

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 20 m/24 h



FREEDOM

K-2 / K-18

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



CABLE MOUNTED

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

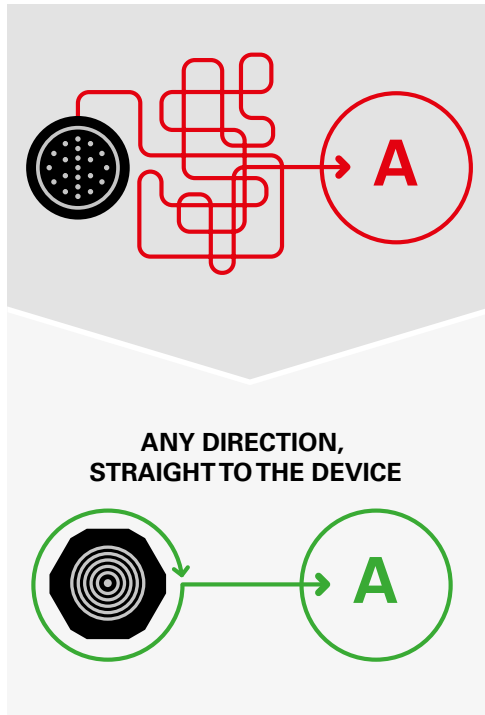
FOR ALL FREEDOM

- Key features K-3
- Body styles & technical dimensions K-4
- Electrical & contact configurations K-11
- PCB hole layout K-11
- Part numbering K-12
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- Accessories K-15
- Technical information K-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

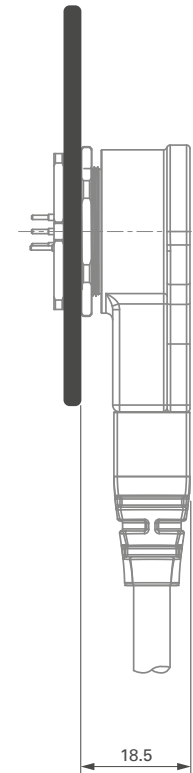
- Surface contacts = fixed tracks & membrane-sealed contacts
- No female contacts that can accumulate dirt, no long male contacts that can get broken
- A true cleanable solution on both receptacle and plug sides



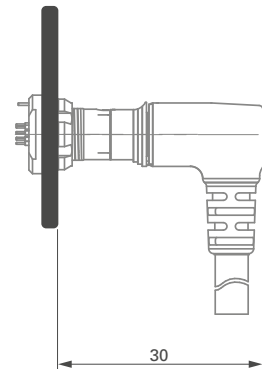
EASY INTEGRATION

- 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™
CONNECTOR



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-17 & 18
	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				-
	Overmoldable	●	●		
	Heat shrinkable	●	●		
Accessories	Cable bend reliefs	●	●		Page K-15
	Protective sleeves				
	Sealing caps	●	●	●	
Size	08		●	●	Technical dimensions, pages K-5 & 6
	14	●		●	

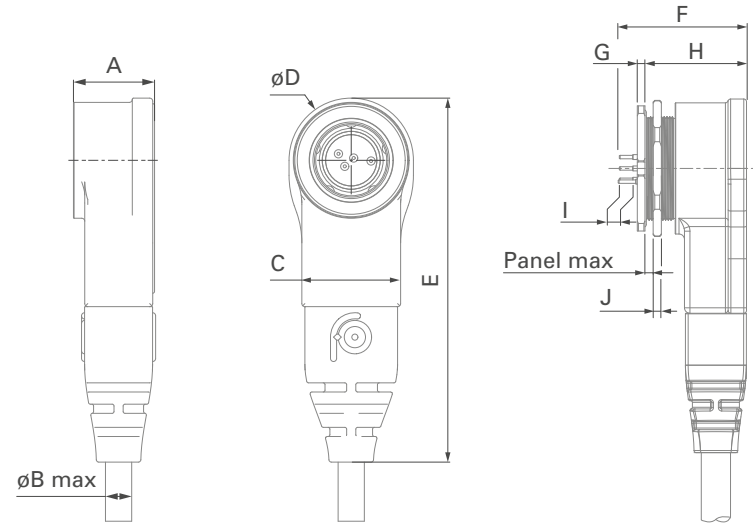
PLUG FLP01

CABLE MOUNTED

METAL SIZE 14



PLASTIC SIZE 08



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

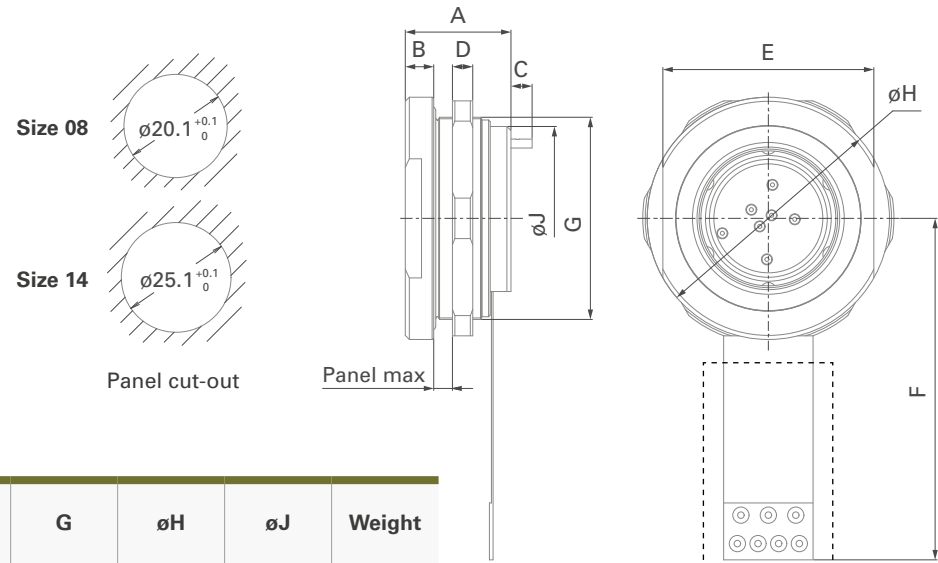
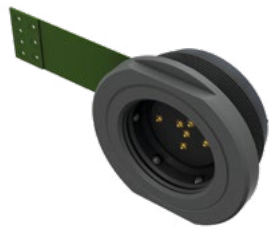
Size	A	øB max	C	øD	E	Panel max	F	G	H	I	J	Weight (without cable)
08 Plastic	13.3	4.8	16.0	21.5	59.3	3	23.8	2.2	18.9	2.5	2	15.8 g
14 Metal	13	5.5	15.6	25.4	67.4	3	23.4	1.4	18.5	2.5	1.5	44.5 g

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

PLUG FLP03

PANEL MOUNTED

METAL



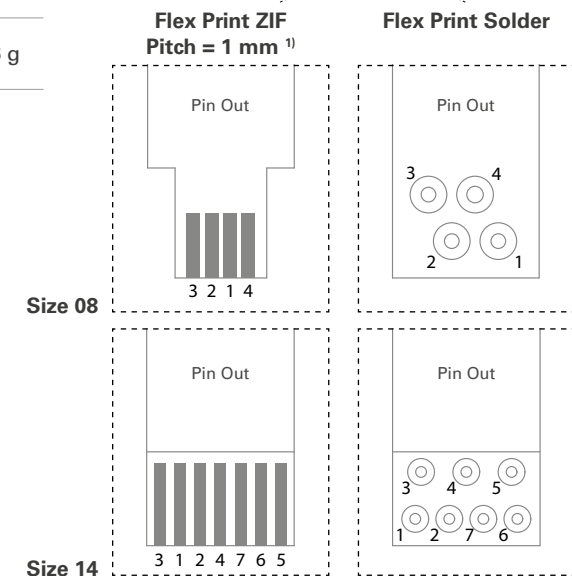
Size	A	B	C	D	E	Panel max	F	G	øH	øJ	Weight
08 Metal	13	3.5	2.7	2.5	21	3.7	42	M20x0.5	25	17.6	20.5 g
14 Metal	13	3.5	2.7	2.5	26	3.7	42	M25x0.5	30	22.6	32.6 g

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



¹⁾ ZIF connectors have a current limitation of 1 A.

RECEPTACLE

PANEL MOUNTED

CABLE MOUNTED



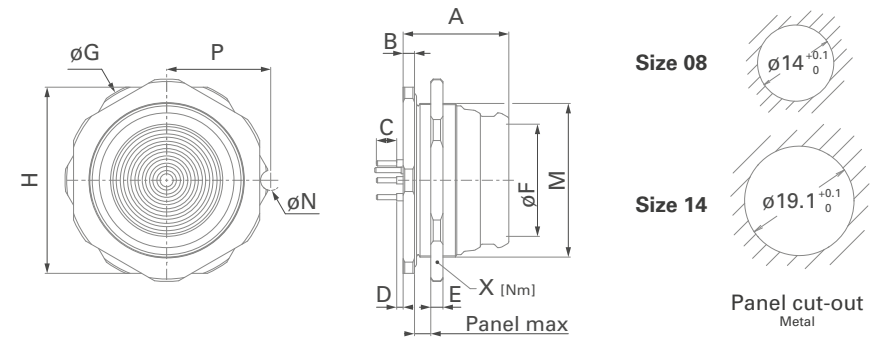
Body style		FLR01	FLR01	FLR50	References to detailed information
Protection	Sealed to IP67		●		Sealing categories, pages K-17 & 18
	Sealed up to IP68	●		●	
	Hermetic				
Termination	Wires			●	Electrical & contact configurations, page K-11
	PCB contacts	●	●		
Housing material	Stainless steel	●			Page 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	Cable bend relief			●	Page K-15 Page K-16
	Protective sleeves				
	Sealing caps	●	●		
	Garment fixation	●	●	●	
Size	08	●	●	●	Technical dimensions, pages K-8 to 10
	14	●		●	

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

RECEPTACLE FLR01

PANEL
REAR MOUNTED

METAL



Size	A	B	C	D	Panel max	øF	øG	H	M	øN	P	X	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.

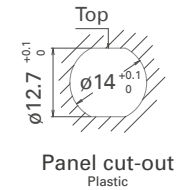
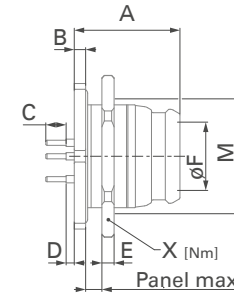
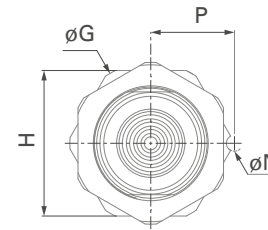


Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
08 Metal	224101	M14x0.5	ø20	2.0	18	Plastic
	223787	M14x0.5	ø20	1.5	18	Metal
14 Metal	222825	M19x0.5	ø25	1.5	23	Metal
	222826	M19x0.5	ø30	1.5	28	Metal

RECEPTACLE FLR01

PANEL
REAR MOUNTED

PLASTIC



Size	A	B	C	D	Panel max	$\varnothing F$	$\varnothing G$	H	M	$\varnothing N$	P	X	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.



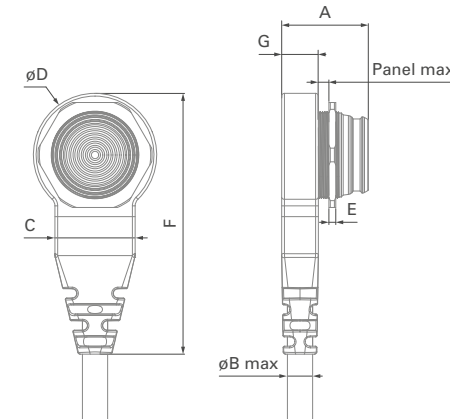
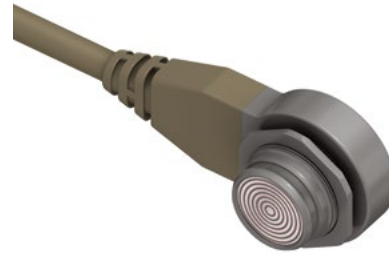
Size	Part number	Inner thread size	Outer diameter	E	Flat open spanner	Material
08 Plastic	224101	M14x0.5	$\varnothing 20$	2.0	18	Plastic
	223787	M14x0.5	$\varnothing 20$	1.5	18	Metal

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

RECEPTACLE FLR50

CABLE MOUNTED

METAL



Size	A	øB max	C	øD	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 Metal	224101	M14x0.5	ø20	2.0	18	Plastic
	223787	M14x0.5	ø20	1.5	18	Metal
14 Metal	222825	M19x0.5	ø25	1.5	23	Metal
	222826	M19x0.5	ø30	1.5	28	Metal

Size	Pin layout	Number of contacts		Receptacle	Pin number	Current [A]	Rated voltage r.m.s [V] ³⁾	Test voltage [kV] in mated position			
				PCB contacts				IEC 60512-4-1 test 4a			
				Pin diameter [mm]		AC r.m.s.		DC			
						IEC 60512-5-2-5b ₁₎	IEC 60664-1 ₂₎	Contact to body	Contact to contact	Contact to body	Contact to contact
08		2	0.63	1, 2	1	≤160	0.7 ⁴⁾	0.7	1.2 ⁴⁾	1.2	
		2	0.63	3, 4	5						
14		4	0.63	1, 2, 6, 7	1	≤160	0.7	0.7	1.2	1.2	
		3	0.63	3, 4, 5	5						

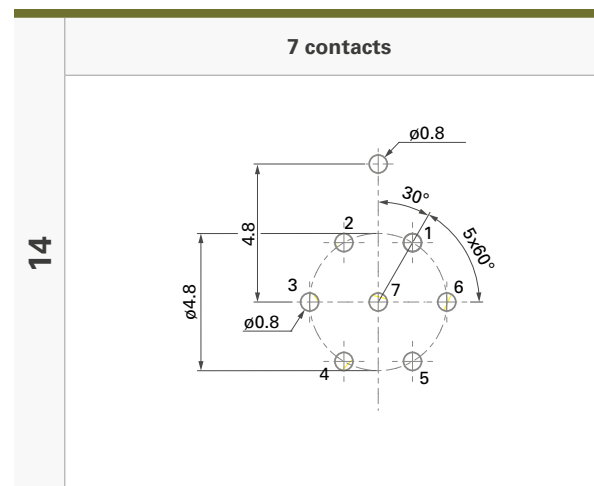
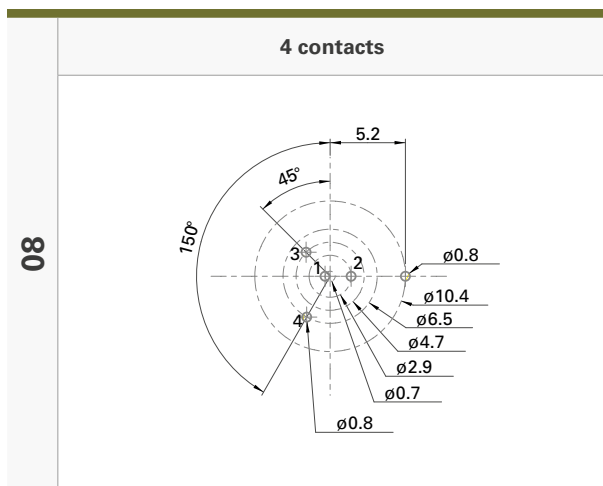
¹⁾ Current per contact at 40 °C temperature rise measured on the basic curve according to IEC 60512-5-2-5b. For the max. operating current, a reduction factor must be used and limitations due to the size of the wires and the permissible upper temperature limit of the materials employed must be taken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

⁴⁾ N/A for plastic version.

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

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 ¹⁾
- **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

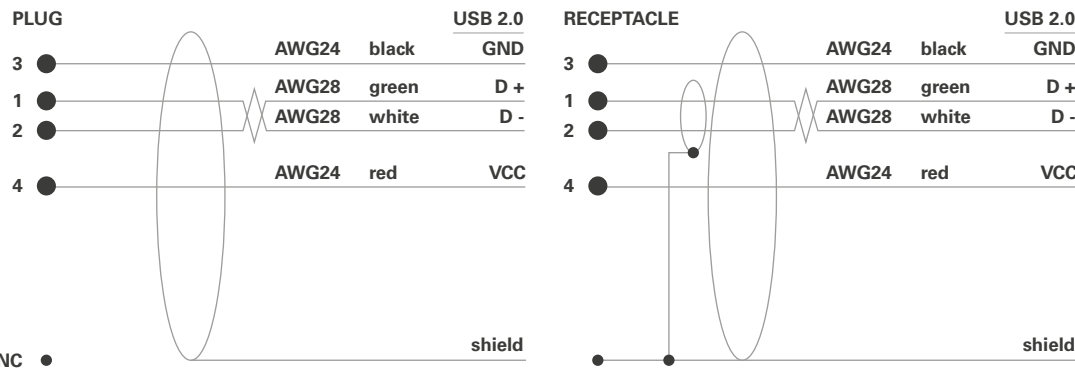
- **AN** = Anthracite
- **BK** = Black

¹⁾ZIF connectors have a current limitation of 1 A.

CABLE SPECIFICATION 4 PINS SIZE 08

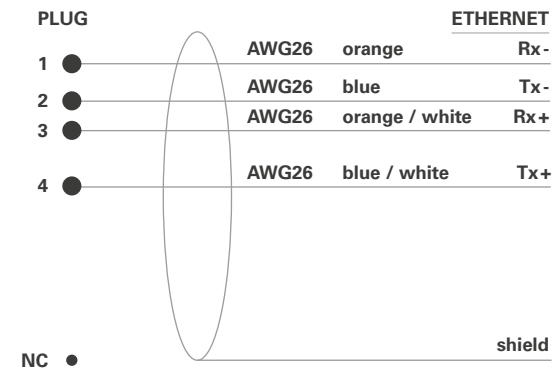
USB CABLE

- 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



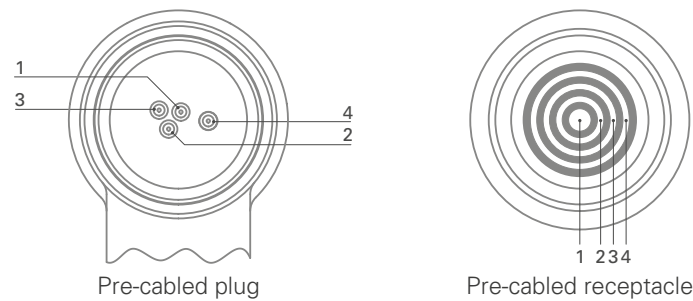
ETHERNET CABLE

- 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



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

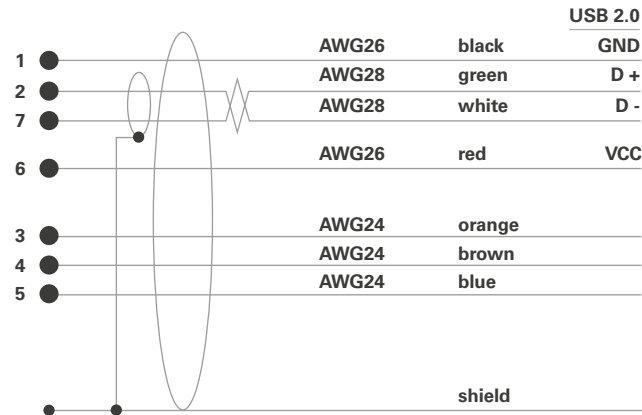
Part Number	ETHERNET 100Mbit/s PRECABLED SOLUTION 1 m, open end
135528	Plug assembly 1 m black cable & bend relief

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

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

AWG24 (blue/brown/orange)

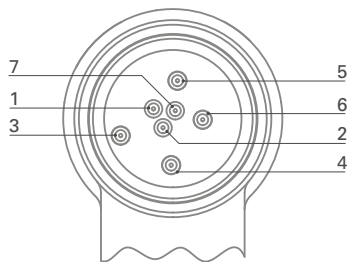
Bare copper conductor 7x0.20 mm / polypropylene insulation / nominal thickness 0.20 mm / nominal diameter 1.0 mm

Shield

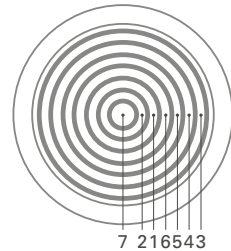
Tinned copper braid / coverage 95% / wire diameter 0.13 mm

WIRING DIAGRAM FOR STANDARD PRE-CABLED PLUG / RECEPTACLE

Wiring diagram front view:



Pre-cabled plug



Pre-cabled receptacle

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**

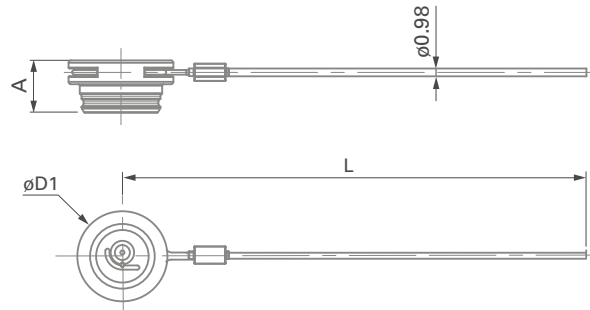


FIGURE 1

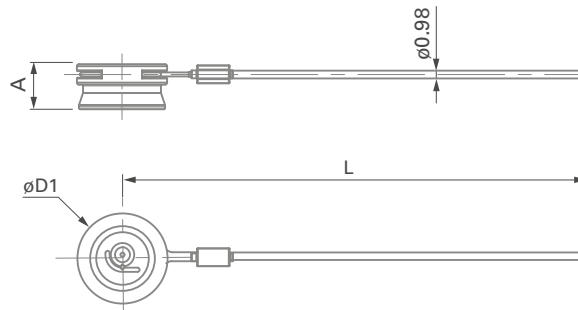


FIGURE 2

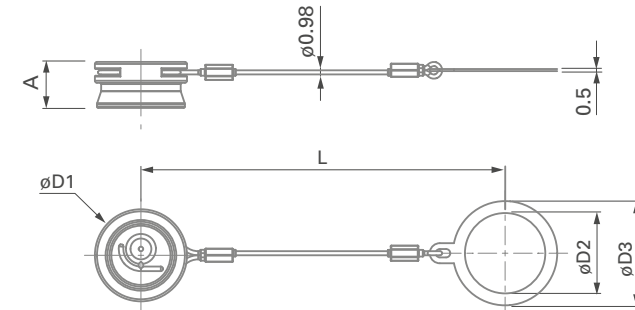
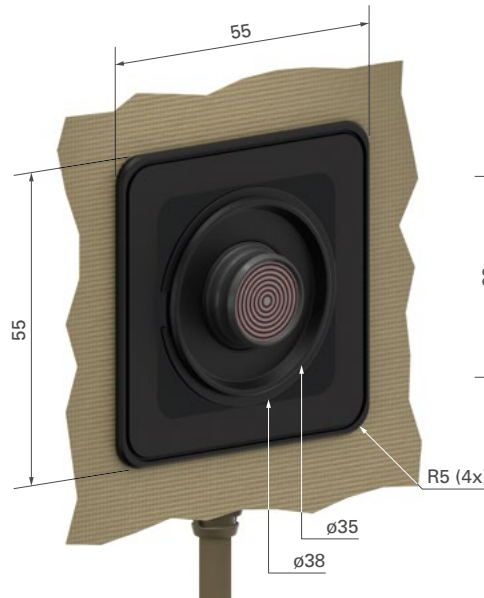
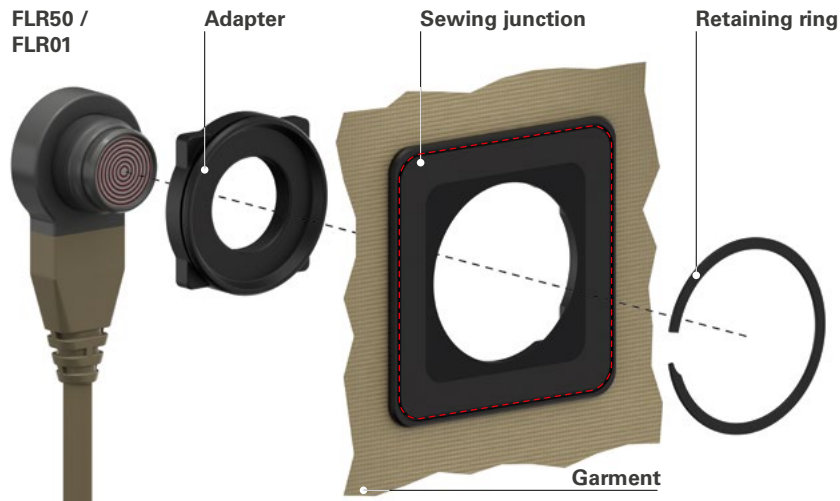


FIGURE 3

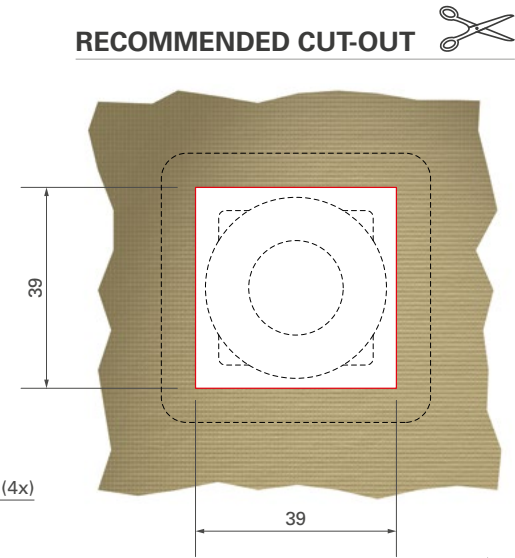
Size	Caps for		A	øD1	L	øD2	øD3	Part number	Fig.
	FLP01 FLP03	FLR01 FLR50							
08	●		11	23.0	200	-	-	FCP08C 1B2 A200 BA	1
		●	11	20.4	200	-	-	FCR08C 1B2 A200 BA	2
		●	11	20.4	95	14.0	18.0	FCR08P 1B2 A095 BA	3
14	●		11	28.0	200	-	-	FCP14C 5B2 A200 BA	1
		●	11	25.4	200	-	-	FCR14C 1B2 A200 BA	2
		●	11	25.4	95	19.2	24.9	FCR14P 1B2 A095 BA	3

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

QUICK DETACH SYSTEM

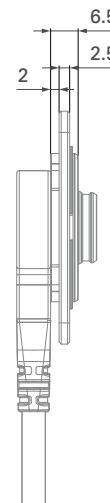


RECOMMENDED CUT-OUT

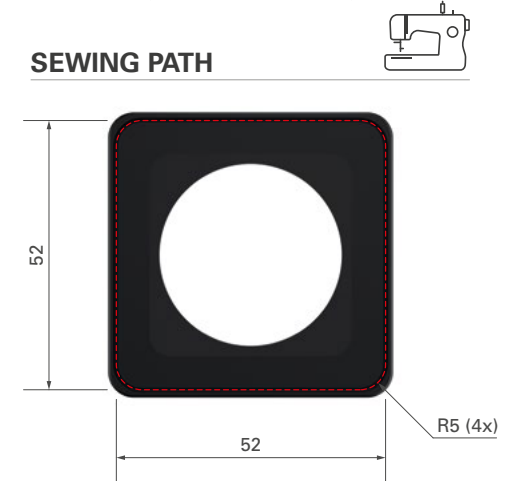


Part	Size	Part number	Material
	08	224464	PPA
	14	224452	
	08/14	224451	Central area: PPA Soft edge for sewing: TPE
		224518	Base material: stainless steel Surface finish: black zinc

Part	Size	Kit number	Kit designation
	08	137502	FREEDOM QDS 08 BK
	14	137503	FREEDOM QDS 14 BK



SEWING PATH



Material thickness on path: 1.6 mm

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 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	

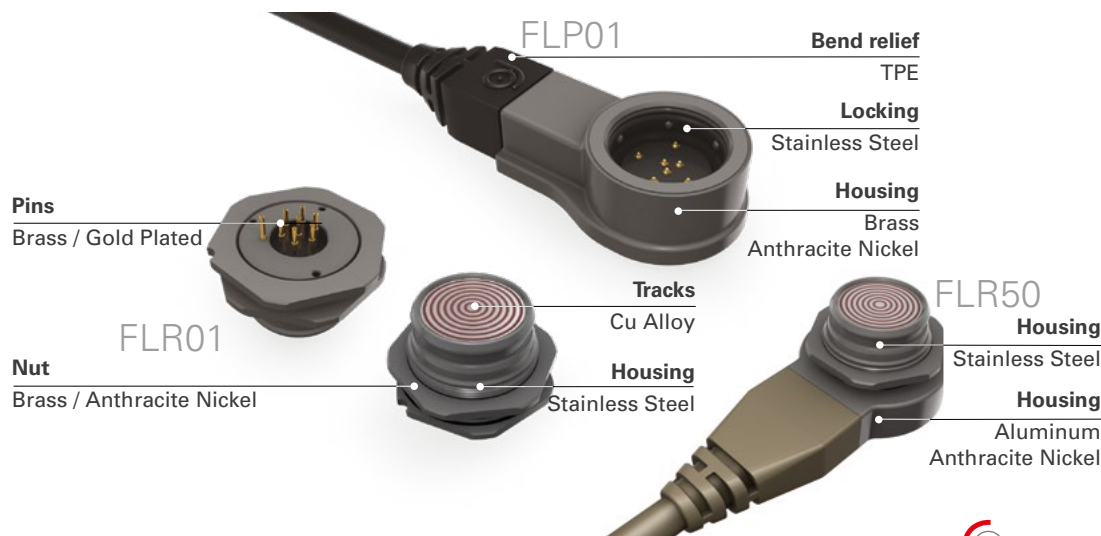
¹⁾ Exception for FLR50: 200 h mated and unmated.

²⁾ 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
Shell resistance	<50 mOhm (cabled; new condition)	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 Mbit/s Ethernet	

MATERIAL & SURFACE FINISH



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

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 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	<50 mOhm (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 Mbit/s Ethernet	

MATERIAL & SURFACE FINISH

