

# K

CHAPTER

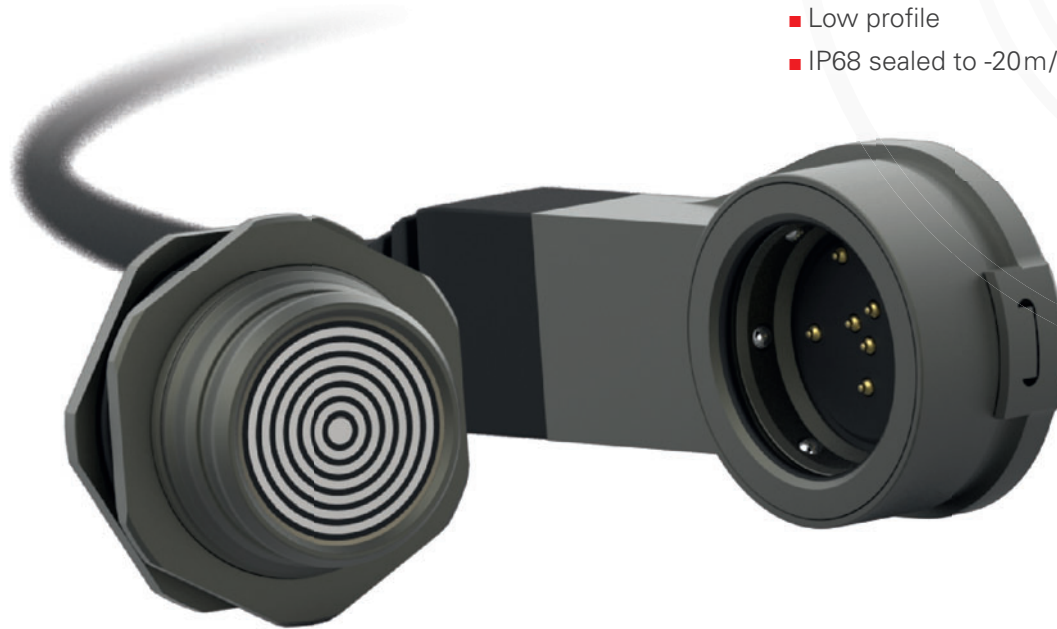


## FISCHER **FREEDOM**<sup>TM</sup> SERIES

EASY MATING | EASY CLEANING | EASY INTEGRATION

### KEY FEATURES

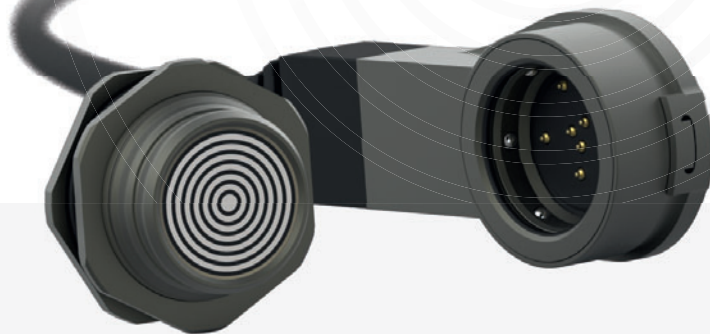
- No key code: 360° mating freedom & optimized cable management
- Membrane-sealed contacts (patent pending)
- Low profile
- IP68 sealed to -20m/24h



FREEDOM

# K-2 / K-12

# FREEDOM



## PLUGS



### CABLE MOUNTED

- Body styles (P01)..... K-4
- Technical dimensions ..... K-5

## RECEPTACLES



### PANEL MOUNTED

- Body styles (R01)..... K-6
- Technical dimensions ..... K-7
- Accessory..... K-7

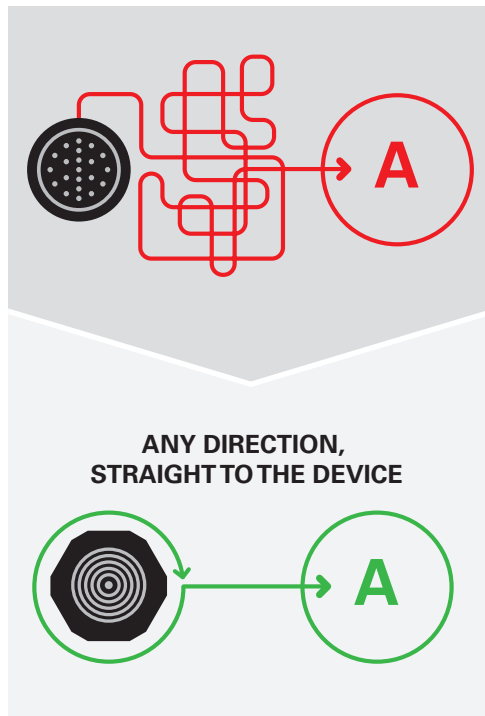
## FOR ALL FREEDOM

- Key features..... K-3
- Electrical & contact configurations..... K-8
- PCB hole layout ..... K-8
- Part numbering ..... K-9
- Pre-cabled plug configuration..... K-10
- Tooling ..... K-11
- Technical information..... K-12

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

### EASY MATING

- No Key code = 360° mating freedom
- Optimized cable management – no more tangles and turns, cables always go in a straight line



### EASY CLEANING

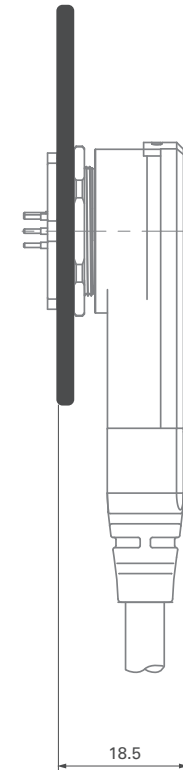
- Surface contacts = fixed tracks & membrane-sealed contacts
- No female contacts that can accumulate dirt, no long male contacts that can get broken
- A true cleanable solution on both receptacle and plug sides



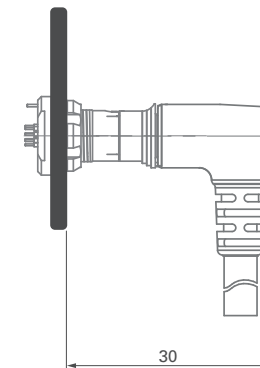
### EASY INTEGRATION

- 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 is limited and access constraint

LP360



ULTIMATE 07



**PLUG**

**CABLE MOUNTED**



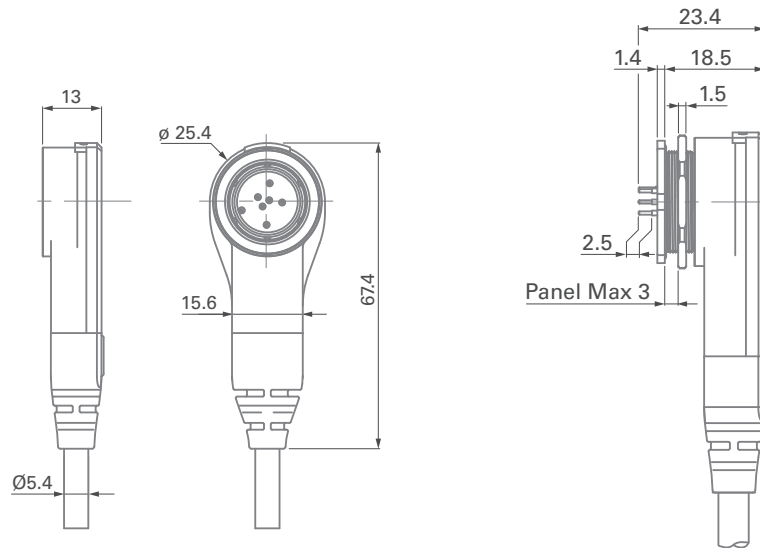
Body style		P01	References to detailed information
Protection	Unsealed (IP65)		Sealing categories, page A-8
	Sealed up to IP68	●	
Locking system	Friction		Locking systems, page A- 7
	Push-pull		
	Quick-release	●	
	Lanyard		
	Tamperproof		
Contacts	Crimp		Electrical & configurations, page K-8
	Solder	●	
Housing color	Anthracite	●	Options, page K-9
	Black		
Design	Shortened body		Body styles, chapter K
	Straight		
	Right-angle	●	
Cabling	Cable clamp sets		Accessories, page K-11
	Overmoldable	●	
	Heat shrinkable	●	
Accessories	Cable bend reliefs	●	
	Protective sleeves		
	Sealing caps	●	
Size	08		Technical dimensions, page K-5
	14	●	For more information visit our website <a href="http://www.fischerconnectors.com/technical">www.fischerconnectors.com/technical</a>

## PLUG

### CABLE MOUNTED

#### P01 / CIRCULAR RIGHT ANGLE

BODY STYLE



**RECEPTACLE**

**PANEL MOUNTED**



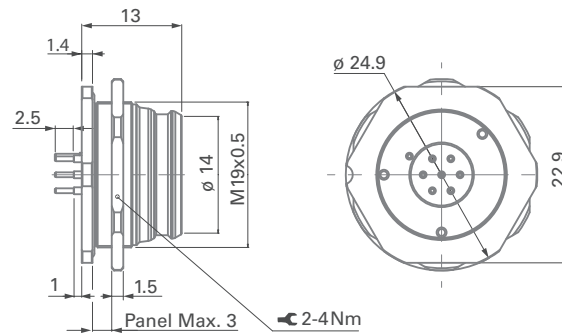
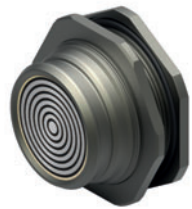
Body style		R01	References to detailed information
Protection	Unsealed (IP65)		Sealing categories, page A 8
	Sealed up to IP68	●	
	Hermetic		
Contacts	Solder		Electrical & contact configurations, page K-8
	PCB	●	
Housing color	Anthracite	●	Options, page K-9
	Black		
Design	Front-projecting	●	Body styles, chapter K
Assembly	Front-mounting		
	Rear-mounting	●	
Accessories	Sealing caps	●	Accessories, section K-11
	Cable bend relief		
	Protective sleeve		
Size	08		Technical dimensions, page K-7 For more information visit our website <a href="http://www.fischerconnectors.com/technical">www.fischerconnectors.com/technical</a>
	14	●	

**RECEPTACLE**

**PANEL MOUNTED**

**R01 / CIRCULAR REAR MOUNTED**

BODY STYLE



**NUT ACCESSORY**

Nut available in different sizes. To be ordered separately.



Part number	Inner thread size	Outer diameter	Flat open spanner
222825	M19x0.5	ø25	23
222826	M19x0.5	ø30	28

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

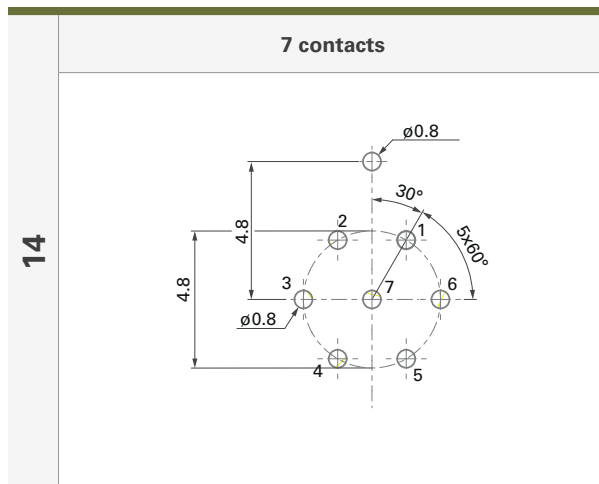
## SIZE 14

Size	Pin layout	Number of contacts	Plug	Receptacle	Current [A]	Rated voltage r.m.s [V]	Test voltage [kV] in mated position			
			Wire size <sup>1)</sup>	PCB contacts			IEC 60512-4-1 test 4a			
			Solder contacts	Pin diameter [mm]	IEC 60512-5-2-5b <sup>2)</sup>	IEC 60664-1 <sup>3)</sup>	AC r.m.s.		DC	
							Contact to body	Contact to contact	Contact to body	Contact to contact
14		4	∅0.8/AWG24	0.63	1	≤ 160	0.8	0.8	1.3	1.3
		3	∅0.8/AWG24	0.63	5					

<sup>1)</sup> Stranding values in brackets. Wire size information is based on Fischer Connectors' standard cabling recommendation for configuration with 2 or 3 power contacts.

<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 A11 for details.

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



Pin 3, 4, 5 = 5A max

Pin 1, 2, 6, 7 = 1A max



	Connector design				Contact block			Housing		Standard options			
Example:	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

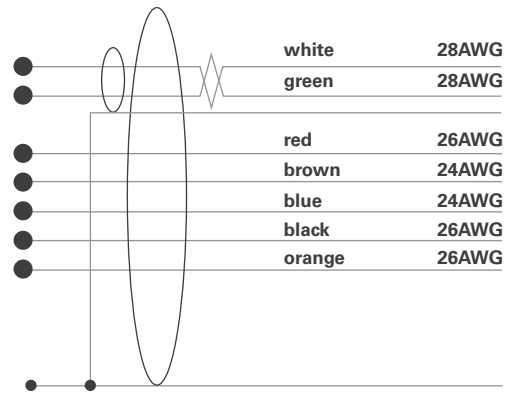
<b>Body style</b>		<ul style="list-style-type: none"> <li>▪ <b>F</b> = Freedom</li> <li>▪ <b>L</b> = Low profile</li> <li>▪ <b>P</b> = Plug / <b>P01</b> = Circular right angled</li> <li>▪ <b>R</b> = Receptacle / <b>R01</b>= Circular rear mounted</li> </ul>		<b>Housing material</b>		<ul style="list-style-type: none"> <li>▪ <b>B</b> = Brass (plug)</li> <li>▪ <b>C</b> = Stainless steel (receptacle)</li> </ul>
<b>Sealing level</b>		<ul style="list-style-type: none"> <li>▪ <b>Z</b> = Not applicable</li> </ul>		<b>Grounding</b>		<ul style="list-style-type: none"> <li>▪ <b>A</b> = Grounding pin (receptacle)</li> <li>▪ <b>Z</b> = Not applicable (plug)</li> </ul>
<b>Plug</b>		<ul style="list-style-type: none"> <li>▪ <b>Z</b> = Not applicable</li> </ul>		<b>Insulating material</b>		<ul style="list-style-type: none"> <li>▪ <b>2</b> = PEEK (plug)</li> <li>▪ <b>3</b> = Epoxy (receptacle)</li> </ul>
<b>Receptacle</b>		<ul style="list-style-type: none"> <li>▪ <b>W</b> = Water sealing</li> </ul>		<b>O-ring material</b>		<ul style="list-style-type: none"> <li>▪ <b>Plug</b> = Interface O-ring</li> <li>▪ <b>Receptacle</b> = Panel O-ring</li> </ul>
<b>Locking system</b>		<ul style="list-style-type: none"> <li>▪ <b>QM</b> = Quick-release medium force</li> </ul>		<b>Keying code</b>		<ul style="list-style-type: none"> <li>▪ <b>360</b> = No code</li> </ul>
<b>Plug</b>		<ul style="list-style-type: none"> <li>▪ <b>ZZ</b> = No locking</li> </ul>		<b>Housing color</b>		<ul style="list-style-type: none"> <li>▪ <b>AN</b> = Anthracite</li> </ul>
<b>Receptacle</b>		<ul style="list-style-type: none"> <li>▪ <b>ZZ</b> = No locking</li> </ul>				
<b>Connector size</b>		<ul style="list-style-type: none"> <li>▪ <b>14</b> = Size 14 (diameter interface)</li> </ul>				
<b>Polarity of contacts</b>		<ul style="list-style-type: none"> <li>▪ <b>P</b> = Piston</li> <li>▪ <b>T</b> = Track</li> </ul>				
<b>Number of contacts</b>		<ul style="list-style-type: none"> <li>▪ <b>Size 14</b> = 007</li> </ul>				
<b>Contact type</b>	<ul style="list-style-type: none"> <li>▪ <b>S</b> = Solder</li> <li>▪ <b>P</b> = PCB</li> </ul>					

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

## CABLE SPECIFICATION

- PUR halogen free, flame retardant outer sheath, nominal thickness 0,55 mm, black (RAL9005 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)

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

### AWG26 (orange)

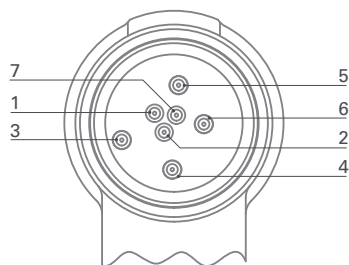
Bare copper conductor 7x0.16mm / polypropylene insulation / nominal thickness 0.16 mm / nominal diameter 0.80 mm

### Shield

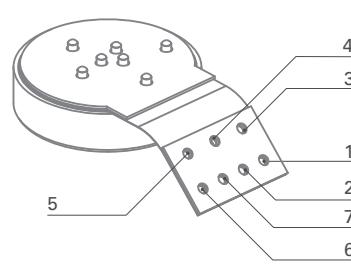
Tinned copper braid / coverage 95% / wire diameter 0.13 mm

## WIRING DIAGRAM

View from front of plug



View for cable assembly



WIRE	PRECABLED SOLUTION
	1m, open end Pin number
AWG28 white	1
AWG28 green	2
AWG26 red	3
AWG24 brown	4
AWG24 blue	5
AWG26 black	6
AWG26 orange	7
Part number	132531

## ENVIRONMENTAL & MECHANICAL DATA

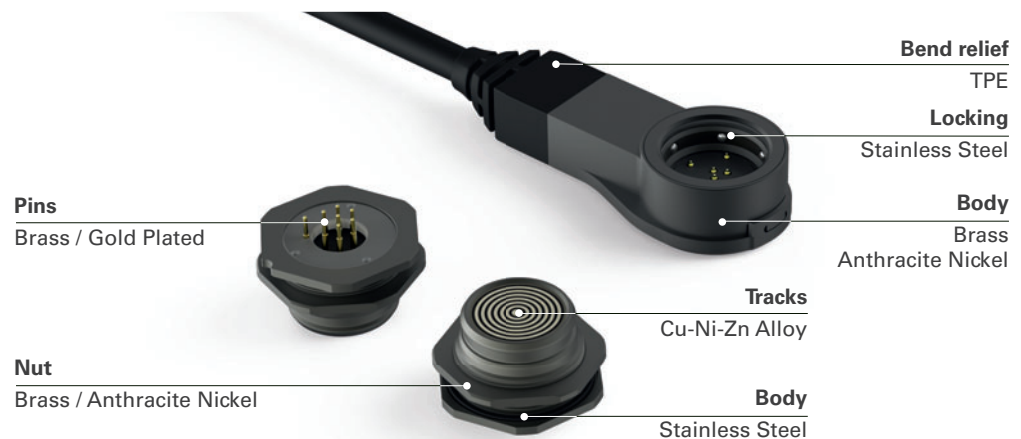
Characteristic	Performance	Standard
<b>Sealing performance</b>	Receptacle = IP68; 20m submersion for 24 hours Mated plug = IP68; 20m submersion for 24 hours Unmated plug with cap = IP68; 20m submersion for 24 hours Unmated plug without cap = IP67	MIL-STD-810 Method 512.6
<b>Operating temperature range (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 hours ; 5% salt solution, 35°C Plug and receptacle in mated condition. Cosmetic changes may appear over time without impacting mechanical or electrical functions.	MIL-STD-883 Method 1009.8 MIL-STD-883 Method 509.6
<b>Endurance</b>	10,000 mating cycles / 5,000 full rotations <sup>1)</sup> Preserved mechanical and electrical functionality. Normal wear will appear.	IEC 60512-9-1
<b>Vibration</b>	9.26G rms	MIL-STD-202 Method 214 Condition I
<b>Unlocking force</b>	Typical 40N	IEC-60512-7-13a
<b>Shock</b>	30g	MIL-STD-202 Method 213 Condition J and 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>Shell resistance</b>	<50mOhm (cabled)	MIL-STD-202 Method 307
<b>Insulation resistance</b>	>10 <sup>10</sup> Ohm	MIL-STD-883 Method 1003
<b>Shielding effectiveness</b>	360° shielded	-
<b>Data protocols</b>	USB 2.0 and 100Mb/s Ethernet	

## MATERIAL & SURFACE TREATMENT



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