

Fischer FiberOptic Series

Technical Specifications

Connect²

Expertise | Reliability | Innovation



Robust Optical Performance

Fiber optic & fiber optic hybrid solutions

www.fischerconnectors.com



Dimensions



Configurations

fischer[®]
C O N N E C T O R S

FISCHER CONNECTORS

Fischer Connectors is a leading company in the design, manufacturing and distribution of high-performance connectors and cable assembly solutions. Known for their quality, ruggedness and excellent sealing, our products prove to be reliable in the most demanding environments.

Innovative and flexible, Fischer Connectors is committed to provide customized solutions of uncompromising quality. Primary design and manufacturing facilities are located in Switzerland, with subsidiaries and distributors located worldwide.



Connect² Expertise

We connect not only with customers who build devices, but with the people who use them on a daily basis, to better understand their needs.

- Engineering Expertise
- Supply Chain Expertise
- Market Expertise

Connect² Reliability

We focus on delivering on time, on cost and on experience connectivity solutions that stand up to the toughest conditions, so you know you can rely on our service and on uncompromising quality in all environments.

- Quality Reliability
- Delivery Reliability
- Response Reliability

Connect² Innovation

Our proven track record in first-to-market, innovative solutions is built on imagination, observation and significant investments in R&D. We help you bring new ideas to market quickly by putting our cutting-edge technology, production tools and experts at your service.

- Technology Innovation
- Product Innovation
- Solutions Innovation

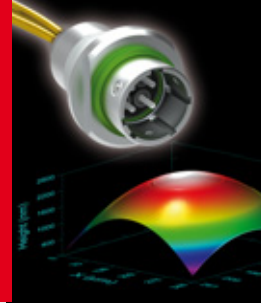
PRODUCT FEATURES

DURABILITY



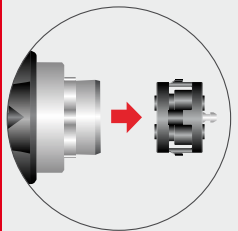
- IP68 Mated
- IP67 Unmated
- 1,000 mating cycles
- Performs under extreme environment
- High optical stability

PERFORMANCE



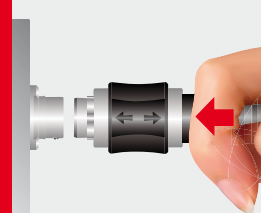
- Low back reflection
- SM & MM Optical Fibers
- UPC & APC Polishing
- High-End butt joint technology

EASY CLEANING



- Removable mono-block mate adapter for easy access to ferrules
- Easy maintenance
- Easy field cleaning

EASY MATING



- Push-Pull connector system makes it easy to mate/unmate with one hand
- Easy operation

CERTIFICATION & COMPLIANCE

Fischer Connectors is committed to quality throughout every phase of its operations. The company supports its customers and applies within its organization all directives and norms improving the quality, safety and environmental friendliness of its connectors, processes and systems.

All connectors from Fischer Connectors are RoHS compliant. The European Directives 2002/95/EC and 2011/65/EU call for the elimination of certain hazardous materials - cadmium, lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenylethers (PBDE) - from electrical and electronic equipment including connectors.

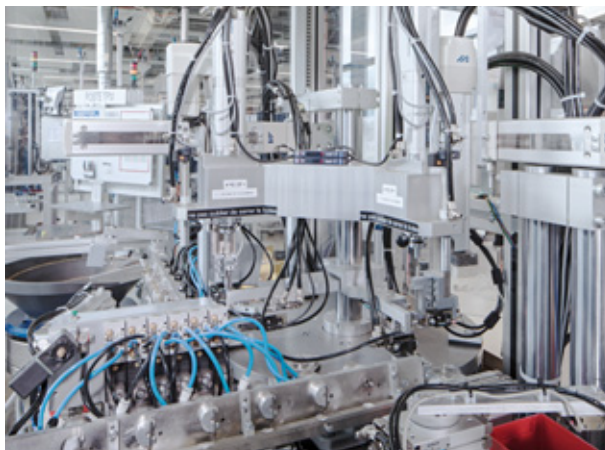
ISO 9001

ISO 13485

ISO 14001

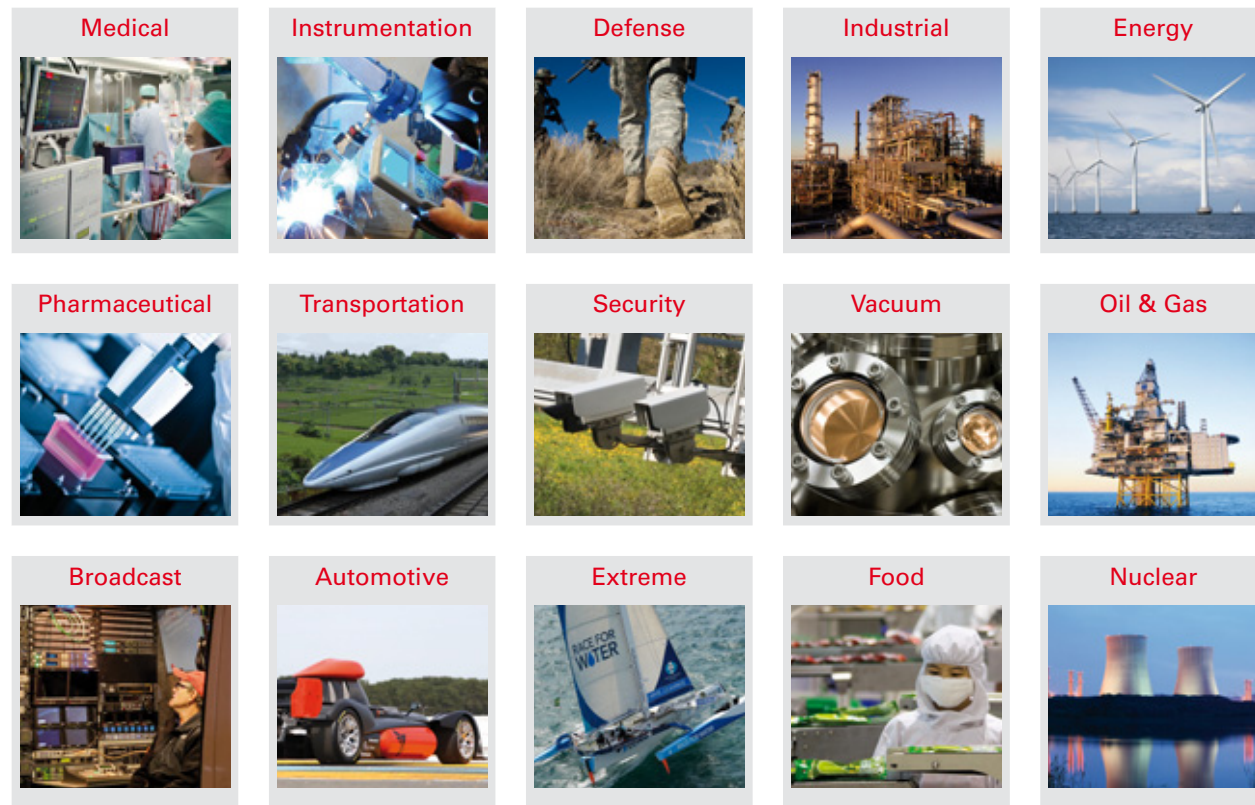
ROHS
compliant

REACH



APPLICATIONS INTRODUCTION

Fischer FiberOptic Series can be used in a wide range of fields requiring faultless quality in indoor, outdoor or for demanding applications, such as Transport, Telecom, Energy, Fiber Sensing, Defense & Security, Broadcast, Civil Construction or Medical Devices.



CABLE ASSEMBLY SOLUTIONS

Fischer FiberOptic push-pull connector solutions are purpose built to withstand the elements of harsh environments, providing virtually faultless optical performance. This rugged product line comes pre-cabled to save you time and money without compromise.

Fischer Connectors is offering a wide range of high performance cables in cooperation with global solution providers. We have chosen high performance cables to maintain a high standard quality manufacturing process.



For more information about the cable offers for the Fischer FiberOptic Series, please consult the Cable Specifications brochure.

PRODUCT RANGE

Fischer FiberOptic FO2 & FO4 – Robust Optical Performance

A rugged fiber optic connector with two (FO2) or four (FO4) fibers.

The Fischer FiberOptic Series with two (FO2) or four (FO4) optical channels features some major revolutionary novelties. Fischer Connectors is able to offer a fiber solution that is extremely quick and easy to clean thanks to a removable mono-block mate adapter and to the possibility of rinsing the unmated connectors freely under water or in an ultrasound bath.

The Fischer FiberOptic connector range will perform perfectly indoor as well as in harsh and extreme environments. It has a high ingress protection of IP68 (2m/24 hours) when mated and IP67 in unmated conditions. In addition, Fischer Connectors' FiberOptic optical performance is insensitive to mechanical strain on the connector. The spring optical contacts employed allow for filtering out any stress applied to the connector housings while keeping the typical advantage of a push-pull solution: quick, safe and easy locking.



Fischer FiberOptic Hybrid FOH 2-2 – Robust Powered Optical Solution

A rugged hybrid connector with two fibers and two electrical contacts

The Fischer FiberOptic Series hybrid connector with two optical channels and two electrical contacts is perfectly suitable for demanding indoor and outdoor applications, where space saving is essential. The hybrid FOH 2-2 has the same key features and benefits as the Fischer FiberOptic Series FO2 and FO4.

The connector is IP68 mated, gas tight receptacles are available and the removable mono-block mate adapter gives the possibilities for easy one-click cleaning and maintenance. One of the major advantages is that both fiber and electrical contacts are now offered in one connecting solution instead of using two separate connectors.

EASY CLEANING

Fischer Connectors recommends the following three cleaning options for the Fischer FiberOptic Series.

1. Rapid cleaning (one click cleaning) - FO2, FO4 and FOH 2-2.

2. Field cleaning (Tap water cleaning) - FO2 and FO4 **only**.

CAUTION: This cleaning method is **NOT** recommended for the FOH 2-2, as the two electrical contacts should be completely dry before using the connector again.

3. Maintenance cleaning (ultrasonic cleaning)

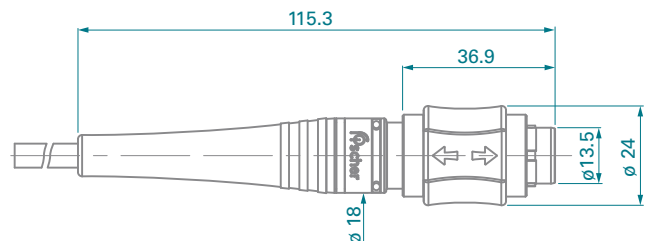
CAUTION: This cleaning method is recommended for the FO2 and FO4. However it is possible for the FOH 2-2, but only if the connector is completely dry before using it again because of the two electrical contacts.



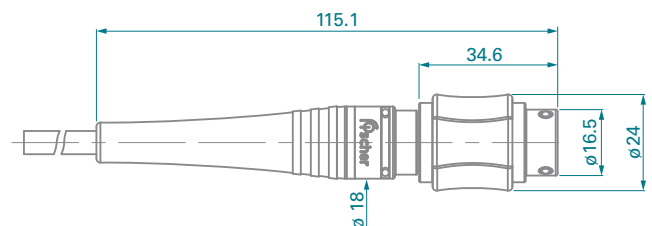
Please consult the Fischer FiberOptic Cleaning Instructions for more detailed information and how to best clean each solution.

TECHNICAL DIMENSIONS (FO2/FO4)

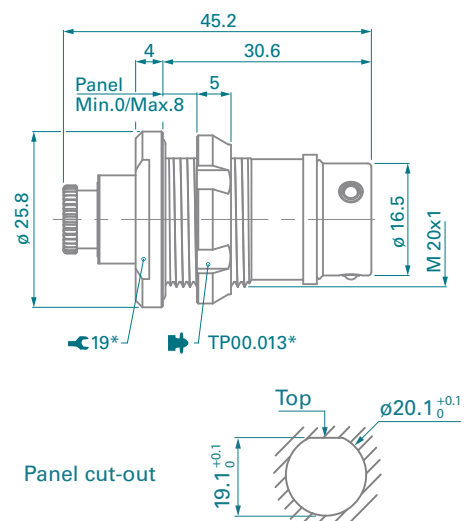
FO P01 CABLE MOUNTED PLUG



FO R50 CABLE MOUNTED RECEPTACLE



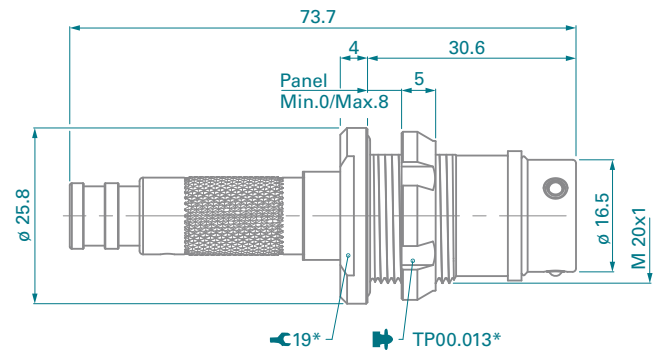
FO R01 PANEL REAR MOUNTED RECEPTACLE



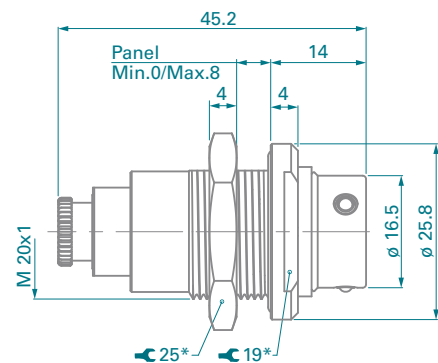
* Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the surface under the nut. Tests have to be made to evaluate the exact values. All dimensions shown are in millimeters and are for reference only. They are subject to change without prior notice.

TECHNICAL DIMENSIONS (FO2 / FO4)

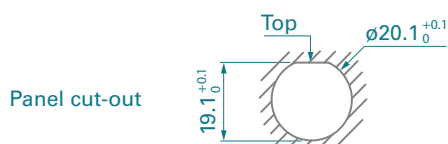
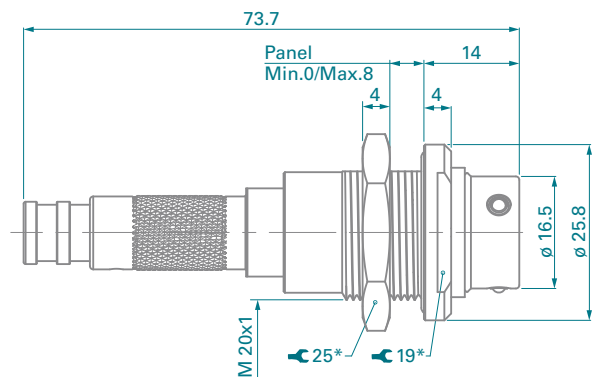
FO R01 PANEL REAR MOUNTED RECEPTACLE - GAS TIGHT



FO R03 PANEL FRONT MOUNTED RECEPTACLE



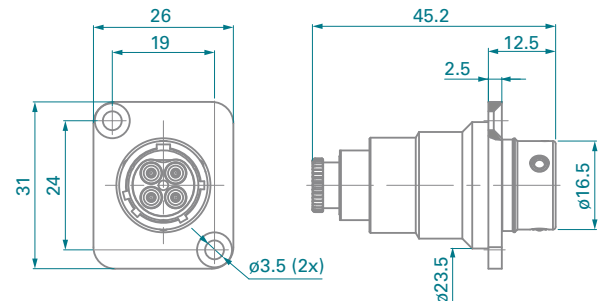
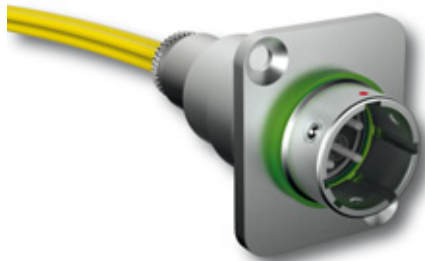
FO R03 PANEL FRONT MOUNTED RECEPTACLE - GAS TIGHT



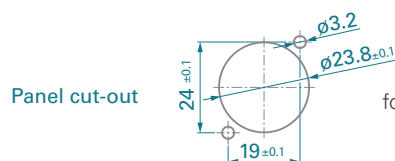
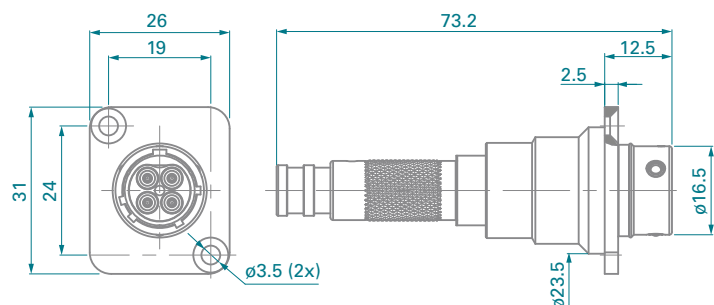
for FO R01, R03 and R03 Gas tight

TECHNICAL DIMENSIONS (FO2/FO4)

FO R13 FRONT PANEL MOUNTED RECEPTACLE - SQUARE FLANGE *



FO R13 FRONT PANEL MOUNTED RECEPTACLE - SQUARE FLANGE GAS TIGHT*



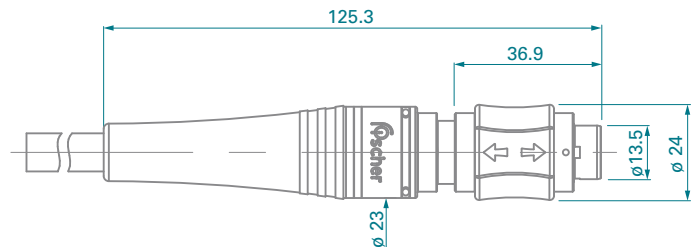
for FOH 2-2 R13, and R13 Gas tight

* No panel sealing for R13 receptacle

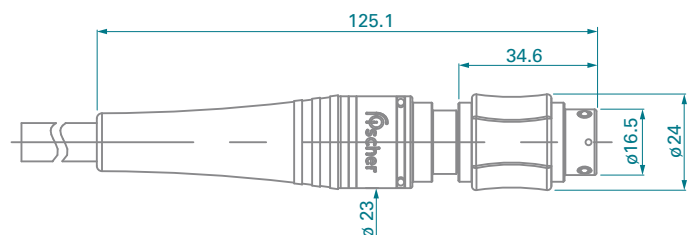
All dimensions shown are in millimeters and are for reference only. They are subject to change without prior notice.

TECHNICAL DIMENSIONS (FOH 2-2)

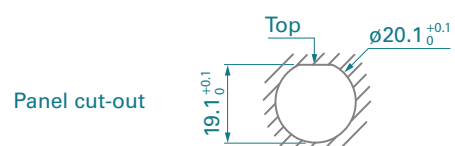
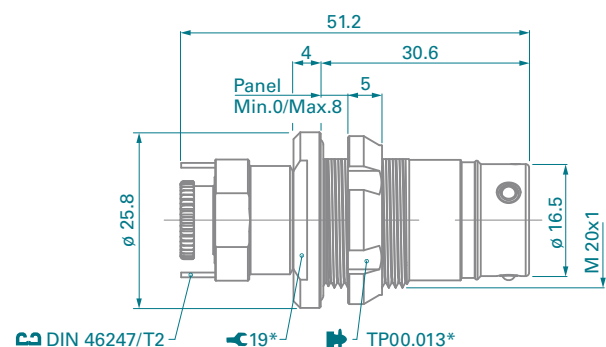
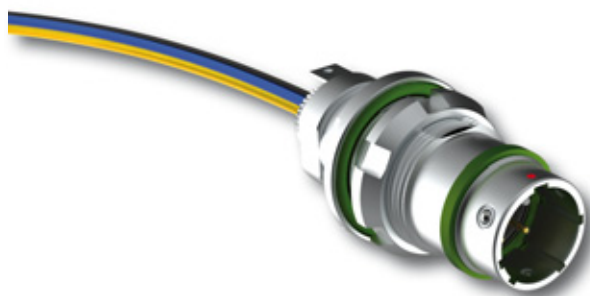
FOH 2-2 P01 CABLE MOUNTED PLUG



FOH 2-2 R50 CABLE MOUNTED RECEPTACLE



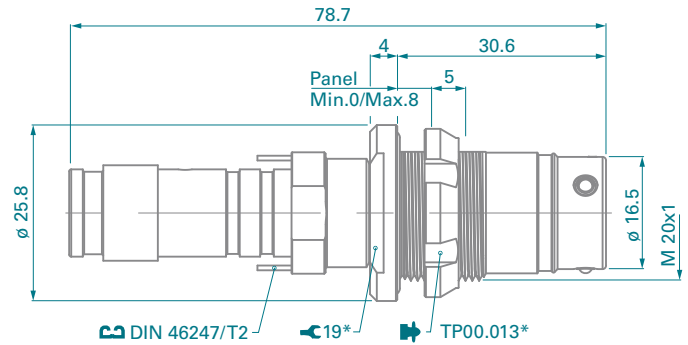
FOH 2-2 R01 PANEL REAR MOUNTED RECEPTACLE



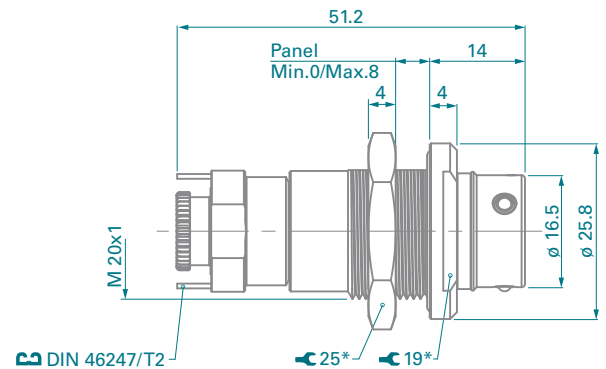
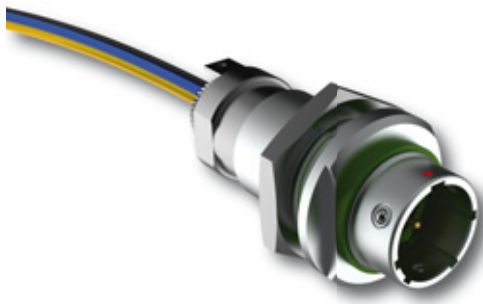
* Torque 6.5 Nm. Torque (Nm) are recommended values that may be influenced by the quality of the surface under the nut.
Tests have to be made to evaluate the exact values.
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TECHNICAL DIMENSIONS (FOH 2-2)

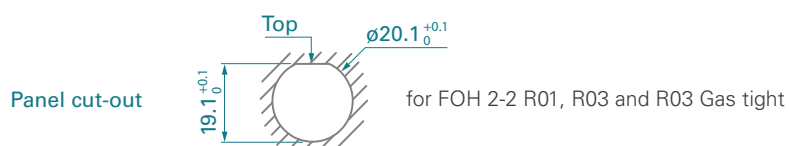
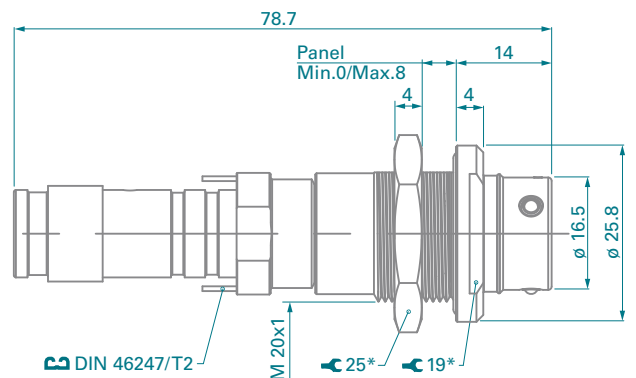
FOH 2-2 R01 PANEL REAR MOUNTED RECEPTACLE - GAS TIGHT



FOH 2-2 R03 PANEL FRONT MOUNTED RECEPTACLE

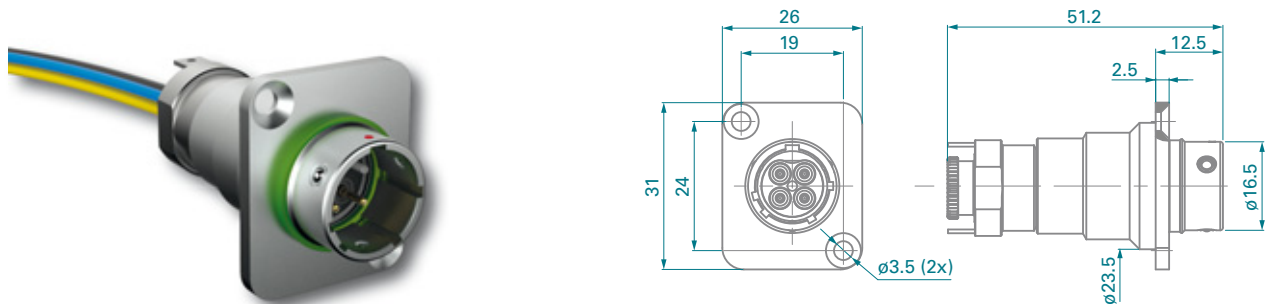


FOH 2-2 R03 PANEL FRONT MOUNTED RECEPTACLE - GAS TIGHT

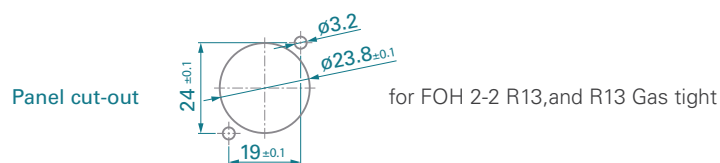
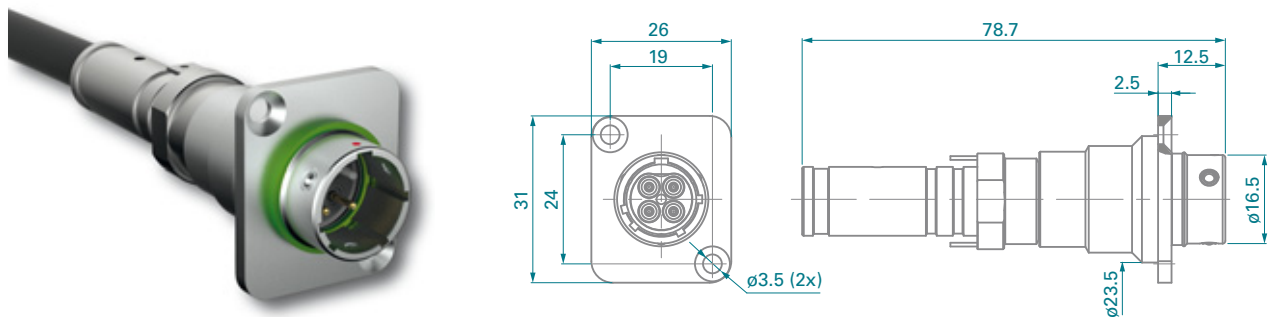


TECHNICAL DIMENSIONS (FOH 2-2)

FOH 2-2 R13 FRONT PANEL MOUNTED RECEPTACLE - SQUARE FLANGE*



FOH 2-2 R13 FRONT PANEL MOUNTED RECEPTACLE - SQUARE FLANGE GAS TIGHT*

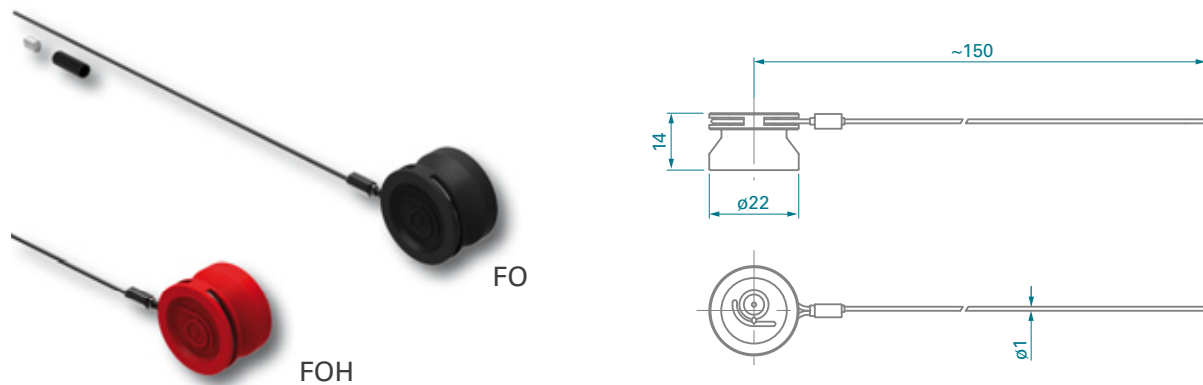


* No panel sealing for R13 receptacle

All dimensions shown are in millimeters and are for reference only. They are subject to change without prior notice.

TECHNICAL DIMENSIONS

SOFT CAPS FOR CABLE MOUNTED PLUGS

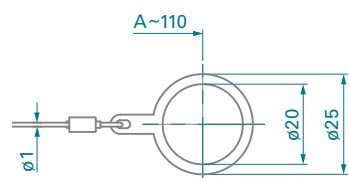
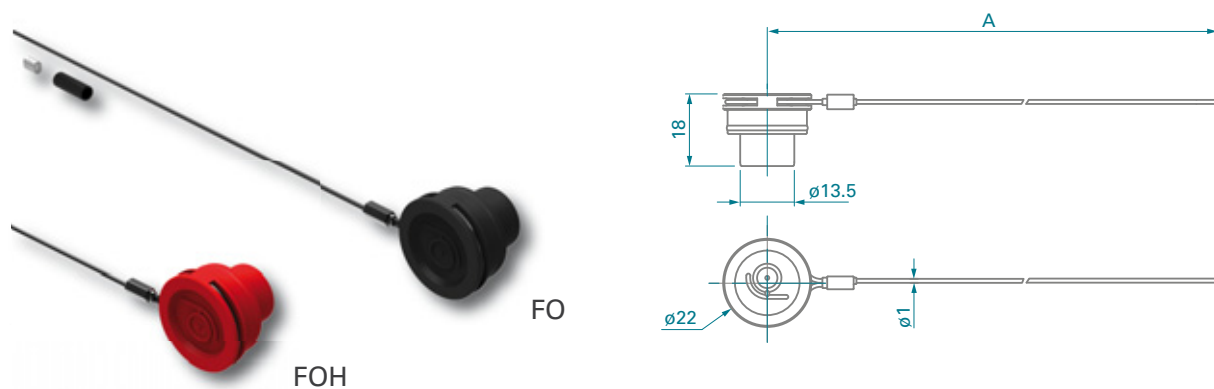


Crimp ferrule and heat shrink tube are included.

Part number: FOCPI4C 1B2 A150 (FO)

Part number: FOHCP14C 1B2 A150 (FOH)

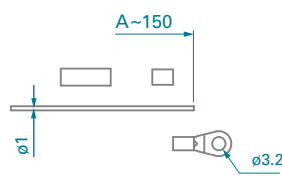
SOFT CAPS FOR CABLE RECEPTACLES



for receptacle R01

Part number: FOCR14P 1B2 A110 (FO)

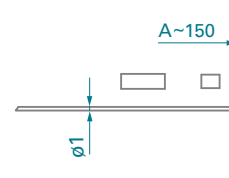
Part number: FOHCR14P 1B2 A110 (FOH)



for receptacle R03

Part number: FOCR14P 1B2 E150 (FO)

Part number: FOHCR14P 1B2 E150 (FOH)



for receptacle R50

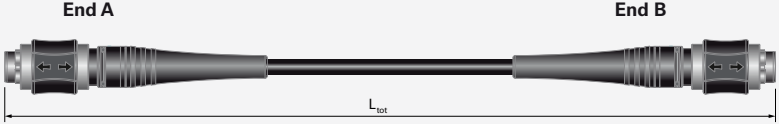
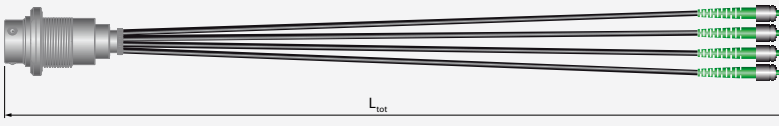
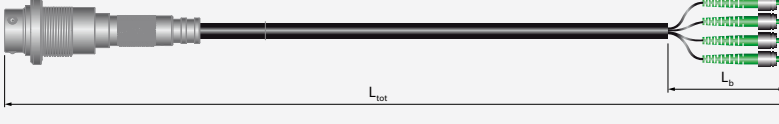
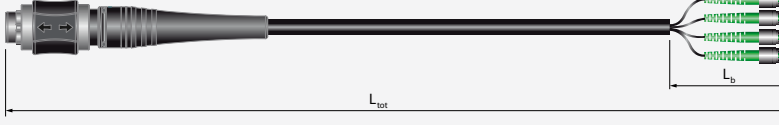
Part number: FOCR14C 1B2 A150 (FO)

Part number: FOHCR14C 1B2 A150 (FOH)

All dimensions shown are in millimeters and are for reference only. They are subject to change without prior notice.

QUOTE REQUEST FORM

☐ **Quantity** - Please use one request form per cable assembly type

Cable Assembly Types	
<input type="checkbox"/> Patch cord	
<input type="checkbox"/> Receptacle	
<input type="checkbox"/> Gas tight receptacle	
<input type="checkbox"/> Breakout	

Drawings are for reference only. All types exist for F02, F04 and F0H 2-2.

CONFIGURE YOUR SOLUTIONS

End A	Assembly	End B
Fiber Optic Connectors	Total length L_{tot} <i>end-to-end total (min. 0.5)</i>	FiberOptic Connector
<input type="checkbox"/> P01 - Plug	<input type="checkbox"/> 1 meter	<input type="checkbox"/> CNA - Free End No Connector
<input type="checkbox"/> R50 - Receptacle <i>Cable Mounted</i>	<input type="checkbox"/> 2 meters	<input type="checkbox"/> P01 - Plug
<input type="checkbox"/> R01 - Receptacle <i>Panel Rear Mounted</i>	<input type="checkbox"/> <input type="text"/>	<input type="checkbox"/> R50 - Receptacle <i>Cable Mounted</i>
<input type="checkbox"/> R03 - Receptacle <i>Panel Front Mounted</i>	<input type="checkbox"/> <input type="text"/>	<input type="checkbox"/> R01 - Receptacle <i>Panel Rear Mounted</i>
<input type="checkbox"/> R13 - Receptacle* <i>Panel Square Flange</i>	<input type="checkbox"/> <input type="text"/>	<input type="checkbox"/> R03 - Receptacle <i>Panel Front Mounted</i>
	<i>Cable length in 0.1 meter units only</i>	<input type="checkbox"/> R13 - Receptacle* <i>Panel Square Flange</i>
	<i>Cable length tolerance according IPC-WHMA-A-620</i>	Telecom Connector
		<input type="checkbox"/> LC <input type="checkbox"/> SC
		<input type="checkbox"/> FC <input type="checkbox"/> ST
Contact End-face <i>Available for SM only</i>		Contact End-face <i>Available for SM only</i>
<input type="checkbox"/> 0° PC <input type="checkbox"/> 8° APC		<input type="checkbox"/> 0° PC <input type="checkbox"/> 8° APC
Options End A		Options End B
<input type="checkbox"/> Receptacle - Gas tight		<input type="checkbox"/> Receptacle - Gas tight

* No panel sealing for R13 receptacle

QUOTE REQUEST FORM

CHOOSE YOUR CABLE

		INDOOR/OUTDOOR			
Supplier Brand	Fiber Count	SM 9/125 G.657.A1	MM 50/125 OM3	MM 62.5/125 OM1+	
OCC	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LEONI	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
LEONI	Hybrid 2+2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

		RODENT PROOF			
Supplier Brand	Fiber Count	SM 9/125 G.657.1.A1	MM50/125 OM3	MM 62.5/125 OM1+	
LEONI Glass Fiber	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
BRUGG Metal Armored	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Please consult Cable Specifications for detailed information.

Available



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

Features	OCC	LEONI	LEONI	BRUGG
Best for	Premium application - Overall ruggedness - Easy deployment - High end tactical cable	High Load application - High load resistance - Easy deployment - High end tactical cable	Rodent proof - Semi-static applications - Easy deployment - Dielectric rodent protection - High flexibility	Metal Armored - 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 jacket	- Tight buffered fibers - Aramid yarn - Fiber glass - PUR double skin jacket	- Stainless steel loose tube - Stainless steel yarn - PA Jacket
Outer Diameter	5.5 mm	5.5 mm	9.4 mm	3.8 mm
Weight	27 kg/km	28 kg/km	105 kg/km	25 kg/km
Operation tensile load* (long term)	600 N	1500 N	2000 N	900 N
Crush resistance	1800 N/cm	800 N/cm	800 N/cm	800 N/cm
Min. Bending radius	3.3 cm	5.5 cm	9.4 cm	5.7 cm
Operating Temperature	-40°C to +85°C	-55°C to +85°C	-55°C to +85°C	-40°C to + 70°C

*Applies to cable only, typical connector locking resistance 1500 N

ACCESSORY LIST

Accessory List - Please indicate the quantity in the boxes below			
Color Silicon Rings  <input type="checkbox"/> Ref: FOCR14 Beige <input type="checkbox"/> Ref: FOCR14 Blue <input type="checkbox"/> Ref: FOCR14 Red <input type="checkbox"/> Ref: FOCR14 Green	Sleeves Holder Mate Adapter  <input type="checkbox"/> Ref: FOP14 Sleeve Holder	Open End Spanner  <input type="checkbox"/> Ref: TX00.025 <input type="checkbox"/> Ref: TX00.019	Nut Driver  <input type="checkbox"/> Ref: TP00.013
Mate Adapter SC  <input type="checkbox"/> Ref: SC Adapter SM/APC <input type="checkbox"/> Ref: SC Adapter SM/UPC <input type="checkbox"/> Ref: SC Adapter MM/UPC	Mate Adapter FC  <input type="checkbox"/> Ref: FC Adapter SM/APC <input type="checkbox"/> Ref: FC Adapter SM-MM	Mate Adapter LC  <input type="checkbox"/> Ref: LC Adapter SM/APC <input type="checkbox"/> Ref: LC Adapter SM/UPC <input type="checkbox"/> Ref: LC Adapter MM/UPC	Mate Adapter ST  <input type="checkbox"/> Ref: ST Adapter SM-MM
Deployment Accessories  <input type="checkbox"/> Ref: FO Cleaning Kit (complete kit) <input type="checkbox"/> Ref: Laser pen <input type="checkbox"/> Ref: Laser pen adapter <input type="checkbox"/> Ref: IBC brand cleaner H125 <input type="checkbox"/> Ref: Precision tweezers <input type="checkbox"/> Ref: 50 impregnated tissues <input type="checkbox"/> Ref: Canned air	Complete Cleaning Kit  <input type="checkbox"/> Ref: FO Cleaning Kit (complete kit) <input type="checkbox"/> Ref: Laser pen <input type="checkbox"/> Ref: Laser pen adapter <input type="checkbox"/> Ref: IBC brand cleaner H125 <input type="checkbox"/> Ref: Precision tweezers <input type="checkbox"/> Ref: 50 impregnated tissues <input type="checkbox"/> Ref: Canned air	Reels*  <input type="checkbox"/> Ref: GT235.RM <input type="checkbox"/> Ref: GT310.RM <input type="checkbox"/> Ref: GT380.RMFK <input type="checkbox"/> Ref: GT450.RMFK <input type="checkbox"/> Ref: HT582.RM	BRUGG Deployment Accessory  <input type="checkbox"/> Ref: Wedge Clamp Black Jaws

* Reel selection can vary following cable choice and length. Contact your local sales for details.
 This form is also available on www.fischerconnectors.com

TECHNICAL DATA

FIBER TYPE AND PIN LAYOUT

Contact Type		Fiber standards	Plug Pin Layout		Receptacle Pin Layout	
Single-mode 9/125	UPC	G.657.A1				
Single-mode 9/125	APC					
Multi-mode 50/125	-	OM3				
Multi-mode 62.5/125	-	OM1+				

*Electrical for FOH 2-2

ENVIRONMENTAL & TECHNICAL SPECIFICATION valid for FO2, FO4 & FOH 2-2

Characteristic	Performance	Standard
Sealing mated	IP68; 2m submersion for 24 hours ¹⁾	IEC 60529
Sealing unmated	IP67 ¹⁾	IEC 60529
Operating temperature range	-40°C to +85°C (depending on fiber-optic cable)	IEC 61300-2-22
Vibration	Sinusoidal, 10 - 55Hz, 3 axes, 0.75 mm amplitude (max 10g) ¹⁾	IEC 61300-2-1
Shock	100 g ¹⁾	IEC 61300-2-9
Salt mist	1,000 hours, 5% salt solution, 35°C ^{1) 2)}	IEC 61300-2-26
Mating durability	1,000 mating cycles ^{1) 3)}	IEC 61300-2-2

1) Exceeds IEC 61753-1 Cat.E Extreme Environment.

2) Connector must be mated or with cap.

3) Recommended cleaning every 50 cycles.

OPTICAL DATA valid for FO2, FO4 & FOH 2-2

Characteristic	Performance	Standard
Insertion loss	SM and MM	≤0.20 dB mean
		≤0.45 dB max for >97% of samples
		≤0.2 dB change during and after testing
Return loss	SM UPC	≥50 dB
	SM APC	≥70 dB (mated) and ≥50 dB (unmated)

ELECTRICAL DATA valid for FOH 2-2

Characteristic	Performance	Standard
Contact count	2 contacts, ground by shell	-
Current Rating	10 [A] ⁴⁾	IEC 60512-5-2-5b
Rated Voltage	400 [V] r.m.s. ^{5) 6)}	EIA-364-20-B
Contact resistance (power contact)	< 10 mΩ	IEC 60512-2-1-2a
Contact resistance (ground contact)	< 50 mΩ	IEC 60512-2-1-2a
Insulation resistance	> 10 ¹⁰ Ω	IEC 60512-3-1-3a
Contact termination	Solder	-
Wire Size	AWG17 / 1 mm ²	-
Test Voltage AC	1.5 [kV] r.m.s	IEC 60512-4-1 Test 4a
Test Voltage DC	2.8 [kV]	IEC 60512-4-1 Test 4a

4) Recommended max. operating current at 40°C temperature rise.

5) Recommended operating voltage at sea level measured according to IEC 60664-1.

This rated voltage is a general purpose guideline where no other electrical standard applies. In case where other standard rule a specific use of the connector the application-specific safety criteria shall be considered first. This must be evaluated within the framework of equipment engineering. In cases where other calculation methods are preferred, please use the Test voltage to determine the specific Operating voltage.

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

TECHNICAL DATA

MATERIAL & SURFACE TREATMENTS valid for FO2, FO4 & FOH 2-2

Metal Parts	Material		Finish	
	Designation	ISO	Designation	Standard
Housing, Nut	Brass CuZn39Pb3		Chrome over Nickel	SAE-AMS 2460
Back nut (Plug)	Brass CuZn39Pb3		Nickel	SAE-AMS-QQ-N-290 SAE-AMS2404
Electrical contact	Brass CuZn39Pb3		1µm Gold over Nickel	MIL-DTL-45204D Type 1 + ASTM B488 SAE-AMS-QQ-N-290 SAE-AMS 2404
Shell contact	Stainless steel		-	-
Spring	Stainless steel		-	-
Mantel clip	Stainless steel		-	-
Sleeve holder shaft	Stainless steel		-	-
Locking balls	Stainless steel		-	-

OTHER PARTS valid for FO2, FO4 & FOH 2-2

Non metallic parts	Material	Flammability
Ferrules & sleeves	Zirconia	-
Contact housing	LCP	UL 94 V-0
Contact bloc & sleeves holder	PBT	UL 94 V-0
Mantel ring	PTFE	UL 94 V-0
O-rings	FPM (Viton®)	UL 94 V-0
	NBR (Nitrile)	UL 94 HB
Sealant material	Bi-component epoxy	UL 94 HB
Cable strain relief	TPE	UL 94 HB
Caps	TPE	UL 94 HB
Locking protection sleeve	TPE	UL 94 HB

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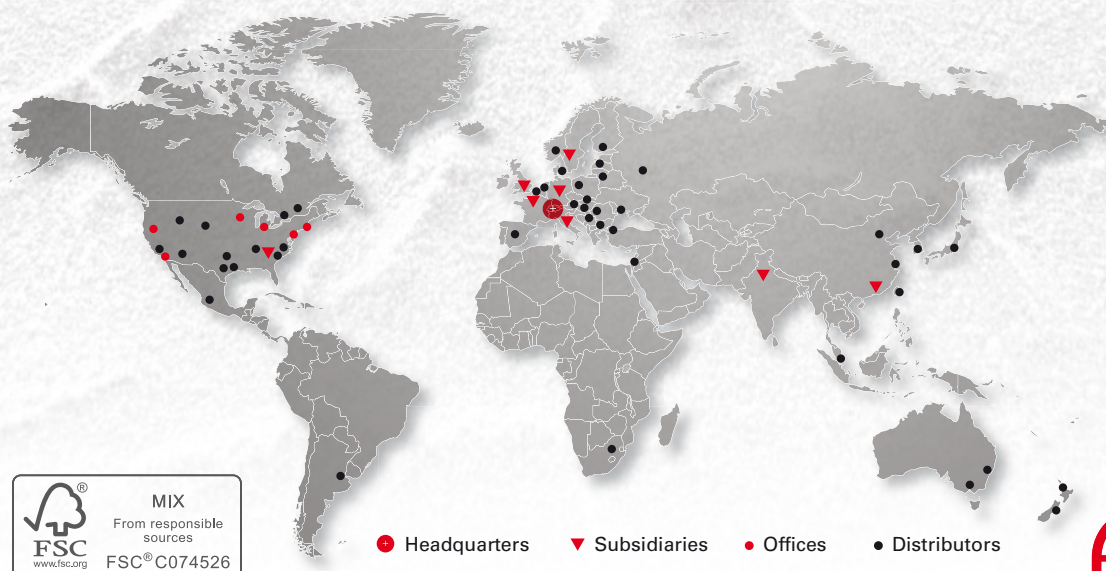
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