K

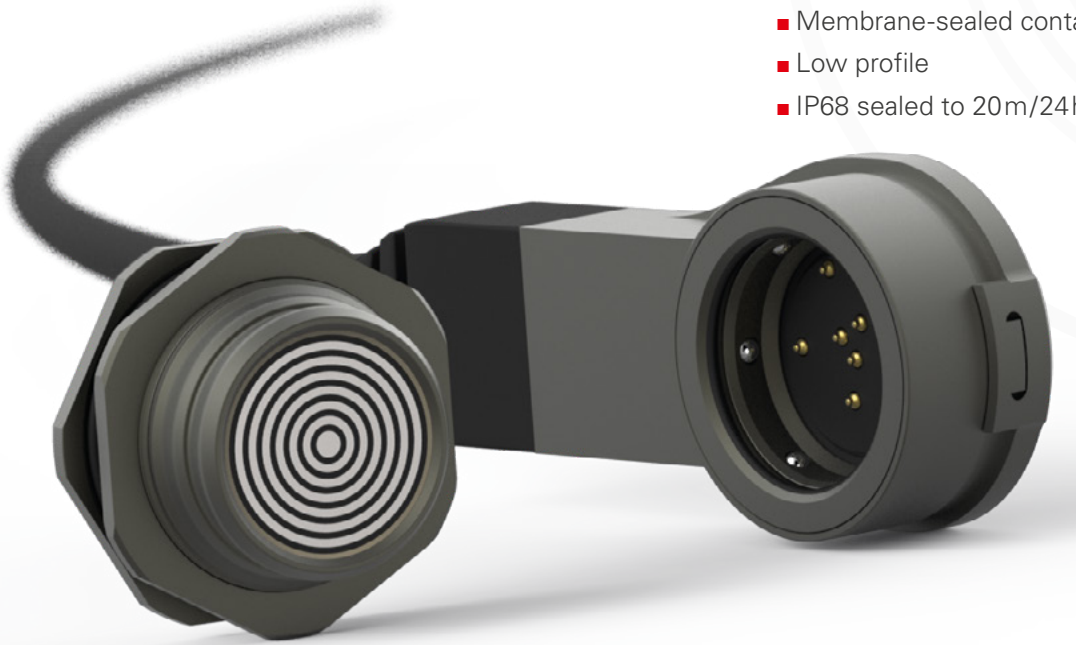
CHAPTER

FISCHER FREEDOM™ SERIES

EASY MATING | EASY CLEANING | EASY INTEGRATION

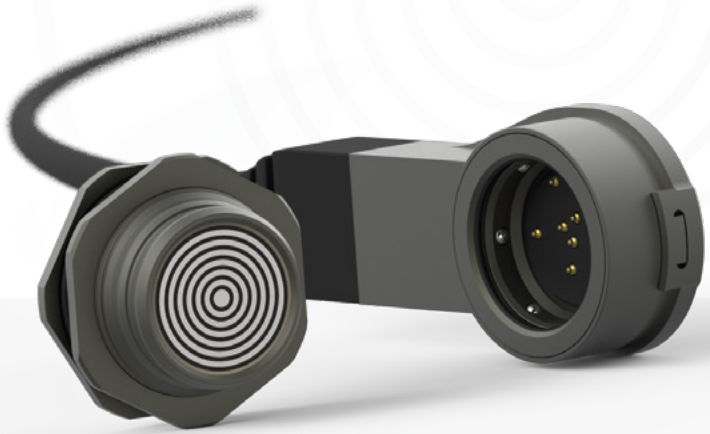
KEY FEATURES

- 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



K-2 / K-17

FREEDOM



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PLUGS

CABLE MOUNTED

PANEL MOUNTED

RECEPTACLES

PANEL MOUNTED

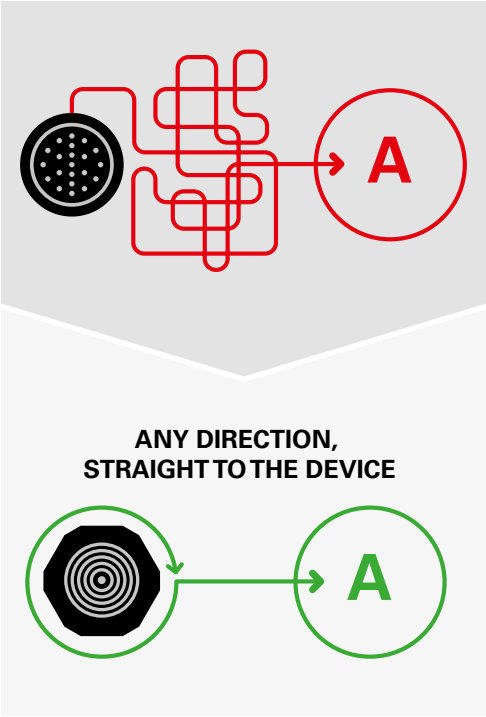
CABLE MOUNTED

FOR ALL FREEDOM

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



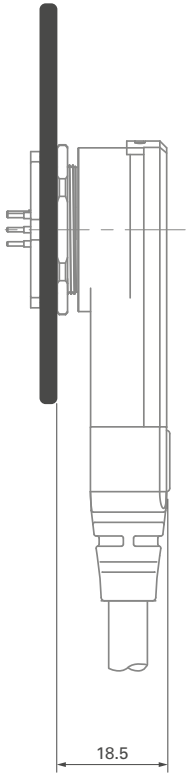
EASY CLEANING

- 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

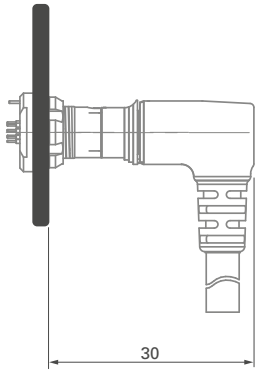
EASY INTEGRATION

- 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



FREEDOM

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

PLUG

CABLE MOUNTED **PANEL MOUNTED**

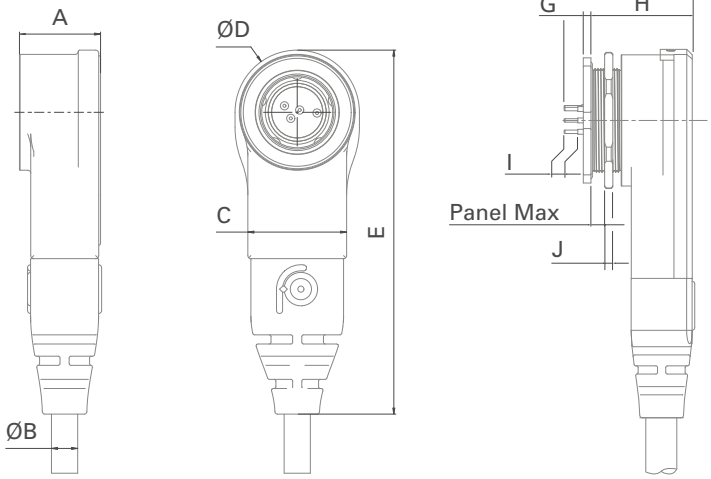
		 Metal	 Plastic	 Metal	
Body style		**FLP01**	**FLP01**	**FLP03**	**References to detailed information**
Protection	**Sealed to IP67**		●		Sealing categories, pages K-16 & 17
	Sealed up to IP68	●		●	
Locking system	**Friction**				-
	Push-pull				
	Quick-release	●	●	●	
	Lanyard				
	Tamperproof				
Termination	**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**	●	●		
	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.

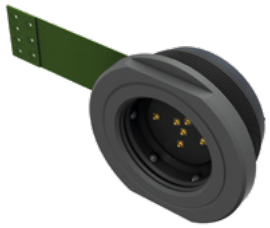
Size	A	ØB	C	ØD	E	Panel max	F	G	H	I	J	Weight (without cable)
08 Plastic	13.3	4.8	16.2	20.4	59.7	3	23.8	2.2	18.9	2.5	2	15.8 g
14 Metal	13	5.4	15.6	25.4	67.4	3	23.4	1.4	18.5	2.5	1.5	44.5 g

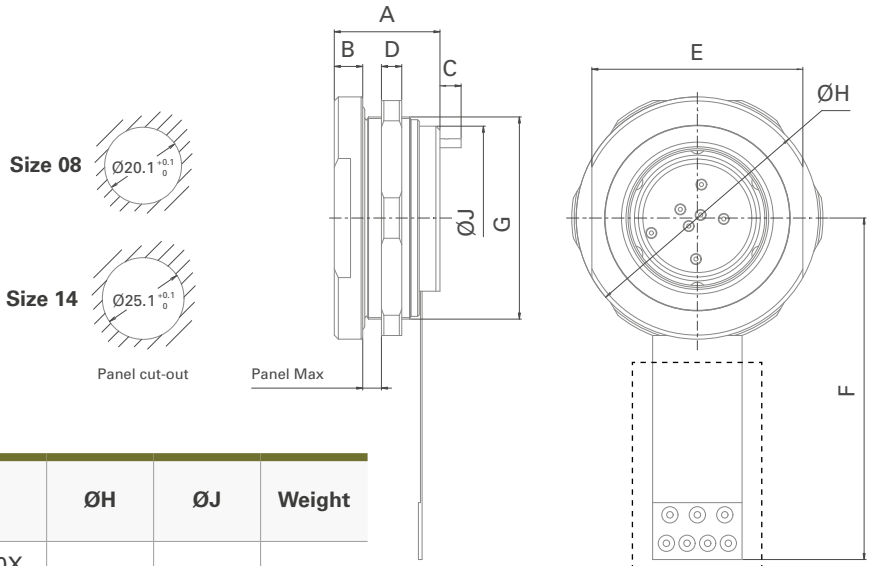
All dimensions are in millimeters and images are for reference only.

PLUG FLP03

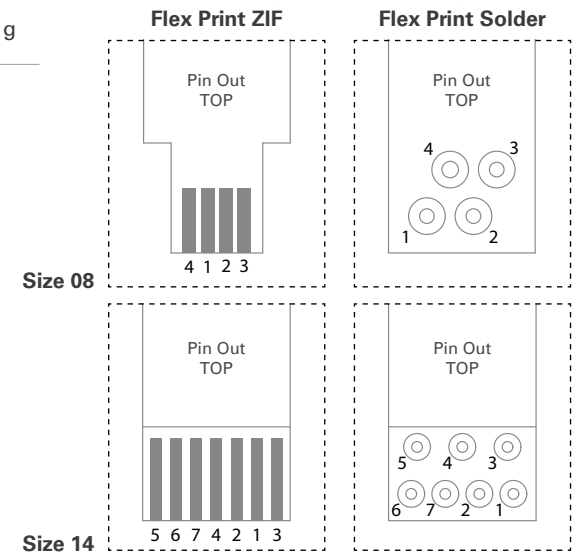
PANEL
MOUNTED

METAL





Size	A	B	C	D	E	Panel Max	F	G	ØH	ØJ	Weight
08 Metal	13	3.5	2.7	2.5	21	3.7	42	M20X 0.5	25	17.6	20.5 g
14 Metal	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
08 Metal	223881	M20x0.5	Ø26	24	Metal
14 Metal	224113	M25x0.5	Ø31	29	Metal

RECEPTACLE

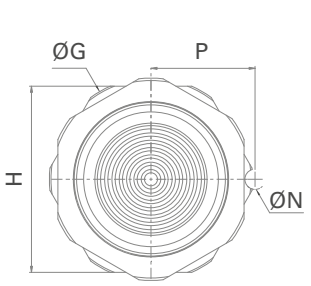
		PANEL MOUNTED		CABLE MOUNTED	
		 Metal	 Plastic	 Metal	
Body style		**FLR01**	**FLR01**	**FLR50**	**References to detailed information**
Protection	**Sealed to IP67**		●		Sealing categories, pages K-16 & 17
	Sealed up to IP68	●		●	
	Hermetic				
Termination	**Wires**			●	Electrical & contact configurations, 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				

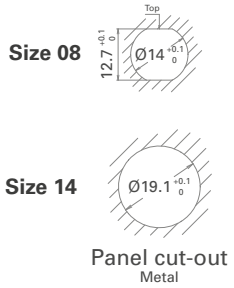
All dimensions are in millimeters and images are for reference only.

RECEPTACLE FLR01

PANEL
REAR MOUNTED

METAL



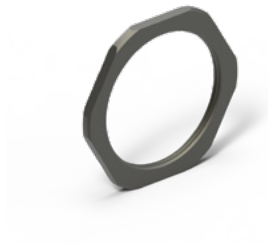


Panel cut-out
Metal

Size	A	B	C	D	Panel Max	E	ØF	ØG	H	M	ØN	P	X	Weight
08 Metal	13	1.4	2.5	1	3	1.5	8	19.9	17.9	M14X 0.5	2	10.3	2-4	7.5 g
14 Metal	13	1.4	2.5	1	3	1.5	14	24.9	22.9	M19X 0.5	2.5	12.8	2-4	15.2 g

NUT ACCESSORY

Nut available in different sizes. To be ordered separately.

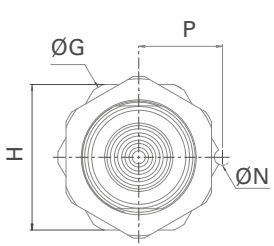


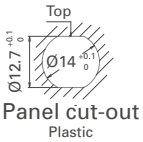
Size	Part number	Inner thread size	Outer diameter	Flat open spanner	Material
08 Metal	**224101**	M14x0.5	Ø20	18	Plastic
	223787	M14x0.5	Ø20	18	Metal
14 Metal	**222825**	M19x0.5	Ø25	23	Metal
	222826	M19x0.5	Ø30	28	Metal

RECEPTACLE FLR01

PANEL
REAR MOUNTED

PLASTIC

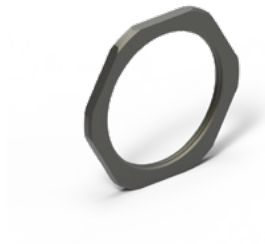




Size	A	B	C	D	Panel Max	E	ØF	ØG	H	M	ØN	P	X	Weight
08 Plastic	13.8	2.2	2.5	0.2	3	2	8	19.9	17.9	M14X0.5	2	10.3	1.0-1.5 Nm	3.3 g

NUT ACCESSORY

Nut to be ordered separately.



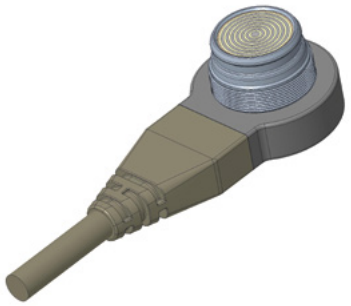
Size	Part number	Inner thread size	Outer diameter	Flat open spanner	Material
08 Plastic	**224101**	M14x0.5	Ø20	18	Plastic
	223787	M14x0.5	Ø20	18	Metal

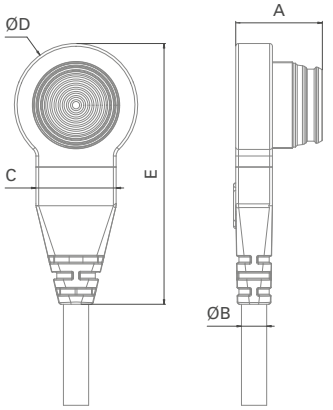
All dimensions are in millimeters and images are for reference only.

RECEPTACLE FLR50

CABLE
MOUNTED

METAL





Size	A	ØB Max	C	ØD	E	Weight (without cable)
14 **Metal**	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
14 **Metal**	**222825**	M19x0.5	Ø25	23	Metal
	222826	M19x0.5	Ø30	28	Metal

Size	Pin layout	Number of contacts		Receptacle PCB contacts Pin diameter *[mm]*	Current *[A]* IEC 60512-5-2-5b [1]	Rated voltage r.m.s *[V]* [3] IEC 60664-1 [2]	Test voltage *[kV] in mated position* IEC 60512-4-1 test 4a			
							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					

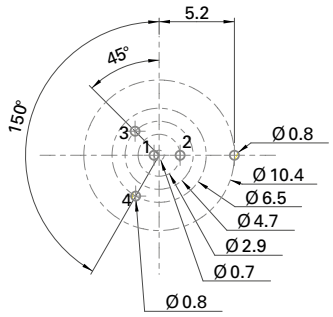
[1] Current per contact at 40°C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken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

[2] 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.

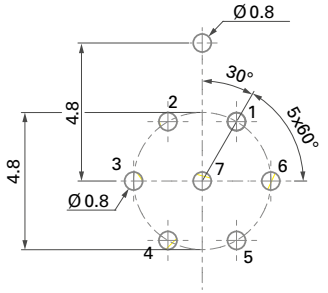
[3] Based on IEC 61984 safety requirements, Fischer Connectors SA recommends that, for operating voltage >50V, power should not be used without integration of an active security system. Please contact us for further information.

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

08 — **4 contacts**



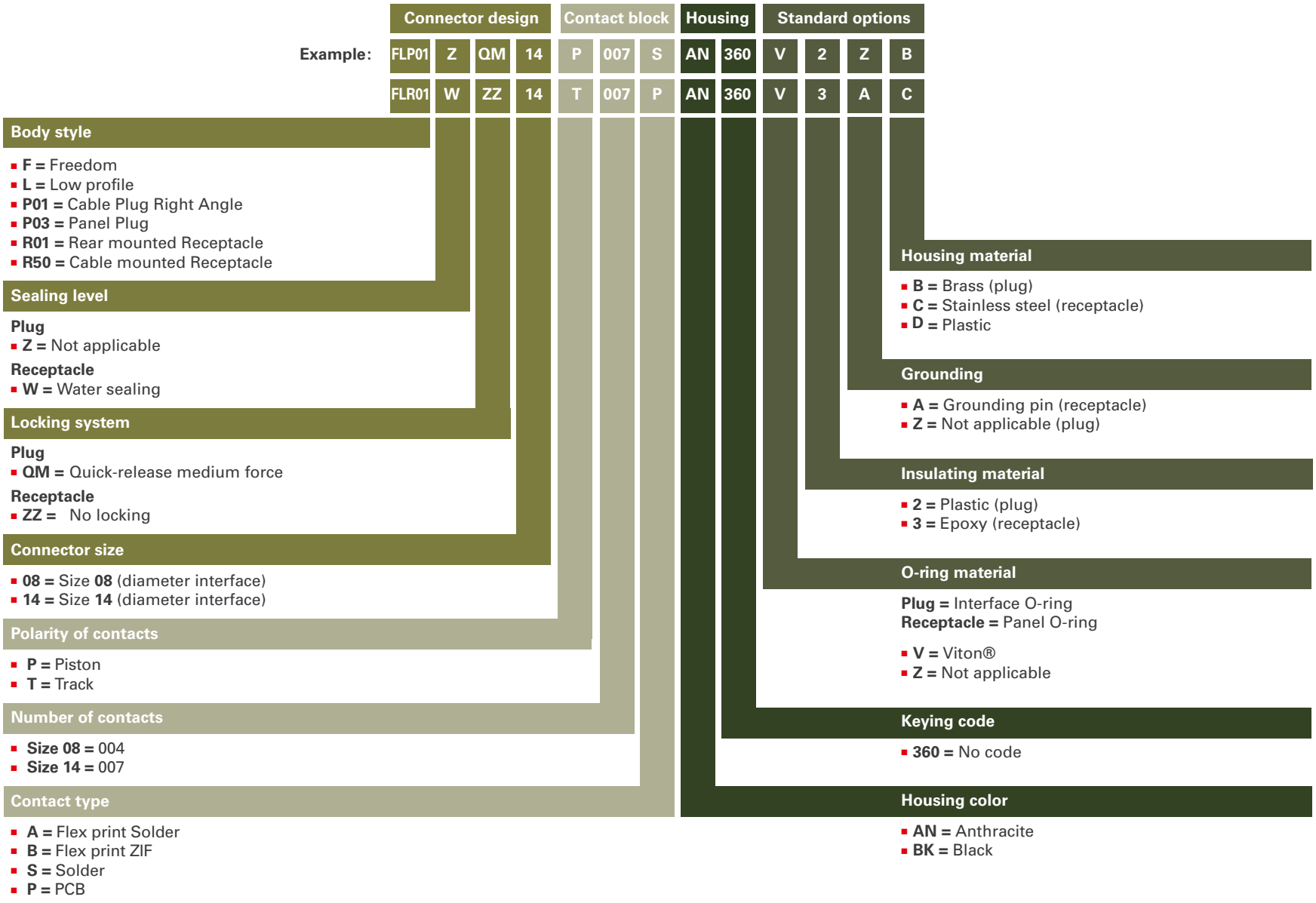
14 — **7 contacts**



FREEDOM

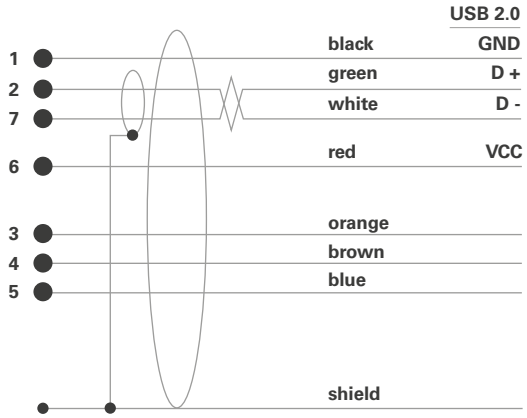
All dimensions are in millimeters and images are for reference only.

Part numbering



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

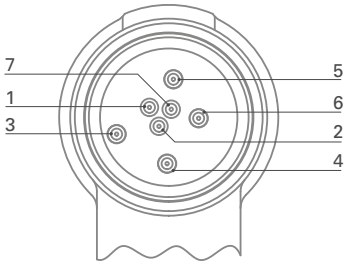
AWG26 (black/red)
Tinned copper conductor 7x0.16mm / polypropylene insulation / nominal thickness 0.21 mm / nominal diameter 0.90 mm

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

Part number	
	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

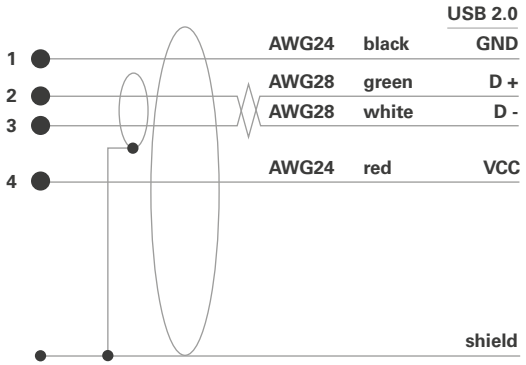
Part number	
	134563 Plug assembly 1m black cable & boot
	134564 Plug assembly 1m TAN cable & boot
	134999 Receptacle assembly 0.5m TAN cable & boot

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

CABLE SPECIFICATION 4 PINS SIZE 08

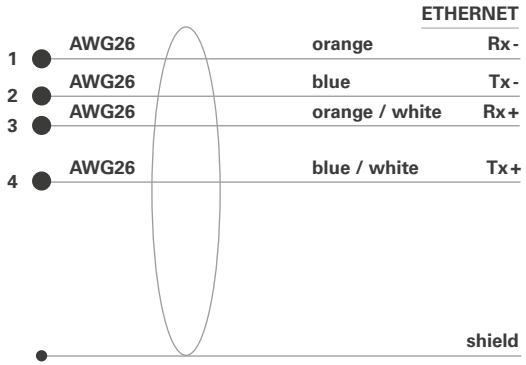
USB **CABLE**

- 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



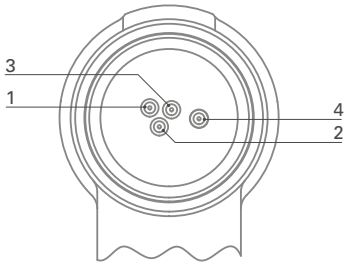
ETHERNET **CABLE**

- 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	1
AWG28 green	2
AWG28 white	3
AWG24 red	4
Part number	**135121** 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
Part number	**135528** Plug assembly 1m black cable & boot

SOFT CAPS

CABLE **MOUNTED**

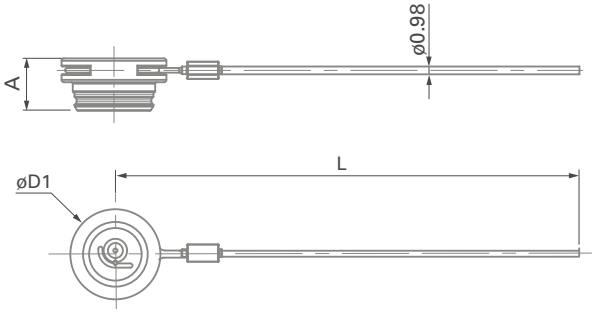


FIGURE 1

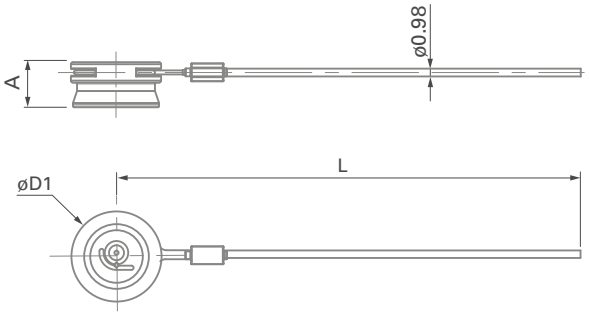


FIGURE 2

PANEL **MOUNTED**

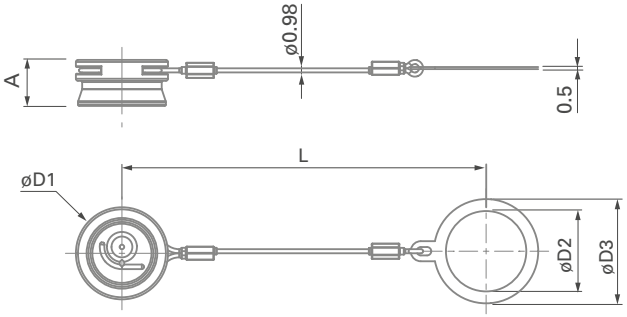


FIGURE 3

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
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 [1] Connectors in mated condition. Cosmetic changes may appear over time without impacting mechanical or electrical functions.		MIL-STD-810 Method 509.6
Mechanical endurance	10,000 mating cycles / 5,000 full rotations [2] Preserved mechanical and electrical functionality. Normal wear will appear.		IEC 60512-9-1
Random vibration	9.26 G rms		MIL-STD-202 Method 214 Condition I
Unmating force	Typical 40 N		IEC 60512-13-1
Shock	30 G		MIL-STD-202 Method 213 Condition J

[1] Exception: 48 h for FLR50.

[2] 180° rotation considered per mating within the mating cycle test.

ELECTRICAL DATA

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

MATERIAL & SURFACE FINISH

FREEDOM

PLASTIC SIZE 08

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 range (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 impacting mechanical or electrical functions.		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

[1] 180° rotation considered per mating within the mating cycle test.

ELECTRICAL DATA

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

MATERIAL & SURFACE FINISH

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