

# Pressure sensors SPAW with display



# Pressure sensors SPAW with display

Key features

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## At a glance

9 pressure ranges from -1 ... +1 bar up to 0 ... +100 bar

Protection class IP67

320° rotatable display

1% accuracy, 0.15% repetition accuracy

Temperature of media -20 ... 85 °C

Materials in contact with media: CrNiMo: 316L, from a measuring range of 10 bar the membrane consists of 13-8-PH



4-digit LED display, easy to read, robust

Display  
– Bar  
– MPA  
– kPa  
– Psi  
– Kg/cm<sup>2</sup>

Simple operation, protected by PIN code

Electrical connection M12

320° rotatable housing

G<sup>1</sup>/<sub>4</sub> internal thread or G<sup>1</sup>/<sub>2</sub> external thread

## Product description

The SPAW is an extremely robust pressure sensor with display used for measuring media pressures in 9 measuring ranges from -1 ... 1 bar to 0 ... 100 bar. It can measure all media which do not corrode the stainless steel measuring cell and stainless steel housing. The switching outputs can be set quickly and easily using three buttons. The high-quality 14-segment LED display can be ro-

tated by 320° and the orientation of the lettering can be rotated by 180°. This ensures that the display is easily readable in every installation position. Different standard designs are available, e.g.:

- Internal thread G<sup>1</sup>/<sub>4</sub> or external thread G<sup>1</sup>/<sub>2</sub>
- 2 x PNP or 2 x NPN
- 4 ... 20 mA or 0 ... 10 V

## Main applications

The pressure sensor SPAW is suitable for standard pressure measurements at an increased mechanical load. It can be used in high pressure pneumatic systems and to monitor the pressure of liquid media (e.g. coolant/cooling circuits, etc.)

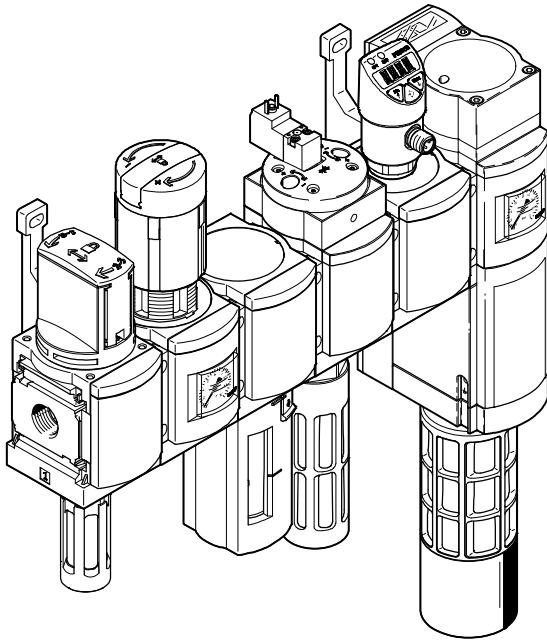
# Pressure sensors SPAW with display

Key features

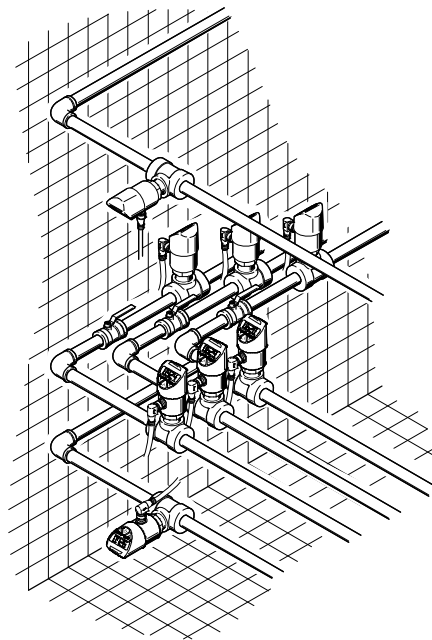
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## Application examples

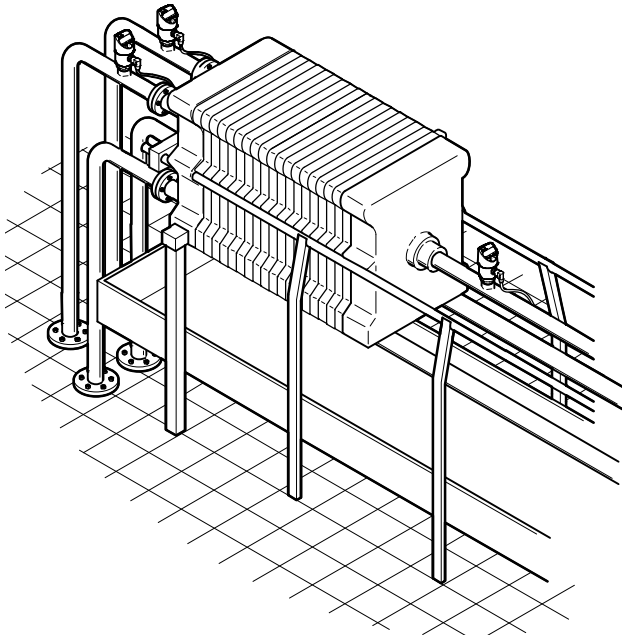
Pressure measurement in air preparation units



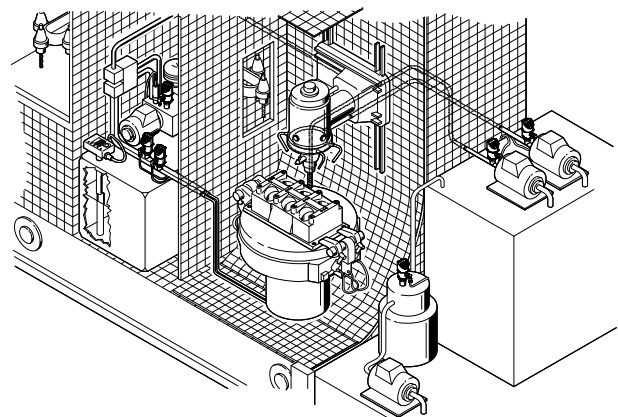
Pressure measurement in piping systems



Pressure measurement in filter systems



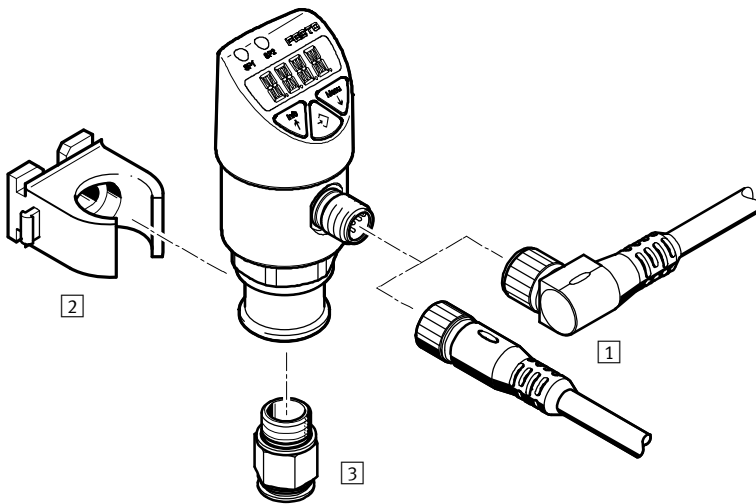
Pressure measurement for cutting oil supply and hydraulic applications



# Pressure sensors SPAW with display

Peripherals overview

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Mounting components and accessories		
	Brief description	→ Page/Internet
1	NEBU-M12 Connecting cable	12
2	PQ-RK-22-B Pipe clamp, only for G $\frac{1}{4}$ with internal thread	12
3	QS- $\frac{1}{4}$ Push-in fitting, only for G $\frac{1}{4}$ with internal thread	12

# Pressure sensors SPAW with display

Type codes

SPAW - B2 R - G12 M - 2P - M12

**Type**

SPAW	Pressure sensor
------	-----------------

**Pressure measuring range [bar]**

B2	-1 ... +1
B11	-1 ... +10
P2	0 ... 2
P6	0 ... 6
P10	0 ... 10
P16	0 ... 16
P25	0 ... 25
P50	0 ... 50
P100	0 ... 100

**Supply port**

R	Relative pressure
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**Pneumatic connection**

G12	G 1/2
G14	G 1/4

**Thread type**

F	Internal thread
M	External thread

**Electrical output**

2P	2xPNP
2 N	2xNPN
2PA	2xPNP, 1 analogue output 4 ... 20 mA
2PV	2xPNP, 1 analogue output 0 ... 10 V
2NA	2xNPN, analogue output 4 ... 20 mA
2NV	2xNPN, analogue output 0 ... 10 V

**Electrical connection**

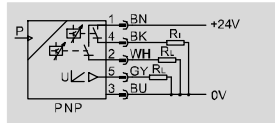
M12	Plug M12, A-coded
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# Pressure sensors SPAW with display

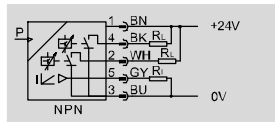
Technical data

Function

e.g. switching output 2PV



e.g. switching output 2NA



- Pressure measuring range up to 100 bar
- For liquid media
- For gaseous media



General technical data	
General	
Certification	RCM trademark cULus listed (OL)
CE marking (see declaration of conformity) <sup>1)</sup>	To EU EMC Directive
Note on materials	Contains PWIS (paint-wetting impairment substances), RoHS-compliant

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

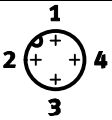
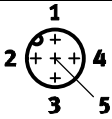
Input signal/measuring element		B2R	P2R	P6R	P10R	B11R	P16R	P25R	P50R	P100R
Input signal/measuring element										
Measured variable		Relative pressure								
Method of measurement		Piezoresistive pressure sensor				Metal thin film pressure sensor				
Pressure measuring range starting value [bar]		-1	0	0	0	-1	0	0	0	0
Pressure measuring range final value [bar]		1	2	6	10	10	16	25	50	100
Overload pressure [bar]		2	4	12	20	20	32	50	100	200
Operating medium		Compressed air to ISO 8573-1:2010 [:-:-] Liquid media <sup>2)</sup> Gaseous media <sup>2)</sup>								
Temperature of medium [°C]		-20 ... 85								
Ambient temperature [°C]		0 ... 80								

2) Please observe the resistance to media of parts that come into contact with the media

# Pressure sensors SPAW with display

Technical data

Electrical data		
Output, general		
Accuracy	[±%FS]	1
Repetition accuracy	[±%FS]	0.15
Switching output		
Switching function		Freely programmable
Switching element function		Switchable
Max. output current	[mA]	250
Analogue output		
Rise time	[ms]	3
Output, additional data		
Protection against short circuit		Yes
Electronics		
Operating voltage range DC	[V]	15 ... 35
Protection against incorrect polarity		For operating voltage
Electromechanical components		
Electrical connection		4-pin Plug M12x1, 5 pin Plug M12x1
		To EN 60947-5-2
		Round design

Pin allocation to EN 60947-5-2		
Plug, 4-pin, only for sensors without analogue output		
M12x1	Pin	Allocation
	1	Operating voltage $U_B$
	3	0V
	4	Switching output SP1
	2	Switching output SP2
Plug, 5-pin, only for sensors with analogue output		
M12x1	Pin	Allocation
	1	Operating voltage $U_B$
	3	0V
	5	Analogue output $A_{out}$
	4	Switching output SP1
	2	Switching output SP2

# Pressure sensors SPAW with display

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Technical data

Mechanical components	G14F	G12M
Mounting position	Any	
Type of mounting	With internal thread, with accessories	With external thread
Pneumatic connection	Internal thread G1/4 (EN 837)	External thread G1/2 (DIN 3852-E)
Product weight [g]	230	
Housing material information	ABS, high-alloy stainless steel	
Materials in contact with the medium <sup>1)</sup>	High-alloy stainless steel	
Seals	–	NBR

Display/operation	
Display type	LED display, 4-character alphanumeric
Displayable units	Bar
	Kg/cm <sup>2</sup>
	kPa
	MPa
	Psi
Switching status display	Red LED
Setting options	Via display and keys
Protection against tampering	PIN code
Threshold value setting range [%]	0.5 ... 100
Hysteresis setting range [%]	0.5 ... 99.5

Immissions/emissions	
Protection class	IP65, IP67
Corrosion resistance class CRC <sup>2)</sup>	4

1) CrNiMo group: Up to 6 bar 316 L, from a measuring range of 10 bar the membrane consists of 13-8-PH

2) Corrosion resistance class 4 to Festo standard 940 070

Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required.

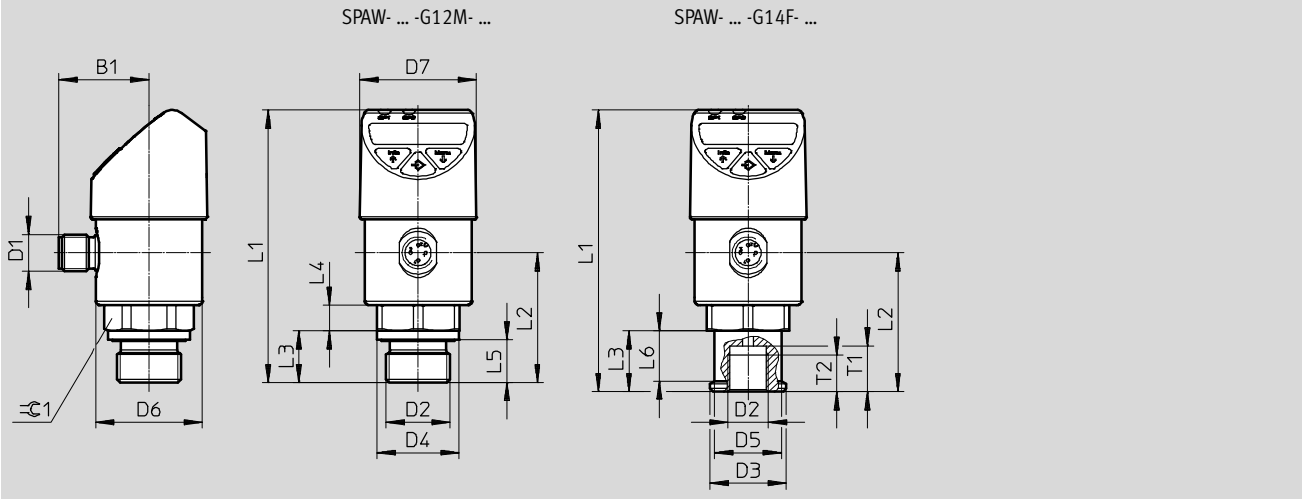


# Pressure sensors SPAW with display

Technical data

Dimensions


Download CAD data → [www.festo.com](http://www.festo.com)



Type	B1	D1	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅	L1	L2	L3	L4	L5	L6	T1	T2	≅
SPAW- ... -G12M- ...	29.5	M12x1	G½	-	26.9	-	35	38	89.4	42.5	17	8.3	14	-	-	-	27
SPAW- ... -G14F- ...	29.5	M12x1	G¼	25	-	22	35	38	92.4	45.5	20	8.3	-	16.5	15	12	27

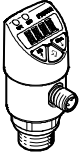
# Pressure sensors SPAW with display

Technical data

Ordering data, G $\frac{1}{4}$ internal thread						
Pneumatic connection	Pressure measuring range [bar]	Switching output	Analogue output		Part No.	Type
			[mA]	[V]		
	-1 ... +1	2x PNP	-	-	8022740	SPAW-B2R-G14F-2P-M12
	-1 ... +10				8022741	SPAW-B11R-G14F-2P-M12
	0 ... +2				8022742	SPAW-P2R-G14F-2P-M12
	0 ... +6				8022743	SPAW-P6R-G14F-2P-M12
	0 ... +10				8022744	SPAW-P10R-G14F-2P-M12
	0 ... +16				8022745	SPAW-P16R-G14F-2P-M12
	0 ... +25				8022746	SPAW-P25R-G14F-2P-M12
	0 ... +50				8022747	SPAW-P50R-G14F-2P-M12
	0 ... +100				8022748	SPAW-P100R-G14F-2P-M12
	-1 ... +1				2x NPN	-
	-1 ... +10	8022759	SPAW-B11R-G14F-2N-M12			
	0 ... +2	8022760	SPAW-P2R-G14F-2N-M12			
	0 ... +6	8022761	SPAW-P6R-G14F-2N-M12			
	0 ... +10	8022762	SPAW-P10R-G14F-2N-M12			
	0 ... +16	8022763	SPAW-P16R-G14F-2N-M12			
	0 ... +25	8022764	SPAW-P25R-G14F-2N-M12			
	0 ... +50	8022765	SPAW-P50R-G14F-2N-M12			
	0 ... +100	8022766	SPAW-P100R-G14F-2N-M12			
	-1 ... +1	2xPNP	4 ... 20	-		
	-1 ... +10				8022777	SPAW-B11R-G14F-2PA-M12
	0 ... +2				8022778	SPAW-P2R-G14F-2PA-M12
	0 ... +6				8022779	SPAW-P6R-G14F-2PA-M12
	0 ... +10				8022780	SPAW-P10R-G14F-2PA-M12
	0 ... +16				8022781	SPAW-P16R-G14F-2PA-M12
	0 ... +25				8022782	SPAW-P25R-G14F-2PA-M12
	0 ... +50				8022783	SPAW-P50R-G14F-2PA-M12
	0 ... +100				8022784	SPAW-P100R-G14F-2PA-M12
	-1 ... +1				2xPNP	-
	-1 ... +10	8022795	SPAW-B11R-G14F-2PV-M12			
	0 ... +2	8022796	SPAW-P2R-G14F-2PV-M12			
	0 ... +6	8022797	SPAW-P6R-G14F-2PV-M12			
	0 ... +10	8022798	SPAW-P10R-G14F-2PV-M12			
	0 ... +16	8022799	SPAW-P16R-G14F-2PV-M12			
	0 ... +25	8022800	SPAW-P25R-G14F-2PV-M12			
	0 ... +50	8022801	SPAW-P50R-G14F-2PV-M12			
	0 ... +100	8022802	SPAW-P100R-G14F-2PV-M12			
	-1 ... +1	2x NPN	4 ... 20	-		
	-1 ... +10				8022813	SPAW-B11R-G14F-2NA-M12
	0 ... +2				8022814	SPAW-P2R-G14F-2NA-M12
	0 ... +6				8022815	SPAW-P6R-G14F-2NA-M12
	0 ... +10				8022816	SPAW-P10R-G14F-2NA-M12
	0 ... +16				8022817	SPAW-P16R-G14F-2NA-M12
	0 ... +25				8022818	SPAW-P25R-G14F-2NA-M12
	0 ... +50				8022819	SPAW-P50R-G14F-2NA-M12
	0 ... +100				8022820	SPAW-P100R-G14F-2NA-M12
	-1 ... +1				2x NPN	-
	-1 ... +10	8022831	SPAW-B11R-G14F-2NV-M12			
	0 ... +2	8022832	SPAW-P2R-G14F-2NV-M12			
0 ... +6	8022833	SPAW-P6R-G14F-2NV-M12				
0 ... +10	8022834	SPAW-P10R-G14F-2NV-M12				
0 ... +16	8022835	SPAW-P16R-G14F-2NV-M12				
0 ... +25	8022836	SPAW-P25R-G14F-2NV-M12				
0 ... +50	8022837	SPAW-P50R-G14F-2NV-M12				
0 ... +100	8022838	SPAW-P100R-G14F-2NV-M12				

# Pressure sensors SPAW with display



Technical data


Ordering data, G $\frac{1}{2}$ with external thread						
Pneumatic connection	Pressure measuring range [bar]	Switching output	Analogue output		Part No.	Type
			[mA]	[V]		
	-1 ... +1	2x PNP	-	-	8022749	SPAW-B2R-G12M-2P-M12
	-1 ... +10				8022750	SPAW-B11R-G12M-2P-M12
	0 ... +2				8022751	SPAW-P2R-G12M-2P-M12
	0 ... +6				8022752	SPAW-P6R-G12M-2P-M12
	0 ... +10				8022753	SPAW-P10R-G12M-2P-M12
	0 ... +16				8022754	SPAW-P16R-G12M-2P-M12
	0 ... +25				8022755	SPAW-P25R-G12M-2P-M12
	0 ... +50				8022756	SPAW-P50R-G12M-2P-M12
	0 ... +100				8022757	SPAW-P100R-G12M-2P-M12
	-1 ... +1				2x NPN	-
	-1 ... +10	8022768	SPAW-B11R-G12M-2N-M12			
	0 ... +2	8022769	SPAW-P2R-G12M-2N-M12			
	0 ... +6	8022770	SPAW-P6R-G12M-2N-M12			
	0 ... +10	8022771	SPAW-P10R-G12M-2N-M12			
	0 ... +16	8022772	SPAW-P16R-G12M-2N-M12			
	0 ... +25	8022773	SPAW-P25R-G12M-2N-M12			
	0 ... +50	8022774	SPAW-P50R-G12M-2N-M12			
	0 ... +100	8022775	SPAW-P100R-G12M-2N-M12			
	-1 ... +1	2xPNP	4 ... 20	-		
	-1 ... +10				8022786	SPAW-B11R-G12M-2PA-M12
	0 ... +2				8022787	SPAW-P2R-G12M-2PA-M12
	0 ... +6				8022788	SPAW-P6R-G12M-2PA-M12
	0 ... +10				8022789	SPAW-P10R-G12M-2PA-M12
	0 ... +16				8022790	SPAW-P16R-G12M-2PA-M12
	0 ... +25				8022791	SPAW-P25R-G12M-2PA-M12
	0 ... +50				8022792	SPAW-P50R-G12M-2PA-M12
	0 ... +100				8022793	SPAW-P100R-G12M-2PA-M12
	-1 ... +1				2xPNP	-
	-1 ... +10	8022804	SPAW-B11R-G12M-2PV-M12			
	0 ... +2	8022805	SPAW-P2R-G12M-2PV-M12			
	0 ... +6	8022806	SPAW-P6R-G12M-2PV-M12			
	0 ... +10	8022807	SPAW-P10R-G12M-2PV-M12			
	0 ... +16	8022808	SPAW-P16R-G12M-2PV-M12			
	0 ... +25	8022809	SPAW-P25R-G12M-2PV-M12			
	0 ... +50	8022810	SPAW-P50R-G12M-2PV-M12			
	0 ... +100	8022811	SPAW-P100R-G12M-2PV-M12			
	-1 ... +1	2xNPN	4 ... 20	-		
	-1 ... +10				8022822	SPAW-B11R-G12M-2NA-M12
	0 ... +2				8022823	SPAW-P2R-G12M-2NA-M12
	0 ... +6				8022824	SPAW-P6R-G12M-2NA-M12
	0 ... +10				8022825	SPAW-P10R-G12M-2NA-M12
	0 ... +16				8022826	SPAW-P16R-G12M-2NA-M12
0 ... +25	8022827				SPAW-P25R-G12M-2NA-M12	
0 ... +50	8022828				SPAW-P50R-G12M-2NA-M12	
0 ... +100	8022829				SPAW-P100R-G12M-2NA-M12	
-1 ... +1	2xNPN				-	0 ... 10
-1 ... +10		8022840	SPAW-B11R-G12M-2NV-M12			
0 ... +2		8022841	SPAW-P2R-G12M-2NV-M12			
0 ... +6		8022842	SPAW-P6R-G12M-2NV-M12			
0 ... +10		8022843	SPAW-P10R-G12M-2NV-M12			
0 ... +16		8022844	SPAW-P16R-G12M-2NV-M12			
0 ... +25		8022845	SPAW-P25R-G12M-2NV-M12			
0 ... +50		8022846	SPAW-P50R-G12M-2NV-M12			
0 ... +100		8022847	SPAW-P100R-G12M-2NV-M12			

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Accessories

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Ordering data – Connecting cables				Technical data → Internet: nebu	
	Number of wires/pins	Cable length [m]	Part No.	Type	
M12x1, straight socket, open end					
	4	2.5	<b>550326</b>	<b>NEBU-M12G5-K-2.5-LE4</b>	
		5	<b>541328</b>	<b>NEBU-M12G5-K-5-LE4</b>	
	5	2.5	<b>541330</b>	<b>NEBU-M12G5-K-2.5-LE5</b>	
		5	<b>541331</b>	<b>NEBU-M12G5-K-5-LE5</b>	
M12x1, angled socket, open end					
	4	2.5	<b>550325</b>	<b>NEBU-M12W5-K-2.5-LE4</b>	
		5	<b>541329</b>	<b>NEBU-M12W5-K-5-LE4</b>	

Ordering data – Push-in fittings <sup>1)</sup>				Technical data → Internet: qs	
	For tubing O.D. Ø	Part No.	Type		
	4 mm	<b>190644</b>	<b>QS-¼-4<sup>1)</sup></b>		
	6 mm	<b>153003</b>	<b>QS-¼-6<sup>1)</sup></b>		
	8 mm	<b>153005</b>	<b>QS-¼-8<sup>1)</sup></b>		

1) Temperature-dependent operating pressure –0.95 ... 14 bar

Ordering data – Pipe clamp			
		Part No.	Type
		<b>550598</b>	<b>PQ-RK-22-B</b>