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# **VOLUME 2**







RUGGED COMPACT LIGHTWEIGHT ROBUST
OPTICAL PERFORMANCE
EASY CLEANING

Locking	Push-pull Quick-release	Push-pull
Shell material	Brass Aluminum	Brass
Plating	Nickel Anthracite / Black (ULTIMATE 80)	Chrome over Nickel
Plug ø [mm]	12 to 29	13 or 24
Number of contacts	2 to 42	1 to 4 fibers / Hybrid 2+2
AWG	AWG9-32	AWG17 (hybrid)
Contact type	Low voltage	Fiber optic / Low voltage (hybrid)
Test voltage DC [kV]	Up to 3.7	Up to 2.8
Current rating [A]	Up to 26	Up to 10
Termination	Contact: Crimp / Solder / PCB	Contact: Optical termini / Solder (hybrid)
Sealing level	IP68/69 Hermetic	IP67/68
Mating cycles	Up to 10,000 1,000	



Technical specifications for our Fischer Core Series can be found in **VOLUME 1**.

# **Connector overview**







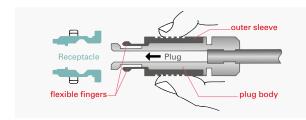
# HIGH-DENSITY MINIATURIZATION HIGH-SPEED DATA TRANSFER RELIABILITY

EASY MATING EASY CLEANING EASY INTEGRATION

Locking	Push-pull Screw-locking / Quick-release	Quick-release	
Shell material	Brass	Brass Stainless Steel 316L	
Plating	Chrome over Nickel Anthracite Nickel	Anthracite Nickel	
Plug ø [mm]	9.9 to 14.9	20.4 or 25.4	
Number of contacts	4 to 30 4 or 7		
AWG	AWG18-30 AWG24-28		
Contact type	Low voltage Low voltage		
Test voltage DC [kV]	Up to 2.4 Up to 1.2		
Current rating [A]	Up to 10 Up to 5.0		
Termination	Contact: Solder / PCB Contact: Solder / PCB / Wires / ZIF		
Sealing level	IP68 Plastic: IP67 Metal: IP68		
Mating cycles	5,000	5,000 Plastic: 5,000 Metal:10,000	

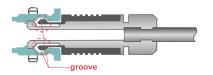
# ORIGINAL PUSH-PULL LOCKING SYSTEM

Fischer Connectors' original push-pull automatic locking system is widely adopted by the industry for its ease of use, safety of mating and speed in connection and disconnection.



#### **MATING**

The plug has an outer sleeve, with flexible fingers, which slides forwards and backwards along the plug body.



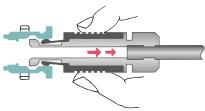
#### WHEN CONNECTED

The beveled edges are firmly captured by a locking groove located inside the receptacle.



#### **PULLING THE CABLE**

The beveled edges of the fingers are forced into the groove, securing the connection.



#### **UNMATING**

Pulling on the outer sleeve of the plug unlocks the latching mechanism.

# OTHER LOCKING SYSTEMS

#### **LANYARD**

Combines push-pull automatic locking with an emergency release lanyard.

#### **QUICK-RELEASE**

Designed without a locking mechanism for emergency release.

#### **FRICTION**

Designed without a snapping mechanism.

#### **TAMPERPROOF**

Features an integral safety locking ring to prevent unauthorized or unintentional disengagement.

#### **SCREW-LOCKING**

Enables firm locking by circular movement with the plug's outer sleeve and receptacle feature threading.

# **Product specifications**

# **SEALING CATEGORIES**

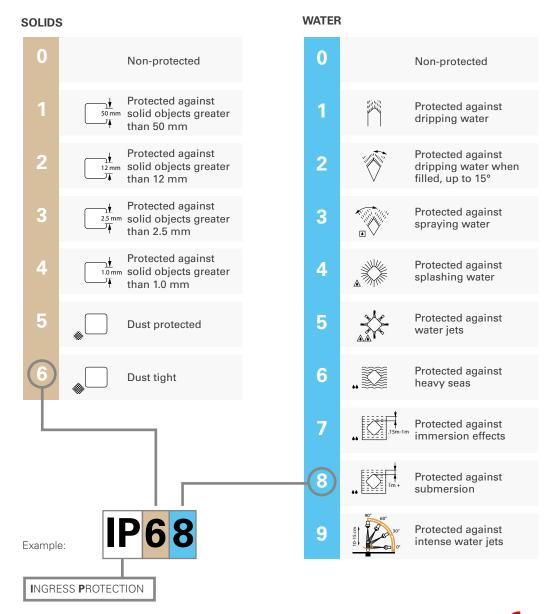
The IP (Ingress Protection) classification system provides a reliable method of comparing relative levels of sealing between various connector products.

The protection level offered by a typical envelope is described in IEC 60529, published by the International Electrotechnical Commission (IEC). While the first number describes the level of protection from solid objects, the second one relates to protection from liquids.

Tests performed during the design and qualification of Fischer Connectors' environmentally sealed products are standardized to IP68 at a depth of 2 meters and for duration of 24 hours. Fischer Connectors' hermetically sealed products achieve IP69.

The digits indicate conformity with the conditions summarized in the tables aside.

### **IP RATING**



# **Product specifications**

# **COMMONLY USED SEALING LEVELS**

- IP50 indoor unexposed applications
- IP68 watertight sealing
- Hermetic sealing

Each requires different sealing levels and, therefore, different connector solutions.

# **IP50 INDOOR / UNEXPOSED APPLICATIONS**

Typically for indoor or industrial applications, the required sealing level is IP50, since the device needs to be protected against dust but not exposed to water.

The IP50 rating can be improved with additional accessories like boots or protective sleeves.

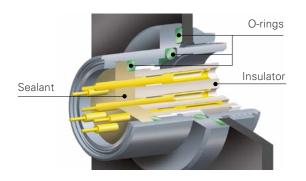
# **IP68 WATERTIGHT SEALING**

Typically for applications requiring outdoor use where they might be exposed to water submersion, rain, sand, mud or any other environmental stress.

# **HERMETIC SEALING**

Typically for applications requiring gas tightness like vacuum applications and pressurized vessels, immersed for long periods of time or exposed to strong jets.

100% of the hermetic pieces are tested with a leak testing instrument to ensure a leak smaller than 10<sup>-8</sup> mbar l/s.

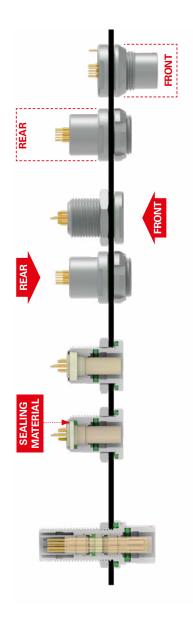








# **HOWTO CHOOSE YOUR RECEPTACLE BODY STYLES**



# Front and rear projecting

- Depending on whether you need the space saving inside or outside the device
- Also available in front or rear mounting

# Front and rear mounting

- Depending on how you need to process your assembly
- Rear mounting is commonly used for PCB mount

# IP68 watertight or hermetic designs

 Hermetic has a specific sealing material for best sealing under high pressures

# **Feedthrough**

Hermetic panel bulkhead feedthrough

# **MATERIALS**

MATERIAL NAME	IDEAL FOR	TEMPERATURE	MAIN ATTRIBUTES	
SHELL MATERIAL				
Chromium-plated brass	Ruggedness	-100 to +200°C	Salt mist and mechanical resistance, cost efficiency, electrical conductivity	
Aluminum	Lightweight	-100 to +200°C	Lightweight	
Stainless steel	Cleaning / Radiation	-100 to +350°C	Corrosion resistance, surface cleanability, nuclear radiation and mechanical resistance	
PEI	Sterilization	-65 to +200°C	Sterilization in autoclave, EtO, Cidex, gamma radiation, Steris <sup>a</sup> , Sterrad <sup>a</sup>	
PBT	Insulation	-65 to +135°C	Electrical insulation, low temperature manipulation	
ABS	Cost efficiency	-20 to +65°C	Disposable solutions, medical applications	
		CONTACT BI	LOCK MATERIAL	
PEEK	High temperature	-65 to +250°C	High temperature, high chemical and high radiation resistance	
LCP	High temperature	-65 to +200°C	High temperature and high chemical resistance	
PBT	Cost efficiency	-65 to +135°C	High chemical resistance, cost efficiency	
PTFE	Electrical insulation	-65 to +160°C	High dielectric strength, high chemical resistance	
ABS	Cost efficiency	-20 to +65°C	Disposable solutions, good stability	
			ALINIO MATERIAL	
		O-RING & SEA	ALING MATERIAL	
FPM (Viton°)	Hermeticity	-20 to +200°C	Acids, weather, ozone, fuels, mineral and silicone oils, high vacuum, gamma rays	
EPDM	Low temperature	-50 to +160°C	Alcohol, weather, hot water, vapour, detergents, gamma rays	
NBR	Oil resistance	-30 to +110°C	Acids, mineral oils, petrol, weather, detergents	
FVMQ	High temperature oil resistance	-55 to +200°C	Mineral oils, alcohol, weather, hot water, detergents	
TPE	Soft accessories	-55 to +130°C	Very resistant, except to aromatic and chlorinated hydrocarbon	
Silicone based resin	IP68 sealing	-55 to +200°C	Mineral oils, acids, alkalines, inorganic saline solutions	
Epoxy based resin	Hermeticity	-65 to +150°C	High chemical and radiation resistance	

# **Product specifications**

# **A/Z POLARITY**

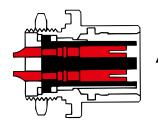
To protect users from contact with dangerous voltage, most of Fischer Connectors' products are available in two versions:

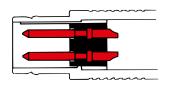
#### STANDARD A POLARITY

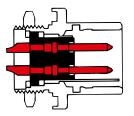
The contacts of the receptacle are protected against accidental touch. **Recommended when voltage is present on the receptacle.** 

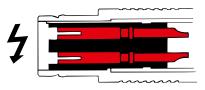


The contacts of the plug are protected against accidental touch. **Recommended when voltage is present on the plug.** 

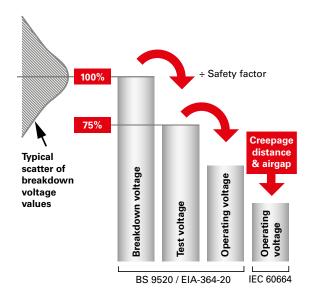








# **TEST VOLTAGE & OPERATING VOLTAGE**



#### **BREAKDOWN VOLTAGE**

Maximum voltage difference that can be applied before the occurrence of a disruptive discharge between mutually insulated portions of a connector or between insulated portions and the ground.

#### **TEST VOLTAGE** (or withstanding voltage)

Voltage level at which the connector is tested during the qualification test. This value represents the upper physical limit. It is usually set at 75% of breakdown value.

#### **OPERATING VOLTAGE** (or rated voltage)

Voltage under which the connector will actually work in the equipment over the normal expected lifetime and in typical environmental conditions.

### General recommendation for connectors in common applications

For connectors in common applications, IEC60664 is in particular recommended. This specification uses creepage distance instead of test voltage as a calculation basis for the operating voltage, taking into account the above-mentioned long-term effects. It is similar to German VDE 0110; typical applications are classified in insulation groups depending on their exposure to pollution.

Fischer Connectors recommends the use of IEC60664 in general multipole connector specifications, unless other more specific standards or regulations are applicable to the design. For example, IEC 60601 provides adequate special guidelines for medical devices.

All values given here are valid for mated connectors, provided that termination of connectors has been completed with adequate cable and following correct termination procedures. Other standards recommend a calculation using the test voltage as a basis with the application of a safety factor. For example, BS 9520 recommends setting the operating voltage at:

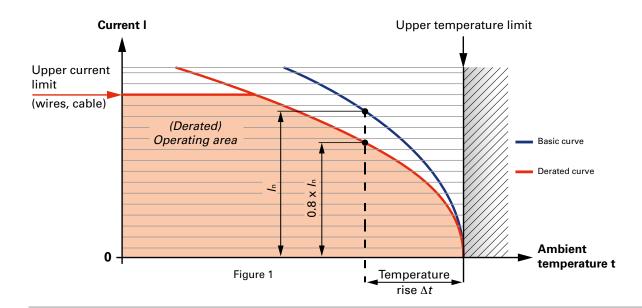
- 0.33 x test voltage for 500V <test voltage <3kV
- 0.66 x test voltage for test voltage >3kV

Similar recommendations are provided in EIA-364-20 and former MIL-STD-1344 method 3001.

# **Product specifications**

# **CURRENT RATING (Maximum permissible current)**

#### DERATING CURVE DERIVED FROM THE BASIC CURVE



The current values listed under "Electrical & contact configurations" were measured in our test laboratory according to IEC 60512-5-2: Current-carrying capacity test, Test 5b: Current-temperature derating. They are the currents that create a temperature rise of 40 °C (unless otherwise specified) within the connectors due to the self-generated heat, and they belong to the basic curve shown in Figure 1.

The maximum permissible current (I) as defined by the above mentioned IEC standard is the basic curve derated by a factor of 0.8 to account for manufacturing tolerances and uncertainty in measurements.

When selecting a connector, attention must be paid to the fact that the temperature rise caused by current must be added to the ambient temperature and that the resulting value shall not exceed the upper temperature limit of the materials, listed under the "Operating temperatures" sections and plotted as a vertical line on the graphs shown in Figure 1.

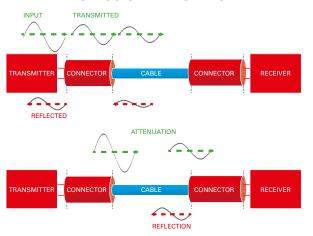
The current-carrying capacity may be further limited by external factors, for example the size of the wire and the cable characteristics. This upper current limit is plotted as a horizontal line on the graphs shown in Figure 1.

The operating area is defined by the surface below the derated curve and limited on top by the upper current limit.

The current values listed under "Electrical & contact configurations" are valid for each contact. For coaxial and triaxial connectors, the current is valid for the center and the outer contact.

### HIGH FREQUENCY SIGNAL & DATA TRANSMISSION

#### **DATA TRANSMISSION PRINCIPLES**



#### Challenges in data transmission

When a signal is emitted at the transmitter, it must undergo minimal distortion across the system (transmitter, connectors, cable, receiver) to be properly recovered at the receiver.

#### Types of signal distortion across the transmission link:

- **Return loss:** When the impedances of two interfaced media do not match (i.e., transmitter/connector, connector/cable, ...), some parts of the signal will reflect back towards the source and be lost. The amount of this loss comes from impedance mismatch and is characterized by the return loss.
- **Insertion loss:** Insertion loss describes the attenuation of the signal along the transmission path. This mainly arises from losses both in the dielectric and the conductors.
- **Crosstalk:** Signals running in close-lying channels are likely to couple to one another. This is described as crosstalk terms.
- **Noise:** Unwanted interferences which could either be external or internal to the system itself might add up to the original signal and cause distortion. For instance, internal interferences can be linked to the noise generated from the transmitter or receiver.

#### CONNECTOR DESIGN RULES TO OPTIMIZE DATA TRANSMISSION

At a system level, the return loss, insertion loss, crosstalk and noise are critical parameters to ensure high quality data transmission. However, impedance and crosstalk play a more prominent role at the connector level.

#### Connector with optimized impedance

To optimize impedance matching, the following factors must be considered: Contact diameter, interaxial contact distance, contact form factor, and the dielectric constant of all the components (i.e., type of material).

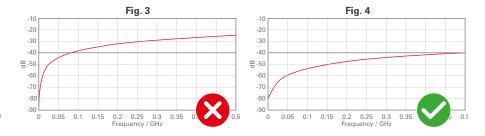
Figures 1 and 2 illustrate the notion of impedance matching in which the green area depicts the tolerated range: Fig. 1 shows a connector with poor impedance-matching, while Fig. 2, shows a connector with optimized impedance matching.



### **Preventing Crosstalk**

To minimize crosstalk, the geometrical distribution of the contacts as well as the contact layout (i.e., signal attribution to specific contacts) are critical.

Figures 3 and 4 illustrate the latter by displaying the crosstalk for two different contact layouts: Fig. 3 shows a connector where the contact layout was not optimized, while Fig. 4 shows a reduced crosstalk noise level which was achieved as a result of an optimized contact layout.



# **Product specifications**

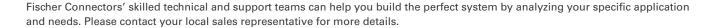
### HIGH FREQUENCY SIGNAL & DATA TRANSMISSION

#### **DATA PROTOCOLS**

Data protocols provide us the normative values of data transmission parameters (ex. Insertion Loss, Return Loss, Crosstalk, Noise). This provides a means of ensuring that the various components of a system (transmitter, connectors, cable, receiver) work together and allow for an optimized transmission of the data streams.

Two complementary methods can be used to assess the system's capability of transmitting a certain high-speed data transmission protocol in terms of signal quality and transmission speeds: Numerical simulations (connector only) and Vector Network Analyzer (VNA) measurements (i.e., cable and connector).

Typical high-speed data transmision protocols are USB, Ethernet and standard protocol for the simultaneous transmission of audio and video.





SYMBOL	•<> \$\$<	絽		ι	JH <b>D</b> ◀»)□
PROTOCOL	USB	SPE (SINGLE PAIR ETHERNET)	ETHERNET	STANDARD AU	DIO/VIDEO PROTOCOL
DESCRIPTION	4 wires for USB 2.0 up to 480 Mbit/s 9 wires for USB 3.2 Gen 1 up to 5 Gbit/s 9 wires for USB 3.2 Gen 2 up to 10 Gbit/s	2 wires for SPE up to 1 Gbit/s (1000BASE-T1)	4 wires for Ethernet up to 100 Mbit/s (100BASE-TX) 8 wires for Ethernet up to 10 Gbit/s (10GBASE-T)	19 wires for standard audio/video protocol up to 10.2 Gbit/s	
FISCHER SERIES PE	ERFORMANCE UPTO:				
CORE SERIES	USB 3.2 Gen 2	1000BASE-T1	5GBASE-T	18 Gbit/s	4K UHD Up to 60 fps
ULTIMATE SERIES	USB 3.2 Gen 2	1000BASE-T1	1000BASE-T	10.2 Gbit/s	4K UHD Up to 30 fps
MINIMAX SERIES	USB 3.2 Gen 2	1000BASE-T1	10GBASE-T	18 Gbit/s	4K UHD Up to 60 fps
FREEDOM SERIES	USB 2.0		100BASE-TX		

USB 3.2 Gen 1 and Gen 2 Connectors and Cable assemblies are validated following parameters (such as impedance, attenuation, Cross talks, conversion modes) listed in the Universal Serial Bus 3.1 Legacy Connectors and Cable Assemblies Compliance Document (Revision 1.1). Speed rate mentioned is the maximum theoretical speed rate achievable with the according protocol. For further request on the parameters tested and the test reports, please contact Technical Support.

### **CONTACTS & ACCESSORIES**



#### **SOLDER CONTACTS**

Most versatile Pre-installed contacts Qualified assemblers required

- Can be produced with any type of contact block material and accept a wide range of wire sizes.
- Contacts are pre-installed in the insulator block, and the wires can be terminated with any appropriately sized soldering iron.
- May require operators who are qualified in specialized soldering techniques.



#### **PCB CONTACTS**

PCB or Flex circuit mount Reduced pin diameter Wave soldering

- Designed to be mounted directly onto a PCB or flex circuit, can be used in wave soldering operations for faster production assembly.
- Preferred for high rates of data transmission due to the low distance to the board that their integration allows. This helps reducing signal perturbations.
- PCB pins are generally used on rear mounted panel connectors.



#### **CRIMP CONTACTS**

Selectively annealed area Special tools required Limited range of wire sizes

- Each contact has a selectively annealed area which is deformed during assembly by specialized tooling to assure proper termination of the wire to the contact.
- Commonly used for field termination or repair, as no soldering process is required.
- Not available for sealed or hermetic connectors.

# **Product specifications**

# **CONTACTS & ACCESSORIES**



#### STAMPED CONTACTS

High volume Automated cable assembly Disposable applications

- Optimized for very high volume and automated cable assembly.
- Come on specific reels to be accommodated in automated cable assembly machines.
- Mainly used in disposable applications due to their limited number of mating cycles.



#### FIBER OPTIC BUTT-JOINT CONTACTS

High optical performance IP67 unmated UPC & APC polishing

- The FiberOptic termini rely on butt-joint technology commonly used in the telecom industry to ensure ultra-low insertion and return losses.
- A unique sealing feature on the termini allows easy cleaning and device protection even unmated (IP67) without compromising on the alignment once mated.
- Guaranteed, tested and certified optical performance platform using high precision polishing process.
- The alignment sleeve parts are located in a removable mate adapter for easy maintenance, replacement and cleaning.

# **BEND RELIEFS**



#### **OVERMOLDED STRAIGHT & RIGHT ANGLE BEND RELIEF**

- Can accommodate a wide range of cable diameters
- Wide choice of colors and materials (e.g. polyurethane, silicon, etc.)
- Best protection to improve cable flex life

# **PROTECTIVE SLEEVE**



Improves mechanical protection on the whole interface:

- Prevents contamination in highly dusty environments
- Protects both plug and receptacle
- Enhances sealing



#### **CABLE BEND RELIEF**

Tool-free terminations for field installations:

- High quality and improved protection
- Wide range of colors for easy cable identification
- Can accommodate a wide range of cable diameters

# **HEAT SHRINKING TUBE**



Allows submersion with adhesive versions:

- Ideal for quick prototyping
- Can accommodate a wide range of cable diameters and multiple cable output
- Protects exposed wires







# VERTICAL INTEGRATION

- Connectors
- Components
- Cables

# **EXPERTISE**

- Design
- Manufacturing
- Testing

# **RELIABILITY**

- Sealing
- Sterilization
- Data transmission

#### Cable assemblies

# INTEGRATED CONNECTIVITY SOLUTIONS FOR EVERY PROJECT

Our engineers work closely with your team to find the right solution for the most demanding applications by integrating precision connectors, components, parts, and engineered cables.

Fischer Connectors' skilled technical and support teams help you build the perfect cable assembly for your unique application, providing advice through design, prototype, assembly, testing, manufacturing, installation, and beyond.

#### LARGE RANGE OF APPLICATIONS:

- High-performance rugged and submersible cable assemblies for the defense and marine markets
- Silicone overmolded solution for high heat protection and maximum flexibility in the medical industry
- High-speed transmission of electrical, power, and optical signals
- Custom and application-specific cable harnesses

# **MEDICAL**



Integration in medical devices

# **SILICONE**



High temperature applications

# **DEFENSE**



Communications

- Overmolded cable assemblies, including thermoplastic & silicone
- Wiring harness assemblies
- Rugged & submersible cable solutions
- Third-party connector integration
- Right-angle overmolds

- Custom overmolds with multi-cable exits
- Potting or heat shrink
- Automated strip and crimp
- Colored overmolding
- Low cost and disposable options

# AT YOUR SERVICE, WHEREVER YOU ARE

#### **GLOBAL FOOTPRINT**

With our worldwide connectors and cable assembly network, located in Europe, North America and Asia Pacific, we provide our customers with quick turnarounds around the globe.

#### STREAMLINING YOUR SUPPLY CHAIN

By purchasing cable assemblies, connectors and manufacturing from one place, you deal with one vendor, pay one bill, and reduce the time and the risk it takes to coordinate your project.

#### **ALL THE RIGHT ANGLES**

Overmolding, including right-angle and custom connections, silicone and low friction cables, are all part of the business. We have overmolding machines for both polyurethane and silicone.

#### **COMPETITIVE PRICING**

Companies that use Fischer Connectors for both their connectors and assembly solutions can see significant savings over the cost of handling each vendor separately.



#### **TOP QUALITY**

We build cable assemblies to the same rigorous quality standards as we build our connectors. Whether you're looking for a simple or complex assembly, Fischer Connectors is able to deliver exactly what you need, when you need it.

# **Cable assemblies**

# **CUSTOM CABLE ASSEMBLIES**

Fischer Connectors has helped hundreds of customers find their unique cable assembly solution that fulfills technical, quality and cost requirements.

From prototyping, design validation, testing and delivery, we support your project from the beginning to the end.

Our team of experts is at your service to recommend the best solution for your connectivity challenges and turn them into a success story.





#### Cable assemblies

# A WIDE RANGE OF CUSTOM OVERMOLDING



Thermoplastic overmolds for the Fischer Core Series, Fischer MiniMax™ Series and Fischer FiberOptic Series



Right-angle thermoplastic overmolds for the Fischer Core Series and Fischer UltiMate™ Series



Silicone overmolds with low friction coatings for medical and high temperature applications



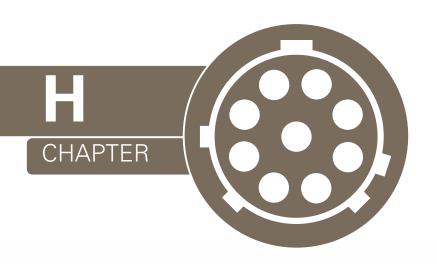
Thermoplastic overmolds for the Fischer UltiMate™ Series



Thermoplastic overmolds with custom cable breakouts



Custom thermoplastic overmolds for multi-cable exits



# FISCHER **ULTIMATE**<sup>TM</sup> SERIES

RUGGED | COMPACT | LIGHTWEIGHT

# **KEY FEATURES**

- IP68 2m/24h / Hermetic
- 360° EMC shielding
- High corrosion resistance
- Up to 10,000 mating cycles

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■ ULTIMATE USB-C table of contents	H-35
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H-2 / H-32

# **ULTIMATE**



# **PLUGS**

	CABLE MOUNTED  ■ Body styles (UP01-L; UP01-Q; UP02-R)
	PANEL FRONT MOUNTED  ■ Body styles (UP50)
RECEPTAC	LES
Since 1	CARLE MOUNTED

CABLE MOUNTED  ■ Body styles (UR50)  ■ Technical dimensions	
PANEL REAR MOUNTED  ■ Body styles (UR01; UR02; UR04)  ■ Technical dimensions	
PANEL FRONT MOUNTED  Body styles (UR03) Technical dimensions	

# **FOR ULTIMATE**

<ul> <li>Size selection</li> <li>Body styles &amp; technical dimensions</li> <li>Electrical &amp; contact configurations</li> <li>Options- Mechanical coding</li> <li>PCB hole layout</li> <li>Part numbering</li> <li>Accessories</li> <li>Tooling</li> <li>Technical information</li> </ul>	H-4 H-13 H-19 H-20 H-26 H-27 H-30
■ Technical information	H-31

This catalog covers our standard connector solutions. For specific requests, including hybrid or custom connectors, please contact your local sales representative.

# **AVAILABLE SIZES**

CONNECTOR SIZE VERSUS CABLE DIAMETER

mm



Size	Min cable ø	Max cable ø	Number of contacts
07	1.9	4.8	2-10
08	2.5	5.2	2-9
11	3.9	7.8	8-19
13	6.9	9.8	5-27
15	6.9	11.3	2-27
18	6.9	14.8	42

Min cable ø compatible with bend relief (accessory). Images of available sizes are on 1:1 scale when printed full size on A4 paper.



# **CABLE**MOUNTED





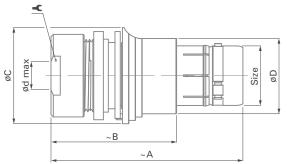
Body style		UP01	UP02	References to detailed information
Protection	Sealed up to IP68	•	•	Cooling automotics many A.C.
Protection	Hermetic			Sealing categories, page A-6
	Push-pull	•		
Locking	Quick-release	•		Locking systems, page A-5
system	RLS (Ratchet Locking System)		•	Locking Systems, page A-5
Termination	Crimp contact			Floatwicel 9, contest configurations, mages II 12 to II 10
iermination	Solder contact	•	•	Electrical & contact configurations, pages H-13 to H-18
Housing	Brass	•		Part numbering, page H-26
material	Aluminum	•	•	rait numbering, page n-20
Housing	Anthracite	•		Part numbering, page H-26
color Black	r art numbering, page 11-20			
	Shortened body	•	•	
Design	Straight	•	•	Body styles, chapter H
	Right-angle	•		
	Cable clamp sets			
Cabling	Overmoldable	•	•	
	Heat shrinkable	•	•	
	Cable bend reliefs	•	•	
Accessories	Protective sleeves			Accessories, page H-27
	Sealing caps	•	•	
	07	•		
Size	08	•		Technical dimensions, page H-5
	11	•		
SIZE	13	•		For more information visit our website
_	15	•	•	www.fischerconnectors.com/technical
	18	•		

**CABLE**MOUNTED

#### UP01

**BODY STYLE** 



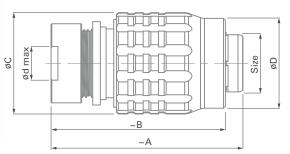


Size	Α	В	øC	øD	ød max	<b>-c</b>	Torque
07	28.0	18.0	12.0	9.0	4.8	8	1.5 Nm
08	39.0	25.0	15.0	10.5	5.2	10	2.5 Nm
11	39.5	26.0	18.5	13.7	7.8	14	3.0 Nm
13	50.0	34.0	21.7	16.0	9.8	17	3.5 Nm
15	50.2	33.6	23.7	18.0	11.3	19	4.0 Nm
18	58.0	38.0	29.0	22.7	14.8	22	6.0 Nm

#### UP02

**BODY STYLE** 





Size	Α	В	øС	øD	ød max	<b>=</b> C	Torque
15 RLS (Ratchet Locking System)	50.0	45.5	26.5	23.5	11.3	19	4.0 Nm

# **PANEL FRONT** MOUNTED



Body style		UP50	References to detailed information
Protection	Sealed up to IP68	•	Sealing categories, page A-6
Protection	Hermetic		Sealing categories, page A-o
	Friction		
	Push-pull		
Locking system	Quick-release		Locking systems, page A-5
oyoto	Lanyard		
	Tamperproof		
Tormination	Crimp contact		Electrical & contact configurations, pages H-13 and H-15
remination	Solder contact	•	Electrical & contact configurations, pages n-13 and n-15
Housing	Brass	•	Part numbering, page H-26
material	rerial Aluminum •	•	rait numbering, page n-20
Housing color	Anthracite	•	Part numbering, page H-26
	Shortened body		
Design	Straight	•	
	Right-angle		Body styles, chapter H
A l- l	Front-mounting	•	
Assembly	Rear-mounting		
	Cable bend reliefs		
Accessories	ccessories Protective sleeves		Accessories, page H-27
	Sealing caps	•	
0:	07	•	Technical dimensions, page H-7
Size	11	•	For more information visit our website www.fischerconnectors.com/technical

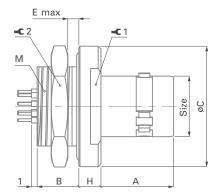
# **PANEL FRONT**

MOUNTED

UP50

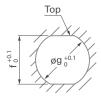
**BODY STYLE** 





Size	Α	В	øС	E max	Н	M	<b>-C</b> 1	<b>-C</b> 2	Torque
07	10.0	5.2	13.0	2.5	3.0	M9x0.5	9	11	1.3 Nm
11	13.2	7.6	21.8	4.5	4.0	M16x1	17	19	4.5 Nm

Size	f	øg
07	8.0	9.1
11	14.5	16.1



PANEL CUT-OUT

# **RECEPTACLES**

# **CABLE**MOUNTED



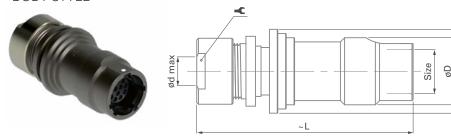
Body style		UR50	References to detailed information				
Protection	Sealed up to IP68	•	Cooling automorphics many A.C.				
Protection	Hermetic		Sealing categories, page A-6				
Termination	Crimp contact	•	Electrical & contact configurations, pages H-13 to H-16				
Termination	Solder contact	•	Electrical & contact configurations, pages 11-13 to 11-10				
Housing	Brass	•	Part numbering, page H-26				
material	Aluminum	•	r art numbering, page 11-20				
Housing color	Anthracite	•	Part numbering, page H-26				
	Shortened body						
Design	Straight	•	Body styles, chapter H				
	Right-angle	•					
	Cable clamp sets						
Cabling	Overmoldable	•					
	Heat shrinkable	•					
	Cable bend reliefs	•					
Accessories	Protective sleeves		Accessories, page H-27				
	Sealing caps	•					
	07	•	Technical dimensions, page H-9				
Size	08						
JIZE	11	•	For more information visit our website				
13		•	www.fischerconnectors.com/technical				

# **RECEPTACLES**

# **CABLE**MOUNTED

**UR50** 

**BODY STYLE** 



Size	øС	øD	ød max	L	<b>-C</b>	Torque
07	12.0	10.0	4.8	27	8	1.5 Nm
08	15.0	12.0	5.2	39	10	2.5 Nm
11	18.5	15.5	7.8	39	14	3.0 Nm
13	21.7	17.9	9.8	50	17	3.5 Nm

FISCHER **ULTIMATE™** SERIES Body styles

# **RECEPTACLES**

PANEL MOUNTED						
Body style	Body style		UR02	UR03	UR04	References to detailed information
Protection	Sealed up to IP68	•	•	•	•	Sealing categories, page A-6
11010011011	Hermetic	•	•	•	•	Sealing categories, page A-0
	Crimp contact					
Termination	Solder contact	•	•	•	•	Electrical & contact configurations, page H-13 to H-18
	PCB contact	•	•	•	•	
Housing material	Brass	•	•	•		Part numbering, page H-26
riousing material	Aluminum	•	•	•	•	r art numbering, page 11-20
Housing color	Anthracite	•	•	•		Part numbering, page H-26
riousing color	Black				•	r art numbering, page 11-20
	Right-angle					
Design	Flush		•			
Design	Front-projecting	•		•	•	Body styles, chapter H
	Bulkhead feedthrough					Body Styles, Glapter 11
Assembly	Front-mounting			•		
Assembly	Rear-mounting	•	•		•	
	Sealing caps	•	•	•	•	
	Spacers					
Accessories	Color-coded washers					Accessories, page H-27
	Grounding washers					
	Locking washers					
	07	•	•	•		
	08	•	•	•		Technical dimensions, page H-11 and H-12
	11	•	•	•		
SIZE	13	•	•			For more information visit our website
	15	•	•		•	www.fischerconnectors.com/technical

# **RECEPTACLES**

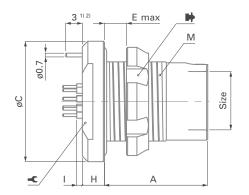
# **PANEL REAR**

**MOUNTED\*** 

**UR01** 

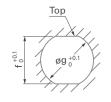
**BODY STYLE** 





Size	Α	øC	E max	Н	ı	М	<b>-c</b>	•	Torque
07	14.2	14.0	4.5	3.0	0.7	M10x0.5	11	TC00.007	1.5 Nm
08	18.7	16.9	5.0	4.0	1.0	M12x1	15	TF00.001	2.5 Nm
11	18.7	21.8	7.0	4.0	1.0	M16x1	17	TK00.002	4.5 Nm
13	22.5	23.8	5.5	4.0	1.0	M18x1	20	TP00.011	6.0 Nm
15	27.7	25.8	9.0	4.0	1.0	M20x1	20	TP00.013	6.5 Nm
18	29.3	31.8	7.5	4.0	1.0	M25x1	27	TO00.005	10.0 Nm

Size	f	øg
07	9.2	10.1
08	10.9	12.1
11	14.5	16.1
13	16.5	18.1
15	18.5	20.1
18	23.2	25.1

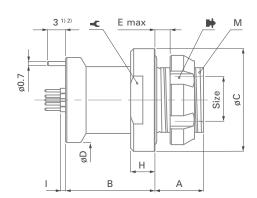


PANEL CUT-OUT

# UR02

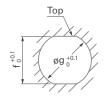
**BODY STYLE** 





Size	Α	В	øС	øD	E max	Н	I	M	<b>-c</b>	•	Torque
07	6.5	10.7	14.0	13.0	3.5	3.5	0.7	M9x0.5	11	TC00.000	1.3 Nm
08	8.0	14.7	16.9	14.0	4.0	4.0	1.0	M12x1	15	TF00.001	2.5 Nm
11	8.0	14.7	21.8	18.8	4.0	4.0	1.0	M16x1	17	TK00.002	4.5 Nm
13	10.5	16.0	23.8	20.0	5.0	4.0	1.0	M18x1	20	TP00.011	6.0 Nm
15	10.5	21.2	25.8	22.0	5.0	4.0	1.0	M20x1	20	TP00.013	6.5 Nm
18	11.0	22.3	31.8	26.0	5.0	4.0	1.0	M25x1	27	TQ00.005	10.0 Nm

Size	f	øg
07	8.0	9.1
08	10.9	12.1
11	14.5	16.1
13	16.5	18.1
15	18.5	20.1
18	23.2	25.1



PANEL CUT-OUT



<sup>\*</sup> Standard version with PCB contacts and grounding pin. For solder contact version, a special solder ground contact pin is included for AWG22[7/30].

<sup>&</sup>lt;sup>11</sup> Solder & PCB ground pins are always equal or larger than the largest contact of corresponding contact bloc layout (except size 13 config. 203 AWG12 [7/20])

<sup>2) 3.6</sup> mm for size 15

FISCHER **ULTIMATE™** SERIES **Technical dimensions** 

# **RECEPTACLES**

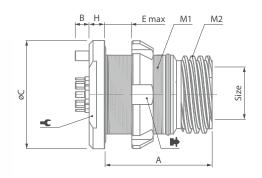
# **PANEL REAR**

**MOUNTED** 

#### **UR04**

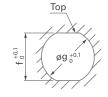
**BODY STYLE** 





Size	Α	В	øC	E max	Н	M1	M2	<b>-</b> C	•	Torque
15	27.7	3.6	25.8	9.0	4.0	M22x1	TR20x6 (P2)	22	TR00.004	8.0 Nm

Size	f	øg
15	20.5	22.1



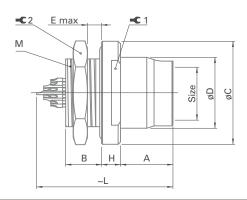
PANEL CUT-OUT

# PANEL FRONT MOUNTED\*

#### **UR03**

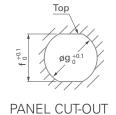
**BODY STYLE** 





Size	Α	В	øC	øD	E max	Н	L	M	<b>-C</b> 1	<b>-</b> C 2	Torque
07	7.7	6.4	14.0	10.0	3.5	2.5	20	M9x0.5	11	11	1.3 Nm
08	11.7	7.0	16.9	11.5	4.0	4.0	27	M12x1	15	14	2.5 Nm
11	11.1	7.6	21.8	15.0	4.6	4.0	29	M16x1	17	19	4.5 Nm

Size	f	øg
07	8.0	9.1
08	10.9	12.1
11	14.5	16.1



<sup>\*</sup> Standard version with solder contacts.

### SIZE 07

Size		Layout reference	Number of contacts	Contact diameter [mm]	Wire size 3)		PCB contacts [mm]		Current rating [A]	Rated voltage r.m.s [V]	Test voltage [kV] in mated position			
											IEC 60512-4-1 Test 4a			
	Pin layout				- -	S 5	Pin ø		IEC 60512-5-2-5b	IEC 60664-1	AC r.m.s.		DC	
					Solder contacts <sup>1)</sup>	Crimp contacts <sup>2)</sup>		Ground pin ø			Contact to body	Contact to contact	Contact to body	Contact to contact
		002	2	0.9	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.83 mm <sup>6)</sup> min ø0.48 mm AWG22-26	0.63	0.7	9.2	≤ 250	1.3	1.7	1.8	2.4
07	7)	0S2	2	0.5	max ø0.88 mm <sup>6)</sup> AWG21 [1] AWG22 [7/30]	-	0.4	0.7	7.0	≤ 250	1.2	1.8	1.8	3.4
		003	3	0.9	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.63	0.7	8.2	≤ 250	1.3	1.3	1.8	1.6
		004	4	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	5.5	≤ 200	1.2	1.2	1.7	1.8
		005	5	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	5.2	≤ 160	0.8	1.0	1.3	1.8
		007	7	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	max ø0.43 mm min ø0.20 mm AWG28-32	0.40	0.7	4.0	≤ 160	0.8	1.0	1.3	1.8
		009	9	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	3.1	≤ 160	0.8	1.1	1.2	1.8
		010	10	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	3.1	≤ 160	0.8	0.9	1.2	1.3

<sup>&</sup>lt;sup>1)</sup>Stranding values are in brackets.



<sup>&</sup>lt;sup>2)</sup> See dedicated crimping instructions document for further information.

<sup>&</sup>lt;sup>9</sup> For a given AWG, the diameter of some stranded cable designs could be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4</sup>Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For maximum operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>5)</sup> Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies.

In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>6)</sup> Standard polarity only.

<sup>7)</sup> Layout dedicated to SPE data protocol 1 Gbit/s

					Wire	size <sup>3)</sup>		CB tacts	Current	Rated voltage	1	Test voltage [kl	/] in mated posit	ion
								m]	rating [A]	r.m.s [V]		IEC 60512-	4-1 Test 4a	
			(0	nm]				pin ø			AC	r.m.s.		OC
Size	Pin layout	Layout reference	Number of contacts	Contact diameter [mm]	Solder contacts <sup>1)</sup>	Crimp contacts <sup>2)</sup>	Pin ø	Ground pii	IEC 60512-5-2-5b	IEC 60664-1 <sub>5)</sub>	Contact to body	Contact to contact	Contact to body	Contact to contact
		002	2	0.9	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.70	0.7	9.2	≤ 250	1.3	1.7	1.8	2.4
		003	3	0.9	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.70	0.7	8.2	≤ 250	1.3	1.3	1.8	1.6
08		004	4	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	5.5	≤ 200	1.2	1.2	1.7	1.8
08		005	5	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	5.2	≤ 160	0.8	1.0	1.3	1.8
		007	7	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	4.0	≤ 160	0.8	1.0	1.3	1.8
		009	9	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	3.1	≤ 160	0.8	1.1	1.2	1.8

<sup>&</sup>lt;sup>1)</sup>Stranding values are in brackets.

<sup>&</sup>lt;sup>2)</sup> See dedicated crimping instructions document for further information.

<sup>&</sup>lt;sup>3)</sup> For a given AWG, the diameter of some stranded cable designs could be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4)</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For maximum operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>5)</sup>Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies.

In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

					Wire	size 3)		CB tacts	Current	Rated voltage	1	est voltage [kl	/] in mated positi	ion	
				[mi	******	SIZE		im]	rating [A]	r.m.s [V]		IEC 60512-	4-1 Test 4a		
	out	e e	er	it ier (n	ts <sub>1</sub>	ts <sup>2)</sup>		-	IEC	IEC	AC	r.m.s.		OC	
Size	Pin layout	Layout reference	Number of contacts	Contact diameter [mm]	Solder contacts <sup>1)</sup>	Crimp contacts <sup>2)</sup>	Pin ø	Ground pin ø	60512-5-2-5b	60664-1 <sub>5)</sub>	Contact to body	Contact to contact	Contact to body	Contact to contact	
		008	8	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	4.2	≤ 250	1.7	1.8	3.1	2.6	
	8)		2	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.40		9.0	≤ 250	1.3	1.6	1.9	2.2	
	USB 3.2	207	6	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	1.0	≤ 250	1.2	1.2	1.7	1.8	
11					1	0.5	max ø0.63 mm AWG24 [1] AWG26 [19/38]	-	0.40		1.0	≤ 250	1.2	1.2	1.7
		012	12	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.7	4.2	≤ 250	1.6	1.6	2.6	2.3	
		016	16	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	2.7	≤ 250	1.2	0.9	2.0	1.5	
		019	19	0.5	max ø0.43 mm AWG26 [1] AWG28 [19/40]	-	0.40	0.7	2.5	≤ 250	1.2	0.9	2.0	1.5	

<sup>1)</sup> Stranding values are in brackets.

<sup>&</sup>lt;sup>2)</sup> See dedicated wire gauge crimping instructions document for further information.

<sup>&</sup>lt;sup>3)</sup> For a given AWG, the diameter of some stranded cable designs could be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For maximum operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>5)</sup> Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies.

In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>&</sup>lt;sup>6)</sup> Not valid for UP50.

<sup>7)</sup> UR0x: standard polarity only.

<sup>8)</sup> Layout dedicated to protocol USB 3.2 Gen 2 (10 Gbit/s)

					Wire	size 3)		CB tacts	Current	Rated voltage	1	Test voltage [kl	/] in mated posit	ion
				[m]				nm]	rating [A]	r.m.s [V]		IEC 60512-	4-1 Test 4a	
	out	r ce	er tacts	ot ter (m	ts.	its 2)		7	IEC	IEC	AC	Cr.m.s. DC		ОС
Size	Pin layout	Layout reference	Number of contacts	Contact diameter [mm]	Solder contacts <sup>1)</sup>	Crimp contacts <sup>2)</sup>	Pin ø	Ground pin ø	60512-5-2-5b	60664-1	Contact to body	Contact to contact	Contact to body	Contact to contact
		2029)	2 <sup>8)</sup>	2.3	max ø3.28 mm AWG9 [19/22]	-	1.8	1.0	26	≤ 320	2.2	4.7	3.7	2.4
		203 <sup>9)</sup>	3	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.5	1.8	1	≤ 320	2.1	1.7	3.7	2.4
13		202	38)	1.6	max ø1.86 mm AWG13 [1] AWG14 [7/22]	-	1.5	1.5	16	≤ 320	2.6	1.6	3.6	2.4
	•.•)	303	3	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.5	0.5	1	≤ 320	2.6	1.0	3.6	2.4
		027	27	0.5	6) max ø0.43 mm AWG26 [1] AWG28 [19/40]	max ø0.43 mm min ø0.20 mm AWG28-32	0.40	0.7	2.0	≤ 200	1.2	0.5	1.8	0.5

<sup>1)</sup> Stranding values are in brackets.

<sup>&</sup>lt;sup>2)</sup> See dedicated wire gauge crimping instructions document for further information.

<sup>&</sup>lt;sup>3)</sup> For a given AWG, the diameter of some stranded conductor designs could exceptionally be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4)</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

Recommended operating voltage at sea level. This rated voltage is a general purpose guideline where no other electrical safety standard applies.

In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>&</sup>lt;sup>6)</sup> UR0x: standard polarity only.

<sup>7)</sup> Only valid for UP01.

<sup>8)</sup> Contact block with male contacts comes standard with advanced power contacts.

<sup>&</sup>lt;sup>9)</sup> UR0x: only available in "V" (Vacuum sealing) version, not in "W" (Water sealing) nor in "N" (Non sealing) versions.

				lı.	Wire	size <sup>2)</sup>	con	CB tacts	Current rating [A]	Rated voltage r.m.s [V]	Т	est voltage [kl		ion
	Ħ	ø	cts	<b>!!</b> [mm]	=	2 3	ĮII		IEC	IEC	AC	r.m.s.		DC .
Size	Pin layout	Layout reference	Number of contacts	Contact diameter /	Solder contacts <sup>1)</sup>	Crimp contacts <sup>2)</sup>	Pin ø	Ground pin ø	60512-5-2-5b	60664-1 4)	Contact Contact to body Contact to body		Contact to body	Contact to contact
		002 <sup>9)</sup>	2	3.0	max ø3.13 mm AWG9 [1] AWG10 [105/30]	-	2.5	2.5	30	≤ 400	1.2	1.6	2.3	3.0
	•••	004 <sup>9)</sup>	4	2.0	max ø2.03 mm AWG13 [1] AWG14 [7/22]	-	1.5	2.5	20	≤ 320	1.8	1.8	2.6	2.6
		204H <sup>8)</sup>	4 5)	1.3	max ø1.18 mm AWG17 [1] AWG18 [16/30]	-	-	-	12	≤ 320	1.5	2.3	2.8	3.5
			2 5)	coax	-	7)	-	-	7)	7)	7)	-	7)	-
15		008	8	1.3	max ø1.18 mm AWG17 [1] AWG18 [16/30]	-	1.0	1.0	10	≤ 320	1.7	2.0	2.5	2.8
		412 <sup>6)</sup>	4	1.6	max ø1.86 mm AWG13 [1] AWG14 [7/22]	-	1.5	2.5	14	1 250	1.6	1.3	2.8	2.1
		412 5/	12	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.5	2.5	1.0	≤ 250	1.0	1.2	1.5	2.0
		027	27	0.7	max ø0.79 mm AWG21 [1] AWG22 [7/30]	-	0.5	1.0	3.0	≤ 250	1.2	1.5	1.5	2.0

<sup>1)</sup> Stranding values are in brackets.

<sup>&</sup>lt;sup>2)</sup> For a given AWG, the diameter of some stranded conductor designs could exceptionally be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>3</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>4)</sup> Recommended operating voltage at sea level. This rated voltage is a general purpose guideline where no other electrical safety standard applies. In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>5)</sup> Standard polarity only.

<sup>&</sup>lt;sup>6)</sup> Contacts dia. 1.6 are positioned to make contact first and break last.

<sup>&</sup>lt;sup>7)</sup> Please refer to https://fischerconnectors.com/en/download-center/ for technical specification of coax insert.

<sup>&</sup>lt;sup>(3)</sup> Max 500 mating cycles due to coax insert characteristics. Coax contacts not included, must be purchased separately.

<sup>&</sup>lt;sup>9)</sup> UR0x: only available in "V" (Vacuum sealing) version, not in "W" (Water sealing) nor in "N" (Non sealing) versions.

			<b>s1</b>	m]	Wire size 3)		con	PCB Current rating [A]		Rated voltage r.m.s [V]	Test voltage [kV] in mated position IEC 60512-4-1 Test 4a				
	out	ce	er tacts	act eter [m	.ts 1)	ts 2)	T IEC		IEC IEC	IEC IEC		JEC IEC AC r.m.s.		DC	
Size	Pin lay	Layout referen	Numb of con	Contac	Solder	Crimp contac	Pin ø	Groun pin ø	60512-5-2-5b	60664-1 <sub>5)</sub>	Contact to body	Contact to contact	Contact to body	Contact to contact	
18		042	42 <sup>6)</sup>	0.7	-	max ø0.62 mm min ø0.38 mm AWG24-28	0.50	0.70	3.0	≤ 250	1.5	1.5	2.4	2.5	

<sup>&</sup>lt;sup>1)</sup> Stranding values are in brackets.

<sup>&</sup>lt;sup>2)</sup> See dedicated wire gauge crimping instructions document for further information.

<sup>&</sup>lt;sup>9</sup> For a given AWG, the diameter of some stranded cable designs could be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For maximum operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies.

In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>&</sup>lt;sup>6)</sup> Standard polarity only.

# **MECHANICAL CODING**

	Size	Code 1	Code 2	Code 3	Code 4
	07				
PLUGS	08	-	-	-	-
	11				
	13				
	15				
	18	1"	. —		1
Visual	coding	•	•		*

	Size	Code 1	Code 2	Code 3	Code 4
10	07				
RECEPTACLES	08	-			
REC	11		_		
	13				
	15				
	18	ı	l	l l	
Visual	coding	•	▼		*

FISCHER ULTIMATE™ SERIES PCB hole layout

#### **POLARITY**

**BODY STYLES** 

UP01 UP50 UR01



#### **POLARITY**

Standard polarity: male contacts on plug / female contacts on receptacle Inverted polarity: female contacts on plug / male contacts on receptacle. WARNING: for high-current applications, make sure to choose the correct polarity (female contacts on device that is supplying the power).



UR02



#### **PCB / PIN LAYOUT**

	ity				Number of co	ntacts (layout reference	ce)		
Size	Polarity	2 (002)	2 (0\$2)	3 (003)	4 (004)	5 (005)	7 (007)	9 (009)	10 (010)
07	Standard	Ø0.8°) 1 5°° 5°° 6°° 6°° 6°° 6°° 6°° 6°° 6°° 6°°	Ø0.8 1 2 1 Ø0.55	120°(3x) Ø0.8°) 60° LΩ 1 60° L	90°(4x) 90.8° us	90.8° 72°(5x) 10 36° 10° 72° 10° 10° 10° 10° 10° 10° 10° 10° 10° 10	Ø0.8 a) 60°(6x) LG 2 7 30° LG 4 5 Ø0.55	80.8° G G G G G G G G G G G G G G G G G G G	Ø0.8 <sup>a</sup> /54° (2x) (2x) (5) (5) (5) (5) (6) (6) (6) (6) (6) (6) (6) (6) (6) (6
0	Inverted	ф 1 2	1 2	3 2		1 2 5 3	2   3 7   1   0 7   1   0 6   0 5	9 2 8 12 3 7 4 6 5	10   3 9

<sup>&</sup>lt;sup>1)</sup> Recommended PCB hole dimensions may be adjusted to application.

a) For optional ground pin.

<b>(1)</b>	Polarity	Number of contacts (layout reference)							
Size	Pola	2 (002)	3 (003)	4 (004)	5 (005)	7 (007)	9 (009)		
œ	Standard	Ø0.8°) 1 0 9 2 00.85	120°(3x) 00.8°) 000 000 000 000 000 000 000 000 000 0	90° (4x)	90.8°) 72°(5x) 2 1 36° 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.8a) 60°(6x) 00 00 00 00 00 00 00 00 00 00 00 00 00	90.8° 09 09 09 09 09 09 09 09 09 09 09 09 09		
80	Inverted	Ф   1   2   1	3 2	Ф   2   2   3   0   0 3	1 2 5 3	0 2   3 70   10 + 4 6   4 6   5	9 2 8 1 3 7 4 6 5		

<sup>&</sup>lt;sup>1)</sup>Recommended PCB hole dimensions may be adjusted to application.

a) For optional ground pin.

FISCHER ULTIMATE™ SERIES PCB hole layout

# **PCB / PIN LAYOUT**

0	Polarity		Nu	umber of contacts (layout reference	ce)	
Size	Pole	8 (008)	9 (207)	12 (012)	16 (016)	19 (019)
	Standard	2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Ø0.8 Ø0.65 (2x) Ø5.0 Ø1.7 1 3 8 8 Ø4.6 Ø0.55 6 7	Ø0.8°	00.8°) 18° 2°° 4°° 4°° 4°° 4°° 4°° 4°° 4°° 4°° 4°	90.8°
11	Inverted	8	-	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccc}  & & & & & & & \\  & & & & & & & \\  & & & &$	18 7 2 29 17 6 7 2 29 17 6 7 2 29 17 6 7 2 29 16 5 7 2 3 3 11 15 4 4 2 12

<sup>&</sup>lt;sup>1)</sup> Recommended PCB hole dimensions may be adjusted to application.

a) For optional ground pin.

		Λ.	Number of contacts (layout reference	,)
Size	Polarity	2+3 (203)	3+3 (303)	27 (027)
13	Standard	91.9° 40- 207 06 3 5 5 6 2 91.95 4 00.65	Ø1.6a 00 00 00 00 00 00 00 00 00 0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
•	Inverted	5   3	1 4 3 2 2 5	50100000000000000000000000000000000000

<sup>&</sup>lt;sup>1)</sup>Recommended PCB hole dimensions may be adjusted to application.

<sup>&</sup>lt;sup>a)</sup> For optional ground pin.

	Ŀ		Nu	umber of contacts (layout referen	ce)	
Size	Polarity	2 (002)	4 (004)	8 (008)	4+12 (412)	27 (027)
15	Standard	Ø2.65	90° 01.65	91.1 45° (6χ) 0 3 2 5 1 8 0 91.15	88 8 10 2 2.5° 2.5° 2.5° 2.5° 2.5° 2.5° 2.5° 2.	01.1 15 15 14 18 6 5 14 19 7 1 14 13 10 20 8 2 1 1 12 27 21 22 9 10 10 26 23 24 24 00.65
	Inverted	1	1 2 2	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		13 15 16 17 18 18 19 20 20 26 10 9 21 22 22 22 22 22 22 22 22 22 22 22 22

<sup>&</sup>lt;sup>1)</sup> Recommended PCB hole dimensions may be adjusted to application.

<sup>&</sup>lt;sup>2)</sup> N/A for pin layout 204H.

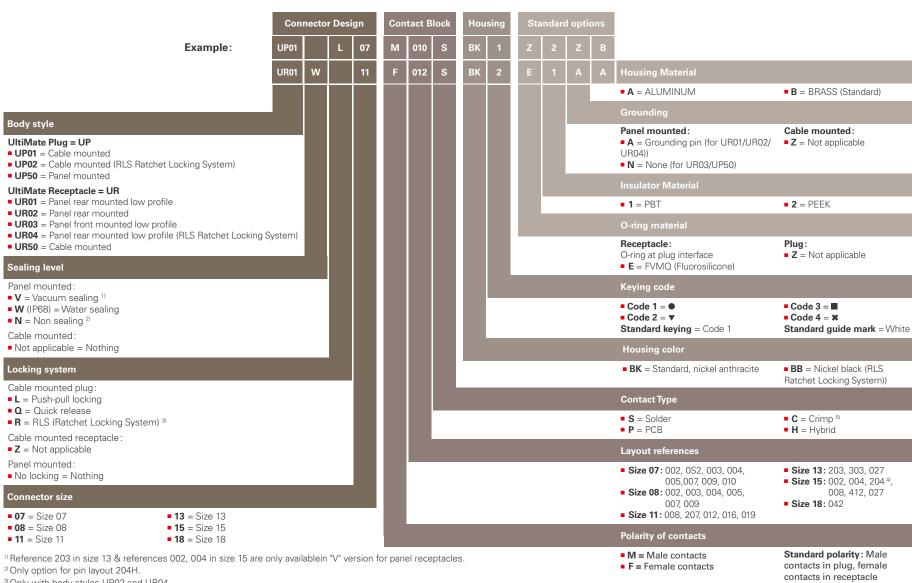
a) For optional ground pin.

		Number of contacts (layout reference)
Size	Polarity	42 (042)
18	Standard	\$\frac{90.8^{\alpha}}{1.6}\$  \[ \frac{25}{32 \rightarrow 19 \rightarrow 6} \rightarrow 0.2 \\ \frac{38}{4.8} \rightarrow 19 \rightarrow 6 \rightarrow 0.8 \\ \frac{37}{4.8} \rightarrow 19 \rightarrow 10 \rightarrow 0.8 \\ \frac{37}{4.8} \rightarrow 19 \rightarrow 10 \rightarrow 0.8 \\ \frac{37}{4.8} \rightarrow 19 \rightarrow 10 \rightarrow 0.8 \\ \frac{37}{4.8} \rightarrow 24 \rightarrow 11 \\ \frac{30.65}{31} \rightarrow 18 \\ \frac{33.2}{4.8} \\ \frac{4.8}{4.8} \\ \frac{30.65}{31} \rightarrow 18 \\ \frac{3.2}{4.8} \\ \frac{4.8}{3.2} \\ \frac{4.8}{4.8} \\ \frac{3.2}{3.2} \\ \frac{4.8}{4.8} \\ \frac{3.2}{3.2} \\ \frac{4.8}{3.2} \\ \frac{3.2}{3.2} \\ \frac{4.8}{3.2} \\ \frac{3.2}{3.2} \\ \
	Inverted	12

<sup>&</sup>lt;sup>1)</sup>Recommended PCB hole dimensions may be adjusted to application.

a) For optional ground pin.

#### **PLUGS & RECEPTACLES**



<sup>3)</sup> Only with body styles UP02 and UR04.

<sup>&</sup>lt;sup>4)</sup> Coax contacts must be ordered separately. Please refer to www.fischerconnectors.com/technical for Coax inserts details.

<sup>5)</sup> On request for panel receptacles

#### **BEND RELIEF**

#### Top performance, no hassle

- No tool required: 5 steps to assemble
- Clean cut: perfectly adjust the bend relief to your cable diameter with a simple blade

#### **Long lasting**

- Resists 10,000 flex cycles at a 90° angle
- Operating temperature-55 °C to +135 °C
- UV resistant



Standard color is black (BK)
Also available in grey (GY), blue (BL), yellow (YL), green (GN), violet (VT) upon request.

Please contact your Fischer Connectors sales representative.

#### **CUTTING DIAMETERS**

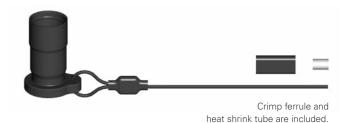
Size	Uncut	Level 1	Level 2	Level 3	Level 4	Part Number
07	ø1.9	ø2.9	ø3.9	ø4.9	-	UB07 A1BK
08	ø2.5	ø3.7	ø5.7	ø7.5	-	UB08 A1BK
11	ø3.9	ø5.4	ø6.9	ø8.9	-	UB11 A1BK
13	ø6.9	ø8.9	ø10.9	ø12.9	-	UB13 A1BK
15	ø6.9	ø8.6	ø10.1	ø11.8	-	UB15 A1BK
18	ø6.9	ø8.4	ø10.4	ø11.9	ø13.9	UB18 A1BK

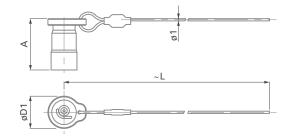


FISCHER **ULTIMATE™** SERIES **Accessories** 

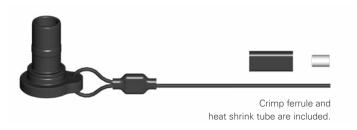
# **SOFT CAPS - LANYARD WITH POLYESTER CORD**

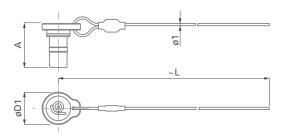
#### FIGURE 1



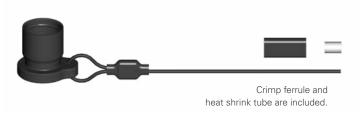


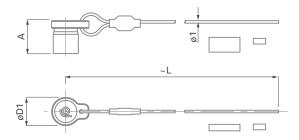
#### FIGURE 2







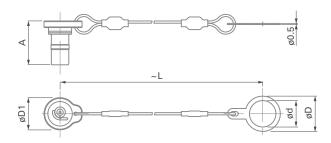




# **SOFT CAPS - LANYARD WITH POLYESTER CORD**

#### FIGURE 4





Size	PI	ug	g Receptacle		otacle		Α	øD1	L	ød	øD	Part number	Fig.
	UP01	UP50	UR01	UR02	UR03	UR50							
	•						18.5	11.0	200	-	-	UCP07C 1A1 A200	1
07			•	•	•	•	16.0	11.0	200	-	-	UCR07C 1A1 A200	2
07		•					12.8	11.0	200	-	-	UCP07P 1A1 A200	3
			•	•	0		16.0	11.0	95	10	14	UCR07P 1A1 A095	4
	•						23.2	14.6	200	-	-	UCP08C 1A1 A200	1
08			•	•	•	•	19.9	14.6	200	-	-	UCR08C 1A1 A200	2
			•	•	0		19.9	14.6	95	12	16	UCR08P 1A1 A095	4
	•						22.0	17.6	200	-	-	UCP11C 1A1 A200	1
11			•	•	•	•	19.2	17.6	200	-	-	UCR11C 1A1 A200	2
			•	•	0		19.2	17.6	95	16	21	UCR11P 1A1 A095	4
	•						25.0	20.7	200	-	-	UCP13C 1A1 A200	1
13			•	•	•	•	22.5	20.7	200	-	-	UCR13C 1A1 A200	2
			•	•			22.5	20.7	95	18	23	UCR13P 1A1 A095	4
45	•						25.0	20.7	200	-	-	UCP15C 1A1 A200	1
15			•	•			22.5	20.5	95	20	25	UCR15P 1A1 A095	4
40	•						29.5	28.7	200	-	-	UCP18C 1A1 A200	1
18			•	•			25.0	28.7	95	25	29	UCR18P 1A1 A095	4

<sup>•</sup> Recommended for optimal sealing.

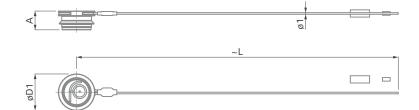
O Compatible but not recommended for optimal sealing.

FISCHER **ULTIMATE™** SERIES **Accessories** 

# **CAPS - LANYARD WITH POLYESTER CORD**

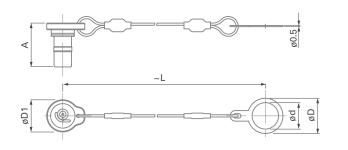
SOFT CAP PLUG





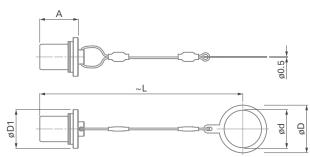
SOFT CAP RECEPTACLE





METAL CAP RECEPTACLE





Size	Plug	Rece	ptacle	A øD1		L	ød	øD	Part number
	UP02 (soft)	UR04 (soft)	UR04 (metal)						
	•			11.7	22.7	200	-	-	UPC15C 1A2 A200
15		•		22.5	20.5	95	22	28	UCR15P 1A1 A095 C
			•	22.6	22.7	95	22	28	UCR15P 4BKA3 A095

<sup>&</sup>lt;sup>1)</sup> Crimp ferrule and heat shrink tube are included.

#### **SPANNER & NUT DRIVER**

DOUBLE-ENDED OPEN SPANNER



# **OPEN SPANNER** EXTRATHIN ♀

Part number

TX00.015

TX00.017

TX00.019

TX00.020

TX00.022

TX00.027



Opening

across

flats

15

17

19

20

22

27

Length

145

160

175

175

196

240

Fork

thickness

5.2

5.5

6.0

6.0

6.5

7.4

#### NUT DRIVER WITH T-HANDLE AND HEX DRIVE ▶



Part number	Thread size	Nut outer dia.
TC00.000	M9 x 0.5	12
TC00.007	M10 x 0.5	13
TF00.001	M12 x 1	15
TK00.002	M16 x 1	20
TP00.011	M18 x 1	23
TP00.013	M20 x 1	25
TQ00.005	M25 x 1	31

Material - Hardened Tool Steel, Nickel plated.

Material – Chrome Vanadium Steel, Chrome plated, Fork Angle – 15°.

Part number	Opening across flats	Length	Fork thickness
TX00.008	8	96	2.3
TX00.009	9	102	2.5
TX00.010	10	104	2.5
TX00.011	11	114	2.5
TX00.014	14	130	3.0

Material - Chrome Alloy Steel, Chrome plated, Fork Angles - 15° and 75°.

**RLS (RATCHET LOCKING SYSTEM)** 

Part number	Opening across flats	Length	Fork thickness
TX00.022	22	196	6.5

Part number	Thread size	Nut outer dia.	øD	Hex drive
TR00.004	M24 x 1	28	32	12

Hex

drive

7

10

12

12

12

17

øD

15

16

18

23

26

28

35

FISCHER **ULTIMATE™** SERIES **Technical information** 

# **MATERIAL & SURFACE FINISH**

o			r	/laterial	F	inish	
Comp	omponents		Designation ISO Standard		Designation	Standard	
D 9	Spring sleeve (plu Mounting nut (rec	g), shell (plug), eptacle UR01 and UR02),	Aluminum AlMgSiSn1Bi	EN-AW-6023	Anthracite Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404	
releas	Bodies (all)		Brass CuZn39Pb3	CW614N UNS C 38500			
-pull 1 Quick	Back nut (plug & o Mounting nut (rec	cable mounted receptacle),	Aluminum AlMgSiSn1Bi	EN-AW-6023	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404	
Push-pull locking and Quick release			Brass CuZn39Pb3	CW614N UNS C 38500			
CI	Bodies (all) , mounting nut (receptacle UR04)		Aluminum AlMg1SiCu	EN-AW-6061	Black Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404	
	Shell (plug)		Aluminum AlMg1SiCu	EN-AW-6061	Hard Anodizing Black Teflon Impregnation	MIL-A-63576 Type I	
t Loc	Back nut (plug)		Aluminum AlMgSiSn1Bi	EN-AW-6023	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404	
(Katcnet Locking em)	Slotted ring, groun	nd contact	Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404	
RLS (Rate System)	Ratchet ring		Carbon PEEK		-	-	
RLS Syst	Compression spring		316 stainless steel		-	-	
Ground contact  Contacts  - Male, ground pin - Female		Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404		
			Brass; CuZn39Pb3 Bronze; CuSn4Zn4Pb4	CW614N; UNS C 38500 CW456K; ASTM B 139 UNS C 54400	1 μm Gold over Nickel	MIL-DTL-45204D Type I; ASTM B488	

Insulator and sealing		International symbol	Flammability
Insulator		PBT, PEEK <sup>1)</sup>	UL 94 V-0
Inner sleeve	- Cable connectors	POM	UL 94 HB
Sealant materials	Sealant materials - «V» Vacuum sealed connectors		UL 94 HB
	- «W» Water sealed connectors	Silicon compound	UL 94 V-0
Bend relief	- Cable connectors	Santoprene™ TPV 101-64	UL 94 HB

O-rings	International symbol	Chemical name
General	FPM (Viton°)	Fluoro elastomer
Interface and locking o-ring (Ratchet Locking System)	FVMQ	Fluorosilicone rubber

<sup>&</sup>lt;sup>1)</sup> PBT for size 08, 11, 13 and 18, PEEK for size 07, 15 and layout 207 for size 11 (USB 3.2 gen 2)

#### **MATERIAL & SURFACE FINISH**

Caps	Material	Flammability
Cap (soft)	TPV (Santoprene™)	UL 94 HB
Cap (metal)	Aluminum AlMg1SiCu	
Cord (soft and metal)	Polyester	-
Fixing lug	Anthracite plated brass (ISO CuZn37)	-
Crimp ferrule	Nickel plated copper	-

# **ENVIRONMENTAL & MECHANICAL DATA (PUSH-PULL LOCKING & QUICK RELEASE)**

Characteristic	Performance	Standard		
Sealing performance	Plug: IP68 2 m submersion for 24 hours	IEC 60529		
mated and unmated 3)	Receptacle "W": IP68 2 m submersion for 24 hours	IEC 60529		
	Receptacle "V": Hermetic, tested <10-8 mbar l/s	IEC 60068-2-17 Test Qk, Method 3		
Sealing performance soft caps	IP68 2 m submersion for 24 hours	IEC 60529		
Operating temperature range	-55 °C to +135 °C 1)	IEC 60068-2-14-Nb		
Corrosion resistance <sup>2)</sup> Salt mist, 1,000 hours, 5% salt solution, 35 °C;		IEC 60068-2-11 Test Ka; MIL-STD-202 Method 101; EIA-364-26		
Endurance	10,000 mating cycles <sup>4)</sup>	IEC 60512-9-1; EIA-364-09		
Vibration, random (Size 08, 11, 13, 15, 18)	37.8 Grms, 50-2000Hz, 3x4hrs, no discontinuity > 1 µs	MIL-STD-202 Method 214A Condition I; EIA-364-28 Condition V		
Vibration (Size 07)  10 to 2,000 Hz, 1.5 mm or 15 g, 12 sweep cycles per axis, 20 minutes per 10-2,000-10 Hz sweep cycle, no discontinuity > 1 us;		MIL-STD-202 Method 204 Condition B		
Shock	300g amplitude, half sine pulse of 3 ms, no discontinuity > 1 µs	MIL-STD-202 Method 213; EIA-364-27		

<sup>1)</sup> Temperature range of -40 °C to +125 °C for cable connectors overmolded with TPU material. Max. temperature of +85 °C for soft caps.

<sup>&</sup>lt;sup>2)</sup> Plug and receptacle in mated position or with cap when unmated. For Brass connectors only.

Aluminum version not recommended for Marine use. Preserved mechanical and electrical functionality. Visual aspect might be altered.

<sup>&</sup>lt;sup>3)</sup> Sealing performance of pin layout 204H valid only in mated condition due to coax insert.

<sup>&</sup>lt;sup>4)</sup>500 mating cycles for pin layout 204H due to coax insert.

# **ENVIRONMENTAL & MECHANICAL DATA (RLS - RATCHET LOCKING SYSTEM)**

Characteristic	Performance	Standard		
Sealing performance <sup>1)</sup> plug (mated and unmated)	IP68 2 m submersion for 24 hours	IEC60529		
Sealing performance 1) receptacle	"W" sealing level: IP68 2 m submersion for 24 hours	IEC60529		
	"V" sealing level: Hermetic : Tested: <10 <sup>-8</sup> mbar l/s	IEC60068-2-17 Test Qk, Method 3		
Sealing performance [P68 2 m submersion for 24 hours]		IEC 60529		
Operating temperature range -55 °C to +135 °C <sup>2)</sup>		IEC 60068-2-14-Nb		
Corrosion resistance Salt mist, 350 hours, 5% salt solution, 35 °C		IEC 60068-2-11 Test Ka; MIL-STD-202 Method 101; EIA-364-26		
ndurance	3,000 mating cycles 3)	IEC 60512-9-1; EIA-364-09		
Vibration, random	37.8 Grms, 50-2000Hz, 3x4hrs, no discontinuity > 1 μs	MIL-STD-202H, Method 214, condition I , Letter J EIA-364-28 Condition V		
Vibration, sinus	30g, 10-2000Hz, 3x4hrs, no discontinuity > 1 μs	MIL-STD-202H Method 204 Condition G		
Shock	300g amplitude, half sine pulse of 3 ms, no discontinuity > 1 µs	MIL-STD-202H Method 213 ; EIA-364-27		

<sup>&</sup>lt;sup>1)</sup> Sealing performance of pin layout 204H valid only in mated condition due to coax insert.

#### **ELECTRICAL DATA** 3)

Characteristic Contact s		Typical values	Standard
Contact resistance over 10,000 mating cycles	ø0.5 mm ø0.7 mm ø0.9 mm ø1.6 mm ø2.3 mm	5.0 mΩ 5.0 mΩ 4.0 mΩ 2.5 mΩ 2.5 mΩ	IEC 60512-2-1-2a IEC 60512-2-2-2b
Shell resistance <sup>1)</sup> (Push-pull locking and quic	k-release)	< 5.0 mΩ	IEC 60512-2-6-2f
Shell resistance 1) (RLS Ratchet Locking System)		< 10.0 mΩ	IEC 60512-2-6-2f
Insulation resistance		> 10 <sup>10</sup> Ω	IEC 60512-3-1-3a Method C
Shielding effectiveness 2)		> 54 dB	up to 1 GHz, IEC 60512-23-3

<sup>&</sup>lt;sup>1)</sup> Measurement points on Figure 1.

# **DATA TRANSMISSION**

<b>●</b> ✓ •	SS←	器		UHĐ♠测□
USB 2.0	USB 3.2	ETHERNET	SINGLE PAIR ETHERNET	AUDIO/VIDEO
480 Mbit/s	10 Gbit/s	1 Gbit/s	1 Gbit/s	10.2 Gbit/s
Size 07 004	Size 11 207	Size 07 009	Size 07 0S2	Size 11 019

<sup>&</sup>lt;sup>2)</sup> Temperature range of 40° C to + 125 °C for cable connectors overmolded with TPU material. Maximum temperature of +85 °C for soft caps.

<sup>&</sup>lt;sup>3)</sup> 500 mating cycles for pin layout 204H due to coax insert

<sup>2)</sup> Size 08 connector pair.

<sup>&</sup>lt;sup>3)</sup> Please refer to www.fischerconnectors.com/technical for technical specification of coax insert.

H-35 / H-46

#### **PLUGS**

	PRE-CABLED SOLUTION	
W Co	■ Body styles  ■ Technical dimensions	

# **ULTIMATE USB-C**

#### **RECEPTACLES**



PRE-CABLED SOLUTION	1
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۱	bouy styles	П-30
ı	Technical dimensions	H-39

#### **FOR ULTIMATE USB-C**

Pre-cabled plug configurations	H-41
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This catalog covers our standard connector solutions. For specific requests, including hybrid or custom connectors, please contact your local sales representative.



1120

FISCHER ULTIMATE™ USB-C

Body styles

# **PLUGS**



Body style  UP02 (to USB-C)  UP02 (to UP02)  References to detailed information  Protection  Sealed up to IP68 21  • Sealing categories, page A-6  Locking system  RLS Ratchet Locking System  • Locking systems, page A-5  Termination  Cabled to  USB-C  UP02R15  Housing material  Housing color  Black 11  • • Part numbering, page H-42  Design  Straight  Right-angle  Cabling  Overmolded  • • Accessories  Sealing caps  • Accessories, page H-43  Size  15			-		
Locking system RLS Ratchet Locking System  ■ USB-C UP02R15  Housing material Aluminum ■ ■ Part numbering, page H-42  Housing color Black ¹¹ ■ ■ Body styles, page H-37  Cabling Overmolded ■ ■ Accessories Sealing caps ■ Accessories, page H-43	Body style	U	P02 (to USB-C)	UP02 (to UP02)	References to detailed information
Termination  Cabled to  USB-C  UP02R15  Housing material Housing color  Black 1)  Straight  Right-angle  Cabling  Overmolded  Accessories  Sealing caps  UP02R15   UP02R15      Part numbering, page H-42   Body styles, page H-37  Body styles, page H-37  Accessories, page H-43	Protection Sealed u	to IP68 <sup>2)</sup>	•	•	Sealing categories, page A-6
Housing material Aluminum  Housing color Black <sup>1)</sup> Straight  Right-angle  Cabling Overmolded  Accessories  Sealing caps  Accessories  Aluminum  Part numbering, page H-42  Body styles, page H-37  Body styles, page H-37  Accessories, page H-43	Locking system RLS Rate	net Locking System	•	•	Locking systems, page A-5
Housing color  Black 1)  Straight  Right-angle  Cabling  Overmolded  Accessories  Sealing caps  Part numbering, page H-42   Body styles, page H-37  Body styles, page H-37  Accessories  Accessories, page H-43	Termination Cabled to		USB-C	UP02R15	
Housing color  Black 1)  Straight  Right-angle  Cabling  Overmolded  Accessories  Sealing caps  Accessories  Black 1)  Body styles, page H-37  Body styles, page H-37  Accessories  Accessories, page H-43	Housing material Aluminu	n	•	•	Port numbering, page H 42
Body styles, page H-37       Right-angle     Body styles, page H-37       Cabling     Overmolded     •       Accessories     Sealing caps     •     Accessories, page H-43	Housing color Black 1)		•	•	ran numbering, page n-42
Right-angle  Cabling Overmolded   Accessories Sealing caps   Accessories Accessories, page H-43			• • Bod		Pody styles page U 27
Accessories Sealing caps    Accessories, page H-43		le			Body Styles, page n-37
	Cabling Overmol	ed	•	•	
Size 15 • Technical dimensions, page H-37	Accessories Sealing of	aps	•	•	Accessories, page H-43
	Size 15		•	•	Technical dimensions, page H-37

<sup>&</sup>lt;sup>1)</sup>Due to surface treatment process, color may slightly differ from one product to another without impacting technical specifications or product properties.

<sup>&</sup>lt;sup>2)</sup>UP02 is IP68 mated or with sealing cap.

# **PLUGS**

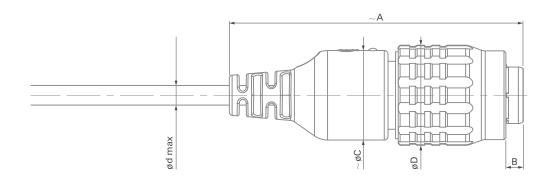
### **PRE-CABLED**

SOLUTION

UP02

**BODY STYLE** 





Size	А	В	С	øD	ød max
15	78.0	4.5	23.8	26.5	5.0

FISCHER ULTIMATE™ USB-C

Body styles

#### **RECEPTACLES**

#### PRE-CABLED



Body style		UR04	References to detailed information
Ductostion	Sealed up to IP68 1)	•	Cooling actoroxics mass A.C.
Protection	Hermetic	•	Sealing categories, page A-6
Termination	Flex 2)	•	
Housing material	Aluminum	•	Post numbering mass II 42
Housing color	Black 3)	•	Part numbering, page H-42
Straig	Straight	•	
Design	Right-angle		Park styles was II 20
	Flush		Body styles, page H-39
Assembly	Assembly Rear-mounting		
Cabling	Overmolded		
Accessories	Sealing caps	•	Accessories, page H-43
Size	15	•	Technical dimensions, page H-39

<sup>1)</sup> IP68 mated or with sealing cap.

<sup>&</sup>lt;sup>2)</sup> Flex terminated with connector Hirose BM24-24DP/2-0.35V, mate with connector Hirose BM24-24DS/2-0.35V.

<sup>&</sup>lt;sup>3</sup> Due to surface treatment process, color may slightly differ from one product to another without impacting technical specifications or product properties.

### **RECEPTACLES**

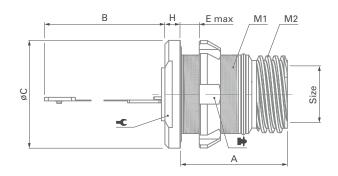
# PRE-CABLED

SOLUTION

**UR04** 

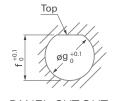
**BODY STYLE** 





Size	Α	В	øС	E max	н	M1	M2	<b>-c</b>	•	Torque
15	27.7	60.0	28.0	9.0	4.0	M22x1	TR20x6 (P2)	22	TR00.004	8 Nm

Size	f	øg
15	20.5	22.1



PANEL CUT-OUT

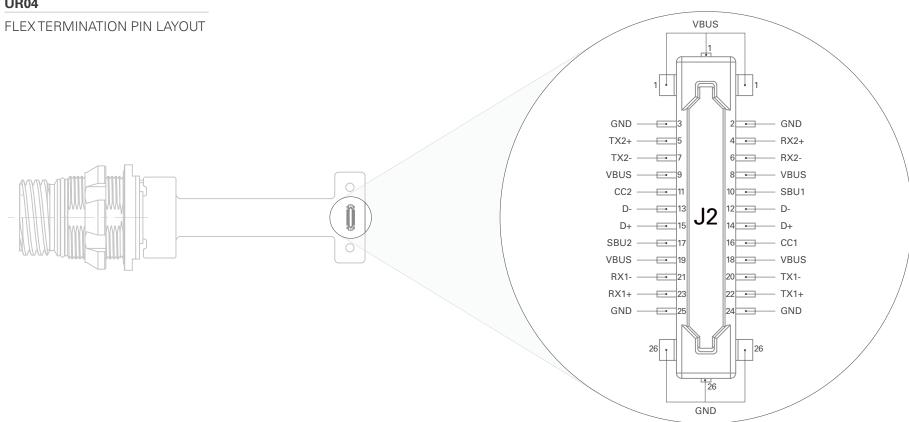
Flex PCB layout FISCHER ULTIMATE™ USB-C

### **RECEPTACLES**

# **PRE-CABLED**

SOLUTION

#### **UR04**



#### **CABLE SPECIFICATION**

■ **Differential Impedance:** 85 +/- 10 Ohms

■ Breaking strength: 300N

■ Working temperature: -30 °C to +85 °C

■ Overall diameter: nominal 4.6 mm +/- 0.20 mm

#### PRE-CABLED PLUG SOLUTION

UP02 TO UP02



STANDARD REFERENCE	Termination 1 UP02R15	Overall length = 0.8m	Termination 2 UP02R15	
143139 CA D 16XLV UP02R15/UP02R15 TPE BK 0.8M				

#### PRE-CABLED PLUG SOLUTION

UP02 TO USB-C

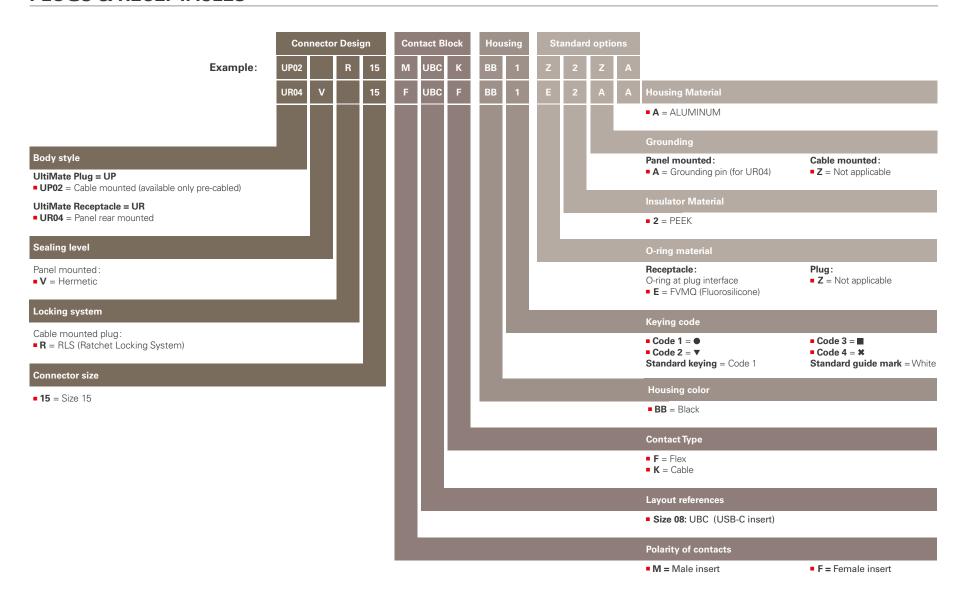


STANDARD REFERENCE	Termination 1 UP02R15	Overall length 0.8m	Termination 2 USB-C	
143140 CA D 16XLV UP02R15/USB-C TPE BK 0.8M				



FISCHER **ULTIMATE™ USB-C**Part numbering

#### **PLUGS & RECEPTACLES**

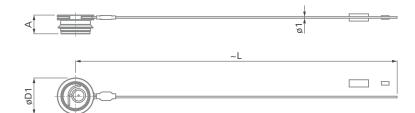


Accessories FISCHER ULTIMATE™ USB-C

### **CAPS - LANYARD WITH POLYESTER CORD**

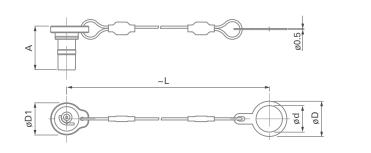
SOFT CAP PLUG





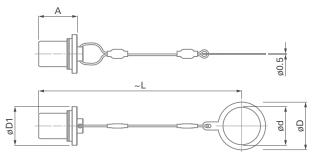
SOFT CAP RECEPTACLE





METAL CAP RECEPTACLE





Size	Plug	Receptacle		А	øD1	L	ød	øD	Part number
	UP02 (soft)	UR04 (soft)	UR04 (metal)						
	•			11.7	22.7	200	-	-	UPC15C 1A2 A200
15		•		22.5	20.5	95	22	28	UCR15P 1A1 A095 C
			•	22.6	22.7	95	22	28	UCR15P 4BKA3 A095

 $<sup>^{\</sup>mbox{\tiny 1)}}\mbox{Crimp}$  ferrule and heat shrink tube are included.



FISCHER ULTIMATE™ USB-C Tooling

# **SPANNER & NUT DRIVER**

# **OPEN SPANNER** EXTRATHIN ¥



# NUT DRIVER WITH T-HANDLE AND HEX DRIVE ➡



Part number	Opening across flats	Length	Fork thickness
TX00.022	22	196	6.5

Material – Chrome Vanadium Steel, Chrome plated, Fork Angle – 15°.

Part number	Thread size	Nut outer dia.	øD	Hex drive
TR00.004	M24 x 1	28	32	12

Material - Hardened Tool Steel, Nickel plated.

Technical information FISCHER ULTIMATE™ USB-C

### **MATERIAL & SURFACE FINISH**

Components		IV	laterial attention of the state		Finish
		Designation ISO	Standard	Designation	Standard
Bodies (all), mountir	ng nut (receptacle UR04)	Aluminum AlMg1SiCu	EN-AW-6061	Black Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404
Shell (plug)		Aluminum AlMg1SiCu	EN-AW-6061	Hard Anodizing Black Teflon Impregnation	MIL-A-63576 TYPE I
Back nut (plug)		Aluminum AlMgSiSn1Bi	EN-AW-6023	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404
Slotted ring, ground	contact	Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404
Ratchet ring		Carbon PEEK	-	-	-
Compression ring		316 stainless-steel	EN1.4401 UNS S31600	-	-
Contacts	- Male, ground pin	Brass; CuZn39Pb3	CW614N; UNS C 38500	1 μm Gold over Nickel	MIL-DTL-45204D
Flex PCB		FR4 + Polyimide (UL 94 V-0)	-	-	-

Insulator and sealing	g	International symbol	Flammability
Insulator		PEEK	UL 94 V-0
Inner sleeve		POM	UL 94 HB
Sealant materials	- Receptacle	Bi-component Epoxy compound	UL 94 HB
	- Plug	Bi-component Polyurethane compound	UL 94 V-0

Caps	Material	Flammability
Cap (soft)	TPV (Santoprene™)	UL 94 HB
Cap (metal)	Aluminum <sup>1)</sup> AlMgSiSn1Bi	-
Cord	Polyester	-
Fixing lug	Anthracite plated brass (ISO CuZn37)	-
Crimp ferrule	Nickel plated copper	-

O-rings	International symbol	Chemical name
General	FPM (Viton <sup>®</sup> )	Fluoro elastomer
Interface and locking o-ring (RLS Ratchet Locking System)	FVMQ	Fluorosilicone rubber

<sup>&</sup>lt;sup>1)</sup> Material standard: EN-AW-6061. Finish: Black Nickel. Standard: SAE-AMS-QQ-N-290, SAE-AMS 2404.



### **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance	Standard
Sealing performance	Plug (mated or with cap): IP68 2 m submersion for 24 hours Plug (unmated): IP50	IEC 60529
	Receptacle (mated and unmated): IP68 2 m submersion for 24 hours, Hermetic : Tested: <10-8 mbar l/s	IEC 60529 IEC 60068-2-17 Test Qk, Method 3
Sealing performance caps	IP68, 2 m submersion for 24 hours	IEC 60529
Operating temperature range	-30 °C to +80°C	IEC 60068-2-14-Nb
Corrosion resistance (mated)	Salt mist, 350 hours, 5% salt solution, 35 °C	IEC 60068-2-11 Test Ka; MIL-STD-202 Method 101; EIA-364-26
Endurance	3,000 mating cycles 1)	IEC 60512-9-1; EIA-364-09
Vibration, random	5.35 Grms, 50-2000Hz, 3x1.5hrs, no discontinuity > 1 μs	MIL-STD-202 Method 214A Condition I; Letter A
Vibration, sinus	10g, 10-500Hz, 3x3hrs, no discontinuity > 1 μs	MIL-STD-202 Method 204 Condition A
Shock	100 g peak, half sine pulse of 6 ms, no discontinuity > 1 μs	MIL-STD-202 Method 213

<sup>&</sup>lt;sup>1)</sup> Flex PCB connector from Hirose on panel receptacle limited to 10 mating cycles.

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# **ULTIMATE 80**



#### **PLUGS**

With	PRE-CABLED SOLUTION	
1	■Body styles (UP81)	
	Technical dimensions	H-49
	CONNECTOR	
G.	■Body styles (UP81)	H-48
200	■Technical dimensions	H-49
	PANEL REAR MOUNTED	
	■Body styles (UP80)	H-48
Marin S.	■Technical dimensions	H-5(
RECEPTAC	LES	
160	PRE-CABLED SOLUTION	

W	PRE-CABLED SOLUTION  ■ Body styles (UR80)  Technical dimensions	H-51 H-52
	CONNECTOR  ■ Body styles (UR80)  Technical dimensions	H-51 H-52
	PANEL REAR MOUNTED  ■ Body styles (UR81)  Technical dimensions	H-51 H-53

#### **FOR ULTIMATE 80**

■ Electrical & contact configurations ■ PCB hole layout ■ Mechanical coding.	H-55 H-55
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<ul><li>Accessories</li><li>Tooling</li></ul>	
■ Technical information	H-60

This catalog covers our standard connector solutions. For specific requests, including hybrid or custom connectors, please contact your local sales representative.



FISCHER ULTIMATE™80

Body styles

# **PLUGS**

		PRE-CABLED	CONNECTOR	PANEL PLUG		
Body style		UP81	UP81	UP80	References to detailed information	
Protection	Sealed up to IP68	•		•	Sealing categories, page A-6	
Locking system	Quick-release	•	•	•		
Termination	Crimp contact	•	•			
	Solder			•	Electrical & contact configurations, page H-54	
	РСВ			•		
Housing material	Aluminum	•	•	•	Part numbering, page H-56	
Housing color	Black 1)	•	•	•	Part numbering, page H-56	
Design	Straight	•		•	Body styles, page H-49	
	Right-angle					
Cabling	Overmolded	•				
Accessories	Sealing caps	•	•	•	Accessories, page H-59	
Size	08	•	•	•	Technical dimensions, page H-49	

<sup>&</sup>lt;sup>1)</sup>Due to surface treatment process, color may slightly differ from one product to another without impacting technical specifications or product properties.

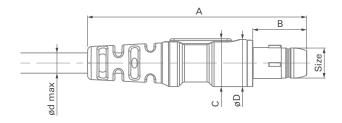
#### **PLUGS**

#### **PRE-CABLED**

**UP81** 

**BODY STYLE** 





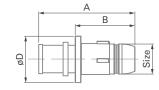
Size	А	В	С	øD	ød max
08	58.0	14.2	12.6	12.4	5.5

### **CONNECTOR**

#### **UP81**

**BODY STYLE** 





Size	А	В	øD
08	25.2	15.7	12.4

FISCHER **ULTIMATE™80** Technical dimensions

# **PLUGS**

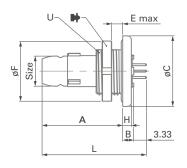
# **PANEL REAR**

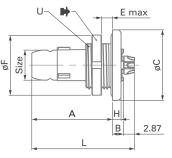
MOUNTED

# **UP80**

**BODY STYLE** 





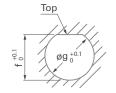


PCB

SOLDER

Size	Termination	Α	В	øC	U	øF	E max	L	•	Torque
00	PCB	21.2	2.9	18.54	1/2-32UN-2A	15.9	3.2	27.43	TX00.401	2.5 Nm
08	Solder	21.2	2.9	18.54	1/2-32UN-2A	15.9	3.2	26.97	TX00.401	2.5 Nm

Size	f	øg
08	12.05	12.8



PANEL CUT-OUT

Body styles FISCHER ULTIMATE™80

# **RECEPTACLES**

# PRE-CABLED SOLUTION CONNECTORS









				10000	
Body style		UR80	UR81	UR80	References to detailed information
Protection	Sealed up to IP68	•	•		Sealing categories, page A-6
	Crimp contact	•		•	
Termination	Solder contact		•		Electrical & contact configurations, page H-54
	PCB contact		•		
Housing material	Aluminum	•	•	•	Part numbering, page H-56
Housing color	Black 2)	•	•	•	Part numbering, page H-56
	Straight	•	•		
Design	Right-angle				Dedication was U.54
	Flush		•		Body styles, page H-51
Assembly Rear-mounting			•		
Cabling	Overmolded	•			
Accessories	Sealing caps	•	•	•	Accessories, page H-59
Size	08	•	•	•	Technical dimensions, page H-52

<sup>&</sup>lt;sup>1)</sup> KIT is delivered with receptacle body, contact block, crimp contacts and crimp shield ferule. SAP 139351

<sup>&</sup>lt;sup>21</sup>Due to surface treatment process, color may slightly differ from one product to another without impacting technical specifications or product properties.

FISCHER **ULTIMATE™80** Technical dimensions

# **RECEPTACLES**

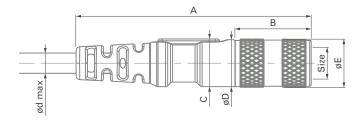
# PRE-CABLED

SOLUTION

# **UR80**

**BODY STYLE** 





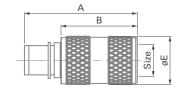
Size	Α	В	С	øD	øΕ	ød max
08	62.2	20.2	12.6	12.4	12.8	5.5

# **CONNECTORS**

# **UR80**

**BODY STYLE** 





Size	А	В	øE
08	29.6	20.2	12.8

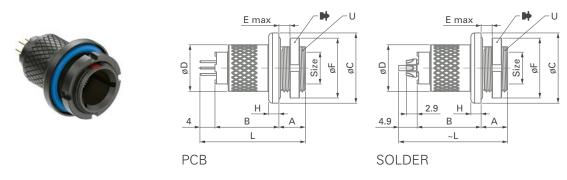
# **RECEPTACLES**

# **PANEL REAR**

**MOUNTED** 

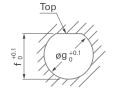
**UR81** 

**BODY STYLE** 



Size	Termination	Α	В	øС	øD	U	øF	н	E max	L	•	Torque
08	РСВ	7.0	16.9	18.6	12.3	1/2-32 UN-2A	15.9	2.8	3.2	27.9	TX00.401	2.5 Nm
06	Solder	7.0	16.9	18.6	12.3	1/2-32 UN-2A	15.9	2.8	3.2	28.8	TX00.401	2.5 Nm

Size	f	øg
08	12.05	12.8



PANEL CUT-OUT

# **ELECTRICAL & CONTACT CONFIGURATIONS**

		v	Wire size 3) PCB contacts		Current rating [A]			Test voltage [kV] in mated position IEC 60512-4-1 Test 4a					
			s	[mm]			iec lec	IEC 60664-1 5)	AC r.m.s. DC		С		
	Pin layout	Layout reference	Number of contacts	/ ·	Solder contacts <sup>2)</sup>	Crimp contacts Pin diamet	60512-5- 2-5b		Contact to body	Contact to contact	Contact to body	Contact to contact	
00		006 /105 <sup>1)</sup>	6	0.7	max ø1.02 mm AWG19 [1] AWG20 [26/34]	max ø0.85 mm min ø0.48 mm AWG22-28	0.5	2x 9 2x 2 2x 0.02	≤ 200	0.8	1.3	1.5	2.3
08		007 /106 <sup>1)</sup>	7	0.7	max ø1.02 mm AWG19 [1] AWG20 [26/34]	max ø0.85 mm min ø0.48 mm AWG22-28	0.5	2x 9 3x 2 2x 0.02	≤ 200	0.8	1.3	1.5	2.3

<sup>&</sup>lt;sup>1)</sup> First digit indicates the number of first mate last break (FMLB) contacts.

<sup>&</sup>lt;sup>2)</sup> Solder contacts option only for UR81 and UP80 in replacement of the standard PCB contacts.

<sup>&</sup>lt;sup>3)</sup> For a given AWG, the diameter of some stranded cable designs could be larger than the hole diameter of the barrel. Testing may be required.

<sup>&</sup>lt;sup>4</sup>Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For maximum operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>5)</sup> Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies. In cases where other standards rule a specific use of the connector, the application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>6)</sup> Alternatively, only 2 contacts loaded: 2x 10 A

# **PCB / PIN LAYOUT**

# View from the front of the plug / receptacle 1)

		Number of contact	s (layout reference)
Size	Туре	006 / 105	007 / 106
80	Plug	Ø0.65 1 2 60° 6	
Ö	Receptacle	Ø0.65 2 1 60° Ø3.88 4 5	90.65 2 1 60° 93.88 4 5

<sup>&</sup>lt;sup>1)</sup>Recommended PCB hole dimensions may be adjusted to application.

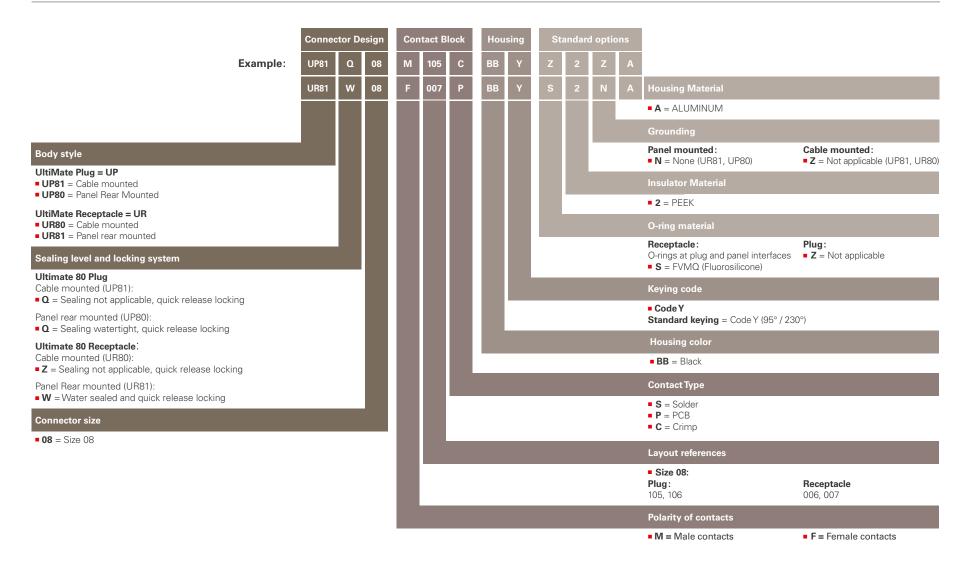
# **MECHANICAL CODING 2)**

	Code Y	ES	Code Y
PLUGS		RECEPTACL	

<sup>&</sup>lt;sup>2)</sup>View from front of connectors. For further details see part numbering.

FISCHER ULTIMATE™80 Part numbering

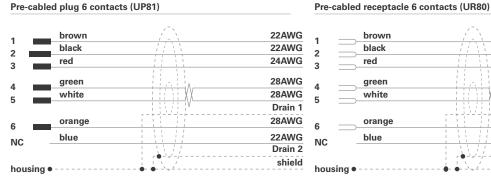
# **PLUGS & RECEPTACLES**

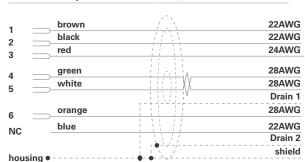


# CABLE SPECIFICATION FOR PRE-CABLED 6 CONTACTS

- PUR halogen free, flame retardant outer sheath, nominal thickness 0.55 mm, TAN (RAL 7002 matt) / BLACK (RAL 9005 matt)
- Working voltage: 300 V
- Weight: 52 kg/km

- Breaking strength: 800 N (Vectran central strength member)
- Minimum bending radius: 27 mm static / 60 mm dynamic
- Working temperature:-40 °C to +90 °C
- Overall diameter: nominal 5.40 mm +/-0.20 mm





### AWG22

Tinned copper conductor 19x0.16 mm / FEP insulation, nominal diameter 1.20 mm, color blue, brown, black

### AWG24

Tinned copper conductor 19x0.13 mm / FEP insulation, nominal diameter 0.86 mm, color red

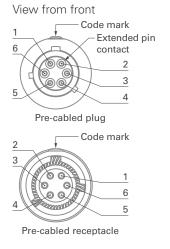
### AWG28

Tinned copper conductor 7x0.13 mm / FEP insulation, nominal diameter 0.90 mm, color white, green / Cores twisted in a pair 90 ohm / Screen of aluminium/polyester tape, tinned copper drain wire 7x0.13 mm, polyester tape

### Shield

Overall screen of aluminium/polyester tape, tinned copper drain wire 7x0.13 mm / Overall tinned copper shield, nominal coverage >= 90%

# WIRING DIAGRAM FOR STANDARD PRE-CABLED 6 CONTACTS



WIRE	PRE-CABLED PLUG SOLUTION 1 m, open end
	Pin number
AWG22 brown	1
AWG22 black	2 Extended pin
AWG24 red	3
AWG28 green	4
AWG28 white	5
AWG28 orange	6
AWG22 blue	Not connected
D. C. L.	<b>140599</b> CA S 06 UP81Q08BBYA/OE PURTN 1.0M
Part number	<b>140608</b> CA S 06 UP81Q08BBYA/OE PUR BK 1.0M

WIRE	PRE-CABLED RECEPTACLE SOLUTION 1 m, open end
	Pin number
AWG22 brown	1
AWG22 black	2
AWG24 red	3
AWG28 green	4
AWG28 white	5
AWG28 orange	6
AWG22 blue	Not connected
	<b>140601</b> CA S 06 UR80Z08BBYA/OE PURTN 1.0M
Part number	<b>140610</b> CA S 06 UR80Z08BBYA/OE PUR BK 1.0M

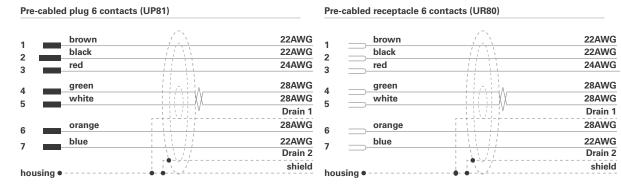
REMARK: Pin No. can be assigned according to NATO AEP-4851 & NATO AEP-4695.



# CABLE SPECIFICATION FOR PRE-CABLED 7 CONTACTS

- PUR halogen free, flame retardant outer sheath, nominal thickness 0.55 mm, TAN (RAL 7002 matt) / BLACK (RAL 9005 matt)
- Working voltage: 300 V
- Weight: 52 kg/km

- Breaking strength: 800 N (Vectran central strength member)
- Minimum bending radius: 27 mm static / 60 mm dynamic
- Working temperature:-40 °C to +90 °C
- Overall diameter: nominal 5.40 mm +/-0.20 mm



### AWG22

Tinned copper conductor 19x0.16 mm / FEP insulation, nominal diameter 1.20 mm, color blue, brown, black

### AWG24

Tinned copper conductor 19x0.13 mm / FEP insulation, nominal diameter 0.86 mm, color red

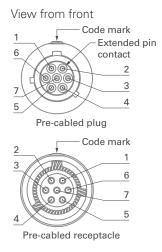
### AWG28

Tinned copper conductor 7x0.13 mm / FEP insulation, nominal diameter 0.90 mm, color white, green / Cores twisted in a pair 90 ohm / Screen of aluminium/polyester tape, tinned copper drain wire 7x0.13 mm, polyester tape

### Shield

Overall screen of aluminium/polyester tape, tinned copper drain wire 7x0.13 mm / Overall tinned copper shield, nominal coverage >= 90%

# WIRING DIAGRAM FOR STANDARD PRE-CABLED 7 CONTACTS



WIRE	PRE-CABLED PLUG SOLUTION  1 m, open end
*****	Pin number
AWG22 brown	1
AWG22 black	2 Extended pin
AWG24 red	3
AWG28 green	4
AWG28 white	5
AWG28 orange	6
AWG22 blue	7
<b>.</b>	<b>140600</b> CA S 07 UP81Q08BBYA/OE PURTN 1.0M
Part number	<b>140609</b> CA S 07 UP81Q08BBYA/OE PUR BK 1.0M

WIRE	PRE-CABLED RECEPTACLE SOLUTION 1 m, open end	
	Pin number	
AWG22 brown	1	
AWG22 black	2	
AWG24 red	3	
AWG28 green	4	
AWG28 white	5	
AWG28 orange	6	
AWG22 blue	7	
Part number	<b>140602</b> CA S 07 UR80Z08BBYA/OE PURTN 1.0M	
rait ilumber	<b>140611</b> CA S 07 UR80Z08BBYA/OE PUR BK 1.0M	

# **SOFT CAPS - LANYARD WITH STAINLESS STEEL CABLE**

# **NUT DRIVER (FOR UR81)**

# NUT DRIVER WITH SQUARE SOCKET\*



\* For use with torque wrenches 1/4" (6.4 mm).

Part number	Nut thread size	Nut outer dia.	øD
TX00.401	1/2-32 UN	16	20

Material – PA

Size	Plug		Receptacle		A øD1		L	ød	øD	Part number	
	UP80	UP81	UR80 1)	UR81							
			•		10.0	12.7	200	-	-	UCR80C 1B2 A200	
00				•	10.0	12.7	95	12.8	16	UCR80P 1B2 A095	
08	•				16.9	12.7	95	12.8	16	UCP80P 1B2 A095 AA	
		•			16.9	12.7	200	-	-	UCP80C 1B2 A200 AA	

<sup>&</sup>lt;sup>1)</sup> Crimp ferrule and heat shrink tube are included.

FISCHER **ULTIMATE™80** Technical information

# **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance	Standard
Sealing performance mated and unmated	IP68 2m/24h	IEC 60529; MIL-STD-810 Method 512.6
Operating temperature range	-55 °C to +135 °C	MIL-STD-810 Method 501.6 and 502.6
Corrosion resistance	Salt mist, 500 hours <sup>1) 2)</sup> , 5% salt solution, 35 °C;	MIL-STD-810 Method 509.6
Endurance	10.000 mating cycles (plug), 5.000 mating cycles (receptacle) 3)	IEC 60512-9-1
Vibration, random	7.7 Grms	MIL-STD-810 Method 514.7
Unmating force	Typical 55 ± 15 N	IEC 60512-13-1
Shock	100g half sine pulse amplitude 6 ms duration, no discontinuity $> 1 \mu s$	MIL-STD-810 Method 516.7 Condition I

<sup>&</sup>lt;sup>1)</sup> Corrosion resistance dependent on body style. 400h for UR81 and UP80 (panel rear mounted plug and receptacle).

# **ELECTRICAL DATA**

Characteristic	Performance	Standard
Contact resistance (typical value)	< 10 mΩ (typical value)	MIL-STD-202 Method 307
Shell resistance (typical value)	$<$ 50 m $\Omega$ (cabled; new condition)	MIL-STD-202 Method 307
Insulation resistance	> 10 <sup>10</sup> Ω	MIL-STD-883 Method 1003 MIL-STD-202 Method 302
Shielding effectiveness	360° shielded. The equipment under test, with two different Fischer Connectors systems that use both UltiMate 80 plug and receptacle, is compliant according to limits of MIL-Standard.	MIL-STD-461G (CE101, CE102, CS101, RE101, RE102, RS101, RS102)

<sup>&</sup>lt;sup>2)</sup>Cosmetic changes may appear over time without impacting mechanical or electrical functions.

<sup>&</sup>lt;sup>3)</sup> Preserved mechanical and electrical functionality. Normal wear could appear.

Technical information FISCHER ULTIMATE™80

# **MATERIAL & SURFACE FINISH**

Components			Material		Finish		
		Designation ISO	Standard	Designation	Standard		
Housing, nut		Aluminum AlMg1SiCu	EN-AW-6061	Black Nickel	SAE-AMS-QQ-N-290 SAE-AMS 2404		
Locking spring (receptacles)		Stainless steel X5CrNiMo18-10	316/1.4401	0.64 µm Gold over Copper	-		
Crimping ring (cable	connectors)	Brass CuZn39Pb3	CW614N UNS C 38500	-	-		
Contacts	- Male or Female (Crimp) - Male or Female (Solder or PCB)	CuNi1Pb1P	UNS C 19160 ASTM C 19160	1 μm Gold over Nickel	MIL-DTL-45204D Type I; ASTM B488		

Insulator and sealing		International symbol	Flammability	
Insulator - Molded		PEEK <sup>1)</sup>	UL 94 V-0	
Sealant materials	- Cable connectors	Bi-component Epoxy compound	-	
	- Panel connectors	Silicone compound	UL 94 V-0	

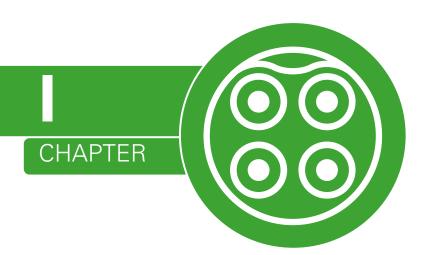
O-rings & seals	International symbol	Chemical name	
O-rings	FVMQ	Fluorosilicone rubber	
Interfacial seal (plug)	FVMQ	Fluorosilicone rubber	

Pre-cabled solutions	Material	Flammability
Overmolding	TPU (Estane <sup>®</sup> )	UL94 V-0
Cable jacket	PUR	UL94 V-2

Soft caps	Material	Flammability
Сар	TPV (Santoprene™)	UL 94 HB
Cable	FEP coated stainless steel	-
Fixing lug	Anthracite plated brass (ISO CuZn37)	-
Crimp ferrule	Aluminum	-
Heat shrink tube	Polyolefin	-

<sup>&</sup>lt;sup>1)</sup>Or any material in the PAEK family that provides equal or better overall performances.





# **FISCHER** FIBEROPTIC SERIES

ROBUST | OPTICAL PERFORMANCE | EASY CLEANING

# **KEY FEATURES**

- Faultless optical performance
- Indoor, outdoor and extreme applications
- Up to IP67 (unmated) / IP68 (mated)
- Easy field cleaning



I-2 / I-32

# **FIBEROPTIC**

# **PLUGS**



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• E	Body styles (P01)	l-4
	Technical dimensions	l-5

# **RECEPTACLES**



# **CABLE MOUNTED**

Body styles (R50)	I-8
Technical dimensions	<u>L9</u>



# **PANEL REAR MOUNTED**

Body styles (R01)	-1	2
Technical dimensions	<u>-</u> 1	13



# **PANEL FRONT MOUNTED**

Body styles (R03; R13)	-1	2	/
Technical dimensions	<u>l-1</u>	16	7



■ Configuration matrix	-4  -22  -23  -25  -26  -28
■ Accessories	l-29

This catalog covers our standard connector solutions. For specific requests, including hybrid or custom connectors, please contact your local sales representative.

# **PLUGS & RECEPTACLES**

Wire set	P01	R01	R03	R13	R50
FO1		•	•	•	
FO2		•	•	•	
FO4		•	•	•	
FOH		•	•	•	

Cable Clamp set	P01	R01	R03	R13	R50
FO1	•	•	•	-	•
FO2	•	•	•	•	•
FO4	•	•	•	•	•
FOH					

Potting set	P01	R01	R03	R13	R50
FO1	•	•	•	_	•
FO2	•	•	•	•	•
FO4	•	•	•	•	•
FOH	•	•	•	•	•

# **PLUGS**

# **CABLE**MOUNTED



Body style		P01	References to detailed
Dody Style		PUI	information
Protection	Unsealed (IP50)		Sealing categories, page A-6
Protection	Sealed up to IP68	Sealing Categories, page A-6	
	Friction		
	Push-pull	•	
Locking system	Quick-release		Locking systems, page A-5
	Lanyard		
	Tamperproof		
Termination	Fiber optic termini	•	Fiber type and min layert mage 1 20
iermination	Electrical solder contacts <sup>1)</sup>	•	Fiber type and pin layout, page I-30
Housing color	Natural chrome	•	Technical information, page I-29
	Shortened body		
Design	Straight	•	
	Right-angle		
	Wire sets		
Rear Accessories <sup>2)</sup>	Cable clamp set	•	Rear Accessories, pages I-5 to I-7
	Potting set	•	
	Cable bend reliefs		
Accessories	Protective sleeves		Accessories, page I-25
	Soft caps	•	
	FO1	•	Technical dimensions, pages I-5 to I-7
Size	FO2/FO4	•	For more information visit our website
	FOH	•	www.fischerconnectors.com/technical

<sup>1)</sup> FOH only.

<sup>&</sup>lt;sup>2)</sup> Please refer to configurations matrix on page I-3.

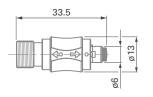
# PLUGS - FO1

# **CABLE**MOUNTED

# P01

**BODY STYLE** 



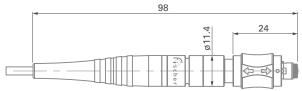


Part number	Description
FO1 P01LGR1 00A00 A 000	FO1 - P01 Plug
FO1 P01 CABLE CLAMP SET L36 D3.5 1)	FO1 - P01 Plug cable clamp set
FO1 P01 POTTING SET L41 D3.5 1)	FO1 - P01 Plug potting set

# **REAR ACCESSORIES**

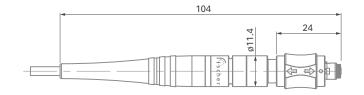
CABLE CLAMP SET





 $<sup>^{1)}</sup>$ The last number indicates the max compatible cable diameter in mm. Note: indicated connector P/N = delivered without contact, termini and rear accessory







FISCHER FIBEROPTIC SERIES Technical dimensions

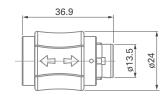
# PLUGS - FO2/FO4

# **CABLE**MOUNTED

### P01

**BODY STYLE** 



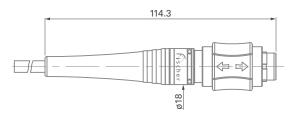


Part number	Description
FO2 P01LGR1 00A00 A 000	FO2 - P01 Plug
FO4 P01LGR1 00A00 A 000	FO4 - P01 Plug
FO2-4 P01 CABLE CLAMP SET L49 D6 1)	FO2/FO4 - P01 Plug cable clamp set
FO2-4 P01 POTTING SET L49 D6.5 1)	FO2/FO4 - P01 Plug potting set
FO2-4 P01 POTTING SET L54 D10.8 1)	FO2/FO4 - P01 Plug potting set

### **REAR ACCESSORIES**

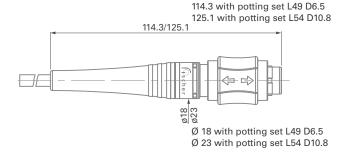
CABLE CLAMP SET





<sup>&</sup>lt;sup>1)</sup>The last number indicates the max compatible cable diameter in mm. Note: indicated connector P/N = delivered without contacts, termini and rear accessory



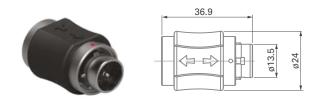


# **PLUGS - FOH**

# **CABLE**MOUNTED

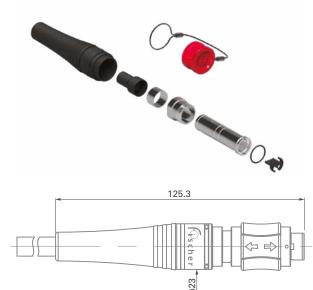
# P01

**BODY STYLE** 



Part number	Description
FOH P01LGR1 00A00 A 000	FOH - P01 Plug
FOH P01 POTTING SET L54 D10.8 1)	FOH - P01 Plug potting set

# **REAR ACCESSORIES**



<sup>&</sup>lt;sup>1)</sup>The last number indicates the max compatible cable diameter in mm. Note: indicated connector P/N = delivered without contacts, termini and rear accessory



# **RECEPTACLES**

# **CABLE**MOUNTED



	R50	References to detailed information	
Unsealed (IP50)		Scaling entagoring page A 6	
Sealed up to IP68	•	Sealing categories, page A-6	
Friction			
Push-pull	•		
Quick-release		Locking systems, page A-5	
Lanyard			
Tamperproof			
Fiber optic termini	•	Fibertuse and min layout mare 1.20	
Electrical solder contacts1)	•	Fiber type and pin layout, page I-30	
Natural chrome	•	Technical information, page I-29	
Shortened body			
Straight	•		
Right-angle			
Wire sets			
Cable clamp set	•	Rear accessories, pages I-9 to I-11	
Potting set	•		
Cable bend reliefs			
Protective sleeves		Accessories, page I-25	
Soft caps	•		
F01	•	Technical dimensions, page I-9 to I-11	
FO2/FO4	•	For more information visit our website	
FOH	•	www.fischerconnectors.com/technical	
FFCLIFF	Gealed up to IP68 Friction Push-pull Quick-release Lanyard Famperproof Fiber optic termini Electrical solder contacts <sup>1)</sup> Natural chrome Shortened body Straight Right-angle Wire sets Cable clamp set Potting set Cable bend reliefs Protective sleeves Goft caps FO1	Unsealed (IP50) Sealed up to IP68 Friction Push-pull Quick-release Lanyard Camperproof Fiber optic termini Electrical solder contacts¹)  Natural chrome Shortened body Straight Right-angle Wire sets Cable clamp set Potting set Cable bend reliefs Protective sleeves Soft caps  FO1 FO2/FO4	

<sup>&</sup>lt;sup>1)</sup> Please refer to configurations matrix on page I-3.

# **RECEPTACLES - FO1**

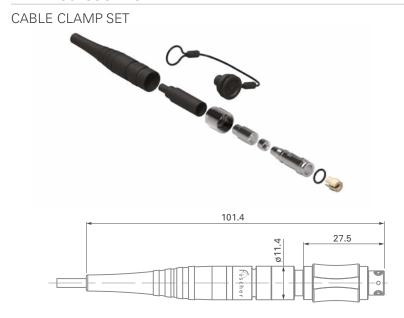
# **CABLE**MOUNTED

# **R50**



Part number	Description
FO1 R50LGR1 00A00 A 000	FO1 - R50 Receptcale
FO1 R50 CABLE CLAMP SET L36 D3.5 1)	FO1 - R50 Receptacle cable clamp set
FO1 R50 POTTING SET L41 D3.5 1)	FO1 - R50 Receptacle potting set

# **REAR ACCESSORIES**



# $^{1)}$ The last number indicates the max compatible cable diameter in mm. Note: indicated connector PN = delivered without contact, termini and rear accessory

# POTTING SET 107.4 27.5



FISCHER FIBEROPTIC SERIES Technical dimensions

# **RECEPTACLES - FO2/FO4**

# **CABLE**MOUNTED

# **R50**

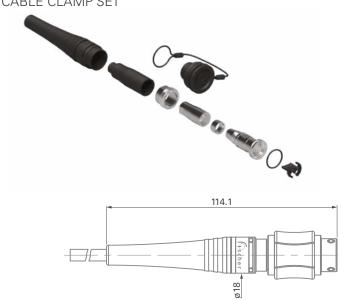
**BODY STYLE** 



Part number	Description
FO2 R50LGR1 00A00 A 000	FO2 - R50 Receptacle
FO4 R50LGR1 00A00 A 000	FO4 - R50 Receptacle
FO2-4 R50 CABLE CLAMP SET L49 D6 1)	FO2/FO4 - R50 Receptacle cable clamp set
FO2-4 R50 POTTING SET L49 D6.5 1)	FO2/FO4 - R50 Receptacle potting set
FO2-4 R50 POTTING SET L54 D10.8 1)	FO2/FO4 – R50 Receptacle potting set

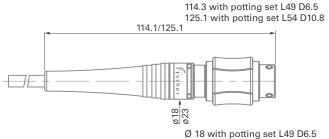
# **REAR ACCESSORIES**

CABLE CLAMP SET



 $<sup>^{1)}</sup>$  The last number indicates the max compatible cable diameter in mm. Note: indicated connector PN = delivered without contacts, termini and rear accessory





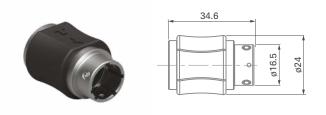
Ø 23 with potting set L49 D6.5

# **RECEPTACLES - FOH**

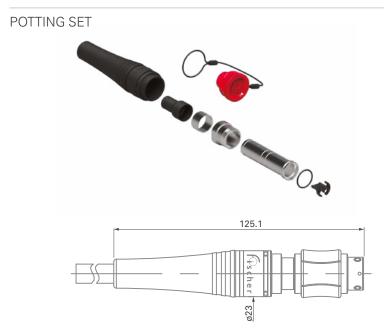
# **CABLE**MOUNTED

# **R50**

**BODY STYLE** 



Part number	Description
FOH R50LGR1 00A00 A 000	FOH - R50 Receptacle
FOH R50 POTTING SET L54 D10.8 1)	FOH - R50 Receptacle potting set



 $<sup>^{\</sup>scriptscriptstyle (1)}$  The last number indicates the max compatible cable diameter in mm. Note: indicated connector P/N = delivered without contact, termini and rear accessory



# **RECEPTACLES**

<b>PANEL</b> MOUNTED			1	· C		
Body style		R01	R03	R13	References to detailed information	
Protection	Unsealed (IP50)				Sealing categories, page A-6	
Protection	Sealed up to IP68	•	•	•	Sealing categories, page A-6	
	Friction					
	Push-pull	•	•	•		
Locking system	Quick-release				Locking systems, page A-5	
	Lanyard					
	Tamperproof					
Termination	Fiber optic termini	•	•	•	F''	
iermination	Electrical solder contacts1)	•	•	•	Fiber type and pin layout, page I-30	
Housing color	Natural chrome	•	•	•	Technical information, page I-29	
	Shortened body					
Design	Straight	•	•	•		
	Right-angle					
	Wire sets	•	•	•		
Rear Accessories1)	Cable clamp set	•	•	•	Pages I-13 to I-21	
	Potting set	•	•	•		
	Cable bend reliefs					
Accessories	Protective sleeves				Accessories, section I-25	
Soft caps	Soft caps	•	•	•		
	F01	•	•	•	Technical dimensions, page I-13 to I-21	
Size F02/F04 • • For more information	For more information visit our website					
	FOH	•	•	•	www.fischerconnectors.com/technical	

**Body styles** 

<sup>&</sup>lt;sup>1)</sup> Please refer to configurations matrix on page I-3.

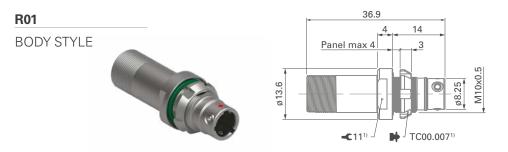
**PANEL CUT-OUT** 

9.5 0.1

 $\phi 10_0^{+0.1}$ 

# **RECEPTACLES - FO1**

# **PANEL REAR** MOUNTED

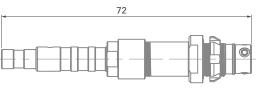


Part number	Description
FO1 R01LGR1 00A00 A 000	FO1 - R01 Receptacle
FO1 R01 WIRE SET L18 D3.5	FO1 - R01 Receptacle wire set
FO1 R01 CABLE CLAMP SET L36 D3.5 2)	FO1 - R01 Receptacle cable clamp set
FO1 R01 POTTING SET L41 D3.5 2)	FO1 - R01 Receptacle potting set

# **REAR ACCESSORIES**

# CABLE CLAMP SET **POTTING SET** WIRE SET





<sup>&</sup>lt;sup>1)</sup> Torque 5.0 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

67.1

41.6

Note: indicated connector P/N = delivered without contact, termini and rear accessory

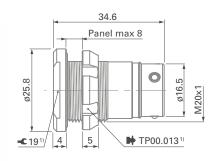


<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

# **RECEPTACLES - FO2/FO4**

# **PANEL REAR** MOUNTED

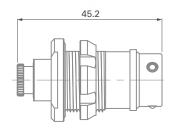




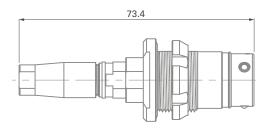
Part number	Description
FO2 R01LGR1 00A00 A 000	FO2/FO4 - R01 Receptacle
FO4 R01LGR1 00A00 A 000	FO2/FO4 - R01 Receptacle
FO2 R01 WIRE SET L20 D6.5	FO2 - R01 Receptacle wire set
FO4 R01 WIRE SET L20 D6.5	FO4 - R01 Receptacle wire set
FO2-4 R01 CABLE CLAMP SET L49 D6 <sup>2)</sup>	FO2/FO4 - R01 Receptacle cable clamp set
FO2-4 R01 POTTING SET L49 D6.5 <sup>2)</sup>	FO2/FO4 - R01 Receptacle potting set
FO2-4 R01 POTTING SET L54 D10.8 2)	FO2/FO4 - R01 Receptacle potting set

# **REAR ACCESSORIES**

# WIRE SET



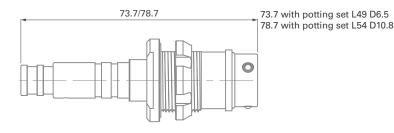
# CABLE CLAMP SET



# PANEL CUT-OUT

ø20.1<sub>0</sub><sup>+0.1</sup>





<sup>&</sup>lt;sup>1)</sup> Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

Note: indicated connector P/N = delivered without contacts, termini and rear accessory

<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

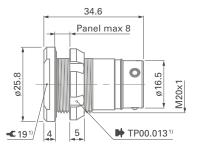
# **RECEPTACLES - FOH**

# PANEL REAR MOUNTED

### **R01**

**BODY STYLE** 



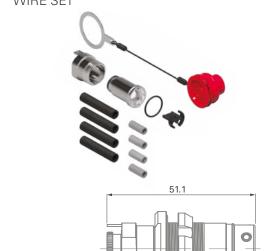


Part number	Description
FOH R01LGR1 00A00 A 000	FOH - R01 Receptacle
FOH R01 WIRE SET L26 D8	FOH - R01 Receptacle wire set
FOH R01 POTTING SET L54 D10.8 2)	FOH - R01 Receptacle potting set

# **REAR ACCESSORIES**

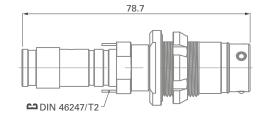
**CO** DIN 46247/T2 -

# WIRE SET

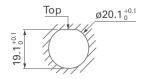




# POTTING SET



# PANEL CUT-OUT



Note: indicated connector P/N = delivered without contacts, termini and rear accessory



<sup>&</sup>lt;sup>1)</sup> Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

# **RECEPTACLES - FO1**

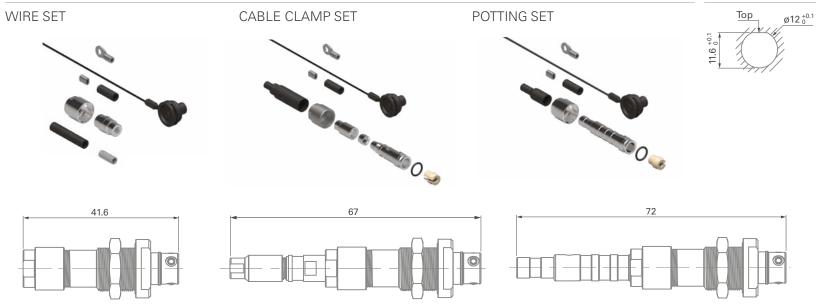
# **PANEL FRONT**

MOUNTED



Part number	Description
FO1 R03LGR1 00A00 A 000	FO1 - R03 Receptacle
FO1 R03 WIRE SET L18 D3.5	FO1 - R03 Receptacle wire set
FO1 R03 CABLE CLAMP SET L36 D3.5 <sup>2)</sup>	FO1 - R03 Receptacle cable clamp set
FO1 R03 POTTING SET L41 D3.5 2)	FO1 - R03 Receptacle potting set

### **REAR ACCESSORIES** PANEL CUT-OUT



<sup>&</sup>lt;sup>1)</sup> Torque 5.0 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

Note: indicated connector P/N = delivered without contact, termini and rear accessory

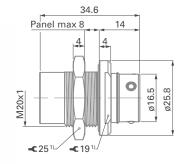
<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

# **RECEPTACLES - FO2/FO4**

# PANEL FRONT MOUNTED

**R03** 

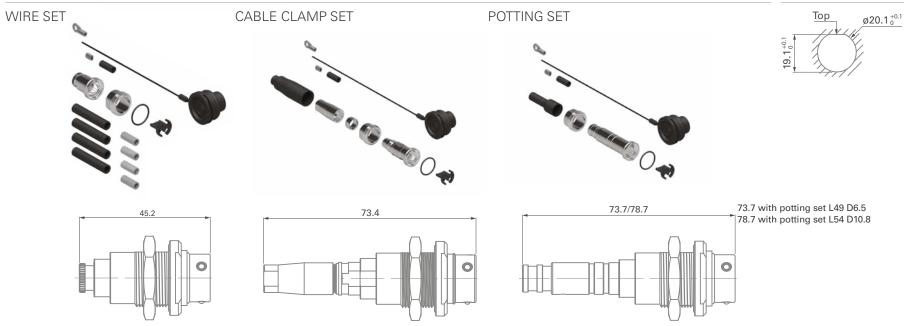
BODY STYLE



Part number	Description
FO2 R03LGR1 00A00 A 000	FO2 - R03 - R13 Receptacle
FO4 R03LGR1 00A00 A 000	FO4 - R03 - R13 Receptacle
FO2 R03-R13 WIRE SET L20 D6.5	FO2 - R03 - R13 Receptacle wire set
FO4 R03-R13 WIRE SET L20 D6.5	FO4 - R03 - R13 Receptacle wire set
FO2-4 R03-R13 CABLE CLAMP SET L49 D6 <sup>2)</sup>	FO2/FO4 - R03 - R13 Receptacle cable clamp set
FO2-4 R03-R13 POTTING SET L49 D6.5 <sup>2)</sup>	FO2/FO4 - R03 - R13 Receptacle potting set
FO2-4 R03-R13 POTTING SET L54 D10.8 <sup>2)</sup>	FO2/FO4 - R03-R13 Receptacle potting set

# **REAR ACCESSORIES**

# PANEL CUT-OUT



<sup>&</sup>lt;sup>1)</sup> Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

Note: indicated connector P/N = delivered without contacts, termini and rear accessory



<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

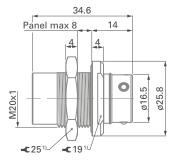
# **RECEPTACLES - FOH**

# **PANEL FRONT** MOUNTED

**R03** 

**BODY STYLE** 





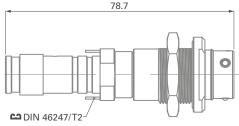
Part number	Description
FOH R03LGR1 00A00 A 000	FOH - R03 Receptacle
FOH R03-R13 WIRE SET L26 D8	FOH - R03-R13 Receptacle wire set
FOH R03 POTTING SET L54 D10.8 <sup>2)</sup>	FOH - R03 Receptacle potting set

# **REAR ACCESSORIES**

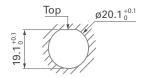
# WIRE SET Q



# **POTTING SET**



# **PANEL CUT-OUT**



51.1

Note: indicated connector PN = delivered without contacts, termini and rear accessory

C2 DIN 46247/T2

<sup>&</sup>lt;sup>1)</sup> Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the panel surface. Tests have to be made to evaluate the exact values.

<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

# **RECEPTACLES - FO1**

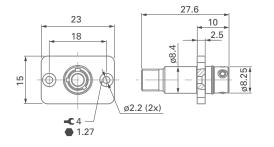
# PANEL FRONT

MOUNTED

# R13 - SQUARE FLANGE<sup>1)</sup>

**BODY STYLE** 



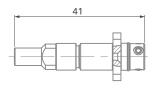


Part number	Description
FO1 R13LGR1 00A00 A 000	FO1 - R13 Receptacle
FO1 R13 WIRE SET L20 D3.5	FO1 - R13 Receptacle wire set

# **REAR ACCESSORY**

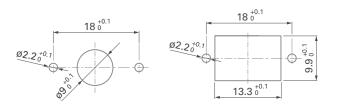
WIRE SET





<sup>&</sup>lt;sup>1)</sup> Due to panel mounting with screws, sealing can't be guaranteed at panel level. Note: indicated connector P/N = delivered without contact, termini and rear accessory

# PANEL CUT-OUT

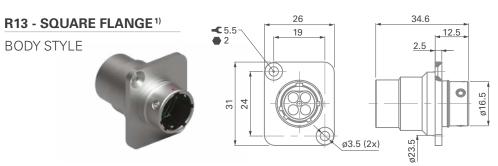


Compatible with above SC & LC duplex panel cut-out



# **RECEPTACLES - FO2/FO4**

# **PANEL FRONT** MOUNTED

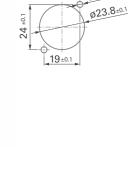


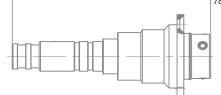
Part number	Description
FO2 R13LGR1 00A00 A 000	FO2 - R13 Receptacle
FO4 R13LGR1 00A00 A 000	FO4 - R13 Receptacle
FO2 R03-R13 WIRE SET L20 D6.5	FO2 - R03-R13 Receptacle wire set
FO4 R03-R13 WIRE SET L20 D6.5	FO4 - R03-R13 Receptacle wire set
FO2-4 R03-R13 CABLE CLAMP SET L49 D6 <sup>2)</sup>	FO2/FO4 - R03-R13 Receptacle cable clamp set
FO2-4 R03-R13 POTTING SET L54 D10.8 <sup>2)</sup>	FO2/FO4 - R03-R13 Receptacle potting set

# **REAR ACCESSORIES**

# CABLE CLAMP SET WIRE SET 73.4 45.2

# **PANEL CUT-OUT POTTING SET**





73.7/78.7

<sup>73.7</sup> with potting set L49 D6.5 78.7 with potting set L54 D10.8

<sup>&</sup>lt;sup>1)</sup> Due to panel mounting with screws, sealing can't be guaranteed at panel level.

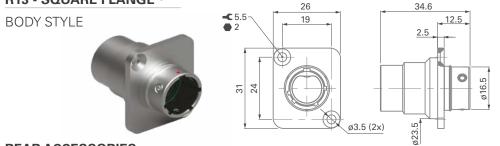
<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

Note: indicated connector PN = delivered without contacts, termini and rear accessory

# **RECEPTACLES - FOH**

# **PANEL FRONT** MOUNTED

# R13 - SQUARE FLANGE<sup>1)</sup>

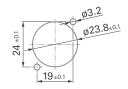


Part number	Description
FOH R13LGR1 00A00 A 000	FOH - R13 Receptacle
FOH R03-R13 WIRE SET L26 D8	FOH - R03-R13 Receptacle wire set
FOH R03-R13 POTTING SET L54 D10.8 <sup>2)</sup>	FOH - R03-R13 Receptacle potting set

# **REAR ACCESSORIES**

# WIRE SET **POTTING SET** 78.7

# **PANEL CUT-OUT**



Note: indicated connector P/N = delivered without contacts, termini and rear accessory



<sup>&</sup>lt;sup>1)</sup> Due to panel mounting with screws, sealing can't be guaranteed at panel level.

<sup>&</sup>lt;sup>2)</sup> The last number indicates the max compatible cable diameter in mm.

# **OPTICAL TERMINI AND ELECTRICAL CONTACTS**



Designation	Part Number
Singlemode terminus	FO TERMINI SMA PC

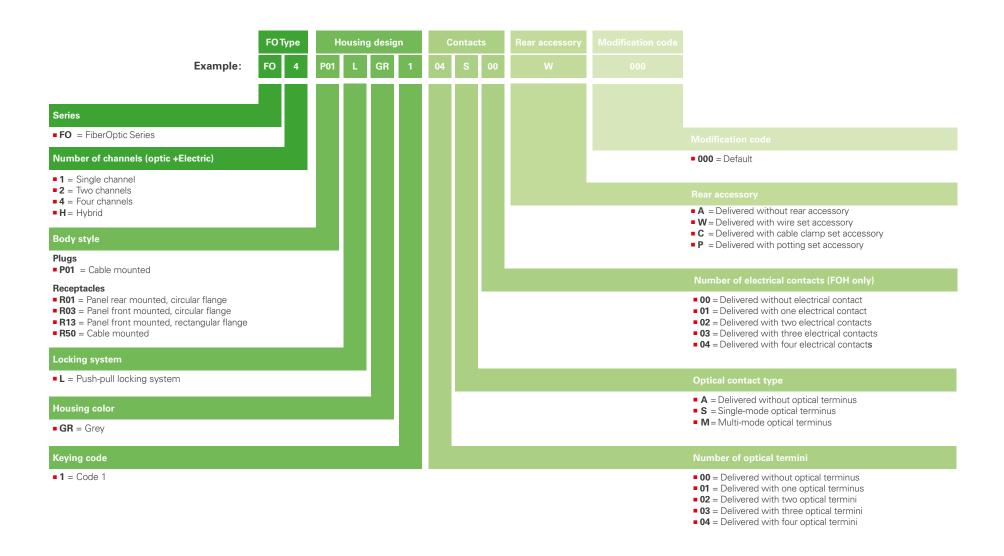


Multimode terminus FO TERMINI MMA PC
--------------------------------------

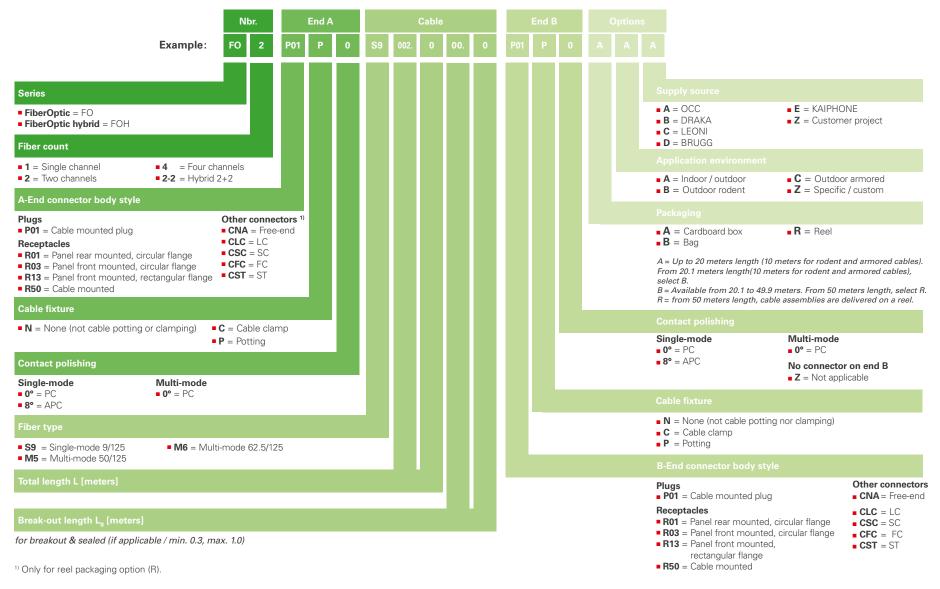


Electrical contact (FOH Only)	FO Termini EL M ø1.25 SR A

# **CONNECTORS**

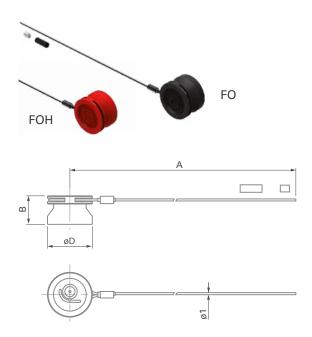


#### **CABLED PRODUCTS**



#### **SOFT CAPS**

#### **FOR PLUGS**

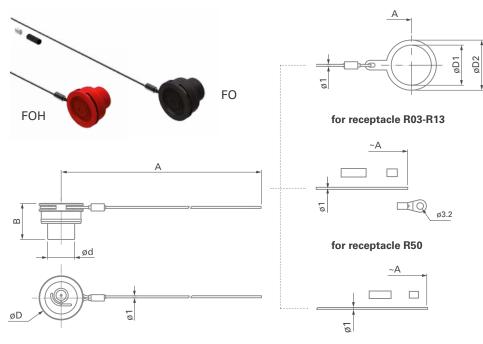


Body siz	Body size & style Part number		Α	В	øD
FO1	P01	FOCP06C 1B2 A120	120	10.5	13
FO2/4	P01	FOCP14C 1B2 A150	150	14.0	22
FOH	P01	FOHCP14C 1B2 A150	150	14.0	22

Crimp ferrule and heat shrink tube are included.

#### **FOR RECEPTACLES**

#### for receptacle R01



Body size	& style	Part number	Α	В	ød	øD	øD1	øD2
FO1	R01	FOCR06P 1B2 A70	70	70			10	14
	R03-R13	FOCR06P 1B2 E150	150	11.5	6.0	13		
	R50	FOCR06C 1B2 A120	120				-	-
FO2/4	R01	FOCR14P 1B2 A110	110	14.0	13.5	22	20	25
	R03-R13	FOCR14P 1B2 E150	150	14.0 10.5	13.5	13.5 22		
	R50	FOCR14C 1B2 A150	150 14.0		13.3	22	-	-
FOH 2-2	R01	FOHCR14P 1B2 A110	110	14.0	13.5	22	20	25
	R03-R13	FOHCR14P 1B2 E150	450 440	10.5	22			
	R50	FOHCR14C 1B2 A150	150	14.0	13.5	22	-	-

**Deployment accessories** 

#### **DAISY CHAINING**



Fiber type	Fiber count	Part number
SM 9	2	FO2 DC 0 S9 AAA
(G657.A1)	4	FO4 DC 0 S9 AAA
	Hybrid	FOH2-2 DC 0 S9 AAA
MM 50	2	FO2 DC 0 M5 AAA
(OM3)	4	FO4 DC 0 M5 AAA
	Hybrid	FOH2-2 DC 0 M5 AAA
MM 62.5	2	FO2 DC 0 M6 AAA
(OM1+)	4	FO4 DC 0 M6 AAA
	Hybrid	FOH2-2 DC 0 M6 AAA
Pin layout	Applies to all configurations	10

#### **LOOPBACK**



Fiber type	Fiber count	Part number
<b>SM 9</b> (G657.A1)	4	FO4 LB 0 S9 AAA
MM 50 (OM3)	4	FO4 LB 0 M5 AAA
MM 62.5 (OM1+)	4	FO4 LB 0 M6 AAA
Pin layout	Applies to all configurations	1 % 2 % 3 % 4 %

The use of caps is recommended for maximum robustness during handling.

#### PRE-CONFIGURED FIBEROPTIC REELS

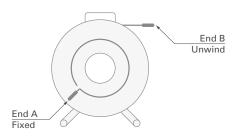


		50 meter reels	100 meter reels
Fiber type	Fiber count	Part number	Part number
	1	FO1 P01P0 S9-050.0-00.0 P01P0 RAA	FO1 P01P0 S9-100.0-00.0 P01P0 RAA
SM 9	2	FO2 P01P0 S9-050.0-00.0 P01P0 RAC	FO2 P01P0 S9-100.0-00.0 P01P0 RAC
(G657.A1)	4	FO4 P01P0 S9-050.0-00.0 P01P0 RAC	FO4 P01P0 S9-100.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 S9-050.0-00.0 P01P0 RAC	FOH2-2 P01P0 S9-100.0-00.0 P01P0 RAC
	1	FO1 P01P0 M5-050.0-00.0 P01P0 RAA	FO1 P01P0 M5-100.0-00.0 P01P0 RAA
MM 50	2	FO2 P01P0 M5-050.0-00.0 P01P0 RAC	FO2 P01P0 M5-100.0-00.0 P01P0 RAC
(OM3)	4	FO4 P01P0 M5-050.0-00.0 P01P0 RAC	FO4 P01P0 M5-100.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 M5-050.0-00.0 P01P0 RAC	FOH2-2 P01P0 M5-100.0-00.0 P01P0 RAC

		150 meter reels	200 meter reels
Fiber type	Fiber count	Part number	Part number
	1	FO1 P01P0 S9-150.0-00.0 P01P0 RAA	FO1 P01P0 S9-200.0-00.0 P01P0 RAA
SM 9	2	FO2 P01P0 S9-150.0-00.0 P01P0 RAC	FO2 P01P0 S9-200.0-00.0 P01P0 RAC
(G657.A1)	4	FO4 P01P0 S9-150.0-00.0 P01P0 RAC	FO4 P01P0 S9-200.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 S9-150.0-00.0 P01P0 RAC	FOH2-2 P01P0 S9-200.0-00.0 P01P0 RAC
	1	FO1 P01P0 M5-150.0-00.0 P01P0 RAA	FO1 P01P0 M5-200.0-00.0 P01P0 RAA
MM 50	2	FO2 P01P0 M5-150.0-00.0 P01P0 RAC	FO2 P01P0 M5-200.0-00.0 P01P0 RAC
(OM3)	4	FO4 P01P0 M5-150.0-00.0 P01P0 RAC	FO4 P01P0 M5-200.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 M5-150.0-00.0 P01P0 RAC	FOH2-2 P01P0 M5-200.0-00.0 P01P0 RAC

		300 meter reels	450 meter reels
Fiber type	Fiber count	Part number	Part number
	1	FO1 P01P0 S9-300.0-00.0 P01P0 RAA	FO1 P01P0 S9-450.0-00.0 P01P0 RAA
(G657.A1)	2	FO2 P01P0 S9-300.0-00.0 P01P0 RAC	FO2 P01P0 S9-450.0-00.0 P01P0 RAC
	4	FO4 P01P0 S9-300.0-00.0 P01P0 RAC	FO4 P01P0 S9-450.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 S9-300.0-00.0 P01P0 RAC	-
	1	FO1 P01P0 M5-300.0-00.0 P01P0 RAA	FO1 P01P0 M5-450.0-00.0 P01P0 RAA
<b>MM 50</b> (OM3)	2	FO2 P01P0 M5-300.0-00.0 P01P0 RAC	FO2 P01P0 M5-450.0-00.0 P01P0 RAC
	4	FO4 P01P0 M5-300.0-00.0 P01P0 RAC	FO4 P01P0 M5-450.0-00.0 P01P0 RAC
	Hybrid	FOH2-2 P01P0 M5-300.0-00.0 P01P0 RAC	-









# COLOR CODING SILICONE RING

#### OPEN SPANNER

#### HEXAGON SPANNER

#### NUT DRIVER



#### PANEL SEAL



FO1 - FOCR06

Beige Red
Blue Green



Beige Red
Blue Green



FO1

TX00.004 TX00.014

#### FO2/4/H

TX00.019 TX00.025



FO1 - R13

TX00.384



FO1

TC00.007

#### FO2/4/H

TP00.013



FO1

FOP06 Sleeve Holder



FOP14 Sleeve Holder



FO1

FO R13 Panel Seal FO1



FO R13 Panel Seal FO2/4/H

# TELECOM MATE ADAPTER



LC Adapter SM/APC
LC Adapter SM/UPC

LC Adapter SM/UPC
LC Adapter MM/UPC



FC Adapter SM/APC
FC Adapter SM-MM



SC Adapter SM/APC
SC Adapter SM/UPC
SC Adapter MM/UPC



ST Adapter SM-MM

## PRE-CABLED REEL\*



GT235.RM GT310.RM

GT380.RMFK GT450.RMFK

HT582.RM

# WEDGE CLAMP JAWS



Wedge Clamp Black Jaws

# FIBER OPTIC CLEANING KIT



FO Cleaning Kit (complete kit)

Cleaning kit components

Laser pen
Laser pen adapter

Precision tweezers 50 alcohol wipes

IBC brand cleaner H125

Contact your local sales for details or visit: www.fischerconnectors.com/fiberoptic

<sup>\*</sup> Pre-configured reels can be found on page I-27.

Reel selection can vary following cable choice and length.

#### **MATERIAL & SURFACE FINISH**

		Material		Finish
Metal components	Designation ISO	Standard	Designation	Standard
Harrison most	Brass	CW614N	Chrome	0.15 4.140 0.400
Housing, nut	CuZn39Pb3	UNS C 38500	over Nickel	SAE-AMS 2460
Back nut (plug)	Brass	CW614N	Anthracite over	SAE-AMS 2460
FO1	CuZn39Pb3	UNS C 38500	Nickel	3AE-AIVI3 2400
Back nut (plug)	Brass	CW614N	NI:-II	SAE-AMS-QQ-N-290
FO2, FO4, FOH	CuZn39Pb3	UNS C 38500	Nickel	SAE-AMS 2404
Electrical contact	Brass CuZn39Pb3	CW614N UNS C 38500	1 μm Gold over Nickel	MIL-DTL-45204D Type 1 + ASTM B488 / SAE-AMS- QQ-N-290 / SAE-AMS 2404
Shell contact	Stainless steel	X5CrNiMo18-10 (1.4401)	-	-
Spring	Stainless steel	X10CrNi18-8 (1.4310)	-	-
Mantel clip	Stainless steel	X5CrNiMo18-10 (1.4401)	-	-
Sleeve holder (plug)	Brass	CW614N		SAE-AMS-QQ-N-290
FO1	CuZn39Pb3	UNS C 38500	Nickel	SAE-AMS 2404
Sleeve holder (center pin) FO2, FO4, FOH	Stainless steel	X8CrNiS18-9 (1.4305)	-	-
Locking balls	Stainless steel	X46Cr13 (1.4034)	-	-

Non-metallic components	Material	Flammability
Ferrules & sleeves	Zirconia	-
Contact housing	LCP	UL 94 V-0
Contact block & sleeve	PBT	UL 94 V-0
holder	PEEK	-
Mantel ring	PTFE	UL 94 V-0
0:	FPM (Viton®)	-
O-rings	NBR (Nitrile)	-
Sealant material	Epoxy compound	-
Cable strain relief	TPE	UL 94 HB
Caps	TPE	UL 94 HB
Locking protection sleeve	TPE	UL 94 HB

#### **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance	Standard
Sealing mated	IP68; 2 m submersion for 24 hours <sup>1)</sup>	IEC 60529
Sealing unmated	IP67 <sup>1)</sup>	IEC 60529
Operating temperature range	-40 °C to +85 °C (cable dependent)	IEC 61300-2-22
Vibration	Sinusoidal, 10 - 55 Hz, 3 axes, 0.75 mm amplitude (max 10 g) <sup>1)</sup>	IEC 61300-2-1
Shock	100 g <sup>1)</sup>	IEC 61300-2-9
Salt mist	1000 hours, 5% salt solution, 35 °C¹) 2)	IEC 61300-2-26
Mating durability	1000 mating cycles <sup>1) 3)</sup>	IEC 61300-2-2

<sup>&</sup>quot;Exceeds IEC 61753-1 Cat.E Extreme Environment. Fischer Connectors can offer FO cable assemblies that are sealed to IP68 deeper than 2 m on request.



<sup>&</sup>lt;sup>2)</sup>Connector must be mated

<sup>&</sup>lt;sup>3)</sup>Recommended cleaning every 50 cycles.

#### FIBER TYPE AND PIN LAYOUT

Contact type		Fiber standards	
Single-mode 9/125	UPC	0.057.44	
Single-mode 9/125	APC	G.657.A1	
Multi-mode 50/125	-	OM3	
Multi-mode 62.5/125	-	OM1 / OM1+	

Plug pin layout					
1	2 1	2 1			

Receptacle pin layout								
1	1 2	1 2 4 3						

#### **OPTICAL DATA**

Characteristic	Performance		Standard	
Insertion loss	SM and MM	≤0.20 dB mean	IEC 61300-3-34 Random mated	
		≤0.45 dB max for >97% of samples	lec 61300-3-34 Kandom mated	
		≤0.2 dB change during and after testing	IEC 61300-3-3	
Return loss	SM UPC	≥50 dB	IEC 61300-3-6 Random mated	
	SM APC	≥70 dB (mated) and ≥50 dB (unmated)	TIEC 01300-3-0 natioutil iffated	

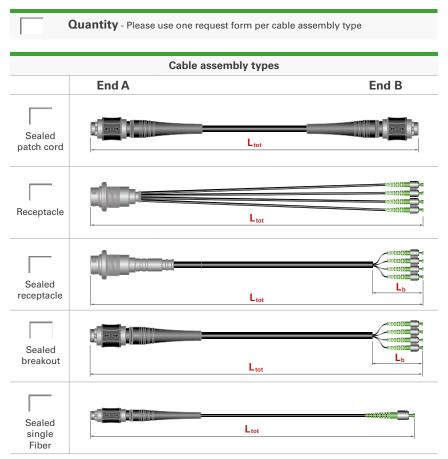
#### **ELECTRICAL DATA - FOH 2-2**

Performance	Standard
2 contacts, ground by shell	-
10 [A] 1)	IEC 60512-5-2-5b
400 [V] r.m.s. <sup>2)</sup>	EIA-364-20-B
< 10 mΩ	IEC 60512-2-1, Test 2a
< 50 mΩ	IEC 60512-2-1, Test 2a
> 10 <sup>10</sup> Ω	IEC 60512-3-1-3a Method C
Solder	-
AWG17 / 1 mm <sup>2</sup>	-
1.5 [kV] r.m.s	IEC 60512-4-1 Test 4a
2.8 [kV]	IEC 60512-4-1 Test 4a
	2 contacts, ground by shell $10 \ [A] \ ^{1)}$ $400 \ [V] \ r.m.s. \ ^{2)}$ $< 10 \ m\Omega$ $< 50 \ m\Omega$ $> 10^{10} \ \Omega$ $Solder$ $AWG17 \ / \ 1 \ mm^2$ $1.5 \ [kV] \ r.m.s$

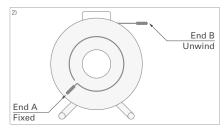
<sup>&</sup>lt;sup>1)</sup>Current per contact at 40°C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. Please refer to section A-12 to determine the maximum operating current.

 $<sup>^{2}\</sup>mbox{Recommended}$  operating voltage at sea leavel measured according to IEC 60664-1. Please refer to A-11

#### **CONFIGURE YOUR SOLUTION**



Drawings are for reference only. Available for FO1, FO2, FO4 and FOH 2-2





End A	Assembly	End B			
FiberOptic connectors  P01 - Plug  R50 - Receptacle cable mounted  R01 - Receptacle panel rear mounted  R03 - Receptacle panel front mounted	Total length L <sub>tot</sub> 1) end-to-end total (min. 0.5 except receptacles)  1 meter  2 meters	FiberOptic connectors  P01 - Plug  R50 - Receptacle cable mounted  R01 - Receptacle panel rear mounted  R03 - Receptacle panel front mounted			
R13 - Receptacle panel square flange  CNA - Free end No Connector 2)	Breakout length L <sub>b</sub> <sup>1)</sup> for breakout & sealed (if applicable / min. 0.3, max. 1.0)  0.5 meter	R13 - Receptacle panel square flange  CNA - Free end No Connector			
Telecom connector <sup>2)</sup> LC SC		Telecom connector			
FC ST  Contact End-face Available for SM only  0° PC 8° APC	Short length receptacles For receptacles < 0.5 meters 900 µm buffered fibers wires For receptacles ≥ 0.5 meters 2.0 mm tight buffered wires	FC ST  Contact End-face Available for SM only  0° PC 8° APC			

<sup>&</sup>lt;sup>1)</sup> Cable length in 0.1 meter units only. Cable length tolerance according IPC-WHMA-A-620.

<sup>&</sup>lt;sup>2)</sup> Only for reel packaging option (R).

#### **CHOOSE YOUR CABLE**

INDOOR/OUTDOOR									
Supplier Brand	Fiber SM 9/125 MM 50/125 MM 62.5/125 Count G.657.A1 OM3 OM1 /OM1+								
	1								
осс	2								
	4								
LEONI	2								
LEOIVI	4								
LEONI	Hybrid 2+2								

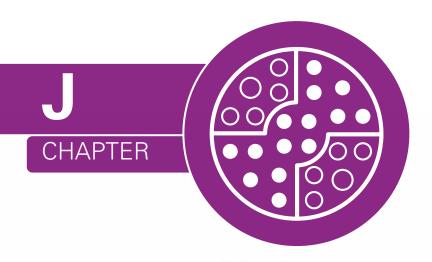
RODENT PROOF									
Supplier Brand	Fiber Count	SM 9/125 G.657.A1	MM50/125 OM3	MM 62.5/125 OM1 /OM1+					
LEONI	2								
Glass Fiber	4								
		IV	IETAL ARMO	RED					
KAIPHONE	1								
PPUOO	2								
BRUGG	4								

See our Cable Specifications for detailed information.

Available

Available under special lead time-please contact your local sales departement for details.

Outdoor cable features	00	cc	LEONI	LEONI	KAIPHONE	BRUGG	
Available for	FO1 FO2, FO4		F02, F04	F02, F04	F01	F02, F04	
Best for	Premium a	application	High load application	Rodent proof	Metal armored	Metal armored	
	- Overall ruggedness - Easy deployment - High end tactical cable		- High load resistance - Easy deployment - High end tactical cable	- Semi-static applications - Easy deployment - Dielectric rodent protection - High flexibility	- High rodent protection - Static & deployable applications - Ultra-light armored technology - Sensing applications	- High rodent protection - Static & deployable applications - Self supporting applications - Ultra-light armored technology - Direct burial	
Technology - Tight buffered fibers - Aramid yarn - PUR jacket				- Tight buffered fibers - Aramid yarn / - PUR double skin jacket	- Stainless steel loose tube - Aramid yarn - LDPE jacket	- Stainless steel loose tube - Stainless steel yarn - PA Jacket	
Outer diameter	iameter 2.9 mm 5.5 mm 5.5 mm		5.5 mm	9.4 mm	3.0 mm	3.8 mm	
Weight	8 kg/km	27 kg/km	28 kg/km	105 kg/km	18 kg/km	25 kg/km	
Operating tensile load 300 N 60		600 N	1500 N	2000 N	300 N	900 N	
Crush resistance	500 N/cm	1800 N/cm	800 N/cm	800 N/cm	300 N/cm	800 N/cm	
Min. bend radius	1.5 cm	1.5 cm 3.3 cm 5.5 cm		9.4 cm	3.0 cm	5.7 cm	
Operating temperature	-40 °C to +85 °	C	-55 °C to +85 °C	-55 °C to +85 °C	-40 °C to + 85 °C	-40 °C to + 70 °C	



# FISCHER MINIMAX TM SERIES

HIGH-DENSITY MINIATURIZATION | HIGH-SPEED DATA TRANSFER | RELIABILITY

#### **KEY FEATURES**

- Signal and Power
- Designed and tested to high-speed data transfer protocols
- IP68 sealed to-20m I 24h



J-2 / J-27

# **MINIMAX**



#### **PLUGS**



#### **CABLE MOUNTED**

■ Body styles (MP11-L/S/Q)	
■ Technical dimensions	
■ Dimensions of overmolding	Lo

#### **RECEPTACLES**

#### **CABLE MOUNTED**

Body styles (MR50-L/S/Q)	J-10
Technical dimensions	J-11
Dimensions of overmolding	J-9



#### **PANEL REAR MOUNTED**

Body styles (MR11-L/S/Q; MR12-L/S/Q)	J-1	2
Technical dimensions	.J-1	3

#### **FOR ALL MINIMAX**

■ Features	J-3
■ Body styles & technical dimensions	J-7
■ Electrical & contact configurations	J-16
■ Mechanical coding	J-17
■ PCB hole layout	J-18
■ Part numbering	J-22
■ Accessories	J-23
■ Tooling	
■ Technical information	J-26

This catalog covers our standard connector solutions. For specific requests, including hybrid or custom connectors, please contact your local sales representative.

#### **HIGH-DENSITY MINIATURIZATION**

- Unique combinations of signal and power
- Replace multiple large connectors with fewer and smaller ones
- Combine multiple protocols into one connector

#### **SIZE**

**COMPARISON 1:1** 

#### **SIZE 06, 08 AND 10**



# **UPTO 45%** SMALLER

#### SIZE 08

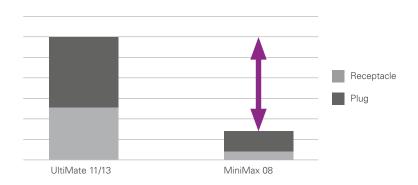
COMPARED TO STANDARD RECEPTACLES WITH SIMILAR NUMBER OF CONTACTS



# **UPTO 75%** LIGHTER

#### SIZE 08

PLUGS & RECEPTACLES WEIGHT COMPARISON WITH SIMILAR NUMBER OF CONTACTS





# **MINIMAX**

#### **HIGH-SPEED DATA TRANSFER**





















		Size 06-4 pins	Size 06-7 pins	Size 06-12 pins	Size 08-8 pins	Size 08-09 pins	Size 08-19 pins	Size 08-19 pins	Size 08-24 pins	Size 10-12 pins	Size 10-30 pins
USB 2.0	•	YES	YES	YES	YES	YES	YES	-	YES	YES	YES
USB 3.2 GEN 1 (5 Gbit/s) USB 3.2 GEN 2 (10 Gbit/s)	SS∕↔	-	-	-	-	YES	-	-	-	YES	-
ETHERNET (10 Gbit/s)	器	-	-	YES*	YES	-	-	-	-	-	-
Standard audio/ video protocol (10.2 Gbit/s)	JHĐ♠≫□	-	-	-	-	-	YES*	YES	-	-	-
Standard audio/ video protocol (18.0 Gbit/s)	JHĐ♠测□	-	-	-	-	-	-	YES	-	-	-
Single pair Ethernet (1 Gbit/s)		YES	-	-	-	-	-	-	-	-	-

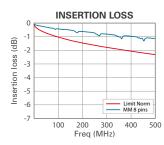
<sup>\*</sup> Application dependent

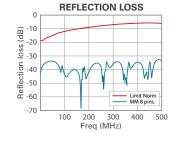
Note that for USB 3.2 the full spec is set with 1 m cable

#### ETHERNET SIZE 08 | 8 PINS 米

A unique robust and sealed miniature connector for Ethernet applications in harsh environments.

- AWG24, compatible with long range standard Ethernet cables
- Symmetrical hermaphroditic contact block
- 0.5 mm contacts

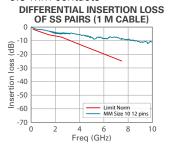




#### **USB 3.2** SIZE 08 | 9 PINS + SIZE 10 | 12 PINS **SS**←

Optimized design for full USB 3.2 Gen 1 and Gen 2 performance, successfully tested to the full S-parameter standards with cables up to 1 m.

- Advanced power contacts
- Hermaphroditic contact block
- 0.5 mm contacts







FISCHER MINIMAX™ SERIES

#### **RELIABILITY**

- IP68,-20m/24h\* water sealing <10-6 mbar l/s gas sealing
- 5,000 mating cycles
- 1,000 h salt mist spray



\*The standard sealing level can be achieved on all MiniMax panel mounted receptacles when correctly integrated.

For all cabled mounted connectors, the sealing level depends on the quality of the assembly process and the size and type of cable being used. For MiniMax, Fischer Connectors guarantees an IP64 cable assembly sealing as standard. Upon request, MiniMax cable assemblies with an IP68 sealing rating-20 m for a duration of 24 hours are available and might require additional testing.



#### **HOUSING COLOR**

MiniMax is available in Anthracite Nickel

■The anthracite treatment offers an improved panel grounding of <5 m $\Omega$  as required by MIL specs.

#### **Anthracite**

Ground contact connected to housing:

- Pin for PCB contact (P) versions
- Solder barrel for solder contact
   (S) versions



#### **CONTACT COMBINATIONS**

The MiniMax contact block is specified by a combination of 4 digits:

- First digit indicates the number of advanced contacts for first mate / last break.
- Second digit indicates the number of larger contacts (and with larger solder cup) for power.
- Digits 3 and 4 are to be considered as one number and will indicate the number of remaining contacts (of standard size and not advanced).

MiniMax uses a hermaphroditic contact block for all configurations except for the 4-pin (2 power + 2 signal) and the 7-pin (3 power + 4 signal) in size 06.

For the 4-pin and 7-pin in size 06, a polarity choice<sup>1)</sup> has to be specified and the mating part will reflect an opposite polarity (F mating M; M mating F).

For clarity reasons, the 4-pin in size 06 with 2 power contacts that are also advanced is designated by the digits 0202 and not 2202. A designation by the digits 2202 may confusingly suggest it has 6 contacts instead of the actual 4.

The table on the right shows **all** available standard contact block combinations to help specify the correct product designation. (Also see page J-20).

Size	MR11 / MR12 / MR50		MP11
	0202 xxFx		0202 xxMx
00	0202 xxMx		0202 xxFx
06	0304 xxFx		0304 xxMx
	0210	Mates with	0210
	0008		8000
	0009		2007
08	0019 2017		0019
	H019		H019
	0420 2418		0420
10	0309		2307
10	0624		0624

<sup>&</sup>lt;sup>1)</sup> Size 06 7-pin configuration is receptacle with female contacts and plug with male contacts. For customization please contact your local sales representative.

#### **PLUGS**

# **CABLE**MOUNTED







Body style		MP11-L	MP11-S	MP11-Q	References to detailed information
Protection	Sealed up to IP68	•	•	•	Seeling estagories mage A 6
Protection	Hermetic			Sealing categories, page A-6	
	Push-pull	•			
Locking system	Quick-release			•	
	Screw		•		
Termination	Crimp contact	Flactrical & contact confi		Electrical & contact configurations, page J-16	
leillillation	Solder contact	•	•	•	Electrical & contact configurations, page 3-10
Housing color	Anthracite Nickel	•	•	•	Part numbering, page J-20
60	Shortened body				
	60° angle 1)	•	•	•	Dady styles showter I
Design	Straight	•	•	•	Body styles, chapter J
	Right-angle 1)	•	•	•	
	Cable clamp sets				
Cabling	Overmoldable	•	•	•	-
	Heat shrinkable	•	•	•	
	Cable bend reliefs 1)	•	•	•	
Accessories	Protective sleeves				Accessories, page J-21 and J-22
	Sealing caps	•	•	•	
	06	•	•	•	T
Size	08	•	•	•	Technical dimensions, page J-8 and J-9 For more information visit our website www.fischerconnectors.com/technical
1	10	•		•	1 of more information visit out website www.nsonerconnectors.com/tecinical

<sup>&</sup>lt;sup>1)</sup> Not available for size 10.



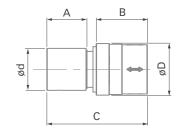
#### **PLUGS**

# **CABLE**MOUNTED

#### MP11-L / PUSH-PULL

**BODY STYLE** 

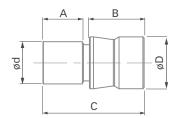




#### MP11-Q / QUICK-RELEASE

**BODY STYLE** 

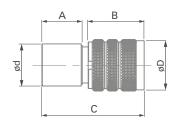




#### **MP11-S / SCREW-LOCKING**

**BODY STYLE** 





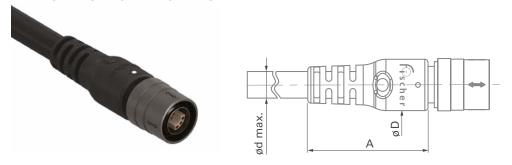
Size	Locking	ød	øD	Α	В	~ <b>C</b>
	Push-pull	8.5	9.9	10.1	12.8	25
06	Quick-release	8.5	9.9	10.1	13.6	25
	Screw	8.5	9.9	10.1	14.0	25
	Push-pull	10.4	12.9	10.1	12.8	25
80	Quick-release	10.4	12.9	10.1	13.6	25
	Screw	10.4	12.9	10.1	14.0	25
	Push-pull	12.4	14.9	10.1	12.8	25
10	Quick-release	12.4	14.9	10.1	13.6	25
	Screw	-	-	-	-	-

#### **DIMENSIONS OF OVERMOLDING 1)**

#### **CABLE MOUNTED**

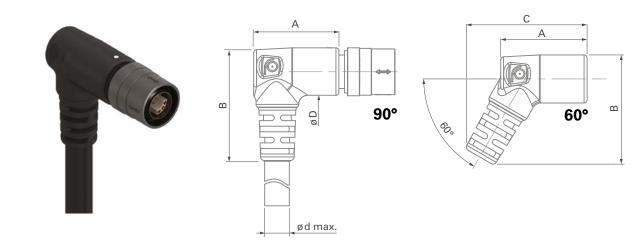
#### MP11-L/S/Q - MR50-L/S/Q

STRAIGHT OVERMOLDING



#### MP11-L/S/Q

RIGHT ANGLE & 60° OVERMOLDING



<sup>&</sup>lt;sup>1)</sup> Overmolding available on request. Contact your Fischer Connectors sales representative for details.

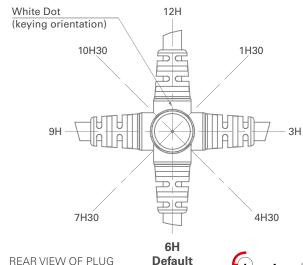
#### All dimensions and images shown are in millimeters and are for reference only.

Size	Angle	ød max.	øD	Α	В	С
	Straight	4.7 <sup>2)</sup>	10.8	30	-	-
06	60°	4.7 2)	10.8	23	29.1	32.2
	90°	4.7 <sup>2)</sup>	10.8	23	30	-
	Straight	6.7	12.8	30	-	-
08	60°	6.7	12.8	23	29.1	32.2
	90°	6.7	12.8	23	30	-
	Straight	8.7	14.8	30	-	-
10	60°	-	-	-	-	-
	90°	-	-	-	-	-

<sup>&</sup>lt;sup>2)</sup> 5.8 for MiniMax size 06 with 7 contacts.

#### **8 POSITIONS**

#### ORIENTATION PARALLEL TO PANEL



REAR VIEW OF PLUG



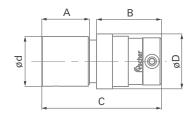
<b>CABLE</b> MOUNTED					
Body style		MR50-L	MR50-L MR50-S MR50-Q		References to detailed information
Protection	Sealed up to IP68		•	•	Cooling estagasias maga A 6
Protection	Hermetic				Sealing categories, page A-6
	Push-pull	•			
Locking system	Quick-release			•	
System	Screw		•		
Termination	Crimp contact				Electrical & contact configurations, page J-16
iermination	Solder contact	•	•	•	Electrical & contact configurations, page 3-16
Housing	Anthracite Nickel	•	•	•	Part numbering, page J-20
	Shortened body				
Danisan	60° angle				Dody styles shorter I
Design	Straight	•	•	•	Body styles, chapter J
	Right-angle				
	Cable clamp sets				
Cabling	Overmoldable	•	•	•	-
	Heat shrinkable	•	•	•	
	Cable bend reliefs	•	•	•	
Accessories	Protective sleeves				Accessories, page J-21 and J-22
	Sealing caps	•	•	•	
	06	•	•	•	
Size	08	•	•	•	Technical dimensions, page J-11 For more information visit our website www.fischerconnectors.com/technical
	10				TOT THOSE INFORMATION VISIT OUT WEDSILE WWW.HSCHERCOMHECTORS.COM/TECHNICAL

# **CABLE**MOUNTED

#### MR50-L / PUSH-PULL

**BODY STYLE** 

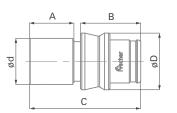




#### MR50-Q / QUICK-RELEASE

**BODY STYLE** 

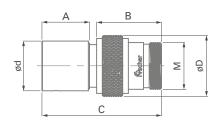




#### MR50-S / SCREW-LOCKING

**BODY STYLE** 





Size	Locking	ød	øD	Α	В	~ C	M
	Push-pull	8.5	9.9	10.1	13.7	25	-
06	Quick-release	8.5	9.9	10.1	13.7	25	-
	Screw	8.5	9.9	10.1	13.7	25	M8x2
	Push-pull	10.5	11.6	10.1	13.7	25	-
08	Quick-release	10.5	12.9	10.1	13.7	25	-
	Screw	10.5	12.9	10.1	13.7	25	M10x2
	Push-pull	-	-	-	-	-	-
10	Quick-release	-	-	-	-	-	-
	Screw	-	-	-	-	-	-



<b>PANEL</b> MOUNTE	D									
Body style		MR11-L	MR11-S	MR11-Q	MR12-L	MR12-S	MR12-Q	References to detailed information		
Protection	Sealed up to IP68	•	•	•	•	•	•	Scaling actoroxica page A.S.		
Protection	Hermetic							Sealing categories, page A-6		
	Crimp contact							F1 10		
Termination	Solder contact	•	•	•	•	•	•	Electrical & contact configurations, page J-16		
PCB contact		•	•	•	•	•	•	page o To		
Housing color	Anthracite Nickel	•	•	•	•	•	•	Part numbering, page J-20		
	Right-angle									
Danisan	Flush									
Design	Front-projecting	•	•	•	•	•	•	Pady styles shorter I		
	Bulkhead feedthrough							Body styles, chapter J		
Assembly	Front-mounting									
Assembly	Rear-mounting	•	•	•	•	•	•			
	Sealing caps	•	•	•	•	•	•			
	Spacers									
Accessories	Color-coded washers							Accessories, page J-21 and J-22		
	Grounding washers							page 3-21 and 3-22		
	Locking washers									
	06	•	•	•	•	•	•	Technical dimensions, page J-13 to J-15		
Size	08	•	•	•	•	•	•	For more information visit our website		
	10	•		•				www.fischerconnectors.com/technical		

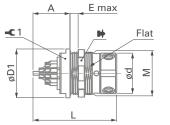
#### **PANEL REAR**

MOUNTED

#### MR11-L / PUSH-PULL

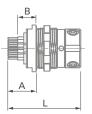
**BODY STYLE** 







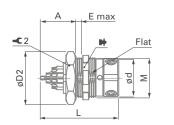
PCB



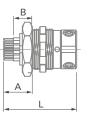
#### MR12-L / PUSH-PULL

**BODY STYLE** 





SOLDER



PCB

Size	Locking	Termination	ød	øD1	øD2	Α	В	L	E max	M Panel thread	<b>-€</b> 1	<b>-c</b> 2	Torque
06	Puch pull	Solder contact	8.0	10.0	11.4	7.6	-	19.1	3.0	M8.5x0.35	8	10	1.0 Nm
06	Push-pull	PCB contact	8.0	10.0	11.4	7.3	4.7	18.8	3.0	M8.5x0.35	8	10	1.0 Nm
08		Solder contact	10.0	12.0	13.7	9.1	-	20.6	3.0	M10.5x0.5	10	12	1.5 Nm
US	Push-pull	PCB contact	10.0	12.0	13.7	7.3	4.7	18.8	3.0	M10.5x0.5	10	12	1.5 Nm
10	Push-pull	Solder contact	12.0	14.0	-	7.6	-	19.1	3.0	M12.5x0.5	12	-	2.0 Nm
10		PCB contact	12.0	14.0	-	7.3	4.7	18.8	3.0	M12.5x0.5	12	-	2.0 Nm





Size	øX	øΥ
06	8.58 +0.1/0	8.25 +0.1/0
08	10.45 +0.1/0	10.2 +0.1/0
10	12.45 +0.1/0	12.2 +0.1/0

FISCHER MINIMAX™ SERIES Technical dimensions

#### **RECEPTACLES**

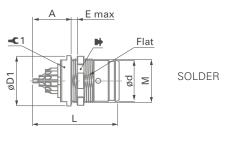
#### **PANEL REAR**

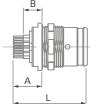
MOUNTED

#### MR11-Q / QUICK-RELEASE

**BODY STYLE** 





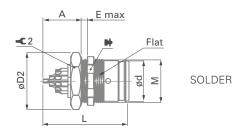


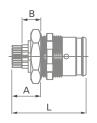
PCB

#### MR12-Q / QUICK-RELEASE

**BODY STYLE** 



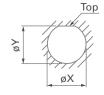




PCB

Size	Locking	Termination	ød	øD1	øD2	Α	В	L	E max	M Panel thread	<b>-€</b> 1	<b>-€</b> 2	Torque
06	Ouisk valages	Solder contact	7.8	10.0	11.4	7.6	-	19.1	3.0	M8.5x0.35	8	10	1.0 Nm
06	Quick- release	PCB contact	7.8	10.0	11.4	7.3	4.7	18.8	3.0	M8.5x0.35	8	10	1.0 Nm
00	0	Solder contact	9.8	12.0	13.7	9.1	-	20.6	3.0	M10.5x0.5	10	12	1.5 Nm
08	Quick-release	PCB contact	9.8	12.0	13.7	7.3	4.7	18.8	3.0	M10.5x0.5	10	12	1.5 Nm
40	0 : 1 1	Solder contact	11.8	14.0	-	7.6	-	19.1	3.0	M12.5x0.5	12	-	2.0 Nm
10	Quick-release	PCB contact	11.8	14.0	-	7.3	4.7	18.8	3.0	M12.5x0.5	12	-	2.0 Nm





Size	х	Υ
06	8.58 +0.1/0	8.25 +0.1/0
08	10.45 +0.1/0	10.2 +0.1/0
10	12.45 +0.1/0	12.2 +0.1/0

#### **PANEL REAR**

**MOUNTED** 

#### **MR11-S / SCREW-LOCKING**

**BODY STYLE** 

Size

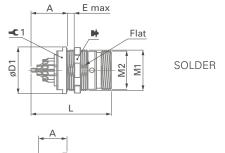
06

80

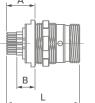
10

Locking





PCB



øD1

Termination

øD2

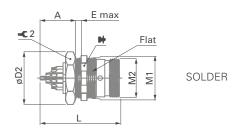
Α

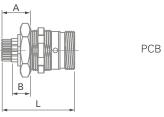
В

### MR12-S / SCREW-LOCKING

**BODY STYLE** 







PANEL	CUT-OUT



Screw	Solder contact	10.0	11.4	7.6	N/A	19.1	2.3	M8.5x0.35	M8x2	8	10	1.0 Nm			
	PCB contact	10.0	11.4	7.3	4.7	18.8	2.3	M8.5x0.35	M8x2	8	10	1.0 Nm	0:	.,	.,
Screw	Solder contact	12.0	13.7	9.1	-	20.6	2.3	M10.5x0.5	M10x2	10	12	1.5 Nm	Size	øΧ	øY
	PCB contact	12.0	13.7	7.3	4.7	18.8	2.3	M10.5x0.5	M10x2	10	12	1.5 Nm	06	8.58 +0.1/0	8.25 +0.1/0
Screw	Solder contact	-	-	-	-	-	-	-	-	-	-	-	08	10.45 +0.1/0	10.2 +0.1/0
	PCB contact	-	-	-	-	-	-	-	-	-	-	-	10	-	-

M2

Locking

thread

Torque

M1

**Panel** 

thread

Ε

max



	. S			11	PCB	2	Rated voltage	Tes	t voltage [kV]	in mated posi	ition						
	Ħ	Ħ,		5	Wire size 1)	contacts	Current [A]	r.m.s [V]			4-1 test 4a						
	ayo		ber inta			Pin diameter	IEC	IEC	AC r.m.s.		DC						
Size	Pin layout		Number of contacts	Contact diameter [mm]	Solder contacts	[mm]	60512-5-2-5b <sup>2)</sup>	60664-1 <sup>3)</sup>	Contact to	Contact to	Contact to	Contact to					
0)	8)		2	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	1.0		body	contact	body	contact					
		4	2	1.3	Max ø1.33 mm – AWG18 [19/30]	0.4	1.0	≤200	1.4	1.2	2.3	1.9					
			4	0.5	Max ø0.70 mm – AWG24 [19/36]	0.7	0.02 (2x) + 1.5 (2x)		1.0	1.2	2.0	1.7					
06		7	3			-		≤160		0.9 7)	_	1.3 7)					
			-	0.7	Max ø0.90 mm – AWG22 [19/34]	0.5	7.0		1.0	0.9	2.0	1.5					
		12	10	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.0	≤50	0.9	0.9	1.5	1.2					
			2	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0										
	ETHERNET		8	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	3.8	≤320	1.6	1.6	2.2	2.2					
	USB 3.2	9	7	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.0	≤250	1.5	4.0	0.4	1.8					
			2 5)	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤250	1.5	1.2	2.4	1.8					
		10	15	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	1.0	~100	0.0	0.0	1.5	1.2					
		19	4	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤100	0.9	0.9	1.5						
08	69	19	10	10	10	13+2 4)	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	1.0	-100	0.0	0.0	4.5	1.0		
Uo			4	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤100	0.9	0.9	1.5	1.2					
	9) UHD	<sup>9)</sup> 19H	12	0.5	Max ø0.55 mm – AWG26 [19/38]	0.4	4 = 10)	-105	1.0	4.0	4.0	4.0					
	LIHD		7	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.5 10)	≤125	1.0	1.0	1.8	1.8					
			20	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.0										
		24	4	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤63	0.9	0.9	1.5	1.2					
	68	0.4	18+2 4)	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.0	.00	2.0		4.5	4.0					
		24	4	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤63	0.9	0.9	1.5	1.2					
			7	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	0.02		1.7	1.5	2.3	2.0					
			2 5)	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	3.0		1.7	1.5	2.3	2.0					
40			12	12		_	12	_					≤250	1.8	3.1	2.4	4.5
10	USB 3.2								3	0.9	Max ø1.03 mm – AWG20 [26/34]	0.7	8.0		-	2.0 6)	-
		0.0	24	0.5	Max ø0.43 mm – AWG28 [19/40]	0.4	1.0	.4.55	1.2	1.0	1.9	1.7					
		30	6	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0	≤160	1.2	1.0	1.9	1.7					
11.0			6	0.5	Max ø0.70 mm – AWG24 [19/36]	0.4	5.0		1.2	1.0	1.9	1.7					

<sup>1)</sup> Stranding values in brackets.

**Electrical & contact configurations** 

<sup>&</sup>lt;sup>2)</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account. See page A-12 for details.

<sup>&</sup>lt;sup>3)</sup> Recommended operating voltage at sea level. This rated voltage is a general guideline where no other electrical safety standard applies. In

cases where other standards rule a specific use of the connector, the <sup>6)</sup> Test voltage between contacts 0.9 and contacts 0.5 for configuration application-specific safety criteria shall be considered first. This must be evaluated in the framework of equipment engineering.

<sup>&</sup>lt;sup>4)</sup> Two advanced signal contacts for USB power are available for Solder (S) or PCB (P) receptacles.

<sup>&</sup>lt;sup>5)</sup> USB 3.2 contact blocks come with two advanced power contacts on the plug side (MP11) as standard (size 08 plug 9-pin contact block 2007 and size 10 plug 12-pin contact block 2307).

MiniMax size 10 2307/0309.

 $<sup>^{7)}\</sup>mbox{Test}$  voltage between contacts 0.7 and contacts 0.5 for configuration MiniMax size 06 0304.

<sup>8)</sup> Contacts 0.7mm suitable for SPE data protocol 1 Gbit/s.

<sup>9)</sup> Layout dedicated to 4K UHD Audio/Video Protocol 18.0 Gbit/s.

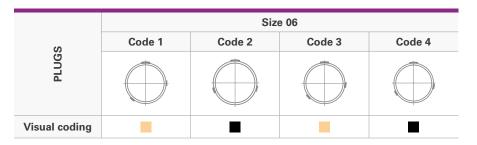
<sup>&</sup>lt;sup>10)</sup> Current of 1.4 A at a maximum temperature rise of 30 °C according to UHD specifications.

#### **MECHANICAL AND VISUAL CODING**

The mechanical coding for MiniMax is available as standard in 4 different variants : code 1, 2, 3, 4.

When size, body type, configuration and code matches the plug and receptacle will mate by aligning the exterior white marks (coding guide).

For additional differentiation, the odd codes are visually identified by a beige contact block while the even codes will vary with a black insulator.



	Size 08								
(0	Code 1	Code 2	Code 3	Code 4					
PLUGS									
Visual coding									

	Size 10								
(0	Code 1	Code 2	Code 3	Code 4					
PLUGS									
Visual coding									



Ground contact connected to housing:

- Pin for PCB contact (P) versions
- Solder barrel for solder contact (S) versions

#### Recommended wiring

Size		06			10		
Configuration	2+2	3+4	12	8	19	24	30
Power	2; 4	5; 6; 7	5; 9	any2	9; 12; 15; 18	14; 17; 20; 23	14; 17; 20; 23; 26; 29
Ethernet	-	-	1/6; 3/10; 7/8; 11/12	1/2; 3/4; 5/6; 7/8	8/19; 10/11; 13/14; 16/17	15/16; 18/19; 21/22; 13/24	Any other
Advanced pin	2; 4	-	-	-	13; 19	18; 24	-

<sup>1)</sup> Recommended

#### USB Signal name 3)

#### Size 08, configuration 9 contacts



- USB 2.0 D SS drain
- 3) USB 2.0 D+
- 4) Vbus 5 V
- 5) SS TX+
- 6) SS TX-7) SS RX+
- 8) SS RX-
- 9) Vbus GND

11) TMDS data 1-

12) TMDS data 0

13) TMDS data 0+

14) TMDS data 0-

CLK shield 16) TMDS data

15) TMDS data

CLK+

CLK -

shield

17) TMDS data

18) TMDS data 2

shield

#### UHD 18.0 Gbit/s protocol

#### Size 08, configuration 19 contacts



- +5 V Power
   DDC/CEC Ground
- 3) Utility4) Hot plug
- detect 5) SDA
- 6) SCL
- 7) CEC (delayed contact)
- 8) TMDS data 2-
- 9) TMDS data 1 shield
- 10) TMDS data 1+ 19) TMDS data 2+

#### Size 10, configuration 12 contacts



- 1) USB 2.0 D-
- 2) SS drain
- 3) USB 2.0 D+
- 4) Vbus 5 V
- 5) SS TX+ 6) SS TX-
- +
- 7) SS RX+ 8) SS RX-
- 9) Vbus GND
- 10) Power
  - 11) Power 12) Power
- <sup>3)</sup> RX/TX labelling of Fischer Rugged Flash Drive. The RX of one device must always connect to the TX of the other device and vice versa.

<sup>2)</sup> Optional on MR11 / MR12

View from the back of the plug/front of receptacle (guide mark at 12 o'clock)

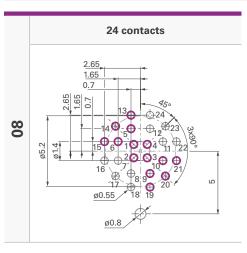
	2+2 contacts	3+4 contacts	12 contacts
90	All contacts are male or female depending on polarity.	© 60.65 (Ø3) Ø0.65 (Ø3.2) Ø0.55 (Ø3.2) Ø0.55 Ø0.8	1.7 0.7 0.9 0.4 12 12 13 14 11 15 15 15 15 15 15 15 15 15

	Contacts						
	Plugs	Receptacles					
0	Male	Female					
0	Female	Male					

FISCHER MINIMAX™ SERIES PCB hole layout

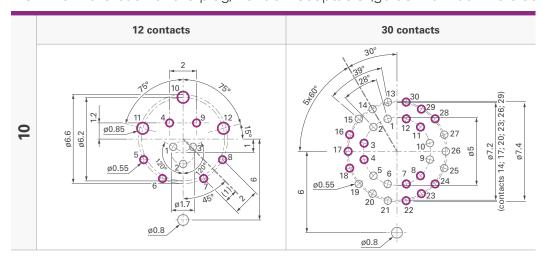
View from the back of the plug/front of receptacle (guide mark at 12 o'clock)

	8 contacts	9 contacts	19 contacts	19 contacts UHD
80	22.5 10 8 20 7 20 5 40 5 6	Ø0.55    (1)   Ø5    (1)   Ø5	15.5° 15.5° 29° 29° 29° 29° 29° 29° 29° 29° 29° 29	9 8 0 19 0 18 10 0 17 17 11 19 0 0 16 0 16 0 16 0 16 0 16 0 16 0



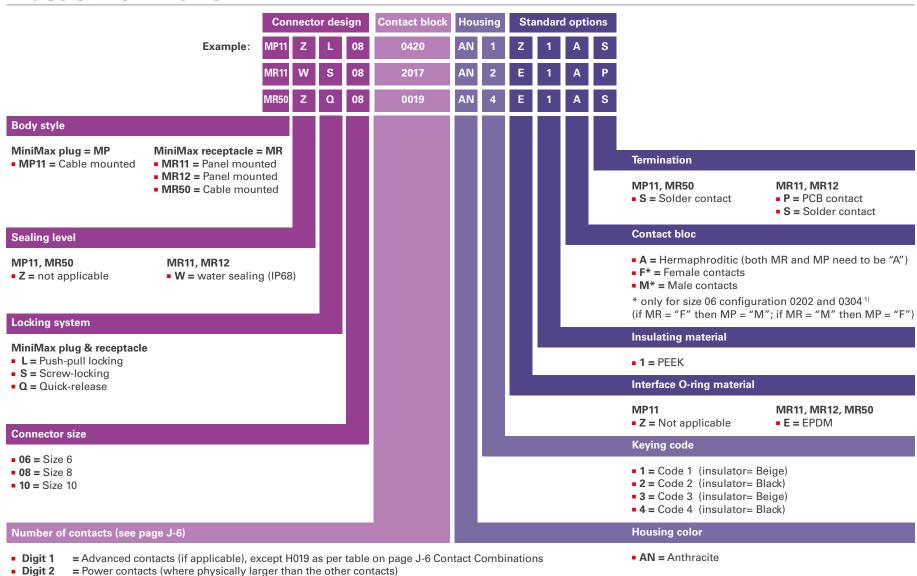
	Contacts							
	Plugs	Receptacles						
0	Male	Female						
0	Female	Male						

View from the back of the plug/front of receptacle (guide mark at 12 o'clock)



	Contacts					
	Plugs	Receptacles				
0	Male	Female				
0	Female	Male				

#### **PLUGS & RECEPTACLES**

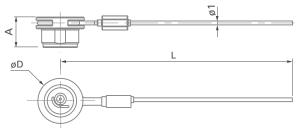


<sup>&</sup>lt;sup>1)</sup> Configuration 0304 is standard with F for receptacle and M for plug. For customization please contact your local sales representative.

■ **Digit 3+4** = Remaining contacts

#### **SOFT CAPS**

#### CABLE MOUNTED



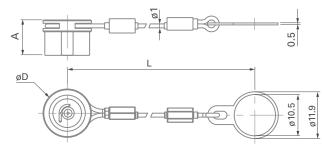
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	-		

øD L	

Size	Body style	Images	Push-pull	Quick-release	Screw-lock	Α	øD	L	Part number
06			•			9.6	10.0	200	MCP06C 1B2 A200 AA
00				•	•	7.8	10.0	200	MCP06C 1B2 A200 BA
08	MP11 1)		•			9.6	12.3	200	MCP08C 1B2 A200 AA
08	IVIFIT			•	•	7.8	12.3	200	MCP08C 1B2 A200 BA
10			•		-	9.6	14.3	200	MCP10C 1B2 A200 AA
10				•	-	7.8	14.3	200	MCP10C 1B2 A200 BA
06			•	•	•	9.0	10.0	200	MCR06C 1B2 A200 AA
08	MR50 1)		•	•	•	9.0	12.3	200	MCR08C 1B2 A200 AA
10			•	•	•	9.0	14.3	200	MCR10C 1B2 A200 AA

<sup>&</sup>lt;sup>1)</sup>Crimp ferrule and heat shrink tube are included.

#### PANEL MOUNTED

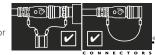


Size	Body style	Images	Push- pull	Quick- release	Screw- lock	Α	øD	L	ød1	ød2	Part number
06			•	•	•	9.0	10.0	95	8.5	9.9	MCR06P 1B2 A095 AA
08	MR11 1) MR12 1)		•	•	•	9.0	12.3	95	10.5	11.9	MCR08P 1B2 A095 AA
10			•	•	-	9.0	14.3	95	12.6	13.9	MCR10P 1B2 A095 AA

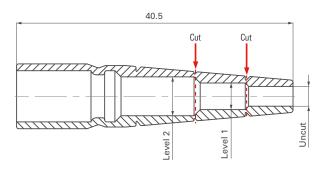
<sup>&</sup>lt;sup>1)</sup>Crimp ferrule, heat shrink tube and mounting ring are included.

To avoid getting debris into the caps when the connectors are mated, please mate the caps together.

Please make sure that the cap is in place when the plug or the receptacle is in unmated position.



#### **STRAIGHT BEND RELIEF**



#### **CUTTING DIAMETERS**

Size	Uncut	Level 1	Level 2	Part Number
06	ø2.9	ø3.9	ø5.7	MB06 A1BK
08	ø3.9	ø5.4	ø6.7	MB08 A1BK
10	-	-	-	-

#### **SPANNER & NUT DRIVER**

# DOUBLE-ENDED OPEN SPANNER EXTRATHIN ♀



Size	Part number	Opening across flats	Length	Fork thickness
06	TX00.008	8	96	2.3
08	TX00.010	10	104	2.5
Uo	TX00.012	12	104	2.5
10	TX00.012	12	104	2.5

Material – Chrome Alloy Steel, Chrome plated, Fork Angles – 15° and 75°.

# NUT DRIVER WITH T-HANDLE AND HEX DRIVE ▶



Part number	Thread size	Nut outer dia.	øD	Hex drive
TX00.383	M8.5x0.35	10	14	7
TC00.007	M10.5x0.5	12	16	7
TX00.403	M12.5x0.5	14	18	7

Material - Hardened Tool Steel, Nickel plated.

# SINGLE SIDED HEX NUT DRIVER



Part number	Thread size	Nut outer dia.	øD	Hex drive
TX00.386	M8.5x0.35	10	14	12
TX00.385	M10.5x0.5	13	16	12
TX00.412	M12.5x0.5	15	18	12

Material – Hardened Tool Steel, Nickel plated and plastic.

#### **CABLE ASSEMBLY**

Note: Cable assembly is only possible with special tooling developed by Fischer Connectors. Due to the complexity of the connector purchase costs may be significant. As an alternative solution, Fischer Connectors offers premium cable assembly services.



Part number	Description
130257	Hand press Luthy HP150T or equivalent



Part number	Description
130254	MiniMax support tool



Part number	Description
130252	MiniMax tool kit Size 06
139451	MiniMax tool kit Size 06 (7 contacts)
130253	MiniMax tool kit Size 08
137461	MiniMax tool kit Size 10



#### **MATERIAL & SURFACE FINISH**

Motel components		IV	laterial (		Finish		
Metal components		Designation ISO	Standard	Designation	Standard		
Housing, Nut		Brass CuZn39Pb3	CW614N UNS C 38500	Anthracite Nickel	SAE-AMS2404 SAE-AMS-QQ-N-290		
Back nut (MP11, MR50)		Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290B SAE-AMS2404G		
Ground contact		Brass CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290B SAE-AMS2404G		
Push-pull locking s Quick-release lock		Stainless steel	X10CrNi18-8 (1.4310)	-	-		
Contacts	- Male, Ground Pin	Brass CuZn39Pb3 Bronze CuSn4Zn4Pb4	CW614N; UNS C 38500 CW456K; ASTM B139 UNS C 54400	1 μm Gold over Nickel 1 μm Gold over Nickel	MIL-DTL-45204D Type I; ASTM B488 MIL-DTL-45204D Type I; ASTM B488		
Ball-locking		Ceramic Si3N4	-	-	-		

Insulator and sealing		International symbol	Flammability
Insulators		PEEK <sup>1)</sup>	UL 94 V-0
O-rings	- General - Interface	FPM (Viton®) EPDM	-
Sealant	- Cable connectors - Panel receptacles	Epoxy compound Silicone/Epoxy <sup>2)</sup> compound	- UL 94 V-0
Bend relief	- Cable connectors	Santoprene™ TPV 101-73	UL 94 HB
Сар	- Cable connectors - Panel receptacles	TPV (Santoprene™)	UL 94 HB

<sup>&</sup>lt;sup>1)</sup> Or any material in the PAEK family that provides equal or better overall performances.

<sup>&</sup>lt;sup>2)</sup> For panel receptacle size 10.

#### **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance	Standard
Sealing performance mated and unmated		
Sealing performance Soft Cap	IP67; 15 cm submersion for 30 min	IEC 60529
Operating temperature range 1)	-40 °C to +135 °C	IEC 60512-6-1 IEC 60068-2-14-Nb
Corrosion resistance mated	Salt mist 1,000 hours; 5% salt solution, 35 °C Plug and receptacle in mated position or with cap when unmated. Appearance may change over time without impacting mechanical or electrical functions.	IEC 60068-2-11 Test Ka; MIL-STD-202 Method 101; EIA-364-26
Endurance	5,000 mating cycles Preserved mechanical and electrical functionality. Normal wear will appear.	IEC 60512-9-1
Vibration Screw-locking version only	10 to 2,000 Hz, 1.5 mm or 15 g, 12 sweep cycles per axis, 20 minutes per 10-2,000-10 Hz sweep cycle, no discontinuity >1 μs, no visible signs of damage	MIL-STD-202 Method 204 Condition B
<b>Vibration</b> Push-pull version	10 to 500 Hz, (1.5 mm or 10 g, 12 sweep cycles per axis, 15 minutes per 10-500-10 Hz sweep cycle, no discontinuity >1 µs, no visible signs of damage	MIL-STD-202 Method 204 Condition A
Unlocking Force Quick-release version only	Size 06 = Typical 25 N±40% Size 08 = Typical 35 N±40% Size 10 = Typical 60 N±40%	
Shock	300 g	MIL-STD-202 Method 213; EIA-364-27

<sup>&</sup>lt;sup>1)</sup> Max temperature of +85 °C for soft caps.

#### **ELECTRICAL DATA**

Characteristic		Performance	Standard
Contact resistance		5 mΩ (typical value)	IEC 60512-2-1-2a; IEC 60512-2-2-2b
Shell resistance 2)	ANTHRACITE	<5 mΩ (Cabled)	IEC 60512-2-6-2f
Insulation resistance		>10 <sup>10</sup> Ω	IEC 60512-3-1-3a
Shielding effectiveness		360° shielded	-

<sup>&</sup>lt;sup>2)</sup> Measured for a mated pair of panel receptacle and cable plug between the grounding pin and the cable shielding.



## **FISCHER** FREEDOM™ SERIES

**EASY MATING | EASY CLEANING | EASY INTEGRATION** 

## **KEY FEATURES**

- No key code: 360° mating freedom & optimized cable management
- Non-magnetic locking mechanism
- Membrane-sealed contacts (patent pending)
- Low profile



K-2 / K-18

## **FREEDOM**



## **PLUGS**



## **RECEPTACLES**



## **FOR ALL FREEDOM**

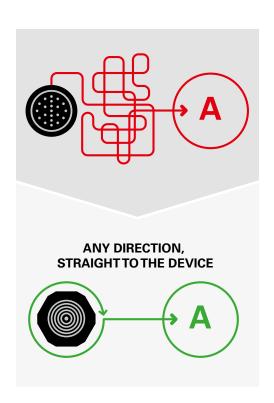
Key features	K-3
Body styles & technical dimensions	K-4
Electrical & contact configurations	K-11
PCB hole layout	K-11
Part numbering	K-12
Pre-cabled plug / receptacle configurations	K-13
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This catalog covers our standard connector solutions. For specific requests, including custom connectors, please contact your local sales representative. Note: The images shown in this catalog are for illustrative purposes only

# FREEDOM

## **EASY MATING**

- No key code = 360° mating freedom
- Optimized cable management no more tangles and turns, cables always go in a straight line
- Non-magnetic quick-release locking mechanism



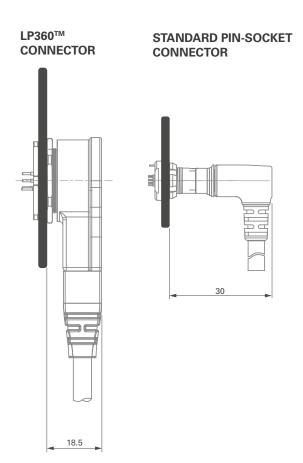
## **EASY CLEANING**

- Surface contacts = fixed tracks & membranesealed contacts
- No female contacts that can accumulate dirt, no long male contacts that can get broken
- A true cleanable solution on both receptacle and plug sides



## **EASY INTEGRATION**

- 2x less protruding compared to a normal pin-socket type of connector
- A true low-profile solution
- Ideal for integration in wearable applications or on panels where space and access are limited





PLUG CABLE MOUNTED PANEL MOUNTED

		Metal	Plastic	Metal	
Body style		FLP01	FLP01	FLP03	References to detailed information
Protection	Sealed to IP67		•		Sealing categories, pages K-17 & 18
1 Totection	Sealed up to IP68	•		•	ocaning categories, pages K-17 & 10
	Friction				
	Push-pull				
Locking system	Quick-release	•	•	•	-
3,310111	Lanyard				
	Tamperproof				
	Wires	•	•		
Termination	Solder			•	Electrical & contacts configurations, page K-11
	ZIF			•	
	Brass	•		•	
Housing material	Aluminum				Page K-12
Illatellal	Plastic		•		
Housing	Anthracite	•		•	D 1/40
color	Black		•		Page K-12
	Cable clamp sets				
Cabling	Overmoldable	•	•		-
	Heat shrinkable	•	•		
	Cable bend reliefs	•	•		
Accessories	Protective sleeves				
	Sealing caps	•	•	•	Page K-15
	08		•	•	-
Size	14	•		•	Technical dimensions, pages K-5 & 6

## **PRE-CABLED PLUG FLP01**

## **CABLE** MOUNTED

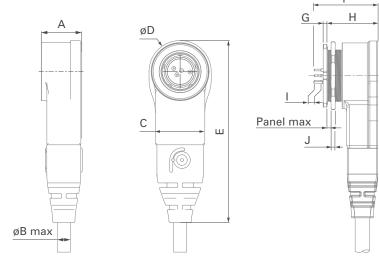
## **METAL SIZE 14**







Note: Plug is only available pre-cabled with a standard length (1 m). For customized solutions, please contact sales.



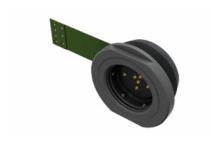
Size	А	øB max	С	øD	E	Panel max	F	G	н	ı	J	Weight (without cable)
08 Plastic	13.3	4.8	16.0	21.5	59.3	3	23.8	2.2	18.9	2.5	2	15.8 g
14 Metal	13	5.5	15.6	25.4	67.4	3	23.4	1.4	18.5	2.5	1.5	44.5 g

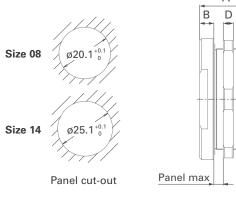
## **PLUG FLP03**

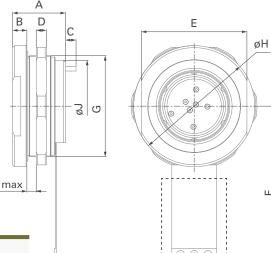
## **PANEL**

MOUNTED

## **METAL**







Size	Α	В	С	D	E	Panel max	F	G	øH	øJ	Weight
08 Metal	13	3.5	2.7	2.5	21	3.7	42	M20x0.5	25	17.6	20.5 g
14 Metal	13	3.5	2.7	2.5	26	3.7	42	M25x0.5	30	22.6	32.6 g

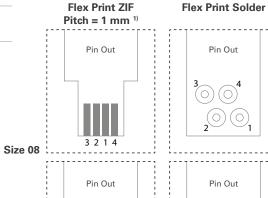
## **NUT ACCESSORY**

Nut to be ordered separately. Available in different sizes.



Size	Part number	Inner thread size	Outer diameter	Flat open spanner	Material
08 Metal	223881	M20x0.5	ø26	24	Metal
14 Metal	224113	M25x0.5	ø31	29	Metal

<sup>&</sup>lt;sup>1)</sup> ZIF connectors have a current limitation of 1 A.



Size 14

## **RECEPTACLE**

PANEL MOUNTED

#### **CABLE MOUNTED**







		Metal	Plastic	Metal	
Body style		FLR01	FLR01	FLR50	References to detailed information
	Sealed to IP67		•		
Protection	Sealed up to IP68	•		•	Sealing categories, pages K-17 & 18
	Hermetic				
Termination	Wires			•	Electrical 9, contact configurations, page V 11
lemination	PCB contacts	•	•		Electrical & contact configurations, page K-11
	Stainless steel	•			
Housing material	Aluminum			•	Page K-12
	Plastic		•		
Housing	Anthracite	•		•	Down V 10
color	Black		•		Page K-12
Design	Front projecting	•	•	•	
Accomplete	Front mounting				Body styles, pages K-8 to 10
Assembly	Rear mounting	•	•	•	
	Cable bend relief			•	
A	Protective sleeves				
Accessories	Sealing caps	•	•		Page K-15
	Garment fixation	•	•	•	Page K-16
C:	08	•	•	•	Technical dimensions mages K 0 to 10
Size	14	•		•	Technical dimensions, pages K-8 to 10

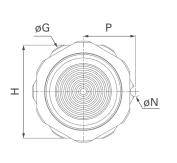
## **RECEPTACLE FLR01**

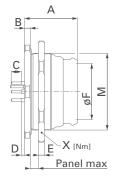
## **PANEL**

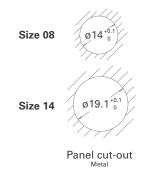
**REAR MOUNTED** 

**METAL** 









Size	A	В	С	D	Panel max	øF	øG	н	М	øN	Р	х	Weight
08 Metal	13	1.4	2.5	1	3	8	19.9	17.9	M14x0.5	2.0	10.3	2-4 Nm	7.5 g
14 Metal	13	1.4	2.5	1	3	14	24.9	22.9	M19x0.5	2.5	12.8	2-4 Nm	15.2 g

## **NUT ACCESSORY**

Nut to be ordered separately. Metal nut available in different sizes. Refer to Accessories section for garment fixation.



Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
08	224101	M14x0.5	ø20	2.0	18	Plastic
Metal	223787	M14x0.5	ø20	1.5	18	Metal
14	222825	M19x0.5	ø25	1.5	23	Metal
Metal	222826	M19x0.5	ø30	1.5	28	Metal

## FREEDO

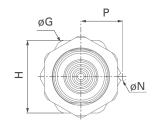
## **RECEPTACLE FLR01**

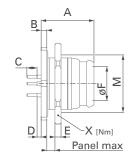
## **PANEL**

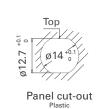
**REAR MOUNTED** 

## **PLASTIC**









Size	А	В	С	D	Panel max	øF	øG	н	М	øN	Р	х	Weight
08 Plastic	13.8	2.2	2.5	0.2	3	8	19.9	17.9	M14x0.5	2.0	10.3	1.0-1.5 Nm	3.3 g

## **NUT ACCESSORY**

Nut to be ordered separately. Refer to Accessories section for garment fixation.



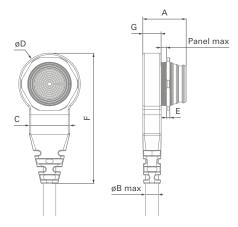
Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material	
08	224101	M14x0.5	ø20	2.0	18	Plastic	
Plastic	223787	M14x0.5	ø20	1.5	18	Metal	

## **RECEPTACLE FLR50**

## **CABLE**MOUNTED

**METAL** 





Size	А	øB max	С	øD	F	G	Panel max	Weight (without cable)
08 Metal	18.9	4.8	17.5	26.9	56.9	8.1	2.3	18 g
14 Metal	18.9	5.5	17.5	26.9	56.9	8.1	2.3	25 g

Note: Receptacle is only available pre-cabled with a standard length (1.0 m). For customized solutions please contact sales.

## **NUT ACCESSORY**

Nut to be ordered separately. Available in different sizes. Refer to Accessories section for garment fixation.

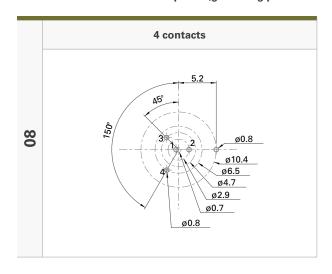


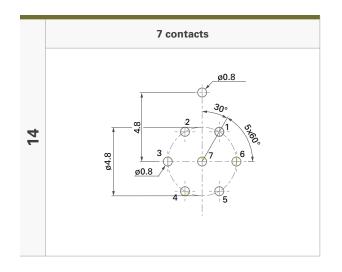
Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
08	224101	M14x0.5	ø20	2.0	18	Plastic
Metal	223787	M14x0.5	ø20	1.5	18	Metal
14	222825	M19x0.5	ø25	1.5	23	Metal
Metal	222826	M19x0.5	ø30	1.5	28	Metal

	Size Pin layout				Receptacle	Receptacle	Current [A]	Rated voltage		Test voltage [kV] in mated position			
		ts		ts	PCB contacts	Pin number		r.m.s [V] 3)		IEC 60512-4-1 test 4a			
		umber f contacts	ber ntac	Pin diameter	IEC	IEC	AC r.	m.s.	D	С			
Size		Pin la		Pin la	Num of co	[mm]		60512-5-2-5b	<b>60664-1</b>	Contact to body	Contact to contact	Contact to body	Contact to contact
00		4	2	0.63	1, 2	1	≤160	≤160 0.7 <sup>4)</sup>	0.7	1.2 4)	1.2		
80		4	2	0.63	3, 4	5							
1.1		7 4	0.63	1, 2, 6, 7	1	100	≤160 0.	0.7	0.7	1.0	1.2		
14		/	3	0.63	3, 4, 5	5		0.7	0.7	1.2	1.2		

<sup>&</sup>lt;sup>1)</sup> Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken into account.

#### View from the front of the receptacle (grounding pin at 12 o'clock)

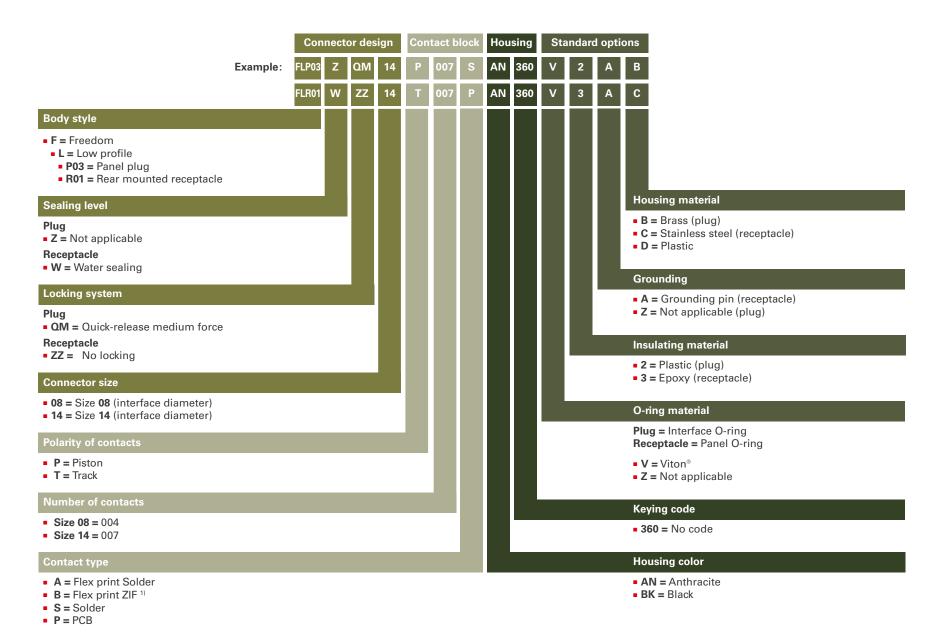




<sup>&</sup>lt;sup>2)</sup> Recommended operating voltage at sea level. This rated voltage is a general-purpose guideline where no other electrical safety standard applies. In case where other standards rule a specific use of the connector, then the application-specific safety criteria shall be considered first. This must be evaluated in the frame of equipment engineering.

<sup>&</sup>lt;sup>3)</sup> Based on IEC 61984 safety requirements, Fischer Connectors recommends that, for operating voltage >50 V, power should not be used without integration of an active security system. Please contact us for further information.

<sup>4)</sup> N/A for plastic version.

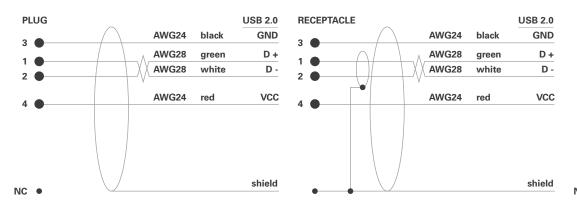


<sup>&</sup>lt;sup>1)</sup> ZIF connectors have a current limitation of 1 A.

## **CABLE SPECIFICATION 4 PINS SIZE 08**

## **USB CABLE**

- PUR halogen free, flame retardant outer sheath, black (RAL9005 matt) / Tan (RAL 7002 matt)
- Working voltage: ≤ 100 V
- Weight: 34 kg/km
- Overall diameter: nominal 4.8 mm / minimum 4.6 mm



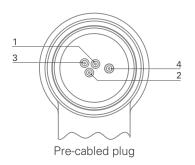
## ETHERNET CABLE

- Breaking strength: ≤ 100 N
- Recommended bending radius: 20 mm static / 40 mm dynamic
- Working temperature: -30 °C to +80 °C
- Weight: 29 kg/km
- Overall diameter: nominal 4.7 mm / minimum 4.4 mm / maximum 5.0 mm

PLUG			ETI	HERNET
1	$\bigcap$	AWG26	orange	Rx-
2	/ \	AWG26	blue	Tx-
3		AWG26	orange / white	Rx+
4		AWG26	blue / white	Tx+
4				
1	\ /			
NC •				shield

## WIRING DIAGRAM AND PART NUMBER FOR PRE-CABLED PLUG / RECEPTACLE

Wiring diagram front view:





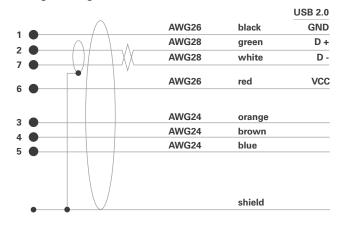
Part Number	USB 2.0 PRECABLED SOLUTION 1 m, open end
135121	Plug assembly 1 m black cable & bend relief
136299	Receptacle assembly 1 m black cable & bend relief
136386	Receptacle assembly 1 m TAN cable & bend relief

Part Number	ETHERNET 100Mbit/s PRECABLED SOLUTION 1 m, open end
135528	Plug assembly 1 m black cable & bend relief



## **CABLE SPECIFICATION 7 PINS SIZE 14**

- PUR halogen free, flame retardant outer sheath, nominal thickness 0.55 mm, black (RAL9005 matt / TAN (RAL 7002 matt)
- Working voltage: 100 V
- Weight: 45 kg/km



- Breaking strength: 400 N (Vectran central strength member)
- Recommended bending radius: 40 mm static / 60 mm dynamic
- Working temperature: -40 °C to +90 °C
- Overall diameter: nominal 5.35 mm / maximal 5.50 mm

#### AWG28 (white/green twisted)

Tinned copper conductor 7x0.13 mm / polypropylene insulation / nominal thickness 0.28 mm / nominal diameter 0.95 mm / characteristic impedance 90 ±10  $\Omega$  Tinned copper drain wire 7x0.13 mm, aluminum / polyester tape

#### AWG26 (black/red)

Tinned copper conductor 7x0.16 mm / polypropylene insulation / nominal thickness 0.21 mm / nominal diameter 0.90 mm

### AWG24 (blue/brown/orange)

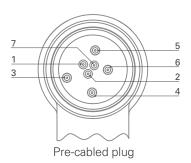
Bare copper conductor 7x0.20 mm / polypropylene insulation / nominal thickness 0.20 mm / nominal diameter 1.0 mm

#### Shield

Tinned copper braid / coverage 95% / wire diameter 0.13 mm

## WIRING DIAGRAM FOR STANDARD PRE-CABLED PLUG / RECEPTACLE

Wiring diagram front view:





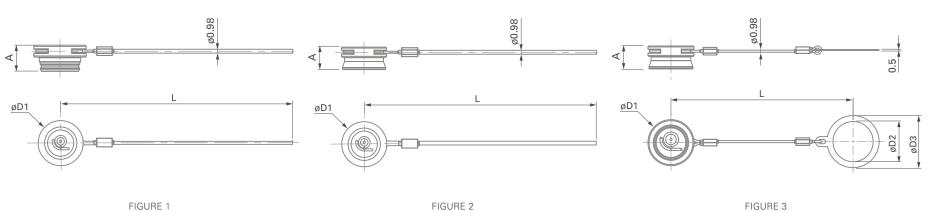
134564	
135674	
133074	

Part Number	PRECABLED SOLUTION 1 m, open end
134563	Plug assembly 1 m black cable & bend relief
134564	Plug assembly 1 m TAN cable & bend relief
135509	Receptacle assembly 1 m black cable & bend relief
135674	Receptacle assembly 1 m TAN cable & bend relief

## **CAPS**

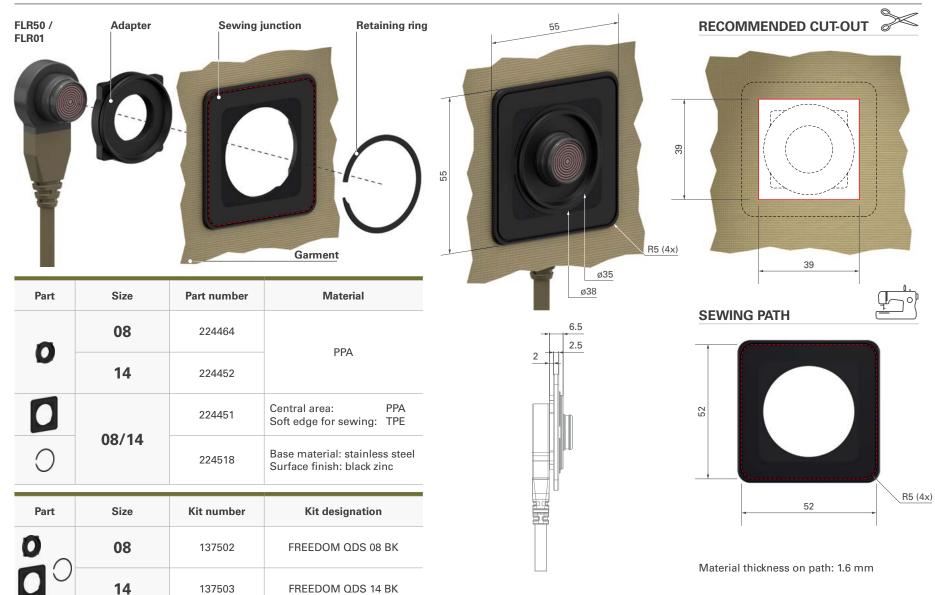
## CABLE **MOUNTED**

## PANEL **MOUNTED**



Size	Сар	s for	- A	øD1		øD2	øD3	Part number	Fig.
Size	FLP01 FLP03	FLR01 FLR50	A	ØDI	<b>L</b>	902	دلو		
	•		11	23.0	200	-	-	FCP08C 1B2 A200 BA	1
08		•	11	20.4	200	-	-	FCR08C 1B2 A200 BA	2
		•	11	20.4	95	14.0	18.0	FCR08P 1B2 A095 BA	3
	•		11	28.0	200	-	-	FCP14C 5B2 A200 BA	1
14		•	11	25.4	200	-	-	FCR14C 1B2 A200 BA	2
		•	11	25.4	95	19.2	24.9	FCR14P 1B2 A095 BA	3

## **QUICK DETACH SYSTEM**



## **METAL**

## **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance		Standard
Sealing	Connectors in mated condition or with cap Plug without cap Receptacle without cap	IP68, 20 m / 24 h IP67, 0.2 m / 30 min IP68, 20 m / 24 h	IEC 60529, MIL-STD-810 Method 512.6
Operating temperature range (connectors only)	-55 °C to +135 °C	MIL-STD-810 Method 501.6 and 502.6	
Corrosion resistance mated	Salt mist 1,000 h <sup>1)</sup> Connectors in mated condition. Cosmetic changes may appear over time without	MIL-STD-810 Method 509.6	
Mechanical endurance	10,000 mating cycles / 5,000 full rotations <sup>2)</sup> Preserved mechanical and electrical functionality. Normal wear will appear.		IEC 60512-9-1
Random vibration	pration 9.26 G rms		MIL-STD-202 Method 214 Condition I
Inmating force Typical 40 N		IEC 60512-13-1	
Shock	30 G		MIL-STD-202 Method 213 Condition J

<sup>&</sup>lt;sup>1)</sup> Exception for FLR50: 200 h mated and unmated.

## **ELECTRICAL DATA**

Characteristic	Performance	Standard
Contact resistance	<50 mOhm (typical value)	MIL-STD-202 Method 307
Shell resistance	<50 mOhm (cabled; new condition)	MIL-STD-202 Method 307
Insulation resistance	>10 <sup>10</sup> Ohm	MIL-STD-202 Method 302, IEC 60512-3-1
Shielding effectiveness	360° shielded	-
Data protocols	USB 2.0 and 100 Ethernet	Mbit/s

## **MATERIAL & SURFACE FINISH**



<sup>&</sup>lt;sup>2)</sup> 180° rotation considered per mating within the mating cycle test.

## **PLASTIC**

## **ENVIRONMENTAL & MECHANICAL DATA**

Characteristic	Performance		Standard	
Sealing	Connectors in mated condition or with cap Plug without cap Receptacle without cap	IP67, 0.2 m / 30 min IP67, 0.2 m / 30 min IP67, 0.2 m / 30 min	IEC 60529, MIL-STD-810 Method 512.6	
Operating temperature ange (connectors only)	-40 °C to +85 °C		MIL-STD-810G Method 501.6 and 502.6	
Corrosion resistance mated	Salt mist 1,000 h Connectors in mated condition. Cosmetic changes may appear over time without	MIL-STD-810G Method 509.6		
Mechanical endurance	5,000 cycles / 2,500 full rotations		IEC 60512-9-1	
Random vibration	9.26 G rms		MIL-STD-202G Method 214A Condition I	
Unmating force	Typical 24 N		IEC-60512-13-1	
Shock	30 G		EIA-364-27B MIL-STD-202G Method 213B Condition J, K	

<sup>&</sup>lt;sup>1)</sup> 180° rotation considered per mating within the mating cycle test.

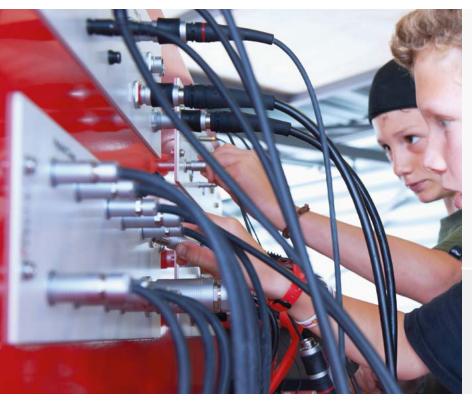
## **ELECTRICAL DATA**

Characteristic	Performance	Standard
Contact resistance	<50 mOhm (typical value)	MIL-STD-202 Method 307
Insulation resistance	>10 <sup>10</sup> Ohm	IEC 60512-3-1 MIL-STD-202 Method 302
Shielding effectiveness	N/A	N/A
Data protocols	USB 2.0 and 10 Ethernet	0 Mbit/s

## **MATERIAL & SURFACE FINISH**



## A GLOBAL PARTNER IN CONNECTIVITY



A pioneer in high-reliability and rugged connector technology, **Fischer Connectors** has kept the spirit of innovation alive for more than 60 years. Since 1954, it has been reimagining connectivity, turning its customers' challenges into success stories through breakthrough technologies, high-quality products and highly responsive customer service.

Fischer Connectors helps its customers around the world produce innovative and reliable applications by designing, manufacturing and distributing high-performance, rugged connectivity solutions that withstand the most demanding environments. Its high-quality solutions are particularly suited to applications requiring faultless precision, durability and resistance to extreme conditions, including defense and security, medical, industrial, instrumentation, audiovisual, transportation, and energy.

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(( Since 1954, we have grown from a provider of connectors to a global partner in connectivity for our customers. We have expanded to meet market demand, providing a range of tailored connectivity solutions that not only meet our customers' needs, but that also have the potential to shape the future. Thank you for joining us on this adventure to reimagine connectivity, together.))

Jonathan Brossard, Group CEO

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**ISO 9001** 

**ISO 13485** 

**ISO 14001** 

ISO 45001

NUCLEAR NUCLEAR







## **UPDATES**

Date	Version	Page	Update	
06.2023	3.5	H-38	Current rating value change	
06.2023	3.5	H-41 - H-42	Values and diagram changes	
06.2023	3.5	H-33 - H-37	Addition of connectors configuration to <b>ULTIMATE 80</b> series.	
06.2023	3.5	H-43	Addition of an accessory soft caps lanyard	
10.2023	3.6	J-1 - J-27	New Minimax configuration : UHD, Size 08, 19 contacts	
11.2023	3.7	H-44	Corrections under «Shielding effectiveness»	
02.2024	3.8	H-45	Changes in the table: materials	
07.2024	4.0		Introduction of new contact layout USB3.2 Gen 2.	
08.2024	4.1		Changes in product finish (Nickel Anthracite/Black Chrome over nickel)	
12.2024	4.2	H-1 - H-58	Ratchet locking system and USB-C addition	
01.2025	4.3	A-14, H-17, J-4	Text corrections	
01.2025	4.3	H-5	Addition of dimensions values	
04.2025	4.4	J-23	Addition of values	
04.2025	4.4	H-40	Pin layout diagram	
04.2025	4.4	H-1 - H-59	Various corrections	
04.2025	4.4	H-45	Addition of datas («Metal Cap»)	
05.2025	4.5	H-47 - H-62	Addition of UP80 connector	
05.2025	4.5	A-21	Map update	



#### **VOLUME 1**

BRASS-STAINLESS STEEL-ALULITE PLASTIC-DISPOSABLE



#### **VOLUME 2**

ULTIMATE- FIBEROPTIC- MINIMAX- FREEDOM



**Technical & Downloads** 

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