

## Pressure sensors SPAW with display

**FESTO**



## Key features

### At a glance



[1] 9 pressure ranges from  
–1 ... +1 bar to 0 ... +100 bar

[2] Protection class IP67

[3] 320° rotatable display

[4] 1% accuracy, 0.15% repetition  
accuracy

[5] Temperature of medium  
–20 ... 85°C

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

[7] 4-digit LED display, easy to read,  
robust

[8] Display

– bar

– MPa

– kPa

– psi

– kgf/cm<sup>2</sup>

[9] Simple operation, protected by  
PIN code

[10] 320° rotatable housing

[11] Electrical connection M12

[12] G1/4 female thread or G1/2 male  
thread

### Product description

The SPAW is an extremely robust pressure sensor with display used for measuring media pressures in 9 measuring ranges from as small as –1 ... 1 bar up to 0 ... 100 bar. It can measure all media which do not react aggressively with 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 rotated 320° and the

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

- G1/4 female thread or G1/2 male thread
- 2 x PNP or 2 x NPN
- 4 ... 20 mA or 0 ... 10 V

The pressure sensor SPAW is suitable for standard pressure measurement at an increased mechanical load. It can

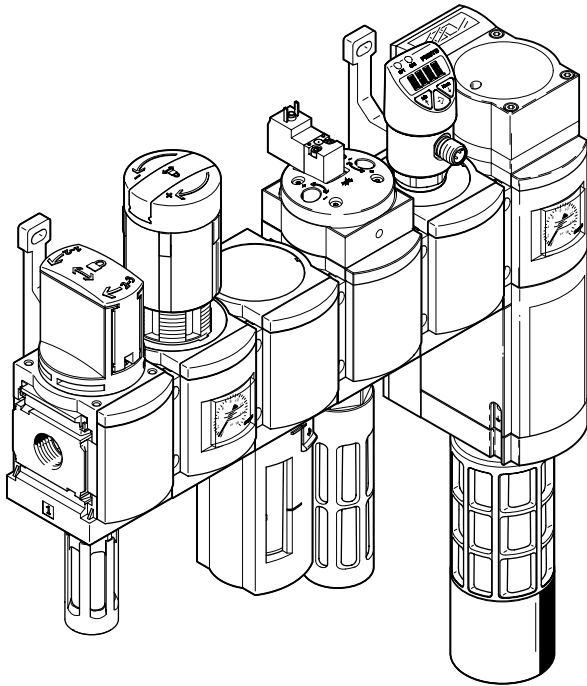
### Main applications

be used in high pressure pneumatic systems and to monitor the pressure of liquid media (e.g. coolant/cooling circuits, etc.)

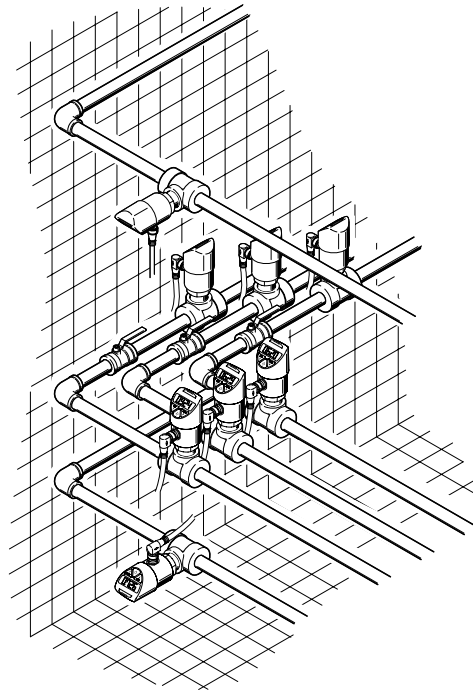
## Key features

### Application examples

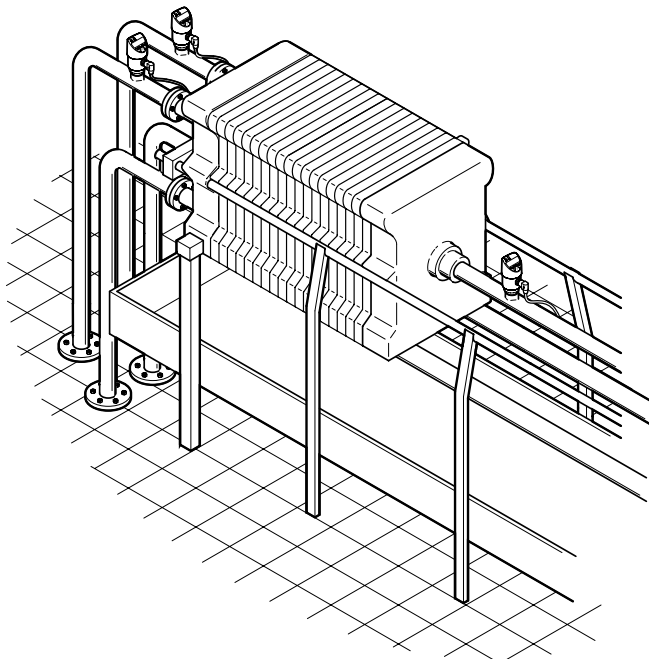
Pressure measurement in air preparation units



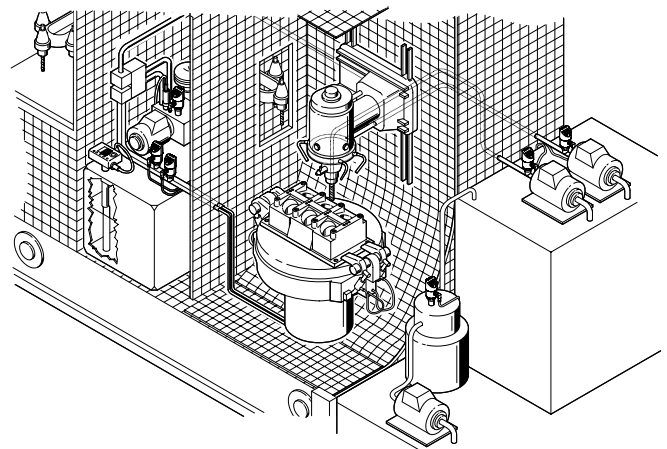
Pressure measurement in piping systems



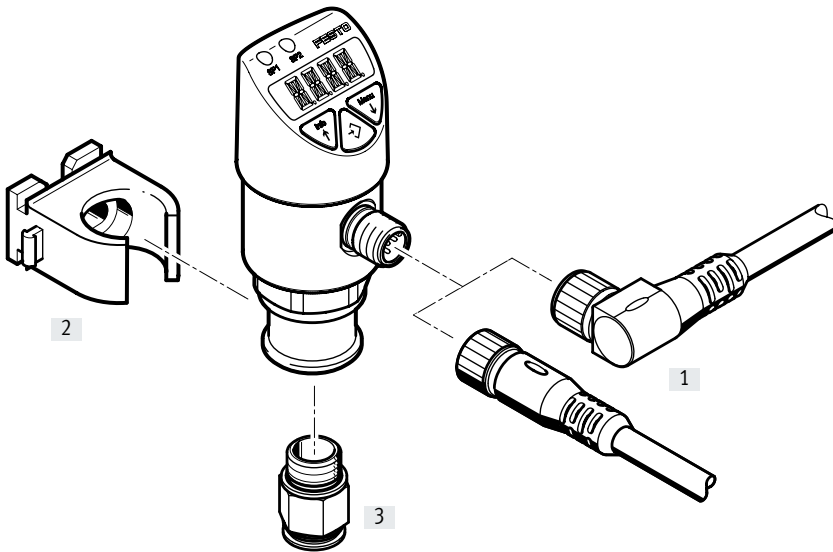
Pressure measurement in filter systems



Pressure measurement for cutting oil supply and hydraulic applications



Peripherals overview



Mounting components and accessories		Brief description	→ Page
[1]	NEBU-M12	Connecting cable	12
[2]	PQ-RK-22-B	Pipe clamp, only for G1/4 with female thread	12
[3]	QS-1/4	Push-in fitting, only for G1/4 with female thread	12

## Type codes

<b>001</b>	Series
<b>SPAW</b>	Pressure sensor

<b>002</b>	Pressure measuring range
<b>B2</b>	-1 ... 1 bar
<b>B11</b>	-1 ... 10 bar
<b>P2</b>	0 ... 2 bar
<b>P6</b>	0 ... 6 bar
<b>P10</b>	0 ... 10 bar
<b>P16</b>	0 ... 16 bar
<b>P25</b>	0 ... 25 bar
<b>P50</b>	0 ... 50 bar
<b>P100</b>	0 ... 100 bar

<b>003</b>	Pressure inlet
<b>R</b>	Relative pressure

<b>004</b>	Pneumatic connection
<b>G14</b>	G1/4
<b>G12</b>	G1/2

<b>005</b>	Thread type
<b>F</b>	Female
<b>M</b>	Male

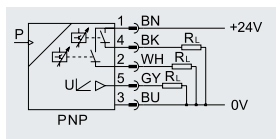
<b>006</b>	Electrical output 1
<b>2P</b>	2x PNP
<b>2N</b>	2x NPN
<b>2PA</b>	2x PNP, 1 analogue output 4 ... 20 mA
<b>2PV</b>	2x PNP, 1 analogue output 0 ... 10 V
<b>2NA</b>	2x NPN, 1 analogue output 4 ... 20 mA
<b>2NV</b>	2x NPN, 1 analogue output 0 ... 10 V

<b>007</b>	Electrical connection
<b>M12</b>	Plug M12, A-coded

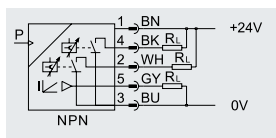
## Data sheet

### 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 c UL us listed (OL)
CE marking (see declaration of conformity) <sup>1)</sup>	To EU EMC Directive To EU RoHS Directive
UKCA marking (see declaration of conformity)	To UK instructions for EMC To UK RoHS instructions
PWIS conformity	VDMA24364 zone III
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: [www.festo.com/catalogue/SPAW](http://www.festo.com/catalogue/SPAW) → Support/Downloads.  
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

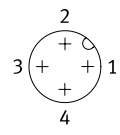
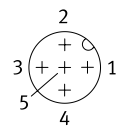
### Input signal/measuring element

SPAW-	B2R	P2R	P6R	P10R	B11R	P16R	P25R	P50R	P100R
<b>Input signal/measuring element</b>									
Measured variable	Relative pressure								
Measurement method	Piezoresistive pressure sensor				Metal thin-film pressure sensor				
Pressure measuring range start value [bar]	-1	0	0	0	-1	0	0	0	0
Pressure measuring range end 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								

<sup>2)</sup> Note media resistance of parts that come into contact with the media

## Data sheet

Electrical data		
<b>General output</b>		
Accuracy	[±%FS]	1
Repetition accuracy	[±%FS]	0.15
<b>Switching output</b>		
Switching function		Freely programmable
Switching element function		Switchable
Max. output current	[mA]	250
<b>Analogue output</b>		
Rise time	[ms]	3
<b>Output, additional data</b>		
Short circuit current rating		Yes
<b>Electronics</b>		
Operating voltage range DC	[V]	15 ... 35
Reverse polarity protection		For operating voltage
<b>Electromechanics</b>		
Electrical connection 1		
Connection type		Plug
Connection technology		M12x1, A-coded to EN 61076-2-101
Number of pins/wires		4, 5
Type of mounting		Screw-type lock

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

## Data sheet

<b>Mechanics</b>		G14F	G12M
Mounting position		Any	
Type of mounting		With female thread, with accessories	With male thread
Pneumatic connection		Female thread G1/4 (EN 837)	Male thread G1/2 (DIN 3852-E)
Product weight	[g]	230	
<b>Information on materials: housing</b>			
		ABS, high-alloy stainless steel	
<b>Materials in contact with the medium<sup>1)</sup></b>			
		High-alloy stainless steel	
<b>Seals</b>			
		-	NBR
<b>Display/operation</b>			
Display type		LED display, 4-character alphanumeric	
Displayable units		bar	
		kg/cm <sup>2</sup>	
		kPa	
		MPa	
		psi	
Switching status indication		Red LED	
Setting options		Via display and buttons	
Protection against tampering		PIN code	
Threshold value setting range	[%]	0.5 ... 100	
Hysteresis setting range	[%]	0.5 ... 99.5	
<b>Immission/emission</b>			
Degree of protection		IP65, IP67	
Corrosion resistance class CRC <sup>2)</sup>		4	

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

2) Corrosion resistance class CRC 4 to Festo standard FN 940070

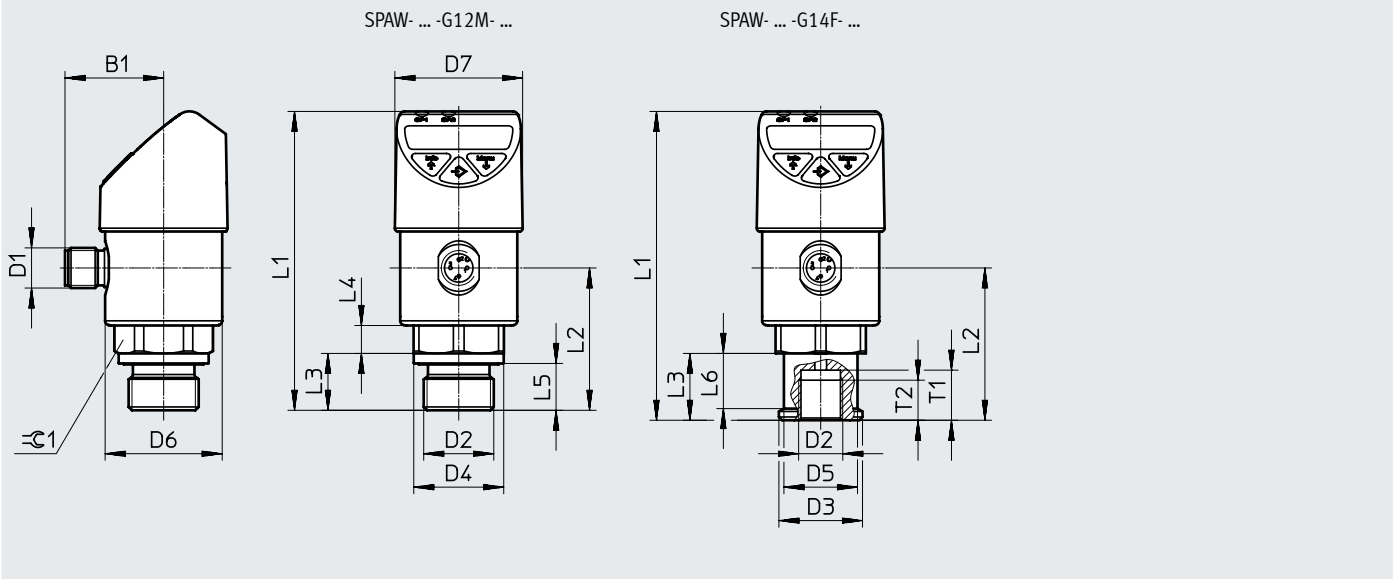
Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, e.g. in the chemical or food industries. Such applications may need to be safeguarded by means of special testing (→ also FN 940082), using appropriate media.



Data sheet

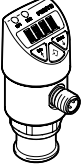
Dimensions

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

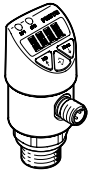


Type	B1	D1	D2	D3 ∅	D4 ∅	D5 ∅	D6 ∅	D7 ∅	L1	L2	L3	L4	L5	L6	T1	T2	≅
SPAW-...-G12M-...	29.5	M12x1	G1/2	-	26.9	-	35	38	89.4	42.5	17	8.3	14	-	-	-	27
SPAW-...-G14F-...	29.5	M12x1	G1/4	25	-	22	35	38	92.4	45.5	20	8.3	-	16.5	15	12	27

Data sheet

Ordering data, G1/4 female 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	2x PNP	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				2x PNP	-
	-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				

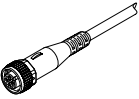
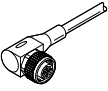
## Data sheet

Ordering data, G1/2 male 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	2x PNP	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				2x PNP	-
	-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	2x NPN	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				2x NPN	-
	-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				

## Accessories


### Ordering data – Connecting cables

Data sheets → Internet: nebu

	Number of wires/pins	Cable length [m]	Part no.	Type
<b>M12x1, straight socket, open end</b>				
	4	2.5	550326	NEBU-M12G5-K-2.5-LE4
		5	541328	NEBU-M12G5-K-5-LE4
	5	2.5	541330	NEBU-M12G5-K-2.5-LE5
		5	541331	NEBU-M12G5-K-5-LE5
<b>M12x1, angled socket, open end</b>				
	4	2.5	550325	NEBU-M12W5-K-2.5-LE4
		5	541329	NEBU-M12W5-K-5-LE4

### Ordering data – Push-in fittings<sup>1)</sup>

Data sheets → Internet: qs

	For tubing O.D.	Part no.	Type
	4 mm	190644	QS-1/4-4 <sup>1)</sup>
	6 mm	153003	QS-1/4-6 <sup>1)</sup>
	8 mm	153005	QS-1/4-8 <sup>1)</sup>

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

### Ordering data – Pipe clamp

	Part no.	Type
	550598	PQ-RK-22-B