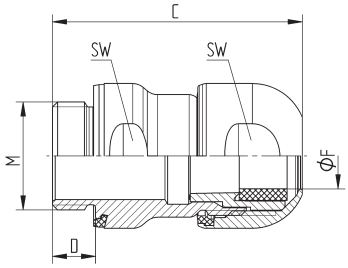
Approvals: according to DIN EN ISO 14 159
according to DIN EN 1672-2
NSF 169

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Thread length (D) in	Min ø above braiding in	Pack size
53806720	M12 x 1.5	Recognized	0.158 - 0.276	4 - 7	0.630	0.256	0.079	5
53806722	M16 x 1.5	Recognized	0.236 - 0.394	6 - 10	0.788	0.276	0.157	5
53806724	M20 x 1.5	Recognized	0.276 - 0.512	7 - 13	0.946	0.315	0.197	5
53806726	M25 x 1.5	Recognized	0.355 - 0.670	9 - 17	1.143	0.315	0.295	5
53806728	M32 x 1.5	Recognized	0.433 - 0.827	11 - 21	1.418	0.354	0.354	5
53806731	M40 x 1.5	Listed	0.748 - 1.102	19 - 28	1.772	0.354	0.591	5
53806732	M50 x 1.5	Listed	1.063 - 1.378	27 - 35	2.126	0.394	0.827	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINTOP® HYGIENIC SC

Hygienic stainless steel strain relief with FDA-approved sealing material for EMC applications



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

Approvals

Application advantage

- Special sealing element for the food & beverage industry
- FDA-approved sealing
- Optimal EMC protection
- Corrosion resistant
- IP68/69 protection
- NSF 169 for use in food zone

Technical data

Material:
- body: stainless steel: V4A (1.4404/316L)
- insert: polyamide
- sealing: special elastomer

Temperature range: -20°C to +100°C

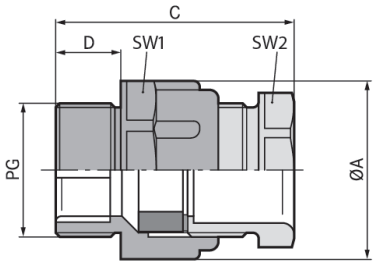
IP Protection: IP68, 10 bar
IP69
NEMA 1, 2, 4X, 6, 12

Approvals: NSF 169

Part number	Thread	UL status	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Thread length (D) in	Min ø above braiding in	Pack size
53105300	M12 x 1.5	Recognized	0.158 - 0.236	4 - 6	0.630	0.256	0.079	5
53105301	M16 x 1.5	Recognized	0.256 - 0.374	6.5 - 9.5	0.788	0.276	0.157	5
53105302	M20 x 1.5	Recognized	0.355 - 0.472	9 - 12	0.945	0.315	0.197	5
53105303	M25 x 1.5	Recognized	0.453 - 0.610	11.5 - 15.5	1.142	0.315	0.295	5
53105314	M32 x 1.5	Recognized	0.630 - 0.787	16 - 20	1.417	0.354	0.354	5
53105315	M40 x 1.5	Recognized	0.866 - 1.063	22 - 27	1.772	0.354	0.591	5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINDICHT® SVFK



The SKINDICHT® SVFK is a compact strain relief connector for flat cable made of polystyrene. The special neoprene bushing provides a flexible seal over a wide range of cable widths. Ideal for use with ÖLFLEX® FLAT, ÖLFLEX® LIFT F, or ÖLFLEX® CRANE F.

Approvals

CE RoHS

Technical data

Material:
- body: polystyrene
- seal: neoprene bushing

Protection: IP54

Color: light gray (RAL 7035)

Temperature range: -20°C to +60°C

Part number	Thread	Minimum flat cable width		Maximum flat cable width		Minimum cable thickness		Maximum cable thickness		Wrenching flats (SW1)	Wrenching flats (SW2)	Overall length (C)	Thread length (D)	Pack size
		in	mm	in	mm	in	mm	in	mm	in	in	in	in	
52005470	PG 16	–	–	0.591	15	–	–	0.197	5	1.064	0.906	1.56	0.39	25
52005680	PG 21	0.394	10	0.808	20.5	0.118	3	0.315	8	1.261	1.182	1.69	0.43	25
52005690	PG 29	0.591	15	1.064	27	0.158	4	0.453	11.5	1.655	1.615	1.77	0.43	25
52005700	PG 36	0.985	25	1.340	34	0.158	4	0.453	11.5	2.088	1.970	2.01	0.51	10
52005710	PG 42	1.182	30	1.576	40	0.197	5	0.473	12	2.364	2.167	2.13	0.51	5
52005720	PG 48	1.379	35	1.773	45	0.197	5	0.473	12	2.561	2.364	2.17	0.59	5

If not otherwise specified, all values relating to the product are nominal values.
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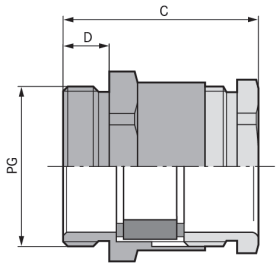
SKINDICHT® SVF

Brass strain relief connectors for flat & festoon cable with PG thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SVF is a compact strain relief connector made of nickel-plated brass for flat cable. The special neoprene bushing provides a flexible seal over a wide range of cable widths. Ideal for use with ÖLFLEX® FLAT, ÖLFLEX® LIFT F, or ÖLFLEX® CRANE F.

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- seal: neoprene bushing

Temperature range: -20°C to +100°C

Protection: IP54

Locknuts: add SKINDICHT® SM, page 542

Part number	Thread	Minimum flat cable width		Maximum flat cable width		Minimum cable thickness		Maximum cable thickness		Wrenching flats (SW1)	Wrenching flats (SW2)	Overall length (C)	Thread length (D)	Pack size
		in	mm	in	mm	in	mm	in	mm	in	in	in	in	
52005480	PG 16	–	–	0.630	16	–	–	0.197	5	0.946	0.867	1.08	0.26	25
52005490	PG 21	0.355	9	0.827	21	0.118	3	0.315	8	1.182	1.103	1.18	0.28	25
52005500	PG 29	0.552	14	1.182	30	0.158	4	0.453	11.5	1.576	1.458	1.24	0.32	10
52005510	PG 36	0.946	24	1.576	40	0.158	4	0.453	11.5	1.970	1.852	1.42	0.35	10
52005520	PG 42	1.143	29	1.773	45	0.197	5	0.473	12	2.246	2.128	1.58	0.39	5
52005530	PG 48	1.340	34	1.970	50	0.197	5	0.473	12	2.522	2.364	1.64	0.39	5

If not otherwise specified, all values relating to the product are nominal values.
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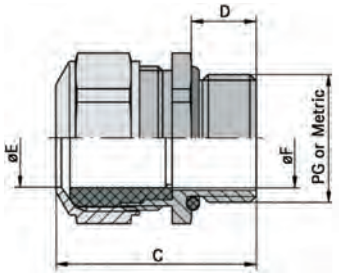
SKINDICHT® CN/CN-M

Chromium-nickel steel strain relief with PG & metric thread



SKINDICHT® CN/CN-M is a high quality, chromium-nickel steel cable gland that is able to withstand extreme temperatures. This gland is ideal for harsh environments, including pharmaceutical, petrochemical, and offshore applications.

Application advantage

- Suitable for use in temperatures up to +200°C (392°F)
- Highly resistant to acids, caustics, and aggressive solvents

Approvals

CE RoHS ECOLAB

Technical data

Material:
- body: chromium-nickel steel (type 303) in acc. with DIN material no. 1.4305
- seal: FPM
- O-ring: FPM

Temperature range: -40°C to +200°C

Protection: IP68, 10 bar
IP69

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Thread length (D) in	Min ø above braiding in	Pack size
PG							
52032520	PG 9	0.236 - 0.394	6 - 10	0.71	1.10	0.39	5
52032525	PG 11	0.217 - 0.472	5.5 - 12	0.87	1.26	0.39	5
52032540	PG 13	0.315 - 0.591	8 - 15	0.94	1.34	0.39	5
52032550	PG 16	0.315 - 0.591	8 - 15	0.94	1.34	0.39	5
52032560	PG 21	0.492 - 0.807	12.5 - 20.5	1.18	1.65	0.47	5
52032570	PG 29	0.748 - 1.082	19 - 27.5	1.61	2.09	0.47	5
Metric							
52032580	M12 x 1.5	0.138 - 0.197	3.5 - 5	0.67	1.06	0.39	5
52032590	M12 x 1.5	0.197 - 0.256	5 - 6.5	0.67	1.06	0.39	5
52032600	M12 x 1.5	0.256 - 0.315	6.5 - 8	0.67	1.06	0.39	5
52032610	M16 x 1.5	0.315 - 0.413	8 - 10.5	0.71	1.18	0.39	5
52032620	M20 x 1.5	0.433 - 0.591	11 - 15	0.94	1.22	0.39	5
52032630	M25 x 1.5	0.630 - 0.807	16 - 20.5	1.18	1.42	0.43	5
52032640	M32 x 1.5	0.827 - 1.004	21 - 25.5	1.42	1.61	0.51	5
52032650	M40 x 1.5	1.122 - 1.300	28.5 - 33	1.81	1.73	0.51	1
52032660	M50 x 1.5	1.457 - 1.654	37 - 42	2.17	1.89	0.55	1
52032670	M63 x 1.5	1.811 - 2.047	46 - 52	2.76	2.01	0.55	1

If not otherwise specified, all values relating to the product are nominal values.
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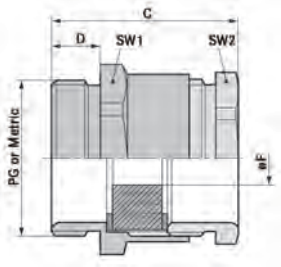
SKINDICHT® SVRE/SVRE-M

Nickel-plated brass cable clamp with PG & metric thread



Complete the installation

SKINDICHT® SM locknuts
page 542

SKINDICHT® O-rings
page 555

The SKINDICHT® SVRE cable clamp is a compact general-purpose cable clamp with an adjustable multi-layered bushing which accommodates a large cable diameter range.

Application advantage

- Provides cost savings: storage of fewer sizes due to adjustable bushing
- Suitable for a wide variety of applications that require compact, reliable strain relief
- Cost-effective strain relief solution

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- bushing/incised sealing:
  - PG: CR
  - metric: CR/NBR

Locknuts: add SKINDICHT® SM, page 542

O-rings: add O-rings, page 555

Temperature range: -20°C to +80°C

Protection: IP54

Part number	Outer thread	Inner thread	Incised sealing ring (øF) in	Max. internal diameter in	Wrenching flats (SW1) in	(SW2) in	Overall length (C) in	Thread length (D) in	Pack size
PG									
52005540	PG 9	PG 9	0.20 / 0.31	–	0.67	0.59	0.890	0.236	100
52000310	PG 11	PG 11	0.28 / 0.39 / 0.49	–	0.79	0.71	0.890	0.236	50
52000320	PG 13	PG 13	0.28 / 0.41 / 0.51 / 0.63	–	0.87	0.79	1.028	0.256	50
52000330	PG 16	PG 16	0.31 / 0.41 / 0.51 / 0.63	–	0.94	0.87	1.067	0.256	50
52000340	PG 21	PG 21	0.43 / 0.59 / 0.71 / 0.79	–	1.18	1.10	1.166	0.276	50
52000350	PG 29	PG 29	0.75 / 0.91 / 1.06 / 1.22	–	1.57	1.46	1.284	0.315	50
52000360	PG 36	PG 36	0.98 / 1.10 / 1.22 / 1.38	–	1.97	1.85	1.520	0.354	20
52005550	PG 42	PG 42	1.38 / 1.54 / 1.67 / 1.81	–	2.24	2.13	1.717	0.394	10
52005560	PG 48	PG 48	1.59 / 1.73 / 1.85 / 1.99	–	2.52	2.36	1.776	0.394	10
Metric									
52104980	M16 x 1.5	PG 9	0.20 / 0.31	0.47	0.71	0.59	0.851	0.197	100
52104990	M20 x 1.5	PG 11	0.28 / 0.39 / 0.49	0.59	0.87	0.71	0.890	0.236	50
52105000	M20 x 1.5	PG 13	0.28 / 0.41 / 0.51 / 0.63	0.59	0.87	0.79	1.008	0.236	50
52105010	M20 x 1.5	PG 16	0.31 / 0.41 / 0.51 / 0.63	0.59	0.94	0.87	1.048	0.236	50
52105002	M25 x 1.5	PG 21	0.43 / 0.59 / 0.71 / 0.79	0.79	1.18	1.10	0.921	0.276	50
52105003	M32 x 1.5	PG 29	0.75 / 0.91 / 1.06 / 1.22	1.06	1.57	1.46	1.284	0.315	50
52105004	M40 x 1.5	PG 36	0.98 / 1.10 / 1.22 / 1.38	1.34	1.97	1.85	1.481	0.315	20
52105005	M50 x 1.5	PG 42	1.38 / 1.54 / 1.67 / 1.81	1.73	2.24	2.13	1.678	0.354	5
52105006	M63 x 1.5	PG 48	1.59 / 1.73 / 1.85 / 1.99	2.13	2.60	2.36	1.776	0.394	5

If not otherwise specified, all values relating to the product are nominal values.
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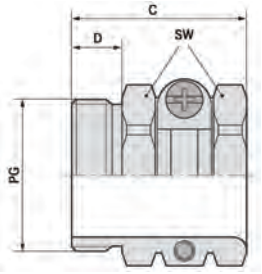
SKINDICHT® SH

Nickel-plated brass cable clamp with single saddle clamp and PG thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SH cable clamp is an extremely durable compact strain relief cable gland constructed of corrosion-resistant nickel-plated brass. Strain relief is achieved by use of a specially formed nickel-plated brass bracket that provides a secure locking system.

Application advantage

- Durable, compact, and corrosion-resistant cable clamp
- Excellent in harsh environment applications including exposure to seawater and chemicals
- Cost-effective strain relief solution

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass

Locknuts: add SKINDICHT® SM, page 542

Temperature range: -20°C to +200°C

Protection: IP20

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Max. installation diameter in	Pack size
52000830	PG 7	0.315 - 0.394	8.0 - 10.0	0.591	0.689	0.216	0.866	50
52000840	PG 9	0.394 - 0.492	10.0 - 12.5	0.669	0.807	0.236	0.985	50
52000850	PG 11	0.433 - 0.591	11.0 - 15.0	0.788	0.847	0.236	1.103	50
52000860	PG 13	0.551 - 0.650	14.0 - 16.5	0.866	0.945	0.295	1.260	25
52000870	PG 16	0.591 - 0.709	15.0 - 18.0	0.945	1.024	0.295	1.379	25
52000880	PG 21	0.709 - 0.925	18.0 - 23.5	1.182	1.142	0.315	1.812	25
52000890	PG 29	0.906 - 1.221	23.0 - 31.0	1.615	1.300	0.315	2.285	10
52000900	PG 36	1.142 - 1.595	29.0 - 40.5	1.970	1.438	0.374	2.758	10
52000910	PG 42	1.339 - 1.773	34.0 - 45.0	2.245	1.497	0.394	3.073	5
52000920	PG 48	1.536 - 1.970	39.0 - 50.0	2.521	1.556	0.453	3.388	5

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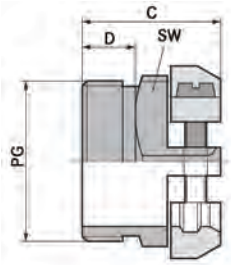
SKINDICHT® SK

Nickel-plated brass strain relief with double saddle clamp and PG thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SK cable gland is equipped with two nickel-plated brass saddle clamps that guarantee reliable strain relief.

Application advantage

- Durable, compact, and corrosion-resistant cable clamp
- The double saddle clamp arrangement accommodates a wide range of cables that are clamped concentrically

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- brackets: nickel-plated brass
- screws: nickel-plated brass

Locknuts: add SKINDICHT® SM, page 542

Temperature range: -20°C to +200°C

Protection: IP20

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Max. installation diameter in	Pack size
52004230	PG 9	0.236 - 0.472	6.0 - 12.0	0.75	0.650	0.236	0.945	50
52004240	PG 11	0.276 - 0.591	7.0 - 15.0	0.83	0.650	0.236	1.063	50
52004250	PG 13	0.472 - 0.650	12.0 - 16.5	0.87	0.728	0.295	1.181	25
52004260	PG 16	0.512 - 0.709	13.0 - 18.0	0.94	0.748	0.295	1.300	25
52004270	PG 21	0.591 - 0.906	15.0 - 23.0	1.18	0.886	0.315	1.654	25
51712740	PG 29	0.788 - 1.221	20.0 - 31.0	1.61	1.024	0.315	2.285	10

If not otherwise specified, all values relating to the product are nominal values.
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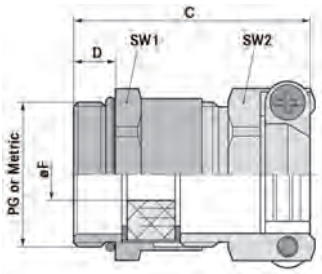
SKINDICHT® SKZ/SKZ-M

Nickel-plated brass strain relief with double saddle clamp & additional sealing, PG & metric thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SKZ cable clamp is a compact strain relief cable gland with double saddle clamps and additional sealing. The sealing is achieved by means of a multi-layered bushing that accommodates a large cable diameter range.

Application advantage

- The extended fitting allows the clamp to reach protection class IP55
- An O-ring is included on the mounting thread to provide additional sealing

Approvals

CE RoHS

Technical data

Material:

- body:	nickel-plated brass
- saddle clamp:	nickel-plated brass
- screws:	nickel-plated brass
- bushing:	neoprene
- O-ring:	NBR
- incised sealing ring:	
- PG:	CR
- metric:	CR/NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range: -20°C to +80°C

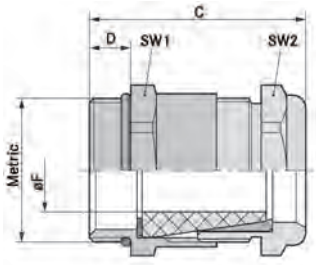
Protection: IP55

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW1) in	Wrenching flats (SW2) in	Overall length (C) in	Thread length (D) in	Max. installation diameter in	Pack size
PG									
52004280	PG 9	0.236 - 0.334	6.0 - 8.5	0.67	0.67	1.182	0.236	0.945	50
52004290	PG 11	0.315 - 0.472	8.0 - 12.0	0.79	0.83	1.182	0.236	1.063	50
52004300	PG 13	0.472 - 0.551	12.0 - 14.0	0.87	0.87	1.339	0.256	1.182	25
52004310	PG 16	0.512 - 0.630	13.0 - 16.0	0.94	0.94	1.379	0.256	1.300	25
52004320	PG 21	0.591 - 0.827	15.0 - 21.0	1.18	1.18	1.615	0.276	1.654	25
52005570	PG 29	0.788 - 1.142	20.0 - 29.0	1.57	1.61	1.812	0.315	2.285	10
Metric									
52106800	M16 x 1.5	0.197 - 0.315	5.0 - 8.0	0.71	0.67	1.142	0.197	0.945	50
52106810	M20 x 1.5	0.276 - 0.472	7.0 - 12.0	0.87	0.79	1.182	0.236	1.063	50
52106820	M20 x 1.5	0.433 - 0.512	11.0 - 13.0	0.87	0.87	1.319	0.236	1.181	25
52106830	M20 x 1.5	0.512 - 0.591	13.0 - 15.0	0.94	0.94	1.359	0.236	1.299	25
52106840	M25 x 1.5	0.630 - 0.760	16.0 - 19.3	1.18	1.18	1.615	0.276	1.654	25
52106850	M32 x 1.5	0.748 - 1.063	19.0 - 27.0	1.57	1.61	1.812	0.315	2.283	10

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.

SKINDICHT® SHV-M

Nickel-plated brass strain relief with sealing capability up to 300 ft (10 bar) and metric thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SHV-M cable gland is a metallic strain relief cable gland with a special tapered seal designed to provide liquid-tight sealing down to 300 feet (10 bar) of water pressure. An O-ring is included on the mounting thread to provide additional sealing.

Application advantage

- Excellent compression strength and strain relief
- Ideal for underwater applications where water pressure-tight protection is required

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- cone seal: CR (NBR)
- O-ring: NBR

Locknuts: add SKINDICHT® SM-M, page 542

Temperature range: -20°C to +80°C

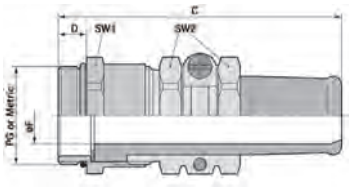
IP Protection: IP68, 10 bar

Part number	Outer thread	Inner thread	Bushing OD in	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW1) in	Wrenching flats (SW2) in	Overall length (C) in	Thread length (D) in	Pack size
52105270	M12 x 1.5	PG 7	0.197	0.118 - 0.189	3.0 - 4.8	0.551	0.551	1.024	0.197	50
52105280	M16 x 1.5	PG 9	0.236	0.177 - 0.228	4.5 - 5.8	0.709	0.669	1.044	0.197	50
52105290	M16 x 1.5	PG 9	0.276	0.177 - 0.267	4.5 - 6.8	0.709	0.669	1.044	0.197	50
52105300	M20 x 1.5	PG 11	0.276	0.177 - 0.267	4.5 - 6.8	0.866	0.788	1.221	0.236	25
52105310	M20 x 1.5	PG 11	0.354	0.256 - 0.346	6.5 - 8.8	0.866	0.788	1.221	0.236	25
52105320	M20 x 1.5	PG 13	0.354	0.256 - 0.346	6.5 - 8.8	0.866	0.866	1.280	0.236	25
52105330	M20 x 1.5	PG 13	0.433	0.354 - 0.425	9.0 - 10.8	0.866	0.866	1.280	0.236	25
52105340	M20 x 1.5	PG 16	0.433	0.354 - 0.425	9.0 - 10.8	0.945	0.945	1.359	0.236	25
52105350	M20 x 1.5	PG 16	0.512	0.374 - 0.504	9.5 - 12.8	0.945	0.945	1.359	0.236	25
52105360	M20 x 1.5	PG 16	0.591	0.512 - 0.583	13.0 - 14.8	0.945	0.945	1.359	0.236	25
52105370	M25 x 1.5	PG 21	0.630	0.531 - 0.622	13.5 - 15.8	1.182	1.182	1.516	0.276	25
52105380	M25 x 1.5	PG 21	0.709	0.591 - 0.701	15.0 - 17.8	1.182	1.182	1.516	0.276	25
52105390	M25 x 1.5	PG 21	0.787	0.689 - 0.780	17.5 - 19.8	1.182	1.182	1.516	0.276	25
52105400	M32 x 1.5	PG 29	0.866	0.689 - 0.858	17.5 - 21.8	1.576	1.576	1.674	0.315	10
52105410	M32 x 1.5	PG 29	0.945	0.748 - 0.937	19.0 - 23.8	1.576	1.576	1.674	0.315	10
52105420	M32 x 1.5	PG 29	1.024	0.906 - 1.016	23.0 - 25.8	1.576	1.576	1.674	0.315	10

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.

SKINDICHT® SR/SR-M

Nickel-plated strain relief with single saddle clamp & special neoprene bushing, PG & metric thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® SR cable clamp is a compact strain relief cable gland constructed of corrosion-resistant nickel-plated brass. Strain relief is achieved by use of specially formed nickel-plated brass saddle clamps and a full length neoprene bushing that protects the cable from over-stress and conductor breakage while providing an effective and durable seal.

Application advantage

- The neoprene bushing provides both a seal and high bend protection
- Strain relief is achieved through the specially formed saddle clamps

Approvals

CE RoHS

Technical data

Material:	
- body:	nickel-plated brass
- saddle clamp:	nickel-plated brass
- screws & bracket:	nickel-plated brass
- O-ring:	NBR
- anti-kink protection:	
- PG:	CR
- metric	CR/NBR

Locknuts:	add SKINDICHT® SM, page 542
Temperature range:	-20°C to +80°C
Protection:	IP65

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If not otherwise specified, all values relating to the product are nominal values.

SKINDICHT® SR

Part number	Outer thread	Inner thread	Opening seal	Clamping range (øF)		Wrenching flats		Overall length (C)	Thread length (D)	Max. installation diameter	Pack size
				in	mm	(SW1) in	(SW2) in	in	in	in	
52000990	PG 7	PG 5	0.20	0.138 - 0.197	3.5 - 5.0	0.55	0.59	1.968	0.197	0.91	50
52001000	PG 9	PG 7	0.28	0.217 - 0.276	5.5 - 7.0	0.67	0.67	2.039	0.236	0.98	50
52001010	PG 11	PG 7	0.28	0.217 - 0.276	5.5 - 7.0	0.79	0.79	2.206	0.236	1.10	25
52001020	PG 11	PG 9	0.35	0.295 - 0.354	7.5 - 9.0	0.79	0.79	2.206	0.236	1.10	25
52001030	PG 13	PG 9	0.35	0.295 - 0.354	7.5 - 9.0	0.87	0.87	2.422	0.256	1.26	25
52001040	PG 13	PG 11	0.43	0.354 - 0.433	9.0 - 11.0	0.87	0.87	2.422	0.256	1.26	25
52001050	PG 13	PG 13	0.51	0.433 - 0.512	11.0 - 13.0	0.87	0.87	2.422	0.256	1.26	25
52001060	PG 16	PG 13	0.51	0.453 - 0.512	11.5 - 13.0	0.94	0.94	2.639	0.256	1.38	25
52001070	PG 16	PG 15	0.59	0.512 - 0.591	13.0 - 15.0	0.94	0.94	2.639	0.256	1.38	25
52001080	PG 21	PG 15	0.59	0.531 - 0.591	13.5 - 15.0	1.18	1.18	3.112	0.276	1.81	25
52001090	PG 21	PG 17	0.67	0.591 - 0.669	15.0 - 17.0	1.18	1.18	3.112	0.276	1.81	25
52001100	PG 21	PG 19	0.75	0.669 - 0.748	17.0 - 19.0	1.18	1.18	3.112	0.276	1.81	25
52001110	PG 21	PG 20	0.79	0.709 - 0.787	18.0 - 20.0	1.18	1.18	3.112	0.276	1.81	25
52001120	PG 29	PG 20	0.79	0.709 - 0.787	18.0 - 20.0	1.57	1.61	3.585	0.315	2.32	10
52001130	PG 29	PG 23	0.91	0.827 - 0.906	21.0 - 23.0	1.57	1.61	3.585	0.315	2.32	10
52001140	PG 29	PG 25	0.98	0.906 - 0.984	23.0 - 25.0	1.57	1.61	3.585	0.315	2.32	10
52001150	PG 36	PG 26	1.02	0.906 - 1.024	23.0 - 26.0	1.97	1.97	4.334	0.354	2.76	5
52001160	PG 36	PG 30	1.18	1.063 - 1.181	27.0 - 30.0	1.97	1.97	4.334	0.354	2.76	5
52001170	PG 36	PG 33	1.30	1.181 - 1.299	30.0 - 33.0	1.97	1.97	4.334	0.354	2.76	5
52001180	PG 36	PG 35	1.38	1.260 - 1.378	32.0 - 35.0	1.97	1.97	4.334	0.354	2.76	5
52001190	PG 42	PG 35	1.38	1.260 - 1.378	32.0 - 35.0	2.24	2.24	4.491	0.394	2.95	5
52001200	PG 42	PG 38	1.50	1.378 - 1.496	35.0 - 38.0	2.24	2.24	4.491	0.394	2.95	5
52001210	PG 42	PG 40	1.57	1.417 - 1.575	36.0 - 40.0	2.24	2.24	4.491	0.394	2.95	5
52001220	PG 48	PG 40	1.57	1.417 - 1.575	36.0 - 40.0	2.52	2.52	4.688	0.394	3.27	1
52001230	PG 48	PG 44	1.73	1.575 - 1.732	40.0 - 44.0	2.52	2.52	4.688	0.394	3.27	1

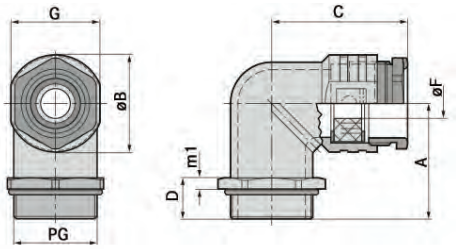
SKINDICHT® SR-M

Part number	Outer thread	Inner thread	Opening seal	Clamping range (øF)		Wrenching flats		Overall length (C)	Thread length (D)	Max. installation diameter	Pack size
				in	mm	(SW1) in	(SW2) in	in	in	in	
52106410	M12 x 1.5	PG 7	0.20	0.157 - 0.197	4.0 - 5.0	0.55	0.59	1.930	0.197	0.91	50
52106420	M16 x 1.5	PG 9	0.28	0.217 - 0.276	5.5 - 7.0	0.71	0.67	1.970	0.197	0.98	50
52106430	M20 x 1.5	PG 11	0.28	0.217 - 0.276	5.5 - 7.0	0.87	0.79	2.167	0.236	1.10	25
52106440	M20 x 1.5	PG 11	0.35	0.295 - 0.354	7.5 - 9.0	0.87	0.79	2.167	0.236	1.10	25
52106450	M20 x 1.5	PG 13	0.35	0.295 - 0.354	7.5 - 9.0	0.87	0.87	2.364	0.236	1.26	25
52106460	M20 x 1.5	PG 13	0.43	0.354 - 0.433	9.0 - 11.0	0.87	0.87	2.364	0.236	1.26	25
52106470	M20 x 1.5	PG 13	0.51	0.433 - 0.512	11.0 - 13.0	0.87	0.87	2.364	0.236	1.26	25
52106480	M20 x 1.5	PG 16	0.51	0.472 - 0.512	12.0 - 13.0	0.94	0.94	2.561	0.236	1.38	25
52106481	M20 x 1.5	PG 16	0.59	0.512 - 0.591	13.0 - 15.0	0.94	0.94	2.600	0.236	1.38	25
52106490	M25 x 1.5	PG 21	0.59	0.492 - 0.591	12.5 - 15.0	1.18	1.18	3.092	0.276	1.81	25
52106500	M25 x 1.5	PG 21	0.67	0.551 - 0.669	14.0 - 17.0	1.18	1.18	3.092	0.276	1.81	25
52106510	M25 x 1.5	PG 21	0.75	0.669 - 0.748	17.0 - 19.0	1.18	1.18	3.092	0.276	1.81	25
52106520	M25 x 1.5	PG 21	0.79	0.669 - 0.788	17.0 - 20.0	1.18	1.18	3.092	0.276	1.81	25
52106530	M32 x 1.5	PG 29	0.79	0.748 - 0.788	19.0 - 20.0	1.57	1.61	3.565	0.315	2.32	10
52106540	M32 x 1.5	PG 29	0.91	0.866 - 0.906	22.0 - 23.0	1.57	1.61	3.565	0.315	2.32	10
52106550	M32 x 1.5	PG 29	0.98	0.906 - 0.985	23.0 - 25.0	1.57	1.61	3.565	0.315	2.32	10
52106560	M40 x 1.5	PG 36	1.02	0.945 - 1.024	24.0 - 26.0	1.97	1.97	4.255	0.315	2.76	5
52106570	M40 x 1.5	PG 36	1.18	1.103 - 1.182	28.0 - 30.0	1.97	1.97	4.255	0.315	2.76	5
52106580	M40 x 1.5	PG 36	1.30	1.221 - 1.300	31.0 - 33.0	1.97	1.97	4.255	0.315	2.76	5
52106590	M40 x 1.5	PG 36	1.38	1.300 - 1.359	33.0 - 34.5	1.97	1.97	4.255	0.315	2.76	5
52106600	M50 x 1.5	PG 42	1.38	1.221 - 1.359	31.0 - 34.5	2.24	2.24	4.373	0.354	2.95	5
52106610	M50 x 1.5	PG 42	1.50	1.260 - 1.497	32.0 - 38.0	2.24	2.24	4.373	0.354	2.95	5
52106620	M50 x 1.5	PG 42	1.57	1.457 - 1.576	37.0 - 40.0	2.24	2.24	4.373	0.354	2.95	5
52106630	M63 x 1.5	PG 48	1.57	1.260 - 1.576	32.0 - 40.0	2.60	2.52	4.649	0.394	3.27	1
52106640	M63 x 1.5	PG 48	1.73	1.418 - 1.733	36.0 - 44.0	2.60	2.52	4.649	0.394	3.27	1

If not otherwise specified, all values relating to the product are nominal values.

SKINDICHT® RWV

Nickel-plated die cast zinc 90° elbow strain relief with PG thread



Complete the installation

SKINDICHT® SM locknuts
page 542

The SKINDICHT® RWV metallic cable gland has a compact 90° elbow design, constructed of corrosion-resistant nickel-plated die-cast zinc with an internal neoprene seal. The SKINDICHT® RWV elbow cable gland can also be used in conjunction with any SKINTOP® PG metallic fitting shown in the catalog to achieve desired connections.

Application advantage

- Compact, durable 90° strain relief
- Ideal for applications where space is an issue and cables must run parallel to the housing unit

Approvals

CE RoHS

Technical data

Material:

- body:	die-cast zinc
- pressure screw:	nickel-plated brass
- nut:	nickel-plated brass
- bushing:	CR
- O-ring:	NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range:

- with sealing ring:	-20°C to +80°C
- without sealing ring:	-20°C to +100°C

Protection: IP55

Part number	Thread	Vertical rise (A) in	Screw size (øB) in	Overall width (G) in	Incised sealing ring size (øF) in	Overall length (C) in	Thread length (D) in	Pack size
52004180	PG 7	0.808	0.603	0.552	0.197	1.024	0.335	25
52004190	PG 9	0.926	0.721	0.670	0.197 / 0.315	1.103	0.374	25
52004200	PG 11	1.024	0.863	0.788	0.276 / 0.394 / 0.493	1.241	0.394	25
52004210	PG 13	1.123	0.946	0.867	0.276 / 0.414 / 0.512 / 0.630	1.359	0.414	25
52004220	PG 16	1.221	1.028	0.946	0.315 / 0.414 / 0.532 / 0.630	1.399	0.433	10
52005420	PG 21	1.320	1.281	1.182	0.433 / 0.591 / 0.709 / 0.788	1.675	0.453	10
52004225	PG 29	1.694	1.655	1.576	0.749 / 0.906 / 1.064 / 1.221	1.931	0.512	10

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SKINTOP®

Cable gland accessories & tools

Locknuts & fittings

541 **SKINTOP® GMP-GL/GMP-GL-M/GMP-HF-M**
Hexagonal locknuts for NPT, PG & metric strain relief cable glands

542 **SKINDICHT® SM/SM-M**
Nickel-plated brass locknuts for NPT, PG & metric strain relief cable glands

543 **SKINDICHT® SM-PE/SM-PE-M**
Nickel-plated brass grounding locknuts for PG & metric strain relief cable glands

544 **SKINTOP® BRUSH Add-on**
EMC fitting for polyamide glands with metric thread

SKINTOP® BRUSH ADD-ON 24 NEW
EMC fitting for multi-cable bushing systems

Bushings

545 **SKINTOP® DIX**
Multiple cable sealing bushings for PG & polyamide NPT strain relief cable glands

545 **SKINTOP® DIX-DV**
Inserts for SKINTOP® DIX NPT, PG & metric bushings

546 **SKINTOP® DIX-M**
Multiple cable sealing bushings for metric & metallic NPT strain relief cable glands

547 **SKINTOP® DIX-ASi**
Cable bushings for UNITRONIC® ASi bus cable; PG & metric

Hole plugs

548 **SKINTOP® SD**
Dust- & moisture-proof plugs for NPT, PG & metric strain relief cable glands

548 **SKINTOP® DV**
Dust- & moisture-proof plugs for NPT, PG & metric strain relief cable glands

549 **SKINDICHT® BL/BL-M**
Brass plugs for use in PG & metric threaded holes

549 **SKINDICHT® BLK/BLK-GL & BLK-M/BLK-GL-M**
Plastic plugs for use in PG & metric threaded holes

550 **SKINTOP® CLICK BLK**
Polyamide plugs for use in metric-sized mounting holes

Reducers, enlargers & adapters

550 **SKINDICHT® MR/MR-M**
Nickel-plated brass reducers for PG & metric SKINTOP® cable glands

551 **SKINDICHT® KU/KUS**
Polyamide reducers for PG SKINTOP® cable glands

551 **SKINDICHT® ME/ME-M**
Nickel-plated brass enlargers for PG & metric SKINTOP® cable glands

552 **PG → NPT adapters**

552 **NPT → PG adapters**

552 **SKINDICHT® MA-M metric → NPT adapters**

552 **SKINDICHT® MA-M metric → PG adapters**

552 **SKINDICHT® ZS-M metric → PG adapters**

553 **SKINDICHT® MA-PG → metric adapters**

553 **SKINDICHT® A-PG → metric adapters**

Sealing

554 **SKINDICHT® E/E-M**
Polychloroprene incised sealing for PG & metric SKINTOP® cable glands

555 **SKINDICHT® Perbunan® O-rings: PG**

555 **SKINDICHT® JT PTFE O-rings: PG**

555 **SKINDICHT® Viton® O-rings: PG**

556 **SKINDICHT® Perbunan® O-rings: metric**

556 **SKINDICHT® JT PTFE O-rings: metric**

556 **SKINDICHT® Viton® O-rings: metric**

Tools

557 **SKINMATIC® RZ wrench**

557 **SKINMATIC® MH-Set**

557 **PTS4 wire stripper**

557 **BULLI cable shears**

558 **KS 15 cable shears**

558 **SKINMATIC® KB-M**
Multi-purpose tap

558 **SKINDICHT® SB-M**
Spiral drill

558 **SKINDICHT® GB-M**
Thread cutting bit

558 **SKINMATIC® QUICK Set**

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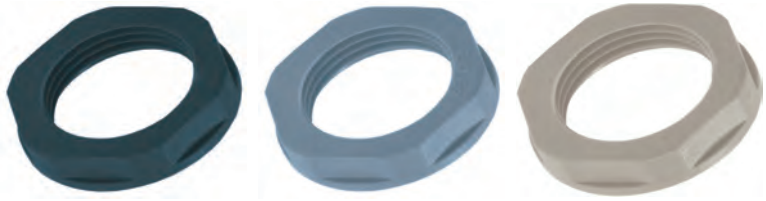
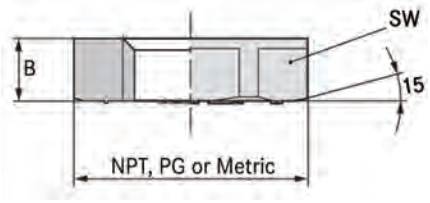
SKINTOP® GMP-GL/GMP-GL-M/GMP-HF-M

Hexagonal locknuts for NPT, PG & metric strain relief cable glands





Designed for use with SKINTOP® cable glands with NPT, PG & metric threads.

Technical data

Material:	glass fiber-reinforced polyamide halogen-free polyamide, V-0 per UL 94
Temperature range:	-20°C to +100°C
Color:	black (RAL 9005), UV resistant gray (RAL 7001)
- halogen-free:	light gray (RAL 7035)

Approvals: NPT & halogen-free metric

CE RoHS

Approvals: PG & metric*

c UL us CE RoHS

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

Part number black	Part number gray	Part number light gray	Size	Wrenching flats (SW) (in)	Nut thickness (D) in	Pack size
NPT thread						
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
PG thread						
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	53019080	–	PG 42	2.561	0.315	25
53019290	53019090	–	PG 48	2.758	0.315	25
Metric thread						
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

If not otherwise specified, all values relating to the product are nominal values.
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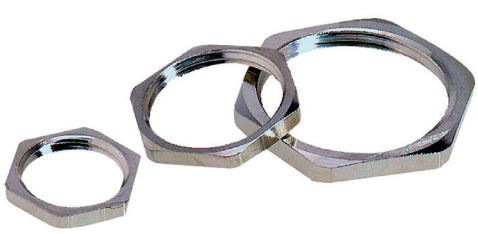
SKINDICHT® SM/SM-M

Nickel-plated brass locknuts for NPT, PG & metric strain relief cable glands



SKINDICHT® SM locknuts are required wherever NPT, PG or metric cable glands must be fastened to a housing, and tapped holes cannot be provided.

Technical data

Material:
- NPT: stamped steel
- PG & metric: nickel-plated brass

Temperature range: -20°C to +100°C

Approvals

CE RoHS

NPT

Part number	Size	Wrenching flats	Nut thickness in	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
811096	NPT 1-1/4”	2.05	0.157	50
811097	NPT 1-1/2”	2.36	0.157	50
811098	NPT 2”	2.85	0.157	25

*Product features a hex design

PG

Part number	Size	Wrenching flats	Nut thickness in	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	0.138	50
52003550	PG 29	1.614	0.138	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

metric

Part number	Size	Wrenching flats	Nut thickness in	Pack size
52103000	M12 x 1.5	0.591	0.118	100
52103010	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

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SKINDICHT® SM-PE/SM-PE-M

Nickel-plated brass grounding locknuts for PG & metric strain relief cable glands

SKINDICHT® SM-PE locknuts are required wherever varnished, anodized, and powder-coated housings are used. When the locknut is tightened, the raised edges cut through the insulating layer, guaranteeing optimum contact. Ideal for use with SKINTOP® MS-SC or SKINTOP® BRUSH grounding cable glands.

Technical data

Material: nickel-plated brass

Temperature range: -20°C to +100°C

Approvals

CE RoHS

PG

Part number	Size	Wrenching flats	Nut thickness in	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

metric

Part number	Size	Wrenching flats	Nut thickness in	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

If not otherwise specified, all values relating to the product are nominal values.
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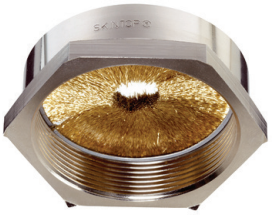
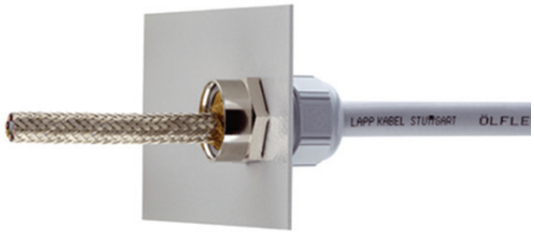
SKINTOP® BRUSH Add-on

EMC fitting for polyamide glands with metric thread





The SKINTOP® BRUSH Add-on is an innovative grounding solution for polyamide glands. The brush design provides a 360° screen contact. When the fitting is tightened, the raised edges cut through the insulation layer of the housing, guaranteeing a reliable EMC contact.

Technical data

Material:

- body:	nickel-plated brass
- brush:	brass
Temperature range:	-70°C to +200°C
Approvals:	UL pending

Application advantage

- Reliable EMI protection
- Optimum, low resistance 360° screen contact
- Easy and quick assembling and disassembling

Approvals

CE RoHS

Part number	Size	Minimum Ø above braiding		Wrenching flats	Thread length	Pack size
		in	mm	in	in	
54110839	M12 x 1.5	0.157	4	0.945	0.394	25
54110840	M16 x 1.5	0.197	5	0.945	0.394	25
54110841	M20 x 1.5	0.197	5	0.945	0.394	10
54110842	M25 x 1.5	0.197	5	1.182	0.394	10
54110843	M32 x 1.5	0.315	8	1.536	0.472	10
54110844	M40 x 1.5	0.394	10	1.851	0.472	5
54110845	M50 x 1.5	0.551	14	2.206	0.472	5
54110846	M63 x 1.5	0.629	16	2.598	0.472	1

If not otherwise specified, all values relating to the product are nominal values.
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SKINTOP® DIX

Multiple cable sealing bushings for PG & polyamide NPT strain relief cable glands

Technical data

Material:
- DIX bushings: silicone
- DIX-DV inserts: polyamide

Color:
- DIX bushings: natural
- DIX-DV inserts: natural

Temperature range: -40°C to +100°C

Protection: IP54
IP68 when all holes are optimally filled*

* Size of holes is equal to size of cable OD

SKINTOP® DIX is a multiple-hole sealing bushing designed to allow several cables to be inserted through one cable gland. This results in a reduction of space and cost as a separate cable gland is not required for each cable. For metal NPT glands, use SKINTOP® DIX-M bushings, page 546.

Approvals

CE RoHS

Part number	SKINTOP® size PG	SKINTOP® size polyamide NPT	Number of holes	Size of holes in	Size of holes mm	Pack size
53607225	PG 7	–	2	0.098	2.5	100
53607417	PG 7	–	4	0.067	1.7	100
53609230	PG 9	NPT ⅜"	2	0.118	3.0	100
53611225	PG 11	–	2	0.098	2.5	100
53611240	PG 11	–	2	0.157	4.0	100
53611330	PG 11	–	3	0.118	3.0	100
53611430	PG 11	–	4	0.118	3.0	100
53613250	PG 13	NPT ½"	2	0.197	5.0	100
53613340	PG 13	NPT ½"	3	0.157	4.0	100
53613440	PG 13	NPT ½"	4	0.157	4.0	100
53616140	PG 16	–	1	0.157	4.0	50
53616225	PG 16	–	2	0.098	2.5	50
53616240	PG 16	–	2	0.157	4.0	50
53616260	PG 16	–	2	0.236	6.0	50
53616340	PG 16	–	3	0.157	4.0	50
53616350	PG 16	–	3	0.197	5.0	50
53616356	PG 16	–	3	0.220	5.6	50
53616360	PG 16	–	3	0.236	6.0	50
53616440	PG 16	–	4	0.157	4.0	50
53616450	PG 16	–	4	0.197	5.0	50
53616540	PG 16	–	5	0.157	4.0	50
53621270	PG 21	NPT ¾"	2	0.276	7.0	50
53621280	PG 21	NPT ¾"	2	0.315	8.0	50
53621370	PG 21	NPT ¾"	3	0.275	7.0	50
53621380	PG 21	NPT ¾"	3	0.315	8.0	50
53621460	PG 21	NPT ¾"	4	0.236	6.0	50
53621550	PG 21	NPT ¾"	5	0.197	5.0	50
53621640	PG 21	NPT ¾"	6	0.157	4.0	50
53629290	PG 29	NPT 1"	2	0.354	9.0	50
53629390	PG 29	NPT 1"	3	0.354	9.0	50
53629470	PG 29	NPT 1"	4	0.275	7.0	50
53629480	PG 29	NPT 1"	4	0.315	8.0	50
53629490	PG 29	NPT 1"	4	0.354	9.0	50
53629556	PG 29	NPT 1"	5	0.220	5.6	50
53629570	PG 29	NPT 1"	5	0.275	7.0	50
53629675	PG 29	NPT 1"	6	0.295	7.5	50

SKINTOP® DIX-DV

Inserts for SKINTOP® DIX NPT, PG & metric bushings

SKINTOP® DIX-DV inserts are designed to seal unused positions in SKINTOP® DIX bushings, which need to be closed to ensure the proper class protection.

Part number	Diameter in	Diameter mm	Length in	Length mm	Pack size
53100003	0.118	3.0	0.354	9	100
53100004	0.157	4.0	0.354	9	100
53100005	0.197	5.0	0.433	11	100
53100006	0.236	6.0	0.551	14	100
53100007	0.275	7.0	0.551	14	100
53100008	0.315	8.0	0.551	14	100
53100009	0.354	9.0	0.551	14	100

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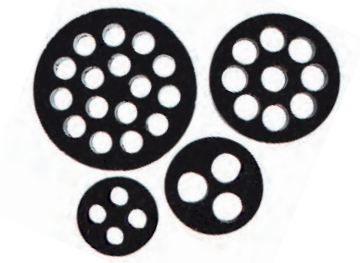
SKINTOP® DIX-M

Multiple cable sealing bushings for metric & metallic NPT strain relief cable glands



SKINTOP® DIX is a multiple-hole sealing bushing designed to allow several cables to be inserted through one cable gland. This results in a reduction of space and cost as a separate cable gland is not required for each cable. Special shapes are available upon request, contact sales for details. For polyamide NPT glands, use SKINTOP® DIX bushings, page 545.

Technical data

Material:	NBR (rubber)	**IP Protection:**	IP54 IP68 when all holes are optimally filled*
Temperature range:	-40°C to +100°C		
RAL Color:	black (RAL 9005)	* Size of holes is equal to size of cable OD	

Approvals

CE RoHS

Part number	SKINTOP® size		Number of holes	Size of holes		Pack size
	metric	metal NPT		in	mm	
53316220	M16	NPT ⅜"	2	0.078	2.0	100
53316230	M16	NPT ⅜"	2	0.118	3.0	100
53316240	M16	NPT ⅜"	2	0.157	4.0	100
53320250	M20	NPT ½"	2	0.197	5.0	100
53320260	M20	NPT ½"	2	0.236	6.0	100
53320340	M20	NPT ½"	3	0.157	4.0	100
53320353	M20	NPT ½"	3	0.208	5.3	100
53320430	M20	NPT ½"	4	0.118	3.0	100
53320440	M20	NPT ½"	4	0.157	4.0	100
53320920	M20	NPT ½"	9	0.078	2.0	100
53325260	M25	NPT ¾"	2	0.236	6.0	50
53325350	M25	NPT ¾"	3	0.197	5.0	50
53325360	M25	NPT ¾"	3	0.236	6.0	50
53325370	M25	NPT ¾"	3	0.275	7.0	50
53325450	M25	NPT ¾"	4	0.197	5.0	50
53325540	M25	NPT ¾"	5	0.157	4.0	50
53325640	M25	NPT ¾"	6	0.157	4.0	50
53332270	M32	NPT 1"	2	0.275	7.0	50
53332280	M32	NPT 1"	2	0.315	8.0	50
53332290	M32	NPT 1"	2	0.354	9.0	50
53332370	M32	NPT 1"	3	0.275	7.0	50
53332380	M32	NPT 1"	3	0.315	8.0	50
53332460	M32	NPT 1"	4	0.236	6.0	50

Part number	SKINTOP® size		Number of holes	Size of holes		Pack size
	metric	metal NPT		in	mm	
53332470	M32	NPT 1"	4	0.275	7.0	50
53332560	M32	NPT 1"	5	0.236	6.0	50
53332650	M32	NPT 1"	6	0.197	5.0	50
53332840	M32	NPT 1"	8	0.157	4.0	50
53332850	M32	NPT 1"	8	0.197	5.0	50
53332940	M32	NPT 1"	9	0.157	4.0	50
53340290	M40	NPT 1¼"	2	0.354	9.0	25
53340310	M40	NPT 1¼"	3	0.394	10.0	25
53340480	M40	NPT 1¼"	4	0.315	8.0	25
53340490	M40	NPT 1¼"	4	0.354	9.0	25
53340580	M40	NPT 1¼"	5	0.315	8.0	25
53340590	M40	NPT 1¼"	5	0.354	9.0	25
53340670	M40	NPT 1¼"	6	0.275	7.0	25
53340860	M40	NPT 1¼"	8	0.236	6.0	25
53340969	M40	NPT 1¼"	9	0.271	6.9	25
53350680	M50	NPT 1½"	6	0.315	8.0	10
53350780	M50	NPT 1½"	7	0.315	8.0	10
53350870	M50	NPT 1½"	8	0.275	7.0	10
53350118	M50	NPT 1½"	11	0.315	8.0	10
53350147	M50	NPT 1½"	14	0.275	7.0	10
53350164	M50	NPT 1½"	16	0.157	4.0	10
53350166	M50	NPT 1½"	16	0.236	6.0	10

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SKINTOP® DIX-ASi

Cable bushings for UNITRONIC® ASi bus cable; PG & metric

Approvals

CE

RoHS

Complete the installation

SKINTOP®
PG thread
page 498

SKINTOP®
metric thread
page 499

Part number	Size	Pack size
53611000	PG 11	50
53611001	M20	50

For use with UNITRONIC® ASi bus cable, page 190.

Technical data

Material:	NBR
Temperature range:	-40°C to +100°C
Color:	black (RAL 9005)
Protection class:	IP54 IP68, 5 bar (when optimally filled)
Approvals:	CE & RoHS

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.

SKINTOP® SD

Dust- & moisture-proof plugs for NPT, PG & metric strain relief cable glands

SKINTOP® SD is designed for use when a SKINTOP® cable gland is installed without a cable. The plugs prevent dust and dirt from entering the housing interior until final cable installation is completed.

Technical data

Material: PE foam

Approvals

CE RoHS

Part number	SKINTOP® size				Diameter		Thickness		Pack size
	PG	metric	polyamide NPT	metal NPT	in	mm	in	mm	
52025235	PG 7	–	–	–	0.413	10.5	0.078	2	500
52025240	PG 9	–	NPT ⅜"	–	0.531	13.5	0.078	2	500
52025250	PG 11	–	–	–	0.669	17.0	0.078	2	250
52025260	PG 13	–	NPT ½"	–	0.728	18.5	0.078	2	250
52025270	PG 16	–	–	–	0.807	20.5	0.078	2	250
52025280	PG 21	–	NPT ¾"	–	1.024	26.0	0.078	2	100
52025290	PG 29	–	NPT 1"	–	1.359	34.5	0.078	2	100
52025291	PG 36	–	–	–	1.753	44.5	0.078	2	100
54113100	–	M12	–	NPT ¼"	0.453	11.5	0.078	2	100
54113110	–	M16	–	NPT ⅜"	0.591	15.0	0.078	2	100
54113120	–	M20	–	NPT ½"	0.788	20.0	0.078	2	100
54113130	–	M25	–	NPT ¾"	0.985	25.0	0.078	2	50
54113140	–	M32	–	NPT 1"	1.182	30.0	0.078	2	50
54113150	–	M40	–	NPT 1¼"	1.576	40.0	0.078	2	25
54113160	–	M50	–	NPT 1½"	1.930	49.0	0.078	2	25
54113170	–	M63	–	NPT 2"	2.285	58.0	0.078	2	25

SKINTOP® DV

Dust- & moisture-proof plugs for NPT, PG & metric strain relief cable glands

SKINTOP® DV is designed for use when a SKINTOP® cable gland is installed without a cable. They prevent dust, dirt, and moisture from entering the housing interior until final cable installation is completed.

Technical data

Material: CR

Approvals

CE RoHS

Part number	SKINTOP® size				Diameter		Thickness		Pack size
	PG	metric	polyamide NPT	metal NPT	in	mm	in	mm	
53800640	PG 7	–	–	–	0.275	7.0	0.256	6.5	500
53800641	PG 9	–	NPT ⅜"	–	0.334	8.5	0.295	7.5	500
53800579	PG 11	–	–	–	0.413	10.5	0.334	8.5	250
53800583	PG 13	–	NPT ½"	–	0.492	12.5	0.334	8.5	250
53800642	PG 16	–	–	–	0.571	14.5	0.354	9.0	250
53800643	PG 21	–	NPT ¾"	–	0.728	18.5	0.433	11.0	100
54113000	–	M12	–	NPT ¼"	0.283	7.2	0.275	7.0	500
54113010	–	M16	–	NPT ⅜"	0.394	10.0	0.315	8.0	500
54113020	–	M20	–	NPT ½"	0.520	13.2	0.330	8.4	250
54113030	–	M25	–	NPT ¾"	0.677	17.2	0.374	9.5	250
54113040	–	M32	–	NPT 1"	0.835	21.2	0.472	12.0	250
54113050	–	M40	–	NPT 1¼"	1.111	28.2	0.571	14.5	100
54113060	–	M50	–	NPT 1½"	1.410	35.8	0.709	18.0	100
54113070	–	M63	–	NPT 2"	1.796	45.6	0.788	20.0	50

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SKINDICHT® BL/BL-M

Brass plugs for use in PG & metric threaded holes

with O-ring

without O-ring

Complete the installation

Blind hood plug: 10053010

Technical data

Material:
- body: nickel-plated brass
- O-ring NBR

Temperature range:
- with O-ring: -30°C to +100°C
- without O-ring: -60°C to +200°C

Protection: IP54
IP68 with O-ring

Approvals

CE RoHS

Part number without O-ring	Part number with O-ring	Size	Outer diameter in	Pack size
52002680	54001610	PG 7	0.55	100
52003390	54000071	PG 9	0.67	100
52003400	54000040	PG 11	0.79	100
52003410	54001630	PG 13	0.87	100
52003420	54001640	PG 16	0.95	100
52003430	54001660	PG 21	1.18	50
52003440	54001620	PG 29	1.54	50
52003450	54001650	PG 36	1.97	25
52003460	54001670	PG 42	2.25	10
52002790	54001680	PG 48	2.52	10
52103100	52103105	M12 x 1.5	0.55	100
52103110	52103115	M16 x 1.5	0.71	100
52103120	52103125	M20 x 1.5	0.87	100
52103130	52103135	M25 x 1.5	1.10	100
52103140	52103145	M32 x 1.5	1.38	50
52103150	52103155	M40 x 1.5	1.73	25
52103160	52103165	M50 x 1.5	2.13	10
52103170	52103175	M63 x 1.5	2.76	10
–	52103190	M75 x 1.5	3.15	1

SKINDICHT® BLK/BLK-GL & BLK-M/BLK-GL-M

Plastic plugs for use in PG & metric threaded holes

BLK/BLK-GL

BLK-M/BLK-GL-M

Technical data

Material:
- BLK & BLK-M: polystyrene
- BLK-GL & BLK-GL-M glass fiber reinforced polyamide

Color:
- BLK, BLK-GL & BLK-M: light gray (RAL 7035)
- BLK-GL-M: black (RAL 9005) silver gray (RAL 7001)

Temperature range:
- BLK -20°C to +70°C
- BLK-M: -25°C to +60°C
- BLK-GL & BLK-GL-M: -40°C to +100°C

Protection: IP54
- BLK-GL-M with O-ring: IP68

Approvals

CE RoHS

PG

Part number BLK	Part number BLK-GL	Size	Thread length in	Pack size
52005949	52024848	PG 7	0.24	100
52005950	52024849	PG 9	0.24	100
52005960	52024850	PG 11	0.24	100
52005970	52024851	PG 13	0.24	100
52005980	52024852	PG 16	0.24	100

Part number BLK	Part number BLK-GL	Size	Thread length in	Pack size
52005990	52024853	PG 21	0.31	50
52006000	52024854	PG 29	0.31	50
52006010	52024855	PG 36	0.39	25
52006020	52024856	PG 42	0.39	25
52006030	52024857	PG 48	0.47	25

Metric

Part number: BLK-M	Part number: BLK-GL-M silver gray without O-ring	silver gray with O-ring	black without O-ring	black with O-ring	Size	Thread length in	Pack size
52006600	52006101	52006109	52006103	52006106	M12 x 1.5	0.24	100
52006610	52006111	52006119	52006113	52006116	M16 x 1.5	0.24	100
52006620	52006121	52006129	52006123	52006126	M20 x 1.5	0.24	100
52006630	52006131	52006139	52006133	52006136	M25 x 1.5	0.31	100
52006640	52006141	52006149	52006143	52006146	M32 x 1.5	0.31	50
52006650	52006151	52006159	52006153	52006156	M40 x 1.5	0.31	25
52006660	52006161	52006169	52006163	52006166	M50 x 1.5	0.39	25
52006670	52006171	52006179	52006173	52006176	M63 x 1.5	0.47	25

If not otherwise specified, all values relating to the product are nominal values.
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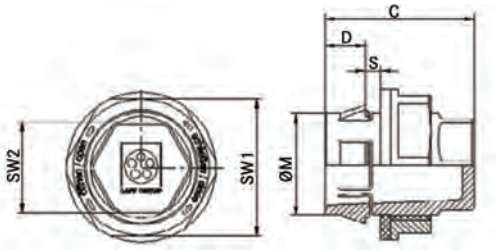
SKINTOP® CLICK BLK

Polyamide plugs for use in metric-sized mounting holes



Technical data

Material:	
- body:	special polyamide
- seal:	special elastomer
Temperature range:	-20°C to +100°C
Color:	light gray (RAL 7035)
Protection:	IP68, 5 bar

Part number	Size	Wall thickness (S) IN	Wrenching flats (SW1) in	(SW2) in	Overall length (C) in	Thread length (D) in	Pack size
52109013	M16	0.04 - 0.16	0.55	0.87	1.12	0.31	50
52109014	M20	0.04 - 0.16	0.71	1.06	1.16	0.31	25
52109015	M25	0.04 - 0.16	0.87	0.55	1.20	0.31	25

Approvals

CE · DVE · DNV·GL · RoHS

SKINDICHT® MR/MR-M

Nickel-plated brass reducers for PG & metric SKINTOP® cable glands

SKINDICHT® MR/MR-M reducers allow the use of cable glands with smaller connection threads than the existing thread hole.

Technical data

Material:	nickel-plated brass
Temperature range:	-60°C to +200°C

Approvals

CE · RoHS

PG

Part number	Size male → female	Pack size
52003750	PG 9 → PG 7	100
52003760	PG 11 → PG 7	100
52003770	PG 11 → PG 9	100
52003780	PG 13 → PG 7	100
52003790	PG 13 → PG 9	100
52003800	PG 13 → PG 11	100
52003810	PG 16 → PG 7	100
52003820	PG 16 → PG 9	100
52003830	PG 16 → PG 11	100
52003840	PG 16 → PG 13	100
52003850	PG 21 → PG 11	50
52003860	PG 21 → PG 13	50
52003870	PG 21 → PG 16	50
52003880	PG 29 → PG 13	50
52003890	PG 29 → PG 16	50
52003900	PG 29 → PG 21	50
52003910	PG 36 → PG 16	25
52003920	PG 36 → PG 21	25
52003930	PG 36 → PG 29	25
52003940	PG 42 → PG 29	10
52003950	PG 42 → PG 36	10
52003970	PG 48 → PG 36	10
52003980	PG 42 → PG 42	10

metric

Part number	Size male → female	Pack size
52104310	M16 → M12	100
52104311	M20 → M12	100
52104312	M20 → M16	100
52104313	M25 → M16	50
52104314	M25 → M20	50
52104315	M32 → M20	50
52104316	M32 → M25	50
52104317	M40 → M25	50
52104318	M40 → M32	25
52104319	M50 → M32	25
52104320	M50 → M40	10
52104321	M63 → M40	10
52104322	M63 → M50	10

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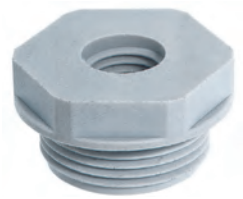
Photographs are not to scale and are not true representations of the products in question.

SKINDICHT® KU/KUS

Polyamide reducers for PG SKINTOP® cable glands

SKINTOP® KU



SKINTOP® KUS

SKINDICHT® KU/KUS reducers allow the use of cable glands with smaller connection threads than the existing thread hole.

Technical data

Material:	glass fiber reinforced polyamide
Temperature range:	-40°C to +100°C
Color:	light gray (RAL 7035)

Approvals

CE RoHS

SKINTOP® KU

Part number	Size male	→	female	Pack size
51730010	PG 11	→	PG 7	50
52025100	PG 13	→	PG 7	50
52025110	PG 16	→	PG 9	50
52025120	PG 21	→	PG 11	25
51730040	PG 21	→	PG 13	25
52025130	PG 29	→	PG 13	25
51730050	PG 29	→	PG 16	25
52025140	PG 36	→	PG 16	25
52025150	PG 36	→	PG 21	25
52025050	PG 36	→	PG 29	25
52025160	PG 42	→	PG 21	25
52025170	PG 42	→	PG 29	25
52025060	PG 42	→	PG 36	25
52025180	PG 48	→	PG 29	25
52025190	PG 48	→	PG 36	25
52025070	PG 48	→	PG 42	25

SKINTOP® KUS

Part number	Size male	→	female	Pack size
52025040	PG 9	→	PG 7	50
51730060	PG 11	→	PG 9	50
51730070	PG 13	→	PG 11	50
51730080	PG 16	→	PG 13	50

SKINDICHT® ME/ME-M

Nickel-plated brass enlargers for PG & metric SKINTOP® cable glands

SKINDICHT® ME/ME-M enlargers allow the use of cable glands with larger connection threads than the existing thread hole.

Technical data

Material:	nickel-plated brass
- O-ring (metric only):	NBR
Temperature range:	-60°C to +200°C

Approvals

CE RoHS

PG

Part number	Size male	→	female	Pack size
52003990	PG 7	→	PG 9	100
52004000	PG 9	→	PG 11	100
52004010	PG 9	→	PG 13	100
52004020	PG 11	→	PG 13	100
52004030	PG 11	→	PG 16	100
52004040	PG 11	→	PG 21	100
52004050	PG 13	→	PG 16	100
52004060	PG 13	→	PG 21	50
52004070	PG 16	→	PG 21	50
52004080	PG 16	→	PG 29	50
52004090	PG 21	→	PG 29	50
52004100	PG 29	→	PG 36	50
52004110	PG 36	→	PG 42	10
52004120	PG 42	→	PG 48	10

metric

Part number	Size* male	→	female	Pack size
52104450	M12	→	M16	100
52104452	M16	→	M20	100
52104454	M20	→	M25	100
52104456	M25	→	M32	50
52104458	M32	→	M40	50
52104460	M40	→	M50	25
52104462	M50	→	M63	25

* Thread pitch is 1.5 mm

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

PG → NPT adapters

Part number	Size male → female	Pack size
01112	PG 11 → NPT ½"	10
01312	PG 13 → NPT ½"	10
01612	PG 16 → NPT ½"	10
02112	PG 21 → NPT ½"	10
02134	PG 21 → NPT ¾"	10
02910	PG 29 → NPT 1"	10
03614	PG 36 → NPT 1¼"	10

Approvals

CE RoHS

NPT → PG adapters

Part number	Size male → female	Pack size
11211	NPT ½" → PG 11	10
11213	NPT ½" → PG 13	10
11216	NPT ½" → PG 16	10
13411	NPT ¾" → PG 11	10
13413	NPT ¾" → PG 13	10
13416	NPT ¾" → PG 16	10
13421	NPT ¾" → PG 21	10
11116	NPT 1" → PG 16	10

Approvals

CE RoHS

SKINDICHT® MA-M metric → NPT adapters

Part number	Size* male → female	Pack size
54020100	M16 → NPT ½"	50
54020110	M20 → NPT ½"	50
54020120	M25 → NPT ½"	25
54020130	M25 → NPT ¾"	25
54020140	M32 → NPT ½"	25
54020152	M32 → NPT 1"	25
54020153	M40 → NPT 1¼"	10

* Thread pitch is 1.5 mm

Approvals

CE RoHS

SKINDICHT® MA-M metric → PG adapters

Part number	Size* male → female	Pack size
52104200	M16 → PG 7	100
52104210	M20 → PG 9	50
52104220	M25 → PG 11	50
52104230	M25 → PG 13	50
52104240	M25 → PG 16	50
52104250	M32 → PG 16	25

Part number	Size* male → female	Pack size
52104260	M32 → PG 21	25
52104270	M40 → PG 21	25
52104280	M50 → PG 29	10
52104290	M63 → PG 36	10
52104300	M63 → PG 42	10

* Thread pitch is 1.5 mm

Approvals

CE RoHS

SKINDICHT® ZS-M metric → PG adapters

Part number	Size* male → female	Pack size
52104330	M12 → PG 7	100
52104340	M16 → PG 9	100
52104010	M16 → PG 11	100
52104360	M20 → PG 11	100
52104370	M20 → PG 16	100
52104380	M20 → PG 16	50

Part number	Size* male → female	Pack size
52104400	M25 → PG 21	50
52104410	M32 → PG 29	25
52104420	M40 → PG 36	10
52104430	M50 → PG 42	10
52104440	M63 → PG 48	10

* Thread pitch is 1.5 mm

Approvals

CE RoHS

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SKINDICHT® MA-PG → metric adapters

shape A

shape B

Technical data

Material: nickel-plated brass

Approvals

CE RoHS

shape A

Part number	Size* male	→	female	Pack size
52104492	PG 11	→	M16	50
52104495	PG 16	→	M20	50
52104497	PG 21	→	M20	50
52104498	PG 21	→	M25	50
52104500	PG 29	→	M25	25
52104501	PG 29	→	M32	25
52104503	PG 36	→	M40	10

shape B

Part number	Size* male	→	female	Pack size
52104490	PG 7	→	M12	100
52104491	PG 9	→	M16	50
52104493	PG 11	→	M20	50
52104494	PG 13	→	M20	50
52104496	PG 16	→	M25	50
52104499	PG 21	→	M32	50
52104502	PG 29	→	M40	10

* Thread pitch is 1.5 mm

SKINDICHT® A-PG → metric adapters

shape A

shape B

Technical data

Material: glass fiber reinforced polyamide

Temperature range: -40°C to +100°C

Color: light gray (RAL 7035)

Approvals

CE RoHS

Part number shape A	Part number shape B	Size* male	→	female	Pack size
52100320	–	PG 7	→	M12	25
52100321	–	PG 7	→	M16	25
52100322	–	PG 9	→	M12	25
52100323	–	PG 9	→	M16	25
52100324	–	PG 9	→	M20	25
52100325	–	PG 11	→	M16	25
52100326	–	PG 11	→	M20	25
52100327	–	PG 11	→	M25	25
52100328	–	PG 13	→	M16	25
52100329	–	PG 13	→	M20	25
52100330	–	PG 13	→	M25	25
52100331	–	PG 16	→	M20	25
52100332	–	PG 16	→	M25	25
52100333	–	PG 16	→	M32	25
52100334	–	PG 21	→	M25	10
52100335	–	PG 21	→	M32	10
52100336	–	PG 21	→	M40	10
–	52100337	PG 29	→	M32	10
52100338	–	PG 29	→	M40	10
52100339	–	PG 29	→	M50	10
–	52100340	PG 36	→	M40	10
52100341	–	PG 36	→	M50	10
52100342	–	PG 36	→	M63	10
–	52100343	PG 42	→	M40	5
52100344	–	PG 42	→	M50	5
52100345	–	PG 42	→	M63	5
–	52100346	PG 48	→	M50	5
52100347	–	PG 48	→	M63	5

* Thread pitch is 1.5 mm

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SKINDICHT® E/E-M

Polychloroprene incised sealing for PG & metric SKINTOP® cable glands

SKINDICHT® E is a polychloroprene incised sealing bushing for use with Lapp's PG strain relief glands. SKINDICHT® E-M is for use with metric cable glands. It can be individually adapted to various cable diameters by removing some of the layers.

Technical data

Material:	CR
Temperature range:	-20°C to +80°C
Color:	black

Approvals

CE RoHS

PG

Part number	Size	Outer diameter in	Bore diameters in	Thickness in	Pack size
52005780	PG 9	0.53	0.20 / 0.31	0.22	250
52003690	PG 11	0.65	0.28 / 0.39 / 0.49	0.24	250
52003700	PG 13	0.73	0.28 / 0.41 / 0.51 / 0.63	0.26	250
52003710	PG 16	0.81	0.31 / 0.41 / 0.53 / 0.63	0.30	250
52003720	PG 21	1.02	0.43 / 0.59 / 0.71 / 0.79	0.31	100
52003730	PG 29	1.38	0.75 / 0.91 / 1.06 / 1.22	0.37	100
52003740	PG 36	1.77	0.98 / 1.10 / 1.22 / 1.38	0.47	50
52005790	PG 42	2.05	1.40 / 1.54 / 1.67 / 1.81	0.55	50
52005800	PG 48	2.24	1.59 / 1.73 / 1.85 / 1.99	0.55	50

metric

Part number	Size*	Outer diameter in	Bore diameters in	Thickness in	Pack size
52100620	M12	0.39	0.20	0.20	250
52100621	M16	0.54	0.12 / 0.24 / 0.35	0.22	250
52100622	M20	0.69	0.16 / 0.28 / 0.39 / 0.51	0.24	250
52100623	M25	0.89	0.33 / 0.45 / 0.57 / 0.69	0.30	100
52100624	M32	1.17	0.63 / 0.75 / 0.87 / 0.98	0.37	100
52100625	M40	1.48	0.91 / 1.02 / 1.14 / 1.26	0.47	50
52100626	M50	1.87	1.18 / 1.30 / 1.42 / 1.54	0.55	50
52100627	M63	2.39	1.42 / 1.54 / 1.65 / 1.77	0.55	50
52005800	PG 48	2.24	1.59 / 1.73 / 1.85 / 1.99	0.55	50

* Thread pitch is 1.5 mm

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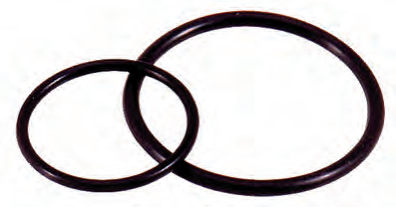
SKINDICHT® Perbunan® O-rings: PG



Perbunan® O-rings provide safe sealing against oil, dust, and water when placed on the fastening threads of the connector.

Approvals

CE RoHS

Technical data

Material: Perbunan® (NBR), ozone & UV resistant

Temperature range: -20°C to +100°C

Color: black

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
53001010	PG 7	0.394	10	0.059	1.5	100
53102011	PG 9	0.512	13	0.059	1.5	100
53001020	PG 11	0.630	16	0.059	1.5	100
52005740	PG 13	0.709	18	0.059	1.5	100
53001030	PG 16	0.788	20	0.059	1.5	100
52005750	PG 21	1.024	26	0.078	2.0	100
53001040	PG 29	1.339	34	0.078	2.0	50
52005760	PG 36	1.733	44	0.078	2.0	50
53001050	PG 42	1.970	50	0.078	2.0	50
52005770	PG 48	2.167	55	0.078	2.0	50

SKINDICHT® JT PTFE O-rings: PG

JT PTFE O-rings provide safe sealing against oil, water, alkalis, acids, solvents, and virtually all chemicals when placed on the fastening threads of a connector. They are suitable for food and dairy applications and have a wide temperature range.

Approvals

CE RoHS

Technical data

Material: PTFE

Temperature range: -120°C to +250°C
- Short-term: up to +300°C

Color: white

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
53801035	PG 7	0.492	0.650	0.078	2.0	100
53801045	PG 9	0.598	0.748	0.078	2.0	100
53801055	PG 11	0.732	0.886	0.078	2.0	100
53801065	PG 13	0.803	0.985	0.078	2.0	100
53801075	PG 16	0.886	1.063	0.078	2.0	100
53801085	PG 21	1.115	1.319	0.118	3.0	50
53801095	PG 29	1.457	1.713	0.118	3.0	50
53801105	PG 36	1.850	2.167	0.118	3.0	25
53801115	PG 42	2.127	2.482	0.118	3.0	25
53801125	PG 48	2.336	2.718	0.118	3.0	25

SKINDICHT® Viton® O-rings: PG

Viton® O-rings provide safe sealing against oil, water, alkalis, acids, solvents, and virtually all chemicals when placed on the fastening threads of a connector. They are also suitable for food and dairy applications and have a wide temperature range.

Approvals

CE RoHS

Technical data

Material: FKM fluoroelastomer

Temperature range: -20°C to +200°C

Color: green

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
52023607	PG 7	0.394	10	0.059	1.5	100
52122011	PG 9	0.512	13	0.059	1.5	100
52023602	PG 11	0.630	16	0.059	1.5	100
52023601	PG 13	0.709	18	0.059	1.5	100
52023603	PG 16	0.788	20	0.059	1.5	50
52023604	PG 21	1.024	26	0.078	2.0	50
52023606	PG 29	1.339	34	0.078	2.0	50
52023608	PG 36	1.733	44	0.078	2.0	25
52023609	PG 42	1.970	50	0.078	2.0	25
52023611	PG 48	2.167	55	0.078	2.0	25

Perbunan® is a registered trademark of BAYER AG. Viton® is a registered trademark of DuPont de Nemour.
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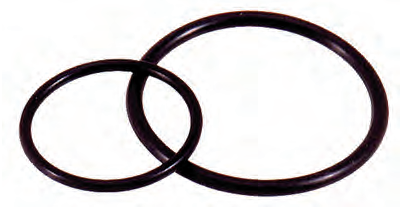
SKINDICHT® Perbunan® O-rings: metric



Perbunan® O-rings provide safe sealing against oil, dust, and water when placed on the fastening threads of the connector.

Approvals

CE RoHS

Technical data

Material: Perbunan® (NBR), ozone & UV resistant

Temperature range: -30°C to +100°C

Color: black

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
53102001	M12 x 1.5	0.354	9.0	0.059	1.5	100
53102000	M12 x 2.0	0.354	9.0	0.078	2.0	100
53102010	M16 x 2.0	0.512	13.0	0.078	2.0	100
53102021	M20 x 1.5	0.669	17.0	0.059	1.5	100
53102020	M20 x 2.0	0.669	17.0	0.078	2.0	100
53102030	M25 x 2.0	0.866	22.0	0.078	2.0	100
53102040	M32 x 2.0	1.103	28.0	0.078	2.0	50
53102050	M40 x 2.0	1.418	36.0	0.078	2.0	50
53102060	M50 x 2.0	1.812	46.0	0.078	2.0	25
53102070	M63 x 2.0	2.245	57.0	0.078	2.0	25

SKINDICHT® JT PTFE O-rings: metric

JT PTFE Teflon O-rings provide safe sealing against oil, water, alkalis, acids, solvents, and virtually all chemicals when placed on the fastening threads of a connector. They are suitable for food and dairy applications and have a wide temperature range.

Approvals

CE RoHS

Technical data

Material: PTFE

Temperature range: -120°C to +250°C
- short-term: up to +300°C

Color: white

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
53801030	M12 x 2.0	0.476	0.654	0.079	2.0	100
53801040	M16 x 2.0	0.634	0.831	0.079	2.0	100
53801050	M20 x 2.0	0.791	1.083	0.079	2.0	100
53801060	M25 x 2.0	0.988	1.315	0.118	3.0	50
53801070	M32 x 2.0	1.264	1.587	0.118	3.0	50
53801080	M40 x 2.0	1.583	2.029	0.118	3.0	25
53801090	M50 x 2.0	1.977	2.427	0.118	3.0	25
53801100	M63 x 2.0	2.490	2.911	0.118	3.0	25

SKINDICHT® Viton® O-rings: metric

Viton® O-rings provide safe sealing against oil, water, alkalis, acids, solvents, and virtually all chemicals when placed on the fastening threads of a connector. They are also suitable for food and dairy applications and have a wide temperature range.

Approvals

CE RoHS

Technical data

Material: FKM fluoroelastomer

Temperature range: -20°C to +200°C

Color: green

Part number	Size	Inner diameter		Thickness		Pack size
		in	mm	in	mm	
52122001	M12 x 1.5	0.354	9.0	0.059	1.5	100
52122000	M12 x 2.0	0.354	9.0	0.078	2.0	100
52122010	M16 x 2.0	0.512	13.0	0.078	2.0	100
52122021	M20 x 1.5	0.669	17.0	0.059	1.5	100
52122020	M20 x 2.0	0.669	17.0	0.078	2.0	100
52122030	M25 x 2.0	0.866	22.0	0.078	2.0	100
52122040	M32 x 2.0	1.103	28.0	0.078	2.0	50
52122050	M40 x 2.0	1.418	36.0	0.078	2.0	50
52122060	M50 x 2.0	1.812	46.0	0.078	2.0	25
52122070	M63 x 2.0	2.245	57.0	0.078	2.0	25

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SKINMATIC® RZ wrench

The SKINMATIC® RZ tool is designed for fast assembly of cable glands. The wrench has two expandable clamping ranges (lock positions) and fits SKINTOP® sizes PG 7 - 21, NPT ⅜" - NPT ¾", and M12 - M25. This tool provides access to SKINTOP® glands in cramped conditions and is ideal for OEM installations.

Part number	Width across flats in	Height in	Length in	Pack size
61791260	0.55 - 1.30	3.150	9.843	1

SKINMATIC® MH-Set

Mounting tools for SKINTOP® brass products

MH-Set is a three piece wrench set intended for use with SKINTOP® MS products such as MS-M, MS-SC-M, and MS-NPT. The bearing surface is shaped to prevent the nut from slipping and ensures a quick and safe assembly. The MH-Set includes the following sizes:

- 16/20 mm (M12/M16)
- 24/29 mm (M20/M25)
- 36/45 mm (M32/M40)

Part number	Size	Wrench size		Thickness	
		in	mm	in	mm
61791273	M12/M16	0.630 - 0.788	16 - 20	7.88	200
	M20/M25	0.945 - 1.142	24 - 29	8.66	220
	M32/M40	1.418 - 1.773	36 - 45	9.85	250

PTS4 wire stripper

The PTS4 is designed for stripping single conductors from 0.25 mm² (24 AWG) to 4 mm² (12 AWG). It can be used to strip several conductors of the same gauge size simultaneously. The blades are self-adjusting to prevent damage to the conductors. In addition, the pressure of the cutting jaw may be adjusted. Diagonal cutters are also integrated so that cutting and stripping can be done with the same tool.

Part number	Description	Length in	Weight lbs	Pack size
61725950	PTS4	6.698	0.441	1
61753620	spare spring	–	–	1

BULLI cable shears

The BULLI cutters are special designed for use with fine wire cables up to 16 mm² (6 AWG). It features a latch and spring return, along with a safety lock for extra protection.

Part number	Description	For outer diameter	Length in	Weight lbs	Pack size
61744160	shears	0.630	7.289	0.298	1
61744161	spare spring	–	–	–	1

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KS 15 cable shears

Cuts copper and aluminum cables with an outer diameters of up to 15 mm (0.59 in). The KS 15 provides easy, precision cutting that can be used for removing the jacket and stripping wires. Not suitable for steel wire and hard-drawn copper conductors.

Part number	For outer diameter in	Length in	Weight lbs	Pack size
61735975	0.591	6.501	0.463	1

SKINMATIC® KB-M
Multi-purpose tap

For simultaneous core drilling and cutting of metric threads. Especially suitable for thin components and sheet metals.

Part number	Size	Overall length		Drill length		Pack size
		in	mm	in	mm	
61791274	M12 x 1.5	5.12	130	1.18	30	1
61791275	M16 x 1.5	5.91	150	1.38	35	1
61791276	M20 x 1.5	6.50	165	1.57	40	1
61791277	M25 x 1.5	7.28	185	1.77	45	1

SKINDICHT® SB-M
Spiral drill

For drilling the core holes of metric threads.

Part number	Size	Overall length		Drill length		Pack size
		in	mm	in	mm	
61791278	M32 x 1.5	11.85	301	7.09	180	1
61791279	M40 x 1.5	13.75	349	7.88	200	1
61791280	M50 x 1.5	14.53	369	8.66	220	1

SKINDICHT® GB-M
Thread cutting bit

For cutting metric threads.

Part number	Size	Overall length		Drill length		Pack size
		in	mm	in	mm	
61791282	M32 x 1.5	5.91	150	1.10	28	1
61791283	M40 x 1.5	6.69	170	1.10	28	1
61791284	M50 x 1.5	7.48	190	1.26	32	1

SKINMATIC® QUICK Set
Torque wrench set

Ratchet set for metric SKINTOP® plastic and brass cable glands.
Set includes one ratchet with extension, and open nuts for four sizes:
• M12 • M16 • M20 • M25

SKINTOP® QUICK Set

Part number	Width of flats mm	Pack size
61610000	15, 16, 19, 20, 25, 30	1

torque wrench

Part number	Measuring range	Pack size
61610012	2 - 10 N m	1
61610013	5 - 25 N m	1

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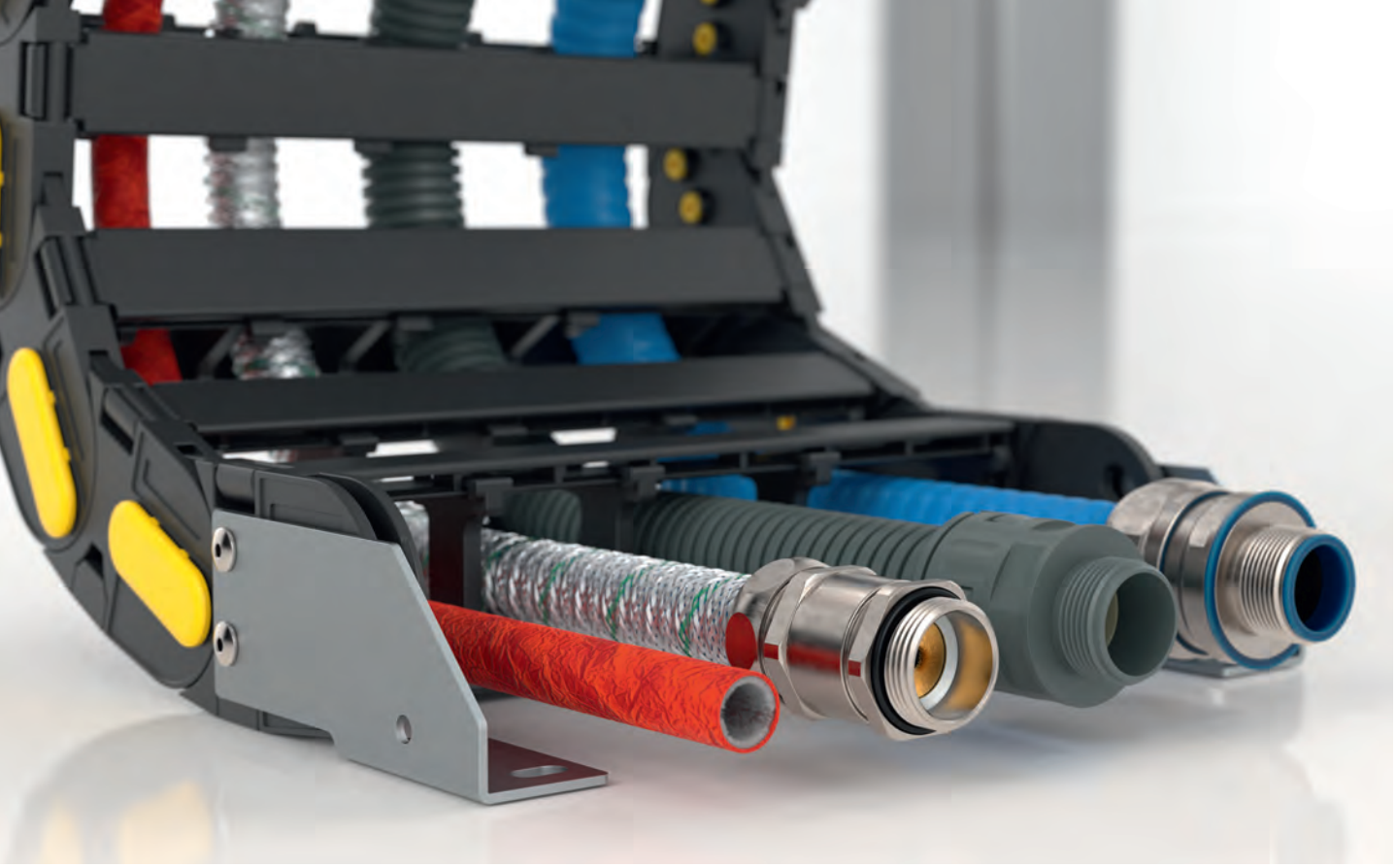

7

SILVYN®

Protective cable conduit & cable carrier systems

The universal range of SILVYN® protection and guidance systems protects cables effectively against dust, moisture, mechanical, thermal, and chemical influences. The versatile SILVYN® CHAIN range of energy supply chains also protects and guides cable in dynamic applications.

Application range

- Industrial machinery and plant engineering
- Automotive industry
- Machine tool manufacture
- Renewable energies
- Wherever cables require additional protection or guidance

SILVYN®

Conduit, sleeving & cable carrier systems

562 **Quick select chart**

Protective conduit

563 **SILVYN® RILL PA 6**
Non-metallic flexible quick-connect conduit

564 **SILVYN® RILL PA 6 SINUS**
Non-metallic flexible conduit

565 **SILVYN® RILL PA 12**
Non-metallic highly flexible quick-connect conduit

566 **SILVYN® SPLIT PA 6/PP**
Non-metallic flexible conduit

567 **SILVYN® EL/ELU/ELÖ/ELT** NEW
Flexible reinforced spiral PVC conduit

568 **SILVYN® FPS**
Continuous flex spiral steel-reinforced PVC conduit

569 **SILVYN® FD-PU**
Flexible reinforced spiral PVC conduit

570 **SILVYN® AS-P**
Flexible steel-reinforced PVC conduit

571 **SILVYN® AS**
Flexible reinforced spiral PVC conduit

572 **SILVYN® EDU-AS**
Flexible metal conduit for heavy mechanical stress

573 **SILVYN® HTDL** NEW
Liquid-tight metal conduit with PVC jacket

574 **SILVYN® FG NM**
Flexible liquid-tight conduit

575 **SILVYN® FG**
Flexible steel-reinforced liquid-tight conduit

576 **SILVYN® FPAS**
Flexible non-metallic conduit

Conduit connectors

577 **SILVYN® KLICK NPT/KLICK PG/KLICK-M**
Straight connectors for SILVYN® RILL PA 6 & PA 12 conduit

578 **SILVYN® KLICK 90° N/KLICK 90° P/KLICK 90° M** NEW
Angled connectors for SILVYN® RILL PA 6 & PA 12 conduit

579 **SILVYN® SPLIT COV/SPLIT COS**
Support assemblies for SILVYN® SPLIT conduit

580 **SILVYN® MPC/MPC-M**
Straight connectors for SILVYN® EL/ELU/ELÖ/ELT conduit

581 **SILVYN® MPC 90°/MPC 90° M**
Angled connectors for SILVYN® EL/ELU/ELÖ/ELT conduit

582 **SILVYN® LKI/LKI-M**
Connectors for SILVYN® FD-PU & SILVYN® FPS conduit

SILVYN®

Conduit, sleeving & cable carrier systems

582 **SILVYN® BW/BW-M**
Mounting brackets for SILVYN® LKI/LKI-M connectors

583 **SILVYN® USK/USK-M**
Connectors for SILVYN® FD-PU & SILVYN® FPS conduit

584 **SILVYN® US/US-M**
Brass connectors for SILVYN® AS, AS-P, EDU-AS, FPS & FD-PU conduit

585 **SILVYN® MSK-M US/MSK-M BRUSH** NEW
Brass connector and strain relief for EMC applications

586 **SILVYN® MSK-M ATEX/MSK-M ATEX BRUSH**
Brass connector and strain relief for hazardous EMC environments

587 **SILVYN® COMPACT** NEW
Brass connector for SILVYN® HTDL conduit

588 **SILVYN® HYGIENIC**
Stainless steel connector for SILVYN® FG & FG NM conduit

589 **SILVYN® FPAX-M**
Watertight connector for SILVYN® FPAS conduit

Sleeving

590 **SILVYN® CC/CC FR**
Non-fraying expandable PET sleeving

591 **SILVYN® PET/PET FR**
Economical general purpose PET sleeving

592 **SILVYN® SW/SW FR**
Semi-rigid PET sleeve with split wrap for easy installation

Cutting tools

593 **Serrated edge scissors**

593 **Bench-mounted hot knife**

593 **Conduit scissors** NEW

Cable carrier systems

594 **SILVYN® CHAIN**

Quick select chart

Product name	Temperature range	Flexibility	Cross-pressure strength	Tensile strength	Bending radius	Oil resistance	Solvent resistance	Flame resistance	Page
SILVYN® RILL PA 6	-40°C to +115°C	★★	★★	★★	★★★	★★★★	★★	★★★★	563
SILVYN® RILL PA 6 SINUS	-40°C to +140°C	★★	–	★★	★★★	★★★★	★★	★★★	564
SILVYN® RILL PA 12	-50°C to +100°C	★★★★	★★	★★	★★★	★★★★	★★★	★★★	565
SILVYN® SPLIT PA 6	-40°C to +120°C	★★	★★	★	★★★	★★★★	★★	★★★	566
SILVYN® SPLIT PP	-40°C to +135°C	★★	★★	★	★★	★★	★★	★★★	566
SILVYN® EL	-20°C to +70°C	★★	★★	★★	★★	★★	★	★	567
SILVYN® ELU	-20°C to +70°C	★★	★★	★★	★★	★★	★	★	567
SILVYN® ELÖ	-20°C to +70°C	★★	★★	★★	★★	★★★	★	★	567
SILVYN® ELT	-20°C to +90°C	★★	★★	★★	★★	★	★	★★	567
SILVYN® FPS	-20°C to +80°C	★★★★	★★	★★	★★★★	★★	★★	★	568
SILVYN® FD-PU	-40°C to +80°C	★★★★	★★	★★	★★★★	★★★★	★★	★★	569
SILVYN® AS-P	-25°C to +80°C	★★★	★★	★★	★★★	★★	★★	★	570
SILVYN® AS	up to +220°C	★★★	★★	★★	★★★★	★★★★	★★★★	★★★★	571
SILVYN® EDU-AS	up to +220°C	★★★	★★	★★★	★★★★	★★★★	★★★★	★★★★	572
SILVYN® HTDL	-40°C to +105°C	★★	★★★★	★★★	★★	★★	★	★★	573
SILVYN® FG NM	-20°C to +60°C	★	★★	★★	★	★★★	★	★	574
SILVYN® FG	-20°C to +60°C	★	★★★★	★★★	★	★★★	★	★	575
SILVYN® FPAS	-20°C to 100°C	★★	★★	★★★	★★★	★★★★	★★	★★★	576

SILVYN® RILL PA 6

Non-metallic flexible quick-connect conduit

SILVYN® RILL PA 6 is a flexible, non-metallic corrugated conduit suitable for use in various industrial applications. It is resistant to liquids, oils, and gases, and highly resistant to acids and solvents. For use in controls, moving machine parts, motor and internal connections, and in industrial, medical, or electronic applications.

Application advantage

- Halogen-free, flame retardant, and self-extinguishing
- Durable, long-lasting conduit is rugged yet flexible

Approvals

Complete the installation

SILVYN® KLICK
page 577

SILVYN® KLICK 90°
page 578

Technical Data

Material: halogen- & silicone-free polyamide

Temperature range:
- short-term: -40°C to +115°C
up to +150°C

Color: black (RAL 9011)
gray (RAL 7031)

Approvals: V-0 per UL 94
RoHS
DNV-GL certified
Lloyd's Register

Part number		Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
black	gray	in	mm	in	mm	in	mm	ft	NPT	PG	metric
164 ft put-ups											
61746935	61746939	0.394	10.0	0.256	6.5	0.512	13.0	164	NPT ¼"	PG 7	M10 x 1.0
61746945	61746940	0.512	13.0	0.394	10.0	0.787	20.0	164	NPT ¼"	PG 9	M12 x 1.5
61746955	61746950	0.622	15.8	0.472	12.0	1.378	35.0	164	NPT ⅜"	PG 11	M16 x 1.5
61747015	61747010	0.728	18.5	0.563	14.3	1.575	40.0	164	–	PG 13	–
61746965	61746960	0.835	21.2	0.650	16.5	1.772	45.0	164	NPT ½"	PG 16	M20 x 1.5
61746975	61746970	1.122	28.5	0.906	23.0	2.165	55.0	164	NPT ¾"	PG 21	M25 x 1.5
82 ft put-ups											
61746985	61746980	1.358	34.5	1.142	29.0	2.559	65.0	82	NPT 1"	PG 29	M32 x 1.5
61746995	61746990	1.673	42.5	1.417	36.0	3.543	90.0	82	NPT 1¼"	PG 36	M40 x 1.5
61747005	61747000	2.146	54.5	1.890	48.0	3.937	100.0	82	NPT 1½"	PG 48	M50 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® RILL PA 6 SINUS

Non-metallic flexible conduit

SILVYN® RILL PA 6 SINUS is a flexible, non-metallic corrugated conduit suitable for use in various industrial applications. It is highly resistant to oils, gases, acids, and other chemicals. Conduit is designed for use in controls, moving machine parts, motor and internal connections, and in industrial, medical, or electronic applications.

Application advantage

- Fast and easy assembly
- Halogen- and cadmium-free
- Durable, long-lasting conduit is rugged yet flexible

Approvals

RoHS

VdTÜV GGVS

Complete the installation

SILVYN®
SPLIT COS
page 579

Technical data

Material:	heat-modified polyamide	**Color:**	black (RAL 9005)
Temperature range:	-40 °C to +140 °C	**Approvals:**	RoHS

Part number	Outer diameter		Inner diameter		Conduit coil put-ups
	in	mm	in	mm	ft
61806550	0.394	10.0	0.264	6.7	164
61806555	0.449	11.4	0.331	8.4	164
61806560	0.512	13.0	0.390	9.9	164
61806565	0.619	15.7	0.481	12.2	164
61806570	0.835	21.2	0.654	16.6	164
61806575	1.001	25.4	0.839	21.3	164
61806580	1.115	28.3	0.914	23.2	164

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® RILL PA 12

Non-metallic highly flexible quick-connect conduit

SILVYN® RILL PA 12 is a continuous flex, non-metallic corrugated conduit. It is resistant to liquids, oils, and gases, and highly resistant to acids and solvents. High flexibility makes it an excellent choice for machine and plant construction where frequent flexing and bending is required. It is also for use in controls, moving machine parts, motor and internal connections, and in industrial, medical, or electronic applications.

Application advantage

- Halogen-free, flame retardant, and self-extinguishing
- Durable, long-lasting conduit is rugged yet flexible
- Designed for continuous movement

Approvals

Railway:
DB, SNCF

Complete the installation

SILVYN® KLICK
page 577

SILVYN® KLICK 90°
page 578

Technical Data

Material: halogen- & silicone-free polyamide

Temperature range:
- short-term: -50°C to +100°C
up to +150°C

Color: black (RAL 9011)
gray (RAL 7031)

Approvals: V-0 per UL 94
RoHS
DNV-GL certified
Lloyd's Register

Part number		Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
black	gray	in	mm	in	mm	in	mm	ft	NPT	PG	metric
164 ft put-ups											
61815105	61815100	0.394	10.0	0.256	6.5	0.512	13.0	164	NPT ¼"	PG 7	M10 x 1.0
61815115	61815110	0.512	13.0	0.394	10.0	0.591	15.0	164	NPT ¼"	PG 9	M12 x 1.5
61815125	61815120	0.622	15.8	0.472	12.0	0.866	22.0	164	NPT ⅜"	PG 11	M16 x 1.5
61815185	61815180	0.728	18.5	0.563	14.3	1.063	27.0	164	–	PG 13	–
61815135	61815130	0.835	21.2	0.650	16.5	1.378	35.0	164	NPT ½"	PG 16	M20 x 1.5
61815145	61815140	1.122	28.5	0.906	23.0	1.772	45.0	164	NPT ¾"	PG 21	M25 x 1.5
82 ft put-ups											
61815155	61815150	1.358	34.5	1.142	29.0	1.969	50.0	82	NPT 1"	PG 29	M32 x 1.5
61815165	61815160	1.673	42.5	1.417	36.0	3.150	80.0	82	NPT 1¼"	PG 36	M40 x 1.5
61815175	61815170	2.146	54.5	1.890	48.0	3.937	100.0	82	NPT 1½"	PG 48	M50 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® SPLIT PA 6/PP

Non-metallic flexible conduit

Application advantage

- Fast and easy assembly
- Halogen- and cadmium-free
- Durable, long-lasting conduit is rugged yet flexible
- IP43 with SILVYN® SPLIT COV

Approvals

RoHS

SILVYN® SPLIT is a flexible corrugated conduit suitable for various industrial applications. It is highly resistant to oils, gases, acids, and other chemicals. Conduit is designed for use in controls, moving machine parts, motor and internal connections in industrial, medical, or electronic applications.

Complete the installation

SILVYN® SPLIT COV
page 579

SILVYN® SPLIT COS
page 579

Technical data

Material: polyamide 6 or polypropylene

Temperature range:
- SILVYN® SPLIT PA 6: -40°C to +120°C
- SILVYN® SPLIT PP: -40°C to +135°C
- SILVYN® SPLIT PP UV: -40°C to +105°C

Color: black (RAL 9005)

Protection: IP43 (with SILVYN® SPLIT COV)

Approvals: RoHS

Part number			Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings	
SPLIT PA 6	SPLIT PP	SPLIT PP UV	in	mm	in	mm	in	mm	ft	PG	metric
61806621	61806615	61806100	0.394	10.0	0.248	6.3	0.591	15.0	164	–	–
61806620	61806625	61806110	0.528	13.4	0.331	8.4	0.591	15.0	164	PG 9	M16
61806631	61806616	61806120	0.634	16.1	0.433	11.0	0.591	15.0	164	–	–
61806630	61806635	61806130	0.729	18.5	0.493	12.5	0.591	15.0	164	PG 13.5	M20
61806641	61806617	61806140	0.847	21.5	0.630	16.0	0.788	20.0	164	–	–
61806640	61806645	61806150	0.997	25.3	0.756	19.2	0.985	25.0	164	PG 21	M25
61806650	61806655	61806160	1.214	30.8	0.922	23.4	1.379	35.0	164	PG 29	M32
61806651	61806618	61806170	1.399	35.5	1.076	27.3	1.379	35.0	164	–	–
61806660	61806665	61806180	1.631	41.4	1.221	31.0	1.576	40.0	82	PG 29	M40
61806670	61806675	61806190	2.128	54.0	1.682	42.7	2.758	70.0	82	–	M50
61806671	61806619	61806200	3.144	79.8	2.660	67.5	3.743	95.0	33	–	–
61806672	61806622	61806210	4.039	102.5	3.448	87.5	3.940	100.0	33	–	–

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® EL/ELU/ELÖ/ELT

Flexible reinforced spiral PVC conduit

SILVYN® EL

SILVYN® ELU

SILVYN® ELÖ

SILVYN® ELT

SILVYN® EL/ELU/ELÖ/ELT conduits are designed with a flexible PVC casing that has a rigid PVC spiral welded into the conduit. This allows them to be very flexible while maintaining their shape.

Application advantage

- Smooth inner walls allow cables to be pulled through easily
- Durable, long-lasting conduit is rugged yet flexible

Approvals

c UL us · CE · RoHS

Complete the installation

SILVYN® MPC
page 580

SILVYN® MPC 90°
page 581

Technical data

Material: PVC sheath with rigid PVC spiral

Temperature range:
- SILVYN® EL/ELU/ELÖ: -20°C to +70°C
- SILVYN® ELT: -20°C to +90°C

Color:
- SILVYN® EL: gray (RAL 7001)
- SILVYN® ELU: black (RAL 9005)
- SILVYN® ELÖ: green (RAL 6001)
- SILVYN® ELT: blue (RAL 5012)

Approvals: UL thermoplastic tubing, RoHS

Part number				Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings	
gray	black	green	blue	in	mm	in	mm	in	mm	ft	PG	metric
61747360	61751790	61751610	61751700	0.571	14.5	0.394	10	0.984	25	98	PG 9	M16 x 1.5/1
61747370	61751791	61751620	61751710	0.650	16.5	0.472	12	0.984	25	98	PG 11, PG 13/1	M16/2, M20/1 x 1.5
61747380	61751792	61751630	61751720	0.827	21.0	0.630	16	1.378	35	98	PG 13/2, PG 16	M20 x 1.5/2
61747390	61751793	61751640	61751730	1.083	27.5	0.866	22	1.772	45	98	PG 21	M25 x 1.5
61747400	61751794	61751650	61751740	1.201	30.5	0.984	25	2.165	55	98	PG 29/1	M32 x 1.5/1
61747410	61751795	61751660	61751750	1.319	33.5	1.102	28	2.362	60	98	PG 29/2	M32 x 1.5/2
61747420	61751796	61751670	61751760	1.614	41.0	1.378	35	3.150	80	98	PG 36	M40 x 1.5
61747430	61751797	61751680	61751770	1.827	46.4	1.575	40	4.134	105	98	PG 42	M50 x 1.5
61747440	61751798	61751690	61751780	2.244	57.0	1.969	50	4.724	120	98	PG 48	M63 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® FPS

Continuous flex spiral steel-reinforced PVC conduit

SILVYN® FPS is designed with an insulated spiral steel spring with a PVC jacket, which creates a continuous flexing conduit. It is excellent for applications where abrasion resistance is a concern.

Application advantage

- Durable, long-lasting conduit is rugged yet flexible
- Silicone-free
- UV- and chemical-resistant
- Airtight and watertight

Approvals

Complete the installation

SILVYN® USK
page 583

SILVYN® LKI
page 582

Technical data

Material:	PVC with insulated steel spiral	**Color:**	gray
Temperature range:	-20°C to +80°C	**Approvals:**	RoHS

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	PG	SILVYN® LKI-M	SILVYN® USK
82 ft put-ups										
61711550	0.394	10.0	0.276	7.0	0.315	8.0	82	PG 7	M12 x 1.5	M10 x 1.5
61711590	0.551	14.0	0.394	10.0	0.394	10.0	82	PG 9	M16 x 1.5	M12 x 1.5
61711630	0.669	17.0	0.512	13.0	0.512	13.0	82	PG 11	M20 x 1.5	M16 x 1.5
61711670	0.748	19.0	0.591	15.0	0.591	15.0	82	PG 13	–	–
61711710	0.827	21.0	0.630	16.0	0.669	17.0	82	PG 16	M25 x 1.5	M20 x 1.5
61711750	1.063	27.0	0.866	22.0	0.787	20.0	82	PG 21	M32 x 1.5	M25 x 1.5
61711790	1.417	36.0	1.142	29.0	0.984	25.0	82	PG 29	M40 x 1.5	M32 x 1.5
61711830	1.772	45.0	1.496	38.0	1.417	36.0	82	PG 36	M50 x 1.5	M40 x 1.5
61711910	2.205	56.0	1.890	48.0	1.575	40.0	82	PG 48	M63 x 1.5	M50 x 1.5
32 ft put-ups										
61721690	0.394	10.0	0.276	7.0	0.315	8.0	32	PG 7	M12 x 1.5	M10 x 1.5
61721700	0.551	14.0	0.394	10.0	0.394	10.0	32	PG 9	M16 x 1.5	M12 x 1.5
61721710	0.669	17.0	0.512	13.0	0.512	13.0	32	PG 11	M20 x 1.5	M16 x 1.5
61721720	0.748	19.0	0.591	15.0	0.591	15.0	32	PG 13	–	–
61721730	0.827	21.0	0.630	16.0	0.669	17.0	32	PG 16	M25 x 1.5	M20 x 1.5
61721740	1.063	27.0	0.866	22.0	0.787	20.0	32	PG 21	M32 x 1.5	M25 x 1.5
61721750	1.417	36.0	1.142	29.0	0.984	25.0	32	PG 29	M40 x 1.5	M32 x 1.5
61721760	1.772	45.0	1.496	38.0	1.417	36.0	32	PG 36	M50 x 1.5	M40 x 1.5
61721780	2.205	56.0	1.890	48.0	1.575	40.0	32	PG 48	M63 x 1.5	M50 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® FD-PU

Continuous flex spiral steel-reinforced PUR conduit

SILVYN® FD-PU is designed with a PVC-insulated spiral steel spring and a PUR jacket to provide a durable continuous flexing conduit. Its PUR jacket makes it suitable for applications in harsh environments as well as automated machines, machine tools, and switchgears. It is also suited for cleanroom applications.

Application advantage

- Halogen- and cadmium-free, resistant to oils, gases, UV, acids, and alkalis
- Suitable for cleanroom applications: airtight, watertight, and does not outgas
- Highly abrasion-proof

Approvals

VDE RoHS

Complete the installation

SILVYN® USK
page 583

SILVYN® LKI
page 582

Technical data

Material: polyurethane jacket with PVC-insulated spring steel wire spiral

Temperature range: -40°C to +80°C

Color: metallic blue

Approvals: V-2 per UL 94
RoHS

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	PG	SILVYN® LKI-M	SILVYN® USK-M
164 ft put-ups										
64453662	0.394	10.0	0.276	7.0	0.315	8.0	164	PG 7	M12 x 1.5	M10 x 1.5
64453672	0.551	14.0	0.394	10.0	0.394	10.0	164	PG 9	M16 x 1.5	M12 x 1.5
64453682	0.669	17.0	0.512	13.0	0.512	13.0	164	PG 11	M20 x 1.5	M16 x 1.5
64453692	0.748	19.0	0.591	15.0	0.591	15.0	164	PG 13	–	–
64453702	0.827	21.0	0.630	16.0	0.669	17.0	164	PG 16	M25 x 1.5	M20 x 1.5
64453712	1.063	27.0	0.827	21.0	0.787	20.0	164	PG 21	M32 x 1.5	M25 x 1.5
82 ft put-ups										
64453721	1.417	36.0	1.142	29.0	0.984	25.0	82	PG 29	M40 x 1.5	M32 x 1.5
64453731	1.772	45.0	1.496	38.0	1.417	36.0	82	PG 36	M50 x 1.5	M40 x 1.5
64453751	2.205	56.0	1.890	48.0	1.575	40.0	82	PG 48	M63 x 1.5	M50 x 1.5
32 ft put-ups										
64453660	0.394	10.0	0.276	7.0	0.315	8.0	32	PG 7	M12 x 1.5	M10 x 1.5
64453670	0.551	14.0	0.394	10.0	0.394	10.0	32	PG 9	M16 x 1.5	M12 x 1.5
64453680	0.669	17.0	0.512	13.0	0.512	13.0	32	PG 11	M20 x 1.5	M16 x 1.5
64453690	0.748	19.0	0.591	15.0	0.591	15.0	32	PG 13	–	–
64453700	0.827	21.0	0.630	16.0	0.669	17.0	32	PG 16	M25 x 1.5	M20 x 1.5
64453710	1.063	27.0	0.827	21.0	0.787	20.0	32	PG 21	M32 x 1.5	M25 x 1.5
64453720	1.417	36.0	1.142	29.0	0.984	25.0	32	PG 29	M40 x 1.5	M32 x 1.5
64453730	1.772	45.0	1.496	38.0	1.417	36.0	32	PG 36	M50 x 1.5	M40 x 1.5
64453750	2.205	56.0	1.890	48.0	1.575	40.0	32	PG 48	M63 x 1.5	M50 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® AS-P

Flexible steel-reinforced PVC conduit

SILVYN® AS-P is designed with an interlocking spirally-wound metal armor surrounded with a PVC jacket. It is ideal for use in machine and equipment manufacturing with harsh and/or wet environments.

Application advantage

- Highly resistant to pressure, impact, and mechanical stress while providing superior flexing qualities
- Resistant to water, oil, and acids

Approvals

VDE RoHS

Complete the installation

SILVYN® US/US-M
page 584

SILVYN® MSK-M BRUSH
page 585

Technical data

Material: galvanized steel with a silicone-free PVC spiral

Color: gray

Approvals: RoHS

Temperature range: -25°C to +80°C
- short-term: up to +100°C

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	PG	SILVYN® US-M	SILVYN® USK-M
164 ft put-ups										
64400010	0.394	10.0	0.276	7.0	1.260	32.0	164	PG 7	M10 x 1.5	M12 x 1.5
64400020	0.551	14.0	0.394	10.0	1.575	40.0	164	PG 9	M12 x 1.5	M16 x 1.5
64400030	0.669	17.0	0.512	13.0	1.772	45.0	164	PG 11	M16 x 1.5	M20 x 1.5
64400040	0.748	19.0	0.591	15.0	2.047	52.0	164	PG 13	–	–
64400050	0.827	21.0	0.669	17.0	2.283	58.0	164	PG 16	M20 x 1.5	M25 x 1.5
64400060	1.063	27.0	0.866	22.0	2.835	72.0	164	PG 21	M25 x 1.5	M32 x 1.5
82 ft put-ups										
64400070	1.417	36.0	1.142	29.0	3.858	98.0	82	PG 29	M32 x 1.5	M40 x 1.5
64400080	1.772	45.0	1.496	38.0	4.646	118.0	82	PG 36	M40 x 1.5	M50 x 1.5
64400090	2.205	56.0	1.929	49.0	5.512	140.0	82	PG 48	M50 x 1.5	M63 x 1.5
32 ft put-ups										
64400100	0.394	10.0	0.276	7.0	1.260	32.0	32	PG 7	M10 x 1.5	M12 x 1.5
64400110	0.551	14.0	0.394	10.0	1.575	40.0	32	PG 9	M12 x 1.5	M16 x 1.5
64400120	0.669	17.0	0.512	13.0	1.772	45.0	32	PG 11	M16 x 1.5	M20 x 1.5
64400130	0.748	19.0	0.591	15.0	2.047	52.0	32	PG 13	–	–
64400140	0.827	21.0	0.669	17.0	2.283	58.0	32	PG 16	M20 x 1.5	M25 x 1.5
64400150	1.063	27.0	0.866	22.0	2.835	72.0	33	PG 21	M25 x 1.5	M32 x 1.5
64400160	1.417	36.0	1.142	29.0	3.858	98.0	32	PG 29	M32 x 1.5	M40 x 1.5
64400170	1.772	45.0	1.496	38.0	4.646	118.0	32	PG 36	M40 x 1.5	M50 x 1.5
64400180	2.205	56.0	1.929	49.0	5.512	140.0	32	PG 48	M50 x 1.5	M63 x 1.5

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SILVYN® AS

Flexible steel-reinforced metal conduit

SILVYN® AS is designed with an interlocking spirally-wound metal armor. It is ideal for heavy mechanical stress.

Application advantage

- Highly resistant to pressure, impact, and mechanical stress while providing superior flexing qualities
- 32 ft put-ups available upon request

Approvals

VDE RoHS

Complete the installation

SILVYN® US/US-M
page 584

SILVYN® MSK-M BRUSH
page 585

Technical data

Material: galvanized steel

Temperature range: up to +220 °C

Approvals: RoHS

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	PG	SILVYN® US-M	SILVYN® USK-M
164 ft put-ups										
61802080	0.394	10.0	0.315	8.0	1.102	28.0	164	PG 7	M10 x 1.5	M12 x 1.5
61802090	0.551	14.0	0.433	11.0	1.339	34.0	164	PG 9	M12 x 1.5	M16 x 1.5
61802100	0.669	17.0	0.551	14.0	1.575	40.0	164	PG 11	M16 x 1.5	M20 x 1.5
61802110	0.748	19.0	0.630	16.0	1.772	45.0	164	PG 13	–	–
61802120	0.827	21.0	0.709	18.0	1.969	50.0	164	PG 16	M20 x 1.5	M25 x 1.5
61802130	1.063	27.0	0.906	23.0	2.480	63.0	164	PG 21	M25 x 1.5	M32 x 1.5
82 ft put-ups										
61802140	1.417	36.0	1.220	31.0	3.346	85.0	82	PG 29	M32 x 1.5	M40 x 1.5
61802150	1.772	45.0	1.575	40.0	3.937	100.0	82	PG 36	M40 x 1.5	M50 x 1.5
61802170	2.205	56.0	2.008	51.0	4.921	125.0	82	PG 48	M50 x 1.5	M63 x 1.5

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SILVYN® EDU-AS

Flexible metal conduit for heavy mechanical stress

SILVYN® EDU-AS is designed with an interlocking spirally-wound metal armor surrounded by a galvanized steel wire braid. SILVYN® EDU-AS is recommended for use with the SILVYN® US brass connector to provide a secure locking system.

Application advantage

- Suitable for heavy mechanical stresses per DIN 49012
- High temperature resistance for exposure to extreme heat
- High tensile, twisting, and bending strength, while offering high flexibility

Approvals

VDE RoHS

Complete the installation

SILVYN® US/US-M
page 584

SILVYN® MSK-M BRUSH
page 585

Technical data

Material: galvanized steel with a galvanized steel wire braid

Temperature range: up to +220°C

Approvals: RoHS

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	PG	SILVYN® US-M	SILVYN® USK-M
164 ft put-ups										
61802380	0.394	10.0	0.276	7.0	1.102	28.0	164	PG 7	M10 x 1.5	M12 x 1.5
61802390	0.551	14.0	0.394	10.0	1.339	34.0	164	PG 9	M12 x 1.5	M16 x 1.5
61802400	0.669	17.0	0.512	13.0	1.575	40.0	164	PG 11	M16 x 1.5	M20 x 1.5
61802410	0.748	19.0	0.591	15.0	1.772	45.0	164	PG 13	–	–
61802420	0.827	21.0	0.669	17.0	1.969	50.0	164	PG 16	M20 x 1.5	M25 x 1.5
61802430	1.063	27.0	0.866	22.0	2.480	63.0	164	PG 21	M25 x 1.5	M32 x 1.5
82 ft put-ups										
61802440	1.417	36.0	1.142	29.0	3.346	85.0	82	PG 29	M32 x 1.5	M40 x 1.5
61802450	1.772	45.0	1.496	38.0	3.937	100.0	82	PG 36	M40 x 1.5	M50 x 1.5
61802470	2.205	56.0	1.929	49.0	5.315	135.0	82	PG 48	M50 x 1.5	M63 x 1.5

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SILVYN® HTDL

Liquid-tight metal conduit with PVC jacket

Application advantage

- Protects against liquids
- Robust with high tensile strength

SILVYN® HTDL is a liquid-tight protective conduit with UL & CSA approvals. It is made of a single grooved metal conduit with PVC jacket. This design makes it suitable for applications in mechanical engineering, plant construction or transformer construction.

* Trade product, not LAPP product.

Approvals

Complete the installation

SILVYN® COMPACT
page 587

Technical data

Material:	galvanized steel with PVC jacket	**Color:**	black
Temperature range:	-40°C to +105°C	**Approvals:**	NEC 501-4B
- short-term:	up to +120°C		RoHS

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	Thread size for fittings		
	in	mm	in	mm	in	mm	ft	NPT	PG	metric
61814190	0.701	17.8	0.496	12.6	3.346	85	196	NPT ½"	PG 13.5	M16 x 1.5
61814200	0.831	21.1	0.634	16.1	4.331	110	196	NPT ½"	PG 16	M20 x 1.5
61814210	1.039	26.4	0.831	21.1	5.512	140	147	NPT ¾"	PG 21	M25 x 1.5
61814220	1.303	33.1	1.055	26.8	6.693	170	98	NPT 1"	PG 29	M32 x 1.5
61814230	1.646	41.8	1.394	35.4	8.465	215	49	NPT 1¼"	PG 36	M40 x 1.5
61814240	1.882	47.8	1.587	40.3	9.843	250	49	NPT 1½"	PG 42	M50 x 1.5
61814250	2.358	59.9	2.031	51.6	11.811	300	49	NPT 2"	PG 48	M63 x 1.5

If not otherwise specified, all values relating to the product are nominal values.
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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. It uses FDA-approved material and is ECOLAB® certified to be used in the food and beverage industry, especially for production and processing equipment of milk and meat products.
* Trade product, not LAPP product

Application advantage

- FDA-approved jacket material
- Protects against liquids
- Flame retardant

Approvals

RoHS ECOLAB

Complete the installation

SILVYN® HYGIENIC
page 588

Technical data

Material: special soft PVC sheath with hard PVC spiral

Temperature range: -20°C to +60°C
- short-term: up to +80°C

Color: blue

Approvals: RoHS
FDA CFR 21
NSF 51

Part number	Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	SILVYN® HYGIENIC
	in	mm	in	mm	in	mm	ft	metric thread
55503370	0.701	17.8	0.496	12.6	2.758	70.0	98	55510700
55503371	0.831	21.1	0.630	16.0	3.940	100.0	98	55510701
55503372	1.040	26.4	0.827	21.0	5.122	130.0	98	55510702
55503373	1.304	33.1	1.044	26.5	7.092	180.0	98	55510703
55503374	1.647	41.8	1.383	35.1	8.865	225.0	49	55510704
55503375	1.883	47.8	1.588	40.3	10.047	255.0	49	55510705
55503376	2.360	59.9	2.033	51.6	12.214	310.0	49	55510706

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® FG

Flexible steel-reinforced liquid-tight conduit

SILVYN® FG is a flexible steel-reinforced non-metallic conduit suitable for use in various industrial applications. It uses FDA-approved material and can be used in the food and beverage industry, especially for production and processing equipment of milk and meat products.
* Trade product, not LAPP product

Application advantage

- FDA-approved jacket material
- High crush resistance
- Protects against liquids
- Flame retardant

Approvals

RoHS

Complete the installation

SILVYN® HYGIENIC
page 588

Technical data

Material:	electrogalvanized strip-wound steel inner hose; special plastic sheath	**Color:**	white blue
Temperature range: - short-term:	-20°C to +60°C up to +80°C	**Approvals:**	RoHS FDA CFR 21 NSF 51

Part number		Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups	SILVYN® HYGIENIC
white	blue	in	mm	in	mm	in	mm	ft	metric thread
55503279	55503286	0.701	17.8	0.496	12.6	2.364	60.0	98	55510700
55503280	55503287	0.831	21.1	0.630	16.0	2.955	75.0	98	55510701
55503281	55503288	1.040	26.4	0.827	21.0	3.546	90.0	98	55510702
55503282	55503289	1.304	33.1	1.044	26.5	4.728	120.0	98	55510703
55503283	55503290	1.647	41.8	1.383	35.1	5.319	135.0	49	55510704
55503284	55503291	1.883	47.8	1.588	40.3	6.501	165.0	49	55510705
55503285	55503292	2.360	59.9	2.033	51.6	8.274	210.0	49	55510706

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® FPAS

Flexible non-metallic conduit

SILVYN® FPAS is a flexible, non-metallic corrugated conduit suitable for use in various industrial applications. It is resistant to liquids, oils, and gases, and highly resistant to acids and solvents. Conduit is for use in controls, moving machine parts, motor and internal connections, and in industrial, medical, or electronic applications.

Application advantage

- Halogen-free, flame retardant, and self-extinguishing
- Durable, long-lasting conduit is rugged yet flexible

Approvals

Complete the installation

SILVYN® FPAX-M
page 589

Technical data

Material: halogen-free polyamide 6

Temperature range:
- static: -40°C to +120°C
- dynamic: -20°C to +100°C

Color: black (RAL 9005)
gray (RAL 7031)

Approvals: V-2 per UL 92
RoHS
DNV-GL certified
Lloyd's Register
UL thermoplastic tubing

Part number		Outer diameter		Inner diameter		Bend radius		Conduit coil put-ups
black	gray	in	mm	in	mm	in	mm	ft
61754005	61754000	0.394	10.0	0.248	6.3	0.591	15.0	164
61754015	61754010	0.512	13.0	0.386	9.8	0.985	25.0	164
61754025	61754020	0.623	15.8	0.465	11.8	1.379	35.0	164
61754275	61754270	0.729	18.5	0.559	14.2	1.576	40.0	164
61737162	61737253	0.788	20.0	0.583	14.8	1.773	45.0	164
61754035	61754030	0.835	21.2	0.658	16.7	1.773	45.0	164
61737164	61737163	0.985	25.0	0.753	19.1	1.970	50.0	164
61754045	61754040	1.123	28.5	0.898	22.8	1.970	50.0	164
61754055	61754050	1.359	34.5	1.107	28.1	2.364	60.0	82
61754065	61754060	1.675	42.5	1.399	35.5	2.758	70.0	82
61754075	61754070	2.147	54.5	1.860	47.2	3.152	80.0	82
61754305	61754300	2.648	67.2	2.218	56.3	5.122	130.0	33

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® KLICK NPT/KLICK PG/KLICK-M

Straight connectors for SILVYN® RILL PA 6 & PA 12 conduit

SILVYN® KLICK is available with NPT, PG & metric threads. Use this straight conduit gland to create a quick, secure connection with SILVYN® RILL conduit.

Approvals

Complete the installation

SILVYN® RILL PA 6
page 563

SILVYN® RILL PA 12
page 565

Technical data

Material:	silicone-free polyamide	**Color:**	black or gray
Temperature range:	-40°C to +115°C	**Protection:**	IP68 IP69 acc. to DIN 40050 T.9

Part number		Thread	Conduit outer diameter		Thread length		Pack size	SILVYN® RILL PA 6		SILVYN® RILL PA 12	
black	gray		in	mm	in	mm		black	gray	black	gray
NPT thread											
61800705	–	NPT ¼"	0.394	10.0	0.453	11.5	50	61746935	61746939	61815105	61815100
61800715	–	NPT ⅜"	0.512	13.0	0.472	12.0	50	61746945	61746940	61815115	61815110
61800725*	–	NPT ⅜"	0.622	15.8	0.472	12.0	50	61746955	61746950	61815125	61815120
61800745	–	NPT ½"	0.835	21.2	0.512	13.0	50	61746965	61746960	61815135	61815130
61800755*	–	NPT ¾"	1.122	28.5	0.551	14.0	25	61746975	61746970	61815145	61815140
61800765*	–	NPT 1"	1.358	34.5	0.630	16.0	25	61746985	61746980	61815155	61815150
61800775	–	NPT 1¼"	1.673	42.5	0.709	18.0	25	61746995	61746990	61815165	61815160
61800785	–	NPT 1½"	2.146	54.5	0.827	21.0	10	61747005	61747000	61815175	61815170
PG thread											
61800865	61800860	PG 7	0.394	10.0	0.394	10.0	50	61746935	61746939	61815105	61815100
61800875	61800870	PG 9	0.512	13.0	0.394	10.0	50	61746945	61746940	61815115	61815110
61800885	61800880	PG 11	0.622	15.8	0.394	10.0	50	61746955	61746950	61815125	61815120
61800855	61800850	PG 13	0.717	18.2	0.433	11.0	50	61747015	61747010	61815185	61815180
61800895	61800890	PG 16	0.835	21.2	0.472	12.0	50	61746965	61746960	61815135	61815130
61800905	61800900	PG 21	1.122	28.5	0.472	12.0	25	61746975	61746970	61815145	61815140
61800915	61800910	PG 29	1.358	34.5	0.472	12.0	25	61746985	61746980	61815155	61815150
61800925	61800920	PG 36	1.673	42.5	0.472	12.0	25	61746995	61745990	61815165	61815160
61800935	61800930	PG 48	2.146	54.5	0.591	15.0	10	61747005	61747000	61815175	61815170
Metric thread											
55501005	55501000	M10 x 1.0	0.394	10.0	0.472	12.0	50	61746935	61746939	61815105	61815100
55501015	55501010	M12 x 1.5	0.512	13.0	0.472	12.0	50	61746945	61746940	61815115	61815110
55501025	55501020	M16 x 1.5/1	0.512	13.0	0.472	12.0	50	61746945	61746940	61815115	61815110
55501035	55501030	M16 x 1.5/2	0.622	15.8	0.472	12.0	50	61746955	61746950	61815125	61815120
55501045	55501040	M20 x 1.5/1	0.622	15.8	0.512	13.0	50	61746950	61746950	61815125	61815120
55501055	55501050	M20 x 1.5/2	0.835	21.2	0.512	13.0	50	61746965	61746960	61815135	61815130
55501065	55501060	M25 x 1.5	1.122	28.5	0.512	13.0	25	61746975	61746970	61815145	61815140
55501075	55501070	M32 x 1.5	1.358	34.5	0.591	15.0	25	61746985	61746980	61815155	61815150
55501085	55501080	M40 x 1.5	1.673	42.5	0.591	15.0	25	61746995	61746990	61815165	61815160
55501095	55501090	M50 x 1.5	2.146	54.5	0.602	15.3	10	61747005	61747000	61815175	61815170
55500995	55500990	M63 x 1.5	2.146	54.5	0.629	16.0	10	61747005	61747000	61815175	61815170

* CSA approved

SILVYN® KLICK 90° N/KLICK 90° P/KLICK 90° M

Angled connectors for SILVYN® RILL PA 6 & PA 12 conduit

NEW

SILVYN® KLICK-90° is available with NPT, PG & metric threads. Use this 90° angled conduit gland to create a quick, secure connection with SILVYN® RILL conduit.

Approvals

cULus · DVE · RoHS

Complete the installation

SILVYN® RILL PA 6
page 563

SILVYN® RILL PA 12
page 565

Technical data

Material:	silicone-free polyamide	**Color:**	black or gray
Temperature range:	-40°C to +115°C	**Protection:**	IP67 IP69 acc. to DIN 40050 T.9

Part number		Thread	Conduit outer diameter		Thread length		Pack size	SILVYN® RILL PA 6		SILVYN® RILL PA 12	
black	gray		in	mm	in	mm		black	gray	black	gray
NPT thread											
61800015	–	NPT ¼”	0.394	10.0	0.394	10.0	50	61746935	61746939	61815105	61815100
61800025	–	NPT ¼”	0.512	13.0	0.414	10.5	50	61746945	61746940	61815115	61815110
61800035*	–	NPT ⅜”	0.622	15.8	0.472	12.0	50	61746955	61746950	61815125	61815120
61800045	–	NPT ½”	0.835	21.2	0.512	13.0	50	61746965	61746960	61815135	61815130
61800055*	–	NPT ¾”	1.122	28.5	0.551	14.0	25	61746975	61746970	61815145	61815140
61800065*	–	NPT 1”	1.358	34.5	0.630	16.0	10	61746985	61746980	61815155	61815150
61800075	–	NPT 1¼”	1.673	42.5	0.709	18.0	10	61746995	61746990	61815165	61815160
61800084	–	NPT 1½”	2.146	54.5	0.709	18.0	10	61747005	61747000	61815175	61815170
PG thread											
61801025	61801020	PG 9	0.512	13.0	0.394	10.0	50	61746945	61746940	61815115	61815110
61801035	61801030	PG 11	0.622	15.8	0.394	10.0	50	61746955	61746950	61815125	61815120
56000105	56000100	PG 13	0.728	18.5	0.433	11.0	50	61747015	61747010	61815185	61815180
61801045	61801040	PG 16	0.835	21.2	0.472	12.0	50	61746965	61746960	61815135	61815130
61801055	61801050	PG 21	1.122	28.5	0.472	12.0	25	61746975	61746970	61815145	61815140
61801065	61801060	PG 29	1.358	34.5	0.472	12.0	10	61746985	61746980	61815155	61815150
61801075	61801061	PG 36	1.673	42.5	0.551	14.0	10	61746995	61746990	61747085	61714200
61801085	61801062	PG 48	2.146	54.5	0.551	14.0	5	61747005	61747000	61747095	61714210
Metric thread											
55501115	55501110	M10 x 1.0	0.394	10.0	0.472	12.0	50	61746935	61746939	61815105	61815100
55501125	55501120	M12 x 1.5	0.512	13.0	0.472	12.0	50	61746945	61746940	61815115	61815110
55501145	55501140	M16 x 1.5	0.622	15.8	0.472	12.0	50	61746955	61746950	61815125	61815120
55501165	55501160	M20 x 1.5	0.835	21.2	0.512	13.0	50	61746965	61746960	61815135	61815130
55501185	55501180	M25 x 1.5	1.122	28.5	0.512	13.0	25	61746975	61746970	61815145	61815140
55501205	55501200	M32 x 1.5	1.358	34.5	0.591	15.0	10	61746985	61746980	61815155	61815150
55501225	55501220	M40 x 1.5	1.673	42.5	0.591	15.0	10	61746995	61746990	61815165	61815160
55501245	55501240	M50 x 1.5	2.146	54.5	0.630	16.0	5	61747005	61747000	61815175	61815170
55501255	55501250	M63 x 1.5	2.146	54.5	0.630	16.0	5	61747005	61747000	61815175	61815170

* CSA approved

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SILVYN® SPLIT COV/SPLIT COS

Support assemblies for SILVYN® SPLIT conduit

SILVYN® SPLIT COV

SILVYN® SPLIT COS

SILVYN® SPLIT COV is a fast and easy support assembly designed specifically for the SILVYN® SPLIT. SILVYN® SPLIT COS is designed to hold SILVYN® SPLIT in place. It has high tensile strength and no loose parts. Both assemblies can be used in areas where cables and wires need to be protected after installation.

Approvals

RoHS ✓

Complete the installation

SILVYN® SPLIT page 566

Technical data

Material: halogen-free polyamide

Color: black (RAL 9005)

Temperature range: -40°C to +120°C

SILVYN® SPLIT COV

Part number	Thread	Min. conduit outer diameter		Max. conduit outer diameter		Pack size	SILVYN® SPLIT		
		in	mm	in	mm		PA 6	PP	PP UV
With locknut									
61806760	PG 9	0.351	8.9	0.536	13.6	100	61806620	61806625	61806110
61806770	PG 13.5	0.508	12.9	0.737	18.7	100	61806630	61806635	61806130
61806780	PG 21	0.780	19.8	1.020	25.9	50	61806640	61806645	61806150
61806790	PG 29	0.934	23.7	1.233	31.3	50	61806650	61806655	61806160
61806800	PG 29	1.249	31.7	1.651	41.9	25	61806650	61806655	61806160
–	PG 50	1.698	43.1	2.135	54.2	25	61806650	61806655	61806160
Without locknut									
61806680	M16 x 1.5	0.351	8.9	0.536	13.6	100	61806620	61806625	61806110
61806681	M20 x 1.5	0.508	12.9	0.737	18.7	100	61806630	61806635	61806130
61806682	M25 x 1.5	0.780	19.8	1.020	25.9	50	61806640	61806645	61806150
61806683	M32 x 1.5	0.934	23.7	1.233	31.3	50	61806650	61806655	61806160
61806684	M40 x 1.5	1.249	31.7	1.651	41.9	25	61806660	61806665	61806180
61806685	M50 x 1.5	1.698	43.1	2.135	54.2	25	61806670	61806675	61806190

SILVYN® SPLIT COS

Part number	Min. conduit outer diameter		Max. conduit outer diameter		Pack size	SILVYN® SPLIT		
	in	mm	in	mm		PA 6	PP	PP UV
61806690	0.351	8.9	0.536	13.6	100	61806620	61806625	61806110
61806700	0.508	12.9	0.737	18.7	100	61806630	61806635	61806130
61806710	0.780	19.8	1.020	25.9	50	61806640	61806645	61806150
61806720	0.934	23.7	1.233	31.3	50	61806650	61806655	61806160
61806730	1.249	31.7	1.651	41.9	20	61806660	61806665	61806180
61806740	1.698	43.1	2.135	54.2	20	61806670	61806675	61806190

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SILVYN® MPC/MPC-M

Straight connectors for SILVYN® EL/ELU/ELÖ/ELT conduit

SILVYN® MPC is a straight conduit connector especially designed for use with the SILVYN® EL/ELU/ELÖ/ELT conduit to create a tight and secure seal. SILVYN® MPC is available in PG and metric threads.

Approvals

cULus CE RoHS

Complete the installation

SILVYN® EL/ELU/ELÖ/ELT
page 567

Technical data

Material: halogen-free polyamide 66

Temperature range: -40°C to +120°C

Color: black (RAL 9005)
gray (RAL 7001)

Protection: IP65

Part number black	Part number gray	Thread	Conduit inner diameter in	Conduit inner diameter mm	Conduit outer diameter in	Conduit outer diameter mm	Pack size	SILVYN® EL	SILVYN® ELU	SILVYN® ELÖ	SILVYN® ELT
PG thread											
55502470	55502496	PG 9	0.394	10.0	0.579	14.7	10	61747360	61751790	61751610	61751700
55502471	55502497	PG 11	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502472	55502498	PG 13/1	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502494	55502499	PG 13/2	0.630	16.0	0.815	20.7	10	61747380	61751792	61751630	61751720
55502473	55502451	PG 16	0.630	16.0	0.815	20.7	10	61747380	61751792	61751630	61751720
55502474	55502452	PG 21	0.866	22.0	1.091	27.7	10	61747390	61751793	61751640	61751730
55502476	55502453	PG 29/1	0.984	25.0	1.205	30.6	10	61747400	61751794	61751650	61751740
55502495	55502454	PG 29/2	1.102	28.0	1.319	33.5	10	61747410	61751795	61751660	61751750
55502477	55502455	PG 36	1.378	35.0	1.614	41.0	2	61747420	61751796	61751670	61751760
55502478	55502456	PG 42	1.575	40.0	1.827	46.4	2	61747430	61751797	61751680	61751770
55502479	55502457	PG 48	1.969	50.0	2.252	57.2	2	61747440	61751798	61751690	61751780
Metric thread											
55502460	55502441	M16 x 1.5/1	0.394	10.0	0.579	14.7	10	61747360	61751790	61751610	61751700
55502461	55502442	M16 x 1.5/2	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502462	55502443	M20 x 1.5/1	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502463	55502444	M20 x 1.5/2	0.630	16.0	0.815	20.7	10	61747380	61751792	61751630	61751720
55502464	55502445	M25 x 1.5	0.866	22.0	1.091	27.7	10	61747390	61751793	61751640	61751730
55502465	55502446	M32 x 1.5/1	0.984	25.0	1.205	30.6	10	61747400	61751794	61751650	61751740
55502469	55502447	M32 x 1.5/2	1.102	28.0	1.319	33.5	10	61747410	61751795	61751660	61751750
55502466	55502448	M40 x 1.5	1.378	35.0	1.614	41.0	2	61747420	61751796	61751670	61751760
55502467	55502449	M50 x 1.5	1.575	40.0	1.827	46.4	2	61747430	61751797	61751680	61751770
55502468	55502439	M63 x 1.5	1.969	50.0	2.252	57.2	1	61747440	61751798	61751690	61751780

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SILVYN® MPC 90°/MPC 90° M

Angled connectors for SILVYN® EL/ELU/ELÖ/ELT conduit

SILVYN® MPC is an angle connector designed especially for the SILVYN® EL/ELU/ELÖ/ELT conduit to create a tight, secure seal. SILVYN® MPC is available in PG and metric threads.

Approvals

cULus CE RoHS

Complete the installation

SILVYN® EL/ ELU/ELÖ/ELT
page 567

Technical data

Material: halogen-free polyamide 66

Temperature range: -40°C to +120°C

Color: black (RAL 9005)
gray (RAL 7001)

Protection: IP65

Part number black	Part number gray	Thread	Conduit inner diameter in	Conduit inner diameter mm	Conduit outer diameter in	Conduit outer diameter mm	Pack size	SILVYN® EL	SILVYN® ELU	SILVYN® ELÖ	SILVYN® ELT
PG thread											
55502486	55502370	PG 11	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502487	55502371	PG 13	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502488	55502372	PG 16	0.630	16.0	0.815	20.7	10	61747380	61751792	61751630	61751720
55502489	55502373	PG 21	0.866	22.0	1.091	27.7	10	61747390	61751793	61751640	61751730
55502490	55502374	PG 29	1.102	28.0	1.319	33.5	10	61747410	61751795	61751660	61751750
55502493	55502375	PG 36	1.378	35.0	1.614	41.0	2	61747420	61751796	61751670	61751760
Metric thread											
55502480	55502458	M16 x 1.5	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502481	55502459	M20 x 1.5/1	0.472	12.0	0.654	16.6	10	61747370	61751791	61751620	61751710
55502482	55502366	M20 x 1.5/2	0.630	16.0	0.815	20.7	10	61747380	61751792	61751630	61751720
55502483	55502367	M25 x 1.5	0.866	22.0	1.091	27.7	10	61747390	61751793	61751640	61751730
55502484	55502368	M32 x 1.5	1.102	28.0	1.319	33.5	10	61747410	61751795	61751660	61751750
55502485	55502369	M40 x 1.5	1.378	35.0	1.614	41.0	2	61747420	61751796	61751670	61751760

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® LKI/LKI-M

Connectors for SILVYN® FD-PU & SILVYN® FPS conduit

SILVYN® LKI is a swivel connector designed to allow the conduit to rotate freely without damage to the conduit or the connection. It is tension and vibration resistant, providing a high quality connection between the protective conduit and the machine. SILVYN® LKI is for use with SILVYN® FPS and FD-PU conduits.

Complete the installation

SKINTOP® GMP locknuts
page 541

Technical data

Material: polypropylene

Locknuts: add SKINTOP® GMP-GL, page 541

Temperature range: -10°C to +110°C

Color: gray

Protection: IP54

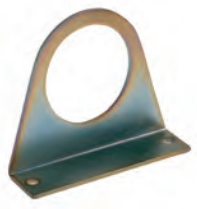
Approvals

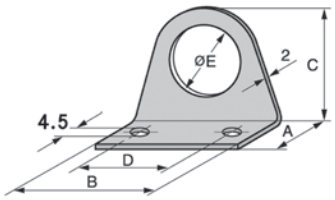
RoHS

Part number	Thread	Conduit outer diameter in	Conduit outer diameter mm	Thread length in	Thread length mm	Pack size	SILVYN® FPS	SILVYN® FD-PU
PG thread								
55000000	PG 7	0.394	10.0	0.394	10.0	50	61711550	64453662
55000010	PG 9	0.551	14.0	0.394	10.0	50	61711590	64453672
55000020	PG 11	0.669	17.0	0.394	10.0	50	61711630	64453682
55000030	PG 13	0.748	19.0	0.394	10.0	50	61711670	64453692
55000040	PG 16	0.827	21.0	0.433	11.0	50	61711710	64453702
55000050	PG 21	1.063	27.0	0.433	11.0	25	61711750	64453712
55000060	PG 29	1.417	36.0	0.472	12.0	25	61711790	64453721
55000070	PG 36	1.772	45.0	0.472	12.0	25	61711830	64453731
55000090	PG 48	2.205	56.0	0.591	15.0	10	61711910	64453751
Metric thread								
55501400	M12 x 1.5	0.394	10.0	0.394	10.0	50	61711550	64453612
55501410	M16 x 1.5	0.551	14.0	0.394	10.0	50	61711590	64453672
55501420	M20 x 1.5	0.669	17.0	0.394	10.0	50	61711630	64453682
55501430	M25 x 1.5	0.827	21.0	0.433	11.0	50	61711710	64453702
55501440	M32 x 1.5	1.063	27.0	0.472	12.0	25	61711750	64453712
55501450	M40 x 1.5	1.417	36.0	0.472	12.0	25	61711790	64453721
55501460	M50 x 1.5	1.772	45.0	0.472	12.0	25	61711830	64453731
55501470	M63 x 1.5	2.205	56.0	0.591	15.0	10	61711910	64453751

SILVYN® BW/BW-M

Mounting brackets for SILVYN® LKI/LKI-M connectors





All dimensions are in mm.

SILVYN® BW is a special mounting bracket to be used with a SILVYN® LKI PG connector to provide the proper sealing protection. The SILVYN® BW-M bracket is designed with metric threads.

Technical data

Material: passivated stainless steel

Part number	Thread	A in	A mm	B in	B mm	C in	C mm	D in	D mm	ØE in	ØE mm	Pack size
PG thread												
55000540	PG 16	0.79	20.0	1.97	50.0	1.50	38.0	1.58	40.0	0.91	23.0	25
55000550	PG 21	0.79	20.0	2.36	60.0	1.85	47.0	1.97	50.0	1.14	29.0	25
55000560	PG 29	0.79	20.0	2.76	70.0	2.24	57.0	2.36	60.0	1.48	37.5	25
Metric thread												
55000531	M16 x 1.5	0.79	20.0	1.97	50.0	1.30	33.2	1.58	40.0	0.67	17.0	25
55000541	M20 x 1.5	0.79	20.0	1.97	50.0	1.50	38.0	1.58	40.0	0.83	21.0	25
55000551	M25 x 1.5	0.79	20.0	2.36	60.0	1.85	46.9	1.97	50.0	1.02	26.0	25
55000561	M32 x 1.5	0.79	20.0	2.76	70.0	2.24	56.9	2.36	60.0	1.30	33.0	25
55000571	M40 x 1.5	0.79	20.0	3.15	80.0	2.64	67.0	2.76	70.0	1.61	41.0	25
55000572	M50 x 1.5	0.79	20.0	3.54	90.0	3.08	78.4	3.15	80.0	2.01	51.0	25

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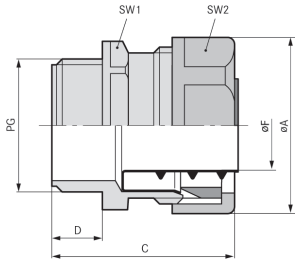
SILVYN® USK/USK-M

Connectors for SILVYN® FD-PU & SILVYN® FPS conduit



SILVYN® USK/USK-M is specially designed to lock in SILVYN® FPS and FD-PU conduit and prevent pullouts and twists that can be encountered during continuous flexing applications. It is tension and vibration resistant, providing a high quality connection between the conduit and the machine.

Approvals

Complete the installation

SILVYN® FPS
page 568

SILVYN® FD-PU
page 569

SKINTOP® GMP locknuts
page 541

Technical data

Material:	polypropylene	**Temperature range:**	-10°C to +110°C
Locknuts:	add SKINTOP® GMP-GL, page 541	**Color:**	gray
		Protection:	IP54

Part number	Thread	Conduit outer diameter		Thread length		Pack size	SILVYN® FPS	SILVYN® FD-PU
		in	mm	in	mm			
PG thread								
52005810	PG 7	0.394	10.0	0.394	10.0	50	61711550	64453662
52005820	PG 9	0.551	14.0	0.394	10.0	50	61711590	64453672
52005830	PG 11	0.669	17.0	0.394	10.0	50	61711630	64453682
52005840	PG 13	0.748	19.0	0.394	10.0	50	61711670	64453692
52005850	PG 16	0.827	21.0	0.433	11.0	50	61711710	64453702
52005860	PG 21	1.063	27.0	0.433	11.0	25	61711750	64453712
52005870	PG 29	1.417	36.0	0.472	12.0	25	61711790	64453721
52005880	PG 36	1.772	45.0	0.472	12.0	25	61711830	64453731
52005900	PG 48	2.205	56.0	0.591	15.0	10	61711910	64453751
Metric thread								
55501300	M10 x 1.0	0.394	10.0	0.394	10.0	50	61711550	64453612
55501310	M12 x 1.5	0.551	14.0	0.472	12.0	50	61711590	64453672
55501320	M16 x 1.5	0.669	17.0	0.472	12.0	50	61711630	64453682
55501330	M20 x 1.5	0.827	21.0	0.512	13.0	50	61711710	64453702
55501340	M25 x 1.5	1.063	27.0	0.512	13.0	25	61711750	64453712
55501350	M32 x 1.5	1.417	36.0	0.591	15.0	25	61711790	64453721
55501360	M40 x 1.5	1.772	45.0	0.591	15.0	25	61711830	64453731
55501370	M50 x 1.5	2.205	56.0	0.630	16.0	10	61711910	64453751

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SILVYN® US/US-M

Brass connectors for SILVYN® AS, AS-P, EDU-AS, FPS & FD-PU conduit

SILVYN® US is a high-quality brass conduit connector designed to ensure a vibration- and tension-resistant connection for applications with high mechanical stress. The inner sealing is made of TPE to create a durable and high-temperature seal. The SILVYN® US MS-DR brass sealing ring should be used in place of the TPE sealing ring when SILVYN® AS & EDU-AS are being used in applications with temperatures above 100°C.

Approvals

RoHS

Complete the installation

SILVYN® AS
page 571

SILVYN® AS-P
page 570

SILVYN® EDU-AS
page 572

SILVYN® FPS
page 568

SILVYN® FD-PU
page 569

SKINDICHT® SM locknuts
page 542

Technical data

Material:
- body & cap nut: nickel-plated brass
- inner sleeve:
  - for AS: nickel-plated brass
  - for AS-P & EDU-AS: brass
  - for FPS & FD-PU: plastic
- sealing ring: TPE

Locknuts: add SKINDICHT® SM, page 542

Temperature range:
- for AS, AS-P & EDU-AS: -40°C to +125°C
- for FPS & FD-PU: -10°C to +110°C

Protection:
- with AS & EDU-AS: IP40
- with AS-P: IP65
- with FPS & FD-PU: IP54

Part number for SILVYN® AS	Part number for SILVYN® AS-P	Part number for SILVYN® EDU-AS	Part number for SILVYN® FPS & FD-PU	Thread	Conduit outer diameter in	Conduit outer diameter mm	Thread length in	Thread length mm	Wrench size in	Wrench size mm	Pack size
PG thread											
55502661	55502671	55502680	55502651	PG 7	0.394	10.0	0.276	7.0	0.591-0.669	15.0-17.0	50
55502662	55502672	55502689	55502652	PG 9	0.551	14.0	0.276	7.0	0.748-0.827	19.0-21.0	50
55502663	55502673	55502682	55502653	PG 11	0.669	17.0	0.276	7.0	0.906-0.984	23.0-25.0	50
55502664	55502674	55502683	55502654	PG 13	0.748	19.0	0.276	7.0	0.984-1.063	25.0-27.0	50
55502665	55502675	55502684	55502655	PG 16	0.827	21.0	0.276	7.0	1.063-1.142	27.0-29.0	50
55502666	55502676	55502685	55502656	PG 21	1.063	27.0	0.394	10.0	1.339-1.417	34.0-36.0	25
55502667	55502677	55502694	55502657	PG 29	1.417	36.0	0.394	10.0	1.693-1.772	43.0-45.0	25
55502668	55502678	55502687	55502658	PG 36	1.772	45.0	0.394	10.0	2.047-2.126	52.0-54.0	20
55502669	55502679	55502688	55502659	PG 48	2.205	56.0	0.394	10.0	2.480-2.598	63.0-66.0	10
Metric thread											
55502611	55502621	55502631	55502601	M10 x 1.0	0.394	10.0	0.394	10.0	0.591-0.669	15.0-17.0	50
55502612	55502622	55502633	55502602	M12 x 1.5	0.551	14.0	0.394	10.0	0.748-0.827	19.0-21.0	50
55502613	55502623	55502634	55502603	M16 x 1.5	0.669	17.0	0.394	10.0	0.906-0.984	23.0-25.0	50
55502614	55502624	55502636	55502604	M20 x 1.5	0.827	21.0	0.394	10.0	1.063-1.142	27.0-29.0	50
55502615	55502625	55502646	55502605	M25 x 1.5	1.063	27.0	0.433	11.0	1.339-1.417	34.0-36.0	25
55502616	55502626	55502638	55502606	M32 x 1.5	1.417	36.0	0.512	13.0	1.693-1.772	43.0-45.0	25
55502617	55502627	55502639	55502607	M40 x 1.5	1.772	45.0	0.512	13.0	2.047-2.126	52.0-54.0	20
55502618	55502628	555022641	55502608	M50 x 1.5	2.205	56.0	0.551	14.0	2.480-2.598	63.0-66.0	10

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SILVYN® MSK-M US/MSK-M BRUSH

Brass connector and strain relief for EMC applications

SILVYN® MSK-M US

SILVYN® MSK-M BRUSH

SILVYN® MSK-M US is a multi-conduit cable gland. It is designed for applications where cable and conduit must be sealed and strain relieved at the same time. SILVYN® MSK-M BRUSH is a combination grounding connector and conduit strain relief. It is most commonly used in EMC-sensitive environments.

Complete the installation

SILVYN® AS
page 571

SILVYN® AS-P
page 570

SILVYN® EDU-AS
page 572

Approvals

CE RoHS

Technical data

Material:
- body: nickel-plated brass
- connector seal: CR/NBR
- sealing ring: TPE
- brush: brass (MSK-M BRUSH only)

Temperature range: -30°C to +100°C

IP Protection:
- cable: IP68
- with AS & EDU-AS: IP40
- with AS-P: IP65

SILVYN® MSK-M US

Part number for SILVYN® AS	Part number for SILVYN® AS-P & EDU-AS	Thread	Pack size	SILVYN® AS	SILVYN® AS-P	SILVYN® EDU-AS
55506080	55506090	M12 x 1.5	5	61802080	64400010	61802380
55506081	55506091	M16 x 1.5	5	61802090	64400020	61802390
55506082	55506092	M20 x 1.5	5	61802100	64400030	61802400
55506083	55506093	M25 x 1.5	5	61802120	64400050	61802420
55506084	55506094	M32 x 1.5	5	61802130	64400060	61802430
55506085	55506095	M40 x 1.5	1	61802140	64400070	61802440
55506086	55506096	M50 x 1.5	1	61802150	64400080	61802450
55506087	55506097	M63 x 1.5	1	61802170	64400090	61802470

SILVYN® MSK-M BRUSH

Part number for SILVYN® AS	Part number for SILVYN® AS-P & EDU-AS	Thread	Pack size	SILVYN® AS	SILVYN® AS-P	SILVYN® EDU-AS
55506020	55506025	M25 x 1.5	10	61802120	64400050	61802420
55506021	55506026	M32 x 1.5	1	61802130	64400060	61802430
55506022	55506027	M40 x 1.5	1	61802140	64400070	61802440
55506023	55506028	M50 x 1.5	1	61802150	64400080	61802450
55506024	55506029	M63 x 1.5	1	61802170	64400090	61802470

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SILVYN® MSK-M ATEX/MSK-M ATEX BRUSH

Brass connector and strain relief for hazardous EMC environments

SILVYN® MSK-M ATEX

SILVYN® MSK-M ATEX BRUSH

SILVYN® MSK-M ATEX is a combination connector and conduit strain relief for hazardous environments. SILVYN® MSK-M ATEX BRUSH includes grounding for EMC applications. Both connectors are Equipment Group II, Category 2G + 1D

Complete the installation

SILVYN® AS
page 571

SILVYN® EDU-AS
page 572

Approvals

Technical data

Material:
- body: nickel-plated brass
- connector seal: CR/NBR
- tube seal: TPE
- brush: brass (MSK-M ATEX BRUSH only)

Temperature range: -30°C to +90°C

Protection:
- cable: IP68
- with AS & EDU-AS: IP40

SILVYN® MSK-M ATEX

Part number for SILVYN® AS	Part number for SILVYN® EDU-AS	Thread	Conduit outer diameter in	Conduit outer diameter mm	Pack size	SILVYN® AS	SILVYN® EDU-AS
55506010	55506018	M12 x 1.5	0.394	10.0	5	61802080	61802380
55506011	55506019	M16 x 1.5	0.552	14.0	5	61802090	61802390
55506012	55506036	M20 x 1.5	0.670	17.0	5	61802100	61802400
55506013	55506037	M25 x 1.5	0.827	21.0	5	61802120	61802420
55506014	55506038	M32 x 1.5	1.064	27.0	5	61802130	61802430
55506015	55506039	M40 x 1.5	1.418	36.0	1	61802140	61802440
55506016	55506040	M50 x 1.5	1.773	45.0	1	61802150	61802450
55506017	55506041	M63 x 1.5	2.206	56.0	1	61802170	61802470

SILVYN® MSK-M ATEX BRUSH

Part number for SILVYN® AS	Part number for SILVYN® EDU-AS	Thread	Conduit outer diameter in	Conduit outer diameter mm	Pack size	SILVYN® AS	SILVYN® EDU-AS
55506042	55506031	M25 x 1.5	0.827	21.0	10	61802120	61802420
55506043	55506032	M32 x 1.5	1.064	27.0	1	61802130	61802430
55506044	55506033	M40 x 1.5	1.418	36.0	1	61802140	61802440
55506045	55506034	M50 x 1.5	1.773	45.0	1	61802150	61802450
55506030	55506035	M63 x 1.5	2.206	56.0	1	61802170	61802470

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SILVYN® COMPACT

Brass connector for SILVYN® HTDL conduit

Complete the installation

SILVYN® HTDL
page 573

SKINDICHT® SM locknuts
page 542

Approvals

SILVYN® COMPACT is a high-quality brass conduit connector for SILVYN® HTDL designed to ensure a vibration- and tension-resistant connection for applications with high mechanical stress. It is a conduit gland that provides optimum assembly conditions due to the compact dimensions. In combination with liquid-tight conduits it forms an easy to install system with high protection degree.

Technical data

Material:
- body & cap nut: nickel-plated brass
- inner sleeve: galvanized steel
- seal: polyamide
- O-ring: NBR

Locknuts: add SKINDICHT® SM, page 542

Temperature range: -45 °C to +105 °C

Protection: IP66, IP67, NEMA 4X

Part number straight	Part number 45° angled	Part number 90° angled	Thread	Conduit outer diameter in	Conduit outer diameter mm	Pack size	SILVYN® HTDL
NPT thread							
61803832	–	61803839	NPT ½"	0.701	17.8	10	61814190
61803833	–	61803840	NPT ½"	0.831	21.1	10	61814200
61803834	–	61803841	NPT ¾"	1.039	26.4	5	61814210
61803835	–	61803842	NPT 1"	1.303	33.1	5	61814220
61803836	–	61803843	NPT 1¼"	1.646	41.8	2	61814230
61803837	–	61803844	NPT 1½"	1.882	47.8	2	61814240
61803838	–	61803845	NPT 2"	2.358	59.9	2	61814250
PG thread							
61803816	–	61803824	PG 11	0.701	17.8	10	61814190
61803817	–	61803825	PG 13.5	0.701	17.8	10	61814190
61803818	–	61803826	PG 16	0.831	21.1	10	61814200
61803819	–	61803827	PG 21	1.039	26.4	5	61814210
61803820	–	61803828	PG 29	1.303	33.1	5	61814220
61803821	–	61803829	PG 36	1.646	41.8	2	61814230
61803822	–	61803830	PG 42	1.882	47.8	2	61814240
61803823	–	61803831	PG 48	2.358	59.9	2	61814250
Metric thread							
61803800	61803850	61803808	M16 x 1.5	0.701	17.8	10	61814190
61803801	61803851	61803809	M20 x 1.5	0.701	17.8	10	61814190
61803802	61803852	61803810	M20 x 1.5	0.831	21.1	10	61814200
61803803	61803853	61803811	M25 x 1.5	1.039	26.4	5	61814210
61803804	61803854	61803812	M32 x 1.5	1.303	33.1	5	61814220
61803805	–	61803813	M40 x 1.5	1.646	41.8	2	61814230
61803806	–	61803814	M50 x 1.5	1.882	47.8	2	61814240
61803807	–	61803815	M63 x 1.5	2.358	59.9	2	61814250

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® HYGIENIC

Stainless steel connector for SILVYN® FG & FG NM conduit

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

Approvals

CE RoHS

Complete the installation

SILVYN® FG NM
page 574

SILVYN® FG
page 575

Technical data

Material:
- body: stainless steel 316
- insert: nickel-plated brass
- inner seal: polyamide 6
- sealing: special elastomer

Temperature range: -50°C to +135°C

Protection: IP66, IP67, IP68 (2 bar), IP69

Part number	Thread	Internal diameter		Pack size	SILVYN® FG NM	SILVYN® FG	
		in	mm			white	blue
55510700	M16 x 1.5	0.422	10.7	1	55503370	55503279	55503286
55510701	M20 x 1.5	0.571	14.5	1	55503371	55503280	55503287
55510702	M25 x 1.5	0.737	18.7	1	55503372	55503281	55503288
55510703	M32 x 1.5	0.969	24.6	1	55503373	55503282	55503289
55510704	M40 x 1.5	1.288	32.7	1	55503374	55503283	55503290
55510705	M50 x 1.5	1.485	37.7	1	55503375	55503284	55503291
55510706	M63 x 1.5	1.929	49.0	1	55503376	55503285	55503292

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SILVYN® FPAX-M

Watertight connector for SILVYN® FPAS conduit

SILVYN® FPAX-M is a connector designed especially for use with the SILVYN® FPAS to create a secure, watertight connection specifically in high vibration applications.

Approvals

c UL us CE RoHS

Complete the installation

SILVYN® FPAS
page 576

Technical data

Material: halogen-free polyamide 66

Temperature range: -50 °C to +135 °C

Color: black (RAL 9005), UV resistant
gray (RAL 7031)

Protection: IP66
IP67
IP68 (2 bar)
IP69

Approvals: UL fitting
Lloyd's Register

Part number		Thread	Pack size	SILVYN® FPAS	
black	gray			black	gray
55506135	55506235	M16 x 1.5/1	10	61754015	61754010
55506145	55506245	M16 x 1.5/2	10	61754025	61754020
55506155	55506255	M20 x 1.5/1	10	61754025	61754020
55506165	55506265	M20 x 1.5/2	10	61754035	61754030
55506175	55506275	M25 x 1.5	10	61754045	61754040

Part number		Thread	Pack size	SILVYN® FPAS	
black	gray			black	gray
55506185	55506285	M32 x 1.5	10	61754055	61754050
55506195	55506295	M40 x 1.5	10	61754065	61754060
55506205	55507265	M50 x 1.5/1	10	61754065	61754060
55506215	55507275	M50 x 1.5/2	10	61754075	61754070
55506225	55507285	M63 x 1.5	10	61754305	61754300

If not otherwise specified, all values relating to the product are nominal values.
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SILVYN® CC/CC FR

Non-fraying expandable PET sleeving

SILVYN® CC is a high-density braid that is used in industrial wire and harness applications and is excellent in bundling and routing wires where durability is crucial. SILVYN® CC FR is a flame-retardant version, designed to quickly self-extinguish and minimize the spread of flame.

Performance characteristics

- High-density braid does not fray when cut and expands without unraveling
- Resistant to oil, chemicals, and abrasion
- Increased braid density for fuller coverage

Approvals

Application advantage

- Hot knife is not required for cutting, improving safety
- Virtually frayless when cut with a hot knife
- Denser coverage provides for increased protection of substrates for increased product life

Technical data

Material: polyethylene terephthalate (PET) filaments

Temperature range: -75 °C to +125 °C (-103 °F to +257 °F)

Melting temperature:
- SILVYN® CC: 230 °C (446 °F)
- SILVYN® CC FR: 250 °C (482 °F)

Color:
- SILVYN® CC: BK: black GY: gray
- SILVYN® CC FR: BW: black with white tracers
WB: white with black tracers

Approvals: UL
CSA
Attributes: VW-1 (SILVYN® CC FR)
Additional: MIL-202 (SILVYN® CC FR)
FAR 25 (SILVYN® CC FR)

SILVYN® CC

Part number replace "XX" with color code	Nominal size in	Nominal size mm	Expansion range in	Expansion range mm	Weight lbs/100 ft	Put-up spool lengths (ft) bulk	Put-up spool lengths (ft) min.
CC-1/8-XX	0.125	3.18	0.125 - 0.250	3.2 - 6.4	0.396	1000	100
CC-1/4-XX	0.250	6.35	0.156 - 0.438	4.0 - 11.1	0.464	1000	100
CC-3/8-XX	0.375	9.53	0.188 - 0.625	4.8 - 15.9	0.744	500	100
CC-1/2-XX	0.500	12.70	0.250 - 0.750	6.4 - 19.1	0.822	500	100
CC-3/4-XX	0.750	19.05	0.625 - 1.000	15.9 - 25.4	1.113	250	75
CC-1-XX	1.000	25.40	0.750 - 1.188	19.1 - 30.2	1.236	250	50
CC-1-1/4-XX	1.250	31.75	1.000 - 1.500	25.4 - 38.1	1.555	250	50
CC-1-1/2-XX	1.500	38.10	1.250 - 2.000	31.8 - 50.8	1.850	250	50

SILVYN® CC FR

Part number replace "XX" with color code	Nominal size in	Nominal size mm	Expansion range in	Expansion range mm	Weight lbs/100 ft	Put-up spool lengths (ft) bulk	Put-up spool lengths (ft) min.
CCFR-1/8-XX	0.125	3.18	0.125 - 0.250	3.2 - 6.4	0.396	1000	100
CCFR-1/4-XX	0.250	6.35	0.156 - 0.438	4.0 - 11.1	0.464	1000	100
CCFR-3/8-XX	0.375	9.53	0.188 - 0.625	4.8 - 15.9	0.744	500	100
CCFR-1/2-XX	0.500	12.70	0.250 - 0.750	6.4 - 19.1	0.822	500	100
CCFR-3/4-XX	0.750	19.05	0.625 - 1.000	15.9 - 25.4	1.113	250	75
CCFR-1-XX	1.000	25.40	0.750 - 1.188	19.1 - 30.2	1.236	250	50
CCFR-1-1/4-XX	1.250	31.75	1.000 - 1.500	25.4 - 38.1	1.555	250	50
CCFR-1-1/2-XX	1.500	38.10	1.250 - 2.000	31.8 - 50.8	1.850	250	50

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® PET/PET FR

Economical general purpose PET sleeving

SILVYN® PET is an economical solution that provides bundling and protection of wires, cables, and hoses. SILVYN® PET FR is a flame-retardant version, designed to quickly self-extinguish and minimize the spread of flame.

Approvals

Performance characteristics

- High resistance to gasoline, chemicals, and cleaning solvents
- Increased braid density for fuller coverage
- Expands up to 150%
- Halogen-free
- Cuts cleanly when a hot knife is used

Application advantage

- Denser coverage provides for increased protection of substrates for increased product life
- Economical alternative for low budget installations
- Increased product life in industrial applications where gasoline, chemicals, and cleaning solvents are present
- Available in a wide variety of colors for color-coding installations

Color codes for SILVYN® PET

NR: neon red	NP: neon pink	NY: neon yellow	
NG: neon green	NB: neon blue	BE: beige	
CB: carbon	NX: nitrox	PT: patriot	
RD: red	OR: orange	YL: yellow	GN: green
BL: blue	PP: purple	CL: clear	BK: black
WH: white	GY: gray		

Technical Data

Material: polyethylene terephthalate (PET) filaments

Temperature range: -75°C to +125°C (-103°F to +257°F)

Melting temperature:
- SILVYN® PET: 230°C (446°F)
- SILVYN® PET FR: 250°C (257°F)

Color:
- SILVYN® PET: see color code chart
- SILVYN® PET FR: BW: black with white tracers
  WB: white with black tracers

Approvals: UL
CSA
FAR 25
FMVSS 302
VW-1 (SILVYN® PET FR)
MIL-202 (SILVYN® PET FR)

SILVYN® PET

Part number replace "XX" with color code	Nominal size in	Expansion range in	Weight lbs/100 ft	Put-up spool lengths (ft) bulk	min.
PET-1/8-XX	0.125	0.094 - 0.250	0.16	1000	225
PET-1/4-XX	0.250	0.125 - 0.438	0.24	1000	200
PET-3/8-XX	0.375	0.188 - 0.625	0.57	500	125
PET-1/2-XX	0.500	0.250 - 0.750	0.77	500	100
PET-5/8-XX	0.625	0.375 - 1.000	0.95	500	100
PET-3/4-XX	0.750	0.500 - 1.250	1.20	250	75
PET-1-XX	1.000	0.625 - 1.625	1.34	250	65
PET-1-1/4-XX	1.250	0.750 - 1.750	1.60	250	50
PET-1-1/2-XX	1.500	1.0 - 2.5	1.96	200	40
PET-1-3/4-XX	1.750	1.25 - 2.50	2.70	200	30
PET-2-XX	2.000	1.5 - 3.5	3.30	200	50
PET-2-1/2-XX	2.500	1.75 - 4.50	3.80	200	50
PET-3-XX	3.000	2.50 - 4.75	4.00	100	50

SILVYN® PET FR

Part number replace "XX" with color code	Nominal Size in	Expansion Range in	Weight lbs/100 ft	Put-up Spool Lengths (ft) bulk	min.
PETFR-1/8-XX	0.125	0.094 - 0.250	0.16	1000	225
PETFR-1/4-XX	0.250	0.125 - 0.438	0.24	1000	200
PETFR-3/8-XX	0.375	0.188 - 0.625	0.57	500	125
PETFR-1/2-XX	0.500	0.250 - 0.750	0.77	500	100
PETFR-3/4-XX	0.750	0.500 - 1.250	1.20	250	75
PETFR-1-1/4-XX	1.250	0.750 - 1.750	1.60	250	50
PETFR-1-1/2-XX	1.500	1.0 - 2.5	1.96	200	40
PETFR-1-3/4-XX	1.750	1.25 - 2.75	2.70	200	30
PETFR-2-XX	2.000	1.5 - 3.5	3.30	200	50
PETFR-2-1/2-XX	2.500	1.75 - 4.50	3.80	200	50
PETFR-3-XX	3.000	2.50 - 4.75	4.00	100	50

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

SILVYN® SW/SW FR

Semi-rigid PET sleeve with split wrap for easy installation

SILVYN® SW is a pre-formed PET sleeve provided with a built-in split. Simply pull the wrap apart, install your wire and hose, and release. SILVYN® SW FR is a flame-retardant version, designed to quickly self-extinguish and minimize the spread of flame.

Approvals

Performance characteristics

- More flexible than spiral wrap
- Tight bend radius without splitting open
- 25% edge overlap
- Halogen-free
- SILVYN® SW FR comes in an easy-access box to protect its shape

Application advantage

- Pre-formed split arrows for easy installation of wire and hoses
- Provides a large overlap for full coverage over splices and in-line connections
- Ease of installation provides for labor and costs savings
- Quiet in installations with high vibration

Technical data

Material: polyethylene terephthalate (PET) filaments

Temperature range: -75°C to +125°C (-103°F to +257°F)

Melting temperature:
- SILVYN® SW: 230°C (446°F)
- SILVYN® SW FR: 250°C (482°F)

Color: black

Approvals: UL
CSA
VW-1 (SILVYN® SW FR)

SILVYN® SW

Part number	Nominal size		Weight	Put-up spool lengths (ft)	
	in	mm	lbs/100 ft	bulk	min.
SW-1/8	0.125	3.2	400	100	0.20
SW-1/4	0.250	6.4	200	100	0.60
SW-1/2	0.500	12.7	150	75	1.40
SW-3/4	0.750	19.1	100	50	1.60
SW-1	1.0	25.4	100	50	2.00
SW-1-1/2	1.5	38.1	75	25	2.70
SW-2	2.0	50.8	50	25	3.60

SILVYN® SW FR

Part number	Nominal size		Weight	Put-up spool lengths (ft)	
	in	mm	lbs/100 ft	bulk	min.
SWFR-1/8	0.125	3.2	400	100	0.20
SWFR-1/4	0.250	6.4	200	100	0.60
SWFR-1/2	0.500	12.7	150	75	1.40
SWFR-3/4	0.750	19.1	100	50	1.60
SWFR-1	1.0	25.4	100	50	2.00
SWFR-1-1/2	1.5	38.1	75	25	2.70
SWFR-2	2.0	50.8	50	25	3.60

If not otherwise specified, all values relating to the product are nominal values.
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Serrated edge scissors

These scissors have a serrated blade on an angle to easily cut sleeving. Other cutting tools are available upon request.

Part number
812056

Bench-mounted hot knife

The bench-mounted hot knife has a 2½" cutting blade and heats to 600°C in 30 seconds. 110V for operation.

Description	Part number
hot knife	812057
replacement blades	812058

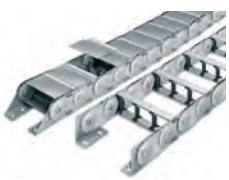
Conduit scissors

NEW

SILVYN® conduit scissors simplifies preparation of protective conduit with proper and safe cutting. Suitable for non-metallic conduit, e.g: SILVYN® EL/ELU/ELÖ/ELT, SILVYN® RILL PA 6/PA 12, SILVYN® SINUS PA 6, SILVYN® SPLIT, and SILVYN® FPAS.

Description	Part number	Max. cutting range	
		in	mm
CC01	61722285	1.338	34
CC02	61722286	2.638	67

SILVYN® CHAIN

Series	Characteristics	Application areas
Light series	• Simple bolt system • Inner height: 0.5 - 1.5 in (12 - 39 mm) • Inner width: 0.5 - 5.9 in (12 - 150 mm) • 7 types available	Light duty applications; automation; smaller robot gantries; textile equipment with long travel; printing equipement
Medium series	• Single yellow pin system • Inner height: 0.7 - 3.0 in (18 - 75.5 mm) • Inner width: 0.6 - 19.6 in (14 - 498 mm) • 12 types available	Medium duty applications; automation; handling equipment; CNC machines; medium sliding applications
Heavy series	• Triple yellow pin system for high performance • Inner height: 1.2 - 4.4 in (30 - 112 mm) • Inner width: 1.5 - 23.6 in (38 - 600 mm) • 12 types available in nylon, aluminum, or stainless steel	Heavy duty applications; automation with high travel frequency; outdoor equipment; movement with high lateral acceleration
Sliding series	• Long sliding distances • Triple yellow pin system for high performance • Inner height: 1.2 - 3.2 in (30 - 80.5 mm) • Inner width: 33.9 - 21.2 in (61 - 539 mm) • 15 types available in nylon, aluminum, or stainless steel	Sliding applications with high speeds and cable weight; applications with long life-cycles
Protection series	• Single yellow pin system • Enclosed design for extra protection • Inner height: 1.0 - 3.0 in (25 - 75.5 mm) • Inner width: 1.6 - 19.2 in (40 - 488 mm) • 12 types available in many widths	Medium duty applications; automation; dirty environments; machine tool centers
Robot series	• Universal solution for rotary applications • Open design for fast cable laying • Unique 3-dimensional link system • Cables isolated in three separate chambers	Robot/torsion applications; welding robots; painting robots; handling robots
Steel chain 	• Highest load capacity and chemical resistance • Metal bolt system • Inner height: 1.3 - 7.2 in (32 - 182 mm) • Inner width: 3.1 - 23.6 in (79 - 600 mm) • 11 standard types available • Customized versions with larger widths or combinations of materials available	Extremely heavy duty applications; steel mills; foundries; off-shore; machining centers with long travel; harsh environments

8

FLEXIMARK®

Marking systems

The requirement: permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking and even electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

Application range

- Control cabinet manufacturing
- Automation technology
- Industrial machinery and plant engineering
- Renewable energies
- Wherever cables are used

FLEXIMARK®

Marking systems

597 **FLEXIMARK® marking systems**

Custom marking systems

598 **FLEXIMARK® FCC custom cable marking**
Made-to-order plastic & stainless steel marking systems

Stainless steel

599 **FLEXIMARK® M holders**
Stainless steel character holders

599 **FLEXIMARK® NM holders**
Pre-cut stainless steel character holders

600 **FLEXIMARK® MR character strips & sets**
Individual stainless steel character strips & sets: blanks, numbers, letters & symbols

601 **FLEXIMARK® LD cable ties**
Stainless steel cable ties for FLEXIMARK® NM holders

601 **FLEXIMARK® LS cable ties**
Self-locking stainless steel cable ties for FLEXIMARK® NM holders

602 **FLEXIMARK® FR 286 fastening strips**
Stainless steel fastening strips for FLEXIMARK® M holders

602 **FLEXIMARK® stainless steel starter set**

FLEXIMARK® marking systems

Custom (plastic & stainless steel)

Discuss your requirements with your sales representative or send us an Excel file and we will create customized solutions for your specific needs.

Assemble your own (stainless steel)

Step 1:
choose character holders →

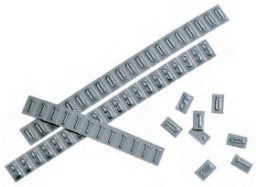
- ☐ **Type M**
  cut-to-size holders

- ☐ **Type NM**
  pre-cut holders

Step 2:
choose character markers →

- ☐ **Character sets**
- ☐ **Letters**

- ☐ **Numbers**
- ☐ **Symbols**



Step 3:
complete with accessories

- ☐ **LD cable ties**

- ☐ **LS self-locking cable ties**

- ☐ **FR 286 fastening strips**

FLEXIMARK® FCC custom cable marking

Made-to-order plastic & stainless steel marking systems

FLEXIMARK® FCC plastic labeling system can be tailored to your specific requirements and application conditions. One- or two-line printing is available, with inkjet or print technology of your choice. Cable ties are included. Markers can accommodate up to 46 characters per marker.

FLEXIMARK® FCC stainless steel is an industrial system for marking cables used in demanding and aggressive environments. Customized stainless steel marking is delivered as ready-made signs with or without cable ties. This marking can be made with one or two rows. Markers can accommodate up to 25 characters per marker.

Ordering instructions

To order customized FLEXIMARK® FCC marking, send a Microsoft™ Excel file to your LAPP representative. For a quick delivery, the Excel file should be set up as follows:

- Column A: text for first row
- Column B: text for second row, if desired
- Column B/C: amount for each marker
  (If only one row is ordered, use column B, if two rows are ordered, use column C)

Approvals

RoHS ✓

Technical data

Dimensions:
- markers:
  - stainless steel, 1 row: 0.394 in (10 mm)
  - stainless steel, 2 rows: 0.552 in (14 mm)
- cable ties:
  - plastic: 5.595 × 0.165 in (142 × 4.2 mm)
  - stainless steel: 7.88 × 0.181 in (200 × 4.6 mm)

Temperature range:
- plastic: -25°C to +70°C
- stainless steel: up to 500°C

Material:
- character holders:
  - plastic: halogen-free polyethylene
  - stainless steel: acid-resistant stainless steel (AISI-316)

Color:
- character holders: black letters on yellow background
- cable ties: natural (black available upon request)

Plastic marking systems

Part number	Text length		Character holder length		Height		Pack size
	in	mm	in	mm	in	mm	
83251300	1.379	35	1.970	50	0.264	6.7	1
83251320	1.379	35	1.970	50	0.374	9.5	1
83251350	according to order		according to order		0.780	19.8	1

Stainless steel marking systems

Part number	Cable ties included	Height		Number of characters	Pack size
		in	mm		
One row with cable tie brackets					
83251406	yes	0.394	10.0	0 - 15	1
83251456	yes	0.394	10.0	16 - 25	1
83251402	no	0.394	10.0	0 - 15	1
83251454	no	0.394	10.0	16 - 25	1
One row with screw holes					
83251450	no	0.394	10.0	0 - 15	1
83251478	no	0.394	10.0	16 - 25	1

Part number	Cable ties included	Height		Number of characters	Pack size
		in	mm		
Two rows with tie brackets					
83251426	yes	0.552	14.0	0 - 15	1
83251468	yes	0.552	14.0	16 - 25	1
83251422	no	0.552	14.0	0 - 15	1
83251466	no	0.552	14.0	16 - 25	1
Two rows with screw holes					
83251451	no	0.552	14.0	0 - 15	1
83251479	no	0.552	14.0	16 - 25	1

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FLEXIMARK® M holders

Stainless steel character holders

FLEXIMARK® M character holders are designed for customized lengths. Each holder is 11.3 inches (286 mm) long and can be cut into the desired length using cutters.

Approvals

RoHS

Complete the installation

FLEXIMARK® MR characters
page 600

FLEXIMARK® FR fasteners
page 602

Technical data

Dimensions:
- height: 0.433 in (11 mm)
- screw hole diameter: 0.118 in (3 mm)

Maximum temperature: 500°C

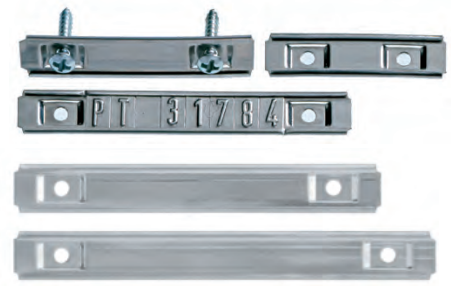
Material: stainless steel (AISI-316)

Part number	Length in	Length mm	Number of characters	Pack size
83254105	1.812	46.0	5	50
83254104	2.285	58.0	7	50
83254103	3.231	82.0	11	50

Part number	Length in	Length mm	Number of characters	Pack size
83254102	4.176	106.0	15	50
83254101	11.268	286.0	42	50

FLEXIMARK® NM holders

Pre-cut stainless steel character holders



FLEXIMARK® NM stainless steel character holders are pre-cut with mounting holes. They are available in 6 sizes, which are able to hold up to 46 characters. Fastening options include LS steel cable ties, LD steel cable ties, or screws and rivets.

Approvals

RoHS

Complete the installation

FLEXIMARK® MR characters
page 600

FLEXIMARK® LD cable ties
page 601

Technical data

Dimensions:
- height: 0.43 in (11 mm)
- screw hole diameter: 0.12 in (3 mm)

Maximum temperature: 500°C

Material: stainless steel (AISI-316)

Part number	Length in	Length mm	Max. number of characters cable mount	Max. number of characters screw mount	Pack size
83254214	1.811	46.0	6	2	50
83254213	2.283	58.0	8	4	50
83254212	3.228	82.0	12	8	50

Part number	Length in	Length mm	Max. number of characters cable mount	Max. number of characters screw mount	Pack size
83254211	4.173	106.0	16	12	50
83254215	6.934	176.0	26	22	50
83254210	11.260	286.0	46	42	50

If not otherwise specified, all values relating to the product are nominal values.
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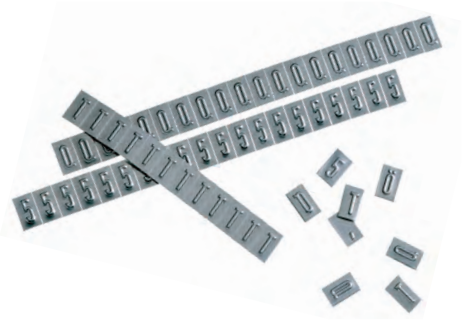
FLEXIMARK® MR character strips & sets

Individual stainless steel character strips & sets: blanks, numbers, letters & symbols



Individual character strips are available to help customize your needs. Order only the characters needed. Each character comes with 10 strips consisting of 20 characters for a total of 200 characters. Individual characters are available in letters, numbers, various symbols, and blank characters.

Complete the installation

FLEXIMARK® NM holders page 599
FLEXIMARK® LD cable ties page 601

Approvals

RoHS

Technical data

Dimensions:
- height: 0.37 in (9.5 mm)
- length: 0.24 in (6.0 mm)

Maximum temperature: 500°C

Material: stainless steel (AISI-316)

Character sets

Part number	Characters	Markers per strip	Strips per character	Pack size
83254122	0 - 9	20	10	1
83254120	A - Z	20	10	1

Character strips

Part number	Character	Markers per strip	Standard pack size
Blanks			
83254189	blank	20	10
Symbols			
83254192	+	20	10
83254191	-	20	10
83254194	/	20	10
83254195	.	20	10
83254199	:	20	10
83254198	~	20	10
83254193	=	20	10
83254200	⏚	20	10
83254196	,	20	10
83254202	(	20	10
Numbers			
83254164	0	20	10
83254179	1	20	10
83254180	2	20	10
83254181	3	20	10
83254182	4	20	10
83254183	5	20	10
83254184	6/9	20	10
83254185	7	20	10
83254186	8	20	10

Part number	Character	Markers per strip	Standard pack size
Letters			
83254150	A	20	10
83254151	B	20	10
83254152	C	20	10
83254153	D	20	10
83254154	E	20	10
83254155	F	20	10
83254156	G	20	10
83254157	H	20	10
83254158	I	20	10
83254159	J	20	10
83254160	K	20	10
83254161	L	20	10
83254162	M	20	10
83254163	N	20	10
83254164	O	20	10
83254165	P	20	10
83254166	Q	20	10
83254167	R	20	10
83254168	S	20	10
83254169	T	20	10
83254170	U	20	10
83254171	V	20	10
83254172	W	20	10
83254173	X	20	10
83254174	Y	20	10
83254175	Z	20	10

If not otherwise specified, all values relating to the product are nominal values.
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FLEXIMARK® LD cable ties

Stainless steel cable ties for FLEXIMARK® NM holders

FLEXIMARK® LD stainless steel cable ties are for use with FLEXIMARK® NM steel character holders.

Approvals

RoHS

Complete the installation

FLEXIMARK® NM holders page 599
FLEXIMARK® MR characters page 600

Technical data

Maximum temperature: 500°C

Material: stainless steel SS2348 (AISI-316)

Part number	Dimensions (length × width) in	mm	Bundle diameter mm	Min. tensile strength N/mm²	Pack size
83280048	5.988 × 0.276	152 × 7	48	1120	100

FLEXIMARK® LS cable ties

Self-locking stainless steel cable ties for FLEXIMARK® NM holders

FLEXIMARK® LS steel cable ties are suitable for use with FLEXIMARK® NM character holders (82 and 106 mm lengths only). These cable ties are self-locking, making it quick and easy to install. Stainless steel construction makes these ties suitable for applications in extreme environmental conditions.

Approvals

RoHS

Complete the installation

FLEXIMARK® NM holders page 599
FLEXIMARK® MR characters page 600

Technical data

Dimensions:
- tie head (W × L × H): 0.394 × 0.591 × 0.197 in
  10 × 15 × 5 mm

Maximum temperature: -80°C to 539°C

Material: stainless steel (AISI-316)

Part number	Dimensions (length × width) in	mm	Bundle diameter mm	Min. tensile strength N/mm²	Pack size
61812950	7.87 × 0.181	200 × 4.6	51	45.3	100
61812960	14.17 × 0.181	360 × 4.6	102	45.3	100
61812970	20.47 × 0.181	520 × 4.6	152	45.3	100
61812980	26.75 × 0.181	679 × 4.6	203	45.3	100
61812990	33.01 × 0.181	838 × 4.6	254	45.3	100
61813000	7.87 × 0.311	200 × 7.9	51	113.3	100

Part number	Dimensions (length × width) in	mm	Bundle diameter mm	Min. tensile strength N/mm²	Pack size
61813010	14.17 × 0.311	360 × 7.9	102	113.3	100
61813020	19.7 × 0.311	500 × 7.9	152	113.3	100
61813030	26.75 × 0.311	679 × 7.9	203	113.3	100
61813040	33.01 × 0.311	838 × 7.9	254	113.3	100
61813050	40.03 × 0.311	1016 × 7.9	305	113.3	100

If not otherwise specified, all values relating to the product are nominal values.
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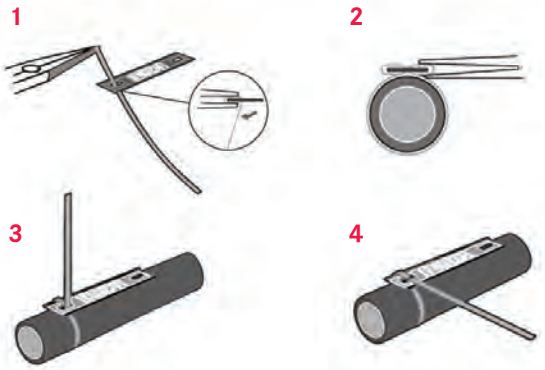
FLEXIMARK® FR 286 fastening strips

Stainless steel fastening strips for FLEXIMARK® M holders

FLEXIMARK® FR 286 stainless steel fastening strips are for use with FLEXIMARK® M character holders.

Installation instructions



Approvals

RoHS

Complete the installation

FLEXIMARK® M holders
page 599

Part number	Dimensions (length × width)		Bundling diameter		Pack size
	in	mm	in	mm	
83254106	11.26 × 16.93	286 × 430	3.150	80.0	100

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).

Approvals

RoHS

Contents

FLEXIMARK® stainless steel starter kit contains:

- 5 pcs holder: 11 × 285 mm
- 5 pcs holder: 11 × 106 mm
- 5 pcs holder: 11 × 82 mm
- 5 pcs holder: 11 × 58 mm
- 5 pcs holder: 11 × 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)

Part number	Description
83254220	stainless steel starter kit

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

9

ÖLFLEX® CONNECT

Systems solutions made by LAPP

With ÖLFLEX® CONNECT, we completed the step from component supplier to system supplier, offering complete solutions from a single source – from specialized cable assemblies and industry-standard servo connections to complex high-speed drag chain systems. We are constantly expanding our engineering, production and assembly capacities around the world.

ÖLFLEX® CONNECT

Systems solutions made by LAPP

ÖLFLEX® CONNECT CABLES

605 **ÖLFLEX® CONNECT CABLES**
Cable solutions made by LAPP

606 **Custom assembly order form**

ÖLFLEX® CONNECT SERVO

607 **ÖLFLEX® CONNECT SERVO**
Servo solutions made by LAPP

608 **AB assemblies for Rockwell Automation® motors**
Feedback & power cable assemblies

610 **AB legacy assemblies for Rockwell Automation® motors**
Legacy feedback & power cable assemblies

612 **Servo assemblies according to SIEMENS® standard 6FX 8002**

613 **Servo assemblies according to SIEMENS® standard 6FX 5002**

614 **Servo LK-INX assemblies according to INDRAMAT® standards**

615 **Servo assemblies according to LENZE® standard**

616 **Servo assemblies according to SEW® standard**

ÖLFLEX® CONNECT CHAIN

617 **ÖLFLEX® CONNECT CHAIN**
Chain solutions made by LAPP

618 **ÖLFLEX® CONNECT CHAIN design form**

Industrial Ethernet & fieldbus cordsets

620 **Industrial Ethernet cordsets**

624 **PROFINET® cordsets**

626 **PROFIBUS® cordsets**

631 **DeviceNet™ cordsets**

Remote access ports

638 **Remote access ports**

640 **Dimensional data**
EPIC® HB series bases & panel cut outs

641 **Custom remote access port order form**

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IENS® is a registered trademark of SIEMENS AG. INDRAMAT® is a registered trademark of Bosch Rexroth AG.
E® is a registered trademark of LENZE AG. SEW® is a registered trademark of SEW Eurodrive GmbH & Co KG.

ÖLFLEX® CONNECT CABLES

For over 30 years, LAPP's dedicated and highly qualified team of engineers, technicians, sales, and service personnel have been developing customized assembled cable solutions – from the design phase to prototyping to production and quality control. Our comprehensive inventory of cables, connectors, and accessories enables us to respond quickly and flexibly to your requirements, and we will source additional components as required to meet your specifications. As a member of the UL Client Data Program, LAPP is able to address your project quickly, efficiently, and reliably address projects from the small and simple to the large and complex.

Cable solutions from A to Z
LAPP produces different cables for CNC machinery, switch boxes, control cabinets, and electrical assemblies. Our product range encompasses single- and multi-conductor cables and EMC-shielded cables, all of which can be fitted with a wide selection of crimp contacts, connectors, and housings for your specific application.

The team at LAPP is committed to provide the entire solution for you, our customers. Developing a concept, application engineering, and executing in production can be a very complex task for your team. Our engineering expertise and assembly processes will enable you to apply your resources for other needs. The LAPP team will review interconnection needs, recommend connectivity solutions, provide concept drawings, quotations, final engineering drawings, and quality finished products. You only need to provide information, access to your knowledgeable project team, and a purchase order.

ÖLFLEX® CONNECT services

- **Cable cut to specifications**
- **Stripping**
- **Crimping**
- **Heat shrinking**
- **Markings** (labels, sleeves, marking rings, packing, stainless steel marking)
- **Cable printing**
- **Crimp force monitoring**
- **Push-pull test**
- **Resistance test**
- **Overmolding**

No capital expenditure

You will not need to invest in your own production facilities. Instead, leverage LAPP's equipment and tools.

Less operating expenditure

Benefit from a simplified supplier base. LAPP supplies you with everything related to cable assemblies from a single source.

Reduced inventory

No stocks of connectors, cables, conduits, and hoses. No component scrap or cutting waste.

Highest scalability

With LAPP's extensive inventory you're poised to respond to increases in demand.

Technical expertise

Make use of LAPP's expert technicians and their extensive knowledge of cabling technology.

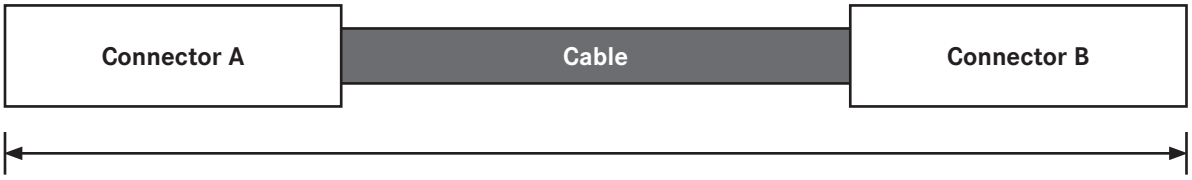
Uncompromising brand quality

High quality products for maximum reliability and safety.

Custom assembly order form

ÖLFLEX® CONNECT offers the complete custom cable assembly solution. Concept development, application engineering, and high-quality production are performed by a team of experts with over 50 years of experience in the industry. A variety of connectorization methods and types are offered to satisfy almost any application requirement. With the ability to use a wide array of hardware and component manufacturers, LAPP can provide existing designs or new concepts and techniques based on customer needs. Use this form to design your assembly, or call us at 800-774-3539 and let the experts guide you with your custom design.

Assembly specifications



Overall assembly length: _____

Connector A		Cable		Connector B	
Housing (hood/base):	_____	Cable type:	_____	Housing (hood/base):	_____
Strain relief:	_____	Cable length:	_____	Strain relief:	_____
Insert:	_____			Insert:	_____

Cable specifications

Manufacturer: _____	Part number (standard): _____	Cable type: ☐ round cable ☐ flat cable
Cable attributes		
Voltage: _____ Amperage: _____ Temperature: _____	Flexibility: _____ Color code: _____ Jacket color: _____	Shield type: ☐ foil shield ☐ braid shield ☐ individual shield ☐ unshielded
Conductor attributes		
# of conductors: _____ AWG size: _____ # of pairs: _____ OD (in): _____	Conductor type: ☐ solid copper ☐ stranded copper ☐ bare copper ☐ tinned copper	Termination: ☐ screw ☐ crimp ☐ solder ☐ cage clamp
Environmental rating		
☐ NEMA 4 ☐ NEMA 4X ☐ NEMA 12 ☐ IP54 ☐ IP65 ☐ IP67 ☐ IP68 ☐ IP69K ☐ other: _____		
Approvals	**Requirements**	
☐ UL ☐ CSA ☐ CE ☐ none ☐ other: _____	Conduit type: _____ Ground requirements: _____ Special concerns (e.g., chemicals): _____	

Fax completed order form to 973-660-9330 or email to sales@lappusa.com or your local LAPP representative.

ÖLFLEX® CONNECT SERVO

As a leading manufacturer of assembled servo cable systems, LAPP offers all of the major industry standards for use in a variety of areas in industrial machinery and drive systems. With international manufacturing excellence, we produce the assemblies in our own facilities across the world.

Whether your application requires a cost-effective servo solution for basic applications, something specially designed for flexing applications, or a servo solution designed for highly dynamic operation, LAPP offers the right solution for every requirement. All of our servo cables are put through their paces at our UL Client Test Data Center with the application site in mind, ensuring maximum quality, reliability, and operational safety.

for Rockwell Automation® motors

according to SIEMENS® standard

according to INDRAMAT® standard

according to LENZE® & SEW® standards

Uncompromising quality

Tested to all standard approval tests and to additional tests in our laboratory.

Strong design heritage

More than 50 years of technology leadership in cables and connectors.

Multi-brand availability

One stop shop for all major servo brands.

Availability at short notice

For components and servo cables of all performance classes

Fastest response

Thanks to our deep expertise in connectivity technology, we can develop customized solutions quickly

Maximum flexibility

High volume customized special products for project business.

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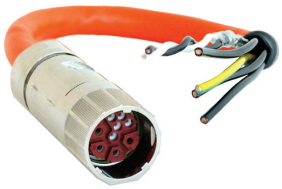
Photographs are not to scale and are not true representations of the products in question.

AB assemblies for Rockwell Automation® motors

Feedback & power cable assemblies



All raw cable is LAPP product. Cable datasheets are available on our website or by contacting sales. Custom versions are available upon request.

For part numbers, replace “xxx” with desired cable length in feet.

Approvals

cULus

Motion type	Application	Jacket color	Jacket material	Nominal voltage	Cable Approvals UL/CSA	Connector Approvals UL/CSA
MP series motors						
stationary	feedback	gray	PVC	300V	CMG, PLTC	ECBT2
stationary	feedback	gray	PVC	300V	CMG, AWM	
stationary	power	black	TPE	600V	TC-ER	
stationary	power with brake	black	TPE	600V	TC-ER	
continuous flex	feedback	green	TPE	600V	CMG, PLTC	
continuous flex	power/power with brake	orange	TPE	600V	TC-ER	
TLY series motors						
stationary	feedback	gray	PVC	300V	CMG,AWM	UL: ECBT2 CSA: CLASS 6233-01
stationary	power	black	TPE	600V	TC-ER	
stationary	power with brake	black	TPE	600V	TC-ER	
continuous flex	feedback	black	PVC	300V	CMG, AWM	
continuous flex	power	black	PVC	600V	TC-ER	
continuous flex	power with brake	orange	TPE	600V	TC-ER	
VP series motors						
stationary	power/power with brake & feedback	orange	PVC	1000V/300V	AWM	ECBT2
continuous flex	power/power with brake & feedback	orange	PUR	1000V/300V	AWM	

* LAPP cable 812876 is PLTC

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Rockwell part numbers are supplied for informational purposes only.
Photographs are not to scale and are not true representations of the products in question.

MP series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	93577xxx-16	2090-CPWM7DF-16AFxx
flexing	93547xxx-16	2090-CPWM4DF-16AFxx
flexing	93577xxx-14	2090-CPWM7DF-14AFxx
flexing	93547xxx-14	2090-CPWM4DF-14AFxx
flexing	93577xxx-10	2090-CPWM7DF-10AFxx
flexing	93547xxx-10	2090-CPWM4DF-10AFxx
flexing	93577xxx-8	2090-CPWM7DF-8AFxx
flexing	93547xxx-8	2090-CPWM4DF-8AFxx
stationary	83577xxx-16	2090-CPWM7DF-16AAxx
stationary	83547xxx-16	2090-CPWM4DF-16AAxx
stationary	83577xxx-14	2090-CPWM7DF-14AAxx
stationary	83547xxx-14	2090-CPWM4DF-14AAxx
stationary	83577xxx-10	2090-CPWM7DF-10AAxx
stationary	83547xxx-10	2090-CPWM4DF-10AAxx
stationary	83577xxx-8	2090-CPWM7DF-8AAxx
stationary	83547xxx-8	2090-CPWM4DF-8AAxx
Power with brake		
flexing	93579xxx-16	2090-CPBM7DF-16AFxx
flexing	93549xxx-16	2090-CPBM4DF-16AFxx
flexing	93579xxx-16E	2090-CPBM7E7-16AFxx
flexing	93579xxx-14	2090-CPBM7DF-14AFxx
flexing	93549xxx-14	2090-CPBM4DF-14AFxx
flexing	93579xxx-14-E	2090-CPBM7E7-14AFxx
flexing	93579xxx-10	2090-CPBM7DF-10AFxx
flexing	93549xxx-10	2090-CPBM4DF-10AFxx

Motion type	LAPP part number	Rockwell part number
flexing	93579xxx-10-E	2090-CPBM7E7-10AFxx
flexing	93579xxx-8	2090-CPBM7DF-8AFxx
flexing	93549xxx-8	2090-CPBM4DF-8AFxx
flexing	93579xxx-8-E	2090-CPBM7EF-8AFxx
stationary	83579xxx-16	2090-CPBM7DF-16AAxx
stationary	83549xxx-16	2090-CPBM4DF-16AAxx
stationary	83579xxx-14	2090-CPBM7DF-14AAxx
stationary	83549xxx-14	2090-CPBM4DF-14AAxx
stationary	83579xxx-10	2090-CPBM7DF-10AAxx
stationary	83549xxx-10	2090-CPBM4DF-10AAxx
stationary	83579xxx-8	2090-CPBM7DF-8AAxx
stationary	83549xxx-8	2090-CPBM4DF-8AAxx
Feedback		
flexing	93572xxx*	2090-CFBM7DF-CEAFxx
flexing	93574xxx*	2090-CFBM7DD-CEAFxx
flexing	93542xxx*	2090-CFBM4DF-CEAFxx
flexing	93572xxx-E*	2090-CFBM7E7-CEAFxx
flexing	93576xxx	2090-CFBM7DF-CDAFxx
flexing	93578xxx	2090-CFBM7DD-CDAFxx
flexing	93546xxx	2090-CFBM4DF-CDAFxx
flexing	93576xxx-E	2090-CFBM7E7-CDAFxx
stationary	83572xxx	2090-CFBM7DF-CEAAxx
stationary	83574xxx	2090-CFBM7DD-CEAAxx
stationary	83576xxx	2090-CFBM7DF-CDAAxx
stationary	83546xxx	2090-CFBM4DF-CDAAxx

* PLTC rated
Highlighted part numbers are stocked in lengths of 10, 30 & 50 ft.

TLY series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	72505xxx	2090-CPWM6DF-16AFxx
stationary	62505xxx	2090-CPWM6DF-16AAxx
Power with brake		
flexing	74505xxx	2090-CPBM6DF-16AAxx
stationary	64505xxx	2090-CPBM6DF-16AAxx

Motion type	LAPP part number	Rockwell part number
Feedback		
flexing	72515xxx	2090-CFBM6DD-CCAFxx
flexing	72514xxx	2090-CFBM6DF-CBAFxx
stationary	62515xxx	2090-CFBM6DD-CCAAxx
stationary	62514xxx	2090-CFBM6DF-CBAAxx

VP series motors

Motion type	LAPP part number	Rockwell part number
Power with brake & feedback		
flexing	53519xxx-16	2090-CSBM1DF-18AFxx
flexing	53519xxx-14	2090-CSBM1DF-14AFxx
flexing	53519xxx-10	2090-CSBM1DF-10AFxx
flexing	53519xxx-16E	2090-CSBM1E1-18AFxx
flexing	53519xxx-14E	2090-CSBM1E1-14AFxx
flexing	53519xxx-10E	2090-CSBM1E1-10AFxx
flexing	54519xxx-16	2090-CSBM1DG-18AFxx
flexing	54519xxx-14	2090-CSBM1DG-14AFxx
flexing	54519xxx-10	2090-CSBM1DG-10AFxx
flexing	53513xxx-16	2090-CSBM1DE-18AFxx
flexing	53513xxx-14	2090-CSBM1DE-14AFxx
flexing	53513xxx-10	2090-CSBM1DE-10AFxx
stationary	43519xxx-16	2090-CSBM1DF-18AAxx
stationary	43519xxx-14	2090-CSBM1DF-14AAxx
stationary	43519xxx-10	2090-CSBM1DF-10AAxx
stationary	44519xxx-16	2090-CSBM1DG-18AAxx
stationary	44519xxx-14	2090-CSBM1DG-14AAxx
stationary	44519xxx-10	2090-CSBM1DG-10AAxx
stationary	43513xxx-16	2090-CSBM1DE-18AAxx
stationary	43513xxx-14	2090-CSBM1DE-14AAxx
stationary	43513xxx-10	2090-CSBM1DE-10AAxx

Motion type	LAPP part number	Rockwell part number
Power & feedback		
flexing	53517xxx-16	2090-CSWM1DF-18AFxx
flexing	53517xxx-14	2090-CSWM1DF-14AFxx
flexing	53517xxx-10	2090-CSWM1DF-10AFxx
flexing	53517xxx-16E	2090-CSWM1E1-18AFxx
flexing	53517xxx-14E	2090-CSWM1E1-14AFxx
flexing	53517xxx-10E	2090-CSWM1E1-10AFxx
flexing	54517xxx-16	2090-CSWM1DG-18AFxx
flexing	54517xxx-14	2090-CSWM1DG-14AFxx
flexing	54517xxx-10	2090-CSWM1DG-10AFxx
flexing	53512xxx-16	2090-CSBW1DE-18AFxx
flexing	53512xxx-14	2090-CSWM1DE-14AFxx
flexing	53512xxx-10	2090-CSWM1DE-10AFxx
stationary	43517xxx-16	2090-CSWM1DF-18AAxx
stationary	43517xxx-14	2090-CSWM1DF-14AAxx
stationary	43517xxx-10	2090-CSWM1DF-10AAxx
stationary	44517xxx-16	2090-CSWM1DG-18AAxx
stationary	44517xxx-14	2090-CSWM1DG-14AAxx
stationary	44517xxx-10	2090-CSWM1DG-10AAxx
stationary	43512xxx-16	2090-CSWM1DE-18AAxx
stationary	43512xxx-14	2090-CSWM1DE-14AAxx
stationary	43512xxx-10	2090-CSWM1DE-10AAxx

AB legacy assemblies for Rockwell Automation® motors

Legacy feedback & power cable assemblies

All raw cable is LAPP product. Cable datasheets are available on our website or by contacting sales. All overmolded products are molded with UL 94 V-0 PVC.

For part numbers, replace “xxx” with desired cable length in feet.

Approvals

For approvals, inquire with our factory: 800-774-3539

Motion type	Application	Jacket color	Material		Nominal voltage	Approvals
			jacket	insulation		
stationary	feedback	gray	PVC	TPE	300V	UL/CSA
stationary	feedback (1394 series only)	gray	PVC	PVC	300V	UL/CSA CMG
stationary	power	gray	PVC	PVC/nylon	600V	UL/CSA
stationary	power/power with brake (MPF series only)	orange	PVC	polypropylene	600V	UL/CSA
continuous flex	feedback	gray	PVC	TPE	300V	UL/CSA
continuous flex	feedback (1394 series only)	gray	PVC	PVC	300V	UL/CSA
continuous flex	power	black	PVC	PVC	600V	UL/CSA
continuous flex	power/power with brake (MPF series only)	orange	PUR	polypropylene	600V	UL/CSA

Discontinued

MP series motors

Motion type	LAPP part number	Rockwell part number
Power: 230V		
flexing	73529xxx-10	2090-UXNPAMP-10Sxx
flexing	73529xxx-14	2090-UXNPAMP-14Sxx
flexing	73529xxx-16	2090-UXNPAMP-16Sxx
flexing	73529xxx-10	2090-XXNPMP-10Sxx
flexing	73529xxx-14	2090-XXNPMP-14Sxx
flexing	73529xxx-16	2090-XXNPMP-16Sxx
stationary	63529xxx-10	2090-UXNPAMP-10Sxx
stationary	63529xxx-14	2090-UXNPAMP-14Sxx
stationary	63529xxx-16	2090-UXNPAMP-16Sxx
stationary	63529xxx-10	2090-XXNPMP-10Sxx
stationary	63529xxx-14	2090-XXNPMP-14Sxx
stationary	63529xxx-16	2090-XXNPMP-16Sxx
Power: 460V		
flexing	73529xxx-8	2090-UXNPBMP-8Sxx
flexing	73529xxx-10	2090-UXNPBMP-10Sxx
flexing	73529xxx-14	2090-UXNPBMP-14Sxx
flexing	73529xxx-16	2090-UXNPBMP-16Sxx
flexing	73529xxx-8	2090-XXNPMP-8Sxx
flexing	73529xxx-10	2090-XXNPMP-10Sxx
flexing	73529xxx-14	2090-XXNPMP-14Sxx
flexing	73529xxx-16	2090-XXNPMP-16Sxx
stationary	63529xxx-8	2090-UXNPBMP-8Sxx
stationary	63529xxx-10	2090-UXNPBMP-10Sxx
stationary	63529xxx-14	2090-UXNPBMP-14Sxx
stationary	63529xxx-16	2090-UXNPBMP-16Sxx

Motion type	LAPP part number	Rockwell part number
stationary	63529xxx-8	2090-XXNPMP-8Sxx
stationary	63529xxx-10	2090-XXNPMP-10Sxx
stationary	63529xxx-14	2090-XXNPMP-14Sxx
stationary	63529xxx-16	2090-XXNPMP-16Sxx
Power: 460V 1394C-SJTXXD (D29)		
flexing	73529xxx-8	2090-CDNPBMP-8Sxx
flexing	73529xxx-10	2090-CDNPBMP-10Sxx
flexing	73529xxx-14	2090-CDNPBMP-14Sxx
flexing	73529xxx-16	2090-CDNPBMP-16Sxx
stationary	63529xxx-8	2090-CDNPBMP-8Sxx
stationary	63529xxx-10	2090-CDNPBMP-10Sxx
stationary	63529xxx-14	2090-CDNPBMP-14Sxx
stationary	63529xxx-16	2090-CDNPBMP-16Sxx
Feedback: 230/460V		
flexing	73528xxx	2090-UXNFBMP-Sxx
flexing	73526xxx	2090-UXNFDMP-Sxx
flexing	75926xxx	2090-XXNFMP-Sxx
stationary	63528xxx	2090-UXNFBMP-Sxx
stationary	63526xxx	2090-UXNFDMP-Sxx
stationary	65926xxx	2090-XXNFMP-Sxx
1394 (D29)		
flexing	71100125-xxx	2090-CDNFDMP-Sxx
stationary	61100125-xxx	2090-CDNFDMP-Sxx
ULTRA 3000/5000 with 1394 brake		
flexing	73524xxx	2090-UXNBMP-18Sxx
stationary	63524xxx	2090-UXNBMP-18Sxx

Discontinued

For a 90° connector on the motor end, add “-R” to end of LAPP P/N
Highlighted part numbers are stocked in lengths of 30 & 50 ft.

For an extension assembly (male-female), add “-E” to end of LAPP P/N

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MPF series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	400270-xxx-10	2090-XXNPMF-10Sxx
flexing	400270-xxx-10NB	without brake
flexing	400270-xxx-14	2090-XXNPMF-14Sxx
flexing	400270-xxx-14NB	without brake
flexing	400270-xxx-16	2090-XXNPMF-16Sxx
flexing	400270-xxx-16NB	without brake
stationary	300270-xxx-10	2090-XXNPMF-10Sxx
stationary	300270-xxx-10NB	without brake
stationary	300270-xxx-14	2090-XXNPMF-14Sxx
stationary	300270-xxx-14NB	without brake
stationary	300270-xxx-16	2090-XXNPMF-16Sxx
stationary	300270-xxx-16NB	without brake
Feedback		
flexing	400271-xxx-15P	with drive connector
flexing	400271-xxx	2090-XXNFMF-SXX
stationary	300271-xxx-15P	with drive connector
stationary	300271-xxx	2090-XXNFMF-SXX

H/F series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	73502xxx	2090-UXNPAHF-14Sxx
flexing	73502xxx	2090-XXNPHF-14Sxx
flexing	73503xxx	2090-UXNPAHF-10Sxx
flexing	73506xxx	2090-UXNPAHF-8Sxx
stationary	63502xxx	2090-UXNPAHF-14Sxx
stationary	63502xxx	2090-XXNPHF-14Sxx
stationary	63503xxx	2090-UXNPAHF-10Sxx
stationary	63506xxx	2090-UXNPAHF-8Sxx
Feedback		
flexing	73513xxx	2090-UXNFBHF-Sxx
flexing	73525xxx	2090-UXNFDHF-Sxx
flexing	75925xxx	2090-XXNFHF-Sxx
stationary	63513xxx	2090-UXNFBHF-Sxx
stationary	63525xxx	2090-UXNFDHF-Sxx
stationary	65925xxx	2090-XXNFHF-Sxx
Brake		
flexing	73544xxx	–
stationary	63544xxx	–

Discontinued

TL series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	71529xxx-16	2090-XXNPT-16Sxx
flexing	71529xxx-16	2090-DANPT-16Sxx
stationary	61529xxx-16	2090-XXNPT-16Sxx
stationary	61529xxx-16	2090-DANPT-16Sxx
Feedback		
flexing	71526xxx	Flying lead configuration
flexing	71528xxx	2090-XXNFT-Sxx
flexing	72528xxx	2090-DANFCT-Sxx
stationary	61526xxx	Flying lead configuration
stationary	61528xxx	2090-XXNFT-Sxx
stationary	62528xxx	2090-DANFCT-Sxx
Brake		
flexing	500058xxx	2090-DANBT-18Sxx
stationary	300058xxx	2090-DANBT-18Sxx

For a 90° connector on the motor end, add "-R" to end of LAPP P/N.
For an extension assembly (male-female), add "-E" to end of LAPP P/N.

Discontinued

Y series motors

Motion type	LAPP part number	Rockwell part number
Power with brake		
flexing	73505xxx	2090-UXNPAY-16Sxx
flexing	73505xxx	2090-XXNPY-16Sxx
stationary	63505xxx	2090-UXNPAY-16Sxx
stationary	63505xxx	2090-XXNPY-16Sxx
Feedback		
flexing	73515xxx	2090-UXNFBN-Sxx
flexing	73514xxx	2090-UXNFD4-Sxx
flexing	75914xxx	2090-XXNF4-Sxx
stationary	63515xxx	2090-UXNFBY-Sxx
stationary	63514xxx	2090-UXNFDY-Sxx
stationary	65914xxx	2090-XXNFY-Sxx

Discontinued

H series motors

Motion type	LAPP part number	Rockwell part number
Power		
flexing	73501xxx	2090-XXNPH-16Sxx
stationary	63501xxx	2090-XXNPH-16Sxx

N series motors

Motion type	LAPP part number	Rockwell part number stationary
Power with brake		
flexing	73507xxx	2090-UXNPAN-16Sxx
flexing	73507xxx	2090-XXNPN-16Sxx
stationary	63507xxx	2090-UXNPAN-16Sxx
stationary	63507xxx	2090-XXNPN-16Sxx
Feedback		
flexing	73516xxx	2090-UXNFBN-Sxx
flexing	73527xxx	2090-UXNFDN-Sxx
flexing	75927xxx	2090-XXNFN-Sxx
stationary	63516xxx	2090-UXNFBN-Sxx
stationary	63527xxx	2090-UXNFDN-Sxx
stationary	65927xxx	2090-XXNFN-Sxx
Brake		
flexing	73534xxx	–
stationary	63534xxx	–

Ultra 100/200 series motors

Motion type	LAPP part number	Rockwell part number
F series: power/brake & feedback		
flexing	71103xxx	9101-1383
flexing	71121xxx	9101-1365
stationary	61103xxx	9101-1383
stationary	61121xxx	9101-1365
F/H series: power/brake & feedback		
flexing	71101xxx	9101-1381
flexing	71102xxx	9101-1382
flexing	71106xxx	9101-1399
flexing	71113xxx	9101-1366
flexing	71118xxx	9101-2027
stationary	61101xxx	9101-1381
stationary	61102xxx	9101-1382
stationary	61106xxx	9101-1399
stationary	61113xxx	9101-1366
stationary	61118xxx	9101-2027

Motion type	LAPP part number	Rockwell part number
N series: power/brake & feedback		
flexing	71107xxx	9101-1467
flexing	71116xxx	9101-1468
flexing	71117xxx	9101-1474
stationary	61107xxx	9101-1467
stationary	61116xxx	9101-1468
stationary	61117xxx	9101-1474
Y series: power/brake & feedback		
flexing	71105xxx	9101-1385
flexing	71114xxx	9101-1373
flexing	71115xxx	9101-1375
stationary	61105xxx	9101-1385
stationary	61114xxx	9101-1373
stationary	61115xxx	9101-1375

Discontinued

Servo assemblies according to SIEMENS® standard 6FX 8002

Approvals

For approvals, inquire with our factory: 800-774-3539.

Technical data

Minimum bend radius:
- power cable:
  - for continuous flex:
    - 16 - 6 AWG: 7.5 x cable diameter
    - 4 - 1 AWG: 10 x cable diameter
  - for stationary use: 4 x cable diameter
- signal cable:
  - for continuous flex: 8 x cable diameter
  - for stationary use: 4 x cable diameter

Temperature range:
- for continuous flex: -20°C to +60°C
- for stationary use: -50°C to +80°C

Nominal voltage:
- power cable, power conductors:
  - UL/CSA: 1000V
  - IEC: 600/1000V
- power cable, control conductors:
  - UL/CSA: 1000V
  - IEC: 250V AC
- signal cable:
  - UL/CSA: 30V AC/DC
  - IEC: 30V AC

Approvals:
UL: AWM 21223
AWM 20236
Canada: AWM I/II A/B FT1
Additional: based on VDE specifications
CE & RoHS

LAPP part number	SIEMENS® part number	LAPP cable
Assemblies for feedback		
335100xxx	6FX8002-1AD00-XXXX	00277131
335104xxx	6FX8002-1AD04-XXXX	00277131
335500xxx	6FX8002-2AD00-XXXX	00277131
335304xxx	6FX8002-2AD04-XXXX	00277131
335200xxx	6FX8002-2AH00-XXXX	00277131
335211xxx	6FX8002-2CA11-XXXX	00277111
335231xxx	6FX8002-2CA31-XXXX	00277141
335234xxx	6FX8002-2CA34-XXXX	00277141
335331xxx	6FX8002-2CB31-XXXX	00277171
335201xxx	6FX8002-2CF01-XXXX	00277131
335202xxx	6FX8002-2CF02-XXXX	00277131
335204xxx	6FX8002-2CF04-XXXX	00277131
335300xxx	6FX8002-2CG00-XXXX	00277111
335400xxx	6FX8002-2CH00-XXXX	00277131
335600xxx	6FX8002-2DC00-XXXX	*
335310xxx	6FX8002-2DC10-XXXX	*
335220xxx	6FX8002-2DC20-XXXX	*
335210xxx	6FX8002-2EQ10-XXXX	00277141
335214xxx	6FX8002-2EQ14-XXXX	00277141
335421xxx	6FX8002-4AA21-XXXX	00277151
Assemblies for power		
335501xxx	6FX8002-5CA01-XXXX	0027784
335505xxx	6FX8002-5CA05-XXXX	0027784
335531xxx	6FX8002-5CA31-XXXX	0027785
335541xxx	6FX8002-5CA41-XXXX	0027786
335551xxx	6FX8002-5CA51-XXXX	0027787
335601xxx	6FX8002-5CS01-XXXX	0027784
335511xxx	6FX8002-5CS11-XXXX	0027785
335702xxx	6FX8002-5CS06-XXXX	0027784
335703xxx	6FX8002-5CS16-XXXX	0027785
335704xxx	6FX8002-5CS26-XXXX	0027784
335705xxx	6FX8002-5CS36-XXXX	0027785
335706xxx	6FX8002-5CS46-XXXX	0027786
335707xxx	6FX8002-5CS56-XXXX	0027787
335708xxx	6FX8002-5CS66-XXXX	0027788
335709xxx	6FX8002-5CN06-XXXX	0027784
335710xxx	6FX8002-5CN16-XXXX	0027785
335711xxx	6FX8002-5CN26-XXXX	0027784
335712xxx	6FX8002-5CN36-XXXX	0027785
335713xxx	6FX8002-5CN46-XXXX	0027786
335714xxx	6FX8002-5CN56-XXXX	0027787
335715xxx	6FX8002-5CN66-XXXX	0027788
Assemblies for power with brake		
335601xxx	6FX8002-5DA01-XXXX	0027790
335605xxx	6FX8002-5DA05-XXXX	0027790
335631xxx	6FX8002-5DA31-XXXX	0027791
335641xxx	6FX8002-5DA41-XXXX	0027791
335651xxx	6FX8002-5DA51-XXXX	0027793
335701xxx	6FX8002-5DS01-XXXX	0027790
335611xxx	6FX8002-5DS11-XXXX	0027791
335716xxx	6FX8002-5DS06 -XXXX	0027790
335717xxx	6FX8002-5DS16 -XXXX	0027791
335718xxx	6FX8002-5DS26 -XXXX	0027790
335719xxx	6FX8002-5DS36 -XXXX	0027791
335720xxx	6FX8002-5DS46 -XXXX	0027792
335721xxx	6FX8002-5DS56 -XXXX	0027793
335722xxx	6FX8002-5DS66 -XXXX	0027794
335723xxx	6FX8002-5DN06 -XXXX	0027790
335724xxx	6FX8002-5DN16 -XXXX	0027791
335725xxx	6FX8002-5DN26 -XXXX	0027790
335726xxx	6FX8002-5DN36 -XXXX	0027791
335727xxx	6FX8002-5DN46 -XXXX	0027792
335728xxx	6FX8002-5DN56 -XXXX	0027793
335729xxx	6FX8002-5DN66 -XXXX	0027794

* Made with special LAPP cable design. Specs are available upon request.
For part number, replace "xxx" with the desired cable length in meters. Custom configurations are available upon request.

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Servo assemblies according to SIEMENS® standard 6FX 5002

Approvals

For approvals, inquire with our factory: 800-774-3539.

Technical data

Minimum bend radius:
- for flexible use: 12 x cable diameter
- for stationary use: 5 x cable diameter

Temperature range:
- for flexible use: 0°C to +60°C
- for stationary use: -20°C to +60°C

Approvals:
UL: AWM 2570 (power)
AWM 2502 (signal)
Additional: based on VDE specifications
CE & RoHS

Nominal voltage:
- power cable, power conductors:
  - UL/CSA: 1000V
  - IEC: 600/1000V
- power cable, control conductors:
  - UL/CSA: 750V
  - IEC: 30V AC
- signal cable:
  - UL/CSA: 30V AC/DC
  - IEC: 30V AC

LAPP part number	SIEMENS® part number	LAPP cable
Assemblies for feedback		
235100xxx	6FX5002-1AD00-XXXX	0025725
235104xxx	6FX5002-1AD04-XXXX	0025725
235500xxx	6FX5002-2AD00-XXXX	0025725
235304xxx	6FX5002-2AD04-XXXX	0025725
235200xxx	6FX5002-2AH00-XXXX	0025725
235211xxx	6FX5002-2CA11-XXXX	0025724
235231xxx	6FX5002-2CA31-XXXX	0025726
235234xxx	6FX5002-2CA34-XXXX	0025726
235201xxx	6FX5002-2CF01-XXXX	0025725
235202xxx	6FX5002-2CF02-XXXX	0025725
235204xxx	6FX5002-2CF04-XXXX	0025725
235300xxx	6FX5002-2CG00-XXXX	0025724
235400xxx	6FX5002-2CH00-XXXX	0025725
235600xxx	6FX5002-2DC00-XXXX	*
235310xxx	6FX5002-2DC10-XXXX	*
235220xxx	6FX5002-2DC20-XXXX	*
235210xxx	6FX5002-2EQ10-XXXX	0025726
235214xxx	6FX5002-2EQ14-XXXX	0025726
Assemblies for power		
235501xxx	6FX5002-5CA01-XXXX	00257001
235505xxx	6FX5002-5CA05-XXXX	00257001
235531xxx	6FX5002-5CA31-XXXX	00257011
235514xxx	6FX5002-5CA41-XXXX	00257021
235551xxx	6FX5002-5CA51-XXXX	00257031
235601xxx	6FX5002-5CS01-XXXX	00257001
235511xxx	6FX5002-5CS11-XXXX	00257011
335730xxx	6FX5002-5CS06-XXXX	00257001
335731xxx	6FX5002-5CS16-XXXX	00257011
335732xxx	6FX5002-5CS26-XXXX	00257001
335733xxx	6FX5002-5CS36-XXXX	00257011
335734xxx	6FX5002-5CS46-XXXX	00257021

LAPP part number	SIEMENS® part number	LAPP cable
335735xxx	6FX5002-5CS56-XXXX	00257031
335736xxx	6FX5002-5CS66-XXXX	0025704
335737xxx	6FX5002-5CN06-XXXX	00257001
335738xxx	6FX5002-5CN16-XXXX	00257011
335739xxx	6FX5002-5CN26-XXXX	00257001
335740xxx	6FX5002-5CN36-XXXX	00257011
335741xxx	6FX5002-5CN46-XXXX	00257021
335742xxx	6FX5002-5CN56-XXXX	00257031
335743xxx	6FX5002-5CN66-XXXX	0025704
Assemblies for power with brake		
235606xxx	6FX5002-5DA01-XXXX	00257151
235605xxx	6FX5002-5DA05-XXXX	00257151
235631xxx	6FX5002-5DA31-XXXX	00257161
235641xxx	6FX5002-5DA41-XXXX	00257171
235651xxx	6FX5002-5DA51-XXXX	00257181
235701xxx	6FX5002-5DS01-XXXX	00257151
235611xxx	6FX5002-5DS11-XXXX	00257161
335744xxx	6FX5002-5DS06 -XXXX	00257001
335745xxx	6FX5002-5DS16 -XXXX	00257011
335746xxx	6FX5002-5DS26 -XXXX	00257001
335747xxx	6FX5002-5DS36 -XXXX	00257011
335748xxx	6FX5002-5DS46 -XXXX	00257021
335749xxx	6FX5002-5DS56 -XXXX	00257031
335750xxx	6FX5002-5DS66 -XXXX	0025704
335751xxx	6FX5002-5DN06 -XXXX	00257001
335752xxx	6FX5002-5DN16 -XXXX	00257011
335753xxx	6FX5002-5DN26 -XXXX	00257001
335754xxx	6FX5002-5DN36 -XXXX	00257011
335755xxx	6FX5002-5DN46 -XXXX	00257021
335756xxx	6FX5002-5DN56 -XXXX	00257031
335757xxx	6FX5002-5DN66 -XXXX	0025704

* Made with special LAPP cable design. Specs are available upon request.
For part number, replace “xxx” with the desired cable length in meters. Custom configurations are available upon request.

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Servo LK-INX assemblies according to INDRAMAT® standards

INDRAMAT standard IKG/RKL

Technical data

Minimum bend radius:
- for stationary use: 6 x cable diameter
- for continuous flex: 10 x cable diameter

Temperature range:
- for stationary use: -50°C to +80°C
- for continuous flex: -30°C to +60°C

Nominal voltage:
- power conductors:
  - UL/CSA: 1000V
  - IEC: 600/1000V
- control conductors:
  - UL/CSA: 1000V
  - IEC: 250V AC

Approvals: UL: AWM 20234

LAPP part number	Length m	INDRAMAT part number	LAPP cable
INDRAMAT standard IKG			
70345476	10	IKG4009-010	7072403
70345503	10	IKG4087-010	7072406
70345521	10	IKG4163-010	7072408
70345522	10	IKG4170-010	7072408
70345541	10	IKG4020-010	7072403
70345542	10	IKG4018-010	7072403
70345543	10	IKG4016-010	7072403
70345545	10	IKG4050-010	7072404

LAPP part number	Length m	INDRAMAT part number	LAPP cable
INDRAMAT standard RKL			
70392839	10	RKL4302-010	7072403
70410001	10	RKL4303-010	7072403
70410000	10	RKL4330-010	7072409

INDRAMAT standard IKS/RKG

Technical data

Minimum bend radius:
- for stationary use: 5 x cable diameter
- for continuous flex: 10 x cable diameter

Nominal voltage: 300V

Temperature range:
- for stationary use: -30°C to +90°C
- for continuous flex: -30°C to +80°C

Approvals: UL: AWM 20234

LAPP part number	Length m	INDRAMAT part number	LAPP cable
INDRAMAT standard IKS			
70335583	10	IKS4374-010	7072401
70335584	10	IKS4376-010	7072401
70335595	10	IKS4103-010	7072401
70335596	10	IKS4153-010	7072401

LAPP part number	Length m	INDRAMAT part number	LAPP cable
INDRAMAT standard RKG			
70392984	10	RKG4200-010	7072401
70410002	10	RKG4201-010	7072401

Listed part numbers are for 10m lengths. Other lengths are available; call 800-774-3539.

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Servo assemblies according to LENZE® standard

Approvals

Technical data

Minimum bend radius:
- for stationary use: 7.5 x cable diameter
- for continuous flex: 10 x cable diameter

Temperature range:
- for stationary use: -25°C to +80°C
- for continuous flex: -5°C to +70°C

Nominal voltage:
- resolver & encoder cable:
  - UL/CSA: 300V
  - VDE: 30V
- motor cable, power conductors:
  - UL/CSA: 600V
  - VDE: 600/1000V

Test voltage:
- resolver & encoder cable: 1500V
- motor cable:
  - power conductors: 4000V
  - control conductors: 2000V

Approvals:
- resolver & encoder cable: AWM 21165 (flexing)
  AWM 2464 (stationary)
- motor cable: AWM 20940 (flexing)
  AWM 2570 (stationary)

LAPP part number	Application type	Length m	Construction ( ) = shielded	LENZE assembly part number
Servo cable				
74321272	flexing	10	16 AWG/4c + (20 AWG/1pr)	EWLM-010GMS-015
74321426	flexing	10	14 AWG/4c + (20 AWG/1pr)	EWLM-010GMS-025
74320320	stationary	10	16 AWG/4c + (20 AWG/1pr)	EWLM-010GM-015
74320499	stationary	10	14 AWG/4c + (20 AWG/1pr)	EWLM-010GM-025
70415002	stationary	10	16 AWG/4c	EYP-0003-A-0100-M01-A00
Fan cable				
74322629	flexing	10	20 AWG/5c	EWLL-010GMS
70415001	flexing	10	19 AWG/5c	EYL-0001-V-0100L02-J02
74322480	stationary	10	20 AWG/5c	EWLL-010GM
Resolver cable				
74323073	flexing	10	3x(26 AWG/1pr) + (20 AWG/1pr)	EWLR-010GMS-T
70415005	flexing	10	26 AWG/3c + 26 AWG/3pr	EYF-0020-A-0100-F01-S04
74320540	stationary	10	3x(26 AWG/1pr) + (20 AWG/1pr)	EWLR-010GM-T
Encoder cable				
74323672	flexing	10	4x(26 AWG/1pr) + (18 AWG/1pr)	EWLE-010GMS-T
74323522	stationary	10	4x(26 AWG/1pr) + (18 AWG/1pr)	EWLE-010GM-T

Listed part numbers are for 10m lengths. Other lengths are available; call 800-774-3539.

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

Servo assemblies according to SEW® standard

Approvals

CE RoHS

Technical data

Minimum bend radius:
- power cable: 15 x cable diameter
- signal cable: 15 x cable diameter

Temperature range:
- power cable: -10°C to +80°C
- signal cable: -5°C to +70°C

Test voltage:
- power cable: 2000V
- signal cable: 1500V

Nominal voltage:
- power cable, power conductors:
  - UL: 600V
  - IEC: 750V
- power cable, signal conductors:
  - UL: 600V
  - IEC: 350V
- signal cable: 250V

Approvals: UL: AWM 2587

LAPP part number	Application type	Length m	Construction	SEW assembly part number
Power cable				
70430251	stationary	10	16 AWG/4c	05904544
70430250	stationary	10	16 AWG/4c + 18 AWG/3c	13324853

LAPP part number	Application type	Length m	Construction	SEW assembly part number
Signal cable				
70430252	flexing	10	24 AWG/6pr	1995405
70430249	stationary	10	24 AWG/6pr	13324535

Listed part numbers are for 10m lengths. Other lengths are available; call 800-774-3539.

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ÖLFLEX® CONNECT CHAIN

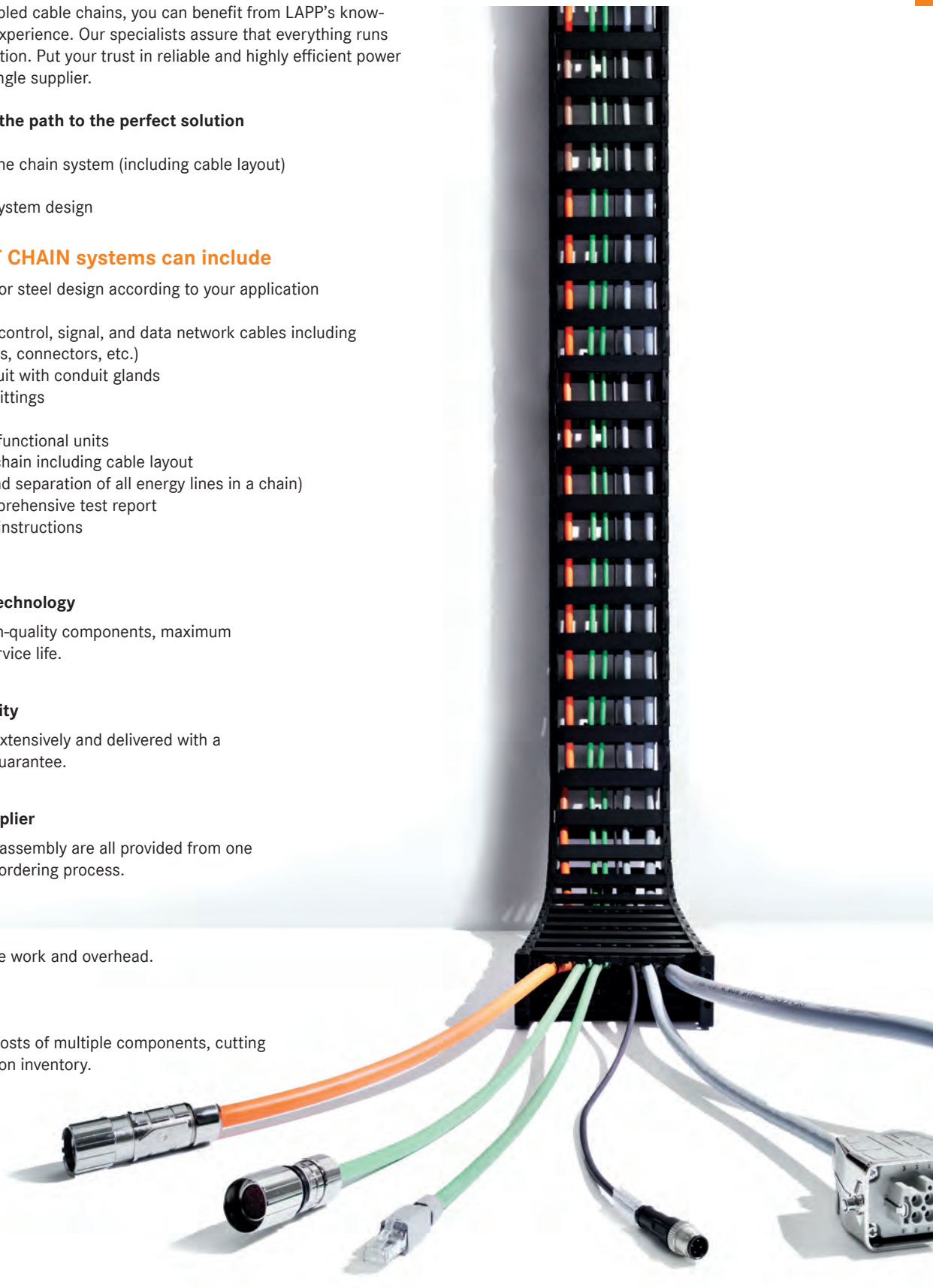
When it comes to assembled cable chains, you can benefit from LAPP's know-how and many years of experience. Our specialists assure that everything runs perfectly for your application. Put your trust in reliable and highly efficient power chain solutions from a single supplier.

We accompany you on the path to the perfect solution

- Technical evaluation
- Initial CAD design of the chain system (including cable layout)
- Project management
- Completion of chain system design

ÖLFLEX® CONNECT CHAIN systems can include

- Cable chains in nylon or steel design according to your application requirements
- Highly flexible power, control, signal, and data network cables including accessories (cable lugs, connectors, etc.)
- Protective cable conduit with conduit glands
- Hydraulic hoses with fittings
- Pneumatic hoses
- Towing arms or other functional units
- CAD drawing of your chain including cable layout (optimal placement and separation of all energy lines in a chain)
- Testing including comprehensive test report
- Individual installation instructions



Reliable cutting-edge technology

LAPP prides itself on high-quality components, maximum functionality and long service life.

Guaranteed brand quality

Our systems are tested extensively and delivered with a comprehensive system guarantee.

Competent system supplier

Components, chain, and assembly are all provided from one source, streamlining the ordering process.

Less effort

You reduce administrative work and overhead.

Cost savings

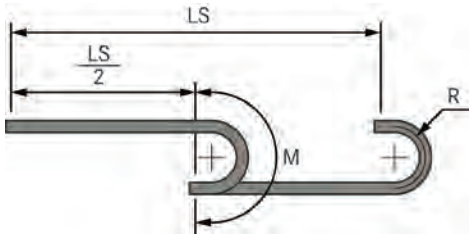
Less inventory carrying costs of multiple components, cutting scrap costs and production inventory.

ÖLFLEX® CONNECT CHAIN design form

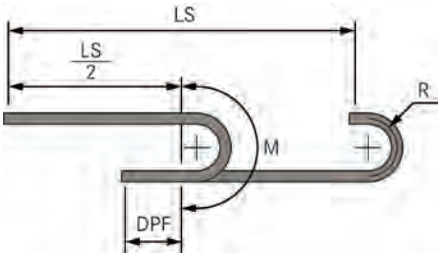
This form is designed to assure LAPP designs and delivers the right populated cable chain for your application.
Please complete as much of the form as possible and fax to 973-660-9330 or email to sales@lappusa.com or your local LAPP representative.
The custom chain order form is also available online at **lappusa.lappgroup.com/nc/systems/populated-tracks/custom-cable-track.html**.

Chain dimensions

1. Total length of existing chain, if replacing: _____
2. Total distance traveled in one cycle (LS): _____
3. Is the chain center mounted? (dia. 1) _____
4. If not center mounted, how much off-center? (DPF, see dia. 2) _____ in.



dia. 1:

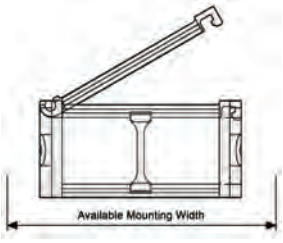


dia. 2:

5. Direction/orientation of travel (please check one):

☐ horizontal _____ ☐ vertical ☐ side-running

6. Bend radius: _____ in.
7. Maximum available mounting width on the machine/equipment (dia. 3 (in)): _____ in.
8. Maximum available mounting height on the machine/equipment (dia. 4 (in)): _____ in.



dia. 3: _____

dia. 4:

9. Standard mounting bracket orientation is outside-to-outside. If other, please specify:

_____

Chain specifications

10. Number of cables and hoses in chain: _____

Quantity	Part number	Weight lbs/ft	Outer diameter in	Min. bend radius in	Length from moving end ft	Length from fixed end ft
Cables						
Hoses						

11. Operation speed: _____ ft/s

12. Chain acceleration: _____ ft/s²

13. Operation frequency: _____ cycles/min

Chain environment

14. Type of equipment chain is installed on: _____

15. Environmental data (please check all that apply):

☐ clean, dry indoors ☐ chemical, wet, or chips ☐ high temperature: > 150°F ☐ outdoors

16. Please describe any unusual environmental factors:

_____

_____

Industrial Ethernet cordsets

The use of both RJ45 and M12 connectors in Ethernet network protocols is common. LAPP continuous flex CAT.5e & CAT.6A cables offer a unique solution for the demanding needs of motion systems, where a network connection has been integrated for program interface from remote locations. LAPP's product offering supports both flexing and stationary industrial Ethernet requirements.

Available configurations

- single-ended cordsets: 4 pair
- extension cordsets: 4 pair
- single-ended cordsets: 2 pair
- extension cordsets: 2 pair

Technical data

Material:

- contact carrier:	
- M12:	thermoplastic polyurethane; black
- RJ45:	polycarbonate
- molded head:	
- M12, 8-position:	thermoplastic polyurethane; black*
- M12, 4-position D-code:	thermoplastic polyurethane; blue-gray*
- RJ45:	thermoplastic polyurethane; black*
- contacts:	gold-plated brass
- coupling nut:	nickel-plated brass
- shield:	copper braid or foil & copper braid
- outer jacket:	polyurethane; teal or green
- conductor insulation:	polyethylene

* color is typical, not standard

Temperature range: see specific cable catalog page

Rated voltage: 42V
- cable: 1000 (not for power applications)

Rated current: 1.5A

Number of conductors:

- M12 D-code/RJ45 shielded:	26 - 22 AWG/2pr, stranded or solid
- M12 8-pos. & RJ45S:	26 - 22 AWG/4pr, stranded or solid

Protection class:

- M12:	IP67 NEMA 1, 3, 4, 6P
- RJ45:	IP20 NEMA 1

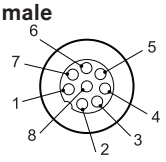
Cable type:

- for stationary use:	CAT.5e:	ETHERLINE® 2 pair CAT.5e, page 237
		ETHERLINE® 4 pair CAT.5e, page 244
	CAT.6A:	ETHERLINE® 4 pair CAT.6A, page 247
- continuous flex:	CAT.5e:	ETHERLINE® 2 pair CAT.5e, page 238
		ETHERLINE® 4 pair CAT.5e, page 245
	CAT.6A:	ETHERLINE® 4 pair CAT.6A, page 248

Pin outs

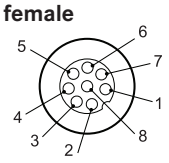
Ethernet M12 8-position, 4 pair

male



1 = white/blue
2 = white/brown
3 = brown
4 = orange (-TX)

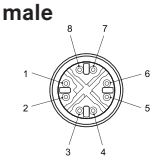
female



5 = white/green (+RX)
6 = white/orange (+TX)
7 = blue
8 = green (-RX)

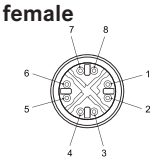
Ethernet M12 X-coded, 4 pair

male



1 = white/orange (+TX)
2 = orange (-TX)
3 = white/green (+RX)
4 = green (-RX)

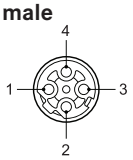
female



5 = white/brown
6 = brown
7 = white/blue
8 = blue

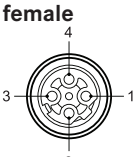
Ethernet M12 D-coded, 2 pair

male



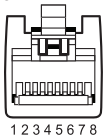
1 = white/orange (+TX)
2 = white/green (+RX)
3 = orange (-TX)
4 = green (-RX)

female



Ethernet RJ45 shielded

4 pair



1 = white/orange (+TX)
2 = orange (-TX)
3 = white/green (+RX)
4 = blue
5 = white/blue
6 = green (-RX)
7 = white/brown
8 = brown

2 pair

1 = white/orange (+TX)
2 = orange (-TX)
3 = white/green (+RX)
4 = N/C
5 = N/C
6 = green (-RX)
7 = N/C
8 = N/C

If not otherwise specified, all values relating to the product are nominal values.

Ethernet single-ended cordsets: 4 pair CAT.5e

8-pos. M12 or 8-wire RJ45 connectors to flying leads

connector 1

male M12 straight connector

male M12 bulkhead

female M12 straight connector

female M12 bulkhead

RJ45 shielded connector

ETHERLINE® 4 pair CAT.5e

connector 2

flying leads

Cable type	Part number	Page
stationary	2170300	244
continuous flexing	2170489	245

90° M12 connectors are also available

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to flying leads			
male M12 straight	flying leads	C5E003Sxx	C5E003Fxx
male M12 bulkhead	flying leads	C5E010Sxx	C5E010Fxx
female M12 straight	flying leads	C5E004Sxx	C5E004Fxx
female M12 bulkhead	flying leads	C5E011Sxx	C5E011Fxx
RJ45 to flying leads			
RJ45 shielded	flying leads	C5E002Sxx	C5E002Fxx

For part number, replace “xx” with the desired cable length in meters

Ethernet extension cordsets: 4 pair CAT.5e

8-pos. M12 or 8-wire RJ45 connectors

connector 1

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

ETHERLINE® 4 pair CAT.5e

connector 2

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

Cable type	Part number	Page
stationary	2170300	244
continuous flexing	2170489	245

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to M12			
male M12 straight	male M12 straight	C5E005Sxx	C5E005Fxx
male M12 straight	female M12 straight	C5E007Sxx	C5E007Fxx
female M12 straight	female M12 straight	C5E006Sxx	C5E006Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to RJ45			
male M12 straight	RJ45 shielded	C5E008Sxx	C5E008Fxx
female M12 straight	RJ45 shielded	C5E009Sxx	C5E009Fxx
RJ45 to RJ45			
RJ45 shielded	RJ45 shielded	C5E001Sxx	

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

Ethernet single-ended cordsets: 2 pair CAT.5e

4-pos. M12 D-coded or 4-wire RJ45 connectors to flying leads

connector 1

male M12 straight connector

male M12 bulkhead

female M12 straight connector

female M12 bulkhead

RJ45 shielded connector

ETHERLINE® 2 Pair CAT.5e

connector 2

flying leads

Cable type	Part number	Page
stationary	2170284	237
continuous flexing	2170289	238

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to flying leads			
male M12 straight	flying leads	C5E103Sxx	C5E103Fxx
male M12 bulkhead	flying leads	C5E110Sxx	C5E110Fxx
female M12 straight	flying leads	C5E104Sxx	C5E104Fxx
female M12 bulkhead	flying leads	C5E111Sxx	C5E111Fxx
RJ45 to flying leads			
RJ45 shielded	RJ45 to RJ25	C5E102Sxx	C5E102Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Ethernet extension cordsets: 2 Pair CAT.5e

4-pos. M12 D-coded or 4-wire RJ45 connectors

connector 1

male M12 straight connector

female M12 straight connector

female M12 straight connector

ETHERLINE® 2 Pair CAT.5e

connector 2

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

Cable type	Part number	Page
stationary	2170284	237
continuous flexing	2170289	238

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to M12			
male M12 straight	male M12 straight	C5E105Sxx	C5E105Fxx
male M12 straight	female M12 straight	C5E107Sxx	
female M12 straight	female M12 straight	C5E106Sxx	C5E106Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to RJ45			
male M12 straight	RJ45 shielded	C5E108Sxx	
female M12 straight	RJ45 shielded	C5E109Sxx	C5E109Fxx
RJ45 to RJ45			
RJ45 shielded	flying leads	C5E101Sxx	

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

Ethernet single-ended cordsets: 4 pair CAT.6A

8-pos. M12 or 8-wire RJ45 connectors to flying leads

connector 1

male M12 straight connector

male M12 bulkhead

female M12 straight connector

female M12 bulkhead

RJ45 shielded connector

connector 2

flying leads

Cable type	Part number	Page
stationary	2170464	247
continuous flexing	2170484	248

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to flying leads			
male M12 straight	flying leads	C6A003Sxx	C6A003Fxx
male M12 bulkhead	flying leads	C6A010Sxx	C6A010Fxx
female M12 straight	flying leads	C6A004Sxx	C6A004Fxx
female M12 bulkhead	flying leads	C6A011Sxx	C6A011Fxx
RJ45 to flying leads			
RJ45 shielded	flying leads	C6A002Sxx	C6A002Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Ethernet extension cordsets: 4 pair CAT.6A

8-pos. M12 or 8-wire RJ45 connectors

connector 1

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

connector 2

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

Cable type	Part number	Page
stationary	2170464	247
continuous flexing	2170484	248

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to M12			
male M12 straight	male M12 straight	C6A005Sxx	C6A005Fxx
male M12 straight	female M12 straight	C6A007Sxx	C6A007Fxx
female M12 straight	female M12 straight	C6A006Sxx	C6A006Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to RJ45			
male M12 straight	RJ45 shielded	C6A008Sxx	C6A008Fxx
female M12 straight	RJ45 shielded	C6A009Sxx	C6A009Fxx
RJ45 to RJ45			
RJ45 shielded	RJ45 shielded		C6A001Fxx

PROFINET® cordsets

These pre-tested molded cordsets utilize high quality continuous flex cable and integral molded strain relief. For motion applications, these cordsets are designed to provide interconnection between simple devices (sensors and actuators) and high level devices (PLCs and computers). Stationary cordsets offer long-lasting, reliable performance at reduced costs when continuous flexing is not required.

Available configurations

- single-ended cordsets: 2 pair
- extension cordsets: 2 pair

Technical data

Material:

- plug:	PBT (V-0 per UL 94)
- coupling nut:	nickel-plated brass
- shield:	foil & tinned copper braid
- outer jacket:	polyurethane or PVC; green
- conductor insulation:	polyethylene

Temperature range:	see specific cable catalog page

Rated voltage:

- PROFINET M12:	250V
- PROFINET RJ45:	42V
- cable:	(not for power applications)
- for stationary use:	600V UL/AWM
- for continuous flexing:	100V

Rated current:

- PROFINET M12:	4A
- PROFINET RJ45:	1.5A

Number of conductors:	22 AWG/2pr, stranded

Protection class:

- PROFINET M12:	IP67
- PROFINET RJ45:	IP20

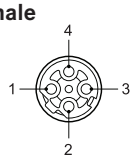
Cable type:

- for stationary use:	ETHERLINE® 2 pair CAT.5, page 237
- for continuous flexing:	ETHERLINE® 2 pair CAT.5, page 238

Pin outs

PROFINET M12 D-coded, 2 pair

male



female

1 = yellow (TD+)
2 = orange (TD-)
3 = white (RD+)
4 = blue (RD-)

PROFINET RJ45 shielded

2 pair

1 = yellow (TD+)
2 = orange (TD-)
3 = white (RD+)
4 = N/C
5 = N/C
6 = blue (RD-)
7 = N/C
8 = N/C

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PROFINET® single-ended cordsets: 2 pair CAT.5

4-pos. M12 or 4-wire RJ45 connectors to flying leads

connector 1

male M12 straight connector

male M12 bulkhead

female M12 straight connector

female M12 bulkhead

RJ45 shielded connector

ETHERLINE® 2 Pair CAT.5

connector 2

flying leads

Cable type	Part number	Page
stationary	2170886	237
continuous flexing	2170894	238

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to flying leads			
male M12 straight	flying leads	CPN003Sxx	CPN003Fxx
male M12 bulkhead	flying leads	CPN010Sxx	CPN010Fxx
female M12 straight	flying leads	CPN004Sxx	CPN004Fxx
female M12 bulkhead	flying leads	CPN011Sxx	CPN011Fxx
RJ45 to flying leads			
RJ45 shielded	flying leads	CPN002Sxx	CPN002Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

PROFINET® extension cordsets: 2 pair CAT.5

4-pos. M12 or 4-wire RJ45 connectors

connector 1

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

ETHERLINE® 2 Pair CAT.5

connector 2

male M12 straight connector

female M12 straight connector

RJ45 shielded connector

Cable type	Part number	Page
stationary	2170886	237
continuous flexing	2170894	238

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to M12			
male M12 straight	male M12 straight	CPN005Sxx	CPN005Fxx
male M12 straight	female M12 straight	CPN007Sxx	
female M12 straight	female M12 straight	CPN006Sxx	CPN006Fxx

For part number, replace “xx” with the desired cable length in meters
90° M12 connectors are also available

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to RJ45			
male M12 straight	RJ45 shielded	CPN008Sxx	
female M12 straight	RJ45 shielded	CPN009Sxx	CPN009Fxx
RJ45 to RJ45			
RJ45 shielded	RJ45 shielded	CPN001Sxx	

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PROFIBUS® cordsets

These pre-tested molded cordsets utilize high-quality continuous flex cable and integral molded strain relief. For motion applications, these cordsets are designed to provide interconnection between simple devices (sensors and actuators) and high level devices (PLCs and computers). Stationary cordsets offer long-lasting, reliable performance at reduced costs when continuous flexing is not required.

Available configurations

- single-ended cordsets
- extension cordsets
- panel mount receptacle cordsets
- D-Sub Y-cordsets
- D-Sub cordsets

Technical data

Material:

- contact carrier:	PBT; black (V-0 per UL 94)
- molded head:	thermoplastic polyurethane; black*
- contacts:	gold-plated brass
- coupling nut:	nickel-plated brass
- shield:	foil & tinned copper braid
- outer jacket:	PVC or polyurethane; violet
- conductor insulation:	polyethylene

* color is typical, not standard

Temperature range:

- PROFIBUS M12:	-40°C to +80°C
- PROFIBUS DB9:	0°C to +60°C
- cable:	see specific cable catalog page

Rated voltage: 250V

Rated current: 4A

Number of conductors: 24 or 22 AWG/2pr (shielded data pair)

Protection class:

- PROFIBUS M12:	IP67 NEMA 1, 3, 4, 6
- PROFIBUS DB:	IP67 NEMA 1, 3, 4, 6, 13
- D9S:	IP20

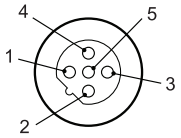
Cable type:

- for stationary use:	UNITRONIC® BUS PB, page 173
- for continuous flex:	UNITRONIC® BUS PB FD, page 174

Pin outs

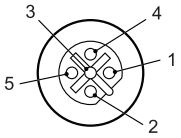
PROFIBUS M12

male

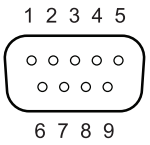


1 = N/C
2 = green (BUS_A)
3 = N/C
4 = red (BUS_B)
5 = bare (shield)

female



PROFIBUS DB 9



1 = N/C
2 = N/C
3 = red (BUS_B)
4 = N/C
5 = N/C
6 = N/C
7 = N/C
8 = green (BUS_A)
9 = N/C

Approvals

For approvals, inquire with our factory: 800-774-3539.

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PROFIBUS® single-ended cordsets

5-pos. M12 connectors to flying leads

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® BUS PB

connector 2

flying leads

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to flying leads			
male M12 straight	flying leads	PB4110100Sxx	PB4110100Fxx
male M12 90°	flying leads	PB4110101Sxx	PB4110101Fxx
female M12 straight	flying leads	PB4110102Sxx	PB4110102Fxx
female M12 90°	flying leads	PB4110103Sxx	PB4110103Fxx

For part number, replace “xx” with the desired cable length in meters

PROFIBUS® extension cordsets

5-pos. M12 connectors to 5-pos. M12 connectors

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® BUS PB

connector 2

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male M12 straight	male M12 straight	PB4110128Sxx	PB4110128Fxx
male M12 straight	male M12 90°	PB4110129Sxx	PB4110129Fxx
male M12 straight	female M12 straight	PB4110104Sxx	PB4110104Fxx
male M12 straight	female M12 90°	PB4110105Sxx	PB4110105Fxx
male M12 90°	male M12 90°	PB4110131Sxx	PB4110131Fxx

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male M12 90°	female M12 straight	PB4110106Sxx	PB4110106Fxx
male M12 90°	female M12 90°	PB4110107Sxx	PB4110107Fxx
female M12 straight	female M12 straight	PB4110134Sxx	PB4110134Fxx
female M12 straight	female M12 90°	PB4110135Sxx	PB4110135Fxx
female M12 90°	female M12 90°	PB4110139Sxx	PB4110139Fxx

For part number, replace “xx” with the desired cable length in meters

PROFIBUS® panel mount receptacle cordsets

5-pos. M12 panel mount bulkheads to flying leads

connector 1

male M12 bulkhead

female M12 bulkhead

UNITRONIC® BUS PB

connector 2

flying leads

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male M12 bulkhead	flying leads	PB4110119Sxx	PB4110119Fxx
female M12 bulkhead	flying leads	PB4110120Sxx	PB4110120Fxx

For part number, replace “xx” with the desired cable length in meters

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PROFIBUS® D-sub Y-cordsets

Two 5-pos. M12 connectors to 9-pos. D-sub node module

connector 1

male M12 straight connector

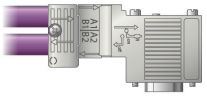
male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® BUS PB
UNITRONIC® BUS PB

connector 2



D-sub node module

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

Connector 1	Connector 2	Part number stationary	Part number continuous flex
2 male M12 to D-sub node			
male M12 straight	male M12 straight	PB4110108Sxx	PB4110108Fxx
male M12 straight	male M12 90°	PB4110149Sxx	PB4110149Fxx
male M12 90°	male M12 90°	PB4110109Sxx	PB4110109Fxx
2 female M12 to D-sub node			
female M12 straight	female M12 straight	PB4110110Sxx	PB4110110Fxx
female M12 straight	female M12 90°	PB4110150Sxx	PB4110150Fxx
female M12 90°	female M12 90°	PB4110111Sxx	PB4110111Fxx
1 male/1 female M12 to D-sub node			
male M12 straight	female M12 straight	PB4110112Sxx	PB4110112Fxx

For part number, replace “xx” with the desired cable length in meters

PROFIBUS® D-sub Y-cordsets

Two 5-pos. M12 connectors to 9-pos. D-sub straight module

connector 1

male M12 straight connector

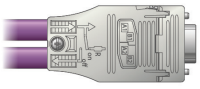
male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® BUS PB
UNITRONIC® BUS PB

connector 2



D-sub straight module

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

Connector 1	Connector 2	Part number stationary	Part number continuous flex
2 male M12 to D-sub straight			
male M12 straight	male M12 straight	PB4110158Sxx	PB4110158Fxx
male M12 straight	male M12 90°	PB4110156Sxx	PB4110156Fxx
male M12 90°	male M12 90°	PB4110160Sxx	PB4110160Fxx
2 female M12 to D-sub straight			
female M12 straight	female M12 straight	PB4110161Sxx	PB4110161Fxx
female M12 straight	female M12 90°	PB4110157Sxx	PB4110157Fxx
female M12 90°	female M12 90°	PB4110162Sxx	PB4110162Fxx
1 male/1 female M12 to D-sub straight			
male M12 straight	female M12 straight	PB4110163Sxx	PB4110163Fxx

For part number, replace “xx” with the desired cable length in meters

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PROFIBUS® D-sub cordsets

5-pos. M12 connectors or flying leads to 9-pos. D-sub terminator module

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

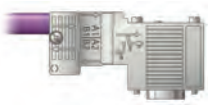
female M12 90° connector

flying leads

UNITRONIC® BUS PB

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

connector 2



D-sub terminator module

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to D-sub terminator			
male M12 straight	D-sub terminator	PB4110141Sxx	PB4110141Fxx
male M12 90°	D-sub terminator	PB4110142Sxx	PB4110142Fxx
female M12 straight	D-sub terminator	PB4110143Sxx	PB4110143Fxx
female M12 90°	D-sub terminator	PB4110144Sxx	PB4110144Fxx
Flying leads to D-sub terminator			
flying leads	D-sub terminator	PB4110140Sxx	PB4110140Fxx

For part number, replace “xx” with the desired cable length in meters

PROFIBUS® D-sub cordsets

5-pos. M12 connectors or flying leads to 9-pos. D-sub master module

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

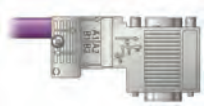
female M12 90° connector

flying leads

UNITRONIC® BUS PB

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

connector 2



D-sub master module

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to D-Sub Master			
male M12 straight	D-sub master	PB4110113Sxx	PB4110113Fxx
male M12 90°	D-sub master	PB4110114Sxx	PB4110114Fxx
female M12 straight	D-sub master	PB4110115Sxx	PB4110115Fxx
female M12 90°	D-sub master	PB4110116Sxx	PB4110116Fxx
Flying leads to D-sub master			
flying leads	D-sub master	PB4110118Sxx	PB4110118Fxx

For part number, replace “xx” with the desired cable length in meters.

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PROFIBUS® D-sub cordsets

5-pos. M12 connectors or flying leads to 9-pos. D-sub node module

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

flying leads

UNITRONIC® BUS PB

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

connector 2

D-sub node module

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to D-sub node			
male M12 straight	D-sub node	PB4110145Sxx	PB4110145Fxx
male M12 90°	D-sub node	PB4110146Sxx	PB4110146Fxx
female M12 straight	D-sub node	PB4110147Sxx	PB4110147Fxx
female M12 90°	D-sub node	PB4110148Sxx	PB4110148Fxx
Flying leads to D-sub node			
flying leads	D-sub node	PB4110117Sxx	PB4110117Fxx

For part number, replace “xx” with the desired cable length in meters.

PROFIBUS® D-sub cordsets

5-pos. M12 connectors or flying leads to 9-pos. D-sub straight module

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

flying leads

UNITRONIC® BUS PB

Cable type	Part number	Page
stationary	2170219	173
continuous flexing	2170322	174

connector 2

D-sub straight module

Connector 1	Connector 2	Part number stationary	Part number continuous flex
M12 to D-sub straight			
male M12 straight	D-sub straight	PB4110152Sxx	PB4110152Fxx
male M12 90°	D-sub straight	PB4110153Sxx	PB4110153Fxx
female M12 straight	D-sub straight	PB4110154Sxx	PB4110154Fxx
female M12 90°	D-sub straight	PB4110155Sxx	PB4110155Fxx
Flying leads to D-sub straight			
flying leads	D-sub straight	PB4110151Sxx	PB4110151Fxx

For part number, replace “xx” with the desired cable length in meters.

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DeviceNet™ cordsets

These molded cordsets offer Thick and Thin connectivity in a DeviceNet™ application. LAPP solutions offer the ability to connect in a motion system such as X-Y-Z motion equipment. The stationary versions offer the same functionality as the flexing in terms of connectivity for an environment when continuous flexing is not required. Conveyor systems are a popular application for these cordsets.

Available configurations

- thick single-ended cordsets
- thick panel mount receptacles
- thick extension cordsets
- thick panel mount extension cordsets
- thin single-ended cordsets
- thin extension cordsets
- thin panel mount receptacles
- thin panel mount extension cordsets
- thin open-style termination cordsets

Technical data

Material:

- contact carrier:	thermoplastic polyurethane; blue-gray
- molded head:	thermoplastic polyurethane; blue-gray*
- contacts:	gold-plated brass
- coupling nut:	nickel-plated brass
- shield:	foil (pairs) & overall tinned copper braid
- outer jacket:	PVC; gray
- conductor insulation:	
- for data:	polyethylene
- for power:	PVC

* color is typical, not standard

Temperature range: -20°C to +75°C

Rated voltage:

- DeviceNet™ 7/8":	300V
- DeviceNet™ M12:	250V

Rated current:

- DeviceNet™ 7/8":	9A
- DeviceNet™ M12:	4A

Number of conductors:

- DeviceNet™ 7/8":	incl. 18 AWG drain wire
- 6001:	14 AWG/1pr + 18 AWG/1pr
- 4001:	15 AWG/1pr + 18 AWG/1pr
- DeviceNet™ M12:	22 AWG/1pr + 24 AWG/1pr + 22 AWG drain wire

Protection class: meets NEMA 1, 3, 4, 6, 13 & IEC IP67

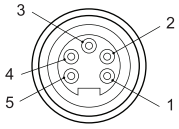
Cable type:

- for stationary use:	UNITRONIC® BUS DeviceNet™ Gray, page 167
- for continuous flex:	UNITRONIC® BUS DeviceNet™ FD Gray, page 168

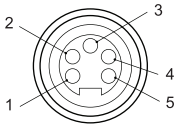
Pin outs

DeviceNet™ 7/8"

male



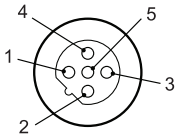
female



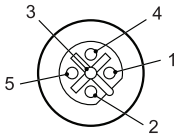
1 = bare (shield)
2 = red (+ voltage)
3 = black (– voltage)
4 = white (CAN_H)
5 = blue (CAN_L)

DeviceNet™ M12

male



female



1 = bare (shield)
2 = red (+ voltage)
3 = black (– voltage)
4 = white (CAN_H)
5 = blue (CAN_L)

Approvals

For approvals, inquire with our factory: 800-774-3539.

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If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

DeviceNet™ thick single-ended cordsets

5-pos. ⅞" connectors to flying leads

connector 1

male ⅞" straight connector

male ⅞" 90° connector

female ⅞" straight connector

female ⅞" 90° connector

UNITRONIC® DeviceNet™ THICK

connector 2

flying leads

Cable type	Part number	Page
stationary	4001	167
continuous flexing	6001	168

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male ⅞" straight	flying leads	DN4110001Sxx	
male ⅞" 90°	flying leads	DN4110002Sxx	DN4110002Fxx
female ⅞" straight	flying leads	DN4110003Sxx	DN4110003Fxx
female ⅞" 90°	flying leads	DN4110004Sxx	DN4110004Fxx

For part number, replace “xx” with the desired cable length in meters

DeviceNet™ thick panel mount receptacle cordsets

5-pos. ⅞" panel mount bulkheads to flying leads

connector 1

male ⅞" panel mount

male ⅞" bulkhead

female ⅞" panel mount

female ⅞" bulkhead

UNITRONIC® DeviceNet™ THICK

connector 2

flying leads

Cable type	Part number	Page
stationary	4001	167
continuous flexing	6001	168

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male ⅞" panel mount	flying leads	DN4110005Sxx	DN4110005Fxx
male ⅞" bulkhead	flying leads	DN4110097Sxx	DN4110097Fxx
female ⅞" panel mount	flying leads	DN4110006Sxx	DN4110006Fxx
female ⅞" bulkhead	flying leads	DN4110098Sxx	DN4110098Fxx

For part number, replace “xx” with the desired cable length in meters

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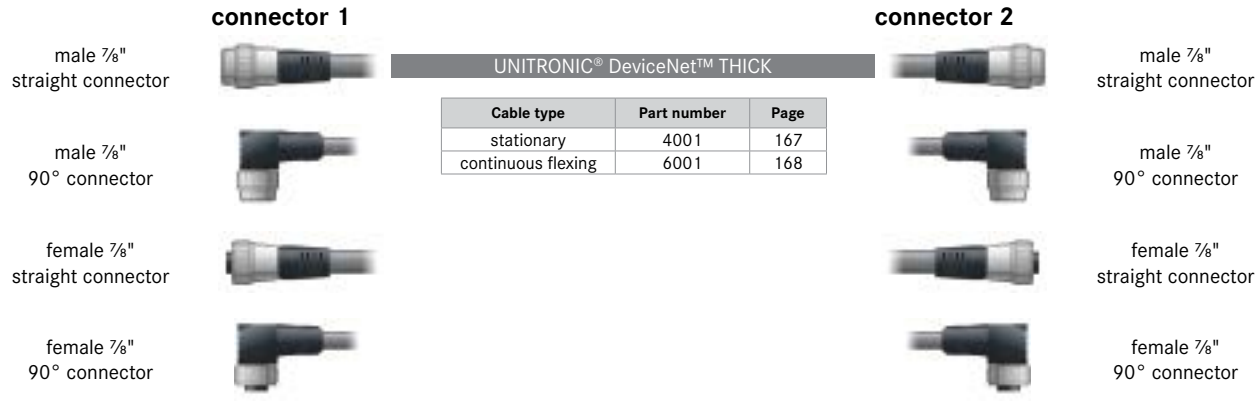
DeviceNet™ thick extension cordsets

5-pos. 7/8" connectors to 5-pos. 7/8" connectors



Cable type	Part number	Page
stationary	4001	167
continuous flexing	6001	168

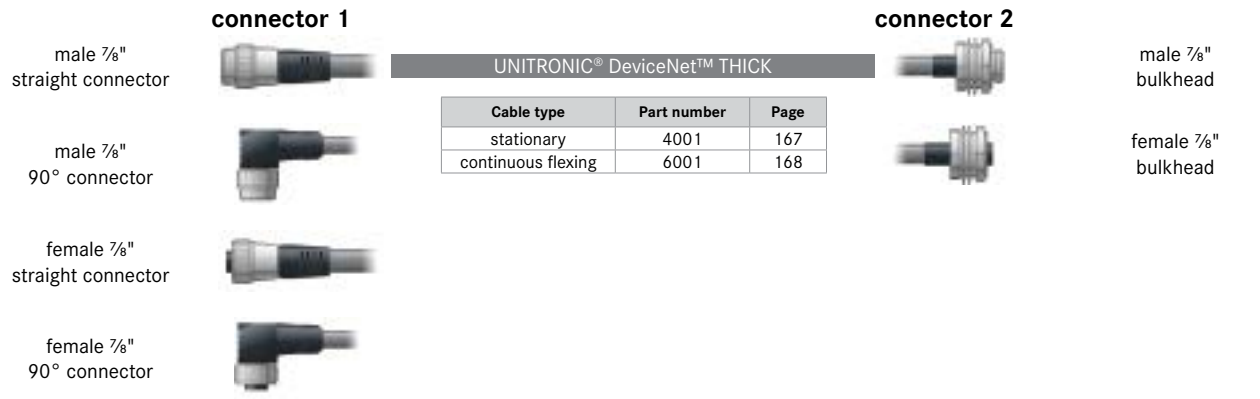
Connector 1	Connector 2	Part number stationary	Part number continuous flex
male 7/8" straight	male 7/8" straight	DN4110052Sxx	DN4110052Fxx
male 7/8" straight	male 7/8" 90°	DN4110053Sxx	DN4110053Fxx
male 7/8" straight	female 7/8" straight	DN4110008Sxx	
male 7/8" straight	female 7/8" 90°	DN4110009Sxx	DN4110009Fxx
male 7/8" 90°	male 7/8" 90°	DN4110054Sxx	DN4110054Fxx

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male 7/8" 90°	female 7/8" straight	DN4110010Sxx	DN4110010Fxx
male 7/8" 90°	female 7/8" 90°	DN4110011Sxx	DN4110011Fxx
female 7/8" straight	female 7/8" straight	DN4110055Sxx	DN4110055Fxx
female 7/8" straight	female 7/8" 90°	DN4110056Sxx	DN4110056Fxx
female 7/8" 90°	female 7/8" 90°	DN4110057Sxx	DN4110057Fxx

For part number, replace “xx” with the desired cable length in meters

DeviceNet™ thick panel mount extension cordsets

5-pos. 7/8" connectors to 5-pos. 7/8" panel mount bulkheads



Cable type	Part number	Page
stationary	4001	167
continuous flexing	6001	168

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male 7/8" straight	male 7/8" bulkhead	DN4110072Sxx	DN4110072Fxx
male 7/8" straight	female 7/8" bulkhead	DN4110017Sxx	DN4110017Fxx
male 7/8" 90°	male 7/8" bulkhead	DN4110073Sxx	DN4110073Fxx
male 7/8" 90°	female 7/8" bulkhead	DN4110018Sxx	DN4110018Fxx

Connector 1	Connector 2	Part number stationary	Part number continuous flex
female 7/8" straight	male 7/8" bulkhead	DN4110015Sxx	DN4110015Fxx
female 7/8" straight	female 7/8" bulkhead	DN4110078Sxx	DN4110078Fxx
female 7/8" 90°	male 7/8" bulkhead	DN4110016Sxx	DN4110016Fxx
female 7/8" 90°	female 7/8" bulkhead	DN4110079Sxx	DN4110079Fxx

For part number, replace “xx” with the desired cable length in meters

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DeviceNet™ thin single-ended cordsets

5-pos. M12 connectors to flying leads

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® DeviceNet™ THIN

connector 2

flying leads

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male M12 straight	flying leads	DN4110019Sxx	
male M12 90°	flying leads	DN4110020Sxx	DN4110020Fxx
female M12 straight	flying leads	DN4110021Sxx	DN4110021Fxx
female M12 90°	flying leads	DN4110022Sxx	DN4110022Fxx

For part number, replace “xx” with the desired cable length in meters

DeviceNet™ thin panel mount receptacle cordsets

5-pos. M12 panel mount bulkheads to flying leads

connector 1

male M12 bulkhead

female M12 bulkhead

UNITRONIC® DeviceNet™ THIN

connector 2

flying leads

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male M12 bulkhead	flying leads	DN4110040Sxx	DN4110040Fxx
female M12 bulkhead	flying leads	DN4110039Sxx	DN4110039Fxx

For part number, replace “xx” with the desired cable length in meters

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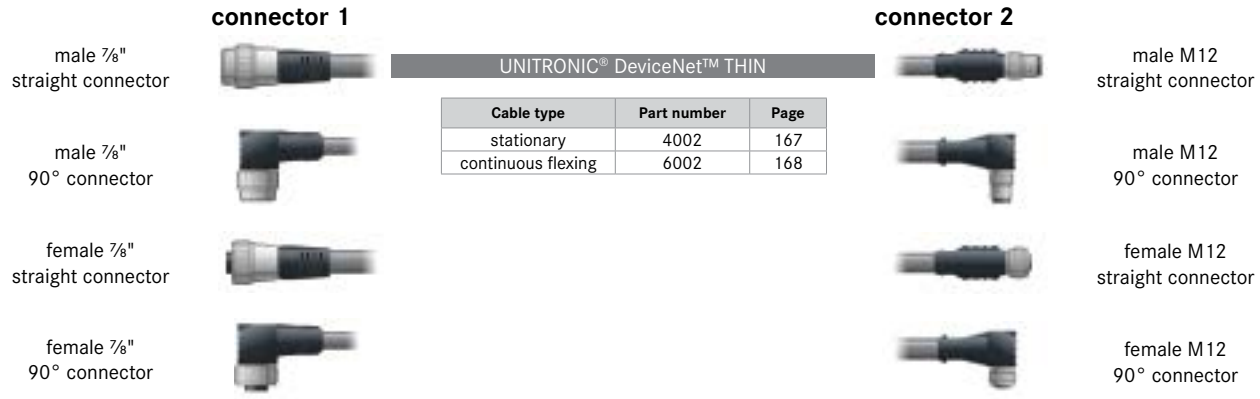
DeviceNet™ thin extension cordsets

5-pos. ⅞" connectors to 5-pos. M12 connectors



Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

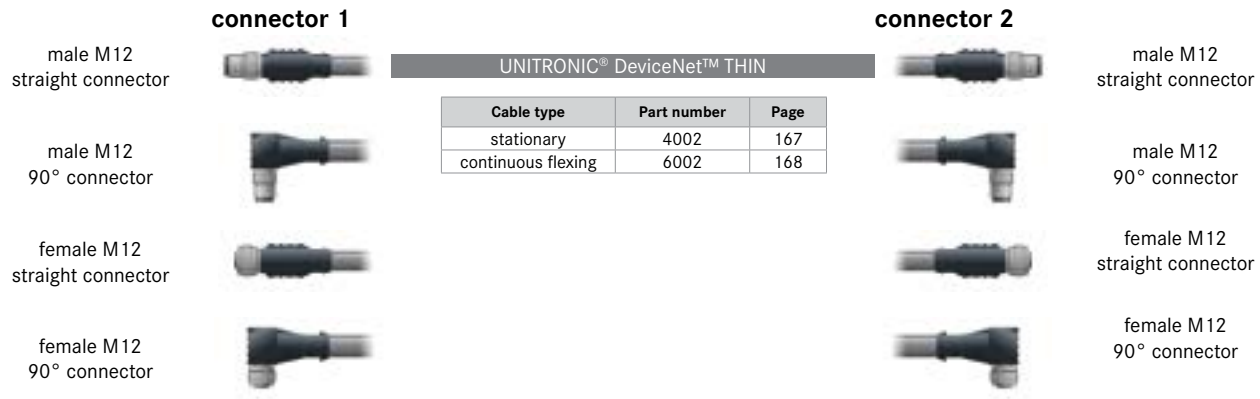
Connector 1	Connector 2	Part number	
		stationary	continuous flex
male ⅞" straight	male M12 straight	DN4110058Sxx	DN4110058Fxx
male ⅞" straight	male M12 90°	DN4110061Sxx	DN4110061Fxx
male ⅞" straight	female M12 straight	DN4110027Sxx	DN4110027Fxx
male ⅞" straight	female M12 90°	DN4110028Sxx	DN4110028Fxx
male ⅞" 90°	male M12 straight	DN4110059Sxx	DN4110059Fxx
male ⅞" 90°	male M12 90°	DN4110062Sxx	DN4110062Fxx
male ⅞" 90°	female M12 straight	DN4110029Sxx	DN4110029Fxx
male ⅞" 90°	female M12 90°	DN4110030Sxx	DN4110030Fxx

Connector 1	Connector 2	Part number	
		stationary	continuous flex
female ⅞" straight	male M12 straight	DN4110031Sxx	DN4110031Fxx
female ⅞" straight	male M12 90°	DN4110032Sxx	DN4110032Fxx
female ⅞" straight	female M12 straight	DN4110065Sxx	DN4110065Fxx
female ⅞" straight	female M12 90°	DN4110068Sxx	DN4110068Fxx
female ⅞" 90°	male M12 straight	DN4110033Sxx	DN4110033Fxx
female ⅞" 90°	male M12 90°	DN4110034Sxx	DN4110034Fxx
female ⅞" 90°	female M12 straight	DN4110066Sxx	DN4110066Fxx
female ⅞" 90°	female M12 90°	DN4110069Sxx	DN4110069Fxx

For part number, replace “xx” with the desired cable length in meters

DeviceNet™ thin extension cordsets

5-pos. M12 connectors to 5-pos. M12 connectors



Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male M12 straight	male M12 straight	DN4110060Sxx	DN4110060Fxx
male M12 straight	male M12 90°	DN4110063Sxx	DN4110063Fxx
male M12 straight	female M12 straight	DN4110023Sxx	
male M12 straight	female M12 90°	DN4110024Sxx	DN4110024Fxx
male M12 90°	male M12 90°	DN4110064Sxx	DN4110064Fxx

Connector 1	Connector 2	Part number	
		stationary	continuous flex
male M12 90°	female M12 straight	DN4110025Sxx	DN4110025Fxx
male M12 90°	female M12 90°	DN4110026Sxx	DN4110026Fxx
female M12 straight	female M12 straight	DN4110067Sxx	DN4110067Fxx
female M12 straight	female M12 90°	DN4110070Sxx	DN4110070Fxx
female M12 90°	female M12 90°	DN4110071Sxx	DN4110071Fxx

For part number, replace “xx” with the desired cable length in meters

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DeviceNet™ thin panel mount extension cordsets

5-pos. 7/8" connectors to 5-pos. M12 panel mount bulkheads

connector 1

male 7/8" straight connector

male 7/8" 90° connector

female 7/8" straight connector

female 7/8" 90° connector

UNITRONIC® DeviceNet™ THIN

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

connector 2

male M12 bulkhead

female M12 bulkhead

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male 7/8" straight	male M12 bulkhead	DN4110085Sxx	DN4110085Fxx
male 7/8" straight	female M12 bulkhead	DN4110091Sxx	DN4110091Fxx
male 7/8" 90°	male M12 bulkhead	DN4110086Sxx	DN4110086Fxx
male 7/8" 90°	female M12 bulkhead	DN4110092Sxx	DN4110092Fxx
female 7/8" straight	male M12 bulkhead	DN4110087Sxx	DN4110087Fxx
female 7/8" straight	female M12 bulkhead	DN4110093Sxx	DN4110093Fxx
female 7/8" 90°	male M12 bulkhead	DN4110088Sxx	DN4110088Fxx
female 7/8" 90°	female M12 bulkhead	DN4110094Sxx	DN4110094Fxx

For part number, replace "xx" with the desired cable length in meters

DeviceNet™ thin panel mount extension cordsets

5-pos. M12 connectors to 5-pos. 7/8" panel mount bulkheads

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® DeviceNet™ THIN

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

connector 2

male 7/8" bulkhead

female 7/8" bulkhead

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male M12 straight	male 7/8" bulkhead	DN4110074Sxx	DN4110074Fxx
male M12 straight	female 7/8" bulkhead	DN4110080Sxx	DN4110080Fxx
male M12 90°	male 7/8" bulkhead	DN4110075Sxx	DN4110075Fxx
male M12 90°	female 7/8" bulkhead	DN4110081Sxx	DN4110081Fxx
female M12 straight	male 7/8" bulkhead	DN4110076Sxx	DN4110076Fxx
female M12 straight	female 7/8" bulkhead	DN4110082Sxx	DN4110082Fxx
female M12 90°	male 7/8" bulkhead	DN4110077Sxx	DN4110077Fxx
female M12 90°	female 7/8" bulkhead	DN4110083Sxx	DN4110083Fxx

For part number, replace "xx" with the desired cable length in meters

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DeviceNet™ thin panel mount extension cordsets

5-pos. M12 connectors to 5-pos. M12 panel mount bulkheads

connector 1

male M12 straight connector

male M12 90° connector

female M12 straight connector

female M12 90° connector

UNITRONIC® DeviceNet™ THIN

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

connector 2

male M12 bulkhead

female M12 bulkhead

Connector 1	Connector 2	Part number stationary	Part number continuous flex
male M12 straight	male M12 bulkhead	DN4110089Sxx	DN4110089Fxx
male M12 straight	female M12 bulkhead	DN4110037Sxx	DN4110037Fxx
male M12 90°	male M12 bulkhead	DN4110090Sxx	DN4110090Fxx
male M12 90°	female M12 bulkhead	DN4110038Sxx	DN4110038Fxx
female M12 straight	male M12 bulkhead	DN4110035Sxx	DN4110035Fxx
female M12 straight	female M12 bulkhead	DN4110095Sxx	DN4110095Fxx
female M12 90°	male M12 bulkhead	DN4110036Sxx	DN4110036Fxx
female M12 90°	female M12 bulkhead	DN4110096Sxx	DN4110096Fxx

For part number, replace “xx” with the desired cable length in meters

DeviceNet™ thin open style termination cordsets

5-pos. ⅞" or M12 panel mount bulkheads to 5-pos. plug header

connector 1

male ⅞" straight connector

male ⅞" bulkhead

male M12 straight connector

male M12 bulkhead

flying leads

UNITRONIC® DeviceNet™ THIN

Cable type	Part number	Page
stationary	4002	167
continuous flexing	6002	168

connector 2

plug header

Connector 1	Connector 2	Part number stationary	Part number continuous flex
⅞" to plug header			
male ⅞" straight	plug header	DN4110046Sxx	DN4110046Fxx
male ⅞" bulkhead	plug header	DN4110050Sxx	DN4110050Fxx
M12 to plug header			
male M12 straight	plug header	DN4110048Sxx	DN4110048Fxx
male M12 bulkhead	plug header	DN4110049Sxx	DN4110049Fxx
Flying leads to plug header			
flying leads	plug header	DN4110047Sxx	DN4110047Fxx

For part number, replace “xx” with the desired cable length in meters

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More than great products – Solutions

Industry-leading custom cable assemblies that meet your needs

ÖLFLEX® CONNECT team

Our dedicated ÖLFLEX® CONNECT team of sales and engineering staff can respond quickly to develop a custom cable assembly solution based on your specific needs. We are your partners providing the highest quality custom cable assemblies, and customer service, that will meet your requirements and exceed your expectations. Maintain crucial industrial communication with ÖLFLEX® CONNECT's proven quality connectivity solutions.

ÖLFLEX® CONNECT advantages:

Quality components create industry-leading finished products.

- We source the highest quality components to build the highest quality end products. Assembly components can carry major national and international approvals.

No capital investment to build your own production capability.

- Our production space is fully equipped and staffed to build the highest quality, custom cable assemblies that will meet your specifications.

We are your single source for total expenditures.

- ÖLFLEX® CONNECT provides complete project management, including sourcing, manufacturing, testing, and support. Streamlined billing processes from a single provider.

Technical expertise with decades of experience across numerous industries.

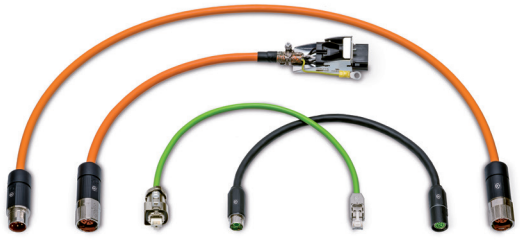
- ÖLFLEX® CONNECT has over 50 years of experience designing and building custom cable assemblies. Our rich history provides us broad capabilities that we bring to bear when creating customer solutions.

Scalability to meet your future requirements.

- We can produce custom assemblies at scale, enabling us to grow with your expanding business

Collaboration from the start.

- Our team will work closely with your engineering and logistics people during every step of the process, from design and configuration, to testing and installation. This ensures the best solution for your custom cable needs.



Standard remote access port configurations

6-9XP

6-45CS

10-1-45CS

10-45CS-UABP

16-1-MD8P

Discontinued

Discontinued

16-1-9XP

24-1-3A-9XP-MD8P

24-1-3A-9XP

32-2-3A-9XP

32-G2-3A-45CS

Discontinued

Part number	EPIC® HB enclosure	Components
10-1-45CS	HB 10	• single AC outlet • RJ45 CAT.5e shielded coupler

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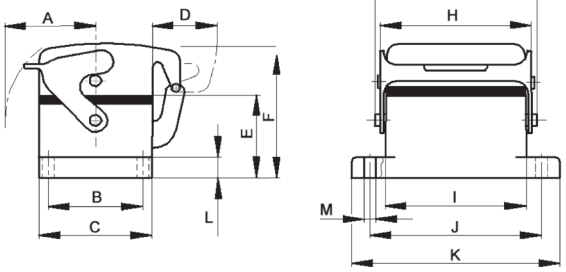
Dimensional data

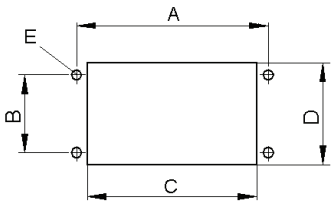
EPIC® HB series bases & panel cut outs

EPIC® HB bases



Series	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M mm
HB 6	44.0	32.0	43.0	25.0	27.8	44.8	74.8	70.0	60.0	70.0	80.0	4.0	4.3
HB 10	50.0	32.0	43.0	25.0	27.8	44.8	91.0	88.5	73.0	83.0	93.0	4.0	4.3
HB 16	50.0	32.0	43.0	25.0	27.8	44.8	111.0	109.5	93.3	103.0	113.0	4.0	4.3
HB 24	50.0	32.0	43.0	25.0	27.8	44.8	138.0	136.5	120.0	130.0	140.0	4.0	4.3
HB 32	57.7	65.0	90.2	17.8	32.7	45.0	112.8	105.0	88.3	110.0	124.3	6.2	4.9
HB 48	105.0	70.0	90.0	30.0	39.5	56.5	152.0	139.5	132.0	148.0	165.0	10.0	7.0

EPIC® HB panel cut outs



Series	A mm	B mm	C mm	D mm	E mm
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	76	5.5
HB 48	148	70	117.0	82	7.0

Custom remote access port order form

Assemble part number using the codes listed below. Ports may be ordered pre-wired with cable sets. Add “C” to the end of the component code to be wired, followed by the desired cable length in feet. Components will be housed in an appropriately-sized EPIC® HB surface mount enclosure.

Example: **Part number 48-1-25MC10-3A**:
EPIC® HB 48 housing (**48**) + Single AC outlet (**1**) + 25-pos. male D-sub (**25M**) with 10 ft of cable (**C10**) + 3A circuit breaker (**3A**)

	Qty.	✔	Description	Code	Gender front	Gender back	Termination			Pass-through configuration (specify genders)
D-subminiatures										
	____	☐	DB 9	9	☐ M	☐ F	☐ T	☐ S	☐ P	_____
	____	☐	DB 15	15	☐ M	☐ F	☐ T	☐ S	☐ P	_____
	____	☐	DB 15 high density	15H	☐ M	☐ F	☐ T	☐ S	☐ P	_____
	____	☐	DB 25	25	☐ M	☐ F	☐ T	☐ S	☐ P	_____
	____	☐	DB 37	37	☐ M	☐ F	☐ T	☐ S	☐ P	_____
							T: terminal block interface	S: solder cup	P: pass-through	

	✔	Description	Code	✔	Description	Code	✔	Description	Code
Network ports									
	☐	RJ45 CAT.5e	45C	☐	RJ45 CAT.6	45C6	☐	RJ45 CAT.6A	45C6A
	☐	RJ45 CAT.5e shielded	45CS	☐	RJ45 CAT.6 shielded	45C6S	☐	RJ45 CAT.6A shielded	45C6AS
				☐	RJ11 coupler	11C			

	✔	Description	Code
Bus connections: solder-terminated			
	☐	M12 male 8-position	M12M8
	☐	M12 female 8-position	M12F8
	☐	M12 male 4-position D-coded	M12M4
	☐	M12 female 4-position D-coded	M12F4
	☐	M12 male 5-position	M12M5
	☐	M12 male 5-position	M12F5
	☐	⅞" male 5-position	78M5
	☐	⅞" female 5-position	78F5
AC outlets			
	☐	single AC outlet	1
	☐	duplex outlet with screw termination	2S
	☐	GFCI: ground fault circuit interrupt	G2
	☐	European outlet	GAC
Mini DIN couplers			
	☐	6-position mini DIN coupler	MD6P
	☐	8-position mini DIN coupler	MD8P

	✔	Description	Code
USB ports: front-to-back			
	☐	USB A-A port	UAP
	☐	USB A-B port	UABP
	☐	USB B-A port	UBAP
	☐	USB B-B port	UBP
Circuit breakers			
	☐	1-amp circuit breaker	1A
	☐	2-amp circuit breaker	2A
	☐	3-amp circuit breaker	3A
	☐	5-amp circuit breaker	5A
Position headers			
	☐	3-position header	3H
	☐	5-position header	5H
Firewire component			
	☐	firewire	FW
Fiber optic coupler			
	☐	fiber optic coupler (specify type)	_____

Other components are available. Please specify your requirements:

_____

_____

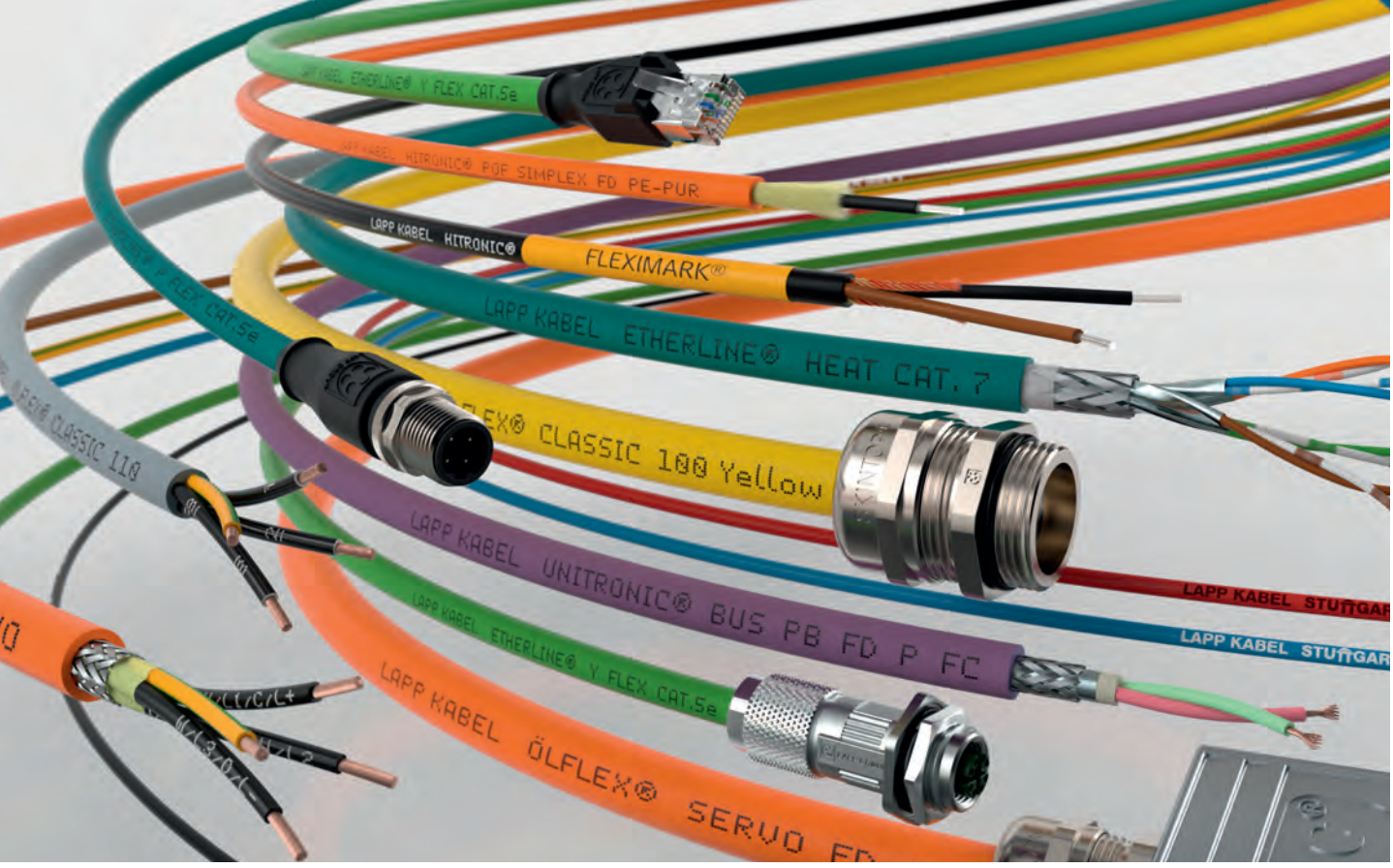
_____

_____

_____

Fax completed order form to 973-660-9330 or email to sales@lappusa.com or your local LAPP representative.

LAPP GROUP


LAPP KABEL ETHERLINE® Y FLEX CAT.5e
LAPP KABEL HITRONIC® FÜR SIMPLEX FD PE-PUR
LAPP KABEL HITRONIC®
FLEXIMARK®
LAPP KABEL ETHERLINE® HEAT CAT. 7
LAPP KABEL UNITRONIC® BUS PB FD P FC
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North American Laboratory

For over half a century, LAPP products have been expertly designed, processed, manufactured, and tested with state-of-the-art equipment, guaranteeing the finest flexible cable products available. Our credibility and expertise have classified LAPP as the innovator in the industrial flexible cable market.

In 2008, LAPP launched a state-of-the-art laboratory at our North American headquarters in Florham Park, New Jersey. This facility is the key to LAPP's leadership in new product development, testing, and product performance validation. This laboratory can simulate specific applications, environments, and test conditions to confirm our products' performance.

LAPP customers are welcome to visit and tour the laboratory and witness product testing; an illustration of our commitment and dedication. Underwriters Laboratories (UL) completed their initial assessment of this facility in July of 2008. Since then, LAPP has successfully maintained status in the Data Acceptance Program (DAP) as a Client Test Data Program (CTDP) laboratory through intense annual UL audit assessments.

As a CTDP member, the LAPP North American Laboratory has the equipment, test methods, and procedures that are identical or superior to those used at the Underwriters Laboratories test facility. This laboratory provides LAPP with the ability and confidence to predetermine compliance to UL and other safety standards. This in turn leads to significant time and cost savings.

The North American Laboratory helps provide LAPP companies with invaluable resources to maintain our edge in research and innovative leadership. This advantage is not only limited to North America but is also available globally through the LAPP network of laboratories. Providing a vital asset internationally, the combined effort of the LAPP Laboratories offer a wide variety of testing to global requirements, standards, and specifications.

State-of-the-art "Network Analyzer" for electrical properties validation

Laboratory services

The LAPP North America Laboratory (NAL) offers a unique and exclusive service for our customers: the ability to validate available products in the market, authenticate test methods and procedures in accordance to UL standards, and simulate product performance in field applications.

Together, the North American Laboratory staff members' experience totals over 50 years in the wire and cable industry. LAPP NAL is fully capable to simulate test conditions similar to real world mechanical, electrical, environmental and motion applications.

Using the test services offered by LAPP NAL will pay off with huge dividends by saving time and money. Customers can now rest assured with the knowledge that a product's test performance is no longer in question. This commitment is clearly reflected in LAPP's current product portfolio and offerings.

The LAPP North America Laboratory has the capability to perform a wide variety of mechanical, electrical, environmental, and motion testing:

Conditions	Types of test	Test method
High temperature	Oil resistance I	unaged sample is submerged in oils or chemicals in a controlled environment to be tested for physical properties retention
	Oil resistance II	
	Air oven aging	unaged sample in a controlled environment to be tested for physical properties retention
Low temperature	Cold impact	sample prepared at required low temperature to be tested for impact
	Cold bend	sample prepared at required low temperature and wrapped around a mandrel
Mechanical	Tensile & elongation	tubular or dumbbell samples to be tested for tensile strength & elongation
	Exposed run crush	crushes made on a sample with a gradual compression force
	Exposed run impact	impacts on sample with a free-fall force
	Direct burial	crushes on a sample with constant compression force for 60 seconds
	Abrasion	samples for abrasion resistance are secured by weight force and rubbed against using emery cloth
Electrical	Direct current resistance	maximum DC resistance is measured across a conductor sample
	Short term insulation resistance	sample is submerged in water for a short period in a controlled environment to be tested for insulation resistance
Flame	Vertical flame	flame application for applicable duration, sample must self-extinguish
	Horizontal flame	
Motion	Continuous flexing	sample is tested for flexibility based on bend radius and speed
	Torsion	sample is tested for torsion based on twist angle

Terms and conditions

1. A complete detailed test report will be provided.
2. Test data is intended for reference purposes only.
3. For prices and details, please contact nalg@lappusa.com.

Cable attributes

OIL RESISTANCE	FLAME RESISTANCE	MOTION TYPE	MECHANICAL PROTECTION

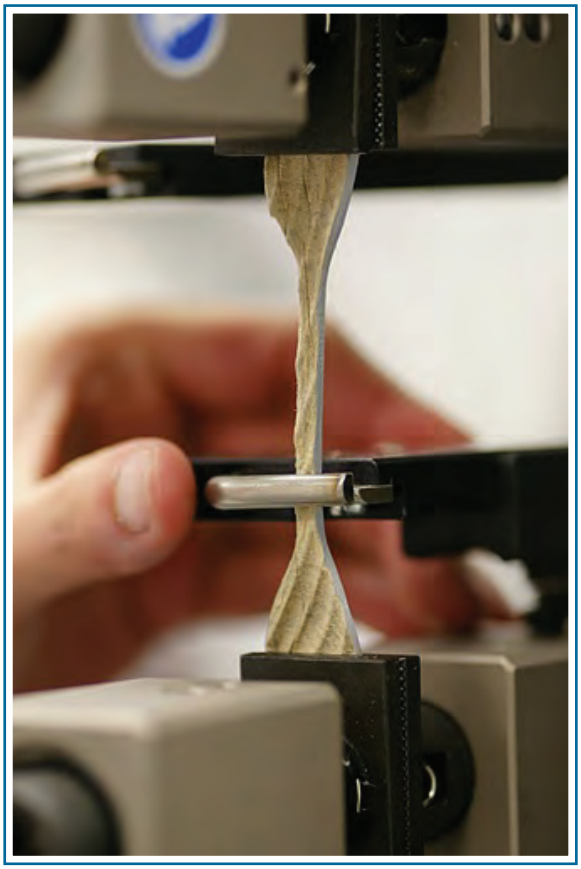
Over 50 years ago, company founder Oskar Lapp designed and manufactured the world's first flexible multi-conductor control cable. Ever since, LAPP has been known as the worldwide leader in flexible cable technology.

Through continual R&D and the extensive knowledge of our engineers, LAPP has developed criteria which will aid the cable user in deciding which cable is best suited to their application.

As you will find on the following pages, LAPP has reached a new level for specifying the following cable attributes: Oil Resistance, Flame Resistance, Motion Type, and Mechanical Protection. By setting the criteria for such important attributes, our engineers have given the cable buyer a more precise and definitive way to choose the cable that's right for their specific application or environment.

The symbols located at the top of the page can be found on the cable product pages within this catalog. To help you choose the LAPP cable that best suits your requirements, we suggest you review the criteria and definitions on the following pages and familiarize yourself with the different levels. We continually strive to provide creative solutions and the highest quality products that you have come to expect.

These criteria are intended to be used as guidelines and not definitive test results. Please contact your LAPP sales representative for specific testing results.



Oil resistance

Level	USA	CSA*	Europe*
OR-00	minimum 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% aged 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	–	–
OR-06	in oil for 7 days @ 180°C 80% unaged tensile strength 60% 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.

The type of industrial environment and other factors such as the duration of oil exposure and quantity of the liquid all attribute to the specific level of oil protection needed. Other parameters, such as the surrounding ambient temperature of the oil and the cable itself, will also play a role in determining the cables ability to withstand this type of chemical exposure. In general, the greater the ability of the cable jacket to resist the possible devastating effects of oil, the longer it will perform uninterrupted in the application. Certain industries (grinding, machine tools, etc.) will require the highest degree of oil resistance available, while other applications (office buildings, residential dwellings, etc.) will only need a minimal amount of this type of protection. LAPP provides a large product offering of cables in a wide array of different constructions that will meet the varying degrees of oil resistance required for your application.

Flame resistance

Level	USA	CSA*	Europe*
FR-00	minimum flame retardancy: cable ignites and burns easily, and will not extinguish itself.	–	–
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 ft.	FT4: Vertical Tray Test Exposed to flame for 20 min. Damage cannot exceed 5 ft.	IEC 60332-3-24 Exposed to flame for 20 min. Damage cannot exceed 8.2 ft.
FR-04	UL Vertical Flame and Smoke Test Exposed to flame for 20 min. Damage cannot exceed 8 ft. Smoke release not to exceed 95 m^2 and peak smoke release rate does exceed 0.25 m^2.	FT4-ST1: Vertical Flame and Smoke Test Exposed to flame for 20 min. Damage cannot exceed 5 ft. Smoke release not to exceed 150 m^2 and peak smoke release rate does exceed 0.40 m^2.	IEC 60332-3-25 Exposed to flame for 20 min. Damage cannot exceed 8.2 ft.
FR-05	UL Flame Test for Riser Cables (UL 1666: 527,500 BTU) Flame spread cannot exceed 12 ft. Measured temperature at any point cannot be greater than 850°F.	–	–
FR-06	UL Flame Test for Plenum Cables (UL 910: 300,000 BTU) Exposed to flame for 20 min. Damage cannot exceed 5 ft, peak smoke optical density not to exceed .50.	FT6 Exposed to flame for 20 min. Damage cannot exceed 5 ft, peak smoke optical density not to exceed .50.	IEC 61034-2 Exposed to flame for a maximum of 40 min. Minimum value of 60% light transmittance.

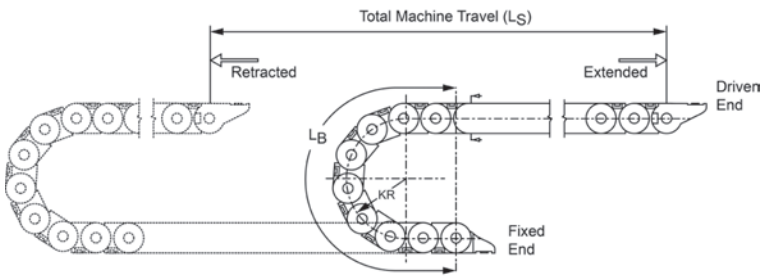
* These flame standards are mentioned for purposes of reference only. Some Canadian and European test standards are not necessarily represented here as complete equivalents to the US standards but have been referenced due to some similarities in requirements. Refer to the individual standards for detailed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

LAPP cables are manufactured to comply with varying degrees of flame resistance requirements. Depending upon your application, certain levels of flame resistance are necessary in order to meet specific end-use requirements. Flammability ratings generally determine the end-use application, which is generally dictated by local or national electrical codes. Certain applications require a minimal amount of flame resistance, such as UL 62 or CSA FT2 for flexible cordage. In this instance, the end use of these products does not deem the necessity of imposing a high flammability requirement. Other applications, such as cables that will be installed permanently within an industrial building, commercial dwelling, or family residence, will most likely require a higher degree of flammability resistance like UL Vertical Tray or CSA FT4. Whatever the end-use application, LAPP meets your requirements with a wide variety of cable products meeting different levels of flame resistance.

Motion type

Level	Description	Definition	Cycle life range
FL-00	very stiff (static)	low strand count and difficult to work with, used in static applications	–
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-01	wind turbine torsion -20°C	designed for basic wind torsion to an angle of ± 150°/m application temperature: -20°C	up to 2,000 cycles
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
WT-03	wind turbine torsion -50°C	designed for basic wind torsion to an angle of ± 150°/m application temperature: -50°C	up to 2,000 cycles
CF-01*	continuous flexing: basic	designed for basic 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	designed for high-cycle continuous flexing and long cable track applications distance: chain length up to 300 feet acceleration: up to 50 m/s² for chain length up to 15 feet	8 - 20 million cycles
T-01	torsion	designed to withstand torsion applications	2 million cycles
TCF-01	torsion & continuous flex	designed for high cycle continuous flexing and torsion applications	10 million cycles

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



L_S = total travel length
L_B = loop length
KR = bend radius

It is important to note that the test variables must be identical, otherwise the comparison is invalid.

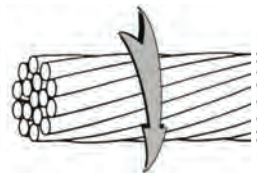
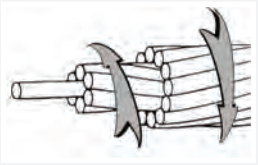
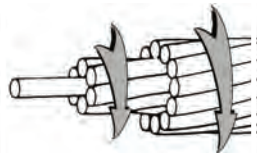
LAPP cable designs are evaluated under the most extreme test conditions. The cycle life testing ranges in the above table do not indicate cable flex cycle failure, but are only indicators of suggested ranges for the intended application. When LAPP continuous flex cables are installed correctly in the application, a longer service life will result. For over half a century, LAPP products have been expertly designed, processed, manufactured, and tested with state-of-the-art equipment, guaranteeing the finest flexible cable products available. Our credibility and expertise have classified LAPP as the innovator in the industrial flexible cable and robotic industry.

Motion type

Types of motion

LAPP terminology	LAPP definition	Recommended applications
Stationary	Cables are installed and left in their original position. They are only moved for purposed of maintenance, repair, or retrofitting.	cable trays, conduits, wire ways installed in buildings, machines, manufacturing facilities, etc.
Flexible	Cables are moved randomly in a non-automated application. They are susceptible to occasional uncontrolled conditions of movement.	flexible cable tray routings, machine tools, residential electronics, portable power equipment, etc.
Continuous Flexing	Cables are in constant linear motion in automated applications. They are subjected to continuous forces applied during bending motions.	horizontal and vertical c-tracks, power chains, automated assemblies, etc.
Torsion	Cables are bending and twisting in a x-y-z motion in automated applications. They are subjected to continuous forces applied during torsion motions.	robot, robot cells, pick-n-place machinery, automotive assembly, etc.

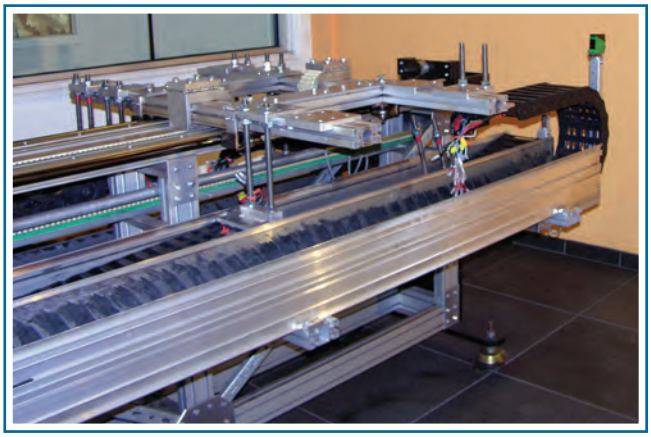
Types of cabling

LAPP terminology	LAPP definition	Recommended applications
Unilay or bunch 	Conductors of any number are twisted together with the same lay direction and cable lay length. Bunch construction will not have a well-defined geometric configuration and may have a variable cross-section. A unilay construction will have a well-defined geometric configuration and a defined cross-section.	this type of cabling technique is usually used on stationary designs.
Concentric contra-helical 	Conductors are surrounded by well-defined layers of helically laid conductors. Each layer has a reversed lay direction and an increasing lay length in each succeeding layer.	this type of cabling technique is usually used on continuous flex designs.
Concentric unilay 	Conductors are surrounded by one or more layers of helically-laid conductors with the same direction of lay and increasing lay length in each succeeding layer.	this type of cabling technique is usually used on torsional and continuous flex designs.

Motion testing

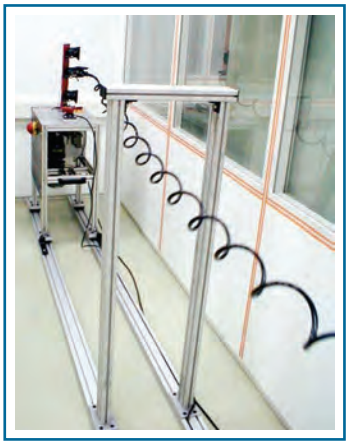
Test conditions for continuous flex cable

Minimum bend radius range factor	5 - 15 x cable diameter
Bending radius range factor during testing	4 - 12 x cable diameter
Travel distance under test conditions	varies: 15 - 300 ft
Acceleration under test conditions	varies: up to 164 ft/s^2
Temperature range during test	-10°C to +22°C
Speed of travel during test	varies: 6.5 - 16 ft/s



Test conditions for torsion cable

Standard torsion test	± 450°/m
Severe torsion test	± 720°/m
Rotational speed	varies: up to 5 rpm
Tensile load	varies: up to 150 lbs



Mechanical protection

Level	Description	Impact	Crush	Cold impact	Cold bend	Tensile	Elongation	Standard
MP-00	Minimum mechanical resistance protection	–	–	–	–	–	–	–
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 (-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-04	Very good rated for Exposed Run (-ER)	10/50 lb	2,500/ 4,200 lbf	-40°C	-55°C***	2,300 psi	275%	UL 1277 ASTM D-412
MP-05	Excellent	**	**	–	–	3,400 psi	325%	ASTM D-1457
MP-06	Superior	**	**	–	–	4,200 psi	500%	ASTM D-412

* 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.

Depending upon the specific application, a cable may be exposed to external factors and various types of abuse. The explicit type of industrial manufacturing or processing environment will determine the actual degree of mechanical protection that a cable requires. Such environments include: CNC machine centers, mining, food and beverage plants, automotive assembly lines, machine tools, data processing, and automation applications. The unintentional mishaps that occur every day during routine manufacturing can range from a cable being struck by a falling object, to it being accidentally run over; there are many types of potential mechanical abuse in industrial environments. With all the hazards that your cable may be exposed to, you will need the protection and reliability that is provided in the many design configurations offered by LAPP.

Installation instructions for cable chain

How to properly install your LAPP cable

1. Only LAPP continuous flexing cable should be used in a moving cable chain application.

2. When selecting cable for cable chains, the following criteria must be taken into consideration: environmental conditions (e.g.: 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 chain 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. It is important that the cable be laid out or hung at least 24 hours prior to installation 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 chain, the chain 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 chain and not weaved between or around other cables. The cables should lay loosely side by side in the chain. A minimum clearance of five percent of the cable diameter should be allowed on each side of the cable. When cable is installed in chain where spacers are provided, they should be separated from each other.

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

7. The weight of the cables must be evenly distributed. Heavier cables should be placed towards the outside of the cable chain, while lighter ones should occupy the center of the cable chain. When the cable chain is side-mounted, always place the larger cable towards the outside and the smaller cables toward the inside. Cables must not be pulled tight against the inner chain curve, nor pushed tight against the outer chain curve.

8. After the cable chain 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 chain is possible.

9. The cables should be clamped into position at both ends of the cable chain. 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. **When calculating 15 x cable diameter, it is important to use the diameter of the largest cable in the chain.**

Properties of insulation materials

Property	ASTM method	PVC	Semi-rigid PVC	Polyethylene	Foamed polyethylene	Polypropylene	Foamed polypropylene	Polyurethane
Specific gravity	D-792	1.15 - 1.68	1.37	0.90 - 1.27	0.55 - 0.61	0.895 - 0.910	0.55 - 0.60	1.00 - 1.20
Tensile strength, psi	D-638	1500 - 4400	3900	1500 - 2150	540	2800 - 4400	250	>4800
Elongation %	D-412	38 - 395	240	175 - 590	165	650	100	530 - 750
Volume resistivity, Ω-cm	D-257	1013 - 1016	1014	>1014	1015	1.5 x 1014 2.8 x 1014	1014	2 x 1012 11 x 1012
Dielectric strength, volts/mil	D-149	240 - 490	390	220 - 1400	290	440 - 830	290	320 - 620
Dielectric constant @ 1 kHz	D-150	3.7 - 8.1	2.9	2.28 - 2.55	1.7	2.2	1.7	5.7 - 7.7
Power factor dissipation @ 1 kHz	D-150	0.008 - 0.17	0.0038	0.00049	0.00035	0.0043	0.0034	0.043 - 0.060
Abrasion resistance		good	excellent	good	poor	poor	poor	excellent
Heat resistance		good	good	good	poor	good	poor	good
Weatherability		good	good	excellent	poor	excellent	poor	good
Flame retardancy		excellent	good	poor	poor	poor	poor	fair
Water resistance		good	good	excellent	poor	excellent	poor	good
Acid resistance		good	good	good	fair	excellent	fair	fair
Alkali resistance		excellent	excellent	good	fair	excellent	fair	fair
Aliphatic hydrocarbon resistance		good	good	poor	fair	fair	poor	fair
Aromatic hydrocarbon resistance		poor	poor	poor	fair	fair	poor	poor

Property	HYTREL®	Nylon	TPE	Thermoset neoprene	SBR	KYNAR®	PFA	TEFLON® FEP	TPE
Specific gravity	1.24	1.08	0.90 - 1.29	1.21 - 1.60	0.92	1.74 - 1.77	2.13 - 2.16	2.13 - 2.16	2.13 - 2.20
Tensile strength, psi	6000	6000	1250 - 2200	1175 - 2600	>2800	5000 - 7400	4000 - 4200	2600 - 3000	1100 - 3300
Elongation %	490	500	490 - 730	290 - 680	>430	500	300	260 - 320	265
Volume resistivity, Ω-cm	1010	1012	2 x 1016	1010 - 1012	3 x 1015	2 x 1012	>1014	2 x 1016	>1016
Dielectric strength, volts/mil	450	460	700	590	400 - 500	250	480	480 - 550	500
Dielectric constant @ 1 kHz	3.8	4.6	2.8	4.9 - 7.1	3	7.6	2.2	2.2	2.2
Power factor dissipation @ 1 kHz	0.018	0.045	0.0018	3.6	0.0035	0.019	0.00003	0.0006	0.0002
Abrasion resistance	excellent	excellent	good	excellent	good	good	fair	good	fair
Heat resistance	good	good	good	good	fair	excellent	excellent	excellent	excellent
Weatherability	excellent	good	good	good	fair	good	good	good	excellent
Flame retardancy	poor	poor	good	good	poor	excellent	excellent	excellent	excellent
Water resistance	good	fair	good	excellent	good	good	excellent	good	excellent
Acid resistance	good	good	good	good	fair	excellent	excellent	excellent	excellent
Alkali resistance	good	good	good	good	fair	excellent	excellent	excellent	excellent
Aliphatic hydrocarbon resistance	good	good	good	good	poor	excellent	excellent	excellent	excellent
Aromatic hydrocarbon resistance	good	good	good	fair	poor	excellent	excellent	excellent	excellent

HYTREL® & TEFLON® are registered trademarks of DuPont. KYNAR® is a registered trademark of Arke

LAPP cable recommendations for common coolants

Common coolants used in harsh environments

✧ = no measurable change ✖ = slight change ✖ = noticeable change * = consult sales rep

Fluid manufacturer	Product	ÖLFLEX® 90, 150, 190, 890, 891	ÖLFLEX® TRAY II, VFD SLIM, VFD with Signal	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	neoprene	PA
Argent	H-114-LS	✖	✧	*	✧	–	✖	–	–	–	–	–
	H-114-M	✧	✖	*	✖	✖	✖	✧	✖	*	✧	–
	MS-5710-CG	✖	✧	✖	✧	–	–	–	–	–	–	–
	MS5710F	✧	✧	✖	✖	✖	✖	✧	✧	✧	✧	–
Armour	Lard	✧	✖	*	✖	✧	✧	–	✧	✧	*	✧
Blaser Swiss	Vasco 1000/Art.2800	✧	✧	✖	✧	–	✧	–	–	–	–	–
	Grindex Univ./Art.882	✧	✧	✖	✧	–	✧	–	–	–	–	–
	Grindex Univ./Art892	✖	✖	✖	✖	*	*	✧	✧	✧	✧	–
Buckeye	Safe-T-Fluid #4	✧	✧	*	✧	–	✧	–	–	–	–	–
	Safe-T-Oil #4	✧	✧	*	✖	✧	✧	✧	✖	✧	✧	–
	CT9612	✧	✖	*	✧	–	✖	–	–	–	–	–
Castrol	WY1-938A	✧	✖	✖	✧	–	–	–	–	–	–	–
	WY3-010C	✧	✧	*	✧	*	✖	–	✖	✖	✧	✧
	Syntillo 1023	✖	✧	✖	✧	–	–	–	–	–	–	–
	WS3-020A	✖	✖	✖	✧	–	–	–	–	–	–	–
	Clearedge 6519	✧	✧	✖	✖	–	–	–	–	–	–	–
	Clearedge 6550	✖	✧	✖	✖	–	–	–	–	–	–	–
	Superedge 6768	✧	✧	*	✖	–	–	–	–	–	–	–
	GTX-SW30- Oil	✧	✖	*	✖	–	–	–	–	–	–	–
	Type F Transmission	✧	✧	✧	✧	–	–	–	–	–	–	–
	DEXRON III Mercon	✧	✧	*	✧	–	–	–	–	–	–	–
	Cooledge 8600	✧	✖	*	*	*	✧	✖	✖	✧	✧	–
	Ilogrind FGO Series	✧	✖	*	✖	✖	✧	✧	✧	✧	✧	–
Chem Tech	CT9612 (2)	✧	✖	✖	✧	–	✧	–	–	–	–	–
	Tech Cool 3404MG	✧	✖	*	✖	✧	✧	–	✧	✧	✧✧✧	
Clorox	Sodium Hypochlorite	✧	✖	✖	✖	✖	✖	–	✧	✧	*	✖
Cin. Millicron	Milpro 6000	✧	✧	*	✧	✧	✧	✧	✧	✧	✧	–
	Quantalube 270	✧	✧	*	✧	✖	✖	✧	✧	✧	✧	–
Citgo	Citcool 22 Conc.	✧	✧	*		✖	✖	–	–	✧	✧	✧
	Citcool 33 Conc.	✧	✧	✧	✖	✖	✖	–	–	✧	✧	✧
	Sentry 19	✧	✧	*	✖	✧	✧	–	–	✧	✖	✧
	Cutting Oil NC 205	✧	✧	*	*	✖	✖	–	–	*	*	✧
	Cutting Oil NC 215	✧	✧	*	✖	✖	✧	–	–	*	*	✧
CLC Lubr.	CLC Finish HX-65	✧	✖	✖	✧	✧	✧	–	✧	✧	✧	✧
D.A. Stuart	Excelene 420	✧	✧	*	✖	–	–	–	–	–	–	–
	Dascool Nobalt KM	✧	✖	✖	✖	✧	✧	✧	✧	✧	✧	–

Lubricating oils/coolants, water soluble oils & emulsions and commercial products are tested at 60°C for 5 days. Paint solvents are tested at 23°C for 5 days.
Not all products tested are listed above. If the cable series you need is not listed above, call your LAPP sales representative for assistance.

☒ = no measurable change ✖ = slight change ✖ = noticeable change * = consult sales rep

Fluid manufacturer	Product	ÖLFLEX® 90, 150, 190, 890, 891	ÖLFLEX® TRAY II, VFD SLIM, VFD with Signal	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	neoprene	PA
EPP Tech	400 Klear Kool	✖	✖	✖	✖	–	–	–	–	–	–	–
Fuchs Lubricants	GK225	☒	✖	*	✖	✖	✖	✖	✖	*	✖	–
	Renogrind FG16	✖	✖	*	✖	✖	☒	–	–	✖	✖	☒
	CPD 7003	☒	☒	*	✖	☒	☒	–	–	✖	✖	☒
	ECOSYN 975 (4%)	☒	☒	☒	☒	☒	✖	☒	☒	☒	☒	–
	ECOSYN 2205 CO	☒	☒	☒	✖	✖	☒	–	–	✖	☒	☒
	Melsol Supersol	☒	✖	*	☒	✖	✖	–	✖	✖	☒	☒
	Tuf Draw 2806-M-100	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	–
G-C Lubricants	Kool Grind 900N	☒	✖	*	✖	✖	☒	–	–	✖	✖	☒
	Kool Grind 960	☒	☒	*	✖	☒	☒	✖	☒	✖	✖	☒
	Aqua Kool PTC	☒	✖	*	✖	✖	✖	–	–	✖	*	☒
	Aqua Syn 55	☒	✖	☒	✖	✖	✖	–	–	✖	☒	☒
	SintoGrind TT	☒	☒	*	☒	☒	☒	✖	☒	☒	☒	–
Hangsterfers	Missie Lube #1XL	✖	✖	*	✖	☒	☒	–	–	✖	✖	☒
	Missie Lube #1XXL	✖	✖	*	✖	✖	☒	–	–	✖	☒	–
	Crystal Cut #322	☒	✖	☒	✖	✖	✖	–	–	✖	✖	–
	Crystal Cut #322 @5%	☒	✖	☒	☒	☒	✖	–	–	✖	✖	–
	R-100	☒	☒	☒	☒	☒	☒	–	☒	☒	✖	☒
	R-100 @ 5%	☒	✖	☒	☒	✖	☒	–	–	☒	✖	–
	S500CF	☒	☒	*	✖	✖	✖	–	✖	*	✖	☒
	S500CF@10%	☒	✖	☒	✖	✖	☒	–	–	☒	✖	–
	Hard Cut 5418	☒	☒	*	✖	✖	☒	☒	☒	✖	☒	–
	Way Oil #2	✖	✖	*	✖	☒	☒	–	–	*	☒	–
	Antiwear 32	✖	☒	✖	✖	☒	☒	–	–	*	☒	–
	Antiwear 66	✖	☒	✖	✖	☒	☒	–	–	*	☒	–
Hanilo	171	☒	☒	*	✖	☒	☒	☒	*	*	☒	–
Humoco	Iodine	✖	✖	☒	*	☒	✖	☒	☒	✖	☒	–
Itech	CT9612 (3)	☒	✖	*	☒	–	☒	–	–	–	–	–
J & J	Mineral Oil	☒	✖	*	☒	☒	☒	–	✖	☒	✖	☒
Lubrisystems	Lubra-Cut UMC	☒	☒	☒	✖	✖	☒	–	–	☒	✖	–
Master Chemical	Trim O D250	☒	✖	✖	✖	✖	☒	✖	✖	☒	☒	–
	Trim VHP E210	☒	☒	✖	*	✖	✖	☒	☒	☒	☒	–
	Trim WB 9303 12 2	☒	☒	*	☒	*	✖	✖	✖	✖	☒	–
Mobil	Mobilemet Upsilon	✖	✖	*	✖	–	☒	–	–	–	–	–
	DTE 11M	☒	☒	*	✖	✖	☒	✖	☒	☒	☒	–
	DTE FM 32	☒	☒	*	☒	✖	☒	✖	☒	✖	☒	–

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Not all products tested are listed above. If the cable series you need is not listed above, call your LAPP sales representative for assistance.

LAPP cable recommendations for common coolants

Common coolants used in harsh environments

☒ = no measurable change ✖ = slight change ✖ = noticeable change * = consult sales rep

Fluid manufacturer	Product	ÖLFLEX® 90, 150, 190, 890, 891	ÖLFLEX® TRAY II, VFD SLIM, VFD with Signal	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	neoprene	PA
Monsanto	Glacier Motor	☒	☒	✖	✖	✖	☒	☒	☒	✖	☒	–
Motorex	SwissCool 7300 CF	☒	✖	✖	✖	☒	✖	–	☒	✖	☒	☒
Mullen	1270-4	☒	✖	*	☒	–	☒	–	–	–	–	–
NASCO	Acetone	*	*	*	☒	✖	*	☒	☒	☒	✖	–
National Oil	Nocco Grind (11) Conc.	✖	☒	*	✖	✖	☒	–	–	✖	✖	☒
	Nocco Grind (11) 10%	☒	✖	☒	✖	✖	✖	–	–	☒	☒	☒
	Nocco Grind 11	☒	☒	*	☒	☒	☒	✖	☒	✖	☒	–
	Nocco Grind Modl	☒	☒	*	☒	☒	☒	✖	☒	✖	☒	–
Novamax	Circlene #FG 20AMO	✖	☒	✖	☒	–	✖	–	–	–	–	–
	Circlene #FG 67	✖	✖	*	✖	–	✖	–	–	–	–	–
Quaker	13413	☒	☒	*	☒	–	☒	–	–	–	–	–
Rustick	WS-500A	☒	☒	*	✖	✖	✖	–	–	✖	*	☒
Solutia	MCS-2638	☒	✖	*	✖	✖	✖	☒	☒	☒	☒	–
Spartan	Carbide Grinder	✖	✖	✖	☒	–	☒	–	–	*	–	–
	Synspar GP	✖	✖	✖	✖	–	–	–	–	*	–	–
	Cutter EXP	☒	☒	✖	✖	–	–	–	–	*	–	–
STP	Dot 3 Brake Fluid	✖	✖	✖	*	*	*	☒	☒	☒	☒	–
	Dot 4 Brake Fluid	✖	✖	✖	*	–	–	–	–	–	–	–
Texaco	Rando Oil HD 26	☒	☒	*	☒	✖	☒	–	–	*	☒	–
	Cleartex D	☒	☒	*	✖	✖	☒	–	–	☒	✖	☒
	Oil Coolant Reno 488	☒	✖	*	✖	✖	☒	–	–	✖	*	☒
Uni-Pro	Pro Cool 3000	☒	✖	✖	✖	*	✖	–	☒	✖	✖	☒
WD-40	WD-40	☒	☒	*	✖	✖	☒	☒	☒	✖	☒	–
Wesson	Vegetable Oil	☒	✖	*	✖	☒	☒	–	☒	✖	✖	☒
Westmont	Bio-Cool 55	☒	✖	✖	✖	☒	✖	–	☒	✖	☒	☒
Yushiro Chem.	Yushiron Oil #2	☒	☒	*	✖	✖	☒	–	–	*	☒	–
Zip Strip	Denaturated Alcohol	☒	✖	*	✖	✖	☒	☒	✖	☒	☒	–
	MEK	*	*	*	*	*	*	☒	☒	☒	✖	–
	Naphtha	☒	☒	☒	☒	☒	☒	✖	☒	☒	☒	–
	Toulene	*	*	*	✖	✖	✖	✖	☒	☒	✖	–
	Xylene	✖	*	*	✖	✖	✖	✖	✖	✖	✖	–
	Turpentine	☒	☒	*	☒	☒	☒	✖	☒	☒	☒	–

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Not all products tested are listed above. If the cable series you need is not listed above, call your LAPP sales representative for assistance.

Cable chemical resistance

– **not tested**
⛒ **good resistance**
no to slight reaction
✖ **moderate resistance**
slight to moderate reaction
✖ **low/no resistance**
moderate to strong reaction

All tests were performed at a temperature of +20°C.

Chemical	ÖLFLEX® SMART 108, CLASSIC 100/110, SERVO 2YSLCY/9YSLCY	ÖLFLEX® FD 90/90 CY, 150, 190, 890, 191/191 CY, FD, TRAY II, VFD cables, SERVO 709 CY, SERVO TC, AUTO-I, CONTROL TM/TM CY, FORTIS, servo cables acc. to SIEMENS® 6FX 5008, UNITRONIC® 300	ÖLFLEX® CLASSIC 110 SY/110 CY, 100 CY	PUR-jacketed cables; ÖLFLEX® CLASSIC 400 P/CP, 490 P, 540 P/CP, 590 P, SERVO 795 P, SERVO 796 CP, 855 P/CP, FD 891 P, ROBOT 900, F1, PUR S, CRANE PUR, servo cables acc. to SIEMENS® FX 8PLUS, UNITRONIC® FD P, LIYD 11Y, FD CP/CP (TP), FD Plus, PUR; HITRONIC® POF (PUR)	ÖLFLEX® CRANE, round & flat	ÖLFLEX® CRANE 2S, LIFT F, POWER IX, H07RN-F, LiFY single core	ÖLFLEX® HEAT 180
Inorganic chemicals							
Alums, cold-saturated concentration	⛒	⛒	⛒	–	⛒	⛒	⛒
Aluminum salts, any concentration	⛒	⛒	⛒	–	⛒	⛒	⛒
Ammonia, aqueous, 10% concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Ammonium acetate, aqueous, any concentration	⛒	⛒	⛒	–	–	⛒	⛒
Ammonium carbonate, aqueous, any concentration	⛒	⛒	⛒	✖	⛒	⛒	–
Ammonium chloride, aqueous, any concentration	⛒	⛒	⛒	⛒	⛒	⛒	–
Barium salts, any concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Boric acid, aqueous	⛒	⛒	⛒	✖	⛒	⛒	⛒
Calcium chloride, aqueous, cold-saturated concentration	⛒	⛒	⛒	✖	⛒	⛒	⛒
Calcium nitrate, aqueous, cold-saturated concentration	⛒	⛒	⛒	–	⛒	⛒	✖
Chromium salts, aqueous, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	–
Potassium carbonate, aqueous (potash)	⛒	⛒	⛒	–	✖	⛒	⛒
Potassium chlorate, aqueous, cold-saturated concentration	⛒	⛒	⛒	–	⛒	⛒	–
Potassium chloride, aqueous, cold-saturated concentration	⛒	⛒	⛒	✖	⛒	⛒	⛒
Potassium dichromate, aqueous	⛒	⛒	⛒	✖	⛒	⛒	⛒
Potassium iodide, aqueous	⛒	⛒	⛒	–	⛒	⛒	⛒
Potassium nitrate, aqueous, cold-saturated concentration	⛒	⛒	⛒	–	–	–	–
Potassium permanganate, aqueous	✖	✖	✖	✖	⛒	✖	⛒
Potassium sulfate, aqueous	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Copper salts, aqueous, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Magnesium salts, aqueous, cold-saturated concentration	⛒	⛒	⛒	✖	⛒	⛒	⛒
Sodium bicarbonate, aqueous (natron)	⛒	⛒	⛒	✖	⛒	⛒	⛒
Sodium bisulfate, aqueous	⛒	⛒	⛒	⛒	✖	⛒	⛒
Sodium chloride, aqueous (table salt)	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Sodium thiosulfate, aqueous (fixing salt)	⛒	⛒	⛒	✖	⛒	⛒	⛒
Nickel salts, aqueous, cold-saturated concentration	⛒	⛒	⛒	–	⛒	⛒	⛒
Phosphoric acid, 50% concentration	⛒	⛒	⛒	✖	⛒	⛒	✖
Mercury, 100% concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Mercury salts, aqueous, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Nitric acid, 30% concentration	✖	✖	✖	✖	✖	✖	✖
Hydrochloric acid, concentrated	✖	✖	✖	✖	✖	✖	✖
Sulfur, 100% concentration	⛒	⛒	⛒	⛒	⛒	⛒	✖
Sulfur dioxide, gaseous	⛒	⛒	⛒	–	⛒	⛒	✖
Carbon disulfide	✖	✖	✖	✖	✖	✖	✖
Hydrogen sulfide	⛒	⛒	⛒	⛒	⛒	⛒	✖
Sea water	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Silver salts, aqueous	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Hydrogen peroxide, 3% concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Zinc salts, aqueous	⛒	⛒	⛒	✖	⛒	⛒	✖
Tin(II) chloride	⛒	⛒	⛒	–	⛒	⛒	⛒
Organic chemicals							
Ethanol, 100% concentration	✖	✖	✖	✖	⛒	✖	⛒
Formic acid, 30% concentration	✖	✖	✖	✖	⛒	✖	–
Petrol	✖	✖	✖	⛒	✖	✖	✖
Succinic acid, aqueous, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	–
Acetic acid, 20% concentration	✖	✖	✖	✖	⛒	✖	⛒
Hydraulic oil	✖	✖	✖	✖	✖	✖	–
Isopropanol, 100% concentration	✖	✖	✖	✖	⛒	✖	✖
Machinery oil	✖	⛒	✖	⛒	✖	✖	✖
Methanol, 100% concentration	✖	✖	✖	✖	⛒	✖	⛒
Oxalic acid, aqueous, cold-saturated concentration	⛒	⛒	⛒	–	✖	⛒	✖
Cutting oil	✖	⛒	✖	⛒	✖	✖	–
Plant-based oils & fats	✖	⛒	✖	⛒	✖	✖	✖
Tartaric acids, aqueous	⛒	⛒	⛒	–	⛒	⛒	⛒
Citric acids	⛒	⛒	⛒	✖	⛒	⛒	⛒

The information presented in this table is accurate to the best of our knowledge and experience.
However, it must be treated as a non-binding guideline only; in many cases, tests must be carried out under working conditions to reach a definitive conclusion.

Cable chemical resistance

– **not tested**
⛒ **good resistance**
no to slight reaction
✖ **moderate resistance**
slight to moderate reaction
✖ **low/no resistance**
moderate to strong reaction

All tests were performed at a temperature of +20°C.

Chemical	TPE-jacketed cables: ÖLFLEX® HEAT 205/260, CRF, HF Tray Plus, SDP, AUTO-X, CONTROL M	Halogen-free cables; UNITRONIC® H-(ST)H, NHXMH, HF TRAY	HITRONIC® fiber optic cables	ÖLFLEX® TC 600, POWER QUAD II, UNITRONIC® 190, 100 CY, LiYY, LiYCY, Li2YCY(TP), Li2YCY PiMF, FD/FD CY, FD 890, computer cables; HITRONIC® FD/FD CY, POF (PVC)	ÖLFLEX® CRANE NSHTÖU, NSGAFÖU, CRANE 2S, H01N2-D, H05RN-F, H07RN-F, H07RN8-F	LiY single cores, H05V-K, H07V-K, LiFY, Multi-standard SC 1/SC 2.1	ÖLFLEX® ROBUST 200, 210, 215 C
Inorganic chemicals							
Alums, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Aluminum salts, any concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Ammonia, aqueous, 10% concentration	⛒	✖	⛒	⛒	–	⛒	⛒
Ammonium acetate, aqueous, any concentration	⛒	–	⛒	⛒	✖	⛒	⛒
Ammonium carbonate, aqueous, any concentration	⛒	–	⛒	⛒	⛒	⛒	⛒
Ammonium chloride, aqueous, any concentration	⛒	–	⛒	⛒	⛒	⛒	⛒
Barium salts, any concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Boric acid, aqueous	⛒	✖	⛒	⛒	⛒	⛒	⛒
Calcium chloride, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Calcium nitrate, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Chromium salts, aqueous, cold-saturated concentration	⛒	–	⛒	⛒	⛒	⛒	✖
Potassium carbonate, aqueous (potash)	⛒	–	⛒	⛒	⛒	⛒	⛒
Potassium chlorate, aqueous, cold-saturated concentration	⛒	–	⛒	⛒	✖	⛒	⛒
Potassium chloride, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Potassium dichromate, aqueous	⛒	–	⛒	⛒	⛒	⛒	⛒
Potassium iodide, aqueous	⛒	✖	⛒	⛒	⛒	⛒	–
Potassium nitrate, aqueous, cold-saturated concentration	–	✖	⛒	⛒	⛒	⛒	⛒
Potassium permanganate, aqueous	⛒	–	✖	✖	⛒	✖	⛒
Potassium sulfate, aqueous	⛒	✖	⛒	⛒	⛒	⛒	⛒
Copper salts, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Magnesium salts, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Sodium bicarbonate, aqueous (natron)	⛒	–	⛒	⛒	⛒	⛒	⛒
Sodium bisulfate, aqueous	⛒	–	⛒	⛒	⛒	⛒	⛒
Sodium chloride, aqueous (table salt)	⛒	✖	⛒	⛒	⛒	⛒	⛒
Sodium thiosulfate, aqueous (fixing salt)	⛒	–	⛒	⛒	⛒	⛒	⛒
Nickel salts, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Phosphoric acid, 50% concentration	⛒	–	⛒	⛒	⛒	⛒	⛒
Mercury, 100% concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Mercury salts, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	⛒	⛒	⛒
Nitric acid, 30% concentration	⛒	✖	✖	✖	✖	✖	✖
Hydrochloric acid, concentrated	⛒	✖	✖	✖	✖	✖	✖
Sulfur, 100% concentration	⛒	⛒	⛒	⛒	⛒	⛒	✖
Sulfur dioxide, gaseous	⛒	–	⛒	⛒	⛒	⛒	⛒
Carbon disulfide	⛒	✖	✖	✖	✖	✖	✖
Hydrogen sulfide	⛒	–	⛒	⛒	⛒	⛒	✖
Sea water	⛒	✖	⛒	⛒	⛒	⛒	⛒
Silver salts, aqueous	⛒	✖	⛒	⛒	⛒	⛒	⛒
Hydrogen peroxide, 3% concentration	⛒	⛒	⛒	⛒	⛒	⛒	✖
Zinc salts, aqueous	⛒	✖	⛒	⛒	⛒	⛒	⛒
Tin(II) chloride	⛒	✖	⛒	⛒	⛒	⛒	⛒
Organic chemicals							
Ethanol, 100% concentration	⛒	✖	✖	✖	⛒	✖	⛒
Formic acid, 30% concentration	⛒	✖	✖	✖	⛒	✖	–
Petrol	⛒	✖	✖	✖	✖	✖	✖
Succinic acid, aqueous, cold-saturated concentration	⛒	⛒	⛒	⛒	⛒	⛒	⛒
Acetic acid, 20% concentration	⛒	✖	✖	✖	⛒	✖	⛒
Hydraulic oil	⛒	✖	✖	✖	✖	✖	✖
Isopropanol, 100% concentration	⛒	⛒	✖	✖	⛒	✖	⛒
Machinery oil	⛒	⛒	✖	✖	✖	✖	✖
Methanol, 100% concentration	⛒	✖	✖	✖	⛒	✖	⛒
Oxalic acid, aqueous, cold-saturated concentration	⛒	✖	⛒	⛒	✖	⛒	⛒
Cutting oil	⛒	✖	✖	✖	✖	✖	✖
Plant-based oils & fats	⛒	✖	✖	✖	✖	✖	✖
Tartaric acids, aqueous	⛒	✖	⛒	⛒	⛒	⛒	⛒
Citric acids	⛒	✖	⛒	⛒	⛒	⛒	⛒

The information presented in this table is accurate to the best of our knowledge and experience.
However, it must be treated as a non-binding guideline only; in many cases, tests must be carried out under working conditions to reach a definitive conclusion.

Frequently asked questions

1. What is U_0/U?

The nominal voltage in European applications is expressed by the combination of two values expressed by the designations U_0/U, where:
U_0: The voltage between any insulated conductor and shield or ground.
U: The voltage between any two conductors of a multi-conductor cable.
Example:
P/N 0026157: the nominal voltage is expressed as 300/500 V.
U_0: 300V, the voltage between any insulated conductor and shield ground.
U: 500V, the voltage between any two conductors of a multi-conductor cable.

2. Are the voltage ratings in the catalog expressed in terms of Alternating Current (AC) or Direct Current (DC)?

Voltages are expressed in Alternating Current. A conservative estimate of the amount of Direct Current voltage is 1.5 times the AC value.
Example:
P/N 0026157: based on the voltage listed above, the estimated DC voltage would be as follows:
U_0: 300 VAC × 1.5 = 450 VDC U: 500 VAC × 1.5 = 750 VDC

3. Do wire and cable require MSDS sheets?

No. Any products that meets the definition of an “article” are exempt from the OSHA Communication Standard and do not require an MSDS.
An article is a manufactured item:
a) which is formed to a specific shape or design during manufacture;
b) which has end-use functions dependent in whole or part upon its shape or design during end use;
c) which does not release or otherwise result in exposure to a hazardous chemical under normal conditions of use.

4. What are the requirements for green/yellow stripe width of LAPP conductors?

For every 15 mm length of conductor, one of those colors shall cover at least 30% and not more than 70% of the surface area of the conductor. The other color covers the remainder.

5. Why are there symmetrical grounds in a VFD cable?

The three symmetrical bare ground wires provide a balanced ground system. This combination reduces AC motor shaft voltage, thereby reducing the likelihood of premature motor bearing or motor insulation failure.

6. Why are conductor diameters not specified for European stranding?

VDE only specifies maximum DC resistance requirements; VDE does not specify a conductor tolerance to the number of strands or diameters. These can vary so that maximum DC resistance requirements are not exceeded.

7. My cable order has been shipped; can I get a test report?

Relevant Test reports can only be provided when requested at the time of order.

8. Can a flexible cable be used in a continuous flexing application?

No. Flexible cables are intended to move randomly in a non-automated application. They are susceptible to occasional uncontrolled conditions of movement.

9. Can a continuous flexing cable be used in a festoon trolley application?

No. Continuous flexing cables are intended for constant linear motion in automated non-festoon applications.

10. Can a continuous flexing cable be used in a robotic application?

No. Robotic applications requires x-y-z motion which will incur continuous bending and torsional (twisting) movements.

11. For wire and cable, can temperature and/or voltage ratings be exceeded?

No. It is never recommended to exceed either temperature and/or voltage ratings due to the potential safety issues.

Frequently asked questions

12. Are UL 94 flammability tests (V-0, V-1, or V-2) required for wire and cable?

No. The standard “Tests for Flammability of Plastic Materials for Parts in Devices and Appliances” is only applicable to plastic materials.

13. AWG versus mm²?

North American agency standards recognize conductors based on diameter tolerances (AWG). European agency standards recognize conductors based on cross-section (mm²) and compliance with maximum DC resistance requirements.

14. Halogen versus non-halogen?

Halogens are the elements of the seventeenth group of the periodic table: chlorine, fluorine, bromine, iodine, and astatine. Halogenated compounds include chlorides, fluorides, bromides, and iodides, which are present in many wire and cable compounds. Non-halogen wire and cable compound formulations include non-antimony based systems to replace traditional halogenated elements. Non-halogenated cable compounds do not contain any of these elements and will not release high levels of smoke or corrosive gases during a fire.

15. How do I determine ampacity of cables with conductors smaller than 18 AWG?

See the following table from the latest edition of NFPA 79. To calculate based on adjustment factors (conductors and ambient temperature), refer to the tables and examples on LAPP catalog page 666.

16 Are LAPP products suitable for use inside airplanes, helicopters, drones, or other air and space travel vehicles?

No. Products are not suitable for the inside of airplanes and helicopters, including drones or other direct air and space travel applications. The remedies of buyer set forth herein are exclusive with respect to breach of the express warranty stated herein, and the total liability of seller for breach of said express warranty, and/or as a result of the manufacture, sale, delivery, installation or technical direction of installation, repair or use of any goods furnished to buyer, whether in contract or in tort (including negligence), shall not exceed the purchase price of the goods determined by seller to be defective in material and/or workmanship.

Conductor size	Ampacity (A)		
	60°C (140°F)	75°C (167°F)	90°C (194°F)
30 AWG	–	0.5	0.5
28 AWG	–	0.8	0.8
26 AWG	–	1.0	1.0
24 AWG	2.0	2.0	2.0
22 AWG	3.0	3.0	3.0
20 AWG	5.0	5.0	5.0

NFPA 79

The electrical standard for industrial machinery

In 2007, the NFPA update involved cable selection options required under section 12.2.7.3, which indicated that single- or multi-conductor AWM was not permitted unless the completed assembly was listed prior for such use. In NFPA 79 2012, AWM was permitted as long as certain requirements were met as specified within the standard. That being said, the acceptability of AWM required a thorough review of the standard because the allowance was not automatic. If the requirements were not followed, or deemed non-compliant by the inspection authority, serious repercussions could occur. With the release of NFPA 79 2018, this edition now also makes reference to cable in Chapter 4 “General Requirements and Operating Conditions”. Traditionally with previous NFPA 79 revisions, any references to wire and cable were featured primarily in Chapters 12 & 13. Cable has been mentioned under Chapter 4 as it directly corresponds to the conditions surrounding Variable Frequency and Servo Drive Systems. This topic is further discussed in the latest edition of LAPP’s NFPA 79 white paper.

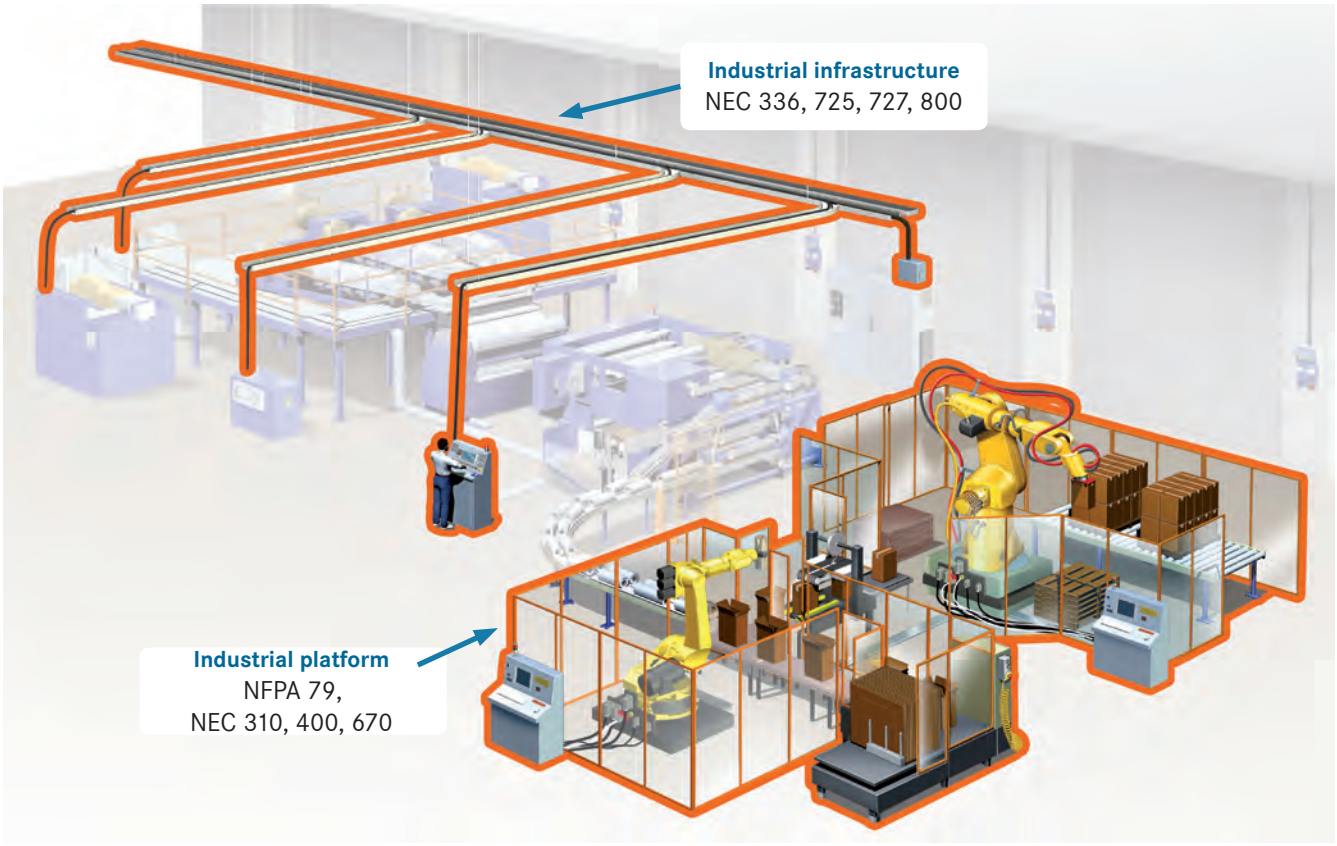
Perhaps one of the most overlooked items regarding the installation of equipment and machines in an industrial or commercial setting is selection of the proper cable. This could be due to expenses surrounding the original purchase price of machines, equipment, and mounting hardware (conduits, trays, raceways), plus labor costs necessary to complete the installation. Intentional or not, cable selection seems to be given a secondary degree of attention in the design and installation process. Unfortunately, this can prove to be very costly to the building contractor, machine fabricator, manufacturing occupant, and all others involved in the process. Today, with the ever increasing prevalence of lawsuits and insurance liability issues, proper cable selection is more important than ever.

In keeping with LAPP’s principles, 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 browse the White Papers section of the LAPP website.

It is of utmost importance to always remember that upon an inspection, any of the cabling used is subject to interpretation by the Authority Having Jurisdiction (AHJ). Only the AHJ has the experience and proper qualifications to provide final determination concerning cabling installation requirements. While LAPP can offer an opinion concerning interpretation of certain aspects of National Electrical Code (NEC) articles or NFPA 79 regulations, we are prohibited from providing any type of final determination.

FIRE PROTECTION

LAPP offers a variety of product solutions that are UL Listed and conform to the NFPA 79 2018 Edition. These products are marked in this catalog by the icon shown here. The diagram below illustrates key NEC and NFPA regulatory codes for an industrial plant manufacturing floor. Each code calls out permissible cable.



NEC® is a registered trademark of the National Fire Prevention Agency.

National Electrical Code

Allowable Conductor Ampacity

Table 310.15(B)(16)

Allowable Ampacities of Insulated Conductors Rated 0 - 2000 V, 60° - 90°C (140° - 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 - 2000V, 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 XHHWT 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 15A for No. 14 copper, 20A for No. 12 copper, and 30A 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 part number 221007 (10 AWG, 6c + ground, 90°C THHN):
  30 Amps ampacity @ 30°C × **0.80** Table 310.15(B)(3)(a) = **24 Amps**
- Using the same P/N at 40°C:
  30 Amps ampacity @ 30°C × **0.80** Table 310.15(B)(3)(a) × **0.91** Table 310.15(B)(2)(a) = **22 Amps**

VFD cable selection guide

Motor properties: AWG size selection chart per NEC

This 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). Amp (FLC) were determined from NEC Art. 430-250:

Drive HP	230V 3ø	460V 3ø	575V 3ø
½ - 2	16*, 14 AWG	16*, 14 AWG	16*, 14 AWG
3 - 5	14 AWG	16*, 14 AWG	16*, 14 AWG
7½ - 10	10 AWG	14 AWG	14 AWG
15	6 AWG	10 AWG	12 AWG
20	4 AWG	10 AWG	10 AWG
25	4 AWG	8 AWG	10 AWG
30	3 AWG	8 AWG	8 AWG
40	1 AWG	6 AWG	6 AWG
50	2/0 AWG	4 AWG	6 AWG
60	3/0 AWG	3 AWG	4 AWG

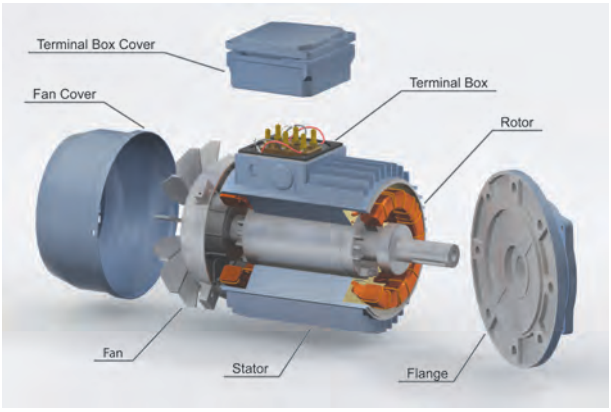
Drive HP	230V 3ø	460V 3ø	575V 3ø
75	250 KCMIL	1 AWG	3 AWG
100	350 KCMIL	2/0 AWG	1 AWG
125	–	3/0 AWG	2/0 AWG
150	–	4/0 AWG	3/0 AWG
200	–	350 KCMIL	250 KCMIL
250	–	500 KCMIL	350 KCMIL
300	–	–	500 KCMIL
350 - 500	–	–	–

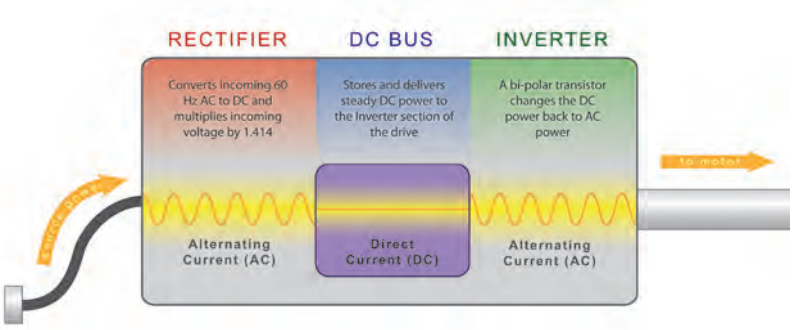
* 16 AWG may be used depending on compliance with the applicable sections of NEC. Final determination can only be provided by the local AHJ.

example:
To calculate AWG size, three factors must be known: motor HP, motor voltage, and FLC.
For a 30 HP 460V motor, the FLC is 40A. Per NEC, **FLC × 125%** is required to calculate AWG size.
40A × 125% = 50A, 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	
Serial No. LAPP 12345			
ML No. 4DFJKJ48DK			





Voltage Drop Factor (VDF), Volts at FLC @ 20°C

This 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 below.

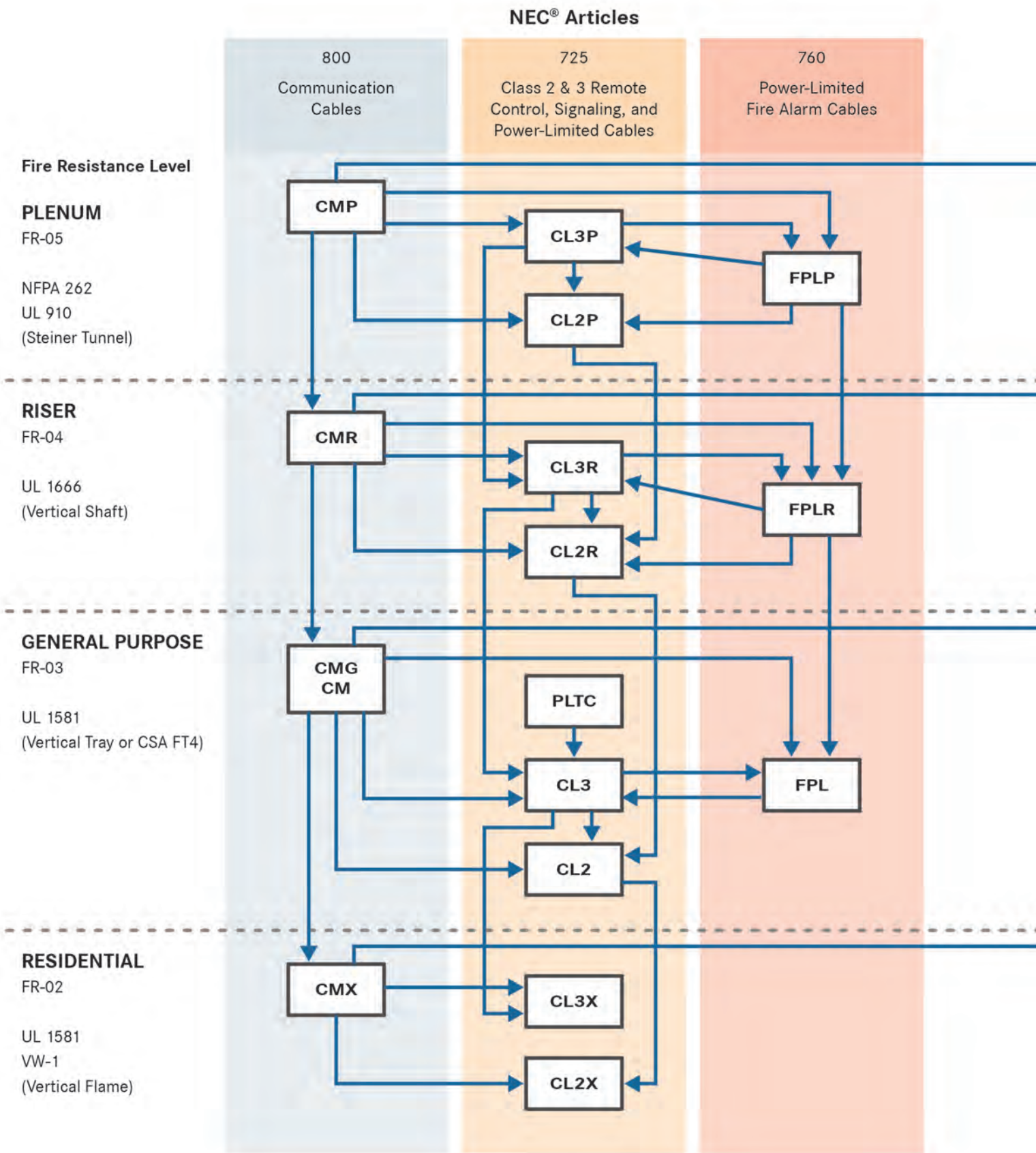
Drive HP	230V 3ø	460V 3ø	575V 3ø
½	0.00696	0.00348	0.00285
¾	0.01013	0.00506	0.00411
1	0.01329	0.00665	0.00538
1½	0.01899	0.00949	0.00759
2	0.02152	0.01076	0.00854
3	0.03038	0.01519	0.01234
5	0.04809	0.02405	0.01930
7½	0.02868	0.03481	0.02848
10	0.02105	0.04430	0.03481
15	0.02009	0.02738	0.03335
20	0.01914	0.02030	0.02868

Drive HP	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

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 × 0.01914 = 3.83V**

In keeping with the principles of LAPP, 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 our website.

NEC® cable substitution hierarchy



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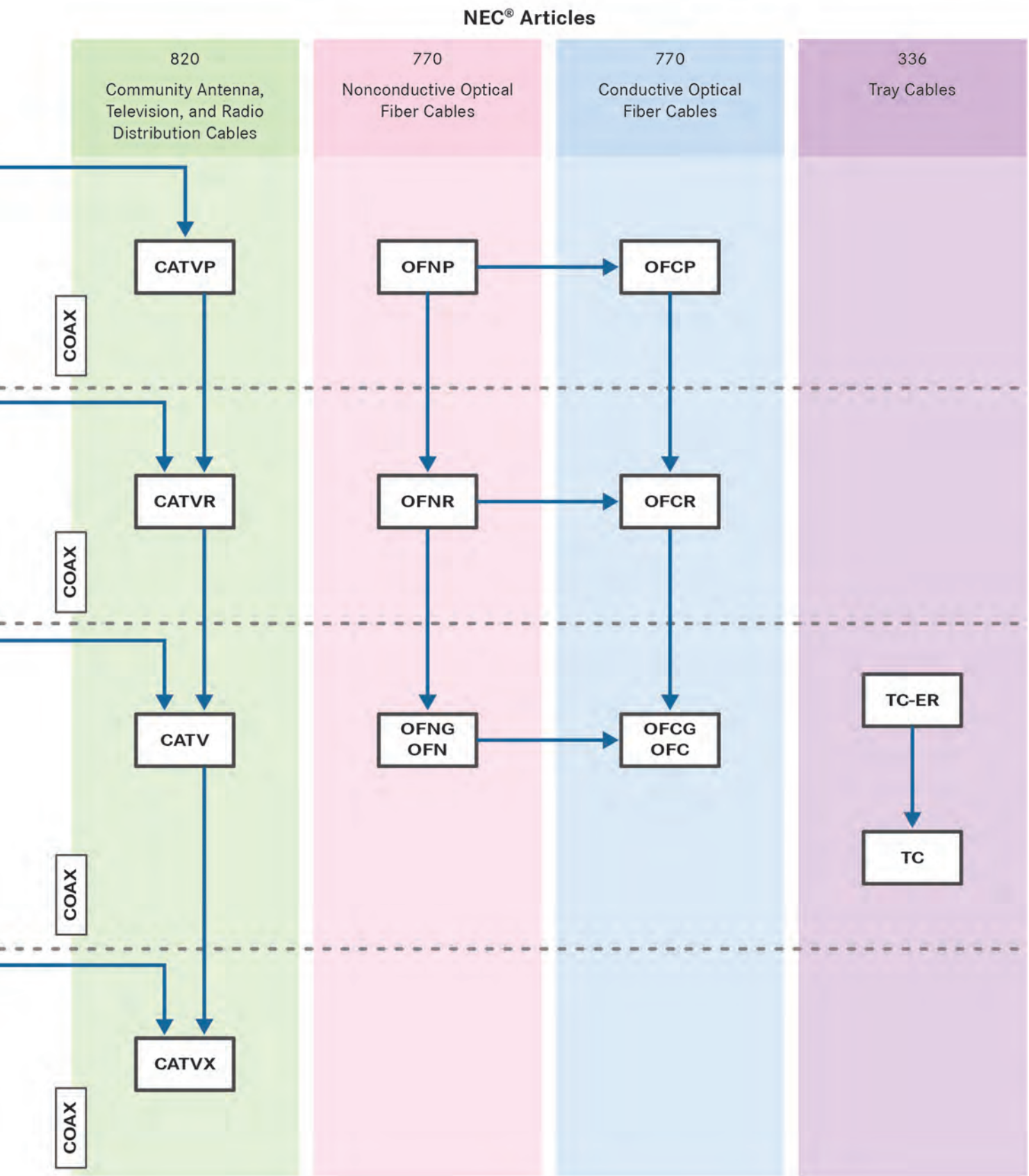

NEC® Articles
820
Community Antenna, Television, and Radio Distribution Cables
770
Nonconductive Optical Fiber Cables
770
Conductive Optical Fiber Cables
336
Tray Cables
CATVP
OFNP
OFCP
COAX
CATVR
OFNR
OFCR
COAX
CATV
OFNG
OFN
OFCG
OFC
TC-ER
TC
COAX
CATVX
COAX

NEC® doppler for use in cable tray applications

LAPP products		–	ÖLFLEX® POWER MULTI ÖLFLEX® POWER IX	–	–	–	
UL cable types	Plenum					FPLP	
	Riser					FPLR	
	General	CT	STOOW, SOOW	PLTC	MC, MI, ITC-HL	FPL	
Article	**Type of article**	**Voltage**	**Hook-up**	**Cordage**	**Thermocouple**	**Armored**	**Fire alarm**
330	Metal Clad: Type MC	600V 2000V				✔	
332	Mineral Insulated Metal Sheathed Cable	300V 600V				✔	
336	Power and Control Tray Cable	600V 2000V				✔	
392	Cable Trays*	150V 2000V	✔ ≥ 1/0 AWG	✔ TC/STOOW**	✔ *	✔ *	✔ *
400	Flexible Cords & Cable	300V 600V		✔ SOOW, STOOW			
500/ 501	Hazardous Locations & Class 1 Locations	150V/ 2000V		✔ Portable SOOW, STOOW Class 1, Division 1	✔ Class 1, Division 2	✔ Class 1, Division 1	
545	Data Processing	300V 600V	✔ (GND) ≥ 4 AWG		✔	✔	✔
725	Power Limited Tray Cable	300V			✔		
727	Instrumentation Tray Cable	150V					
760	Fire Alarm Systems	300V					✔
770	Optical Fiber Cables & Raceways	N/A					
800	Communications Circuits	300V					
820	Community Antenna Television and Radio	60V					

* Different voltage-rated cables may be installed in the same tray provided that cables ≤ 600V are separated by a divider from cables > 600V
** UL Dual Rated
ER: Exposed Run, support every 6 feet

National Electric Code & NEC® is a registered trademark of the National Fire Prevention Agency.
DeviceNet™ is a trademark of Open DeviceNet Vendor Association, Inc.

	–	UNITRONIC® 190 UNITRONIC® 300 UNITRONIC® BUS DeviceNet™ UNITRONIC® BUS PB UNITRONIC® BUS CC-Link UNITRONIC® BUS ASi UNITRONIC® BUS FOUNDATION Fieldbus ETHERLINE® CAT.5/CAT.5e	UNITRONIC® 300 UNITRONIC® BUS DeviceNet™ UNITRONIC® BUS PB UNITRONIC® BUS CC-Link UNITRONIC® BUS ASi UNITRONIC® BUS FOUNDATION Fieldbus ETHERLINE® CAT.5/CAT.5e	ÖLFLEX® TRAY II ÖLFLEX® TRAY VTC ÖLFLEX® CONTROL TM ÖLFLEX® CONTROL M ÖLFLEX® AUTO-X ÖLFLEX® AUTO-I ÖLFLEX® VFD	–
	CATVP	CMP	CL3P, CL2P		OFCP
	CATVR	CMR	CL2R, CL2R		OFCR
	CATV	CMG, CM, DP-1	ITC, PLTC, CL3/2	TC, TC-ER	OFCG, OFC
	Coaxial	**Data cables**	**Control cables**	**Power cables**	**Fiber optic**
				✔ ER*	
	✔*	✔*	✔*	✔ *	✔ *
				✔ * Class 1, Division 2	
			✔ Class 1, Division 2	✔ * Class 1, Division 2	
	✔	✔	✔	✔	✔
		✔	✔ ER 300V PLTC		
			✔ 150V ITC		
		✔			
					✔
		✔	✔ No PLTC		
	✔	✔			

North American regulatory & safety standard agencies

Underwriters Laboratories, Inc., (UL) is chartered to establish, maintain, and operate laboratories for the examination and testing of devices, systems, and materials. UL determines hazards to life and property, and defines standards, classifications, and specifications for materials, devices, products, equipment, constructions, methods, and systems affecting such hazards.

UL Listed wire and cable products

Wire and cable covered by this category are intended for use as fixed wiring for the three general building types: residential, commercial, and industrial. Listed wire and cable must not only comply with the applicable individual UL standards but also with requirements indicated under specific Articles of the National Electrical Code. The National Electrical Code defines specific end use application and where a particular listed wire or cable is installed.

example of Listed wire and cable use: A UL Listed wire or cable can be used inside a building where a connection is required from a circuit breaker box to a wall outlet or externally as a coaxial cable when a connection is required from a satellite dish to a television wall receptacle. UL Listed cable can also be used to supply power to a UL Listed piece of equipment, such as the flexible cord used in the cord set of your computer or appliance.

cUL Listing Mark

This marking is represented by a lower case “c” appearing adjacent to the applicable UL symbol and indicate that a wire or cable has been tested by Underwriters Laboratories for conformance to standards from the Canadian Standards Association. These Marks are applied to products that are intended for use in the Canadian marketplace.

UL Listed Component Mark for Canada and the United States

This Listing Mark was introduced by UL in early 1998. This Mark indicates compliance with both US and Canadian requirements. The use of the combined Canada/US UL Mark is optional. UL encourages manufacturers with products certified for both countries to use this Mark, but they may continue using separate UL Marks for Canada and the United States.

UL AWM Recognized components

Appliance Wiring Material (AWM) covers wire and cable intended for use as factory installed components of complete equipment. Appliance Wiring Material is not intended for use in direct separate installation in the field. Wire or cable indicating a UL AWM style marking is intended for applications that are unique to each individual style sheet. The usage statement of an individual style sheet will dictate specific end use limitations of the AWM wire or cable.

The NEC does not recognize AWM as an approved wiring method.

example of AWM use: If a manufacturer desires to obtain UL Listing for their new piece of equipment they must submit their design to Underwriters Laboratories. The entire UL Listing process will move much more quickly and easily if all internal components used within the equipment design are UL Recognized. If the internal components are not UL Recognized then the UL Listing process will take much longer and cost more as the individual components now must be tested for compliance. AWM can also be used externally to interconnect two UL Listed components such as the data cable assembly that connects a computer to a printer.

UL AWM Recognized Components

This Mark also covers Appliance Wiring Material and is applied to products that are intended for use in the Canadian market. Products that contain this Mark have been evaluated by UL for compliance to the applicable CSA standard for either internal or external use as designated by Class number and group type.

Recognized Component Mark for Canada and the United States

This UL Recognized Component Mark may be used on components certified by UL to both Canadian and US requirements. Although UL had not originally planned to introduce a combined Recognized Component Mark, the popularity of the Canada/US Listing and classification marks among clients with UL certifications for both Canada and the United States led to the creation of this Mark.

General information

The local or state office of the electrical inspector dictates regulations governing cables that are installed in conduit. These regulations can vary or fluctuate depending upon interpretation of the National Electrical Code in different states and local municipalities.

Canadian Standards Association (CSA)

CSA is one of five accredited standards writing organizations in Canada. Unlike other foreign countries, Canada does not have separate standards and national testing agencies. The CSA Mark indicates that a product has been tested and approved for use in Canada. LAPP USA offers the following type of wire and cable certified by the Canadian Standards Association on a wide variety of different products.

Appliance Wiring Material (AWM) refers to wire and cable that is manufactured per the requirements specified in CSA Standard C22.2 No.210. AWM wire and cable is intended to be used internally within electrical and electronic equipment and can also be used for external interconnection between equipment. C22.2 No.210 defines AWM categories as follows:

Class I Internal
Group (A) – Where not subjected to mechanical abuse
Group (B) – Where may be subjected to mechanical abuse
(1) Wet Location
(2) Oil Resistant

Class II External
Group (A) – Where not subjected to mechanical abuse
Group (B) – Where may be subjected to mechanical abuse
(1) Wet Location
(2) Oil Resistant

International regulatory & safety standard agencies

Most countries have their own standard-writing agencies. However, the basis for the majority of international standards are adaptations from, or exact duplication of, publications from the following safety standard agencies. These agencies are commissioned to create and publicize international safety standards. They are standard-setting agencies only; the enforcement of and testing to these standards is undertaken at the national level, but the final interpretation of design and approval of the product always lies with the National Test Agencies.

IEC (International Electrotechnical Commission)

The IEC is composed of representatives from manufacturers, users, and national testing labs from many of the European industrialized nations. Their primary directive is to publicize recommendations for safety standards. Although IEC publications do not have the force of law, in most cases new standards published by the National Testing Agencies in Europe and Australia have only minor deviations from IEC publications.

CENELEC (European Committee for Electrotechnical Standardization)

The primary responsibility of CENELEC is to develop electrotechnical standards that represent a consensus among its European member countries. While IEC publications are generally the basis for European National Standards, CENELEC will cover matters that are not completely addressed by IEC documents.

International testing & approval agencies

Although a product may have been designed to comply with individual standard agencies, or with IEC, CEE, or CENELEC, each product must be tested, approved, and marked by the National Test Agency for each country where the products are to be sold. In most cases it is illegal to sell non-approved products.

Germany:
VDE (Association of German Electrical Engineers)

Germany:
Germanischer Lloyd

Norway:
DNV (Det Norske Veritas)

Germany:
TÜV Rheinland Group
(Technical Monitoring Association)

Switzerland:
SEV (Swiss Electrotechnical Association)

United Kingdom:
Lloyd's Register of Shipping

Russia:
GOST-R (Russian State Standard)

Germany:
VdTÜV
(Association of Technical Monitoring Clubs)

Products with Russian GOST-R certification

Product
ÖLFLEX® CLASSIC 100/100 CY
ÖLFLEX® CLASSIC 100 SY
ÖLFLEX® CLASSIC 110/110 CY
ÖLFLEX® CLASSIC 110 SY
ÖLFLEX® CLASSIC 110 BLACK
ÖLFLEX® CLASSIC 110 CY BLACK
ÖLFLEX® CLASSIC 115 CW
ÖLFLEX® EB/EB CY
ÖLFLEX® 150 QUATTRO/150 CY QUATTRO
ÖLFLEX® 191/191 CY
ÖLFLEX® CONTROL TM/TM CY
ÖLFLEX® TRAY II
ÖLFLEX® CLASSIC 100 H
ÖLFLEX® CLASSIC 110 H
ÖLFLEX® CLASSIC 110 CH
ÖLFLEX® 120 H/120 CH
ÖLFLEX® CLASSIC 130 H
ÖLFLEX® CLASSIC 135 CH
ÖLFLEX® CLASSIC 130 H BLACK
ÖLFLEX® CLASSIC 135 CH BLACK
ÖLFLEX® ROBUST 200
ÖLFLEX® ROBUST 210
ÖLFLEX® ROBUST 215 C
ÖLFLEX® CLASSIC 400 P/400 CP
ÖLFLEX® 491 P/491 CP
ÖLFLEX® CONTROL M
ÖLFLEX® 540 P/540 CP
H07RN8-F
H07BN4-F Wind
ÖLFLEX® SERVO 700/700 CY
ÖLFLEX® SERVO 720 CY
ÖLFLEX® SERVO 730/730 CY
ÖLFLEX® SERVO 2YSLCY-JB
ÖLFLEX® 709 CY
ÖLFLEX® SERVO 9YSLCY-JB
Servo cable acc. to SIEMENS® standard 6FX 5008
ÖLFLEX® SERVO FD 750 P
ÖLFLEX® SERVO FD 755 P/755 CP
ÖLFLEX® SERVO FD 755 CP DESINA®
ÖLFLEX® SERVO FD 760 CP
ÖLFLEX® SERVO FD 770 CP
ÖLFLEX® SERVO FD 770 CP DESINA®
ÖLFLEX® SERVO FD 781 CY
ÖLFLEX® SERVO FD 781 P/781 CP
ÖLFLEX® SERVO FD 785 P/785 CP
ÖLFLEX® SERVO FD 790 CP
ÖLFLEX® SERVO FD 795 P/795 CP
Servo cable acc. to SIEMENS® standard 6FX 7008
Servo cable acc. to SIEMENS® standard 6FX 8008
Servo cable acc. to INDRAMAT® standard INX
Servo cable acc. to LENZE® standard
Servo cable acc. to SEW® standard
ÖLFLEX® FD CLASSIC 810/810 CY

Product
ÖLFLEX® FD 820 H/820 CH
ÖLFLEX® FD CLASSIC 810 P/810 CP
ÖLFLEX® FD 855 P/855 CP
ÖLFLEX® FD ROBUST
ÖLFLEX® FD ROBUST C
ÖLFLEX® FD 90/90 CY
ÖLFLEX® FD 891/891 CY
ÖLFLEX® FD 891 P/891 CP
ÖLFLEX® ROBOT 900 P
ÖLFLEX® ROBOT 900 DP
ÖLFLEX® ROBOT F1
ÖLFLEX® SOLAR XL multi
ÖLFLEX® SOLAR XLS
ÖLFLEX® SOLAR XLV
ÖLFLEX® SOLAR V4A
ÖLFLEX® SOLAR plus
ÖLFLEX® SOLAR XL
ÖLFLEX® SOLAR XLR ST
ÖLFLEX® SOLAR SR
ÖLFLEX® SOLAR plus V4A
ÖLFLEX® CRANE NSHTÖU
ÖLFLEX® CRANE VS NSHTÖU
ÖLFLEX® CRANE PUR
ÖLFLEX® CRANE
ÖLFLEX® CRANE 2S
ÖLFLEX® LIFT
ÖLFLEX® LIFT T
ÖLFLEX® LIFT S
ÖLFLEX® CRANE F
ÖLFLEX® LIFT F
ÖLFLEX® HEAT 105 SC/105 MC
ÖLFLEX® HEAT 145 SC/145 MC
ÖLFLEX® HEAT 180 SiHF
ÖLFLEX® HEAT 180 SiF/GL
ÖLFLEX® HEAT 180 SiD
ÖLFLEX® HEAT 180 SiZ
ÖLFLEX® HEAT 180 FZLSi
ÖLFLEX® HEAT 180 H05SS-F EWKF
ÖLFLEX® HEAT 180 MC
ÖLFLEX® HEAT 180 GLS
ÖLFLEX® HEAT 205 SC/205 MC
ÖLFLEX® HEAT 205 PTFE/FEP
ÖLFLEX® HEAT 260 SC/260 MC
ÖLFLEX® HEAT 260 C MC
ÖLFLEX® HEAT 260 GLS
ÖLFLEX® HEAT 350 SC (Zero Flame 350 SC)
ÖLFLEX® HEAT 350 MC (Zero Flame 350 SC)
ÖLFLEX® HEAT 1565 SC (Zero Flame SC 1565)
UNITRONIC® LiYY/LiYCY
UNITRONIC® LiYCY-CY
UNITRONIC® LiYY (TP)
UNITRONIC® LiYCY (TP)

Product
UNITRONIC® 300/300 CY
UNITRONIC® PUR CP
UNITRONIC® PUR CP TP
UNITRONIC® LiHH/LiHCH
UNITRONIC® LiHCH (TP)
UNITRONIC® FD/FD CY
UNITRONIC® FD P PROFIBUS HYBRID
UNITRONIC® FD P plus A
UNITRONIC® FD CP plus A
UNITRONIC® FD CP (TP) plus A
UNITRONIC® Li2YCY (TP)
UNITRONIC® Li2YCYv (TP)
UNITRONIC® Li2YCY PIMF
UNITRONIC® LAN TYPE 1A 600 MHz
UNITRONIC® LAN Twinax
UNITRONIC® BUS IBS
UNITRONIC® BUS P COMBI IBS
UNITRONIC® BUS FD P IBS
UNITRONIC® BUS FD P COMBI IBS
UNITRONIC® BUS YV IBS
UNITRONIC® BUS YV COMBI IBS
UNITRONIC® BUS PB A
UNITRONIC® BUS FD P L2/FIP
UNITRONIC® BUS PB FD P FC A
UNITRONIC® BUS PB FD P COMBI
UNITRONIC® BUS PB YV
UNITRONIC® BUS DN THICK FRNC
UNITRONIC® BUS DEVICENET THICK CABLE FRNC, UL/CSA (CMG) (halogen-free)
UNITRONIC® BUS DN THIN FRNC
UNITRONIC® BUS DEVICENET THIN CABLE FRNC, UL/CSA (CMG) (halogen-free)
UNITRONIC® BUS CAN
UNITRONIC® BUS CAN FD
H05RR-F
H05RN-F
H07RN-F
NSSHÖU
H07ZZ-F
H01N2-D
LiFY measurement cores
LiFY highly flexible measurement cores
ESUY copper earthing cable
H00V3-D copper earthing cable
NSGAFÖU
NSHXAFÖ
NiCr/Ni PVC/PVC compensating cable
LiY stranded hook-up wire
H05V-K single core
H07V-K single core
H05Z-K single core
H07Z-K single core

Environmental standards: REACH & RoHS

The use of hazardous substances in products is subject to ever stricter international laws and restrictions. All products in this catalogue meet the following legal requirements (among others): • **REACH directive 1907/2006/EC** • **RoHS directive 2011/65/EU, or 2002/95/EC**

REACH

Directive 1907/2006/EC represents the EU's standard system for the Registration, Evaluation, Authorization and Restriction of Chemicals, or REACH for short. The purpose of the directive is to ensure a high level of protection for human health and the environment.

REACH came into force on June 1, 2007 and replaced a number of former specifications relating to the material composition of products as previously governed, for example, by directive 76/769/EEC on the approximation of the laws, regulations, and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations. All LAPP products fall within the meaning of REACH. The following requirements of the REACH directive are therefore particularly significant:

1. Information requirement for manufacturers and importers of products containing a material on the Candidate List at a concentration in excess of 0.1% of the mass of the product.
2. Observance of substances requiring authorization in accordance with REACH Annex XIV.
3. Observance of the manufacturing, marketing, and use restrictions specified in REACH Annex XVII.

No duty of substance registration applies to LAPP. The duty of registration is linked to specific conditions, such as the manufacture of substances or preparations, or the release of substances from products. LAPP does not meet any of these conditions.

LAPP has attributed great importance to the subject of safety and the environment from a very early stage. Our aim is to implement the REACH directive by keeping our products free from substances of very high concern (SVHC) or to replace such substances with non-hazardous materials. We therefore keep a very close eye on the Candidate List, in which the European Chemicals Agency lists these dangerous substances, continuously evaluate our products and implement any necessary substitution measures. We observe all registration requirements for materials in accordance with REACH Annex XIV as well as the manufacturing, marketing, and use restrictions specified in REACH Annex XVII.

For further information on the subject of REACH, visit our website at www.lappusa.com or contact our competent REACH experts regarding specific substances.

RoHS

The full title of the RoHS directive is as follows: "DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment". The new RoHS directive 2011/65/EC was published on July 1, 2011 and replaces the previous RoHS directive 2002/95/EC. Different transitional periods apply for the amendments introduced by the new RoHS directive.

In addition to the extended scope of the directive, which now also comprises other electrical and electronic equipment (EEE), one significant new feature is the obligation to assure compliance with the requirements of the RoHS directive by means of a conformity assessment procedure. LAPP certifies the RoHS conformity of EEE covered by the directive with a product-specific EC declaration of conformity and the application of the CE Mark.

Irrespective of the scope of the RoHS directive, all products in this catalogue meet the substance-specific requirements of RoHS. The exceptions detailed in the RoHS directive notwithstanding, our products do not contain any of the restricted substances specified in the RoHS directive or exceed the maximum concentrations stipulated therein.

Note:
All information is provided to the best of our knowledge and belief. This information provided is representative of current environmental standards. This is supported through continuous random testing of our products.

Given the vast number of our products, complete verification without exception is not possible. Therefore, the specifications above do not constitute a generally applicable guarantee in a legal or warranty sense.

WEEE directive

The WEEE directive governs the disposal and recycling of electrical and electronic goods. A list of products from our range falling under the category of electrical and electronic tools and equipment is provided here, along with the relevant registration numbers.

The stated article/registration numbers are subject to change as a result of any modifications to the scope of the WEEE directive after printing of this catalogue.

Article number	Registration number
61806430	54158606
21700002, 21700012	39257114

LAPP global stranding

AWG	LAPP	mm²	Class K	mm²	Class 5	mm²	DCR*	Class 6	Class M	mm²
26	–	–	–	–	–	0.14	42.0	18 / 0.10	7/34	0.14
24	–	–	–	–	14 / 0.15	0.25	24.0	32 / 0.10	10/34	0.20
22	–	–	7/30	0.35	19 / 0.15	0.34	17.3	42 / 0.10	19/34	0.38
20	–	–	10/30	0.51	16 / 0.21	0.50	11.88	28 / 0.15	26/34	0.52
	–	–	–	–	24 / 0.21	0.75	7.92	42 / 0.15	41/34	0.83
18	19/30**	–	16/30	1.00	32 / 0.21	1.0	5.94	56 / 0.15	–	–
16	28 / 30	1.5	26/30	1.32	30 / 0.26	1.5	4.05	84 / 0.15	65/34	1.31
14	46 / 30	2.5	41/30	2.08	50 / 0.26	2.5	2.43	140 / 0.15	105/34	2.11
12	56 / 0.0117	4	65/30	3.30	56 / 0.31	4	1.50	224 / 0.15	168/34	3.38
10	82/ 0.0117	6	105/30	5.32	84 / 0.31	6	1.00	192 / 0.20	259/34	5.21
8	74/ 0.0159	10	168/30	8.52	80 / 0.41	10	0.582	320 / 0.20	413/34	8.31
6	119 / 0.0159	16	266/30	13.5	128 / 0.41	16	0.368	512 / 0.20	665/34	13.40
4	–	–	413/30	21.0	200 / 0.41	25	0.237	800 / 0.20	1064/34	21.40
2	–	–	665/30	33.7	280 / 0.41	35	0.168	1120 / 0.20	1666/34	33.50
1	–	–	836/30	43.0	400 / 0.41	50	0.117	705 / 0.30	2109/34	42.0
2/0	–	–	1330/30	67.0	356 / 0.50	70	0.082	990 / 0.30	–	–
3/0	–	–	–	–	485 / 0.50	95	0.062	1340 / 0.30	–	–
4/0	–	–	2107/30	106	614 / 0.50	120	0.049	1690 / 0.30	–	–
300 KCMIL	–	–	–	–	765 / 0.50	150	0.039	2123 / 0.30	–	–
350 KCMIL	–	–	–	–	944 / 0.50	185	0.032	1470 / 0.40	–	–
500 KCMIL	–	–	–	–	1225 / 0.50	240	0.024	1905 / 0.40	–	–
600 KCMIL	–	–	–	–	1530 / 0.50	300	0.019	2385 / 0.40	–	–
750 KCMIL	–	–	–	–	2035 / 0.50	400	0.014	–	–	–
1000 KCMIL	–	–	–	–	1768 / 0.60	500	0.011	–	–	–

* DCR @ 20°C (Ω/mft)
** Meets only Class 5 cross section and DC resistance

European cable stranding

Cross-section mm²	(1) strands VDE 0295 BS 6360 Class 2	(2) multi-wire strands	(3) fine-wire strands VDE 0295 BS 6360 Class 5	(4) fine-wire strands VDE 0295 BS 6360 Class 6	(5) super fine wire strands	(6) super fine wire strands	(7) super fine wire strands
0.05	–	–	–	–	–	36 x 0.07	24 x 0.05
0.08	–	–	–	–	–	65 x 0.07	41 x 0.05
0.14	–	–	–	18 x 0.10	18 x 0.10	88 x 0.07	72 x 0.05
0.25	–	–	14 x 0.16	32 x 0.10	32 x 0.10	100 x 0.07	128 x 0.05
0.34	–	7 x 0.25	19 x 0.16	42 x 0.10	42 x 0.10	131 x 0.07	174 x 0.05
0.38	–	7 x 0.27	12 x 0.21	21 x 0.15	48 x 0.10	195 x 0.07	194 x 0.05
0.50	7 x 0.30	7 x 0.30	16 x 0.21	28 x 0.15	64 x 0.10	260 x 0.07	256 x 0.05
0.75	7 x 0.37	7 x 0.37	24 x 0.21	42 x 0.15	96 x 0.10	392 x 0.07	384 x 0.05
1.00	7 x 0.43	7 x 0.43	32 x 0.21	56 x 0.15	128 x 0.10	651 x 0.07	512 x 0.05
1.50	7 x 0.52	7 x 0.52	30 x 0.26	84 x 0.15	192 x 0.10	1040 x 0.07	768 x 0.05
2.50	7 x 0.67	19 x 0.41	50 x 0.26	140 x 0.15	320 x 0.10	1560 x 0.07	1280 x 0.05
4	7 x 0.85	19 x 0.52	56 x 0.31	224 x 0.15	512 x 0.10	2600 x 0.07	–
6	7 x 1.05	19 x 0.64	84 x 0.31	192 x 0.20	768 x 0.10	–	–
10	7 x 1.35	49 x 0.51	80 x 0.41	320 x 0.20	1280 x 0.10	–	–
16	7 x 1.70	49 x 0.65	128 x 0.41	512 x 0.20	2048 x 0.10	–	–
25	7 x 2.13	84 x 0.62	200 x 0.41	800 x 0.20	3200 x 0.10	–	–
35	7 x 2.52	133 x 0.58	280 x 0.41	1120 x 0.20	–	–	–
50	19 x 1.83	133 x 0.69	400 x 0.41	705 x 0.30	–	–	–
70	19 x 2.17	189 x 0.69	356 x 0.51	990 x 0.30	–	–	–
95	19 x 2.52	259 x 0.69	485 x 0.51	1340 x 0.30	–	–	–
120	37 x 2.03	336 x 0.67	614 x 0.51	1690 x 0.30	–	–	–
150	37 x 2.27	392 x 0.69	765 x 0.51	2123 x 0.30	–	–	–
185	37 x 2.52	494 x 0.69	944 x 0.51	1470 x 0.40	–	–	–
240	61 x 2.24	627 x 0.70	1225 x 0.51	1905 x 0.40	–	–	–
300	61 x 2.50	790 x 0.70	1530 x 0.51	2385 x 0.40	–	–	–
400	61 x 2.89	–	2035 x 0.51	–	–	–	–
500	61 x 3.23	–	1768 x 0.51	–	–	–	–

The number of wires in columns (3) - (7) is optional.
VDE 0295 specifies only the maximum diameter of the individual wires and the maximum resistance assigned to the cross-section.

Stranded conductors: AWG

AWG	Stranding	Diameter		Cross-sectional area		Weight	DCR @ 20°C (Ω/mft)	
		in	mm	CMA*	mm²	lbs/mft	bare copper	tinned copper
30	7/38	0.012	0.3048	112.00	0.0567	0.34	100.30	107.700
	19/42	0.013	0.3302	118.75	0.0589	0.36	101.90	109.400
28	7/36	0.015	0.3810	175.00	0.0889	0.55	63.55	68.220
	19/40	0.016	0.4064	182.59	0.0931	0.59	63.06	67.690
27	7/35	0.017	0.4318	219.52	0.1113	0.63	50.44	54.150
	65/44	0.018	0.4572	260.00	0.1235	0.70	49.41	53.050
26	7/34	0.019	0.4826	277.83	0.1407	0.87	39.70	42.610
	10/36	0.020	0.5080	250.00	0.1270	0.77	44.92	48.210
	19/38	0.020	0.5080	304.00	0.1539	0.93	37.33	40.070
24	7/32	0.024	0.6096	448.00	0.2268	1.38	24.46	26.250
	10/34	0.023	0.5842	396.90	0.2010	1.22	28.06	31.120
	19/36	0.025	0.6350	475.00	0.2413	1.47	23.64	25.380
	41/40	0.024	0.6096	384.40	0.2009	1.25	29.78	31.970
22	7/30	0.030	0.7620	700.00	0.3542	2.19	15.57	16.720
	19/34	0.032	0.8128	754.11	0.3819	2.32	14.77	16.100
	26/36	0.029	0.7366	650.00	0.3302	1.97	17.44	18.720
20	7/28	0.038	0.9652	1111.00	0.5628	3.49	9.81	10.420
	10/30	0.036	0.9144	1000.00	0.5060	3.14	11.00	11.810
	19/32	0.038	0.9652	1216.00	0.6156	3.75	9.10	9.770
	26/34	0.040	1.0160	1031.94	0.5226	3.21	10.90	11.700
	41/36	0 038	0.9652	1025.00	0.5207	3.17	11.17	11.990
18	7/26	0 046	1.1684	1769.60	0.8960	5.04	6.165	6.550
	16/30	0.046	1.6840	1600.00	0.8096	5.00	6.877	7.384
	19/30	0.048	1.2192	1900.00	0.9614	5.90	5.791	6.218
	41/34	0.046	1.6840	1627.29	0.8241	5.06	6.975	7.487
	65/36	0.048	1.2192	1625.00	0.8255	5.00	7.043	7.560
16	7/24	0.060	1.5240	2828.00	1.4322	8.56	3.855	4.002
	19/29	0.054	1.3716	2426.30	1.2293	7.50	4.538	4.817
	26/30	0.058	1.4732	2600.00	1.3156	8.06	4.273	4.588
	65/34	0.059	1.4986	2579.85	1.3065	8.03	4.400	4.723
	105/36	0.059	1.4986	2625.00	1.3335	8.09	4.360	4.680
14	7/22	0.073	1.8542	4480.04	2.2694	12.76	2.428	2.531
	19/27	0.068	1.7272	3830.40	1.9399	12.50	2.874	3.054
	41/30	0.070	1.7780	4100.00	2.0746	12.88	2.735	2.937
	105/34	0.086	2.1844	4167.50	2.1105	13.00	2.724	2.924
12	7/20	0.096	2.4384	7168.00	3.6302	21.69	1.516	1.574
	19/25	0.090	2.2860	6087.60	3.0837	19.70	1.806	1.916
	65/30	0.102	2.5908	6500.00	3.2890	20.76	1.725	1.853
	165/34	0.095	2.4130	6548.90	3.3165	19.82	1.750	1.878
10	37/26	0.110	2.7940	9353.60	4.7360	29.00	1.189	1.263
	49/27	0.116	2.9464	9878.40	5.0029	29.89	1.136	1.207
	105/30	0.120	3.0480	105300.00	5.3130	33.10	1.068	1.147
8	49/25	0.147	3.7338	15699.60	7.9527	47.53	0.714	0.757
	133/29	0.166	4.2164	16984.11	8.6051	52.87	0.661	0.701
	655/36	0.147	3.7338	16625.01	8.3185	51.30	0.706	0.757
6	133/27	0.206	5.2324	26812.80	13.5793	81.14	0.418	0.445
	266/30	0.210	5.3340	25900.01	13.4596	86.01	0.426	0.457
	1050/36	0.184	4.6736	26250.01	13.3350	79.47	0.440	0.472
4	7x19/25	0.257	6.5278	42613.00	21.5859	133.00	0.263	0.279
	259/27	0.232	5.8928	52214.40	26.4439	158.02	0.217	0.231
	1666/36	0.232	5.8928	41650.00	21.1582	126.10	0.277	0.298
2	133/32	0.292	7.4168	67936.40	34.4071	205.62	0.164	0.171
	259/26	0.292	7.4168	65475.20	33.1520	198.14	0.173	0.184
	665/30	0.328	8.3112	66500.00	33.1430	213.00	0.170	0.183
	2109/34	0.292	7.4168	66150.00	33.6042	200.28	0.175	0.187
1	19/0.0664	0.328	8.3312	82983.60	42.4700	251.20	0.134	0.137
	19x44/30	0.377	9.5758	81700.00	43.3016	267.79	0.135	0.171
	2109/34	0.328	8.3312	83706.20	42.3909	253.29	0.137	0.147
1/0	133/21	0.368	9.3472	108035.90	54.7162	327.05	0.104	0.108
	259/24	0.368	9.3472	104636.00	52.9914	316.76	0.108	0.112
2/0	133/20	0.414	10.5156	136192.00	68.9738	400.41	0.0821	0.085
	259/23	0.414	10.5156	132297.20	67.0033	430.00	0.0855	0.089
	1330/30	0.406	10.3124	133300.00	67.2980	501.70	0.0851	0.091
3/0	259/22	0.464	11.7856	163195.00	83.9678	522.20	0.0682	0.071
	427/24	0.464	11.7856	172508.00	87.3642	638.88	0.0657	0.068
4/0	259/21	0.597	15.1638	210385.70	106.5526	660.01	0.0537	0.056
	427/23	0.598	15.1892	218111.60	110.4649	653.00	0.0519	0.054
	2107/30	0.608	15.4332	211468.00	106.6142	676.00	0.0537	0.058

* CMA: Circular Mil Area

Solid conductors: AWG

AWG	Diameter		Cross-Sectional area		DCR @ 20°C (Ω/mft)		Weight	Break strength
	in	mm	CMA*	mm²	bare copper	tinned copper	lbs/mft	lbs/max
40	0.0031	0.07874	9.6	0.0049	1552.00	1236.60	0.0291	0.3106
39	0.0035	0.08890	12.3	0.0062	897.10	963.00	0.0371	0.3917
38	0.0040	0.10160	16.0	0.0081	681.90	732.00	0.0484	0.4939
37	0.0045	0.11430	20.3	0.0103	535.70	575.10	0.0613	0.6228
36	0.0050	0.12700	25.0	0.0127	431.90	463.60	0.0757	0.7854
35	0.0056	0.14224	31.4	0.0159	342.80	368.00	0.0949	0.9904
34	0.0063	0.16002	39.7	0.0201	269.80	289.60	0.120	1.249
33	0.0071	0.18034	50.4	0.0255	211.70	227.30	0.153	1.575
32	0.0080	0.20320	64.0	0.0324	166.20	178.40	0.194	1.986
31	0.0089	0.22606	79.2	0.0401	133.90	143.70	0.240	2.504
30	0.0100	0.25400	100	0.0506	105.80	113.60	0.304	3.157
29	0.0113	0.28702	128	0.0647	82.90	88.00	0.387	3.981
28	0.0126	0.32004	159	0.0804	66.70	70.80	0.481	5.020
27	0.0142	0.36068	202	0.1021	52.50	55.80	0.610	6.331
26	0.0159	0.40386	253	0.1280	41.90	44.50	0.765	7.983
25	0.0179	0.45466	320	0.1623	33.00	35.00	0.970	10.070
24	0.0201	0.51054	404	0.2046	26.20	27.20	1.22	12.690
23	0.0226	0.57404	511	0.2587	20.70	21.50	1.55	15.410
22	0.0253	0.64262	640	0.3242	16.50	17.20	1.94	19.430
21	0.0285	0.72390	812	0.4114	13.00	13.50	2.46	24.500
20	0.0320	0.81280	1020	0.5186	10.30	10.70	3.10	30.890
19	0.0359	0.91186	1290	0.6527	8.21	8.54	3.90	38.950
18	0.0403	1.02362	1620	0.8225	6.52	6.78	4.92	49.120
17	0.0453	1.15062	2050	1.0393	5.16	5.37	6.21	61.930
16	0.0508	1.29032	2580	1.3070	4.10	4.26	7.81	78.100
15	0.0571	1.45034	3260	1.6512	3.25	3.38	9.87	98.480
14	0.0641	1.62814	4110	2.0809	2.58	2.68	12.40	124.20
13	0.0720	1.82880	5180	2.6254	2.04	2.12	15.70	156.60
12	0.0808	2.05232	6530	3.3064	1.62	1.68	19.80	197.50
11	0.0907	2.30378	8230	4.1663	1.29	1.34	24.90	249.00
10	0.1019	2.58826	10380	5.2588	1.02	1.06	31.40	314.00
9	0.1144	2.90576	13090	6.6281	0.809	0.833	39.60	380.50
8	0.1285	3.26390	16510	8.3626	0.641	0.660	50.00	479.80
7	0.1443	3.66522	20820	10.5456	0.508	0.523	63.00	605.00
6	0.1620	4.11480	26240	13.2913	0.403	0.415	79.40	762.90
5	0.1819	4.62026	33090	16.7572	0.320	0.329	100	961.90
4	0.2043	5.18922	41740	21.1385	0.254	0.261	126	1213
3	0.2294	5.82676	52620	26.6516	0.201	0.206	159	1530
2	0.2593	6.58622	66360	34.0520	0.157	0.161	201	1929
1	0.2893	7.34822	83690	42.3871	0.126	0.129	253	2432
1/0	0.3249	8.25246	105600	53.4609	0.100	0.102	319	2984
2/0	0.3648	9.26592	133100	67.3980	0.0795	0.0814	403	3763
3/0	0.4096	10.43084	167800	84.9683	0.0631	0.0616	508	4745
4/0	0.4600	11.68400	211600	107.1649	0.0500	0.0512	641	5983

* CMA: Circular Mil Area

Wire size conversion

American Wire Gauge (AWG) to mm²

AWG	mm²
30	0.05
28	0.08
26	0.14
24	0.25
22	0.34
20	0.50
19	0.75
18	1.0
16	1.5
14	2.5

AWG	mm²
12	4
10	6
8	10
6	16
4	25
2	35
1	50
1/0	50
2/0	70
3/0	95

AWG	mm²
4/0	120
250	120
300	150
350	185
400	185
450	240
500	240
600	300
750	400

mm² to American Wire Gauge (AWG)

mm²	AWG
0.14	26
0.25	24
0.34	22
0.50	20
0.75	19
1.0	18
1.5	16
2.5	14

mm²	AWG
4	12
6	10
10	8
16	6
25	4
35	2, 1
50	1/0
70	2/0, 3/0

mm²	AWG
95	4/0
120	250
150	300
185	350, 400
240	450, 500
300	600
400	750, 800

Exact correspondences between AWG and mm² do not exist. These conversions are approximations to facilitate comparison.
For the most accurate cross section, see the specific cable catalog page.

Color code charts

Chart 1

ÖLFLEX® 590 P/CP

Conductor	Color
1	black
2	white
3	red
4	green/yellow

Conductor	Color
5	brown
6	blue
7	orange
8	yellow

Conductor	Color
9	violet
10	gray
11	pink
12	tan

Chart 2

UNITRONIC® 190/190 CY

Cond.	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

Cond.	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

Cond.	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

Cond.	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

UNITRONIC® 300 STP, 190 CY (TP)

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

Chart 4

UNITRONIC® 300/300 S (24 - 22 AWG)

Cond.	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

Cond.	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

Cond.	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

Cond.	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)

Cond.	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

Cond.	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

Cond.	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

Cond.	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

# of Cond.	Color
2	blue + brown (does not include ground)
3	blue + brown + green/yellow (ground)
4	brown + black + gray + green/yellow (ground)

# of Cond.	Color
5	blue + brown + black + gray + green/yellow (ground)
6 +	black with printed numbers + green/yellow (ground)

Cables built to DIN VDE 0293:

ÖLFLEX® CLASSIC 100
ÖLFLEX® CLASSIC 100 CY
ÖLFLEX® CLASSIC 100 SY
ÖLFLEX® CLASSIC 130 H BK
ÖLFLEX® CLASSIC 135 CH BK
ÖLFLEX® CRANE
ÖLFLEX® CRANE F
ÖLFLEX® CRANE NSHTÖU
ÖLFLEX® CRANE PUR
ÖLFLEX® CRANE VS (N) NSHTÖU
ÖLFLEX® HEAT 180 MS
ÖLFLEX® HEAT 180 SiHF
ÖLFLEX® HEAT 180 GLS
ÖLFLEX® HEAT 180 H05SS-F
EWKF
ÖLFLEX® HEAT 145 MC
ÖLFLEX® HEAT 125 C MC
ÖLFLEX® H05VV-F
ÖLFLEX® H07RN-F
ÖLFLEX® H07RN-F enhanced
ÖLFLEX® LIFT F
ÖLFLEX® POWER IX
ÖLFLEX® POWER QUAD II
ÖLFLEX® SERVO 9YSLCY-JB
ÖLFLEX® SERVO 2YSLCY-JB
ÖLFLEX® SPIRAL 540 P
ÖLFLEX® SPIRAL H07BQ-F

Color code charts

Chart 7: DIN 47100 for paired cables (for telephone & electronic use only)

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 colors for pairs 1 - 22
45 - 66	repeat colors for pairs 1 - 22

Cables built to DIN 47100 for paired cables:

UNITRONIC® CY PiDY (TP)
UNITRONIC® FD CP (TP)
UNITRONIC® LiHCH (TP)
UNITRONIC® LiYCY (TP)
INTERBUS bus cables
PROFIBUS bus cables

Chart 8: DIN 47100 without color repetition (for telephone & electronic use only)

Cond.	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

Cond.	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

Cond.	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

Cond.	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

Cables built to DIN 47100 without color repetition:

ÖLFLEX® ROBOT 900 P/DP
ÖLFLEX® ROBOT F1/F1 C
UNITRONIC® BUS CAN/CAN FD
UNITRONIC® BUS INTERBUS
UNITRONIC® FD 890
UNITRONIC® FD/FD CY
UNITRONIC® FD P plus/CP plus
UNITRONIC® LD/LD FD P
UNITRONIC® LiHH/LiHCH
UNITRONIC® LiYY/LiYCY
UNITRONIC® SPIRAL

Chart 9: six or more conductors

ÖLFLEX® PUR S

Cond.	Color
0	green/yellow
1	white
2	black
3	blue
4	brown
5	gray
6	red
7	violet
8	pink
9	orange
10	transparent
11	tan
12	black/white
13	blue/white
14	brown/white
15	gray/white
16	red/white
17	violet/white
18	pink/white
19	orange/white
20	trn./white
21	tan/white
22	blue/black
23	brown/black
24	gray/black
25	red/black

Cond.	Color
26	violet/black
27	pink/black
28	orange/black
29	trn./black
30	tan/black
31	brown/blue
32	gray/blue
33	red/blue
34	pink/blue
35	orange/blue
36	trn./blue
37	tan/blue
38	gray/brown
39	red/brown
40	violet/brown
41	pink/brown
42	orange/brown
43	trn./brown
44	tan/brown
45	red/gray
46	violet/gray
47	pink/gray
48	orange/gray
49	trn./gray
50	tan/gray
51	orange/red

Cond.	Color
52	trn./red
53	tan/red
54	pink/violet
55	orange/violet
56	trn./violet
57	tan/violet
58	trn./pink
59	tan/pink
60	trn./orange
61	tan/orange
62	blue/white/black
63	brown/white/black
64	gray/white/black
65	red/white/black
66	violet/white/black
67	pink/white/black
68	orange/white/black
69	trn./white/black
70	tan/white/black
71	brown/white/blue
72	gray/white/blue
73	red/white/blue
74	violet/white/blue
75	pink/white/blue
76	orange/white/blue
77	trn./white/blue

Cond.	Color
78	tan/white/blue
79	gray/white/brown
80	red/white/brown
81	violet/white/brown
82	pink/white/brown
83	orange/white/brown
84	trn./white/brown
85	tan/white/brown
86	red/white/gray
87	violet/white/gray
88	pink/white/gray
89	orange/white/gray
90	trn./white/gray
91	tan/white/gray
92	blue/white/red
93	brown/white/red
94	violet/white/red
95	pink/white/red
96	orange/white/red
97	brown/white/violet
98	orange/white/violet
99	brown/black/blue
100	gray/black/blue
101	red/black/blue

Chart 10: ICEA-NEMA (K-2)

ÖLFLEX® TRAY VTC, FLAT

Cond.	Color
1	black
2	red
3	blue
4	orange
5	yellow
6	brown
7	red/black
8	blue/black
9	orange/black

Cond.	Color
10	yellow/black
11	brown/black
12	black/red
13	blue/red
14	orange/red
15	yellow/red
16	brown/red
17	black/blue
18	red/blue

Cond.	Color
19	orange/blue
20	yellow/blue
21	brown/blue
22	black/orange
23	red/orange
24	blue/orange
25	yellow/orange
26	brown/orange
27	black/yellow

Cond.	Color
28	red/yellow
29	blue/yellow
30	orange/yellow
31	brown/yellow
32	black/brown
33	red/brown
34	blue/brown
35	orange/brown
36	yellow/brown

example 1:
ÖLFLEX® TRAY VTC P/N 201807 is a 7 conductor cable. All conductors are black and printed with white ink according to the chart above:
1: black, 2: red, 3: blue, 4: orange, 5: yellow, 6: brown, 7: green/yellow

The last conductor of the cable is always colored green/yellow (30% stripe width) with no printing, except for 21 conductor cables.

example 2:
ÖLFLEX® FLAT P/N 811259 is a 4 conductor cable. The conductors are colored according to the chart above, with alpha-numeric printing:
1: black printed “1-ONE”, 2: red printed “2-TWO”, 3: blue printed “3-THREE”, 4: orange printed “4-FOUR”

There is no green/yellow ground.

Connector housings

The most important considerations for a heavy duty connector are its electrical characteristics, its mechanical characteristics and the materials from which it is manufactured. The heavy duty connector provides safe connection and disconnection of electrical power or signals with robust housings suitable for hostile environments (connectors should never be mated or unmated under load due to the possibility of arc flash.)

The construction of a rectangular connector can be selected specifically for a customer's requirement. EPIC® industrial connectors from LAPP are made up of various components (housings, inserts, contacts, strain relief.)

The various components of the heavy duty rectangular connector are purchased individually and assembled together. A wide range of housing sizes and many options of inserts and contacts make it possible to design the ideal connector for each application. For 3D or 2D CAD drawings refer to www.lappusa.com

Housing types

Hood
A hood may have a top or an angle (side) entry of different PG, metric, or NPT sizes to accommodate a wide range of cable diameters. The hood can be mated with either a surface or panel mounting base, or a cable coupler hood (for cable to cable connection.)

Panel mount base
The panel base is wired from below through a hole cut in a panel. The panel base is attached to the surface of a control panel for connection of control or power cables.

Surface mount base
The surface base is a complete enclosure only offering cable entry through a cable gland mounted either on one or both sides of the base.

Cable coupler hood
The cable connector mates with a top entry hood to offer cable to cable connection. This is frequently used to extend cables.

Fixed locking lever (latches)
Hoods & bases can feature single or double levers. There are two types of locking levers:

- single locking lever: bolts on the longer side of the connector
- double locking lever: bolts two levers on the shorter sides of the connector

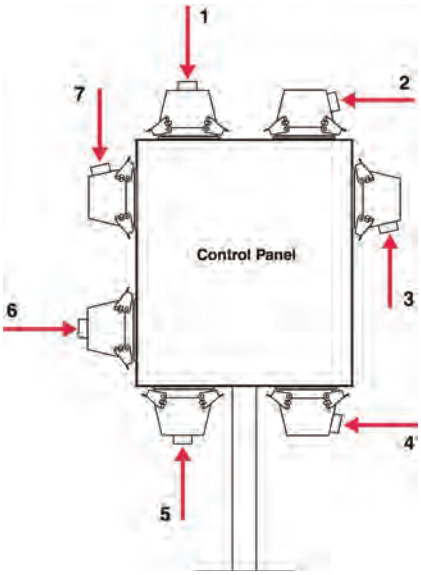
There is no right or wrong way to position a connector for installation. The goal is to match the hood entry to the installation requirement as closely as possible.

Choose your housing by answering these two questions:

1. Where are you mounting the connector?
2. Where is the cable coming from?

This will allow you to make a reasonable selection.

Diagram example	Hood entry location	Cabinet mounting panel surface	Cable entry direction
1	top	top	vertical down from above
2	side	top	horizontal from side
3	side	side	vertical up from below
4	side	bottom	horizontal from side
5	top	bottom	vertical up from below
6	top	side	horizontal from side
7	side	side	vertical down from above



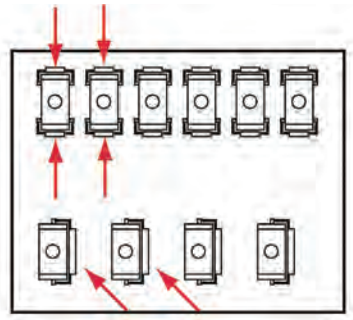
Single vs. double bolt hoods

Although either bolt location can be used, the key is to use a bolt location that allows the connectors to be mounted as close together as possible while providing the maximum access possible to the locking levers on the base.

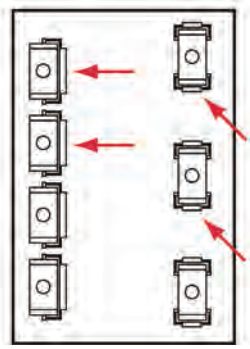
For connectors mounted horizontally side by side, the double bolt location is recommended.

For connectors mounted vertically top-to-bottom, the single bolt location is recommended.

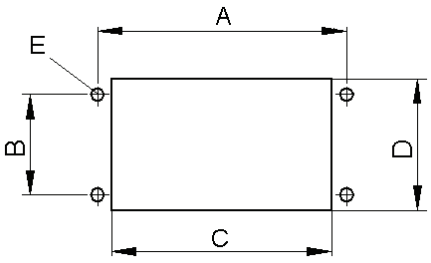
connectors mounted horizontally



connectors mounted vertically



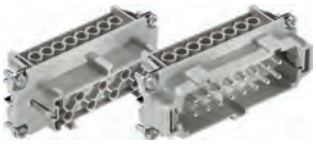
Panel cut-out sizes



Panel mount base size	A in	A mm	B in	B mm	C in	C mm	D in	D mm	E in	E mm
EPIC® HA										
HA 3	1.181	30	–	–	0.827	21.0	0.827	21.0	0.130	3.3
HA 10	2.756	70	0.689	17.5	2.264	57.5	0.945	24.0	0.142	3.6
HA 16	3.386	86	0.689	17.5	2.902	73.7	0.945	24.0	0.142	3.6
HA 32	3.622	92	1.654	42.0	2.921	74.2	1.906	48.4	0.169	4.3
HA 48	4.331	110	2.560	65.0	3.366	85.5	2.795	71.0	0.217	5.5
HA 64	5.827	148	2.756	70.0	4.606	117.0	3.228	82.0	0.276	7.0
EPIC® HB										
HB 6	2.756	70	1.260	32	2.055	52.2	1.378	35.0	0.169	4.3
HB 10	3.268	83	1.260	32	2.567	65.2	1.378	35.0	0.169	4.3
HB 16	4.055	103	1.260	32	3.366	85.5	1.378	35.0	0.169	4.3
HB 24	5.118	130	1.260	32	4.409	112.2	1.378	35.0	0.169	4.3
HB 32	4.331	110	2.560	65	3.366	85.5	2.795	71.0	0.217	5.5
HB 48	5.827	148	2.756	70	4.606	117.0	3.228	82.0	0.276	7.0

Rectangular plugs & receptacles

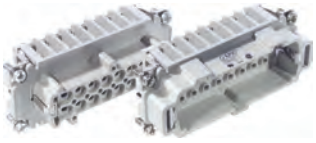
The male and female inserts house male (pin) and female (socket) contacts respectively, and are the interface for the electrical connection. Cable is terminated to the contacts, while the inserts provide the electrical insulation.



Screw-terminated plugs & receptacles

This simple type of termination is distinguished by its ease of maintenance. No special tool is required, just a screwdriver to undo and tighten up the terminal screws. Screw connection technology is per DIN EN 60999:

	Conductor cross-section					
	1 mm²	1.5 mm²	2.5 mm²	4 mm²	5 mm²	10 mm²
Screw thread	M 2.6	M 3	M 3	M 3.5	M 4	M 4
Recommended Ncm	40.7	50	50	80	120	120



Crimp-terminated plugs & receptacles

The purpose of crimping is to produce a good mechanical, electrical, and gas-tight connection. This should remain unchanged with regard to quality in the long-term, and should thus be reliable. Crimping also reduces termination time and allows the designer to achieve more connections than screw termination would permit in the same space.

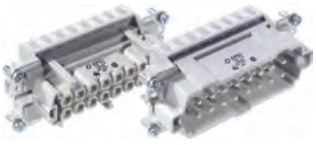
Hand operated tools or crimping machines can be used to assemble crimp contacts. The following points must be followed in order to obtain the ideal crimping result:

- cross section dimension/gauge size and structure of the cable
- contact type and size
- tool and tool setting

There are two different crimp contact types: machined and stamped and formed. These two types of contacts have differing characteristics in terms of quality and how the termination is made.

Stamped & formed contacts
The crimping sleeve allows a wider range of wire gauges to be crimped. This guarantees reliable crimping quality. Furthermore, the insertion and extraction force is usually lower with stamped pin and socket contacts, achieved by the large contact area and the spring characteristics of the stamped contacts' material. Stamped contacts can be supplied reeled for use with automatic feed crimping tools.

Machined contacts
With this popular type of contact, the suitable contact size is matched to the wire gauge of the cable. The correct crimping tool or dies must be used.



Screwless spring cage clamp inserts

This type of termination is noted for its ease and speed of fitting without an additional tool. The compensating effect of the cage clamp enables good contact to be maintained in the long term.

Modular inserts

The modular series inserts provide flexibility. A combination of 2 or up to 14 modules can be combined into one connector housing. The available modules include coax, high voltage, cage clamp and crimp terminated, and configurations up to 280 contacts.

General design specifications

General design

EPIC® connectors consist of mating male and female inserts of various sizes and electrical characteristics, which utilize either screw-clamp, crimp contacts, or cage clamp terminations. The inserts are fully enclosed in hoods and housings of either plastic or metal.

Termination

Screw-clamp insert contacts are made of copper alloy and plated with silver to inhibit corrosion. Clamping and fixing screw are made of galvanized steel with a silver chromate plating.

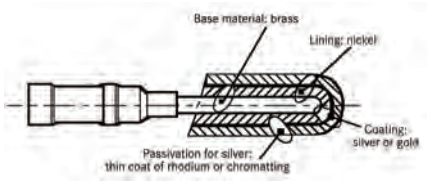
Crimp-contact inserts shall accept either stamped and formed or machined crimp contacts. Crimp contacts feature a base crimp contact and a stainless steel locking spring. Crimp contacts are made of a copper zinc alloy, plated with an appropriate material (tin/lead, gold or silver) to provide corrosion resistance.

Cage clamp insert contacts are made of copper alloy. The cage clamp screwless spring termination requires no special tools for termination. The connection is vibration-proof and never requires re-tightening.

Hoods & bases

Hoods and bases are made of either metal or plastic depending on the application requirement. Metal hoods are made of an anodized aluminum or zinc cast material for corrosion resistance. Additionally, metal hoods and bases feature a powder-paint or nickel-plated surface for wear resistance. Thermoplastic housings are heat resistant for high temperature applications.

Conductor specifications



Contact material

The coating of the base material with a precious metal is necessary to guarantee a good, long lasting connection. The contacts are normally plated through galvanic processes. For a long-lasting plating, there are some requirements for the contact and the plating material:

Requirements for contact material:

- good dimensional stability
- high corrosion resistance
- good electrical conductivity

Brass (copper zinc alloy) is used for its good mechanical properties and electrical conductivity. Because it is also relatively economical, it has become one of the most preferred contact materials.

Requirements for contact coatings:

- high abrasion resistance
- low contact resistance
- high corrosion resistance
- low porosity
- good coat formation
- solderability

Silver or gold are the usual choices for surface coating.

Silver possesses the highest electrical conductivity of any metal and is the most cost-effective precious metal. With sulfur or sulfurous products in the ambient air, a brownish to black oxide coating made up of silver sulfide (Ag_2S) will rapidly be formed. However, this coating will break up in the process of mating and will be broken down by high currents, so that the necessary electrical conductivity is maintained. Passivation of the silver surface will delay the formation of the oxide coating and will reduce the mating and unmating forces.

Gold is the most tarnish-resistant precious metal. Formation of oxides and sulfides can be discounted. Gold contacts are distinguished by their low mating and unmating forces. They are mainly used for transmission of signals with low current and voltage values.

Alternative materials

Nickel is normally applied as a corrosion protection and blocking layer. Furthermore, the relatively high hardness of the Ni coating has a positive effect on wear characteristics.

Tin or tin/lead is one of the most frequently employed metals for contacts, especially in the automotive field. As an aid to soldering, virtually all partially coated strips in the connection are coated with tin or tin/lead. Due to the low hardness of tin, the mating forces are very high and this makes it unsuitable for connectors that are designed for a high number of mating cycles.

General approvals

Pollution

The numerical value which states the anticipated pollution in the micro-environment:

Pollution level 1
No pollution or only dry, non-conductive pollution occurs. This pollution has no influence. For example: open, unprotected insulations in air-conditioned or clean, dry rooms.

Pollution level 2
Only non-conductive pollution occurs. Occasionally, however, transient conductivity may arise due to condensation. For example: open unprotected insulations in residential, commercial, or business premises (fine mechanical engineering workshops, laboratories, test areas, rooms used for medical purposes). Pollution level 2 is typical for households.

Pollution level 3
Conductive pollution occurs, or condensation causes dry, non-conductive pollution to become conductive. For example: open unprotected insulations in rooms of industrial, commercial, and agricultural companies, unheated storage rooms, boiler houses, and workshops. Pollution level 3 is typical for industrial environments.

Pollution level 4
Contamination leads to continuous conductivity caused by condensation or other environmental contaminants. For example: external exposed installation subject to all environmental changes.

Insulation materials

Insulation materials are categorized into 4 groups according to the CTI values (Comparative Tracking Index)

Insulation material group I	600 ≤ CTI
Insulation material group II	400 ≤ CTI < 600
Insulation material group IIIa	175 ≤ CTI < 400
Insulation material group IIIb	100 ≤ CTI ≤ 175

Comparative tracking index

The test for determination of the comparative index of tracking (CTI or comparative tracking index) as per IEC 112 provides a comparison of the characteristics of various insulating materials under test conditions. By dripping an aqueous solution onto a horizontal surface the electrolytic condition can be measured. This produces a qualitative result. When the insulating material is introduced to the tracking, a quantitative comparison can be measured, ex. the comparative tracking index.

Switch contact

If the construction of the circuit requires that, for safety reasons, the circuit power should remain off until one or more contacts are engaged, or that the circuit power should be turned off prior to one or more contacts being disengaged, then a connector with switch contacts (EPIC® HBVE series) should be used.

EMC (electromagnetic compatibility)

EMC is the capacity of an electrical installation to function properly in an electromagnetic environment without adversely influencing the environment, including other installations (DIN/VDE 0870, Section 1).

Coding

Coding is a system by which it is possible to prevent interfacing confusion between adjacent connectors that are similarly configured. This is useful if two or more connectors of the same type are mounted on the same unit.

Polarization

Polarization of connectors prevents incorrect mating of male and female inserts, e.g., pin1 to pin1.

Materials

PA (polyamide)
Polyamides are high-impact, very tough thermoplastics that exhibit very good electrical insulation characteristics, favorable tracking characteristics, and resistance to flashover. The greater the proportion of filling agents, the lower the water absorption rate and the better the dimensional stability. Their specific surface resistance, due to humidity absorption, is somewhat less than that of other plastics. However, this reduces the likelihood of a build up of electrostatic charge and consequently avoids attracting dust. These characteristics mean that polyamides are suitable for production of casings for electrical plants.
Typical applications: high voltage modules, plastic frame grips

PC (polycarbonate)
Polycarbonate is an amorphous thermoplastic. It is distinguished by high strength, viscosity, hardness, rigidity, a good resistance to heat and cold in relation to its form, and good electrical characteristics. PC is a glass-clear, easily dyed plastic with very low water absorption, and exhibits high dimensional precision, low waste, and good processability.
Typical applications: inserts/insulators, frames, and individual modules for modular systems

PBT (polybutylene terephthalate)
Polybutylene terephthalate is a thermoplastic polyester and is distinguished by its high rigidity, high stability of form under heat, low creep, low water absorption of < 0.2%, high dimensional stability, and good to very good electrical characteristics. It is a tough, viscous plastic with high abrasion resistance, high dimensional stability, and long-term strength combined with good slip and wear characteristics.
Typical applications: inserts/insulators

Chemical resistance of plastics

Diluted acid	PA 6 GF	PA 66 GF	PC GF	PBT GF
Acetone	⛒	⛒	⛒	⛒
Aqueous ammoniac	⛒	⛒	✖	⛒
Benzene	⛒	⛒	⛒	⛒
Benzol	⛒	⛒	⛒	⛒
Diesel oil	⛒	⛒	✖	⛒
Concentrated acetic acid	⛒	⛒	⛒	⛒
Alkaline potassium	✖	✖	✖	✖
Methanol	✖	✖	✖	⛒
Engine oil	✖	✖	✖	⛒
Diluted alkalis	⛒	⛒	⛒	⛒
Chlorohydrocarbons	⛒	⛒	✖	⛒
Outdoor exposure	⛒	⛒	✖	✖
Cold water/seawater	⛒	⛒	✖	⛒

⛒ **resistant**
✖ **conditionally resistant**
✖ **not resistant**

Electrical, thermal & mechanical values

	Unit	PA 6 GF	PA 66 GF	PC GF	PBT GF
Electrical values					
Flash over resistance (DIN 53481; VDE 0303)	Ed * KV/mm	80/40	> 80/40	35	100
Tracking current resistance (DIN 53480; VDE 0303)	CTI	> 500	> 500	> 125 to 250	> 500
Thermal values					
Temperature limit for short-term application	°C	180	200	165	190
Temperature limit for long-term application	°C	105	120	130	140
Mechanical values					
Density (DIN 53479)	g/cm3	1.35	1.35	1.34	1.53
Modulus of elasticity in the flexional and tensile test (DIN 53457)	EZ * MPa	8500/6000	9700/7500	6000	10000
Absorption of humidity in NK until occurrence of saturation (DIN 5714)	%	2.1	1.5	0.13	0.13

* Numerical information relates to both dry and atmospherically humid conditions

Sealing materials

NBR (e.g.: Perbunan®)
This is a synthetic rubber used for parts with high resistance to fuels, oils, fats, and aliphatic solvents at high temperatures. The durability of the material can be used to protect against ozone or the prevailing environmental conditions.

O-rings are used in various applications: electrical and automotive industry, hydraulics, mechanical engineering, oil industry for membranes, fuel hoses, seals, formed items, plate gaskets, etc.
Typical applications: seals and gaskets for rectangular connectors and glands.

Perbunan® is a registered trademark of BAYER AG.

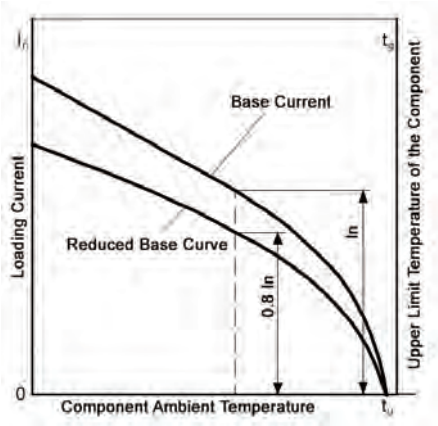
FPM (e.g.: Viton®)
This fluoroelastomer is commonly used for rubber parts and withstands fuels, oils, lubricants, and many acids and chemicals during extreme thermal stress. Viton also has good mechanical qualities, flame resistance, and high durability against ozone and environmental impacts of every kind.
Typical applications: seals in circular connector type A and glands.

Viton® is a registered trademark of DuPont de Nemour.

Chemical, thermal & mechanical values

Abbreviation	NBR	FPM
Commercial name	Perbunan N Hycar	Viton/Fluorel
Shore A hardness range at standard solid quality tolerance ± 5° Shore (approx.)	25 - 40	60 - 90
Tear strength N/mm² @ +20°C	approx. 20	approx. 17
General weather-resistance	good	excellent
Ozone resistance	satisfactory	excellent
Resistance to oil	excellent	excellent
Resistance to fuel	good	excellent
Resistance to solvent	partially good	very good
General resistance to acids	satisfactory	very good
Temperature resistance: a) Short-term: b) Long-term:	 -40°C to +150°C -30°C to +120°C	 -30°C to +280°C -20°C to +230° C
Vapor resistance	good	satisfactory to good
Can be supplied in food packaging products	yes	no

Derating curves



The derating curve indicates the maximum current that can permanently and simultaneously flow through all connections if the component is exposed to ambient temperatures below its upper limit temperature.

The upper limit temperature of a component is determined by its material(s). The maximum temperature is calculated from the ambient temperature and from heating due to current loading. It must not exceed the upper limit temperature of the component. The derating of a component is not a constant value, but decreases hand-in-hand with the increase in component ambient temperature. Furthermore, current loading capacity is dependent upon geometry, the materials employed, the number of poles, and the conductor.

Since it is not advisable to use heavy duty connectors at their loading limits, the base curve is reduced. If the loading currents are reduced to 80%, then this produces the reduced base curve in relation to the various connectors and measurement uncertainties at which temperature measurements are taken into account. Experience shows that use of the reduced base curve data will provide operation over the widest range of connector applications.

Note: only the reduced base curve is reproduced on the following derating curves for inserts.

Recommended torque for EPIC® assembly screws

Screw size	EPIC® connector assembly part example	Recommended torque	
		metric	US
M3	EPIC® HBE & HA screw terminals, EPIC® insert mounting screws, EPIC® guide pin & bushing	0.80 Nm	0.59 lb/ft (7.08 lb)
M4	EPIC® HD, HDD, HBE & HA ground screw, EPIC® HBS screw terminal	1.50 Nm	1.11 lb/ft (13.32 lb)

Screw size	EPIC® connector assembly part example	Recommended torque	
		metric	US
M5	EPIC® HBS grounding screw	2.50 Nm	1.84 lb/ft (22.13 lb)
M6	MP 80A screw terminal Modular MC2 screw terminal	3.00 Nm	2.21 lb/ft (26.52 lb)

Cable outer diameter for PG glands

Exact correspondences between AWG and mm² do not exist. These conversions are approximations to facilitate comparison. For the most accurate cross section, see the specific cable catalog page.

PG size	Cable outer diameter range	
	in	mm
PG 7	0.157 - 0.236	4.0 - 6.0
PG 9	0.157 - 0.433	4.0 - 11.0
PG 11	0.256 - 0.531	6.5 - 13.5
PG 13	0.256 - 0.531	6.5 - 13.5
PG 16	0.256 - 0.630	6.5 - 16.0

PG size	Cable outer diameter range	
	in	mm
PG 21	0.354 - 0.787	9.0 - 20.0
PG 29	0.669 - 1.102	17.0 - 28.0
PG 36	0.906 - 1.339	23.0 - 34.0
PG 42	1.142 - 1.575	29.0 - 40.0

PG to metric conversion

A one-to-one conversion is not possible between PG and metric sizes. The table presented here offers approximate comparisons. LAPP North America continues to support PG and metric components.

PG	Metric
7	12
9	16
11	20
13	–
16	25

PG	Metric
21	–
29	32
36	40
42	50
48	63

PG gland sizes for multi-conductor cable

20 AWG (0.5 mm²)

Number of conductors	Cable diameter mm	PG size						
2	5.7 - 8.7	9						
3	6.0 - 9.0	9	11					
4	6.7 - 9.7	9	11	13	16			
5	7.2 - 10.2	9	11	13	16			
6	7.6 - 10.6	9	11	13	16			
7	8.0 - 10.6	9	11	13	16			
8	9.4 - 12.8	9	11	13	16			
10	9.4 - 12.8	9	11	13	16			
12	9.7 - 12.9	9	11	13	16			
14	10.2 - 13.4		11	13	16			
16	10.7 - 13.9		11	13	16			
21	12.3 - 15.1			13	16	21		
24	13.5 - 16.7			13	16	21		
30	14.3 - 17.5				16	21		
35	16.0 - 18.6					21		
40	16.6 - 19.2					21		
52	19.2 - 21.6					21	29	
61	20.3 - 23.1					21	29	
80	22.9 - 25.7						29	36
100	26.4 - 29.6						29	36

18 AWG (1.0 mm²)

Number of conductors	Cable diameter mm	PG size						
2	6.8 - 9.8	9	11					
3	7.2 - 9.7	9	11	13				
4	7.9 - 10.3	9	11	13	16			
5	8.9 - 10.9	9	11	13	16			
6	8.9 - 12.3	9	11	13	16			
7	9.6 - 12.3	9	11	13	16			
8	10.4 - 13.8		11	13	16			
9	10.7 - 13.9		11	13	16			
10	10.4 - 13.8		11	13	16			
12	10.7 - 13.9		11	13	16			
15	12.3 - 13.5			13	16			
18	13.0 - 16.2			13	16			
21	13.6 - 16.8			13	16	21		
25	15.9 - 18.5				16	21		
32	17.1 - 19.7					21	29	
40	19.0 - 21.4					21	29	
50	21.3 - 24.1					21	29	
61	22.6 - 25.4					21	29	36
80	26.1 - 29.3					21	29	36
100	29.4 - 33.0							36

16 - 18 AWG (1.0 mm²)

Number of conductors	Cable diameter mm	PG size						
2	7.1 - 10.1	9	11					
3	7.5 - 10.1	9	11					
4	8.4 - 10.7	9	11	13				
5	9.2 - 11.4	9	11	13	16			
6	9.2 - 12.6	9	11	13	16			
7	9.2 - 12.6	9	11	13	16			
8	11.0 - 14.4		11	13	16	21		
9	11.8 - 15.2		11	13	16	21		
10	11.0 - 14.4		11	13	16	21		
12	11.8 - 14.6		11	13	16	21		
14	12.4 - 15.2			13	16	21		
16	13.0 - 16.2			13	16	21		
18	13.7 - 16.9			13	16	21		
20	14.4 - 17.6				16	21		
24	16.5 - 19.1					21		
25	16.9 - 19.5					21		
34	19.4 - 21.8					21		
48	22.0 - 24.8					21		
56	23.2 - 26.0					21	36	
61	24.5 - 27.2						36	
80	27.7 - 30.9						36	
100	31.8 - 35.2						36	42

16 AWG (1.5 mm²)

Number of conductors	Cable diameter mm	PG size							
2	8.0 - 11.0	9	11	13	16				
3	8.7 - 11.0	9	11	13	16				
4	9.7 - 11.8	9	11	13	16				
5	10.8 - 13.0		11	13	16				
6	10.8 - 14.2		11	13	16				
7	10.8 - 14.2		11	13	16				
8	13.2 - 16.6			13	16	21			
11	13.6 - 16.8			13	16	21			
12	17.6 - 16.8			13	16	21			
14	14.4 - 17.6				16	21			
16	15.8 - 18.4				16	21			
18	16.6 - 19.2					21	29		
20	17.4 - 20.0					21	29		
25	20.2 - 23.0					21	29		
32	23.8 - 24.5						29	36	
34	22.6 - 25.4						29	36	
42	25.8 - 29.0						29	36	
50	27.0 - 30.2						29	36	
56	27.8 - 31.0						29	36	
61	28.6 - 31.8							36	
80	33.0 - 36.4							36	42
90	34.6 - 37.6							36	42
100	37.8 - 41.4								42

12 - 14 AWG (2.5 mm²)

Number of conductors	Cable diameter mm	PG size							
2	9.8 - 12.8	9	11	13	16				
3	10.6 - 13.4		11	13	16				
4	11.7 - 14.4		11	13	16				
5	13.0 - 16.4			13	16	21			
6	13.3 - 16.7			13	16	21			
7	13.3 - 16.7			13	16	21			
8	17.4 - 20.8					21	29		
11	18.0 - 20.6					21	29		
16	20.6 - 23.4					21	29		
18	21.7 - 24.5						29	36	
25	26.4 - 29.6						29	36	
34	31.3 - 33.1							36	42
50	37.0 - 39.4								42
61	39.0 - 41.5								42

10 - 12 AWG (4 mm²)

Number of conductors	Cable diameter mm	PG size						
2	10.7 - 14.1	9	11	13		21		
4	13.0 - 16.4			13		21		
5	14.3 - 17.7					21		
7	16.2 - 19.6					21	29	36
11	ca - 24.5						29	36

These tables are based on a representative construction type of multi-conductor cable. Other products may vary.

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:

- penetration of dust (6)
- jets of water from any direction (5)

IP68, 5 bar provides protection against:

- penetration of dust (6)
- water protection (8) up to 5 bar/70 psi

NEMA ratings

NEMA Type 1:
General Purpose: Indoor Use
Intended to provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.

NEMA Type 2:
Drip-proof: Indoor Use
General purpose indoor use intended to be dust-proof and provide protection against limited amounts of falling dirt and water.

NEMA Type 3:
Dust-tight, Rain-tight, Sleet Resistant: Outdoor Use
Intended to provide protection against wind-blown dust and rain. Should be undamaged by the formation of ice on the enclosure.

NEMA Type 3R:
Rain-proof & Sleet Resistant: Outdoor Use
Intended to provide protection against falling rain. Should be undamaged by the formation of ice on the enclosure.

NEMA Type 3S:
Outdoor Use
Intended to provide protection against wind-blown dust, rain, and sleet. The external mechanisms should remain operable while ice-laden.

NEMA Type 4:
Water-tight & Dust-tight: Indoor/Outdoor Use
Intended to provide protection against dust, falling rain, splashing, and hose-directed water sprays. Should be undamaged by the formation of ice on the enclosure.

NEMA Type 4X:
Water-tight, Dust-tight, Corrosion Resistant: Indoor/Outdoor Use
Intended to provide protection against dust, falling rain, splashing, and hose-directed water sprays. Should be undamaged by the formation of ice on the enclosure. Should be corrosion resistant.

NEMA Type 5:
Dirt-tight, Dust-tight, Liquid-tight: Indoor Use
Intended to provide protection against falling dirt, airborne dust, lint, fibers, and filings. Also provides protection against dripping and light splashing of liquids.

NEMA Type 6:
Indoor/Outdoor Use
Intended to provide protection against the entry of water during temporary and limited submersion. Should remain undamaged by the formation of ice on the enclosure.

NEMA Type 6P:
Indoor/Outdoor Use
Intended to provide protection against the entry of water during prolonged submersion at limited depths. Should remain undamaged by the formation of ice on the enclosure.

NEMA Type 7:
Indoor Use in Hazardous Applications
Used in Class 1, Division 1, Groups A, B, C, or D applications.

NEMA Type 8:
Indoor/Outdoor Use in Hazardous Applications
Used in Class 1, Division 1, Groups A, B, C, or D applications.

NEMA Type 9:
Indoor Use in Hazardous Applications
Used in Class 2, Division 1, Groups E, F, or G applications.

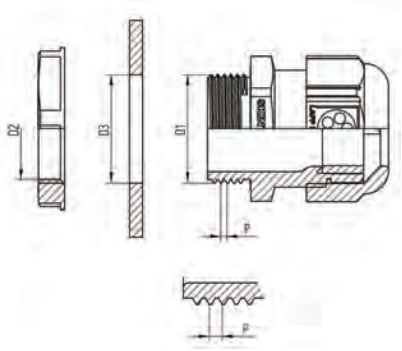
NEMA Type 10:
Mine Use
Meets the requirements of the mine safety and health administration, 30 FR, Part 18.

NEMA Type 11:
Indoor Use
Intended to provide corrosion resistance and protection during oil immersion.

NEMA Type 12:
Indoor Use
Intended to provide protection against entry of dust, dirt, and dripping water. Should provide protection against non-corrosive liquids.

NEMA Type 13:
Indoor Use
Intended to provide protection against entry of dust, dirt, and dripping water. Should provide protection against non-corrosive liquids.

Threading dimensions



NPT thread technical data for assembly ASA B2.1-1945

Thread size	Core diameter (D1)		Pitch (P)		Nominal thread bore diameter (D3)	
	in	mm	in	mm	in	mm
NPT ¼"	0.539	13.7	0.055	1.41	0.556 - 0.008	14.1 - 0.2
NPT ⅜"	0.673	17.1	0.055	1.41	0.685 - 0.008	17.4 - 0.2
NPT ½"	0.839	21.3	0.071	1.81	0.851 - 0.008	21.6 - 0.2
NPT ¾"	1.051	26.7	0.071	1.81	1.063 - 0.008	27.0 - 0.2
NPT 1"	1.315	33.4	0.087	2.21	1.327 - 0.008	33.7 - 0.2
NPT 1¼"	1.662	42.2	0.087	2.21	1.674 - 0.008	42.5 - 0.2
NPT 1½"	1.903	48.3	0.087	2.21	1.918 - 0.008	48.7 - 0.2
NPT 2"	2.375	60.3	0.087	2.21	2.391 - 0.008	60.7 - 0.2

PG thread technical data for assembly DIN 40430

Thread size	Core diameter (D1)		Pitch (P)		Outside diameter (D2)		Nominal thread bore diameter (D3)	
	in	mm	in	mm	in	mm	in	mm
PG 7	0.492	12.5	0.050	1.27	0.445	11.3	0.504 - 0.008	12.8 - 0.2
PG 9	0.598	15.2	0.055	1.41	0.547	13.9	0.611 - 0.008	15.5 - 0.2
PG 11	0.732	18.6	0.055	1.41	0.681	17.3	0.745 - 0.008	18.9 - 0.2
PG 13	0.803	20.4	0.055	1.41	0.752	19.1	0.816 - 0.008	20.7 - 0.2
PG 16	0.886	22.5	0.055	1.41	0.835	21.2	0.898 - 0.008	22.8 - 0.2
PG 21	1.115	28.3	0.063	1.59	1.055	26.8	1.127 - 0.008	28.6 - 0.2
PG 29	1.457	37.0	0.063	1.59	1.398	35.5	1.474 - 0.012	37.4 - 0.3
PG 36	1.851	47.0	0.063	1.59	1.792	45.5	1.868 - 0.012	47.4 - 0.3
PG 42	2.127	54.0	0.063	1.59	2.068	52.5	2.143 - 0.012	54.4 - 0.3
PG 48	2.336	59.3	0.063	1.59	2.277	57.8	2.352 - 0.012	59.7 - 0.3

Metric thread technical data for assembly, EN 60423 (for cable glands EN 50 262)

Thread size	Core diameter (D1)		Pitch (P)		Outside diameter (D2)		Nominal thread bore diameter (D3)	
	in	mm	in	mm	in	mm	in	mm
M12 x 1.5	0.472	12.0	0.059	1.50	0.417	10.6	0.484 - 0.008	12.3 - 0.2
M16 x 1.5	0.630	16.0	0.059	1.50	0.575	14.6	0.642 - 0.008	16.3 - 0.2
M20 x 1.5	0.788	20.0	0.059	1.50	0.732	18.6	0.799 - 0.008	20.3 - 0.2
M25 x 1.5	0.985	25.0	0.059	1.50	0.929	23.6	0.996 - 0.008	25.3 - 0.2
M32 x 1.5	1.260	32.0	0.059	1.50	1.205	30.6	1.272 - 0.008	32.3 - 0.2
M40 x 1.5	1.576	40.0	0.059	1.50	1.520	38.6	1.591 - 0.012	40.4 - 0.3
M50 x 1.5	1.970	50.0	0.059	1.50	1.914	48.6	1.985 - 0.012	50.4 - 0.3
M63 x 1.5	2.482	63.0	0.059	1.50	2.427	61.6	2.497 - 0.012	63.4 - 0.3
M75 x 1.5	2.955	75.0	0.059	1.50	2.899	73.6	2.969 - 0.012	75.4 - 0.3
M90 x 2.0	3.546	90.0	0.078	2.00	3.498	88.8	3.559 - 0.012	90.4 - 0.3
M110 x 2.0	4.334	110.0	0.078	2.00	4.286	108.8	4.347 - 0.012	110.4 - 0.3

Tightening values

Tightening torque for metric cable glands

These torque values are recommended for metric SKINTOP® cable glands in order to attain protection category IP68, 5 bar and strain relief category A according to EN 50262.

Given values are tightening torques for the intermediary, as well as maximum tightening torques for the cap nuts. To prevent damage to the outer sheath, please note that different cable materials require various torques.

Not for SKINTOP® ATEX glands.

Thread	Tightening torque (Nm)	
	polymer	metal
M12 x 1.5	1.5	8.0
M16 x 1.5	3.0	10.0
M20 x 1.5	6.0	12.0
M25 x 1.5	8.0	12.0
M32 x 1.5	10.0	18.0
M40 x 1.5	13.0	18.0
M50 x 1.5	15.0	20.0
M63 x 1.5	16.0	20.0
M63 x 1.5 Plus	–	25.0
M75 x 1.5	–	30.0
M90 x 2	–	45.0
M110 x 2	–	55.0

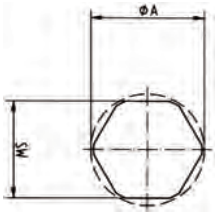
Tightening torque for NPT & PG cable glands

These torque values are recommended for NPT & PG SKINTOP® cable glands in order to attain protection in accordance with DIN/VDE 0619, Point 7.

Given values are tightening torques for the intermediary, as well as maximum tightening torques for the cap nuts. To prevent damage to the outer sheath, please note that different cable materials require various torques.

Thread		Tightening torque for intermediary (Nm)		Tightening torque for cap nut (Nm)	
NPT	PG	polymer	metal	polymer	metal
–	PG 7	3.0	6.25	1.7	6.25
NPT ⅜"	PG 9	4.0	6.25	2.5	6.25
–	PG 11	4.0	6.25	2.5	6.25
NPT ½"	PG 13	4.0	6.25	2.5	6.25
–	PG 16	6.0	7.50	3.3	7.50
NPT ¾"	PG 21	8.0	10.00	5.0	10.0
NPT 1"	PG 29	13.0	10.00	5.0	10.0
–	PG 36	13.0	10.00	5.0	10.0
–	PG 42	13.0	10.00	5.0	10.0
–	PG 48	13.0	10.00	5.0	10.0

Fitting dimensions & widths across flats



The diameter SW indicates the wrenching flats. The diameter A indicates the assembly space required for the relevant hexagon. This diameter corresponds to the width across the corner of the hexagon, plus an assembly tolerance.

Wrenching flats (SW)		Assembly space (øA)	
in	mm	in	mm
0.354	9.0	0.409	10.4
0.433	11.0	0.492	12.5
0.512	13.0	0.587	14.9
0.551	14.0	0.630	16.0
0.590	15.0	0.673	17.1
0.630	16.0	0.717	18.2
0.669	17.0	0.764	19.4
0.709	18.0	0.803	20.4
0.748	19.0	0.866	22.0
0.787	20.0	0.894	22.7
0.945	24.0	1.075	27.3
0.984	25.0	1.118	28.4
1.024	26.0	1.162	29.5

Wrenching flats (SW)		Assembly space (øA)	
in	mm	in	mm
1.063	27.0	1.205	30.6
1.103	28.0	1.252	31.8
1.142	29.0	1.280	32.5
1.182	30.0	1.339	34.0
1.260	32.0	1.426	36.2
1.300	33.0	1.465	37.2
1.418	36.0	1.595	40.5
1.457	37.0	1.635	41.5
1.536	39.0	1.733	44.0
1.576	40.0	1.780	45.2
1.615	41.0	1.816	46.1
1.654	42.0	1.851	47.0
1.773	45.0	2.017	51.2

Wrenching flats (SW)		Assembly space (øA)	
in	mm	in	mm
1.812	46.0	2.068	52.5
1.851	47.0	2.068	52.5
1.970	50.0	2.297	58.3
2.088	53.0	2.364	60.0
2.127	54.0	2.403	61.0
2.167	55.0	2.442	62.0
2.245	57.0	2.537	64.4
2.364	60.0	2.659	67.5
2.521	64.0	2.846	72.3
2.561	65.0	2.880	73.1
2.600	66.0	2.935	74.5
2.639	67.0	2.935	74.5

ATEX

Electric systems in areas with risk of explosions: directive 94/9/CE

The ATEX directive 94/9/CE applies to all products for systems designed to be used in explosive atmospheres. ATEX stands for **AT**mosphere **EX**plosive 94/9/CE (year/number/European Community). It defines the requirements for protecting the safety and health of people, pets, and property, and states the various procedures to be followed for demonstrating the conformity of devices to the directive's requirements.

An "explosive environment" means a mixture of air and flammable substances (gas, vapors, mists, or dusts) at ambient temperature and pressure which rapidly combusts when it comes in contact with a source of ignition.

Components conforming to ATEX safety requirements should be used in all hazardous areas with a risk of explosions. The risk is divided into three levels, each of which has a particular construction category:

- **Category 1** covers the level of maximum risk (areas 0 & 20)
- **Category 2** covers the highest risk level (areas 1 & 21)
- **Category 3** covers the "normal" risk level (areas 2 & 22)

All community laws impose the maximum possible levels of protection against the formation of explosive atmospheres, so that only areas 2 and 22 should exist in "normal" conditions. A number of different methods of protection can be employed. The protection method used should be clearly marked on the device. ATEX SKINTOP® glands conform to protection method "e" (increased safety), which consists of taking provisions to prevent the formation of hot-spots.

Protection modes: Ex n

Protection method Ex n is fundamentally based on provisions for prevention and is divided into two main categories.
The category applicable to SKINTOP® products is EEx nA. It is applicable to non-sparking appliances, namely those that do not produce arcs, sparks, or hot-spots during normal operation, e.g.: junction & connector boxes, fuse holders, lighting appliances, etc. The nA category bases the protection criteria on increased safety provisions. Those that apply to SKINTOP® glands are as follows:

- protection levels suitable for the environment
- possible loss-proof gaskets
- recommended minimum resistance of the enclosure to impacts: 5J (> IK08)
- resin housings with adequate resistance to temperature and surface current effects
- the maximum temperature of any surface in contact with the outside air must not exceed the limits acceptable to the temperature class

ATEX Compliance Marking

ATEX-compliant products must be clearly marked to show the specifics of the compliance. Products may be marked in several different ways. There can be a combined gas/dust marking, or gas and dust can be marked separately. The ATEX construction symbol (Ex) may be used instead of the Safe Construction Prefix.

A combined mark for SKINTOP® ATEX would be:

EEx e II 2G 1D

Type of construction
Suitable for area 20, where explosive dust may be present continuously or for prolonged periods. Pertains to IP6X device protection.

Type of construction
Suitable for area 1, where explosive gas may occasionally be present.

Group symbol
Potentially explosive atmospheres not found in mines.

Protection mode used
Increased safety

Safe construction prefix

An alternate marking (using separate gas/dust markings and the ATEX construction symbol) would be:

Ex II 2G Ex II 1D IP6X

Chemical resistance of plastics

– **not tested**
⛒ **good resistance** no to slight reaction
✖ **moderate resistance** slight to moderate reaction
✖ **low/no resistance** moderate to strong reaction

Reagent	Concentration	at °C	Polyamide PA 6	Polyamide PA 6.6	Polyamide PA 12	Thermoplastic polyurethane PU	Polypropylene PP	Polyethylene HD-PE	Polyethylene LD-PE	Polystyrene PS	Nitrile butadiene rubber NBR
Exhaust gases containing CO_2	all	60	–	–	–	–	–	⛒	⛒	–	–
Exhaust gases containing SO_2	low	60	–	–	–	–	–	⛒	⛒	–	–
Acetaldehyde	40%	20	✖	✖	⛒	–	⛒	–	–	–	20°C ⛒
Acetone	100%	20	⛒	⛒	⛒	✖	⛒	✖	✖	–	✖
Acrylic acid	100%	> 30	✖	✖	✖	–	–	–	–	–	✖
Alums, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	⛒	20°C ⛒
Allyl alcohol	96%	20	✖	✖	⛒	⛒	⛒	⛒	20% ⛒	–	–
Aluminum chloride, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	⛒	20°C ⛒
Aluminum sulfate, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	⛒	20°C ⛒
Formic acid, aqueous	10%	20	✖	✖	⛒	–	⛒	⛒	–	⛒	–
Ammonia, aqueous	saturated	20	20% ⛒	20% ⛒	20% ⛒	–	⛒	⛒	⛒	25% ⛒	–
Ammonium chloride, aqueous	saturated	60	–	–	–	3% ✖	⛒	⛒	⛒	–	20°C ⛒
Ammonium nitrate, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	⛒	20°C ⛒
Ammonium sulfate, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	–	✖
Aniline, pure	100%	20	✖	✖	✖	–	⛒	⛒	⛒	✖	–
Aniline hydrochloride, aqueous	saturated	–	–	–	–	–	⛒	✖	✖	–	–
Benzaldehyde, aqueous	saturated	20	pure ✖	pure ✖	pure ✖	–	⛒	–	–	✖	✖
Benzine	100%	20	⛒	⛒	⛒	–	✖	✖	✖	✖	✖
Benzoic acid, aqueous	all	40	20% ✖	20% ✖	–	–	⛒	⛒	⛒	⛒	✖
Benzole	100%	20	⛒	⛒	⛒	–	✖	✖	✖	✖	✖
Bleach liquor	12.5 Cl	20	✖	✖	✖	3% ✖	⛒	⛒	⛒	✖	–
Drilling oil	all	20	✖	✖	✖	–	✖	✖	✖	✖	✖
Chrome alum, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	–	20°C ⛒
Cyclohexanol	–	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	⛒
Diesel fuel	–	85	⛒	⛒	⛒	20°C ⛒	20°C ⛒	20°C ⛒	20°C ⛒	–	–
Ferric chloride, aqueous, neutral	10%	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	⛒
Glacial acetic acid	100%	20	–	–	–	–	⛒	⛒	⛒	–	✖
Acetic acid	10%	20	✖	✖	⛒	3% ✖	⛒	⛒	⛒	✖	–
Ethyl alcohol, aqueous	10%	20	40 vol% ⛒	40 vol% ⛒	40 vol% ⛒	–	–	⛒	–	⛒	–
Ethylene chloride	100%	20	–	–	–	–	✖	✖	✖	–	✖
Ethylene oxide	100%	20	–	–	–	–	✖	–	–	–	–
Ethyl ether	100%	20	–	–	–	–	✖	–	–	–	✖
Potassium ferrocyanide, aqueous	saturated	60	–	–	–	–	⛒	⛒	⛒	–	–
Fluorine	50%	40	pure ✖	pure ✖	pure ✖	✖	✖	✖	–	–	–
Formaldehyde, aqueous	diluted	40	pure ⛒	pure ⛒	pure ✖	–	40% ⛒	40% ⛒	40% ⛒	30% ⛒	20°C ✖
Glucose, aqueous	all	50	–	–	–	–	⛒	⛒	⛒	–	–
Urea, aqueous	up to 10%	40	20% ⛒	20% ⛒	20% ⛒	–	⛒	⛒	⛒	⛒	–
Flame-retardant hydraulic fluid	–	80	⛒	⛒	⛒	–	–	–	–	–	–
Hydraulic oils H & HL (DIN 51524)	–	100	⛒	⛒	⛒	–	–	–	–	–	–
Hydroxylamine sulfate, aqueous	up to 12%	30	–	–	–	–	⛒	–	–	–	–
Caustic potash, aqueous	50%	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	–
Potassium bromide, aqueous	all	20	10% ⛒	10% ⛒	10% ⛒	–	⛒	⛒	⛒	⛒	–
Potassium chloride, aqueous	10%	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	⛒
Potassium dichromate, aqueous	40%	20	5% ✖	5% ✖	5% ✖	–	⛒	⛒	⛒	–	⛒
Potassium nitrate, aqueous	all	20	10% ⛒	10% ⛒	10% ⛒	–	⛒	⛒	⛒	⛒	⛒
Potassium permanganate, aqueous	saturated	20	–	–	–	–	⛒	–	–	⛒	–
Hydrosilicofluoric acid, aqueous	up to 30%	20	✖	✖	–	–	⛒	⛒	⛒	–	–

The information presented in this table is accurate to the best of our knowledge and experience. However, it must be treated as a non-binding guideline only; in many cases, tests must be carried out under working conditions to reach a definitive conclusion.

– **not tested**
⛒ **good resistance**
no to slight reaction
✖ **moderate resistance**
slight to moderate reaction
✖ **low/no resistance**
moderate to strong reaction

Reagent	Concentration	at °C	Polyamide PA 6	Polyamide PA 6.6	Polyamide PA 12	Thermoplastic polyurethane PU	Polypropylene PP	Polyethylene HD-PE	Polyethylene LD-PE	Polystyrene PS	Nitrile butadiene rubber NBR
Carbon dioxide, dry	100%	60	–	–	–	–	⛒	⛒	⛒	50°C ⛒	20°C ⛒
Carbonic acid	100%	60	⛒	⛒	⛒	–	–	–	–	–	20°C ⛒
Cresylic acid, aqueous	up to 90%	20	pure ✖	pure ✖	–	–	⛒	⛒	✖	✖	✖
Coolant (DIN 53521)	–	120	✖	✖	–	–	–	–	–	–	–
Copper chloride, aqueous	saturated	20	–	–	–	–	⛒	⛒	⛒	–	⛒
Copper sulfate, aqueous	saturated	60	–	–	–	–	⛒	⛒	⛒	–	20°C ⛒
Magnesium carbonate, aqueous	saturated	100	–	–	–	–	⛒	–	–	50°C ⛒	–
Magnesium chloride, aqueous	saturated	20	10% ⛒	10% ⛒	10% ⛒	–	⛒	⛒	⛒	⛒	⛒
Methyl alcohol	100%	20	⛒	⛒	⛒	–	40°C ⛒	⛒	⛒	⛒	⛒
Methylene chloride	100%	20	✖	✖	✖	–	✖	✖	✖	–	–
Lactic acid, aqueous	up to 90%	20	10% ⛒	10% ⛒	10% ⛒	3% ✖	⛒	⛒	⛒	80% ⛒	⛒
Mineral oil	–	–	⛒	⛒	⛒	–	20°C ⛒	20°C ⛒	20°C ⛒	–	–
Sodium chlorate, aqueous	saturated	20	10% ✖	10% ✖	10% ✖	–	⛒	⛒	⛒	–	–
Sodium hydroxide, aqueous	10%	20	⛒	⛒	⛒	3% ✖	⛒	⛒	⛒	⛒	–
Nickel chloride, aqueous	saturated	20	10% ✖	10% ✖	10% ✖	–	⛒	–	–	⛒	⛒
Nickel sulfate, aqueous	saturated	20	10% ✖	10% ✖	10% ✖	–	⛒	⛒	⛒	–	⛒
Nitroglycerin	diluted	20	–	–	–	–	–	✖	✖	–	–
Oil and grease	–	20	⛒	⛒	⛒	–	✖	–	–	–	–
Oleic acid	–	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	✖
Oxalic acid	all	20	10% ✖	10% ✖	10% ✖	3% ✖	⛒	⛒	⛒	⛒	✖
Ozone	pure	–	✖	✖	✖	–	✖	✖	✖	–	–
Petroleum	100%	80	⛒	⛒	⛒	–	20°C ⛒	20°C ⛒	20°C ✖	✖	–
Phosgene, gaseous	100%	20	–	–	–	–	✖	✖	✖	–	–
Phosphoric acid, aqueous	diluted	20	10% ✖	10% ✖	10% ✖	3% ✖	⛒	⛒	⛒	86% ⛒	✖
Phosphorus pentoxide	100%	20	–	–	–	–	⛒	–	–	–	–
Mercury	pure	20	⛒	⛒	⛒	–	⛒	⛒	⛒	⛒	⛒
Nitric acid, aqueous	50%	20	✖	✖	✖	3% ✖	✖	✖	✖	30% ⛒	✖
Hydrochloric acid, aqueous	30%	20	20% ✖	20% ✖	20% ✖	3% ✖	⛒	⛒	⛒	15% ⛒	✖
Lubricating grease, ester oil base	–	110	✖	✖	–	–	–	–	–	–	–
Polyphenyl, ester base	–	110	⛒	⛒	⛒	–	–	–	–	–	–
Lubricating grease, silicone oil base	–	110	⛒	⛒	⛒	–	–	–	–	–	–
Carbon disulfide	100%	20	⛒	⛒	⛒	–	⛒	✖	✖	✖	✖
Sodium sulfide, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	–	–
Sulphuric acid, aqueous	10%	20	✖	✖	✖	3% ✖	50% ⛒	50% ⛒	50% ⛒	⛒	✖
Sea water	–	40	⛒	⛒	⛒	20°C ⛒	⛒	⛒	⛒	⛒	20°C ⛒
Soap solution, aqueous	all	20	diluted ⛒	diluted ⛒	diluted ⛒	⛒	⛒	⛒	–	⛒	–
Carbon tetrachloride	100%	20	⛒	⛒	⛒	–	✖	✖	✖	✖	–
Toluene	100%	20	⛒	⛒	⛒	✖	–	✖	✖	✖	✖
Trichloroethylene	100%	20	✖	✖	✖	–	✖	✖	✖	–	–
Vinyl acetate	100%	20	–	–	–	–	⛒	–	–	–	–
Hydrogen	100%	60	20°C ⛒	20°C ⛒	20°C ⛒	–	⛒	⛒	⛒	–	20°C ⛒
Xylene	100%	20	⛒	⛒	⛒	–	✖	✖	✖	✖	✖
Zinc chloride, aqueous	diluted	60	10% ✖	10% ✖	–	–	⛒	⛒	⛒	50°C ⛒	20°C ⛒
Zinc sulfate, aqueous	diluted	60	–	–	–	–	⛒	⛒	⛒	–	20°C ⛒
Zinc chloride, aqueous	diluted	40	–	–	–	–	⛒	⛒	⛒	✖	20°C ⛒
Citric acid	up to 10%	40	20°C ⛒	20°C ⛒	20°C ⛒	3% ✖	⛒	⛒	⛒	⛒	20°C ⛒

The information presented in this table is accurate to the best of our knowledge and experience. However, it must be treated as a non-binding guideline only; in many cases, tests must be carried out under working conditions to reach a definitive conclusion.

Optimal screening: problems with the use of cable glands

by U. Bochler (Dr.-Ing.) & M. Jacobsen (Dipl.-Ing.)

In industrial environments, motors, controls, and automatic welding machines can seriously impair electromagnetic compatibility (EMC). Particular problems are caused in industrial installations by long cable runs for power supply or data transmission between individual components; appropriate preventive measures are therefore essential.

Due to the antenna radiation effect of such cables, unwanted radio interference can be picked up, blanketing the useful signal. This results in functional disturbances in the connected equipment – from undetected false readings to the breakdown of an entire production line. Conversely, cables can function as transmitters, causing radio interference. Installing electronic components in an earthed switch cabinet with shielded cables has proven to be an effective countermeasure. In practice, however, the location of the cable duct frequently constitutes a weak point in the switch cabinet. Insufficient contact between the cable shielding and the metal housing often destroys the desired shielding effect. It is here that the SKINTOP® and SKINDICHT® cable glands from LAPP prove their worth. The newly developed SKINTOP® MS-SC-M and SKINTOP® MS-M BRUSH in particular are distinguished by their excellent EMC characteristics in addition to ease of handling. It enables the use of various different cable designs within a large diameter range.

Shielding concepts

With the interference phenomena typically found in the industrial environment, we must distinguish principally between cable-linked and field-linked interference. Field-linked interference emissions are either radiated directly from a circuit board or exercise an effect upon it, and can be effectively checked by installing electrical or electronic assemblies in closed metal housings such as switch cabinets. If the housing does not have any particularly large apertures, a Faraday shield is produced, which affords efficient protection against electromagnetic interference. In practice, this type of shielding is generally extremely expensive and is hardly practical in the case of moving machine components. Cables with a braided shield provide an alternative solution. In this case, the quality of the shielding depends to a great extent on the texture and thickness of the braiding. In addition, optimum attachment of the cable shield to the housing must be ensured by suitable mechanical elements in order to prevent penetration of the interference. This is where the bleeder resistance, which is the resistance that a wave faces when it hits the wall of the enclosure, plays a crucial role.

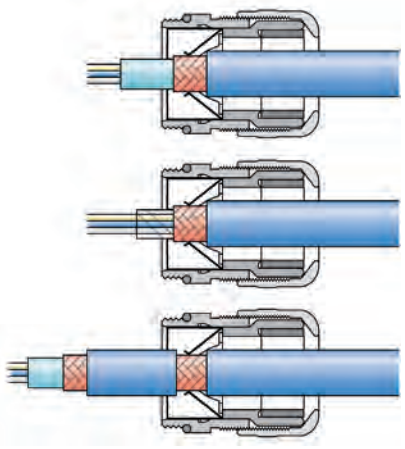
Practical requirements

To improve EMC, we have a series of practical requirements for optimum contact:

- The connection between the cable shield and the housing potential must be of low impedance. To ensure this, the contact surfaces must be as large as possible. Under ideal conditions the cable shield, together with the housing wall, constitute a closed connection and form a continuation of the housing, without permitting any openings to be formed.
- The connection must be of low induction. This means that the cable screening must be led to the housing wall via the shortest possible path and with the widest possible cross-section. Preferably a type of contact should be chosen which completely surrounds the internal conductor. The common attitude of figuring out where and how to ground a cable only after installing the cable into the housing makes effective shielding almost impossible.
- For practical application, simplicity of handling and installation are desirable. An electrician must be able to carry out installation without difficulty.

SKINTOP® & SKINDICHT®

LAPP SKINTOP® and SKINDICHT® cable glands guarantee, in addition to perfect mechanical contact, the necessary low impedance and low induction connection. These easy-to-install glands are available in different versions and sizes. With SKINDICHT® SHVE-M, the cable shield is pressed between an earthing sleeve and a conical seal, permitting 360° contact over a wide area. In the case of SKINTOP® MS-SC-M, the contact is produced by means of cylindrically arranged contact springs. The SKINTOP® MS-M BRUSH offers a 360° contact with an EMC brush. Only the cable sheathing in the area of the contact springs must be removed, and it is not necessary to open the screen braiding.



This article will focus on the SKINTOP® MS-SC-M. In a number of tests, excellent shielding properties were demonstrated. Since the appropriate standard for cable glands does not define a particular set-up of test equipment, two possible measuring procedures and their evaluation are described below:

- **Bleeder resistance & attenuation:** Bleeder resistance is being used as a parameter to assess the quality of the cable connection to the wall of the enclosure (reference potential). This provides information as to what extent charges on the cable shield can be derived against the potential of the housing. To determine the screen attenuation factor of a cable, the derivation attenuation is calculated: the potential at the derivation resistance is related to the maximum available potential in a 50 W reference system. The derivation attenuation is obtained as follows:

  aA (in dB) = 20 log(2RA / (2RA + 50 W)).

- **Triaxial method:** In the triaxial method, measurement is carried out in accordance with the German Defense Equipment Standard VG 95373 Pt 40 or 41.

  These set-ups employ a coaxial structure in a graduated tube (hence the term triaxial), and are designed for a male/female socket pair, or a piece of cable of defined length. The values of the screen attenuation mass aS and the coupling impedance ZK are determined for evaluation of the shielding effect of the connectors depending upon their material characteristics and their construction, according to the formula:

  AS = 20 log(50 W / ZK).

  In order to comply with the standards for measurement, the supply cable bring used must have a solid shield (usually this is accomplished with the help of conduit). However, this results in screen attenuation values of almost 100 dB; for practical

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	Triaxial method	Measurement of the derivation impedance
Application	pairs of connectors and shielded cable	cable glands
Measurement	shield attenuation mass from which the interaction impedance is calculated	derivation impedance is determined directly
Reference to later application	description of how effectively re-radiation is suppressed by field-linked interference	description of how effectively interference on the shield can be derived to an earthing mass (e.g.: wall of switch cabinet)

applications on a switch cabinet wall, depending upon the conditions, these can be achieved only with difficulty or not at all.

- **Comparison of both methods:** In order to provide a description of practical use of the a/m products, the Measurement procedure of the derivation impedance and conversion into screen attenuation has been used (see table above).

Measurement results

Measurements were taken using both methods with SKINTOP® MS-SC-M glands of various sizes with shielded ÖLFLEX® CY cable with diameters of 6 – 22 mm.

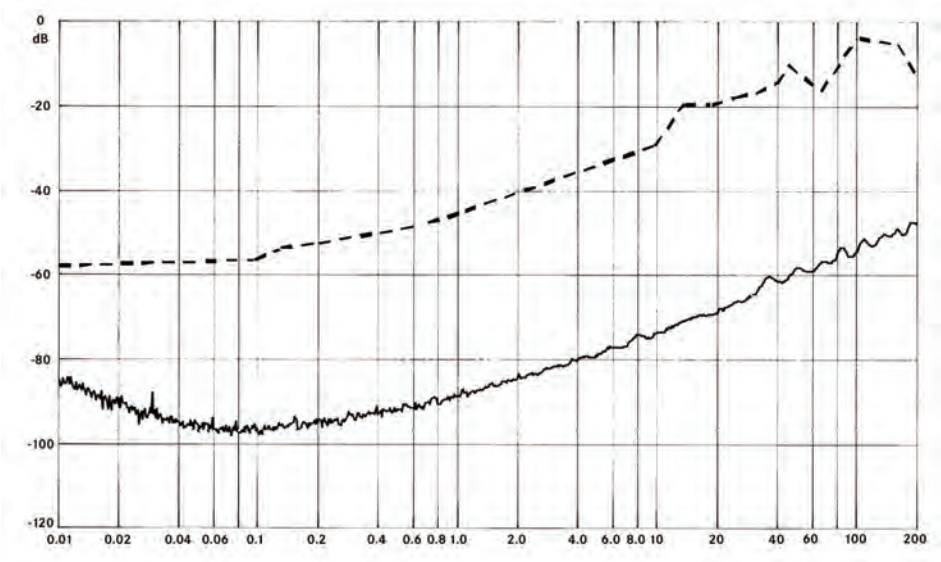
- **Measuring the derivation impedance:** In order to determine the derivation impedance, the cable glands were in each case connected to a piece of cable approx. 10 cm long. At frequencies up to 10 MHz, all glands reveal a derivation impedance of < 1W. This results in attenuation values of 30 – 50 dB (assuming a 50 W reference system). The amplitudes of disruptive high-frequency components located in this range are thus reduced by a factor of at least 30, at maximum 300. Only at frequencies above 3 – 4 MHz does the achievable attenuation sink to values < 40 dB (factor 100). At higher frequencies (100 MHz), derivation impedance values in the range of 5 - 10 W are obtained. The measurement values confirm the assumed favorable EMC characteristics. Even up to high frequencies, low derivation impedance – or high derivation attenuation values – can be obtained. With effective cable shielding, optimum protection against cable-conducted interference signals can be achieved.
- **Triaxial measurement:** Measurements were performed as described above, in accordance with the German Defense Equipment Standard VG 95373, Procedure KS 01 B. The DC resistance of the glands equals 1 mW; this produces shielding attenuation values, which, depending upon the size and type of the gland, can reach at least 100 dB.
- **Comparison of results:** The results reveal a clear difference between derivation attenuation and the screening attenuation in a system with identical components. The curve for derivation attenuation is nearly 40 dB higher than the screening attenuation curve (see chart below). Nevertheless, these values are more meaningful with regard to cable-conducted interference, because in reality, attenuation values of between 80 and 100 dB are rarely achieved.

Conclusion

The different measurement methods give different values for the attenuation rate and using these values, different characteristics are expressed. On the one hand, the value “screening attenuation” expresses how effectively the re-radiation or the irradiation is suppressed by field-linked interferences (Triaxial Method); the value “derivation attenuation”, on the other hand, expresses how effectively interferences on the screening can be derived to an earthing mass (measurement of derivation impedance). This means that attenuation values cannot simply be compared without further consideration. However, it can be assumed that since the triaxial method relies on cable shielding, results gained from the “derivation attenuation” method are more relevant for cable glands.

comparison of measurement results:

derivation attenuation (dotted) vs. triaxial (solid)



Cable gland selector

	SKINTOP® SLN/SLRN	SKINTOP® SL/SLR	SKINTOP® SLM/SLRM	SKINTOP® CLICK/CLICK-R	SKINTOP® ST-HF-M	SKINTOP® SOLAR/SOLAR plus	SKINTOP® FLEX	SKINTOP® CLICK FLEX	SKINTOP® BT/BT-M	SKINTOP® K-M/KR-M ATEX plus	SKINTOP® MULTI	SKINTOP® CUBE MULTI	SKINTOP® CUBE	SKINTOP® MS-NPT/MSR-NPT	SKINTOP® MS/MSR	SKINTOP® MS-XL/MSR-XL	SKINTOP® MS-M/MSR-M	SKINTOP® MS-M-XL/MSR-M-XL	SKINTOP® MS-M ATEX/MSR-M ATEX	SKINTOP® INOX/INOX-R	SKINTOP® HYGIENIC	SKINTOP® COLD/COLD-R	SKINTOP® GRIP-M	SKINTOP® MS-SC	SKINTOP® MS BRUSH	SKINTOP® MS-M ATEX BRUSH	SKINTOP® INOX SC	SKINTOP® HYGIENIC SC
page	497	498	499	500	501	502	503	504	505	506	507	508	510	512	513	514	515	516	517	518	519	520	521	522	524	525	526	527
Properties																												
IP protection rating/NEMA	68	68	*	68	68	68	68	68	68	68	68	65	64	68	68	*	*	*	68	*	*	68	*	68	*	68	*	*
NPT thread	✔						✔							✔										✔	✔			
PG thread		✔					✔		✔						✔													
metric thread			✔		✔	✔	✔		✔	✔						✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔
for round cables	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
for flat cables											✔																	
metal								✔						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
plastic	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔															
angled																												
strain relief	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
vibration protection	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔															
anti-kink protection							✔	✔	✔														✔					
shield connection																								✔	✔	✔	✔	✔
suitable for Ex safety area										✔									✔							✔		
halogen-free					✔																							
Approvals																												
UL	✔	✔				✔	✔							✔										✔				
cULus			✔	✔			✔	✔								✔	✔	✔	✔						✔			
RU	✔	✔				✔	✔							✔										✔	✔			
cRUus			✔	✔			✔	✔			✔					✔	✔	✔	✔									
CSA	✔	✔				✔	✔							✔										✔				✔
TÜV		✔	✔																									
VDE			✔	✔	✔		✔	✔								✔	✔	✔				✔			✔			
DNV			✔	✔			✔	✔		✔						✔	✔	✔	✔						✔	✔		
ATEX										✔									✔							✔		

for thread-specific approvals, see product catalog page
* IP68/69

	SKINDICHT® SVFK	SKINDICHT® SVF	SKINDICHT® CN/CN-M	SKINDICHT® SVRE	SKINDICHT® SVRE-M	SKINDICHT® SH	SKINDICHT® SK	SKINDICHT® SKZ	SKINDICHT® SKZ-M	SKINDICHT® SHV-M	SKINDICHT® SR	SKINDICHT® SR-M	SKINDICHT® RWV
page	528	529	530	531	531	532	533	534	534	535	536	536	538
Properties													
IP protection rating/NEMA	54	54	68	54	54	20	20	55	55	68	65	65	55
NPT thread													
PG thread	✔	✔	✔	✔		✔	✔	✔			✔		✔
metric thread		✔	✔		✔				✔	✔		✔	
for round cables			✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
for flat cables	✔	✔											
metal		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
plastic	✔												
angled													✔
strain relief	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	
vibration protection													
anti-kink protection											✔	✔	
shield connection													
suitable for Ex safety area													
halogen-free													

The information presented in these tables is accurate to the best of our knowledge and experience.
However, it must be treated as a non-binding guideline only; in many cases, tests must be carried out under working conditions to reach a definitive conclusion.

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Appendix
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Part numbers

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710 1119341 to 1243001

711 1243104 to 201603

712 201604 to 251619X...

713 251625I... to 335703xxx

714 335704xxx to 44424012

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717 52103270 to 53112045

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721 61801061 to 700222NP

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726 DN4110096Sxx to SWFR-3/4

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727 Metric conversion

727 Wire size conversion

Part numbers
00008746 to 0027950

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00008749	453	0015404	30	0026150	70	0026287	70	0027450	224	0027628	62
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00008822	453	0015407	30	0026152	70	0026604	74	0027503	144	0027635	62
00008825	453	0015412	30	0026153	70	0026608	74	0027504	144	0027636	62
00008829	453	0015418	30	0026154	70	0026611	74	0027505	144	0027637	62
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00008867	453	0015703	30	0026157	70	0026620	74	0027531	62	0027639	62
00008899	453	0015704	30	0026159	70	0026623	74	0027532	62	0027640	62
00008978	454	0015705	30	0026170	70	0026626	74	0027533	62	0027641	62
00008979	453	0015707	30	0026171	70	0026629	74	0027534	62	0027643	62
00009005	454	0015803	30	0026172	70	0026635	74	0027535	62	0027649	62
00009045	453	0015804	30	0026173	70	0026641	74	0027536	62	0027650	62
00009057	454	0015805	30	0026175	70	0026651	74	0027537	62	0027651	62
00009082	454	0015807	30	0026180	70	0026653	74	0027538	62	0027652	62
00009135	454	0015903	30	0026181	70	0026655	74	0027540	62	0027653	62
00009371	454	0015904	30	0026183	70	0026657	74	0027541	62	0027654	62
00009470	454	0015905	30	0026185	70	0026659	74	0027545	62	0027656	62
00009894	454	0015907	30	0026186	70	0026661	74	0027546	62	0027661	62
00010108	451	0016043	43	0026187	70	0026663	74	0027547	62	0027784	119
00010521	451	0016065	43	0026200	70	0026665	74	0027548	62	0027785	119
0010086	41	0016088	43	0026201	70	0026667	74	0027549	62	0027786	119
0010087	41	0016101	43	0026202	70	0026669	74	0027550	62	0027787	119
0010100	41	0016106	43	0026203	70	0026671	74	0027551	62	0027788	119
0010105	41	0025704	121	0026204	70	0026673	74	0027552	62	0027789	119
0010210	41	0025705	121	0026205	70	0027370	62	0027553	62	0027790	119
0010301	41	0025706	121	0026206	70	0027371	62	0027555	62	0027791	119
0010302	41	0025707	121	0026207	70	0027372	62	0027560	62	0027792	119
0010303	41	0025708	121	0026219	70	0027373	62	0027561	62	0027793	119
0010304	41	0025719	121	0026220	70	0027374	62	0027562	62	0027794	119
0010305	41	0025724	121	0026221	70	0027375	62	0027563	62	0027795	119
0010306	41	0025725	121	0026222	70	0027376	62	0027564	62	0027796	119
0010307	41	0025726	121	0026223	70	0027380	62	0027565	62	0027797	119
0010308	41	0026100	70	0026224	70	0027381	62	0027566	62	0027798	119
0015003	30	0026101	70	0026226	70	0027382	62	0027568	62	0027841	223
0015004	30	0026102	70	0026227	70	0027383	62	0027575	62	0027842	223
0015005	30	0026103	70	0026230	70	0027384	62	0027576	62	0027843	223
0015007	30	0026104	70	0026231	70	0027385	62	0027577	62	0027844	223
0015012	30	0026105	70	0026232	70	0027386	62	0027578	62	0027845	223
0015018	30	0026106	70	0026233	70	0027411	224	0027579	62	0027846	223
0015025	30	0026107	70	0026234	70	0027412	224	0027580	62	0027847	223
0015103	30	0026109	70	0026235	70	0027413	224	0027582	62	0027848	223
0015104	30	0026110	70	0026238	70	0027414	224	0027585	62	0027855	223
0015105	30	0026119	70	0026239	70	0027416	224	0027586	62	0027856	223
0015107	30	0026120	70	0026241	70	0027418	224	0027587	62	0027857	223
0015112	30	0026121	70	0026242	70	0027420	224	0027605	62	0027858	223
0015118	30	0026122	70	0026249	70	0027422	224	0027606	62	0027859	223
0015125	30	0026123	70	0026250	70	0027425	224	0027607	62	0027860	223
0015203	30	0026124	70	0026251	70	0027426	224	0027608	62	0027861	223
0015204	30	0026125	70	0026252	70	0027427	224	0027609	62	0027863	223
0015205	30	0026126	70	0026253	70	0027428	224	0027610	62	0027865	223
0015207	30	0026127	70	0026254	70	0027429	224	0027611	62	0027870	223
0015212	30	0026130	70	0026256	70	0027431	224	0027612	62	0027871	223
0015218	30	0026131	70	0026257	70	0027434	224	0027613	62	0027872	223
0015225	30	0026132	70	0026259	70	0027436	224	0027615	62	0027873	223
0015303	30	0026133	70	0026270	70	0027438	224	0027616	62	0027874	223
0015304	30	0026134	70	0026271	70	0027440	224	0027620	62	0027875	223
0015305	30	0026135	70	0026272	70	0027441	224	0027621	62	0027876	223
0015307	30	0026138	70	0026273	70	0027442	224	0027622	62	0027877	223
0015312	30	0026139	70	0026281	70	0027443	224	0027623	62	0027878	223
0015318	30	0026142	70	0026282	70	0027444	224	0027624	62	0027950	113

Part numbers

0027951 to 0035220

0027951	113	0028214	213	0028653	225	0029599	81	0030964	227	0034507	213
0027952	113	0028216	213	0028654	225	0029600	81	0034250	218	0034508	213
0027953	113	0028220	213	0028655	225	0029601	81	0034251	218	0034510	213
0027954	113	0028225	213	0028656	225	0029608	81	0034252	218	0034512	213
0027955	113	0028236	213	0028657	225	0029609	81	0034253	218	0034514	213
0027956	113	0028237	213	0028658	225	0029612	81	0034254	218	0034515	213
0027957	113	0028240	213	0028659	225	0029614	81	0034255	218	0034516	213
0027958	113	0028250	213	0028660	225	0029615	81	0034256	218	0034518	213
0027959	113	0028256	213	0028661	225	0029616	81	0034257	218	0034520	213
0027960	113	0028302	213	0028662	225	0029617	81	0034258	218	0034521	213
0027961	113	0028303	213	0028663	225	0029618	81	0034259	218	0034525	213
0027962	113	0028304	213	0028664	225	0029619	81	0034302	213	0034528	213
0027963	113	0028305	213	0028665	225	0029620	81	0034303	213	0034530	213
0027964	113	0028307	213	0028666	225	0029624	81	0034304	213	0034532	213
0027965	113	0028308	213	0028667	225	0029627	81	0034305	213	0034536	213
0027966	113	0028310	213	0028668	225	0029629	81	0034306	213	0034540	213
0027967	113	0028312	213	0028669	225	0029631	81	0034307	213	0034550	213
0027969	113	0028314	213	0028670	225	0029641	81	0034308	213	0034602	213
0027970	113	0028316	213	0028671	225	0029653	81	0034310	213	0034603	213
0027971	113	0028318	213	0028672	225	0029654	81	0034312	213	0034604	213
0027972	113	0028320	213	0028673	225	0029655	81	0034314	213	0034605	213
0027973	113	0028325	213	0028674	225	0029656	81	0034315	213	0034606	213
0027974	113	0028330	213	0028675	225	0029657	81	0034316	213	0034607	213
0027975	113	0028332	213	0028702	213	0029658	81	0034318	213	0034608	213
0027976	113	0028336	213	0028703	213	0029689	81	0034320	213	0034610	213
0027977	113	0028337	213	0028705	213	0029690	81	0034321	213	0034612	213
0028100	83	0028340	213	0028802	213	0030910	227	0034325	213	0034618	213
0028105	83	0028350	213	0028803	213	0030911	227	0034328	213	0034620	213
0028110	83	0028400	83	0028804	213	0030912	227	0034330	213	0034625	213
0028116	83	0028402	213	0028880	226	0030913	227	0034332	213	0034630	213
0028126	83	0028403	213	0028881	226	0030914	227	0034336	213	0034802	213
0028135	83	0028404	213	0028882	226	0030915	227	0034340	213	0034803	213
0028136	83	0028405	213	0028883	226	0030916	227	0034344	213	0034804	213
0028145	83	0028407	213	0028884	226	0030919	227	0034350	213	0034805	213
0028146	83	0028408	213	0028885	226	0030920	227	0034402	213	0034807	213
0028160	83	0028410	213	0028886	226	0030921	227	0034403	213	0034810	213
0028164	83	0028412	213	0028887	226	0030922	227	0034404	213	0034812	213
0028170	83	0028414	213	0028888	226	0030923	227	0034405	213	0034818	213
0028171	83	0028416	213	0028889	226	0030924	227	0034406	213	0034825	213
0028172	83	0028420	213	0028890	226	0030925	227	0034407	213	0034902	213
0028174	83	0028421	213	0028891	226	0030926	227	0034408	213	0034903	213
0028176	83	0028425	213	0028892	226	0030928	227	0034410	213	0034904	213
0028178	83	0028430	213	0028893	226	0030929	227	0034412	213	0034905	213
0028180	83	0028436	213	0028894	226	0030930	227	0034414	213	0034907	213
0028181	83	0028440	213	0028895	226	0030932	227	0034415	213	0034912	213
0028182	83	0028450	213	0028896	226	0030933	227	0034416	213	0034918	213
0028185	83	0028502	213	0028897	226	0030934	227	0034418	213	0034925	213
0028186	83	0028503	213	0028898	226	0030937	227	0034420	213	0035000	41
0028187	83	0028504	213	0028899	226	0030938	227	0034421	213	0035001	41
0028189	83	0028505	213	0028900	226	0030939	227	0034425	213	0035002	41
0028190	83	0028507	213	0028901	226	0030940	227	0034428	213	0035011	41
0028191	83	0028508	213	0028902	226	0030941	227	0034430	213	0035131	213
0028195	83	0028510	213	0028903	226	0030942	227	0034432	213	0035132	213
0028198	83	0028512	213	0028904	226	0030943	227	0034436	213	0035133	213
0028202	213	0028516	213	0028905	226	0030944	227	0034440	213	0035134	213
0028203	213	0028520	213	0028906	226	0030955	227	0034450	213	0035135	213
0028204	213	0028525	213	0029590	81	0030956	227	0034461	213	0035136	213
0028205	213	0028530	213	0029591	81	0030957	227	0034502	213	0035137	213
0028207	213	0028540	213	0029592	81	0030958	227	0034503	213	0035141	213
0028208	213	0028650	225	0029593	81	0030959	227	0034504	213	0035142	213
0028210	213	0028651	225	0029594	81	0030962	227	0034505	213	0035150	213
0028212	213	0028652	225	0029596	81	0030963	227	0034506	213	0035220	41

Part numbers
0035221 to 00430253

0035221	41	0037027	105	0037508	216	0039060	142	00161183	43	0041045	146
0035458	41	0037028	105	0037510	216	0039061	142	00257001	121	0041046	146
0035800	213	0037100	216	0037516	216	0039107	142	00257011	121	0041047	146
0035801	213	0037101	216	0037525	216	0039109	142	00257021	121	0041048	146
0035802	213	0037102	216	0037602	216	0039116	142	00257031	121	0041049	146
0035803	213	0037103	216	0037603	216	0039120	142	00257151	121	0041050	146
0035804	213	0037104	216	0037604	216	0039148	142	00257161	121	0041051	146
0035805	213	0037105	216	0037605	216	0039208	142	00257171	121	0041052	146
0035806	213	0037106	216	0037606	216	0039209	142	00257181	121	0041053	146
0035807	213	0037107	216	0037607	216	0039210	142	00277101	119	0041054	146
0035808	213	0037108	216	0037608	216	0039307	142	00277111	119	0041055	146
0035810	213	0037109	216	0037610	216	0039309	142	00277121	119	0041056	146
0035811	213	0037110	216	0037612	216	0039312	142	00277131	119	0041057	146
0035812	213	0037120	216	0037618	216	0039316	142	00277141	119	0041058	146
0035813	213	0037121	216	0037625	216	0039318	142	00277151	119	0041059	146
0035814	213	0037122	216	0037802	216	0039324	142	00277161	119	0041060	146
0035816	213	0037123	216	0037803	216	0039336	142	00277171	119	0041061	146
0035817	213	0037124	216	0037804	216	00100004	41	00277992	119	0041062	146
0035830	213	0037125	216	0037807	216	00100014	41	00350033	41	0041063	146
0035831	213	0037126	216	0037902	216	00100024	41	00350123	41	00420013	147
0035832	213	0037127	216	0037903	216	00100034	41	00350133	41	00420023	147
0035836	213	0037128	216	0037905	216	00100424	41	00350143	41	0042003	147
0036433	106	0037129	216	0038302	216	00100434	41	00350153	41	0042004	147
0036434	106	0037140	216	0038303	216	00100444	41	00350173	41	0042005	147
0036435	106	0037141	216	0038304	216	00100634	41	00350183	41	0042006	147
0036436	106	0037142	216	0038306	216	00100644	41	00350193	41	00420073	147
0036437	106	0037143	216	0038308	216	00100654	41	00350213	41	00420083	147
0036438	106	0037144	216	0038310	216	00100664	41	00350223	41	0042009	147
0036447	106	0037146	216	0038312	216	00100883	41	00350233	41	0042010	147
0036448	106	0037147	216	0038316	216	00100893	41	00350243	41	00420113	147
0036449	106	0037150	216	0038320	216	00101013	41	00350253	41	0042012	147
0036450	106	0037151	216	0038325	216	00101023	41	00350263	41	00420133	147
0036451	106	0037152	216	0038402	216	00101063	41	00350273	41	00420143	147
0036910	115	0037153	216	0038403	216	00101073	41	00350283	41	00420153	147
0036911	115	0037154	216	0038404	216	00101093	41	00350293	41	00420163	147
0036912	115	0037155	216	0038406	216	00101103	41	00352013	41	0042020	147
0036913	115	0037171	216	0038408	216	00101123	41	00352223	41	0042021	147
0036914	115	0037172	216	0038412	216	00101133	41	00352233	41	0042022	147
0036915	115	0037181	216	0038416	216	00101153	41	00352903	41	0042023	147
0036916	115	0037182	216	0038602	216	00101163	41	00354303	41	0042050	147
0036917	115	0037302	216	0038603	216	00101173	41	00354313	41	00430003	141
0036918	115	0037303	216	0038604	216	00101183	41	00354323	41	00430053	141
0036920	115	0037304	216	0038606	216	00101193	41	00354593	41	0043006	141
0036921	115	0037306	216	0038608	216	00101203	41	00354603	41	00430073	141
0036923	115	0037307	216	0038612	216	00101213	41	00390033	142	0043008	141
0036924	115	0037308	216	0038616	216	00103093	41	00390043	142	0043009	141
0036926	115	0037312	216	0038802	216	00103123	41	00390193	142	0043010	141
0036927	115	0037316	216	0038803	216	00160443	43	00390203	142	0043011	141
0036928	115	0037325	216	0038804	216	00160453	43	00390363	142	0043012	141
0036929	115	0037402	216	0038805	216	00160663	43	00390373	142	0043013	141
0036930	115	0037403	216	0039001	142	00160673	43	00390463	142	00430143	141
0037008	105	0037404	216	0039002	142	00160893	43	00390473	142	0043015	141
0037009	105	0037406	216	0039017	142	00160903	43	00390483	142	0043016	141
0037010	105	0037407	216	0039018	142	00161023	43	00390493	142	0043017	141
0037011	105	0037408	216	0039034	142	00161033	43	00390503	142	0043018	141
0037012	105	0037410	216	0039035	142	00161073	43	00390513	142	0043019	141
0037013	105	0037425	216	0039054	142	00161083	43	00390523	142	00430203	141
0037014	105	0037502	216	0039055	142	00161103	43	00390533	142	00430213	141
0037023	105	0037503	216	0039056	142	00161113	43	0041041	146	00430223	141
0037024	105	0037504	216	0039057	142	00161133	43	0041042	146	00430233	141
0037025	105	0037505	216	0039058	142	00161163	43	0041043	146	00430243	141
0037026	105	0037507	216	0039059	142	00161173	43	0041044	146	00430253	141

Part numbers
00430263 to 101219

00430263	141	0046041	89	0046909	90	10019949	47	10035093	47	100759NP	389
00430283	141	0046042	89	00469103	90	10019950	47	10035094	47	100769	389
00430293	141	00460453	89	00469113	90	10019951	47	10035095	47	100769NP	389
00430303	141	0046600	87	0046912	90	10019952	47	10035096	47	100789	389
00430323	141	0046601	87	0046913	90	10019953	47	10035097	47	100789NP	389
00430333	141	00466023	87	00469143	90	10019954	47	10035098	47	100800	391
00430343	141	00466033	87	00469153	90	10019961	47	10035099	47	100800NP	391
0045207	143	0046604	87	0046916	90	10019963	47	100350NP	386	100809	388
0045209	143	0046612	87	00469173	90	10019965	47	10035380	47	100809NP	388
0045210	143	0046613	87	0046919	90	10019967	47	10035382	47	100820	391
0045211	143	00466143	87	00469203	90	10019969	47	10035384	47	100820NP	391
0045212	143	00466153	87	01112	552	10019971	47	10035386	47	100829	388
0045213	143	0046616	87	01312	552	10019972	47	100359	383	100829NP	388
0045214	143	0046617	87	01612	552	10019975	47	100359NP	383	100860	393
0045215	143	0046618	87	02112	552	100210	379	100369	383	100860NP	393
0045216	143	0046619	87	02134	552	100210NP	379	100369NP	383	100869	390
0045218	143	00466203	87	02910	552	100220	379	100389	383	100869NP	390
0045220	143	00466213	87	03614	552	100220NP	379	100389NP	383	10087000	429
0045221	143	0046622	87	100030C0	381	100240	381	100400	385	10088500	429
0045222	143	0046623	87	100040C0	381	100240NP	381	100400NP	385	10088600	429
0045223	143	0046625	87	100050	380	10027000	436	100401	385	10088700	429
0045224	143	0046626	87	100050NP	380	10027100	436	100401NP	385	100900	391
0045225	143	0046628	87	100060	380	10027200	436	100407	382	100900NP	391
0045227	143	0046629	87	100060NP	380	10027300	436	100407NP	382	100920	391
0045228	143	00466303	87	100070	380	10027410	436	100409	382	100920NP	391
0045229	143	00466313	87	100070NP	380	10027510	436	100409NP	382	100929	388
0045230	143	0046633	87	100090	380	10027610	436	100420	385	100929NP	388
0045231	143	00466343	87	100090NP	380	10027710	436	100420NP	385	101020C0	399
0045232	143	00466353	87	100110NP	379	10027810	436	100421	385	10102900	396
0045233	143	0046636	87	100110R	379	100320C0	387	100421NP	385	10103900	396
0045234	143	00466373	87	100120	379	10032900	384	100428	382	101040	398
0045237	143	00466383	87	100120NP	379	10033900	384	100428NP	382	101040NP	398
0045238	143	0046701	87	100140	381	100340	386	100429	382	101049	395
0046007	89	0046702	87	100140NP	381	100340NP	386	100429NP	382	101049NP	395
0046008	89	0046703	87	10015000	429	100347	383	100460	387	101050	398
00460093	89	0046708	87	10016500	429	100347NP	383	100460NP	387	101050NP	398
00460103	89	0046709	87	10017101	432	100349	383	100469	384	101059	395
00460153	89	0046710	87	10018920	435	100349NP	383	100469NP	384	101059NP	395
00460163	89	0046711	87	10018921	435	100350	386	10047000	429	101079	395
0046012	89	0046712	87	10018922	435	10035031	47	10048500	429	101079NP	395
0046013	89	0046716	87	10018923	435	10035033	47	10048600	429	101099	395
0046014	89	0046717	87	10019000	433	10035035	47	10048700	429	101099NP	395
0046018	89	0046718	87	10019849	47	10035036	47	10051000	432	101110	397
0046019	89	0046719	87	10019851	47	10035037	47	10051200	432	101110NP	397
0046020	89	0046720	87	10019854	47	10035056	47	10051400	432	101119	394
00460213	89	0046721	87	10019856	47	10035058	47	10051600	432	101119NP	394
00460223	89	0046723	87	10019901	47	10035060	47	10052000	432	101130	397
0046024	89	0046724	87	10019903	47	10035061	47	10052200	432	101130NP	397
0046025	89	0046728	87	10019905	47	10035062	47	10055000	432	101139	394
0046026	89	0046729	87	10019906	47	10035063	47	10055100	432	101139NP	394
00460273	89	0046730	87	10019907	47	10035064	47	10056013	432	101170	399
00460283	89	0046734	87	10019931	47	10035068	47	10056014	432	101170NP	399
0046030	89	0046735	87	10019932	47	10035070	47	100720C0	393	101179	396
0046031	89	0046736	87	10019933	47	10035071	47	10072900	390	101179NP	396
0046032	89	0046740	87	10019934	47	10035072	47	10073900	390	10118000	429
00460333	89	0046741	87	10019935	47	10035073	47	100740	392	10118020	429
00460343	89	0046742	87	10019937	47	10035074	47	100740NP	392	10118600	429
0046036	89	00469063	90	10019938	47	10035075	47	100749	389	10118700	429
00460373	89	00469073	90	10019945	47	10035089	47	100749NP	389	10119500	429
00460383	89	0046904	90	10019946	47	10035090	47	100750	392	101210	397
0046039	89	0046905	90	10019947	47	10035091	47	100750NP	392	101210NP	397
0046040	89	0046908	90	10019948	47	10035092	47	100759	389	101219	394

Part numbers
101219NP to 1026759

101219NP	394	101660	402	10195000	296	1023246	61	1024416	92	1026544	72
101230	397	101660HA	423	10195100	296	1023248	61	1024417	92	1026547	72
101230NP	397	101660NP	402	10196000	297	1023249	61	1024418	92	1026548	72
101239	394	101660NP-HA	423	10196100	297	1023250	61	1024419	92	1026549	72
101239NP	394	101661	402	10197000	297	1023251	61	1024420	92	1026550	72
101270	399	101661HA	423	10197100	297	1023252	61	1024423	92	1026551	72
101270NP	399	101661NP	402	1020010	107	1023253	61	1024424	92	1026553	72
101279	396	101661NP-HA	423	1020011	107	1023254	61	1024425	92	1026555	72
101279NP	396	101670	402	1020012	107	1023255	61	1024426	92	1026557	72
101320C0	401	101670HA	423	1020013	107	1023275	117	1024427	92	1026559	72
101330	400	101670NP	402	1020014	107	1023276	117	1024428	92	1026561	72
101330NP	400	101670NP-HA	423	1020015	107	1023277	117	1024433	92	1026563	72
101340	400	101671	402	1020016	107	1023278	117	1024434	92	1026565	72
101340NP	400	101671HA	423	1020017	107	1023279	117	1024435	92	1026567	72
101343NP	400	101671NP	402	1020018	107	1023280	117	1024436	92	1026569	72
101350	400	101671NP-HA	423	1020019	107	1023290	118	1024437	92	1026571	72
101350NP	400	101680	402	1020020	107	1023291	118	1024438	92	1026573	72
101360	400	101680HA	423	1020021	107	1023292	118	1024441	92	1026700	68
101360NP	400	101680NP	402	1020022	107	1023293	118	1024446	92	1026701	68
101370	400	101680NP-HA	423	1020023	107	1023294	118	1024451	92	1026702	68
101370NP	400	101681	402	1020024	107	1023295	118	1024480	92	1026703	68
101380	400	101681HA	423	1020025	107	10239010	318	1024481	92	1026704	68
101380NP	400	101681NP	402	1020026	107	10239110	318	1024482	92	1026705	68
101390	401	101681NP-HA	423	1020027	107	10240010	318	1024483	92	1026706	68
101390NP	401	10170000	315	1020028	107	10240110	318	1024484	92	1026707	68
101395	401	10170600	315	1020029	107	1024300	92	1024485	92	1026708	68
101395NP	401	10171000	315	1020030	107	1024301	92	1024486	92	1026709	68
10-1-45CS	639	10171600	315	1020031	107	1024307	92	1024487	92	1026710	68
10152000	403	10180002	294	1020032	107	1024308	92	1024488	92	1026711	68
101520HA	423	10180400	311	1020060	107	1024309	92	1024489	92	1026712	68
10152500	403	10181002	294	1020061	107	1024310	92	1024490	92	1026713	68
101525HA	423	10181400	311	1020062	107	1024311	92	1026513	72	1026714	68
101550	402	10182002	295	1020063	107	1024315	92	1026514	72	1026715	68
101550HA	422	10182400	311	1020064	107	1024316	92	1026515	72	1026716	68
101550NP	402	10183002	295	1020065	107	1024317	92	1026516	72	1026717	68
101550NP-HA	422	10183400	311	1020066	107	1024318	92	1026517	72	1026718	68
101560	402	10184002	296	1020067	107	1024319	92	1026518	72	1026719	68
101560HA	422	10184202	298	1020068	107	1024320	92	1026519	72	1026720	68
101560NP	402	10184400	312	1020069	107	1024323	92	1026520	72	1026721	68
101560NP-HA	422	10184502	313	1020071	107	1024324	92	1026521	72	1026722	68
101570	402	10185002	296	1020072	107	1024325	92	1026522	72	1026723	68
101570HA	422	10185202	298	1020073	107	1024326	92	1026523	72	1026724	68
101580	402	10185400	312	1020074	107	1024327	92	1026524	72	1026725	68
101580HA	422	10185500	313	1020075	107	1024328	92	1026525	72	1026726	68
101580NP	402	10186002	297	1020076	107	1024333	92	1026526	72	1026727	68
101580NP-HA	422	10186202	299	10202000	298	1024334	92	1026527	72	1026728	68
101590	402	10186400	312	10202100	298	1024335	92	1026528	72	1026729	68
101590HA	422	10186500	313	10203000	298	1024336	92	1026529	72	1026730	68
101590NP	402	10187002	297	10203100	298	1024337	92	1026530	72	1026731	68
101590NP-HA	422	10187202	299	10204000	299	1024341	92	1026531	72	1026732	68
101600	402	10187400	312	10204100	299	1024342	92	1026532	72	1026733	68
101600HA	422	10187500	313	10205000	299	1024346	92	1026533	72	1026734	68
10161000	403	10190000	294	10205100	299	1024347	92	1026534	72	1026737	68
101610HA	423	10190100	294	10210010	318	1024400	92	1026535	72	1026751	68
101650	402	10191000	294	10210110	318	1024401	92	1026536	72	1026752	68
101650HA	423	10191100	294	10211010	318	1024407	92	1026537	72	1026753	68
101650NP	402	10192000	295	10211110	318	1024408	92	1026538	72	1026754	68
101650NP-HA	423	10192100	295	1023229	61	1024409	92	1026539	72	1026755	68
101651	402	10193000	295	1023230	61	1024410	92	1026540	72	1026756	68
101651HA	423	10193100	295	1023238	61	1024411	92	1026541	72	1026757	68
101651NP	402	10194000	296	1023239	61	1024412	92	1026542	72	1026758	68
101651NP-HA	423	10194100	296	1023245	61	1024415	92	1026543	72	1026759	68

Part numbers
1026760 to 1119334

1026760	68	10390412	368	10429100	414	10487200	308	105885NP	420	11147111	289
1026761	68	10390413	368	10429200	414	10488100	308	10607100	432	11147120	289
1026762	68	10390500	367	104292NP	414	10490200	308	10607200	432	11147130	289
1026763	68	10390600	367	10429500	414	10491100	308	10607300	432	11147170	289
1026764	68	10390700	367	10430000	429	10492200	308	10607600	432	11147180	289
1026765	68	10399000	360	10430100	429	10493100	308	10608500	432	11147190	289
1026766	68	10399100	360	10430300	429	10500200	309	10620300	414	11147200	289
1026767	68	10399200	357	10430400	429	10501100	309	10620600	413	11147201	289
1026768	68	10399300	357	10431000	301	10502200	309	106255C0	421	11147210	289
1026769	68	10399400	366	10431500	305	10503100	309	1062900	76	11147300	289
1026770	68	10399500	366	10432000	301	10509000	433	1062901	76	11148000	445
1026771	68	10399600	366	10432500	305	10512100	413	1062902	76	11148300	445
1026772	68	10399700	366	10436500	433	105121NP	413	1062903	76	11153700	289
1026773	68	10399800	359	104390	416	10512300	413	1062904	76	11153800	289
1026774	68	10399900	359	104390NP	416	105123NP	413	1062905	76	11158400	289
1026775	68	10400000	294	10440000	301	10512700	414	1062906	76	11160000	289
1026776	68	10400100	295	10440100	301	105127NP	414	1062907	76	11161000	289
1026777	68	10400200	296	10441000	301	10512900	414	1062908	76	11171000	289
1026778	68	10400300	297	10441100	301	105129NP	414	1062909	76	11171100	289
1026779	68	10400400	298	104420C0	415	10513000	429	1062910	76	11171200	352
1026780	68	10400500	299	104450	415	10513100	429	1062911	76	11182500	289
1026781	68	10401000	294	104450NP	415	10530000	302	1062912	76	11190000	287
1026782	68	10401100	295	104455	415	105300LE64	303	1062913	76	1119003	44
1026783	68	10401200	296	104455NP	415	10531000	302	1062914	76	1119004	44
1026784	68	10401300	297	104460	415	105310LE64	303	1062915	76	1119005	44
1026785	68	10401400	298	104460NP	415	10532000	302	1062916	76	1119007	44
1026788	68	10401500	299	104461	415	10533000	302	1062917	76	11190100	287
10270010	318	10407900	316	104461NP	415	10540000	302	1062918	76	1119012	44
10270110	318	10407910	316	104480	416	10540100	303	1062920	76	1119018	44
10271010	318	10420000	301	104480NP	416	10541000	302	1062921	76	11190200	287
10271110	318	10421000	301	104481	416	10541100	303	1062922	76	1119025	44
10344100	353	10422000	413	104481NP	416	10542000	302	1062923	76	11190300	287
10344300	369	10422200	413	104500	416	10542100	303	1062929	76	11190400	287
10344600	353	10422500	413	104500NP	416	10543000	302	1062940	76	1119035	44
10345100	353	10423000	413	104501	416	10543100	303	1062941	76	1119052	44
10345300	369	10423100	413	104501NP	416	105630	418	1062942	76	1119065	44
10345600	353	10423200	406	10-45CS-UABP	639	105630NP	418	1062943	76	1119080	44
10349000	371	10423201	405	10451400	433	105640	417	1062944	76	1119100	44
10349100	371	10423202	406	10457500	429	105640NP	417	1062945	76	11192000	287
10381000	371	10423203	405	10457600	429	105645	417	1062946	76	1119203	44
10381100	371	10423204	406	10457700	429	105645NP	417	1062947	76	1119204	44
10381200	371	10423300	405	10457800	429	105650	417	1062948	76	1119205	44
10381300	371	10423500	413	104620C0	417	105650NP	417	1062949	76	1119207	44
10381400	372	10424000	414	10469500	429	10565200	417	1062950	76	11192100	287
10381500	372	10424200	414	10469600	429	105652NP	417	1062951	76	1119212	44
10381600	372	104242NP	414	10469700	429	105670	418	1062952	76	1119218	44
10381700	372	10424500	414	10469800	429	105670NP	418	106308	421	11192200	287
10382000	358	10425500	413	104720C0	419	105671	418	106308NP	421	1119225	44
10382100	358	104255NP	413	104740	420	105671NP	418	106318	421	1119234	44
10382200	362	10426000	413	104740NP	420	105680	418	106318NP	421	1119241	44
10382300	362	104260NP	413	104741	420	105680NP	418	106338	422	1119250	44
10382400	363	10426400	413	104741NP	420	105760	419	106338NP	422	1119265	44
10382500	363	10426500	413	10481500	429	105760NP	419	109000NCDR	639	1119280	44
10383200	361	10426700	413	10481600	429	105770	419	11116	552	1119300	44
10383300	361	10427000	413	10481700	429	105770NP	419	11132500	289	1119303	44
10383400	364	104270NP	413	10481800	429	105820	419	11/1408	376	1119304	44
10383500	364	10427100	413	104820	420	105820NP	419	11147000	431	1119305	44
10383600	365	10427300	413	104820NP	420	105830	419	11147004	289	1119307	44
10383700	365	104273NP	413	104821	420	105830NP	419	11147005	289	1119312	44
10390400	367	10427500	413	104821NP	420	105880	420	11147006	289	1119318	44
10390410	368	10429000	414	10485200	308	105880NP	420	11147100	289	1119325	44
10390411	368	104290NP	414	10486100	308	105885	420	11147110	289	1119334	44

Part numbers

1119341 to 1243001

1119341	44	1121570C	287	1123461	49	1125225	46	1135203	44	1234007	94
1119350	44	11216	552	1123462	49	11252500	322	1135204	44	1234104	94
1119365	44	1121800C	287	1123463	49	1125303	46	1135205	44	1234105	94
1119403	44	1121810C	287	1123464	49	1125304	46	1135207	44	1234106	94
1119404	44	1121820C	287	1123465	49	1125305	46	1135212	44	1234114	94
1119405	44	1121830C	287	1123466	49	1125307	46	1135218	44	1235000	94
1119407	44	1121840C	287	1123467	49	1125312	46	1135225	44	1235001	94
1119412	44	11219200	288	1123468	49	1125318	46	1135303	44	1235002	94
1119418	44	11220000	286	1123469	49	1125325	46	1135304	44	1235003	94
1119425	44	11220100	286	1123470	49	11253500	322	1135305	44	1235005	94
1119434	44	11220700	286	1123471	49	1125403	46	1135307	44	1235006	94
1119450	44	11221000	286	1123472	49	1125404	46	1135312	44	1235007	94
11195000	287	11221300	286	1123473	49	1125405	46	1135318	44	1235009	94
1119503	44	11222700	286	1123474	49	1125407	46	1135325	44	1235104	94
1119504	44	11223000	286	1123475	49	1125412	46	1135403	44	1235105	94
1119505	44	11223500	286	1123476	49	1125418	46	1135404	44	1235106	94
1119507	44	11226000	286	1123477	49	1125425	46	1135405	44	1235114	94
11195100	287	11226500	286	1123478	49	11255000	324	1135407	44	1236000	94
11195200	287	11227700	286	1123479	49	1125503	46	1135504	44	1236001	94
11195300	287	11228000	286	1123480	49	1125504	46	1135505	44	1236002	94
11195400	287	11228500	286	1123481	49	1125505	46	1135604	44	1236003	94
1119603	44	11230000	286	1123482	49	11256000	324	1135614	44	1236005	94
1119604	44	11230400	286	1123483	49	1125604	46	1135624	44	1236006	94
1119605	44	11230700	286	1123484	49	1125605	46	1135902	44	1236007	94
1119607	44	11231100	286	1123485	49	1125614	46	11764200	435	1236009	94
1119614	44	11233100	286	1123486	49	1125624	46	11764201	435	1236104	94
1119624	44	1123410	49	1123487	49	1125852	46	11764202	435	1236105	94
1119634	44	1123411	49	1123488	49	11260000	326	11764203	435	1236106	94
1119644	44	1123412	49	1123489	49	11261000	326	11764300	435	1236114	94
1119645	44	1123413	49	1123490	49	11265000	328	11764301	435	1237000	94
11197000	287	1123414	49	1123491	49	11265200	327	11764400	435	1237001	94
11197100	287	1123415	49	1123492	49	11266000	328	11764401	435	1237002	94
11197200	287	1123416	49	1123493	49	11266200	327	1232000	94	1237003	94
1119752	44	1123417	49	1123494	49	11270000	332	1232001	94	1237009	94
1119852	44	1123418	49	11235000	286	11271000	332	1232002	94	1237104	94
1119902	44	1123419	49	11235200	286	11272000	331	1232003	94	1237105	94
1119952	44	1123420	49	11235700	286	11273000	331	1232005	94	1237106	94
11201000	287	1123421	49	11236100	286	11280000	433	1232006	94	1237114	94
11202000	287	1123422	49	11238100	286	11281000	433	1232007	94	1238000	94
11205000	287	1123423	49	11240000	286	11282200	323	1232009	94	1238001	94
11206000	287	1123424	49	11240400	286	11282300	325	1232104	94	1238002	94
11208000	287	1123425	49	11240700	286	11283200	323	1232105	94	1238003	94
11208500	287	1123426	49	11/2408	376	11283300	325	1232106	94	1238104	94
11209000	287	1123427	49	11241100	286	11285000	338	1232114	94	1238106	94
11209500	287	1123428	49	11243100	286	11285100	338	1233000	94	1238114	94
1121000C	287	1123429	49	11250000	321	11285200	339	1233001	94	1239000	94
1121010C	287	1123430	49	1125003	46	11285300	339	1233002	94	1239001	94
1121020C	287	1123431	49	1125004	46	11285400	340	1233003	94	1239002	94
1121060C	287	1123432	49	1125005	46	11285500	340	1233005	94	1239003	94
1121070C	287	1123433	49	1125007	46	11286000	338	1233006	94	1239104	94
11211	552	1123434	49	1125012	46	11286100	338	1233007	94	1240000	94
11213	552	1123435	49	1125018	46	11286200	339	1233009	94	1240001	94
1121300C	287	1123436	49	1125025	46	11286300	339	1233104	94	1240002	94
1121310C	287	1123437	49	11250500	320	11286400	340	1233105	94	1240104	94
1121320C	287	1123438	49	11251000	321	11286500	340	1233106	94	1241000	94
1121330C	287	1123439	49	11251500	320	1135003	44	1233114	94	1241001	94
1121340C	287	1123440	49	1125203	46	1135004	44	1234000	94	1241104	94
11214200	288	1123441	49	1125204	46	1135005	44	1234001	94	1242000	94
1121500C	287	1123442	49	1125205	46	1135007	44	1234002	94	1242001	94
1121510C	287	1123443	49	1125207	46	1135012	44	1234003	94	1242104	94
1121520C	287	1123444	49	1125212	46	1135018	44	1234005	94	1243000	94
1121560C	287	1123460	49	1125218	46	1135025	44	1234006	94	1243001	94

Part numbers
1243104 to 201603

1243104	94	1249580	91	12954100	426	16011123	132	19111000	397	19445500	415
1244000	94	1249582	91	12954200	426	16011163	132	19111900	394	19446000	415
1244001	94	1249583	91	12954300	426	16011193	132	19113000	397	19446100	415
1244104	94	1249584	91	12954400	426	1601121	132	19113900	394	19448000	416
1245001	94	1249585	91	12954500	426	16011233	132	19117000	399	19448100	416
1245104	94	1249586	91	12954600	426	1601125	132	19117900	396	19450000	416
1246001	94	1249587	91	12954700	426	16011263	132	19121000	397	19450100	416
1246104	94	1249588	91	12954800	426	16011293	132	19121900	394	19474000	420
1247000	94	1249589	91	12957100	426	16011353	132	19123000	397	19474100	420
1247001	94	1249590	91	13162000	286	16-1-9XP	639	19123900	394	19482000	420
1247104	94	1249591	91	13162100	286	16-1-MD8P	639	19127000	399	19482100	420
1248001	94	1249592	91	13162200	286	19005000	380	19127900	396	19512100	413
1248104	94	1249593	91	13162300	286	19006000	380	19134000	400	19512300	413
1249001	94	1249600	91	13162400	286	19007000	380	19134400	400	19512700	414
1249104	94	1249602	91	13162500	286	19009000	380	19135000	400	19512900	414
1249500	91	1249603	91	13162600	286	19011000	379	19136000	400	19563000	418
1249502	91	1249604	91	13162700	286	19012000	379	19136200	400	19563200	418
1249503	91	1249605	91	13162800	286	19014000	381	19137000	400	19564000	417
1249504	91	1249606	91	13162900	286	19021000	379	19138000	400	19564500	417
1249505	91	1249607	91	13163000	286	19022000	379	19139500	401	19565000	417
1249506	91	1249608	91	13163100	286	19024000	381	19145400	400	19565300	417
1249507	91	1249609	91	13163200	286	19034000	386	19146400	400	19567000	418
1249508	91	1249610	91	13163300	286	19034100	386	19155000	402	19567100	418
1249509	91	1249611	91	13163400	286	19034700	383	191550HA	422	19568000	418
1249510	91	1249620	91	13163500	286	19034900	383	19156000	402	19576000	419
1249511	91	1249622	91	13163600	286	19035000	386	191560HA	422	19577000	419
1249520	91	1249623	91	13163700	286	19035100	386	19157000	402	19577500	419
1249522	91	1249624	91	13163800	286	19035900	383	191570HA	422	19582000	419
1249523	91	1249625	91	13163900	286	19036900	383	19158000	402	19583000	419
1249524	91	1249626	91	13411	552	19038900	383	191580HA	422	19588000	420
1249525	91	1249627	91	13413	552	19040000	385	19159000	402	19588500	420
1249526	91	1249628	91	13416	552	19040100	385	191590HA	422	19630800	421
1249527	91	1249640	91	13421	552	19040700	382	19160000	402	19631800	421
1249528	91	1249642	91	1600103	134	19040900	382	191600HA	422	19633800	422
1249529	91	1249643	91	16001043	134	19042000	385	19165000	402	19635600	421
1249530	91	1249644	91	16001053	134	19042100	385	191650HA	423	19636600	421
1249531	91	1249645	91	16001063	134	19042800	382	19165100	402	19638600	422
1249532	91	1249646	91	16001073	134	19042900	382	191651HA	423	19639600	422
1249533	91	1249660	91	16001083	134	19046000	387	19166000	402	200604	56
1249534	91	1249662	91	16001093	134	19046900	384	191660HA	423	200605	56
1249535	91	1249663	91	16001103	134	19074000	392	19166100	402	200804	56
1249540	91	1249664	91	16001113	134	19074900	389	191661HA	423	200805	56
1249542	91	1249665	91	16001123	134	19075000	392	19167000	402	201003	56
1249543	91	1249666	91	16001133	134	19075900	389	191670HA	423	201004	56
1249544	91	1249680	91	16001143	134	19076900	389	19167100	402	201005	56
1249545	91	1249682	91	16001153	134	19078900	389	191671HA	423	201007	56
1249546	91	1249683	91	16001163	134	19080000	391	19168000	402	201203	56
1249547	91	1249684	91	1600117	134	19080500	391	191680HA	423	201204	56
1249548	91	1249685	91	1600118	134	19080900	388	19168100	402	201205	56
1249549	91	1249686	91	1600119	134	19082000	391	191681HA	423	201207	56
1249550	91	1249700	91	1600120	134	19082900	388	19421900	414	201212	56
1249551	91	1249702	91	1600121	134	19086000	393	19424500	414	201216	56
1249560	91	1249703	91	16001233	134	19086900	390	19425500	413	201403	56
1249562	91	1249704	91	16001283	134	19090000	391	19426000	413	201404	56
1249563	91	1249705	91	16001293	134	19092000	391	19426500	413	201405	56
1249564	91	1249706	91	16001303	134	19092900	388	19427000	413	201407	56
1249565	91	1249720	91	16001313	134	19104000	398	19427300	413	201409	56
1249566	91	1249722	91	1601102	132	19104900	395	19427500	413	201412	56
1249567	91	1249723	91	1601103	132	19105000	398	19429000	414	201418	56
1249568	91	1249724	91	1601109	132	19105900	395	19429200	414	201419	56
1249569	91	1249725	91	1601111	132	19107900	395	19439000	416	201425	56
1249570	91	1249726	91	1601114	132	19109900	395	19445000	415	201603	56

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201604	56	21700630	259	2170326	173	2170852	252	221604	54	22260766	188
201605	56	21700631	259	2170330	173	2170853	173	2216040	54	22260825	202
201607	56	21700632	259	2170331	178	2170854	174	221605	54	22260826	202
201608	56	21700633	259	2170332	177	2170856	175	2216050	54	22260889	181
201609	56	21700636	259	2170340	169	2170857	185	221607	54	22260985	201
201612	56	21700637	259	2170341	169	2170875	176	2216070	54	22260986	201
201616	56	21700638	259	2170342	169	2170885	199	221608	54	22261001	182
201618	56	21700639	259	2170343	169	2170886	237	221609	54	22262010	203
201619	56	21700640	259	2170344	170	2170887	242	221612	54	22262011	203
201625	56	2170203	189	2170345	170	2170888	239	2216120	54	22262012	203
201803	56	2170204	189	2170346	170	2170891	236	221616	54	22262013	203
201804	56	2170205	189	2170347	170	2170893	236	221618	54	22262022	261
201805	56	2170206	193	2170350	198	2170894	238	2216180	54	22262078	181
201807	56	2170207	193	2170351	198	2170901	237	221625	54	235100xxx	613
201809	56	2170208	193	2170352	198	2170905	254	2216250	54	235104xxx	613
201812	56	2170209	193	2170353	198	2170934	250	221634	54	235200xxx	613
201818	56	2170213	189	2170357	191	220104	54	221641	54	235201xxx	613
201819	56	2170214	189	2170358	191	220203	54	221650	54	235202xxx	613
201825	56	2170215	189	2170360	196	220204	54	221661	54	235204xxx	613
21124030	262	2170216	194	2170370	197	2202040	54	221803	54	235210xxx	613
21124040	262	2170217	193	2170371	190	220403	54	2218030	54	235211xxx	613
21124041	262	2170218	194	2170372	190	220404	54	221804	54	235214xxx	613
21700501	180	2170219	173	2170450	253	2204040	54	2218040	54	235220xxx	613
21700502	180	2170220	173	2170451	255	220603	54	221805	54	235231xxx	613
21700503	180	2170222	174	2170452	255	220604	54	2218050	54	235234xxx	613
21700504	180	2170223	173	2170453	255	2206040	54	221807	54	235300xxx	613
21700505	180	2170227	176	2170454	256	220605	54	2218070	54	235304xxx	613
21700506	180	2170228	190	2170455	256	220804	54	221809	54	235310xxx	613
21700507	180	2170229	190	2170456	256	2208040	54	221812	54	235400xxx	613
21700508	180	2170230	190	2170464	247	220805	54	2218120	54	235500xxx	613
21700509	180	2170231	190	2170465	247	221003	54	221818	54	235501xxx	613
21700511	180	2170232	190	2170466	247	221004	54	2218180	54	235505xxx	613
21700513	180	2170236	173	2170474	247	2210040	54	221825	54	235511xxx	613
21700514	180	2170260	183	2170475	247	221005	54	2218250	54	235514xxx	613
21700515	180	2170261	183	2170476	247	2210050	54	221850	54	235531xxx	613
21700527	180	2170263	183	2170481	251	221007	54	222204	54	235551xxx	613
21700528	180	2170264	183	2170482	249	2210070	54	222504	54	235600xxx	613
21700529	180	2170266	183	2170483	249	221104	54	223304	54	235601xxx	613
21700530	180	2170267	183	2170484	248	221203	54	223504	54	235605xxx	613
21700536	186	2170269	183	2170485	248	221204	54	224404	54	235611xxx	613
21700537	186	2170270	183	2170488	246	2212040	54	225004	54	235631xxx	613
21700538	186	2170272	184	2170489	245	221205	54	22260044	201	235641xxx	613
21700539	180	2170273	184	2170494	236	2212050	54	22260046	201	235651xxx	613
21700540	257	2170275	184	2170495	176	221207	54	22260120	201	235701xxx	613
21700544	180	2170276	184	2170496	241	2212070	54	22260121	201	24-1-3A-9XP	639
21700545	180	2170278	184	2170500	183	221403	54	22260125	201	24-1-3A-9XP-MD8P	639
21700546	180	2170279	184	2170636	240	2214030	54	22260126	201	24420055	448
21700547	180	2170280	236	2170803	189	221404	54	22260127	202	24420056	443
21700549	180	2170281	236	2170813	189	2214040	54	22260129	202	24420058	443
21700600	258	2170283	237	2170814	189	221405	54	22260131	202	249538	466
21700601	258	2170284	237	2170815	189	2214050	54	22260132	202	249550FX	465
21700602	261	2170289	238	2170818	194	221407	54	22260133	202	251603I...	58
21700605	258	2170289NA	238	2170820	173	2214070	54	22260134	202	251603X...	78
21700611	260	2170295	199	2170822	174	221409	54	22260135	187	251607I...	58
21700612	260	2170296	243	2170824	173	221412	54	22260136	187	251607X...	78
21700613	260	2170297	243	2170826	173	2214120	54	22260640	202	251611I...	58
21700614	260	2170298	243	2170830	191	221418	54	22260646	181	251611X...	78
21700615	258	2170299	244	2170831	191	2214180	54	22260649	202	251612I...	58
21700616	258	2170300	244	2170842	190	221425	54	22260653	181	251612X...	78
21700617	261	2170317	191	2170843	190	2214250	54	22260722	182	251617I...	58
21700618	261	2170318	191	2170850	252	221603	54	22260761	181	251619I...	58
21700623	262	2170322	174	2170851	252	2216030	54	22260765	187	251619X...	78

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251625X...	78	26610308	275	281005	32	28620702	271	302004	208	302420S	208
251633I...	58	26610404	275	281005CY	32	300058xxx	611	302004S	208	302425	208
251633X...	78	26610406	275	281007	32	300058xxx-E	611	302006	208	302425S	208
251642I...	58	26610408	275	281007CY	32	300058xxx-R	611	302006S	208	311403	131
251642X...	78	27400104	274	281009	32	300270-xxx-10	611	302006STP	210	311404	131
251649I...	58	27400108	274	281203	32	300270-xxx-10NB	611	302008	208	311405	131
251649X...	78	27400112	274	281203CY	32	300270-xxx-14	611	302008S	208	311602	131
251665I...	58	27400124	274	281204	32	300270-xxx-14NB	611	302009STP	210	311603	131
251665X...	78	27400204	274	281204CY	32	300270-xxx-16	611	302010	208	311604	131
251803I...	58	27400208	274	281205	32	300270-xxx-16NB	611	302010S	208	311605	131
251803X...	78	27400212	274	281205CY	32	300271-xxx	611	302015	208	311802	131
251805I...	58	27400224	274	281207	32	300271-xxx-15P	611	302015S	208	311803	131
251805X...	78	27400304	274	281207CY	32	301601STP	210	302015STP	210	311804	131
251807I...	58	27400308	274	281209	32	301602	208	302020	208	311805	131
251807X...	78	27400312	274	281403	32	301602S	208	302020S	208	320803	133
251811I...	58	27400324	274	281403CY	32	301603	208	302025	208	320804	133
251811X...	78	27400904	274	281404	32	301603S	208	302202	208	321003	133
251812I...	58	27400908	274	281404CY	32	301604	208	302025S	208	321004	133
251812X...	78	27400912	274	281405	32	301604S	208	302201STP	210	321005	133
251819I...	58	27400924	274	281405CY	32	301606	208	302202S	208	321204	133
251825I...	58	27560104	277	281407	32	301606S	208	302202STP	210	321205	133
251825X...	78	27560108	277	281407CY	32	301608	208	302203	208	321404	133
251833I...	58	27560112	277	281409	32	301608S	208	302203S	208	321803	133
251833X...	78	27560124	277	281412	32	301610	208	302203STP	210	321804	133
251842I...	58	27560204	277	281412CY	32	301610S	208	302204	208	32-2-3A-9XP	639
251842X...	78	27560208	277	281419	32	301615	208	302204S	208	32-G2-3A-45CS	639
251849I...	58	27560212	277	281419CY	32	301615S	208	302206	208	335100xxx	612
251849X...	78	27560224	277	281425	32	301620	208	302206S	208	335104xxx	612
251865I...	58	27560304	277	281425CY	32	301620S	208	302206STP	210	335200xxx	612
251865X...	78	27560308	277	281603	32	301625	208	302208	208	335201xxx	612
259538	466	27560312	277	281603CY	32	301625S	208	302208S	208	335202xxx	612
26310102	276	27560324	277	281604	32	301801STP	210	302209STP	210	335204xxx	612
26310104	276	27560904	277	281604CY	32	301802	208	302210	208	335210xxx	612
26310108	276	27560908	277	281605	32	301802S	208	302210S	208	335211xxx	612
26310112	276	27560912	277	281605CY	32	301802STP	210	302215	208	335214xxx	612
26310202	276	27560924	277	281607	32	301803	208	302215S	208	335220xxx	612
26310204	276	27600104	273	281607CY	32	301803S	208	302215STP	210	335231xxx	612
26310208	276	27600108	273	281609	32	301803STP	210	302220	208	335234xxx	612
26310212	276	27600112	273	281612	32	301804	208	302220S	208	335300xxx	612
26310302	276	27600124	273	281612CY	32	301804S	208	302225	208	335304xxx	612
26310304	276	27600204	273	281618	32	301806	208	302225S	208	335310xxx	612
26310308	276	27600208	273	281618CY	32	301806S	208	302401STP	210	335331xxx	612
26310312	276	27600212	273	281619	32	301806STP	210	302402	208	335400xxx	612
26310902	276	27600224	273	281625	32	301808	208	302402S	208	335421xxx	612
26310904	276	27600304	273	281625CY	32	301808S	208	302402STP	210	335500xxx	612
26310908	276	27600308	273	281803	32	301809STP	210	302403	208	335501xxx	612
26310912	276	27600312	273	281803CY	32	301810	208	302403S	208	335505xxx	612
26400324	274	27600324	273	281804	32	301810S	208	302403STP	210	335511xxx	612
26400348	274	27600904	273	281804CY	32	301815	208	302404	208	335531xxx	612
26400924	274	27600908	273	281805	32	301815S	208	302404S	208	335541xxx	612
26400944	274	27600912	273	281805CY	32	301815STP	210	302406	208	335551xxx	612
26400948	274	27600924	273	281807	32	301820	208	302406S	208	335600xxx	612
26400972	274	28000001	267	281807CY	32	301820S	208	302406STP	210	335601xxx	612
26400996	274	28000002	269	281809	32	301825	208	302408	208	335605xxx	612
26610104	275	28020001	268	281812	32	301825S	208	302408S	208	335611xxx	612
26610106	275	28020002	270	281812CY	32	302001STP	210	302409STP	210	335631xxx	612
26610108	275	28020702	271	281818	32	302002	208	302410	208	335641xxx	612
26610204	275	28030002	270	281819	32	302002S	208	302410S	208	335651xxx	612
26610206	275	281003	32	281819CY	32	302002STP	210	302415	208	335701xxx	612
26610208	275	281003CY	32	281825	32	302003	208	302415S	208	335702xxx	612
26610304	275	281004	32	281825CY	32	302003S	208	302415STP	210	335703xxx	612

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335705xxx	612			401407	36	402025	36	44420046	449	44423218	344
335706xxx	612			401407CP	36	402025CP	36	44420048	449	44423219	344
335707xxx	612			401409	36	408337FX	465	44420050	450	44423220	344
335708xxx	612			401409CP	36	408339FX	465	44420052	450	44423221	344
335709xxx	612			401412	36	408349FX	465	44420071	450	44423222	345
335710xxx	612			401412CP	36	41604..	128	44420078	451	44423223	345
335711xxx	612			401418	36	41605..	128	44420083	451	44423224	345
335712xxx	612			401418CP	36	41606..	128	44420085	451	44423225	345
335713xxx	612			401425	36	41607..	128	44420087	451	44423226	346
335714xxx	612			401425CP	36	41608..	128	44420088	443	44423227	346
335715xxx	612			401602	36	41609..	128	44420089	443	44423228	348
335716xxx	612			401602CP	36	41610..	128	44420090	443	44423229	348
335717xxx	612			401603	36	41611..	128	44420091	443	44423230	348
335718xxx	612			401603CP	36	41612..	128	44420092	444	44423231	348
335719xxx	612			401604	36	41613..	128	44420093	444	44423232	347
335720xxx	612			401604CP	36	41614..	128	44420094	444	44423233	347
335721xxx	612			401605	36	41615..	128	44420095	444	44423234	349
335722xxx	612			401605CP	36	41804..	128	44420103	445	44423235	349
335723xxx	612			401607	36	41805..	128	44420104	445	44423236	349
335724xxx	612	4001	167	401607CP	36	41806..	128	44420105	445	44423237	349
335725xxx	612	400124	466	401609	36	431611	466	44420148	447	44423238	350
335726xxx	612	400124FX	465	401609CP	36	431611FX	465	44420150	447	44423239	350
335727xxx	612	400126	466	401612	36	431622	466	44420152	447	44423240	350
335728xxx	612	400126FX	465	401612CP	36	431622FX	465	44420154	447	44423241	350
335729xxx	612	400136	466	401618	36	433211	466	44420156	447	44423242	288
335730xxx	613	400137FX	465	401618CP	36	433211FX	465	44420158	447	44423243	288
335731xxx	613	400139	466	401625	36	433222	466	44422018	391	44423244	288
335732xxx	613	400139FX	465	401625CP	36	433222FX	465	44422019	397	44423245	288
335733xxx	613	400146	466	401802	36	43512xxx-10	609	44422020	397	44423246	288
335734xxx	613	400149	466	401802CP	36	43512xxx-14	609	44422021	397	44423247	288
335735xxx	613	4002	167	401803	36	43512xxx-16	609	44422022	400	44423248	288
335736xxx	613	400224	466	401803CP	36	43513xxx-10	609	44422023	400	44423249	288
335737xxx	613	400224FX	465	401804	36	43513xxx-14	609	44423017	432	44423250	288
335738xxx	613	400226	466	401804CP	36	43513xxx-16	609	44423018	432	44423251	288
335739xxx	613	400226FX	465	401805	36	43517xxx-10	609	44423021	432	44423252	288
335740xxx	613	400236	466	401805CP	36	43517xxx-14	609	44423026	384	44423253	288
335741xxx	613	400237FX	465	401807	36	43517xxx-16	609	44423140	440	44423254	288
335742xxx	613	400239	466	401807CP	36	43519xxx-10	609	44423141	440	44423255	288
335743xxx	613	400239FX	465	401809	36	43519xxx-14	609	44423142	440	44423256	288
335744xxx	613	400246	466	401809CP	36	43519xxx-16	609	44423143	440	44423257	288
335745xxx	613	400249	466	401812	36	441622	466	44423144	440	44423258	288
335746xxx	613	400249FX	465	401812CP	36	441622FX	465	44423145	440	44423259	288
335747xxx	613	400270-xxx-10	611	401818	36	441638	466	44423146	440	44423264	349
335748xxx	613	400270-xxx-10NB	611	401818CP	36	441650FX	465	44423147	440	44423265	348
335749xxx	613	400270-xxx-14	611	401825	36	443222	466	44423200	294	44423266	347
335750xxx	613	400270-xxx-14NB	611	401825CP	36	443222FX	465	44423201	294	44423267	347
335751xxx	613	400270-xxx-16	611	402002	36	443238	466	44423202	295	44423268	289
335752xxx	613	400270-xxx-16NB	611	402002CP	36	443250FX	465	44423203	295	44423269	289
335753xxx	613	400271-xxx	611	402003	36	44420009	449	44423204	296	44423270	289
335754xxx	613	400271-xxx-15P	611	402003CP	36	44420011	449	44423205	296	44423271	289
335755xxx	613	400336	466	402004	36	44420022	450	44423206	297	44423272	289
335756xxx	613	400339	466	402004CP	36	44420024	450	44423207	297	44423273	289
335757xxx	613	400346	466	402005	36	44420026	450	44423208	298	44424004	370
346338	466	400349	466	402005CP	36	44420028	451	44423209	298	44424005	370
346350FX	465	401402	36	402007	36	44420035	450	44423210	299	44424006	370
349538	466	401402CP	36	402007CP	36	44420036	448	44423211	299	44424007	370
349550FX	465	401403	36	402009	36	44420037	448	44423212	342	44424008	370
356338	466	401403CP	36	402009CP	36	44420038	448	44423213	342	44424009	370
359538	466	401404	36	402012	36	44420039	449	44423214	343	44424010	370
3649FD	192	401404CP	36	402012CP	36	44420040	449	44423215	343	44424011	370
		401405	36	402018	36	44420041	449	44423216	343	44424012	354

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44424013 to 51730050

44424013	354	4520..1	129	4533101	135	471376FX	465	475202FX	465	477326	466
44424014	287	4520..2	129	4533103	135	471377	466	475302FX	465	477326FX	465
44424015	287	4520..3	129	4533105	135	471377FX	465	475312FX	465	477327	466
44424017	355	4520..4	129	4533107	135	471386	466	475512FX	465	477327FX	465
44424018	355	4520..5	129	4533109	135	471386FX	465	476203	466	477328	466
44424019	288	4520..6	129	4533111	135	471387	466	476203FX	465	477328FX	465
44424020	288	4521..1	129	4533113	135	471387FX	465	476206	466	477412	466
44424021	288	4521..2	129	4533115	135	471472	466	476206FX	465	477413	466
44424022	288	4521..3	129	456322	466	471473	466	476303	466	477416	466
44424023	288	4521..4	129	456322FX	465	471476	466	476303FX	465	477417	466
44424024	288	4521..5	129	456338	466	471477	466	476306	466	477422	466
44424028	316	4521..6	129	459322	466	471482	466	476306FX	465	477423	466
44424030	356	4521..7	129	459322FX	465	471483	466	476313	466	477426	466
44424031	356	4521..8	129	459538	466	471486	466	476313FX	465	477427	466
44424032	288	4521..9	129	460124	466	471487	466	476316	466	477513FX	465
44424033	288	453222	466	460124FX	465	471572FX	465	476316FX	465	477516FX	465
44424034	288	453222FX	465	460126	466	471573FX	465	476317	466	477517FX	465
44424035	288	453238	466	460126FX	465	471576FX	465	476317FX	465	500058xxx	611
44424036	288	4533004	135	460136	466	471577FX	465	476318	466	500058xxx-E	611
44424037	288	4533005	135	460137FX	465	4725..1	130	476318FX	465	500058xxx-R	611
44424038	289	4533006	135	460139	466	4725..2	130	476323	466	501003	38
44424039	289	4533007	135	460139FX	465	4725..3	130	476326	466	501003CP	38
44424040	289	4533008	135	460146	466	4726..1	130	476326FX	465	501004	38
44424041	376	4533009	135	460224	466	4726..2	130	476327	466	501004CP	38
44424042	376	4533010	135	460224FX	465	4726..3	130	476327FX	465	501005CP	38
44424043	376	4533011	135	460226	466	4726..4	130	476328	466	501203	38
44424044	376	4533012	135	460226FX	465	4726..5	130	476328FX	465	501203CP	38
44424049	306	4533013	135	460236	466	4726..6	130	476413	466	501204	38
44424050	306	4533014	135	460237FX	465	4726..7	130	476416	466	501204CP	38
44424052	433	4533015	135	460239	466	4726..8	130	476423	466	501205CP	38
44429009	286	4533016	135	460239FX	465	4726..9	130	476426	466	501403	38
44429010	286	4533017	135	460246	466	4727..1	130	476513FX	465	501403CP	38
44429013	286	4533027	135	460249	466	4727..2	130	476516FX	465	501404	38
44429014	286	4533029	135	460249FX	465	473203	466	476517FX	465	501404CP	38
44429015	413	4533031	135	460337FX	465	473203FX	465	476903	479	501405	38
44429017	288	4533033	135	460339	466	473206	466	476905	479	501405CP	38
44429018	288	4533035	135	460339FX	465	473206FX	465	476907	479	501602	38
44429019	288	4533037	135	460349	466	473303	466	476909	479	501602CP	38
44429020	288	4533039	135	460349FX	465	473303FX	465	476913	479	501603	38
44429021	288	4533041	135	471262	466	473306	466	476923	479	501603CP	38
44429022	288	4533043	135	471262FX	465	473306FX	465	476925	479	501604	38
44429370	445	4533045	135	471263	466	473313	466	477202	466	501604CP	38
44429371	445	4533061	135	471263FX	465	473313FX	465	477203	466	501605	38
44517xxx-10	609	4533063	135	471266	466	473316	466	477203FX	465	501605CP	38
44517xxx-14	609	4533065	135	471266FX	465	473316FX	465	477206	466	501607	38
44517xxx-16	609	4533067	135	471267	466	473317	466	477206FX	465	501802	38
44519xxx-10	609	4533069	135	471267FX	465	473317FX	465	477302	466	501803	38
44519xxx-14	609	4533071	135	471332	466	473318	466	477303	466	501803CP	38
44519xxx-16	609	4533073	135	471333	466	473318FX	465	477303FX	465	501804	38
446322	466	4533075	135	471362	466	473323	466	477306	466	501804CP	38
446322FX	465	4533077	135	471362FX	465	473326	466	477306FX	465	501805	38
446338	466	4533079	135	471363	466	473326FX	465	477312	466	501805CP	38
446350FX	465	4533081	135	471363FX	465	473327	466	477313	466	501807	38
449322	466	4533083	135	471366	466	473327FX	465	477313FX	465	50200800	452
449322FX	465	4533085	135	471366FX	465	473328	466	477316	466	50201120	452
449538	466	4533087	135	471367	466	473328FX	465	477316FX	465	50201203	452
449550FX	465	4533089	135	471367FX	465	473413	466	477317	466	50202203	452
4510..1	129	4533091	135	471372	466	473416	466	477317FX	465	50206204	452
4510..2	129	4533093	135	471372FX	465	473423	466	477318	466	51712740	533
4510..3	129	4533095	135	471373	466	473426	466	477318FX	465	51730010	551
451622	466	4533097	135	471373FX	465	473513FX	465	477322	466	51730040	551
451638	466	4533099	135	471376	466	473516FX	465	477323	466	51730050	551

Part numbers

51730060 to 52103260

51730060	551	52003570	542	52005470	528	52006151	549	52024849	549	52100329	553
51730070	551	52003580	542	52005480	529	52006153	549	52024850	549	52100330	553
51730080	551	52003690	554	52005490	529	52006156	549	52024851	549	52100331	553
52000310	531	52003700	554	52005500	529	52006159	549	52024852	549	52100332	553
52000320	531	52003710	554	52005510	529	52006161	549	52024853	549	52100333	553
52000330	531	52003720	554	52005520	529	52006163	549	52024854	549	52100334	553
52000340	531	52003730	554	52005530	529	52006166	549	52024855	549	52100335	553
52000350	531	52003740	554	52005540	531	52006169	549	52024856	549	52100336	553
52000360	531	52003750	550	52005550	531	52006171	549	52024857	549	52100337	553
52000830	532	52003760	550	52005560	531	52006173	549	52025040	551	52100338	553
52000840	532	52003770	550	52005570	534	52006176	549	52025050	551	52100339	553
52000850	532	52003780	550	52005680	528	52006179	549	52025060	551	52100340	553
52000860	532	52003790	550	52005690	528	52006600	549	52025070	551	52100341	553
52000870	532	52003800	550	52005700	528	52006610	549	52025100	551	52100342	553
52000880	532	52003810	550	52005710	528	52006620	549	52025110	551	52100343	553
52000890	532	52003820	550	52005720	528	52006630	549	52025120	551	52100344	553
52000900	532	52003830	550	52005740	555	52006640	549	52025130	551	52100345	553
52000910	532	52003840	550	52005750	555	52006650	549	52025140	551	52100346	553
52000920	532	52003850	550	52005760	555	52006660	549	52025150	551	52100347	553
52000990	536	52003860	550	52005770	555	52006670	549	52025160	551	52100620	554
52001000	536	52003870	550	52005780	554	52010170	427	52025170	551	52100621	554
52001010	536	52003880	550	52005790	554	52010180	427	52025180	551	52100622	554
52001020	536	52003890	550	52005800	554	52010190	427	52025190	551	52100623	554
52001030	536	52003900	550	52005810	583	52010200	427	52025235	548	52100624	554
52001040	536	52003910	550	52005820	583	52010210	427	52025240	548	52100625	554
52001050	536	52003920	550	52005830	583	52010220	427	52025250	548	52100626	554
52001060	536	52003930	550	52005840	583	52010230	427	52025260	548	52100627	554
52001070	536	52003940	550	52005850	583	52010240	427	52025270	548	52103000	543
52001080	536	52003950	550	52005860	583	52010340	427	52025280	548	52103010	543
52001090	536	52003970	550	52005870	583	52010350	427	52025290	548	52103020	543
52001100	536	52003980	550	52005880	583	52010370	427	52025291	548	52103030	543
52001110	536	52003990	551	52005900	583	52010380	427	52032520	530	52103040	543
52001120	536	52004000	551	52005949	549	52015700	513	52032525	530	52103050	543
52001130	536	52004010	551	52005950	549	52015710	513	52032540	530	52103060	543
52001140	536	52004020	551	52005960	549	52015720	513	52032550	530	52103070	543
52001150	536	52004030	551	52005970	549	52015730	513	52032560	530	52103071	543
52001160	536	52004040	551	52005980	549	52015740	513	52032570	530	52103072	543
52001170	536	52004050	551	52005990	549	52015750	513	52032580	530	52103073	543
52001180	536	52004060	551	52006000	549	52015760	513	52032590	530	52103100	549
52001190	536	52004070	551	52006010	549	52015765	513	52032600	530	52103105	549
52001200	536	52004080	551	52006020	549	52015766	513	52032610	530	52103110	549
52001210	536	52004090	551	52006030	549	52015767	513	52032620	530	52103115	549
52001220	536	52004100	551	52006101	549	52015770	513	52032630	530	52103120	549
52001230	536	52004110	551	52006103	549	52015780	513	52032640	530	52103125	549
52002680	549	52004120	551	52006106	549	52015790	513	52032650	530	52103130	549
52002790	549	52004180	538	52006109	549	52015800	513	52032660	530	52103135	549
52003390	549	52004190	538	52006111	549	52015810	513	52032670	530	52103140	549
52003400	549	52004200	538	52006113	549	52015820	513	52100200	427	52103145	549
52003410	549	52004210	538	52006116	549	52015830	513	52100220	427	52103150	549
52003420	549	52004220	538	52006119	549	52015831	513	52100240	427	52103155	549
52003430	549	52004225	538	52006121	549	52015832	513	52100250	427	52103160	549
52003440	549	52004230	533	52006123	549	52015833	513	52100260	427	52103165	549
52003450	549	52004240	533	52006126	549	52023601	555	52100270	427	52103170	549
52003460	549	52004250	533	52006129	549	52023602	555	52100320	553	52103175	549
52003490	542	52004260	533	52006131	549	52023603	555	52100321	553	52103190	549
52003500	542	52004270	533	52006133	549	52023604	555	52100322	553	52103200	543
52003510	542	52004280	534	52006136	549	52023606	555	52100323	553	52103210	543
52003520	542	52004290	534	52006139	549	52023607	555	52100324	553	52103220	543
52003530	542	52004300	534	52006141	549	52023608	555	52100325	553	52103230	543
52003540	542	52004310	534	52006143	549	52023609	555	52100326	553	52103240	543
52003550	542	52004320	534	52006146	549	52023611	555	52100327	553	52103250	543
52003560	542	52005420	538	52006149	549	52024848	549	52100328	553	52103260	543

Part numbers

52103270 to 53112045

52103270	543	52104498	553	52109013	550	53015060	498	53015950	503	53111100	499
52103300	544	52104499	553	52109014	550	53015070	498	53017420	505	53111110	499
52103310	544	52104500	553	52109015	550	53015080	498	53017430	505	53111120	499
52103320	544	52104501	553	52110023	525	53015090	498	53017440	505	53111130	499
52103330	544	52104502	553	52110024	525	53015100	498	53019000	541	53111140	499
52103340	544	52104503	553	52110025	525	53015110	498	53019010	541	53111150	499
52103350	544	52104980	531	52110026	525	53015120	498	53019020	541	53111160	499
52103360	544	52104990	531	52110027	525	53015130	498	53019030	541	53111170	499
52103370	544	52105000	531	52110028	525	53015140	498	53019040	541	53111200	499
52103371	544	52105002	531	52115700	514	53015150	498	53019050	541	53111210	499
52103372	544	52105003	531	52115710	514	53015160	498	53019060	541	53111220	499
52103373	544	52105004	531	52115720	514	53015170	498	53019070	541	53111230	499
52104010	552	52105005	531	52115730	514	53015180	498	53019080	541	53111240	499
52104200	552	52105006	531	52115740	514	53015190	498	53019090	541	53111250	499
52104210	552	52105010	531	52115750	514	53015200	498	53019200	541	53111260	499
52104220	552	52105270	535	52115760	514	53015210	498	53019210	541	53111270	499
52104230	552	52105280	535	52115770	514	53015220	498	53019220	541	53111300	499
52104240	552	52105290	535	52115780	514	53015230	498	53019230	541	53111310	499
52104250	552	52105300	535	52115790	514	53015240	498	53019240	541	53111320	499
52104260	552	52105310	535	52115800	514	53015250	498	53019250	541	53111330	499
52104270	552	52105320	535	52115810	514	53015260	498	53019260	541	53111340	499
52104280	552	52105330	535	52115820	514	53015270	498	53019270	541	53111350	499
52104290	552	52105340	535	52115830	514	53015280	498	53019280	541	53111360	499
52104300	552	52105350	535	52122000	556	53015290	498	53019290	541	53111370	499
52104310	550	52105360	535	52122001	556	53015300	498	53100003	545	53111407	501
52104311	550	52105370	535	52122010	556	53015310	498	53100004	545	53111417	501
52104312	550	52105380	535	52122011	555	53015320	498	53100005	545	53111427	501
52104313	550	52105390	535	52122020	556	53015330	498	53100006	545	53111437	501
52104314	550	52105400	535	52122021	556	53015340	498	53100007	545	53111447	501
52104315	550	52105410	535	52122030	556	53015350	498	53100008	545	53111457	501
52104316	550	52105420	535	52122040	556	53015360	498	53100009	545	53111467	501
52104317	550	52106410	536	52122050	556	53015370	498	53102000	556	53111477	501
52104318	550	52106420	536	52122060	556	53015380	498	53102001	556	53111600	503
52104319	550	52106430	536	52122070	556	53015390	498	53102010	556	53111610	503
52104320	550	52106440	536	52220000	510	53015410	505	53102011	555	53111620	503
52104321	550	52106450	536	52220001	510	53015420	505	53102020	556	53111630	503
52104322	550	52106460	536	52220002	510	53015430	505	53102021	556	53111640	503
52104330	552	52106470	536	52220003	510	53015440	505	53102030	556	53111700	503
52104340	552	52106480	536	52220004	510	53015450	505	53102040	556	53111710	503
52104360	552	52106481	536	52220005	510	53015600	503	53102050	556	53111720	503
52104370	552	52106490	536	52220006	510	53015610	503	53102060	556	53111730	503
52104380	552	52106500	536	52220007	510	53015620	503	53102070	556	53111740	503
52104400	552	52106510	536	52220040	510	53015630	503	53105100	519	53112000	515
52104410	552	52106520	536	52220050	508	53015640	503	53105110	519	53112004	512
52104420	552	52106530	536	52220053	508	53015650	503	53105120	519	53112005	516
52104430	552	52106540	536	52220056	508	53015700	503	53105130	519	53112006	512
52104440	552	52106550	536	52220057	508	53015710	503	53105200	519	53112010	515
52104450	551	52106560	536	52220065	507	53015720	503	53105210	519	53112014	512
52104452	551	52106570	536	52220073	507	53015730	503	53105220	519	53112015	516
52104454	551	52106580	536	52220080	507	53015740	503	53105230	519	53112016	512
52104456	551	52106590	536	52220085	507	53015750	503	53105300	527	53112020	515
52104458	551	52106600	536	53001010	555	53015800	503	53105301	527	53112024	512
52104460	551	52106610	536	53001020	555	53015810	503	53105302	527	53112025	516
52104462	551	52106620	536	53001030	555	53015820	503	53105303	527	53112026	512
52104490	553	52106630	536	53001040	555	53015830	503	53111000	499	53112030	515
52104491	553	52106640	536	53001050	555	53015840	503	53111010	499	53112034	512
52104492	553	52106800	534	53015000	498	53015850	503	53111020	499	53112035	516
52104493	553	52106810	534	53015010	498	53015900	503	53111030	499	53112036	512
52104494	553	52106820	534	53015020	498	53015910	503	53111040	499	53112037	524
52104495	553	52106830	534	53015030	498	53015920	503	53111050	499	53112040	515
52104496	553	52106840	534	53015040	498	53015930	503	53111060	499	53112044	512
52104497	553	52106850	534	53015050	498	53015940	503	53111070	499	53112045	516

Part numbers

53112046 to 54113120

53112046	512	53112640	522	53112929	500	53320260	546	53611000	547	53806726	526
53112047	524	53112645	522	53112930	522	53320340	546	53611001	547	53806728	526
53112050	515	53112650	522	53112931	500	53320353	546	53611225	545	53806739	518
53112054	512	53112655	522	53112934	504	53320430	546	53611240	545	53806740	518
53112055	516	53112660	522	53112935	504	53320440	546	53611330	545	53806741	518
53112056	512	53112665	522	53112936	504	53320920	546	53611430	545	53806742	518
53112057	524	53112670	522	53112937	504	53325260	546	53613250	545	53806743	518
53112060	515	53112675	522	53112940	522	53325350	546	53613340	545	53806744	518
53112064	512	53112676	524	53112950	522	53325360	546	53613440	545	53806745	518
53112065	516	53112677	524	53112960	522	53325370	546	53616140	545	53806749	518
53112066	512	53112678	524	53113180	521	53325450	546	53616225	545	53806750	518
53112067	524	53112679	524	53113200	521	53325540	546	53616240	545	53806751	518
53112070	515	53112680	524	53113210	521	53325640	546	53616260	545	53806752	518
53112074	512	53112681	524	53113220	521	53332270	546	53616340	545	53806753	518
53112076	512	53112696	500	53113300	502	53332280	546	53616350	545	53806754	518
53112077	524	53112697	500	53113310	502	53332290	546	53616356	545	53806755	518
53112080	515	53112698	500	53113321	502	53332370	546	53616360	545	53806780	518
53112087	524	53112699	500	53113331	502	53332380	546	53616440	545	53806781	518
53112100	515	53112700	517	53113500	520	53332460	546	53616450	545	53806782	518
53112105	516	53112705	517	53113510	520	53332470	546	53616540	545	53806783	518
53112110	515	53112710	517	53113520	520	53332560	546	53621270	545	53806784	518
53112115	516	53112715	517	53113530	520	53332650	546	53621280	545	54000040	549
53112120	515	53112720	517	53113540	520	53332840	546	53621370	545	54000071	549
53112125	516	53112725	517	53113550	520	53332850	546	53621380	545	54001610	549
53112130	515	53112730	517	53113560	520	53332940	546	53621460	545	54001620	549
53112135	516	53112735	517	53113570	520	53340290	546	53621550	545	54001630	549
53112140	515	53112740	517	53113600	520	53340310	546	53621640	545	54001640	549
53112145	516	53112745	517	53113610	520	53340480	546	53629290	545	54001650	549
53112150	515	53112750	517	53113620	520	53340490	546	53629390	545	54001660	549
53112155	516	53112755	517	53113630	520	53340580	546	53629470	545	54001670	549
53112160	515	53112760	517	53113640	520	53340590	546	53629480	545	54001680	549
53112165	516	53112765	517	53113650	520	53340670	546	53629490	545	540141FX	479
53112170	515	53112770	517	53113660	520	53340860	546	53629556	545	540151FX	479
53112210	522	53112775	517	53113670	520	53340969	546	53629570	545	54020100	552
53112220	522	53112779	517	53119000	541	53350118	546	53629675	545	54020110	552
53112230	522	53112797	500	53119010	541	53350147	546	53800579	548	54020120	552
53112240	522	53112876	500	53119020	541	53350164	546	53800583	548	54020130	552
53112250	522	53112877	500	53119030	541	53350166	546	53800640	548	54020140	552
53112260	522	53112878	500	53119040	541	53350680	546	53800641	548	54020152	552
53112270	522	53112879	500	53119050	541	53350780	546	53800642	548	54020153	552
53112310	522	53112880	500	53119060	541	53350870	546	53800643	548	541011FX	479
53112320	522	53112881	500	53119070	541	53512xxx-10	609	53801030	556	541021FX	479
53112330	522	53112882	500	53119100	541	53512xxx-14	609	53801035	555	541030FX	479
53112340	522	53112883	500	53119110	541	53512xxx-16	609	53801040	556	541080FX	479
53112350	522	53112884	500	53119120	541	53513xxx-10	609	53801045	555	541090FX	479
53112360	522	53112885	500	53119130	541	53513xxx-14	609	53801050	556	54110840	544
53112500	524	53112886	500	53119140	541	53513xxx-16	609	53801055	555	54110841	544
53112501	524	53112887	500	53119150	541	53517xxx-10	609	53801060	556	54110842	544
53112503	524	53112906	504	53119160	541	53517xxx-10E	609	53801065	555	54110843	544
53112504	524	53112907	504	53119170	541	53517xxx-14	609	53801070	556	54110844	544
53112505	524	53112908	504	53119200	541	53517xxx-14E	609	53801075	555	54110845	544
53112510	515	53112909	504	53119210	541	53517xxx-16	609	53801080	556	54113000	548
53112511	515	53112910	522	53119220	541	53517xxx-16E	609	53801085	555	54113010	548
53112512	515	53112911	504	53119230	541	53519xxx-10	609	53801090	556	54113020	548
53112514	515	53112912	504	53119240	541	53519xxx-10E	609	53801095	555	54113030	548
53112515	515	53112920	522	53119250	541	53519xxx-14	609	53801100	556	54113040	548
53112610	522	53112921	500	53119260	541	53519xxx-14E	609	53801105	555	54113050	548
53112615	522	53112922	500	53119270	541	53519xxx-16	609	53801115	555	54113060	548
53112620	522	53112923	500	53316220	546	53519xxx-16E	609	53801125	555	54113070	548
53112625	522	53112924	500	53316230	546	53607225	545	53806720	526	54113100	548
53112630	522	53112927	500	53316240	546	53607417	545	53806722	526	54113110	548
53112635	522	53112928	500	53320250	546	53609230	545	53806724	526	54113120	548

Part numbers

54113130 to 600804

54113130	548	55000541	582	55501440	582	55502490	581	55503276	590	55506081	585
54113140	548	55000550	582	55501450	582	55502493	581	55503277	590	55506082	585
54113150	548	55000551	582	55501460	582	55502494	580	55503278	590	55506083	585
54113160	548	55000560	582	55501470	582	55502495	580	55503279	575	55506084	585
54113170	548	55000561	582	55502366	581	55502496	580	55503280	575	55506085	585
54115200	506	55000570	582	55502367	581	55502497	580	55503281	575	55506086	585
54115205	506	55000571	582	55502368	581	55502498	580	55503282	575	55506087	585
54115210	506	55000572	582	55502369	581	55502499	580	55503283	575	55506090	585
54115215	506	55001310	445	55502370	581	55502601	584	55503284	575	55506091	585
54115220	506	55001312	451	55502371	581	55502602	584	55503285	575	55506092	585
54115225	506	55500990	577	55502372	581	55502603	584	55503286	575	55506093	585
54115230	506	55500995	577	55502373	581	55502604	584	55503287	575	55506094	585
54115235	506	55501000	577	55502374	581	55502605	584	55503288	575	55506095	585
54115240	506	55501005	577	55502375	581	55502607	584	55503289	575	55506096	585
54115245	506	55501010	577	55502439	580	55502608	584	55503290	575	55506097	585
54115250	506	55501015	577	55502441	580	55502609	584	55503291	575	55506135	589
54115255	506	55501020	577	55502442	580	55502611	584	55503292	575	55506145	589
54115260	506	55501025	577	55502443	580	55502612	584	55503370	574	55506155	589
54115265	506	55501030	577	55502444	580	55502613	584	55503371	574	55506165	589
54115270	506	55501035	577	55502445	580	55502614	584	55503372	574	55506175	589
54115275	506	55501040	577	55502446	580	55502615	584	55503373	574	55506185	589
54115400	506	55501045	577	55502447	580	55502616	584	55503374	574	55506195	589
54115405	506	55501050	577	55502448	580	55502617	584	55503375	574	55506205	589
54115410	506	55501055	577	55502449	580	55502618	584	55503376	574	55506215	589
54115415	506	55501060	577	55502451	580	55502621	584	55503397	590	55506225	589
54115420	506	55501065	577	55502452	580	55502622	584	55506010	586	55506235	589
54115425	506	55501070	577	55502453	580	55502623	584	55506011	586	55506245	589
54115430	506	55501075	577	55502454	580	55502624	584	55506012	586	55506255	589
54115435	506	55501080	577	55502455	580	55502625	584	55506013	586	55506265	589
54115440	506	55501085	577	55502456	580	55502626	584	55506014	586	55506275	589
54115445	506	55501090	577	55502457	580	55502627	584	55506015	586	55506285	589
54115450	506	55501095	577	55502458	581	55502628	584	55506016	586	55506295	589
54115455	506	55501110	578	55502459	581	55502651	584	55506017	586	55507265	589
54115460	506	55501115	578	55502460	580	55502652	584	55506018	586	55507275	589
54115465	506	55501120	578	55502461	580	55502653	584	55506019	586	55507285	589
54115470	506	55501125	578	55502462	580	55502654	584	55506020	585	55510700	588
54115475	506	55501140	578	55502463	580	55502655	584	55506021	585	55510701	588
54517xxx-10	609	55501145	578	55502464	580	55502656	584	55506022	585	55510702	588
54517xxx-14	609	55501160	578	55502465	580	55502657	584	55506023	585	55510703	588
54517xxx-16	609	55501165	578	55502466	580	55502658	584	55506024	585	55510704	588
54519xxx-10	609	55501180	578	55502467	580	55502659	584	55506025	585	55510705	588
54519xxx-14	609	55501185	578	55502468	580	55502661	584	55506026	585	55510706	588
54519xxx-16	609	55501200	578	55502469	580	55502662	584	55506027	585	556322	466
546322	466	55501205	578	55502470	580	55502663	584	55506028	585	556322FX	465
546322FX	465	55501220	578	55502471	580	55502664	584	55506029	585	556338	466
546338	466	55501225	578	55502472	580	55502665	584	55506030	586	559322	466
546350FX	465	55501240	578	55502473	580	55502666	584	55506031	586	559322FX	465
549322	466	55501245	578	55502474	580	55502667	584	55506032	586	559538	466
549322FX	465	55501250	578	55502476	580	55502668	584	55506033	586	56000100	578
549538	466	55501255	578	55502477	580	55502669	584	55506034	586	56000105	578
549550FX	465	55501300	583	55502478	580	55502671	584	55506035	586	571129	479
55000000	582	55501310	583	55502479	580	55502672	584	55506036	586	571229	479
55000010	582	55501320	583	55502480	581	55502673	584	55506037	586	6001	168
55000020	582	55501330	583	55502481	581	55502674	584	55506038	586	6002	168
55000030	582	55501340	583	55502482	581	55502675	584	55506039	586	600204	28
55000040	582	55501350	583	55502483	581	55502676	584	55506040	586	600205	28
55000050	582	55501360	583	55502484	581	55502677	584	55506041	586	600404	28
55000060	582	55501370	583	55502485	581	55502678	584	55506042	586	600405	28
55000070	582	55501400	582	55502486	581	55502679	584	55506043	586	600604	28
55000090	582	55501410	582	55502487	581	55503269	590	55506044	586	600604CY	28
55000531	582	55501420	582	55502488	581	55503271	590	55506045	586	600605	28
55000540	582	55501430	582	55502489	581	55503275	590	55506080	585	600804	28

Part numbers
600804CY to 61801060

600804CY	28	601807	28	602404S	211	611205	40	61746960	563	61754065	576
600805	28	601807CY	28	602404TP	211	61121xxx	611	61746965	563	61754070	576
601003	28	601809	28	602405	211	611403	40	61746970	563	61754075	576
601003CY	28	601812	28	602405S	211	611404	40	61746975	563	61754270	576
601004	28	601812CY	28	602405TP	211	611405	40	61746980	563	61754275	576
601004CY	28	601818	28	602407	211	611603	40	61746985	563	61754300	576
601005	28	601818CY	28	602407S	211	611604	40	61746990	563	61754305	576
601005CY	28	601825	28	602408	211	611605	40	61746995	563	61791260	557
601007CY	28	601825CY	28	602408S	211	611607	40	61747000	563	61791273	557
601203	28	601834	28	602408TP	211	611612	40	61747005	563	61791274	558
601203CY	28	601841	28	602410	211	611618	40	61747010	563	61791275	558
601204	28	601850	28	602410S	211	611625	40	61747015	563	61791276	558
601204CY	28	602002	28	602415	211	611803	40	61747360	567	61791277	558
601205	28	602002CY	28	602415S	211	611804	40	61747370	567	61791278	558
601205CY	28	602003	28	602420S	211	611805	40	61747380	567	61791279	558
601207	28	602003CY	28	602425S	211	61526xxx	611	61747390	567	61791280	558
601207CY	28	602004	28	602603	211	61526xxx-E	611	61747400	567	61791282	558
601211	28	602004CY	28	602603S	211	61526xxx-R	611	61747410	567	61791283	558
601402	28	602005	28	602604S	211	61528xxx	611	61747420	567	61791284	558
601403	28	602005CY	28	602605	211	61528xxx-E	611	61747430	567	61800015	578
601403CY	28	602007	28	602607	211	61528xxx-R	611	61747440	567	61800025	578
601404	28	602007CY	28	602607S	211	61529xxx-16	611	61751610	567	61800035	578
601404CY	28	602009	28	602608S	211	61529xxx-16-E	611	61751620	567	61800045	578
601405	28	602012	28	602610	211	61529xxx-16-R	611	61751630	567	61800055	578
601405CY	28	602012CY	28	602610S	211	61610000	558	61751640	567	61800065	578
601407	28	602018	28	602615S	211	61610012	558	61751650	567	61800075	578
601407CY	28	602025	28	602620	211	61610013	558	61751660	567	61800085	578
601409	28	602025CY	28	602620S	211	61711550	568	61751670	567	61800705	577
601412	28	602202	211	602625	211	61711590	568	61751680	567	61800715	577
601412CY	28	602202S	211	602636	211	61711630	568	61751690	567	61800725	577
601418	28	602202TP	211	602802	211	61711670	568	61751700	567	61800745	577
601418CY	28	602203	211	602803	211	61711710	568	61751710	567	61800755	577
601425	28	602203S	211	602804	211	61711750	568	61751720	567	61800765	577
601602	28	602203TP	211	602805	211	61711790	568	61751730	567	61800775	577
601603	28	602204	211	602807	211	61711830	568	61751740	567	61800785	577
601603CY	28	602204S	211	602808	211	61711910	568	61751750	567	61800850	577
601604	28	602204TP	211	602810	211	61721690	568	61751760	567	61800855	577
601604CY	28	602205	211	602815	211	61721700	568	61751770	567	61800860	577
601605	28	602205S	211	602820	211	61721710	568	61751780	567	61800865	577
601605CY	28	602205TP	211	602825	211	61721720	568	61751790	567	61800870	577
601607	28	602206TP	211	602850	211	61721730	568	61751791	567	61800875	577
601607CY	28	602207	211	610803	40	61721740	568	61751792	567	61800880	577
601609	28	602207S	211	610804	40	61721750	568	61751793	567	61800885	577
601612	28	602208	211	61100125-xxx	610	61721760	568	61751794	567	61800890	577
601612CY	28	602208S	211	61100125-xxx-E	610	61721780	568	61751795	567	61800895	577
601618	28	602210	211	61100125-xxx-R	610	61722285	593	61751796	567	61800900	577
601618CY	28	602210S	211	611003	40	61722286	593	61751797	567	61800905	577
601625	28	602212	211	611004	40	61725950	557	61751798	567	61800910	577
601625CY	28	602215S	211	61101xxx	611	61735800	431	61753620	557	61800915	577
601634	28	602216S	211	61102xxx	611	61735975	558	61754000	576	61800920	577
601641	28	602220	211	61103xxx	611	61737162	576	61754005	576	61800925	577
601650	28	602220S	211	61105xxx	611	61737163	576	61754010	576	61800930	577
601661	28	602225	211	61106xxx	611	61737164	576	61754015	576	61800935	577
601802	28	602225S	211	61107xxx	611	61737253	576	61754020	576	61801020	578
601802CY	28	602236	211	61113xxx	611	61744160	557	61754025	576	61801025	578
601803	28	602236S	211	61114xxx	611	61744161	557	61754030	576	61801030	578
601803CY	28	602240S	211	61115xxx	611	61746935	563	61754035	576	61801035	578
601803NG	28	602402	211	61116xxx	611	61746939	563	61754040	576	61801040	578
601804CY	28	602402TP	211	61117xxx	611	61746940	563	61754045	576	61801045	578
601804	28	602403	211	61118xxx	611	61746945	563	61754050	576	61801050	578
601805	28	602403S	211	611203	40	61746950	563	61754055	576	61801055	578
601805CY	28	602404	211	611204	40	61746955	563	61754060	576	61801060	578

Part numbers
61801061 to 700222NP

61801061	578	61803839	587	61806700	579	61U00115	584	63529xxx-8-R	610	70002699	152
61801062	578	61803840	587	61806710	579	61U00116	584	63534xxx	611	70002700	152
61801065	578	61803841	587	61806720	579	61U00197	430	63544xxx	611	70002701	152
61801075	578	61803842	587	61806730	579	61U00198	430	64400010	570	70002702	152
61801085	578	61803843	587	61806740	579	61U00199	430	64400020	570	70002705	152
61802080	571	61803844	587	61806760	579	61U00200	430	64400030	570	70002706	152
61802090	571	61803845	587	61806770	579	61U00201	430	64400040	570	70002707	152
61802100	571	61803850	587	61806780	579	61U00203	430	64400050	570	70002708	152
61802110	571	61803851	587	61806790	579	61U80086	590	64400060	570	70002709	152
61802120	571	61803852	587	61806800	579	61U80087	590	64400070	570	70002710	152
61802130	571	61803853	587	61812950	601	61U80088	590	64400080	570	70002711	152
61802140	571	61803854	587	61812960	601	61U80089	590	64400090	570	70002712	152
61802150	571	61806100	566	61812970	601	620204	28	64453662	569	70002716	152
61802170	571	61806110	566	61812980	601	620204CY	28	64453672	569	70002717	152
61802380	572	61806120	566	61812990	601	620404	28	64453682	569	70002718	152
61802390	572	61806130	566	61813000	601	620404CY	28	64453692	569	70002719	152
61802400	572	61806140	566	61813010	601	620405	28	64453702	569	70002721	152
61802410	572	61806150	566	61813020	601	621634	28	64453712	569	70002722	152
61802420	572	61806160	566	61813030	601	621641	28	64453721	569	70002723	152
61802430	572	61806170	566	61813040	601	621650	28	64453731	569	70002724	152
61802440	572	61806180	566	61813050	601	621661	28	64453751	569	70002750	160
61802450	572	61806190	566	61813958	431	621834	28	64505xxx	609	70002751	160
61802470	572	61806200	566	61814190	573	621841	28	6-45CS	639	70002752	160
61803800	587	61806210	566	61814200	573	621850	28	65914xxx	611	70002753	160
61803801	587	61806550	564	61814210	573	62505xxx	609	65925xxx	611	70002754	160
61803802	587	61806555	564	61814220	573	62514xxx	609	65926xxx	610	70002755	160
61803803	587	61806560	564	61814230	573	62515xxx	609	65926xxx-E	610	70002756	160
61803804	587	61806565	564	61814240	573	62528xxx	611	65926xxx-R	610	70002757	160
61803805	587	61806570	564	61814250	573	62528xxx-E	611	65927xxx	611	70002758	160
61803806	587	61806575	564	61815100	565	62528xxx-R	611	6-9XP	639	70002759	160
61803807	587	61806580	564	61815105	565	63501xxx	611	70002646	152	70002760	160
61803808	587	61806615	566	61815110	565	63502xxx	611	70002647	152	70002761	160
61803809	587	61806616	566	61815115	565	63503xxx	611	70002648	152	700052	380
61803810	587	61806617	566	61815120	565	63505xxx	611	70002649	152	700052NP	380
61803811	587	61806618	566	61815125	565	63506xxx	611	70002651	152	700054	380
61803812	587	61806619	566	61815130	565	63507xxx	611	70002652	152	700054NP	380
61803813	587	61806620	566	61815135	565	63513xxx	611	70002653	152	700062	380
61803814	587	61806621	566	61815140	565	63514xxx	611	70002654	152	700062NP	380
61803815	587	61806622	566	61815145	565	63515xxx	611	70002656	152	700102	381
61803816	587	61806625	566	61815150	565	63516xxx	611	70002657	152	700102NP	381
61803817	587	61806630	566	61815155	565	63524xxx	610	70002658	152	700104	381
61803818	587	61806631	566	61815160	565	63524xxx-E	610	70002659	152	700104NP	381
61803819	587	61806635	566	61815165	565	63524xxx-R	610	70002661	152	700124	466
61803820	587	61806640	566	61815170	565	63525xxx	611	70002662	152	700124FX	465
61803821	587	61806641	566	61815175	565	63526xxx	610	70002663	152	700126	466
61803822	587	61806645	566	61815180	565	63526xxx-E	610	70002664	152	700126FX	465
61803823	587	61806650	566	61815185	565	63526xxx-R	610	70002666	152	700136	466
61803824	587	61806651	566	61U00100	584	63527xxx	611	70002667	152	700137FX	465
61803825	587	61806655	566	61U00101	584	63528xxx	610	70002668	152	700139	466
61803826	587	61806660	566	61U00102	584	63528xxx-E	610	70002669	152	700139FX	465
61803827	587	61806665	566	61U00103	584	63528xxx-R	610	70002670	152	700146	466
61803828	587	61806670	566	61U00104	584	63529xxx-10	610	70002671	152	700149	466
61803829	587	61806671	566	61U00105	584	63529xxx-10-E	610	70002672	152	700152	380
61803830	587	61806672	566	61U00106	584	63529xxx-10-R	610	70002673	152	700152NP	380
61803831	587	61806675	566	61U00107	584	63529xxx-14	610	70002681	152	700162	380
61803832	587	61806680	579	61U00108	584	63529xxx-14-E	610	70002682	152	700162NP	380
61803833	587	61806681	579	61U00109	584	63529xxx-14-R	610	70002683	152	700202	379
61803834	587	61806682	579	61U00110	584	63529xxx-16	610	70002684	152	700202NP	379
61803835	587	61806683	579	61U00111	584	63529xxx-16-E	610	70002687	152	700204NP	379
61803836	587	61806684	579	61U00112	584	63529xxx-16-R	610	70002688	152	700204R	379
61803837	587	61806685	579	61U00113	584	63529xxx-8	610	70002689	152	700222	379
61803838	587	61806690	579	61U00114	584	63529xxx-8-E	610	70002690	152	700222NP	379

Part numbers
700224 to 71220138

700224	466	700652NP	383	700904	393	701526	397	70345521	614	704922	417
700224FX	465	700654	383	700904NP	393	701526NP	397	70345522	614	704922NP	417
700224NP	379	700654NP	383	700922	390	701544	394	70345541	614	704924	417
700224R	379	700700	98	700922NP	390	701544NP	394	70345542	614	704924NP	417
700226	466	700701	98	700924	390	701546	394	70345543	614	7072400	123
700226FX	465	700702	98	700924NP	390	701546NP	394	70345545	614	7072401	123
700236	466	700703	98	700942	388	701602	395	7038864	200	7072402	123
700237FX	465	700704	98	700942NP	388	701602NP	395	7038865	200	7072403	123
700239	466	700705	98	700944	388	701604NP	395	7038866	200	7072404	123
700239FX	465	700706	98	700944NP	388	701604R	395	7038867	200	7072405	123
700246	466	700707	98	701002	391	701612	395	7038868	200	7072406	123
700249	466	700710	100	701002NP	391	701612NP	395	7038885	200	7072407	123
700249FX	465	700711	100	701004NP	391	701614	395	7038886	200	7072408	123
700352	386	700712	100	701004R	391	701614NP	395	7038887	200	7072409	123
700352NP	386	700713	100	701022	391	701642	395	70392839	614	7072410	123
700354	386	700714	100	701022NP	391	701642NP	395	70392984	614	7072414	123
700354NP	386	700715	100	701024	391	701644	395	70410000	614	7072415	123
700362	386	700716	100	701024NP	391	701644NP	395	70410001	614	7072416	123
700362NP	386	700717	100	701042	388	701652	395	70410002	614	7072417	123
700364	386	700720	99	701042NP	388	701652NP	395	70415001	615	710124	466
700364NP	386	700721	99	701044	388	701654	395	70415002	615	710126	466
700402	387	700722	99	701044NP	388	701654NP	395	70415005	615	710136	466
700402NP	387	700723	99	701102	389	70250200	407	70430249	616	710146	466
700404NP	387	700724	99	701102NP	389	70250201	407	70430250	616	710224	466
700404R	387	700725	99	701104	389	70250202	407	70430251	616	710226	466
700406	387	700726	99	701104NP	389	70250203	407	70430252	616	710236	466
700406NP	387	700727	99	701112	389	70250204	407	704440C0	415	710246	466
700422	384	700730	109	701112NP	389	70250205	407	704500	416	710336	466
700422NP	384	700731	109	701114	389	70250206	408	704500NP	416	710346	466
700424	384	700732	109	701114NP	389	70250207	408	704504	416	71100125-xxx	610
700424NP	384	700733	109	701142	389	70250208	408	704504NP	416	71100125-xxx-E	610
700426	384	700734	109	701142NP	389	70250209	408	704552	416	71100125-xxx-R	610
700426NP	384	700735	109	701144	389	70250210	409	704552NP	416	71101xxx	611
700442	382	700736	109	701144NP	389	70250211	409	704554	416	71102xxx	611
700442NP	382	700737	109	701152	389	70250212	409	704554NP	416	71103xxx	611
700444	382	700738	109	701152NP	389	70250213	409	704562	416	71105xxx	611
700444NP	382	700739	109	701154	389	70250214	410	704562NP	416	71106xxx	611
700504	385	700740	109	701154NP	389	70250215	410	704564	416	71107xxx	611
700504NP	385	700741	109	701352NP	398	70250216	410	704564NP	416	71113xxx	611
700506	385	700742	109	701354	398	70250217	410	704602	415	71114xxx	611
700506NP	385	700750	111	701354NP	398	70250219	411	704602NP	415	71115xxx	611
700524	385	700751	111	701362	398	70250220	411	704604	415	71116xxx	611
700524NP	385	700752	111	701362NP	398	70250221	411	704604NP	415	71117xxx	611
700526	385	700753	111	701364	398	70250222	411	704622	415	71118xxx	611
700526NP	385	700754	111	701364NP	398	70250250	429	704622NP	415	71121xxx	611
700542	382	700755	111	701404NP	399	70250251	429	704624	415	71200000	426
700542NP	382	700756	111	701404R	399	70250252	429	704624NP	415	71200200	426
700544	382	700757	111	701406NP	399	70250253	429	704740C0	417	71200300	426
700544NP	382	700758	111	701424	396	70250254	429	704802	418	71200400	426
700602	383	700759	111	701424NP	396	70250255	429	704802NP	418	71200500	426
700602NP	383	700760	111	701426	396	70250256	429	704804	418	71201200	426
700604NP	383	700761	111	701426NP	396	70250257	429	704804NP	418	71201300	426
700604R	383	700762	111	701444	394	70314100	297	704852	418	71201400	426
700612	383	700852	392	701444NP	394	70315100	297	704852NP	418	71201500	426
700612NP	383	700852NP	392	701446	394	70316100	297	704854	418	71220131	154
700614	383	700854	392	701446NP	394	70317100	297	704854NP	418	71220132	154
700614NP	383	700854NP	392	701504	397	70335583	614	704862	418	71220133	154
700642	383	700862	392	701504NP	397	70335584	614	704862NP	418	71220134	154
700642NP	383	700862NP	392	701506	397	70335595	614	704902	417	71220135	154
700644	383	700864	392	701506NP	397	70335596	614	704902NP	417	71220136	154
700644NP	383	700864NP	392	701524	397	70345476	614	704904	417	71220137	154
700652	383	700902NP	393	701524NP	397	70345503	614	704904NP	417	71220138	154

Part numbers
71220151 to 759538

71220151	154	73002716	447	73220159	154	73220258	156	73220340	158	73529xxx-10-E	610
71220152	154	73002718	447	73220160	154	73220259	156	73220341	158	73529xxx-10-R	610
71220153	154	73002720	447	73220161	154	73220260	156	73220342	158	73529xxx-14	610
71220154	154	73002722	447	73220162	154	73220261	156	73220343	158	73529xxx-14-E	610
71220163	154	73002724	447	73220200	156	73220262	156	73220344	158	73529xxx-14-R	610
71220164	154	73002726	447	73220201	156	73220263	156	73220345	158	73529xxx-16	610
71220165	154	73002728	447	73220202	156	73220264	156	73220346	158	73529xxx-16-E	610
71220166	154	73002730	447	73220203	156	73220265	156	73220347	158	73529xxx-16-R	610
71526xxx	611	73002732	447	73220204	156	73220266	156	73220348	158	73529xxx-8	610
71526xxx-E	611	73002734	447	73220205	156	73220267	156	73220349	158	73529xxx-8-E	610
71526xxx-R	611	73002736	447	73220206	156	73220268	156	73220350	158	73529xxx-8-R	610
71528xxx	611	73002738	447	73220207	156	73220269	156	73220351	158	73534xxx	611
71528xxx-E	611	73002740	447	73220208	156	73220270	156	73220352	158	73544xxx	611
71528xxx-R	611	73002742	447	73220209	156	73220271	156	73220353	158	74033000	445
71529xxx-16	611	73002744	447	73220210	156	73220272	156	73220354	158	74033001	445
71529xxx-16-E	611	73002746	447	73220211	156	73220273	156	73220355	158	74033100	445
71529xxx-16-R	611	73002760	447	73220212	156	73220274	156	73220356	158	74033101	445
72004000	448	73002762	447	73220213	156	73220275	156	73220357	158	74034000	445
72004100	448	73002764	447	73220214	156	73220276	156	73220358	158	74034001	445
72004200	448	73002766	447	73220215	156	73220277	156	73220359	158	74034100	445
720124	466	73002768	447	73220216	156	73220278	156	73220360	158	74034101	445
720124FX	465	73002770	447	73220217	156	73220279	156	73220361	158	74034500	445
720126	466	73008000	447	73220218	156	73220300	158	73220362	158	74034501	445
720126FX	465	73008500	447	73220219	156	73220301	158	73220363	158	7404044	102
720136	466	730124	466	73220220	156	73220302	158	73220364	158	7406044	102
720137FX	465	730126	466	73220221	156	73220303	158	73220365	158	7408044	102
720139	466	730136	466	73220222	156	73220304	158	73220366	158	7410044	102
720139FX	465	730146	466	73220223	156	73220305	158	73220367	158	7412044	102
720146	466	73018000	447	73220224	156	73220306	158	73220368	158	7412048	102
720149	466	73018500	447	73220225	156	73220307	158	73220369	158	7414044	102
720224	466	730224	466	73220226	156	73220308	158	73220370	158	7414048	102
720224FX	465	730226	466	73220227	156	73220309	158	73220371	158	7416048	102
720226	466	730236	466	73220228	156	73220310	158	73220372	158	74200600	447
720226FX	465	730246	466	73220229	156	73220311	158	73220373	158	74320320	615
720236	466	73028000	447	73220230	156	73220312	158	73220374	158	74320499	615
720237FX	465	73028500	447	73220231	156	73220313	158	73220375	158	74320540	615
720239	466	730336	466	73220232	156	73220314	158	73220376	158	74321272	615
720239FX	465	730346	466	73220233	156	73220315	158	73220377	158	74321426	615
720246	466	73220123	154	73220234	156	73220316	158	73220378	158	74322480	615
720249	466	73220124	154	73220235	156	73220317	158	73220379	158	74322629	615
720249FX	465	73220125	154	73220236	156	73220318	158	73501xxx	611	74323073	615
72400000	447	73220126	154	73220237	156	73220319	158	73502xxx	611	74323522	615
72401000	447	73220127	154	73220238	156	73220320	158	73503xxx	611	74323672	615
72401600	447	73220128	154	73220239	156	73220321	158	73505xxx	611	74505xxx	609
72402000	447	73220129	154	73220240	156	73220322	158	73506xxx	611	749550FX	465
72402600	447	73220130	154	73220241	156	73220323	158	73507xxx	611	746338	466
72403000	447	73220139	154	73220242	156	73220324	158	73513xxx	611	749538	466
72404000	447	73220140	154	73220243	156	73220325	158	73514xxx	611	75007710	445
72505xxx	609	73220141	154	73220244	156	73220326	158	73515xxx	611	75007810	445
72514xxx	609	73220142	154	73220245	156	73220327	158	73516xxx	611	75017400	445
72515xxx	609	73220143	154	73220246	156	73220328	158	73524xxx	610	75017500	445
72528xxx	611	73220144	154	73220247	156	73220329	158	73524xxx-E	610	75018010	451
72528xxx-E	611	73220145	154	73220248	156	73220330	158	73524xxx-R	610	75018110	451
72528xxx-R	611	73220146	154	73220249	156	73220331	158	73525xxx	611	75018310	445
73002700	447	73220147	154	73220250	156	73220332	158	73526xxx	610	756338	466
73002702	447	73220148	154	73220251	156	73220333	158	73526xxx-E	610	75914xxx	611
73002704	447	73220149	154	73220252	156	73220334	158	73526xxx-R	610	75925xxx	611
73002706	447	73220150	154	73220253	156	73220335	158	73527xxx	611	75926xxx	610
73002708	447	73220155	154	73220254	156	73220336	158	73528xxx	610	75926xxx-E	610
73002710	447	73220156	154	73220255	156	73220337	158	73528xxx-E	610	75926xxx-R	610
73002712	447	73220157	154	73220256	156	73220338	158	73528xxx-R	610	75927xxx	611
73002714	447	73220158	154	73220257	156	73220339	158	73529xxx-10	610	759538	466

Part numbers

7603000 to 8920054

76003000	442	79044400	382	79152800	397	811357	145	83254198	600	8718120	64
76004000	442	79050400	385	79154400	394	811358	145	83254199	600	8718120S	64
760204	101	79050600	385	79154600	394	812056	593	83254200	600	8718180	64
760404	101	79052400	385	79154800	394	812057	593	83254202	600	8718180S	64
760604	101	79052600	385	79160200	395	812058	593	83254210	599	8718250	64
760804	101	79054200	382	79160400	395	812984	103	83254211	599	8718250S	64
76083000	443	79054400	382	79161200	395	812985	103	83254212	599	8902044	66
76084000	443	79060200	383	79161400	395	812986	103	83254213	599	8904044	66
761004	101	79060400	383	79164200	395	812987	103	83254214	599	8906044	66
761204	101	79061200	383	79164400	395	812988	103	83254215	599	8906044S	66
76123000	443	79061400	383	79165200	395	812989	103	83254220	602	8908044	66
76123100	443	79061600	383	79165400	395	812990	103	83280048	601	8908044S	66
76124000	443	79064200	383	79178500	397	812991	103	83546xxx	609	8910044	66
76124100	443	79064400	383	79450000	416	83254101	599	83547xxx-10	609	8910044S	66
76133000	444	79064600	383	79450400	416	83254102	599	83547xxx-14	609	8912044	66
76134000	444	79065200	383	79455200	416	83254103	599	83547xxx-16	609	8912044S	66
761404	101	79065400	383	79455400	416	83254104	599	83547xxx-8	609	8912074	66
76143000	444	79085200	392	79456200	416	83254105	599	83549xxx-10	609	8912074S	66
76144000	444	79085400	392	79456400	416	83254106	602	83549xxx-14	609	8914044	66
76153000	444	79086200	392	79460200	415	83254120	600	83549xxx-16	609	8914044S	66
76154000	444	79086400	392	79460400	415	83254122	600	83549xxx-8	609	8914074	66
761604	101	79090200	393	79462200	415	83254150	600	83572xxx	609	8914074S	66
761804	101	79090400	393	79462400	415	83254151	600	83574xxx	609	8914184S	66
771004	103	79092200	390	79480200	418	83254152	600	83576xxx	609	8916034	66
771204	103	79092400	390	79480400	418	83254153	600	83577xxx-10	609	8916034S	66
771404	103	79094200	388	79485200	418	83254154	600	83577xxx-14	609	8916044	66
780104	104	79094400	388	79485400	418	83254155	600	83577xxx-16	609	8916044S	66
780204	104	79094600	388	79486400	418	83254156	600	83577xxx-8	609	8916054	66
780404	104	79100200	391	79490200	417	83254157	600	83579xxx-10	609	8916054S	66
780604	104	79100400	391	79490400	417	83254158	600	83579xxx-14	609	8916074	66
780804	104	79100800	391	79492200	417	83254159	600	83579xxx-16	609	8916074S	66
781004	104	79102200	391	79492400	417	83254160	600	83579xxx-8	609	8916124	66
781204	104	79102400	391	79506800	420	83254161	600	8710040	64	8916124S	66
781404	104	79102800	391	79520600	419	83254162	600	8710040S	64	8916184	66
79005200	380	79104200	388	811092	542	83254163	600	8712040	64	8916184S	66
79005400	380	79104400	388	811093	542	83254164	600	8712040S	64	8916254	66
79005600	380	79104800	388	811094	542	83254165	600	8714040	64	8916254S	66
79006200	380	79110200	389	811095	542	83254166	600	8714040S	64	8916344	66
79006400	380	79110400	389	811232	145	83254167	600	8714070	64	8916344S	66
79006600	380	79111200	389	811233	145	83254168	600	8714070S	64	8916504	66
79010200	381	79111400	389	811234	145	83254169	600	8716030	64	8918034	66
79015200	380	79114200	389	811235	145	83254170	600	8716030S	64	8918034S	66
79015400	380	79114400	389	811236	145	83254171	600	8716040	64	8918044	66
79015600	380	79115200	389	811237	145	83254172	600	8716040S	64	8918044S	66
79016200	380	79115400	389	811238	145	83254173	600	8716050	64	8918054	66
79016400	380	79128600	391	811239	145	83254174	600	8716050S	64	8918054S	66
79016600	380	79135200	398	811240	145	83254175	600	8716070	64	8918074	66
79020200	379	79135400	398	811259	145	83254179	600	8716070S	64	8918074S	66
79020400	379	79136200	398	811261	145	83254180	600	8716120	64	8918124	66
79022200	379	79136400	398	811262	145	83254181	600	8716120S	64	8918124S	66
79022400	379	79140400	399	811263	145	83254182	600	8716180	64	8918154	66
79035200	386	79140600	399	811264	145	83254183	600	8716180S	64	8918184	66
79035400	386	79142400	396	811266	145	83254184	600	8716250	64	8918184S	66
79036200	386	79142600	396	811267	145	83254185	600	8716250S	64	8918254	66
79036400	386	79144400	394	811269	145	83254186	600	8718030	64	8918254S	66
79040200	387	79144600	394	811270	145	83254189	600	8718030S	64	8918344	66
79040400	387	79144800	394	811271	145	83254191	600	8718040	64	8918344S	66
79040600	387	79150400	397	811272	145	83254192	600	8718040S	64	8920034	66
79042200	384	79150600	397	811273	145	83254193	600	8718050	64	8920034S	66
79042400	384	79150800	397	811274	145	83254194	600	8718050S	64	8920044	66
79042600	384	79152400	397	811279	145	83254195	600	8718070	64	8920044S	66
79044200	382	79152600	397	811280	145	83254196	600	8718070S	64	8920054	66

Part numbers

8920054S to DN4110096Fxx

8920054S	66	C5E003Fxx	621	C6A009Fxx	623	CPN007Sxx	625	DN4110029Sxx	635	DN4110064Sxx	635
8920074	66	C5E003Sxx	621	C6A009Sxx	623	CPN008Fxx	625	DN4110030Fxx	635	DN4110065Fxx	635
8920074S	66	C5E004Fxx	621	C6A010Fxx	623	CPN008Sxx	625	DN4110030Sxx	635	DN4110065Sxx	635
8920124	66	C5E004Sxx	621	C6A010Sxx	623	CPN009Fxx	625	DN4110031Fxx	635	DN4110066Fxx	635
8920124S	66	C5E005Fxx	621	C6A011Fxx	623	CPN009Sxx	625	DN4110031Sxx	635	DN4110066Sxx	635
8920254	66	C5E005Sxx	621	C6A011Sxx	623	CPN010Fxx	625	DN4110032Fxx	635	DN4110067Fxx	635
8920184S	66	C5E006Fxx	621	CC-1/2-BK	590	CPN010Sxx	625	DN4110032Sxx	635	DN4110067Sxx	635
8920254S	66	C5E006Sxx	621	CC-1/2-GY	590	CPN011Fxx	625	DN4110033Fxx	635	DN4110068Fxx	635
8920184	66	C5E007Fxx	621	CC-1/4-BK	590	CPN011Sxx	625	DN4110033Sxx	635	DN4110068Sxx	635
892203	222	C5E007Sxx	621	CC-1/4-GY	590	DN4110001Fxx	632	DN4110034Fxx	635	DN4110069Fxx	635
892205	222	C5E008Fxx	621	CC-1/8-BK	590	DN4110001Sxx	632	DN4110034Sxx	635	DN4110069Sxx	635
892207	222	C5E008Sxx	621	CC-1/8-GY	590	DN4110002Fxx	632	DN4110035Fxx	637	DN4110070Fxx	635
892210	222	C5E009Fxx	621	CC-1-1/2-BK	590	DN4110002Sxx	632	DN4110035Sxx	637	DN4110070Sxx	635
892214	222	C5E009Sxx	621	CC-1-1/2-GY	590	DN4110003Fxx	632	DN4110036Fxx	637	DN4110071Fxx	635
892218	222	C5E010Fxx	621	CC-1-1/4-BK	590	DN4110003Sxx	632	DN4110036Sxx	637	DN4110071Sxx	635
892225	222	C5E010Sxx	621	CC-1-1/4-GY	590	DN4110004Fxx	632	DN4110037Fxx	637	DN4110072Fxx	633
892405	222	C5E011Fxx	621	CC-1-BK	590	DN4110004Sxx	632	DN4110037Sxx	637	DN4110072Sxx	633
892407	222	C5E011Sxx	621	CC-1-GY	590	DN4110005Fxx	632	DN4110038Fxx	637	DN4110073Fxx	633
892410	222	C5E101Fxx	622	CC-3/4-BK	590	DN4110005Sxx	632	DN4110038Sxx	637	DN4110073Sxx	633
892414	222	C5E101Sxx	622	CC-3/4-GY	590	DN4110006Fxx	632	DN4110039Fxx	634	DN4110074Fxx	636
892425	222	C5E102Fxx	622	CC-3/8-BK	590	DN4110006Sxx	632	DN4110039Sxx	634	DN4110074Sxx	636
911264	195	C5E102Sxx	622	CC-3/8-GY	590	DN4110007	171	DN4110040Fxx	634	DN4110075Fxx	636
911370	541	C5E103Fxx	622	CCFR-1/2-BW	590	DN4110008Fxx	633	DN4110040Sxx	634	DN4110075Sxx	636
911371	541	C5E103Sxx	622	CCFR-1/2-WB	590	DN4110008Sxx	633	DN4110043	172	DN4110076Fxx	636
911372	541	C5E104Fxx	622	CCFR-1/4-BW	590	DN4110009Fxx	633	DN4110044	171	DN4110076Sxx	636
911373	541	C5E104Sxx	622	CCFR-1/4-WB	590	DN4110009Sxx	633	DN4110045	171	DN4110077Fxx	636
93542xxx	609	C5E105Fxx	622	CCFR-1/8-BW	590	DN4110010Fxx	633	DN4110046Fxx	637	DN4110077Sxx	636
93546xxx	609	C5E105Sxx	622	CCFR-1/8-WB	590	DN4110010Sxx	633	DN4110046Sxx	637	DN4110078Fxx	633
93547xxx-10	609	C5E106Fxx	622	CCFR-1-1/2-BW	590	DN4110011Fxx	633	DN4110047Fxx	637	DN4110078Sxx	633
93547xxx-14	609	C5E106Sxx	622	CCFR-1-1/2-WB	590	DN4110011Sxx	633	DN4110047Sxx	637	DN4110079Fxx	633
93547xxx-16	609	C5E107Fxx	622	CCFR-1-1/4-BW	590	DN4110012	172	DN4110048Fxx	637	DN4110079Sxx	633
93547xxx-8	609	C5E107Sxx	622	CCFR-1-1/4-WB	590	DN4110013	172	DN4110048Sxx	637	DN4110080Fxx	636
93549xxx-10	609	C5E108Fxx	622	CCFR-1-BW	590	DN4110014	172	DN4110049Fxx	637	DN4110080Sxx	636
93549xxx-14	609	C5E108Sxx	622	CCFR-1-WB	590	DN4110015Fxx	633	DN4110049Sxx	637	DN4110081Fxx	636
93549xxx-16	609	C5E109Fxx	622	CCFR-3/4-BW	590	DN4110015Sxx	633	DN4110050Fxx	637	DN4110081Sxx	636
93549xxx-8	609	C5E109Sxx	622	CCFR-3/4-WB	590	DN4110016Fxx	633	DN4110050Sxx	637	DN4110082Fxx	636
93572xxx	609	C5E110Fxx	622	CCFR-3/8-BW	590	DN4110016Sxx	633	DN4110051	172	DN4110082Sxx	636
93572xxx-E	609	C5E110Sxx	622	CCFR-3/8-WB	590	DN4110017Fxx	633	DN4110052Fxx	633	DN4110083Fxx	636
93574xxx	609	C5E111Fxx	622	CE5091	262	DN4110017Sxx	633	DN4110052Sxx	633	DN4110083Sxx	636
93576xxx	609	C5E111Sxx	622	CE5092	262	DN4110018Fxx	633	DN4110053Fxx	633	DN4110085Fxx	636
93576xxx-E	609	C5E200C	260	CE5093	262	DN4110018Sxx	633	DN4110053Sxx	633	DN4110085Sxx	636
93577xxx-10	609	C5E201C	260	CE6321	257	DN4110019Fxx	634	DN4110054Fxx	633	DN4110086Fxx	636
93577xxx-14	609	C5E202C	261	CE6323	257	DN4110019Sxx	634	DN4110054Sxx	633	DN4110086Sxx	636
93577xxx-16	609	C5E203C	261	CE6324	258	DN4110020Fxx	634	DN4110055Fxx	633	DN4110087Fxx	636
93577xxx-8	609	C5E204C	261	CE6326	369	DN4110020Sxx	634	DN4110055Sxx	633	DN4110087Sxx	636
93578xxx	609	C5E205C	261	CPN001F1	264	DN4110021Fxx	634	DN4110056Fxx	633	DN4110088Fxx	636
93579xxx-10	609	C6A001Fxx	623	CPN001F10	264	DN4110021Sxx	634	DN4110056Sxx	633	DN4110088Sxx	636
93579xxx-10-E	609	C6A001Sxx	623	CPN001F2	264	DN4110022Fxx	634	DN4110057Fxx	633	DN4110089Fxx	637
93579xxx-14	609	C6A002Fxx	623	CPN001F5	264	DN4110022Sxx	634	DN4110057Sxx	633	DN4110089Sxx	637
93579xxx-14-E	609	C6A002Sxx	623	CPN001Fxx	625	DN4110023Fxx	635	DN4110058Fxx	635	DN4110090Fxx	637
93579xxx-16	609	C6A003Fxx	623	CPN001Sxx	625	DN4110023Sxx	635	DN4110058Sxx	635	DN4110090Sxx	637
93579xxx-16E	609	C6A003Sxx	623	CPN002Fxx	625	DN4110024Fxx	635	DN4110059Fxx	635	DN4110091Fxx	636
93579xxx-8	609	C6A004Fxx	623	CPN002Sxx	625	DN4110024Sxx	635	DN4110059Sxx	635	DN4110091Sxx	636
93579xxx-8-E	609	C6A004Sxx	623	CPN003Fxx	625	DN4110025Fxx	635	DN4110060Fxx	635	DN4110092Fxx	636
C5E001F1	263	C6A005Fxx	623	CPN003Sxx	625	DN4110025Sxx	635	DN4110060Sxx	635	DN4110092Sxx	636
C5E001F10	263	C6A005Sxx	623	CPN004Fxx	625	DN4110026Fxx	635	DN4110061Fxx	635	DN4110093Fxx	636
C5E001F2	263	C6A006Fxx	623	CPN004Sxx	625	DN4110026Sxx	635	DN4110061Sxx	635	DN4110093Sxx	636
C5E001F5	263	C6A006Sxx	623	CPN005Fxx	625	DN4110027Fxx	635	DN4110062Fxx	635	DN4110094Fxx	636
C5E001Fxx	621	C6A007Fxx	623	CPN005Sxx	625	DN4110027Sxx	635	DN4110062Sxx	635	DN4110094Sxx	636
C5E001Sxx	621	C6A007Sxx	623	CPN006Fxx	625	DN4110028Fxx	635	DN4110063Fxx	635	DN4110095Fxx	637
C5E002Fxx	621	C6A008Fxx	623	CPN006Sxx	625	DN4110028Sxx	635	DN4110063Sxx	635	DN4110095Sxx	637
C5E002Sxx	621	C6A008Sxx	623	CPN007Fxx	625	DN4110029Fxx	635	DN4110064Fxx	635	DN4110096Fxx	637

Part numbers

DN4110096Sxx to SWFR-3/4

DN4110096Sxx 637
DN4110097Fxx 632
DN4110097Sxx 632
DN4110098Fxx 632
DN4110098Sxx 632
DN4110150 171
DN4110151 171
DN4110152 171
DN4110153 171
DN4110154 171
DN4110155 171
DN4110156 171
DN4110157 171
FW-1/2-BE 592
FW-1/2-BK 592
FW-1/2-GY 592
FW-1/2-WH 592
FW-1-1/4-BE 592
FW-1-1/4-BK 592
FW-1-1/4-GY 592
FW-1-1/4-WH 592
FW-2-BE 592
FW-2-BK 592
FW-2-GY 592
FW-2-WH 592
FW-3/4-BE 592
FW-3/4-BK 592
FW-3/4-GY 592
FW-3/4-WH 592
FWFR-1/2 592
FWFR-1-1/4 592
FWFR-2 592
FWFR-3/4 592
HBSH16 434
HBSH24 434
MP/F400 376
MP/F402 376
MP/M400 376
MP/M402 376
PB4110100Fxx 627
PB4110100Sxx 627
PB4110101Fxx 627
PB4110101Sxx 627
PB4110102Fxx 627
PB4110102Sxx 627
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PET-1-XX 591
PET-1-1/2-XX 591
PET-1-1/4-XX 591
PET-1-3/4-XX 591
PET-1/2-XX 591
PET-1/4-XX 591
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PET-2-XX 591
PET-2-1/2-XX 591
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PET-3/4-XX 591
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PETFR-3/8-XX 591
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S2713 503
S2716 503
S2721 503
SHG 0 434
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SHG 11 434
SHG 12 434
SHG 13 434
SHG 14 434
SHG 15 434
SHG 3 434
SHG 4 434
SHG 5 434
SHG 6 434
SHG 7 434
SHG 8 434
SHG 9 434
SW-1 592
SW-1/2 592
SW-1/4 592
SW-1/8 592
SW-1-1/2 592
SW-2 592
SW-3/4 592
SWFR-1 592
SWFR-1/2 592
SWFR-1/4 592
SWFR-1/8 592
SWFR-1-1/2 592
SWFR-2 592
SWFR-3/4 592

Metric conversion

Length			
millimeter (mm)	= inch × 25.4	**inch (in)**	= millimeter × 0.039
meter (m)	= foot × 0.305	**foot (ft)**	= meter × 3.281
kilometer (km)	= mile × 1.609	**mile (mi)**	= kilometer × 0.621
Ω/km	= Ω/mft × 0.305	**Ω/mft**	= Ω/km × 3.281

Mass			
gram (g)	= ounce × 28.35	**ounce (oz)**	= gram × 0.035
kilogram (kg)	= pound × 0.454	**pound (lb)**	= kilogram × 2.205
kg/km	= lb/mft × 1.488	**lb/mft**	= kg/km × 0.672

Area			
sq. centimeter (cm²)	= sq. inch × 6.452	**sq. inch (in²)**	= sq. centimeter × 0.155
sq. meter (m²)	= sq. foot × 0.093	**sq. foot (ft²)**	= sq. meter × 10.76
sq. kilometer (km²)	= sq. mile × 2.590	**sq. mile (mi²)**	= sq. kilometer × 0.386
circular mil	= square mil × 1.273	**square mil**	= circular mil × 0.785
mm² = (strand mm)² × (# strands) × 0.785			

Temperature			
degrees Celsius	= (°F - 32) x 0.556	**degrees Fahrenheit**	= °C × 1.8 + 32

Wire size conversion

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)

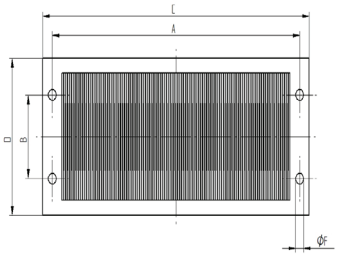
mm²	AWG	mm²	AWG
0.14	26	4	12
0.25	24	6	10
0.34	22	10	8
0.50	20	16	6
0.75	19	25	4
1.0	18	35	2, 1
1.5	16	50	1/0
2.5	14	70	2/0, 3/0

Exact correspondences between AWG and mm² do not exist. These conversions are approximations to facilitate comparison.
For the most accurate cross section, see the specific cable catalog page.

Notes

SKINTOP® BRUSH ADD-ON 24

EMC fitting for multi-cable bushing systems



Complete the installation

Rectangular hole punch
page 430

SKINTOP® MULTI
page 507

The SKINTOP® BRUSH ADD-ON 24 is an optimal, low impedance screen contacts for the SKINTOP® multiple cable entry. The brush layout allows you to get a reliable and permanent contact after you insert cable.

Technical data

Material:

- frame:	aluminum
- contact brush:	brass
- distance sleeves:	aluminum
- screws, nuts & washers:	nickel-plated steel

Temperature range: -20°C to 110°C

Application advantage

- Faster, easier shield contact
- Optimum EMC protection
- Quicker installation and EMC contacting compared with other systems
- Usable with different cable diameters at the same time

Approvals

CE

Part number	A		B		C		D		E		F	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
52220089	5.118	130	1.260	32	5.512	140	2.362	60	0.256	6.5	0.165	4.2

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® SERVO FD 7FTC

Continuous flex encoder/feedback cable

ÖLFLEX® SERVO FD 7FTC is an encoder cable for use with servo motors. Continuous flex and oil resistant cable suitable for mounting from cable track to tray. Low capacitance insulation ideal for long cable runs. Many popular configurations available, including for Rockwell and Siemens servo drives.

Recommended applications

Connecting cable between servo controller and encoder/resolver; connecting cable between servo controller and motor via cable chains. Cable used in machine parts, transfer lines, and production lines.

Approvals

Continuous Flex Test Method Verified
verifyUL.com A522492

Construction

Conductors: finely stranded tinned copper
Pairs: twisted and bundled; shielded (see chart)
Insulation: XLPE (Plus)
Shielding: tinned copper braid (85% coverage)
Jacket: specially formulated thermoplastic elastomer (TPE); green, orange

Application advantage

- One cable solution, from tray to track
- Low capacitance insulation for improved signal transmission over long distances
- Resistant to wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure.

Cable attributes		page 648		
OIL	OR-03	FLAME	FR-03
MOTION	CF-02*	MECH.	MP-03

Complete the installation

EPIC® SIGNAL M23
page 446

ÖLFLEX® SERVO FD 7TCE
page 111

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT SERVO
page 607

Technical data

Minimum bend radius:
- for continuous flexing: 10 x cable diameter

Temperature range:
- for stationary use: -40°C to +90°C
- for continuous flexing: -25°C to +90°C

Nominal voltage: UL/CSA: 300V; UL/CSA AWM: 1000V

Test voltage: 2000V

Conductor stranding: fine wire

Color code: see color chart next page

Approvals:
UL: AWM 22022 per UL 758
PLTC per UL 13 (22AWG to 16AWG only)
ITC per UL2250 (22AWG to 16AWG only)
CMG per UL 444
cRU: AWM II A/B FT4 per CSA C22.2 No210
c(UL): CMG per CSA C22.2 No214
Additional: NEC articles 725, 727, and 800
NFPA 79
RoHS directive
*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction: conductors		Construction: pairs	Jacket color	Approvals	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft	EPIC® SIGNAL M23 # of contacts
1034110			16 AWG/1pr + 26 AWG/6pr + 22AWG/1pr	green	CMG, AWM	0.434	11.0	51	94	16
1034111			22 AWG/5pr	green	PLTC, ITC, CMG, AWM	0.368	9.3	40	80	12
1034112	20 AWG/2c	+	24 AWG/4pr	orange	CMG, AWM	0.324	8.2	32	60	12
1034113	20 AWG/4c	+	22 AWG/4pr	green	PLTC, ITC, CMG, AWM	0.400	10.2	50	94	12
1034114	20 AWG/2c + 26 AWG/4c	+	3 x (26AWG/1pr)	green	CMG, AWM	0.355	9.0	43	80	12
1034115			18 AWG/1pr + 24 AWG/4pr	orange	CMG, AWM	0.344	8.7	39	74	12
1034116	20 AWG/2c + 26AWG/4c 24 AWG/4c	+	3 x (26AWG/1pr)	green	CMG, AWM	0.367	9.3	47	87	16
1034117	20 AWG/2c	+	24 AWG/2pr	green	CMG, AWM	0.274	7.0	24	47	12
1034118	(18 AWG/2c)	+	4 x (26 AWG/1pr)	green	CMG, AWM	0.383	9.7	56	94	12
1034119	18 AWG/4c + (26AWG/4c)	+	26 AWG/4pr	orange	CMG, AWM	0.405	10.3	61	100	16
1034120	20 AWG/5c	+	26 AWG/2pr	green	CMG, AWM	0.308	7.8	42	67	9
1034121	20 AWG/9c			green	PLTC, ITC, CMG, AWM	0.393	10.0	61	100	9
1034122	2 x (20 AWG/1C)	+	3 x (26AWG/1PR)	green	CMG, AWM	0.342	8.7	40	73	9

( ) = foil and tinned copper spiral shield (90% coverage)
All designs have an overall tinned copper Braid Shield (85% coverage)

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the pro

ÖLFLEX® SERVO FD 7FTC

color code chart

Part number	Conductors color codes		Pairs color codes	
1034110			26 AWG, 6pr	blue & white/blue • black & white/black red & white/red • green & white/green • brown & white/brown • yellow & white/yellow
			16 AWG, 1pr	gray & white/gray
			22 AWG, 1pr	orange & white/orange
1034111			22 AWG 5 pr	red & red/white • gray & gray/white • black & black/white • green & green/white • orange & orange/white
1034112	20 AWG 2c	white/brown	24 AWG 4pr	brown & green • gray & pink • blue & violet • red & black
1034113	20 AWG 4c	blue/white • black/white • red/white • yellow/white	22 AWG 4pr	brown & black • red & orange • yellow & green, blue & violet
1034114	20 AWG 2c	brown/red • brown/blue		
	26 AWG 4c	gray, blue, white/yellow, white/black	3x (26 AWG 1pr)	yellow & green, black & brown, red & orange
1034115			24 AWG 4pr	brown & green • gray & pink • blue & violet • red & black
			18 AWG 1pr	white • brown
1034116	20 AWG 2c	brown/red • brown/blue	3x (26 AWG 1pr)	yellow & green • black & brown, red & orange
	24 AWG 4c	brown/yellow • brown/gray • green/black • green/red		
	26 AWG 4c	gray • blue • white/yellow • white/black		
1034117	20 AWG 2c	white • brown	24 AWG 2pr	red & black • gray & pink
1034118	(18 AWG 2c)	white • black	4x (26 AWG 1pr)	black & yellow • black & green • black & red • black & blue
1034119	18 AWG 4c	white • brown/green • white/green • blue	26 AWG 4pr	red & black • brown & green • yellow & violet • gray & pink
	(26 AWG 4c)	yellow/black • blue/black • green/black • red/black		
1034120	20 AWG 5c	yellow • green • gray • pink • blue	26 AWG 2pr	brown & white • black & violet
1034121	20 AWG 9c	white • blue • pink • green • yellow • brown • • red • black • gray		
1034122	2 x (20 AWG 1c)	white • brown	3 x (26 AWG 1pr)	yellow & green • red & blue • gray & pink

ÖLFLEX® VFD 1XL

Flexible VFD cable; 600V/1000V; UL TC-ER & c(UL) CIC approval

ÖLFLEX® VFD 1XL is a robust oil- and UV-resistant shielded motor cable for VFD drives. Enhanced electrical properties of XLPE insulation provide problem-free performance where precision control is critical. The new leaner design enables reduced cable diameters and increases flexibility. UL TC-ER rating allows for installation without conduit.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications.

Approvals

c UL us · c TÜV us · FIRE PROTECTION · CE · RoHS · Continuous Flex Test Method Verified UL VERIFIED verifyUL.com A522492

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	CF-01*	MECH.	MP-03

Construction

Conductors: tinned copper fine wire

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage); tinned copper drain wire

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- Low capacitance design
- UL TC-ER & c(UL) CIC/TC approved
- Industrial grade phthalate-free jacket design for harsh environments
- Reduces space and weight in tray
- No conduit required due to TC-ER rating
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Complete the installation

SKINTOP® MS-M BRUSH
page 725

EPIC® ULTRA HB
page 407

Technical data

Minimum bend radius:
for continuous flexing: 15 x OD
for installation: 7.5 x OD

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

Nominal voltage:
- UL TC: 600V
- UL Flexible Motor Supply: 1000V
- UL/CSA AWM: 1000V

Test voltage:
- 16 AWG - 10 AWG: 3000V
- 8 AWG - 4 AWG: 3500V
- 2 AWG: 4000V

Conductor stranding:
- 16 AWG - 2 AWG: Class K

Color code: black with white numbers, plus green/yellow ground

Approvals:

UL:	TC-ER per UL 1277 Flexible Motor Supply Cable per UL 2277 AWM 22022 per UL 758
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
NEC:	Class 1 Division 2 per NEC Article 501
Canada:	c(UL) CIC FT4 cRU AWM II A/B FT4
Additional:	RoHS II Meets XHHW-2 performance requirements per UL 44
*UL Verified ID A522492:	Continuous Flex Test Method Verified

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.5 mm²)							
701700	4 + drain	0.374	9.5	57.5	108	53112630	53112676
14 AWG (2.5 mm²)							
701701	4 + drain	0.410	10.4	81.8	137	53112630	53112676
12 AWG (4 mm²)							
701702	4 + drain	0.464	11.8	121.7	188	53112640	53112676
10 AWG (6 mm²)							
701703	4 + drain	0.504	12.8	184.1	268	53112640	53112676

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (10 mm²)							
701704	4 + drain	0.706	17.9	301.9	448	53112650	53112677
6 AWG (16 mm²)							
701705	4 + drain	0.915	23.2	440.7	687	53110660	53112678
4 AWG (21 mm²)							
701706	4 + drain	1.051	26.7	633.5	969	53112660	53112678
2 AWG (33.7 mm²)							
701707	4 + drain	1.223	31.1	995.5	1410	53112670	53112679

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® VFD 1XL with Signal

Flexible VFD cable; 600V/1000V; UL TC-ER & c(UL) CIC approval

ÖLFLEX® VFD 1XL w/Signal is a robust oil- and UV-resistant shielded motor cable for VFD drives. Enhanced electrical properties of XLPE insulation provide problem-free performance where precision control is critical. The new leaner design enables reduced cable diameters and increases flexibility. UL TC-ER rating allows for installation without conduit.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications.

Approvals

c UL us | c TÜV us | FIRE PROTECTION | CE | RoHS

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-02	MECH.	MP-03

Construction

Conductors: tinned copper fine wire

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage); tinned copper drain wire

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- One cable for applications
- Low capacitance design
- UL TC-ER & c(UL) CIC approved
- Industrial grade phthalate-free jacket design for harsh environments
- Reduces space and weight in tray
- No conduit required due to TC-ER rating
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Complete the installation	
SKINTOP® MS-M BRUSH page 524	EPIC® ULTRA HB page 407

Technical data

Minimum bend radius:
for installation: 7.5 x OD

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

Nominal voltage:
- UL TC: 600V
- UL Flexible Motor Supply: 1000V
- UL/CSA AWM: 1000V

Test voltage:
- 18 AWG - 10 AWG: 3000V
- 8 AWG - 4 AWG: 3500V
- 2 AWG: 4000V

Conductor stranding:
- 16 AWG - 2 AWG: Class K

Color code:
black with white numbers, plus green/yellow ground
1-pair: black with white numbers

Approvals:
UL: TC-ER per UL 1277
Flexible Motor Supply Cable per UL 2277
AWM 22022 per UL 758
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
NEC: Class 1 Division 2 per NEC Article 501
Canada: c(UL) CIC FT4
cRU AWM II A/B FT4
Additional: NFPA 79
RoHS II
Meets XHHW-2 performance requirements per UL 44

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.5 mm²)							
701710	4 + (18 AWG)	0.446	11.3	72.1	137	53112630	53112676
14 AWG (2.5 mm²)							
701711	4 + (18 AWG)	0.486	12.3	93.4	166	53112630	53112676
12 AWG (4 mm²)							
701712	4 + (18 AWG)	0.533	13.5	129.1	210	53112640	53112676
10 AWG (6 mm²)							
701713	4 + (18 AWG)	0.593	15.1	179.1	289	53112650	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (10 mm²)							
701714	4 + (14 AWG)	0.767	19.5	292.5	448	53112650	53112677
6 AWG (16 mm²)							
701715	4 + (14 AWG)	0.958	24.3	442.9	694	53112660	53112678
4 AWG (21.0 mm²)							
701716	4 + (14 AWG)	1.079	27.4	652.1	976	53112660	53112678
2 AWG (33.7 mm²)							
701717	4 (14 AWG)	1.234	31.3	1008.6	1483	53112670	53112679

ECOLAB® is a registered trademark of Ecolab, Inc.
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If not otherwise specified, all values relating to the product a entations of the products in question.

ETHERLINE® TRAY CAT.7; stationary

Tray-rated Industrial Ethernet cable for stationary applications

ETHERLINE® TRAY CAT.7 is designed for stationary applications with performance and maximum transfer rate (IEEE 802.3) of 10 GBit/s up to 328 feet. Pairs are individually foil shielded with and overall braid shield; offering excellent shielding properties based on IEC 61156-5 and can be used in areas where reliable transmission is key including EtherNet/IP, Profinet with 4 pairs, EtherCAT, Power over Ethernet (IEEE 802.3af) and Power over Ethernet Plus (802.3at).

Construction

Conductors: solid strand bare copper

Pairs: 4 twisted pairs individually shielded

Insulation: foam polyethylene insulation

Shielding: overall tinned copper braid

Jacket: Specially formulated PVC; green

Recommended applications

Stationary applications, cable trays, industrial machinery, commercial and plant infrastructure

Application advantage

- Wide application range due to multiple certifications
- PLTC (Power Limited Tray Cable) for use in cable trays
- Suitable for EtherNet/IP applications
- Suitable for PoE per IEEE 802.3af and 802.3at
- Sunlight resistant
- **Meets or exceeds requirements for Cat.6A per ANSI/TIA 568.2-D**

Approvals

c UL us | RoHS | EtherCAT Technology Group | EtherNet/IP

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-01	MECH.	MP-02

Complete the installation

SKINTOP® MS-SC
page 522

RJ45 CAT.6A connectors
page 258

ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES
page 605

Technical data

Minimum bend radius:
- for stationary use: 10 x cable diameter
- for flexible use: 15 x cable diameter

Temperature range:
- for stationary use: -40°C to +80°C
- for flexible use: -20°C to +80°C

Nominal voltage: (not for power applications)
UL/CSA 300V
UL/CSA AWM 600V

Test voltage: 1500V

Characteristic impedance: 100Ω ± 15Ω (1 – 100 MHz)

Color code: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

Approvals:
UL: CMG per UL 444
PLTC per UL 13
AWM 21695 per UL 758
NEC: Class 1 Division 2 per NEC Article 501
Canada: c(UL) CMG per CSA C22.2 No. 214
Additional: cRU AWM II A/B FT4 per CSA C22.2 No 210

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	RJ45 Connector
CAT.7										
2170472	22 AWG/4pr	solid	PVC	green	UL CMG, UL AWM 600V, PLTC	yes	0.350	8.9	77	21700636

Max cable run: 328 ft (100 m)

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values.
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SKINTOP® MULTI-M

Cable bushing system with metric thread

SKINTOP® MULTI-M provides IP68 protection in a round multi-cable bushing system with metric connection thread. Its compact design allows a space-saving feed-through of unassembled cables. Highly elastic gel technology makes pre-puncturing unnecessary, and keeps unused entry points securely sealed to prevent entry of external elements. Large variable clamping range allows greater flexibility.

Application advantage

- Large variable clamping range due to innovative elastic gel membrane technology
- Optimum strain relief of the entire cable bundle
- Easy installation of cables even for high packing density
- UV, ozone, and oil resistant

Recommended applications

Control systems, control cabinets, and equipment - areas where many cables and wires need to be inserted into housing or panel; with minimum space available for cables and media conduits.

Approvals

c UL us CE

Technical data

Material:
- shell: polycarbonate (PC)
- seal: gel
- O-ring NBR

Color: black

Temperature range:
with O-Ring -20°C to +100°C (UL: 50°C)
without O-Ring -30°C to +110°C (UL: +50°C)

Protection: IP66, IP67, and IP68 (0,1 bar / 60min) in acc. to EN 60529
Type Rating 1,5 (Indoor) in acc. to UL50 E

Part number	Part name	Thread size	Number of entries	Number of cable x cable-ø
52220140	SKINTOP® MULTI-M25	M25	4	4x ø2-6mm
52220146	SKINTOP® MULTI-M32	M32	8	8x ø2-6mm
52220110	SKINTOP® MULTI-M40	M40	12	2x ø1-4mm; 10x ø2-6mm
52220111	SKINTOP® MULTI-M50	M50	18	18x ø2-6mm
52220112	SKINTOP® MULTI-M63	M63	30	30x ø2-6mm

If not otherwise specified, all values relating to the product are nominal values.
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ÖLFLEX® HEAT 260 SC

Highly flame retardant, high temperature single conductor cable

ÖLFLEX® HEAT 260 SC is a heat-resistant single conductor, insulated with a Polytetraflouroethylene compound with excellent fire and chemcial resistance characteristics and a very wide temperature range.

Recommended applications

For use in high temperature environments, heavy chemical usage, furnaces and brickworks, heating equipment, and control cabinets with high heat.

Approvals

Cable attributes			page 648
OIL	OR-01	FLAME	FR-03
MOTION	FL-01	MECH.	MP-01

Construction

Conductors: silver plated copper conductor

Insulation: Polytetraflouroethylene (PTFE)

Application advantage

- Highly flame retardant
- Outstanding resistance against chemicals
- Extreme low temperature rating of -190°C

Technical data

Minimum bend radius: 4 x cable diameter

Temperature range:

Fixed installation	-190°C to +260°C
- UL/CSA	up to +200°C

Nominal voltage:

UO/U	300/500V
- UL/CSA	600V

Test voltage: UL: 2000V

Conductor stranding: AWG conductor sizes 7, 19, or 37. Stranding varies depending on cross section

Color code:

000:	green/yellow	007:	violet
001:	black	009:	orange
002:	blue	104:	red
003:	brown	105:	white
005:	yellow	106:	grey
006:	green	114:	dark blue

Approvals: CE & RoHS
UL AWM Style 11486 (28-12 AWG)
cRU AWM I A/B

Part number (strands)	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
28 AWG (7)				
0094..	0.035	0.9	0.6	1.3
26 AWG (7)				
0095..	0.039	1.0	0.9	1.8
26 AWG (19)				
0096..	0.039	1.0	1.0	1.9
24 AWG (7)				
0097..	0.045	1.15	1.5	2.6
24 AWG (19)				
0098..	0.045	1.15	1.5	2.7
22 AWG (7)				
0099..	0.051	1.3	2.3	3.6
22 AWG (19)				
0100..	0.051	1.3	2.5	3.8
20 AWG (7)				
0101..	0.059	1.5	3.6	5.2

Part number (strands)	Nominal outer diameter in	Nominal outer diameter mm	Copper weight lbs/mft	Approx. weight lbs/mft
20 AWG (19)				
0102..	0.059	1.5	3.9	5.5
18 AWG (7)				
0103..	0.068	1.75	5.8	8.1
18 AWG (19)				
0104..	0.068	1.75	6.2	8.1
16 AWG (19)				
0105..	0.081	2.05	7.9	10.8
14 AWG (19)				
0106..	0.096	2.45	12.6	15.5
12 AWG (19)				
0107..	0.122	3.1	19.9	23.5
10 AWG (37)				
0108..	0.133	3.4	30.6	34.3

For LAPP part number, add the three digit color code (see above) to the part number in the table, e.g.: 16 AWG green = 0105006
Available in 100M putups only.
Some sizes/colors are subject to minimum order quantities.
Not all cable sizes are available in all colors.

If not otherwise specified, all values relating to the product are nominal values.
Photographs are not to scale and are not true representations of the products in question.

ETHERLINE® GUARD

Device for monitoring cable status

21700150
Wired

21700151
Wireless

ETHERLINE® GUARD evaluates the current performance of a data cable and specifies it as a percentage from installation. This allows for the real time status to be displayed and the wear limit of a cable to be detected for optimum planning of replacement.

Application advantage

Increase system visability and capability to plan downtimes for reduced maintenance costs.

Plug & Play solution for both new and existing networks that does not require a new data line or changes to the cable design.

Reliable IIoT communications thanks to the MQTT interface (for status / data evaluation, settings, WLAN configuration, updates, etc.)

Compact design ideal for use in control cabinet.

Recommended applications

For monitoring the service life of a data cable at risk of failure (e.g. function-critical data cable in dynamic applications)

Suitable for data cables according to transmision standard 100BASE-TX (with 100 Mbit/s) according to IEEE 802.3.

Also suitable for EtherCAT, EtherNET/IP and 2-pair PROFINET applications.

Technical data

Classification ETIM 5/6: ETIM 5.0/6.0 Class-ID: EC000734
ETIM 5/0/6.0 Class-Description: Network switch

Power supply: DC 24 V (18-30 V DC)

Protection: IP20

Temperature range: -40°C to +65°C

Part number	Construction	Construction	Approvals
21700150	ETHERLINE® GUARD PM03T	Wired LAN	ETIM 5/6
21700151	ETHERLINE® GUARD PM02TWA	Wireless WLAN	ETIM 5/6

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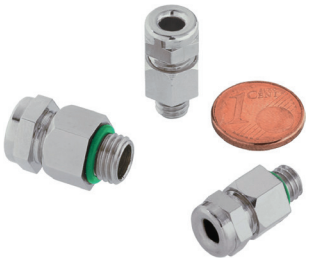
SKINDICHT® MINI NBR / MINI FKM / MINI COLD

NBR



FKM

COLD

SKINDICHT® MINI is a nickel-plated cable gland for the smallest conductor sizes. This cable gland features a low profile design, making it ideal for use wherever there is limited assembly space. These cable glands are also well suited for applications with sensors, and measurement and control devices.

Approvals

CE RoHS

Technical data

Material:
SKINDICHT® MINI NBR
- Body: Nickel-plated brass
- Sealing: CR/NBR

SKINDICHT® MINI FKM
- Body: nickel-plated brass
- Sealing: FKM

SKINDICHT® MINI COLD
- Body: Nickel-plated brass
- Sealing: Silicone

Protection:
IP66
IP68, 5 bar

Temperature range:
SKINDICHT® MINI NBR
-20°C to +100°C
SKINDICHT® MINI FKM
-20°C to +200°C
SKINDICHT® MINI COLD
-60°C to +100°C

Application advantage

- High degree of ingress protection
- High packing density for the smallest coductor sizes
- Low profile
- Gentle cable clamping

Product features

SKINDICHT® MINI NBR
- Suitable for use in oily surroundings

SKINDICHT® MINI FKM
- Suitable for high temperature and aggressive media surroundings

SKINDICHT® MINI COLD
- Suitable for extreme low temperatures

Part number	Thread	Clamping range (øF) in	Clamping range (øF) mm	Wrenching flats (SW) in	Overall length (C) in	Thread length (D) in	Pack size
SKINDICHT® MINI NBR							
52001860	M 6 x 1	0.078 - 0.118	2 - 3	0.354	0.775	0.196	50
52001880	M 8 x 1	0.137 - 0.196	3.5 - 5	0.433	0.807	0.196	50
52001895	M 10 x1	0.216 - 0.275	5.5 - 7	0.551	0.551	0.196	50
SKINDICHT® MINI FKM							
52001889	M 6 x 1	0.078 - 0.118	2 - 3	0.354	0.775	0.196	50
52001887	M 8 x 1	0.137 - 0.196	3.5 - 5	0.433	0.807	0.196	50
52001894	M 10 x 1	0.216 - 0.275	5.5 - 7	0.551	0.551	0.196	50
SKINDICHT® MINI COLD							
520018774	M 6 x 1	0.078 - 0.118	2 - 3	0.354	0.775	0.196	50
52001878	M 8 x 1	0.276 - 0.394	3.5 - 5	0.433	0.807	0.196	50
52001879	M 10 x 1	0.216 - 0.275	5.5 - 7	0.551	0.551	0.196	50

If not otherwise specified, all values relating to the product are nominal values.
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Industrial Ethernet cable assemblies

Technical data

Material:
- contact carrier:
  - RJ45: polymid
  - M12: polyurethane
- molded head:
  - RJ45: polyurethane; black
  - M12: polyurethane; black
- contacts:
  - RJ45: gold-plated brass
  - M12: gold-plated bronze
- coupling nut: nickel-plated zinc
- shield: foil & tinned copper braid
- outer jacket: polyurethane
- conductor insulation: see specific catalog page

Temperature range: see specific catalog page

Rated voltage: 50V
- cable: see specific catalog page

Rated current: 1.5A

Protection class:
- RJ45: IP20 NEMA 1
- M12: IP67

Standard cable lengths in meters: **1, 2, 3, 5, 10**

Connector 1	Coding	Cable	Connector 2	Coding	Assembly UL	LAPP part number
2 Pair PROFINET CAT.5						
M12/4pos/Male/Shielded	D	2170894	RJ45		UL Listed	CPN008Fxx
RJ45			RJ45		UL Listed	CPN001Fxx
M12/4pos/Male/Shielded	D		M12/4pos/Female/Shielded	D	UL Listed	CPN007Fxx
2 Pair CAT.5e						
M12/4pos/Male/Shielded	D	2170289	RJ45		UL Recognized	C5E108Fxx
RJ45			RJ45		UL Recognized	C5E101Fxx
M12/4pos/Male/Shielded	D		M12/4pos/Female/Shielded	D	UL Recognized	C5E107Fxx

For part number, replace “xx” with the desired cable length in meters

Standard cable lengths in meters: **1, 2, 3, 5, 10**

Connector 1	Coding	Cable	Connector 2	Coding	Assembly UL	LAPP part number
4 Pair CAT.5e						
M12/8pos/Male/Shielded	A	2170489	RJ45		UL Recognized	C5E008Fxx
RJ45			RJ45		UL Recognized	C5E001Fxx
M12/8pos/Male/Shielded	A		M12/8pos/Female/Shielded	A	UL Recognized	C5E007Fxx
4 Pair CAT.7						
RJ45		2170934	RJ45		UL Recognized	C6A001Sxx

For part number, replace “xx” with the desired cable length in meters

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

Sensor/Actuator cable assemblies

Technical data

Material:
- contact carrier:
  - M8: polyurethane
  - M12: polyurethane
- molded head:
  - M8: polyurethane; black
  - M12: polyurethane; black
- contacts: gold-plated bronze
- coupling nut: nickel-plated zinc
- outer jacket: polyurethane
- conductor insulation: polypropylene

Temperature range: see specific catalog page

Rated voltage:
- M8: 60V
- M12: 250V
- cable: see specific catalog page

Rated current: 4.0A

Number of conductors:
- M12 D-code/RJ45 shielded: 26 - 22 AWG/2pr, stranded or solid
- M12 8-pos. & RJ45S: 26 - 22 AWG/4pr, stranded or solid

Protection class:
- M8: IP67/IP69K
- RJ45: IP68/IP69K

Standard cable lengths in meters: **1, 2, 3, 5, 10**

Connector 1	Coding	Cable	Connector 2	Coding	Assembly UL	LAPP part number
4 Wire Sensor/Actuator - M12						
M12/4pos/Male	A	7038865	Open		UL Listed	SA-M124003Fxx
M12/4pos/Male	A		M12/4pos/Female	A	UL Listed	SA-M124007Fxx
M12/4pos/Male	A		M12/4pos/Male	A	UL Listed	SA-M124005Fxx
4 Wire Sensor/Actuator - M8						
M8/4pos/Male	A	7038865	Open		UL Listed	SAM804003Fxx
M8/4pos/Male	A		M8/4pos/Female	A	UL Listed	SAM804007Fxx
M8/4pos/Male	A		M8/4pos/Male	A	UL Listed	SAM804005Fxx

For part number, replace “xx” with the desired cable length in meters

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DeviceNet™ cable assemblies

connector 1		UNITRONIC® DeviceNet™	connector 2	
M 12, male straight connector			Open	
M 12, male straight connector				M12, female straight connector
7/8” 5Pos male connector			Open	
7/8” 5Pos male connector				7/8” 5Pos female connector

Technical data

Material:

- contact carrier:	
- 7/8”:	polyurethane
- M12:	polyurethane
- molded head:	
- 7/8”:	polyurethane; black
- M12:	polyurethane; black
- contacts:	gold-plated bronze
- coupling nut:	nickel-plated zinc
- shield:	foil & tinned copper braid
- outer jacket:	polyurethane
- conductor insulation:	polyolefin

Temperature range:	see specific catalog page
Rated voltage:	60V
- cable:	See specific catalog page
Rated current:	4.0A
Protection class:	IP67/IP68

Standard cable lengths in meters: **1, 2, 3, 5, 10**

Connector 1	Coding	Cable	Connector 2	Coding	Assembly UL	LAPP part number
DeviceNet™						
M12/5pos/Male	A	2170345	Open		UL Listed	DN4110019Fxx
M12/5pos/Male	A		M12/5pos/Female	A	UL Listed	DN4110023Fxx
7/8”/5pos/Male		2170344	Open		UL Listed	DN4110001Fxx
7/8”/5pos/Male			7/8” / 5pos/Female		UL Listed	DN4110008Fxx

For part number, replace “xx” with the desired cable length in meters

ÖLFLEX® VFD 1XLC

Flexible VFD cable; 600V/1000V; c(UL) CIC/TC-ER approval

ÖLFLEX® VFD 1XLC is designed to meet Canadian standards. A robust oil- and UV-resistant shielded motor cable for VFD drives. c(UL) CIC/TC-ER rating allows for installation in exposed areas without conduit where TECK 90 cable can be used. Enhanced electrical properties of XLPE insulation provide problem-free performance where precision control is critical.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications.

Approvals

c UL us c UL us FIRE PROTECTION CE ECOLAB®

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-02*	MECH.	MP-03

Construction

Conductors: tinned copper fine wire

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage); tinned copper drain wire

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- Low capacitance design
- c(UL) CIC/TC-ER approved
- Industrial grade phthalate-free jacket design for harsh environments
- Reduces space and weight in tray
- No conduit required due to TC-ER rating
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Complete the installation

SKINTOP® MS-M BRUSH
page 524

EPIC® ULTRA HB
page 407

Technical data

Minimum bend radius:
for installation: 7.5 x OD

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

Nominal voltage:
- UL/CSA TC 600V
- UL Flexible Motor Supply: 1000V
- UL/CSA AWM: 1000V
- – c(UL) CIC/TC: 600V

Test voltage:
- 16 AWG - 10 AWG: 3000V
- 8 AWG - 4 AWG: 3500V
- 2 AWG: 4000V

Conductor stranding:
- 16 AWG - 2 AWG Class K

Color code: black with white numbers, plus green/yellow ground

Approvals:
Canada: c(UL) CIC/TC-ER
cRU AWM II A/B FT4
UL: TC-ER per UL 1277
Flexible Motor Supply Cable per UL 2277
AWM 22022 per UL 758
Attributes: UL Oil Res I/II
XHHW-2 90°C wet or dry
-40°C cold bend; -25°C cold impact
sunlight resistant
direct burial
NFPA 79
NEC: Class 1 Division 2 per NEC Article 501
Additional: RoHS II

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.3 mm²)							
701900	4 + drain	0.419	10.9	62.8	126	53112630	53112676
14 AWG (2.1 mm²)							
701901	4 + drain	0.470	11.8	86.3	158	53112630	53112676
12 AWG (3.3 mm²)							
701902	4 + drain	0.504	13.1	127.7	211	53112640	53112676
10 AWG (5.3 mm²)							
701903	4 + drain	0.625	14.8	186.0	293	53112640	53112676

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (8.5 mm²)							
701904	4 + drain	0.781	19.8	310.6	479	53112650	53112677
6 AWG (13.5 mm²)							
701905	4 + drain	0.942	23.9	447.0	707	53110660	53112678
4 AWG (21.0 mm²)							
701906	4 + drain	1.077	27.3	646.7	991	53112660	53112678
2 AWG (33.7 mm²)							
701907	4 + drain	1.251	31.8	1012.5	1428	53112670	53112679

ECOLAB® is a registered trademark of Ecolab, Inc.
Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.
If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

ÖLFLEX® VFD 1XLC with Signal

Flexible VFD cable; 600V/1000V; c(UL) CIC/TC-ER approval

ÖLFLEX® VFD 1XLC with Signal is designed to meet Canadian standards. A robust oil- and UV-resistant shielded motor cable for VFD drives. c(UL) CIC/TC-ER rating allows for installation in exposed areas without conduit where TECK 90 cables can be used. Enhanced electrical properties of XLPE insulation provide problem-free performance where precision control is critical.

Recommended applications

VFD drive and motor connections; pumps; compressors; conveyors; elevators; extruders; presses; HVAC; on/off, slow down/speed up applications.

Approvals

c(UL)us c(UL)us FIRE PROTECTION CE ECOLAB®

Cable attributes			page 648
OIL	OR-03	FLAME	FR-03
MOTION	FL-02	MECH.	MP-03

Construction

Conductors: tinned copper fine wire

Insulation: XLPE (plus)

Shielding: barrier tape; triple layer foil tape (100% coverage); tinned copper braid (85% coverage); tinned copper drain wire

Signal Pair: individually foil shielded with TC drain wire

Jacket: specially formulated thermoplastic elastomer (TPE); black

Application advantage

- One cable for applications
- Low capacitance design
- c(UL) CIC TC-ER approved
- Industrial grade phthalate-free jacket design for harsh environments
- Reduces space and weight in tray
- No conduit required due to TC-ER rating
- Resistant to a wide range of disinfecting solutions used in the food, beverage, chemical and related industries, according to ECOLAB® PM 40-1 test procedure

Complete the installation

SKINTOP® MS-M BRUSH
page 524

EPIC® ULTRA HB
page 407

Technical data

Minimum bend radius:
for installation: 7.5 x OD

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

Nominal voltage:
- UL TC: 600V
- UL Flexible Motor Supply: 1000V
- UL/CSA AWM: 1000V

Test voltage:
- 18 AWG - 10 AWG: 3000V
- 8 AWG - 4 AWG: 3500V
- 2 AWG: 4000V

Conductor stranding:
- 16 AWG - 2 AWG: Class K

Color code:
black with white numbers, plus green/yellow ground
1-pair: black with white numbers

Approvals:
Canda: c(UL) CIC/TC-ER
cRU AWM II A/B FT4
UL: TC-ER per UL 1277
Flexible Motor Supply Cable per UL 2277
AWM 22022 per UL 758
Attributes: UL Oil Res I/II
XHHW-2 90°C wet or dry
-40°C cold bend; -25°C cold impact
sunlight resistant
direct burial
NFPA 79
NEC: Class 1 Division 2 per NEC Article 501
Additional: NFPA 79
RoHS II

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
16 AWG (1.3 mm²)							
701910	4 + (18 AWG)	0.503	12.8	73.6	137	53112630	53112676
14 AWG (2.1 mm²)							
701911	4 + (18 AWG)	0.536	13.6	94.4	166	53112630	53112676
12 AWG (3.3 mm²)							
701912	4 + (18 AWG)	0.625	14.8	131.7	210	53112640	53112676
10 AWG (5.3 mm²)							
701913	4 + (18 AWG)	0.680	16.6	178.4	289	53112650	53112677

Part number	Number of conductors incl. ground	Nominal outer diameter in	mm	Copper weight lbs/mft	Approx. weight lbs/mft	SKINTOP® MS-SC metric thread	SKINTOP® MS-M BRUSH metric thread
8 AWG (8.5 mm²)							
701914	4 + (14 AWG)	0.856	21.7	309.5	448	53112650	53112677
6 AWG (13.5 mm²)							
701915	4 + (14 AWG)	1.004	25.5	447.6	694	53112660	53112678
4 AWG (21 mm²)							
701916	4 + (14 AWG)	1.125	28.6	649.2	976	53112660	53112678
2 AWG (33.7 mm²)							
701917	4 + (14 AWG)	1.281	32.5	1011.2	1483	53112670	53112679

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ÖLFLEX® SERVO FD 798 CP

color code chart

Part number	Power conductors		Control pairs	
	Size	Color code & shielding	Size	Color code & shielding
0036910	20 AWG 4c	blue/white • black/white red/white • yellow/white	22 AWG 4pr	black & brown • red & orange yellow & green • blue & violet
0036911	20 AWG 2c	white • brown indiv. shield: wrapped with tinned copper wires covering: polyolefin	26 AWG 3pr	yellow & green • red & blue • gray & pink indiv. pair shield: drain wire of tinned copper wire strands overall shield: tinned copper wires covering: polyolefin
0036912	26 AWG 4c	4-conductor bundle: gray • blue • white/yellow • white/black	26 AWG 3pr	yellow & green • black & brown • red & orange pair shield: drain wire of tinned copper wire strands, wrapped with tinned copper wires
			20 AWG 1pr	brown/red & brown/blue
0036913	26 AWG 4c	4-conductor bundle: gray • blue • white/yellow • white/black	26 AWG 3pr	yellow & green • black & brown • red & orange pair shield: drain wire of tinned copper wire strands, wrapped with tinned copper wires
	24 AWG 4c	4-conductor bundle: brown/yellow • brown/gray • green/black • green/red	20 AWG 1pr	brown/red & brown/blue
0036914*	20 AWG 9c	blue • white • red • pink • green yellow • brown • black • gray		–
0036915*	18 AWG 2c	white • brown	24 AWG 4pr	brown & green • gray & pink blue & violet • red & black
0036916*	20 AWG 2c	white • brown	24 AWG 6pr	white & brown • green & yellow • gray & pink blue & red • black & violet • gray/pink & red/blue
0036917	26 AWG 10c	white • brown • green • yellow • gray pink • blue • red • black • violet	20 AWG 1pr	white & brown
0036918	26 AWG 10c	white • brown • green • yellow • gray pink • blue • red • black • violet		–
	20 AWG 4c	white • brown • blue • black		
0036920	20 AWG 4c	white • blue • white/green • brown/green	26 AWG 4pr	red & black • brown & green yellow & violet • gray & pink
0036921		–	24 AWG 4pr	white & brown • green & yellow gray & pink • blue & red
0036923		–	26 AWG 8pr	white/yellow & white/green • white/red & white/orange white/black & white/brown • gray & white • blue & violet yellow & green • red & orange • black & brown
0036924		–	26 AWG 4pr	black & brown • red & orange yellow & green • blue & violet
0036926	26 AWG 12c	black • brown • red • orange • yellow • green • blue • violet • gray • white • white/black • white/brown		–
0036927*	20 AWG 2c	white • brown	24 AWG 4pr	brown & green • gray & pink blue & violet • red & black
0036928	26 AWG 4c	4-conductor bundle: white • brown • green • yellow shield: wrapped with tinned copper wires	26 AWG 2pr	blue & red • gray & pink
	20 AWG 4c	white • brown • green • yellow	26 AWG 2pr	white & brown • green & yellow pair shield: wrapped with tinned copper wires
0036929*	20 AWG 2c	pink • gray	24 AWG 2pr	white & brown • green & yellow pair shield: aluminum-laminated foil, wrapped with tinned copper wires
0036930*	20 AWG 2c	white • brown	24 AWG 2pr	red & black • gray & pink

* Contains tinned copper drain wire under overall shield.
All designs have an overall tinned copper braid shield (85% coverage)

ÖLFLEX®
Power and control cables

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