

# K

CHAPTER

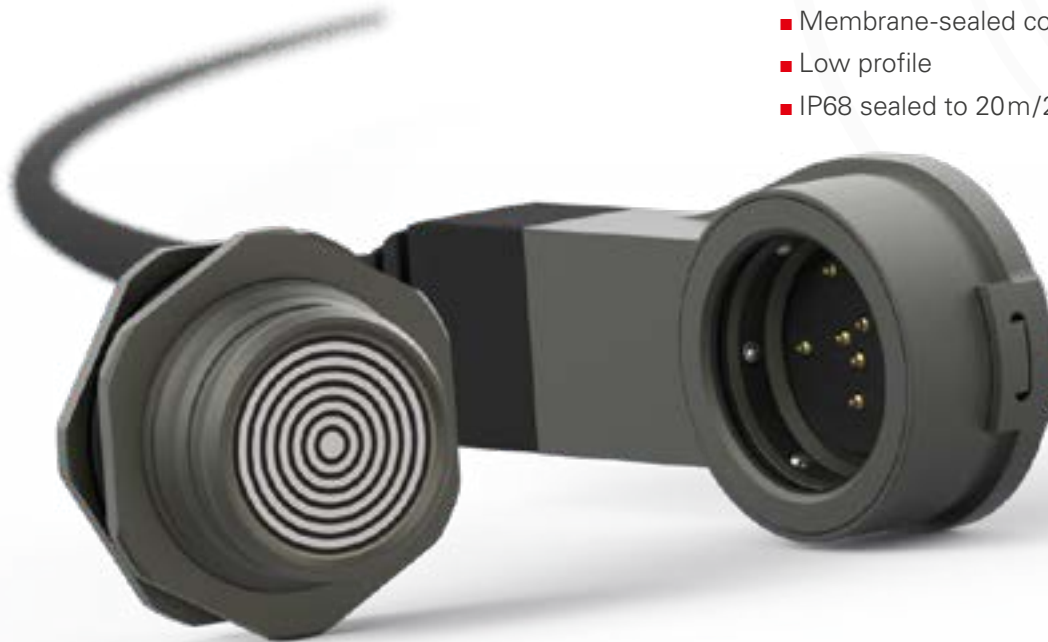


## FISCHER **FREEDOM™** SERIES

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
- IP68 sealed to 20m/24h



FREEDOM

K-2 / K-17

# FREEDOM



## PLUGS



### CABLE MOUNTED

- Body style (FLP01) ..... K-4
- Technical dimensions ..... K-5



### PANEL MOUNTED

- Body style (FLP03) ..... K-4
- Technical dimensions ..... K-6

## RECEPTACLES



### PANEL MOUNTED

- Body style (FLR01) ..... K-7
- Technical dimensions ..... K-8-9



### CABLE MOUNTED

- Body style (FLR50) ..... K-7
- Technical dimensions ..... K-10

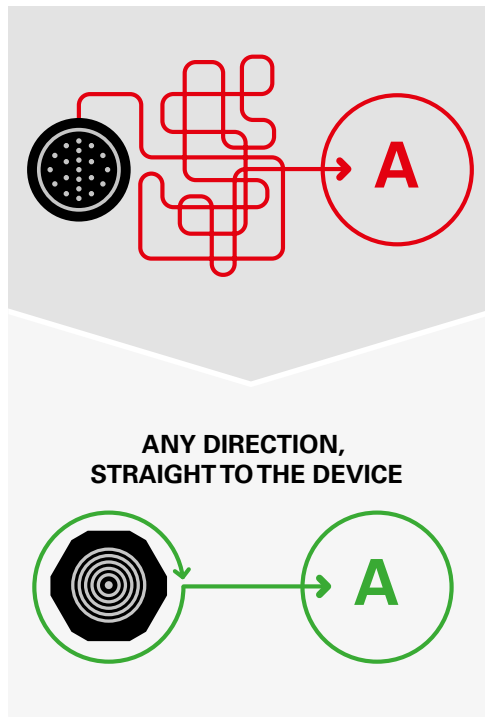
## FOR ALL FREEDOM

- Key features ..... K-3
- Electrical & contact configurations ..... K-11
- PCB hole layout ..... K-11
- Part numbering ..... K-12
- Pre-cabled plug / receptacle configurations ..... K-13-14
- Accessories ..... K-15
- Technical information ..... K-16-17

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.

### 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

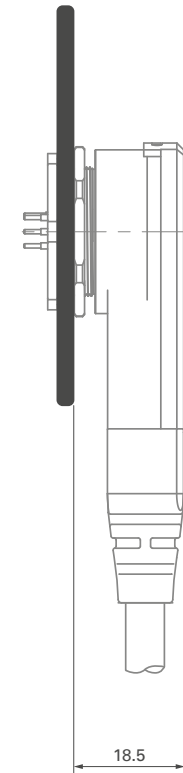
- Surface contacts = fixed tracks & membrane-sealed contacts
- No female contacts that can accumulate dirt, no long male contacts that can get broken
- A true cleanable solution on both receptacle and plug sides



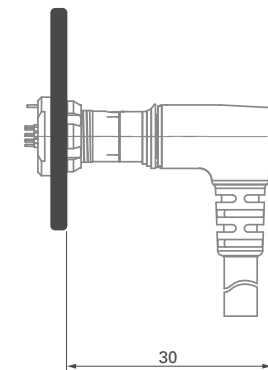
### EASY INTEGRATION

- 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

LP360™ SERIES



STANDARD PIN SOCKET CONNECTOR



**PLUG**

CABLE MOUNTED

PANEL MOUNTED



Body style		FLP01	FLP01	FLP03	References to detailed information
Protection	Sealed to IP67		●		Sealing categories, pages K-16 & 17
	Sealed up to IP68	●		●	
Locking system	Friction				-
	Push-pull				
	Quick-release	●	●	●	
	Lanyard				
	Tamperproof				
Termination	Wires	●	●		Electrical & contacts configurations, page K-11
	Solder			●	
	ZIF			●	
Housing material	Brass	●		●	Page K-12
	Aluminum				
	Plastic		●		
Housing color	Anthracite	●		●	Page K-12
	Black		●		
Cabling	Cable clamp sets				Accessories, page K-15
	Overmoldable	●	●		
	Heat shrinkable	●	●		
Accessories	Cable bend reliefs	●	●		Accessories, page K-15
	Protective sleeves				
	Sealing caps	●	●	●	

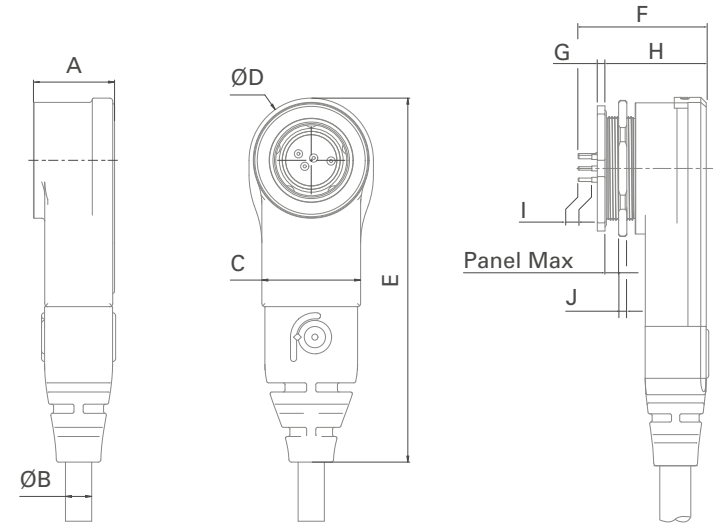
**PLUG FLP01**

**CABLE**  
MOUNTED

**METAL SIZE 14**



**PLASTIC SIZE 08**



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

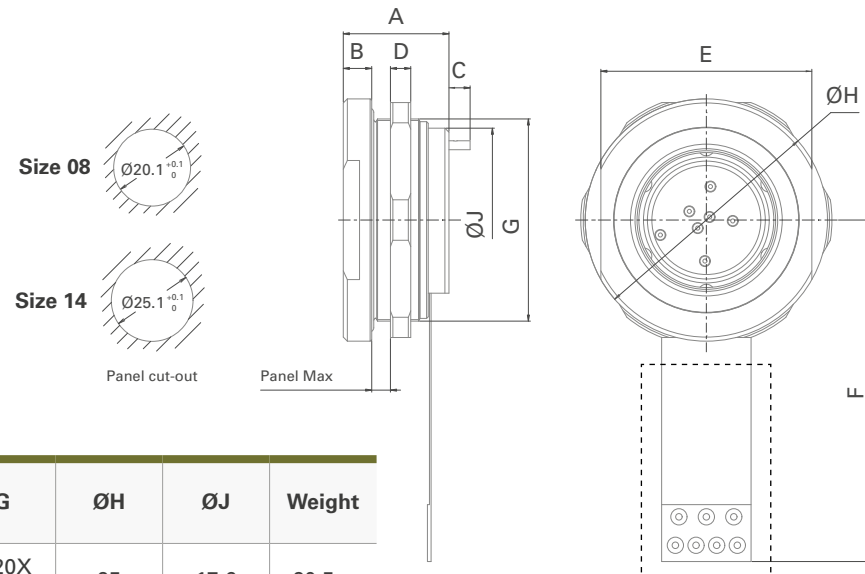
Size	A	ØB	C	ØD	E	Panel max	F	G	H	I	J	Weight (without cable)
<b>08</b> Plastic	13.3	4.8	16.2	20.4	59.7	3	23.8	2.2	18.9	2.5	2	15.8 g
<b>14</b> Metal	13	5.4	15.6	25.4	67.4	3	23.4	1.4	18.5	2.5	1.5	44.5 g

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

## PLUG FLP03

### PANEL MOUNTED

#### METAL



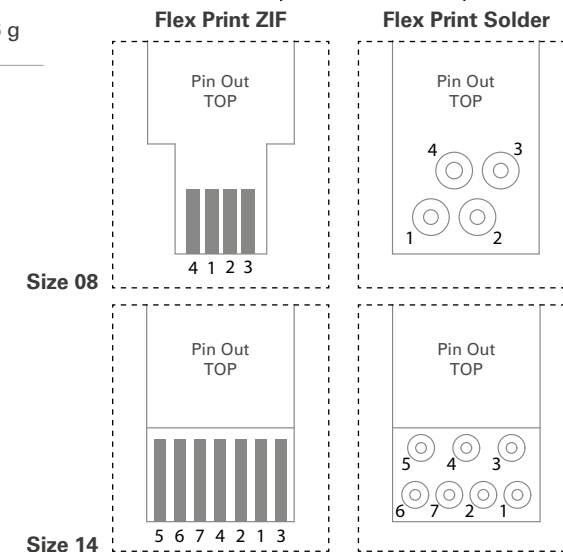
Size	A	B	C	D	E	Panel Max	F	G	ØH	ØJ	Weight
<b>08 Metal</b>	13	3.5	2.7	2.5	21	3.7	42	M20X 0.5	25	17.6	20.5 g
<b>14 Metal</b>	13	3.5	2.7	2.5	26	3.7	42	M25X 0.5	30	22.6	32.6 g

#### NUT ACCESSORY

Nut available in different sizes. To be ordered separately.



Size	Part number	Inner thread size	Outer diameter	Flat open spanner	Material
<b>08 Metal</b>	223881	M20x0.5	Ø26	24	Metal
<b>14 Metal</b>	224113	M25x0.5	Ø31	29	Metal



**RECEPTACLE**

PANEL MOUNTED

CABLE MOUNTED

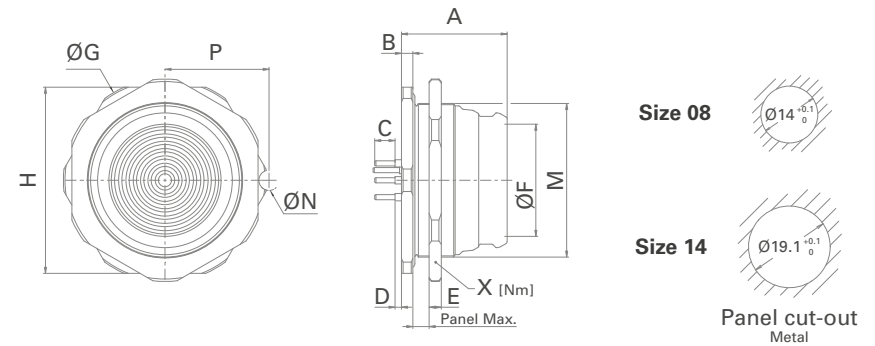


Body style		FLR01	FLR01	FLR50	References to detailed information
Protection	Sealed to IP67		●		Sealing categories, pages K-16 & 17
	Sealed up to IP68	●		●	
	Hermetic				
Termination	Wires			●	Electrical & contact configurations, page K-11
	PCB contacts	●	●		
Housing material	Stainless steel	●			Page K-12
	Aluminum			●	
	Plastic		●		
Housing color	Anthracite	●		●	Page K-12
	Black		●		
Design	Front-projecting	●	●	●	Body styles, pages K-8 to 10
Assembly	Front-mounting				
	Rear-mounting	●	●	●	
Accessories	Sealing caps	●	●		Accessories, page K-15
	Cable bend relief			●	
	Protective sleeves				

## RECEPTACLE FLR01

**PANEL**  
REAR MOUNTED

**METAL**



Size	A	B	C	D	Panel Max	ØF	ØG	H	M	ØN	P	X	Weight
<b>08</b> 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
<b>14</b> 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 available in different sizes. To be ordered separately.



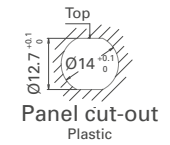
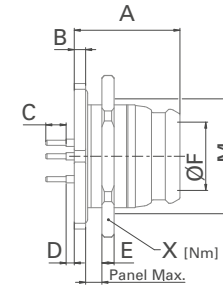
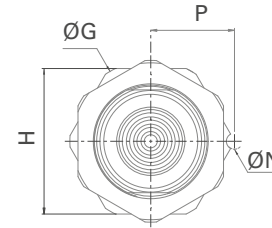
Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
<b>08</b> Metal	224101	M14x0.5	Ø20	2.0	18	Plastic
	223787	M14x0.5	Ø20	1.5	18	Metal
<b>14</b> Metal	222825	M19x0.5	Ø25	1.5	23	Metal
	222826	M19x0.5	Ø30	1.5	28	Metal



**RECEPTACLE FLR01**

**PANEL**  
REAR MOUNTED

PLASTIC



Size	A	B	C	D	Panel Max	ØF	ØG	H	M	ØN	P	X	Weight
<b>08</b> 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.



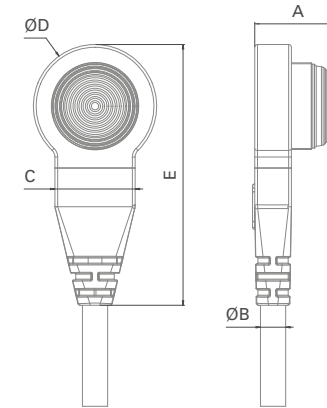
Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
<b>08</b> Plastic	<b>224101</b>	M14x0.5	Ø20	2.0	18	Plastic
	<b>223787</b>	M14x0.5	Ø20	1.5	18	Metal

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

**RECEPTACLE FLR50**

**CABLE MOUNTED**

**METAL**



Size	A	ØB Max	C	ØD	E	Weight (without cable)
<b>14 Metal</b>	18.9	5.5	17.5	26.9	56.9	25 g

Note: Receptacle is only available pre-cabled with a standard length (0.5m). For customized solutions please contact sales.

**NUT ACCESSORY**

Nut available in different sizes. To be ordered separately.



Size	Part number	Inner thread size	Outer diameter	Flat open spanner	Material
<b>14 Metal</b>	222825	M19x0.5	Ø25	23	Metal
	222826	M19x0.5	Ø30	28	Metal

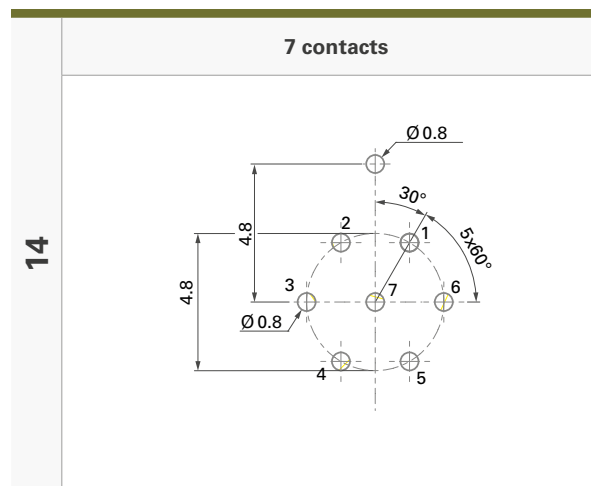
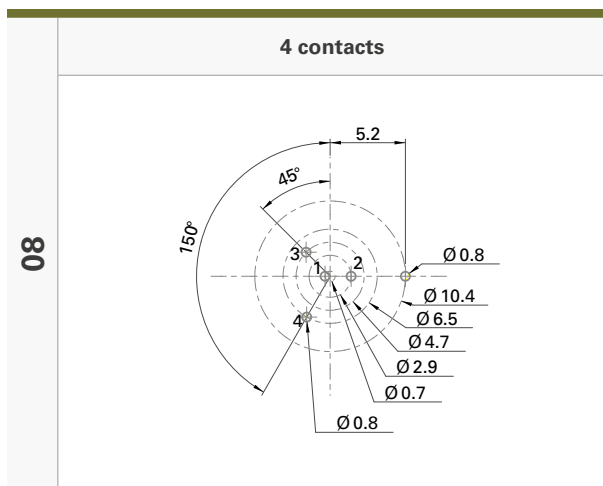
Size	Pin layout	Number of contacts		Receptacle	Current [A]	Rated voltage r.m.s [V] <sup>3)</sup>	Test voltage [kV] in mated position			
				PCB contacts			IEC 60512-4-1 test 4a			
				Pin diameter [mm]	IEC 60512-5-2-5b <sup>1)</sup>	IEC 60664-1 <sup>2)</sup>	AC r.m.s.		DC	
							Contact to body	Contact to contact	Contact to body	Contact to contact
08		4	2	0.63	1	≤160	N/A plastic	0.7	N/A plastic	0.7
			2	0.63	5					
14		7	4	0.63	1	≤160	0.7	0.7	1.2	1.2
			3	0.63	5					

<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.

<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>3)</sup> 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.

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



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

Example:	Connector design				Contact block			Housing		Standard options			
	FLP01	Z	QM	14	P	007	S	AN	360	V	2	Z	B
FLR01	W	ZZ	14	T	007	P	AN	360	V	3	A	C	

**Body style**

- F = Freedom
- L = Low profile
- P01 = Cable Plug Right Angle
- P03 = Panel Plug
- R01 = Rear mounted Receptacle
- R50 = Cable mounted Receptacle

**Sealing level**

- Plug**
- Z = Not applicable
- Receptacle**
- W = Water sealing

**Locking system**

- Plug**
- QM = Quick-release medium force
- Receptacle**
- ZZ = No locking

**Connector size**

- 08 = Size 08 (diameter interface)
- 14 = Size 14 (diameter interface)

**Polarity of contacts**

- P = Piston
- T = Track

**Number of contacts**

- Size 08 = 004
- Size 14 = 007

**Contact type**

- A = Flex print Solder
- B = Flex print ZIF
- S = Solder
- P = PCB

**Housing material**

- B = Brass (plug)
- C = Stainless steel (receptacle)
- D = Plastic

**Grounding**

- A = Grounding pin (receptacle)
- Z = Not applicable (plug)

**Insulating material**

- 2 = Plastic (plug)
- 3 = Epoxy (receptacle)

**O-ring material**

- Plug** = Interface O-ring  
**Receptacle** = Panel O-ring
- V = Viton®
  - Z = Not applicable

**Keying code**

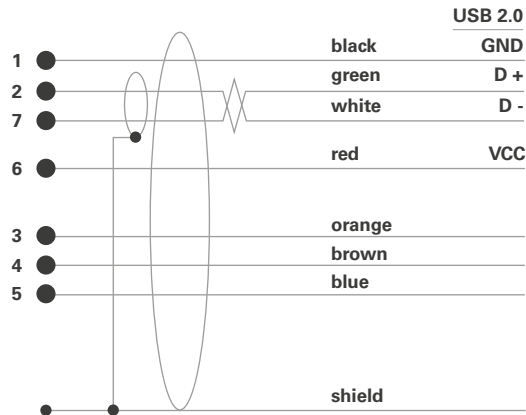
- 360 = No code

**Housing color**

- AN = Anthracite
- BK = Black

### 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 Ω Tinned copper drain wire 7x0.13 mm, aluminum / polyester tape

**AWG26 (black/red)**

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

**AWG24 (blue/brown/orange)**

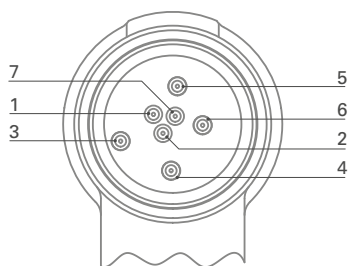
Bare copper conductor 7x0.20mm / polypropylene insulation / nominal thickness 0.20 mm / nominal diameter 1.0 mm

**Shield**

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

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

View from front of plug



WIRE	PRECABLED SOLUTION	
	1m, open end	
	Pin number	
AWG26 black	1	
AWG28 green	2	
AWG26 orange	3	
AWG24 brown	4	
AWG24 blue	5	
AWG26 red	6	
AWG28 white	7	
<b>Part number</b>	133714 Plug assembly 1m black cable & boot	
	133736 Plug assembly 1m black cable overmold	

WIRE	PRECABLED SOLUTION	
	1m, open end	
	Pin number	
AWG26 black	1	
AWG28 green	2	
AWG24 orange	3	
AWG24 brown	4	
AWG24 blue	5	
AWG26 red	6	
AWG28 white	7	
<b>Part number</b>	134563 Plug assembly 1m black cable & boot	
	134564 Plug assembly 1m TAN cable & boot	
	134999 Receptacle assembly 0.5m TAN cable & boot	

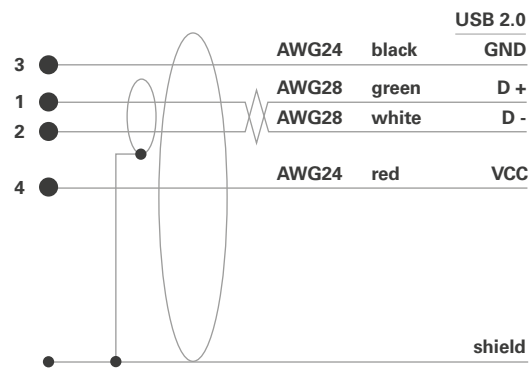
All dimensions are in millimeters and images are for reference only.



## CABLE SPECIFICATION 4 PINS SIZE 08

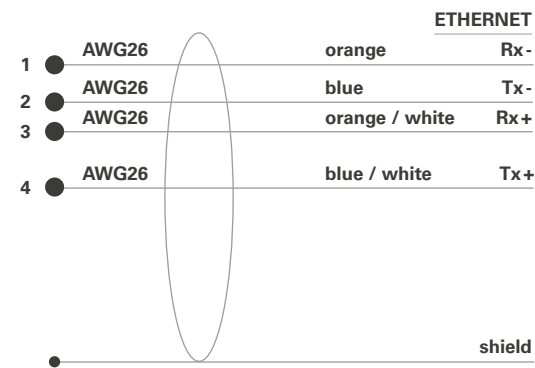
### USB **CABLE**

- 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



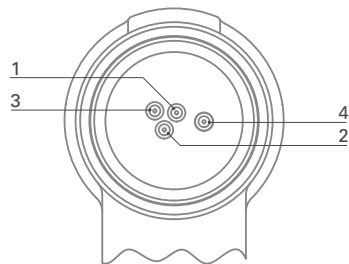
### ETHERNET **CABLE**

- 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



## WIRING DIAGRAM FOR STANDARD PRE-CABLED PLUG

View from front of plug



WIRE	PRECABLED SOLUTION
	USB 2.0 1m, open end
	Pin number
AWG24 black	3
AWG28 green	1
AWG28 white	2
AWG24 red	4
<b>Part number</b>	<b>135121</b> Plug assembly 1m black cable & boot

WIRE	PRECABLED SOLUTION
	Ethernet 100 Mb/s 1m, open end
	Pin number
AWG26 orange	1
AWG26 blue	2
AWG26 orange / white	3
AWG26 blue / white	4
<b>Part number</b>	<b>135528</b> Plug assembly 1m black cable & boot

**SOFT CAPS**

CABLE MOUNTED

PANEL MOUNTED

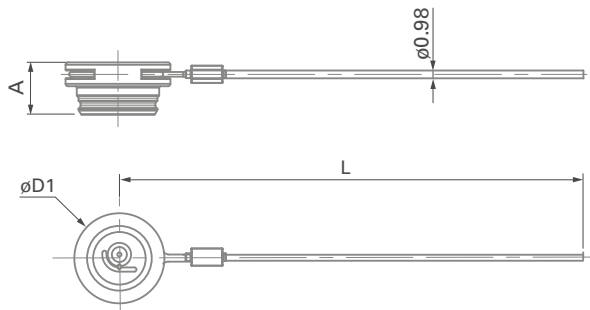


FIGURE 1

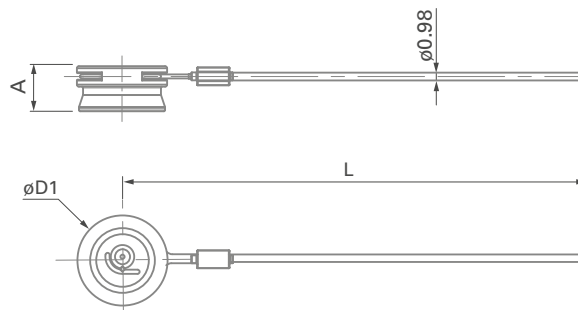


FIGURE 2

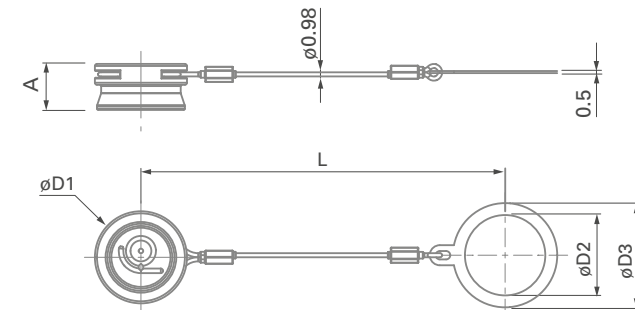


FIGURE 3

Size	Caps for		A	ØD1	L	ØD2	ØD3	Part number	Fig.
	FLP01	FLR01							
08	●		11	23	200	-	-	FCP08C 1B2 A200	1
		●	11	20.4	200	-	-	FCR08C 1B2 A200	2
		●	11	20.4	95	14	18	FCR08C 1B2 A095	3
14	●		11	28	200	-	-	FCP14C 1B2 A200	1
		●	11	25.4	200	-	-	FCR14C 1B2 A200	2
		●	11	25.4	95	19.2	24.9	FCR14C 1B2 A095	3

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

## METAL SIZE 14

### ENVIRONMENTAL & MECHANICAL DATA

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

<sup>1)</sup> Exception: 48 h for FLR50.

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

### ELECTRICAL DATA

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

### MATERIAL & SURFACE FINISH





## PLASTIC SIZE 08

### ENVIRONMENTAL & MECHANICAL DATA

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

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

### ELECTRICAL DATA

Characteristic	Performance	Standard
<b>Contact resistance</b>	<50mOhm (typical value)	MIL-STD-202 Method 307
<b>Insulation resistance</b>	>10 <sup>10</sup> Ohm	IEC 60512-3-1 MIL-STD-202 Method 302
<b>Shielding effectiveness</b>	N/A	N/A
<b>Data protocols</b>	USB 2.0 and 100 Mb/s Ethernet	

### MATERIAL & SURFACE FINISH



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