

Pressure sensor SPAF

FESTO



Characteristics

At a glance

The SPAF pressure sensor is designed for automating applications with compressed air and non-corrosive gases in a wide range of applications. These range from mains and controller monitoring to vacuum gripping and force control in clamping or pressing applications. Thanks to the protection class IP65, installation in difficult industrial environments is also no problem. The piezoresistive measuring cell records the pressure with a high accuracy of 1.5% of the measuring range. The fluid connection is made via a QS4 or QS6 plug-in connection or via a G1/8 external thread, which enables subsequent sensor alignment using a TORX® screwdriver. The sensor can essentially be categorized into two variants. For simple pressure monitoring, a version with a light emitting diode and a signal output is available, which can be assigned either with IO-Link® or a digital switching output. The LCD display variant, which is available with two signal outputs, provides a little more flexibility for process monitoring. In addition to IO-Link® and the switching output, a parameterizable Analogue output is also available.

- Compact design with in-line pressure measurement
- Protection class IP65 for harsh industrial environments
- Switching cycle counter for predictive maintenance of the system
- Fast commissioning thanks to replication function
- Adjustable switch and analog outputs
- Fast one-button teach-in

Pressure measuring range

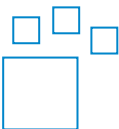
[B11]	-1 ... 10 bar	[P10]	0 ... 10 bar
[V1]	0 ... -1 bar		

Electrical output 1

[PNLK]	PNP/NPN/IO-Link
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IO-Link® communication for smart remote parameterization even in inaccessible places

Ordering data - modular system



Configurable product
This product and all its product options can be ordered online via the configurator.

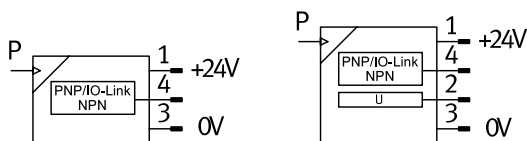
Type code

001	Series	
SPAF	Pressure sensor SPAF	
002	Pressure measuring range	
B11	-1 ... 10 bar	
P10	0 ... 10 bar	
V1	0 ... -1 bar	
003	Pressure inlet	
R	Relative pressure	
004	Pneumatic connection	
G18	G1/8	
Q4	Push-in connector, 4 mm	
Q6	Push-in connector, 6 mm	
005	Thread type	
	Without	
M	Outside	
006	Display	
L	LCD, backlit	
N	LED	

007	Electrical output 1	
PNLK	PNP/NPN/IO-Link	
008	Electrical output 2	
	Without	
VB	0 ... 10 V or 1 ... 5 V	
009	Electrical connection	
M8	Plug M8, A-coded	
M12	Plug M12, A-coded	
010	Mounting accessories	
	Without	
MC	Mounting clip	
011	Electrical accessories	
	Without	
2.5A	Angled plug socket, cable 2.5 m	
2.5S	Straight socket, 2.5 m cable	
5A	Angled plug socket, cable 5 m	
5S	Straight socket, 5 m cable	
012	Certificate	
	Without	
T	Test report	

Datasheet

General technical data



Type code	SPAF-
Certification	RCM compliance mark
CE marking (see declaration of conformity)	As per EU EMC directive, As per EU RoHS directive
UKCA marking (see declaration of conformity)	To UK instructions for EMC, To UK RoHS instructions
Note on materials	RoHS compliant

Input signal, measuring element

Pressure measuring range	-1 ... 10 bar	0 ... 10 bar	0 ... -1 bar
Measured variable	Relative pressure		
Method of measurement	Piezoresistive pressure sensor		
Pressure measuring range initial value	-0.1 MPa	0 MPa	
Pressure measuring range initial value	-1 bar	0 bar	
Pressure measuring range initial value	-14.5 psi	0 psi	
Pressure measuring range end value	1 MPa		-0.1 MPa
Pressure measuring range end value	10 bar		-1 bar
Pressure measuring range end value	145 psi		-14.5 psi
Overload pressure	1.5 MPa		0.5 MPa
Overload pressure	15 bar		5 bar
Overload pressure	217.5 psi		72.5 psi
Operating medium	Compressed air as per ISO 8573-1:2010 [7:4:4], Inert gases		
Information on operating and pilot media	Ester oil < 0.1mg/m ³ , according to ISO 8573-1:2010 [---:2], Lubricated operation possible		
Temperature of medium	0 ... 50°C		
Ambient temperature	0 ... 50°C		

Output, general

Accuracy in ± % FS	1.5 %FS
Repetition accuracy in ± %FS	0.3 %FS
Temperature co-efficient in ± %FS/K	0.05 %FS/K

Switching output

Switching output ¹⁾	PNP/NPN switchable
Switching function	Window comparator, Threshold value comparator, Threshold value with variable hysteresis
Switching element function	N/C contact/N/O contact, switchable
On time	3 ms
Switch-off time	3 ms
Max. output current	100

1) Second PNP output can only be activated via IO-Link®.

Datasheet

Analog output

Analog output	0 - 10 V, 1 - 5 V
Output characteristic curve initial value	0 V
End value output characteristic curve	10 V
Precision analog output in ± %FS	1.5 %FS
Linearity error in ± % FS	0.3
Rise time	6 ms
Min. load resistance of voltage output	20 kOhm

Measured value display

Display range start value	0 %FS
Display range end value	100 %FS

Output, additional data

Short-circuit protection	Yes
Overload protection	Available

IO-Link® device according to IEC 61131-9

Protocol	IO-Link®
IO-Link, revision ID	V1.1
IO-Link, device profile	Firmware update, Function Locator, Function Product URI, Function Quantity detection, Smart Sensor - SSP 4.1.1
IO-Link, transmission rate	COM3
IO-Link®, SIO mode support	Yes
IO-Link, port type	Class A
IO-Link, process data length output	0 bit
IO-Link, process data length input	32 bit
IO-Link®, process data content IN	Pressure measured value 16 bit MDC, Flow rate monitoring 2-bit SSC
IO-Link®, service data contents IN	Temperature 16 bit
IO-Link®, minimum cycle time	0.9 ms
IO-Link®, data memory required	0.5 KB

Electronics

DC operating voltage range ¹⁾	15 ... 30 V
Reverse polarity protection	for all electrical connections

1) For IO-Link® 18 - 30 V

Electromechanics

Electrical connection 1, connection type	Plug
Electrical connection 1, connection technology	M8x1 A-coded as per EN 61076-2-104
Electrical connection 1, number of pins/wires	3, 4
Electrical connection 1, type of mounting	Snap-locking, Screw-type lock, not rotatable
Electrical connection 1, type of mounting	Compatible with snap-locking, Compatible with rotatable screw-type lock
Material of plug housing	PA-reinforced

Datasheet

Electromechanics

Electrical connection 1, connection type	Plug
Electrical connection 1, connection technology	M12x1 A-coded as per EN 61076-2-101
Electrical connection 1, number of pins/wires	4
Electrical connection 1, type of mounting	Screw-type lock, not rotatable
Electrical connection 1, type of mounting	Compatible with rotatable screw-type lock
Material of plug housing	High-alloy stainless steel

Mechanical components

Pneumatic connection	External thread G1/8	QS-4	QS-6
Type of mounting	Alternatively:, With external thread, With accessories	With accessories	
Mounting position	Any		
Product weight	45 g	30 g	
Housing material	PA-reinforced		
Materials in contact with the media	High-grade steel, NBR, PA-reinforced		

Display, operation

Display type	Backlit blue LCD	LED indicator
Displayable unit(s)	MPa, bar, KPa, psi	–
Ready status indication	Via backlighting	Green LED
Switching status indication	–	Yellow LED
Setting options	IO-Link®, Teach-in, Via display and keys	IO-Link®, Teach-in
Protection against tampering	IO-Link®, PIN code	IO-Link®
Setting range threshold value	0 ... 100%	
Setting range hysteresis	0 ... 90%	

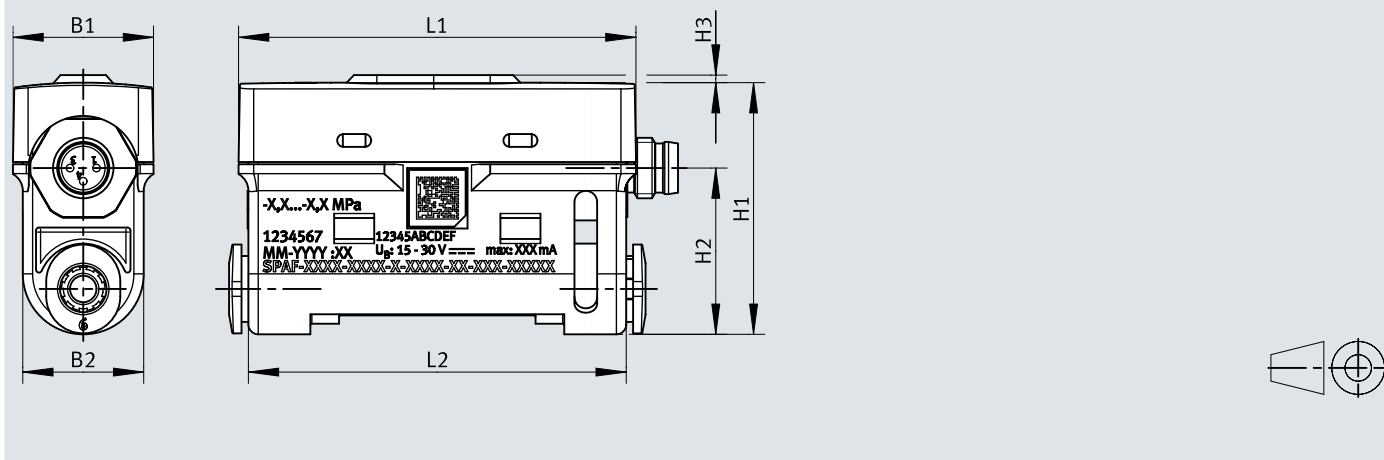
Immission, emission

Degree of protection	IP65
Corrosion resistance class (CRC) ¹⁾	2 - Moderate corrosion stress
LABS (PWIS) conformity	VDMA24364-B1/B2-L
Suitability for the production of Li-ion batteries	Suitable for battery production with reduced Cu/Zn/Ni values (F1a)
Cleanroom suitability, measured according to ISO 14644-14	Class 4 according to ISO 14644-1

1) For more information, visit www.festo.com/x/topic/kbk

Dimensions

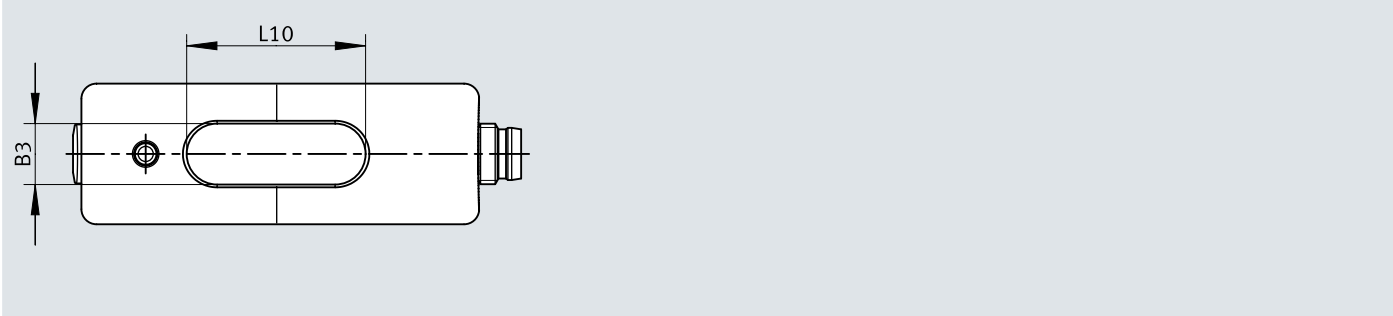
Dimensions – SPAF-...

Download CAD data www.festo.com

	B1	B2	H1	H2	H3	L1	L2
SPAF-...	18,6	16	52,6	50	1	52,6	50

Dimensions

Dimensions – SPAF-...-L-... [Download CAD data](#) www.festo.com

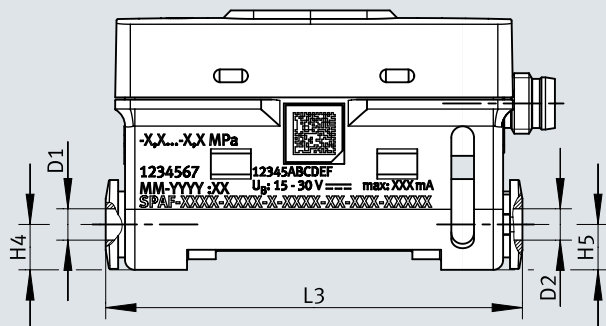


	B3	L10
SPAF-...-L-...	8	24

Dimensions

Dimensions – SPAF-...-Q-...-...

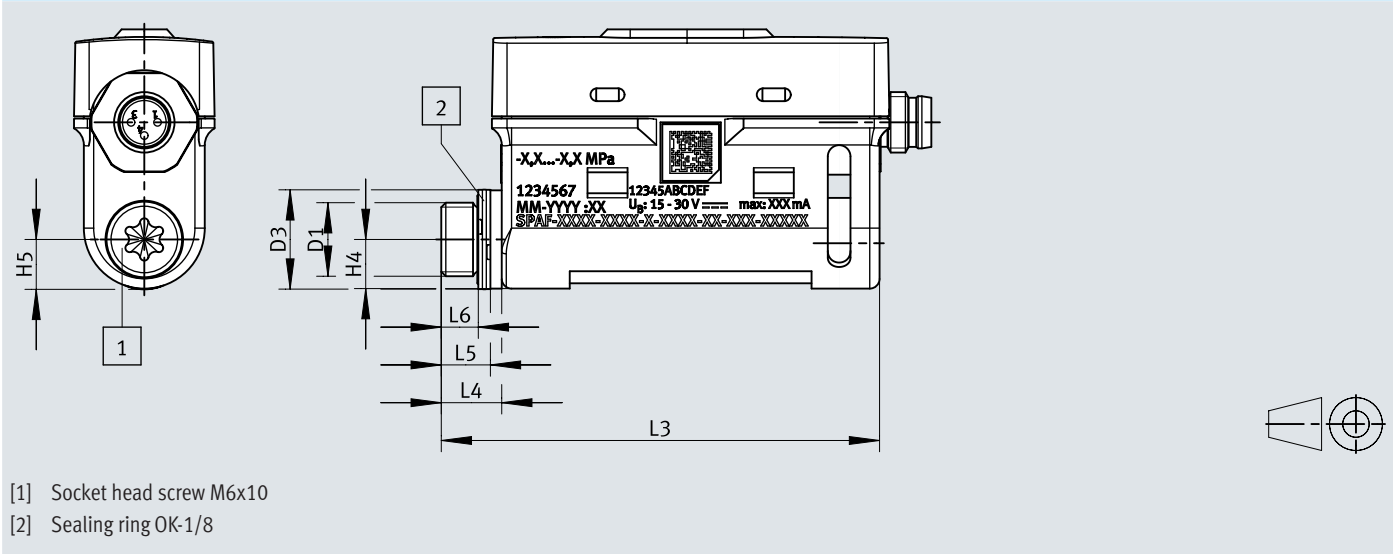
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	D1	D2	H4	H5	L3
SPAF-...-Q4-...	4	4	6	6	54,4
SPAF-...-Q6-...	6	6			

Dimensions

Dimensions – SPAF-...-G18M-... Download CAD data www.festo.com

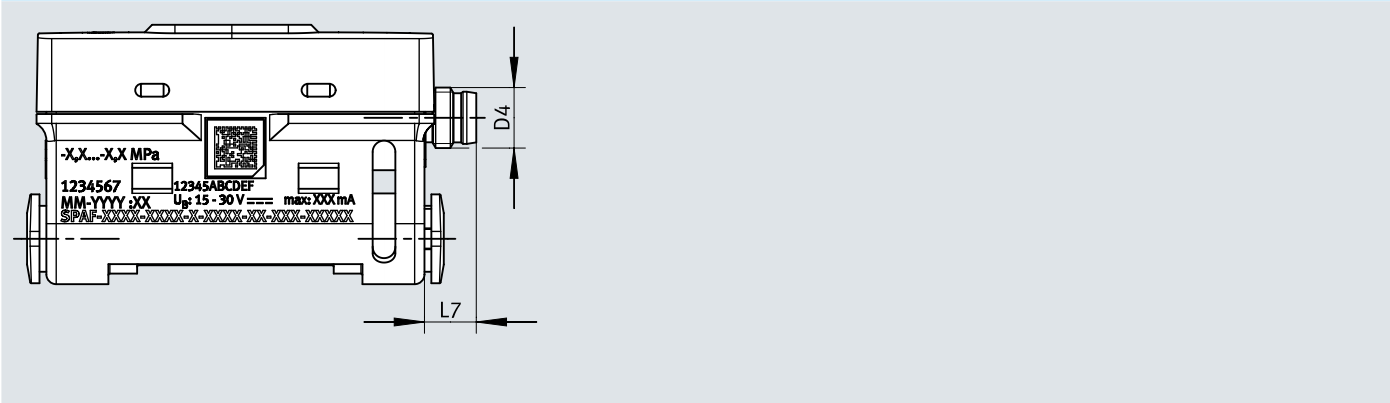


	D1	D3 Ø	H4	H5	L3	L4	L5	L6
SPAF-...-G18M-...	G1/8	13,2	6,5	6,5	58	8	6,5	4,9

Dimensions

Dimensions – SPAF-...-M8-...

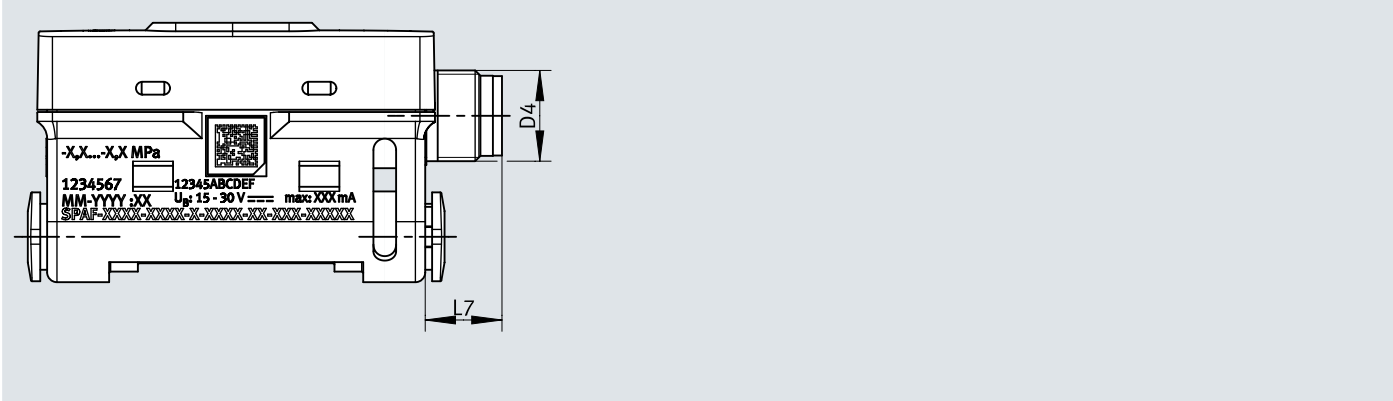
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	D4	L7
SPAF-...-M8-...	M8x1	6,9

Dimensions

Dimensions – SPAF-...-M12-... [Download CAD data](#) www.festo.com

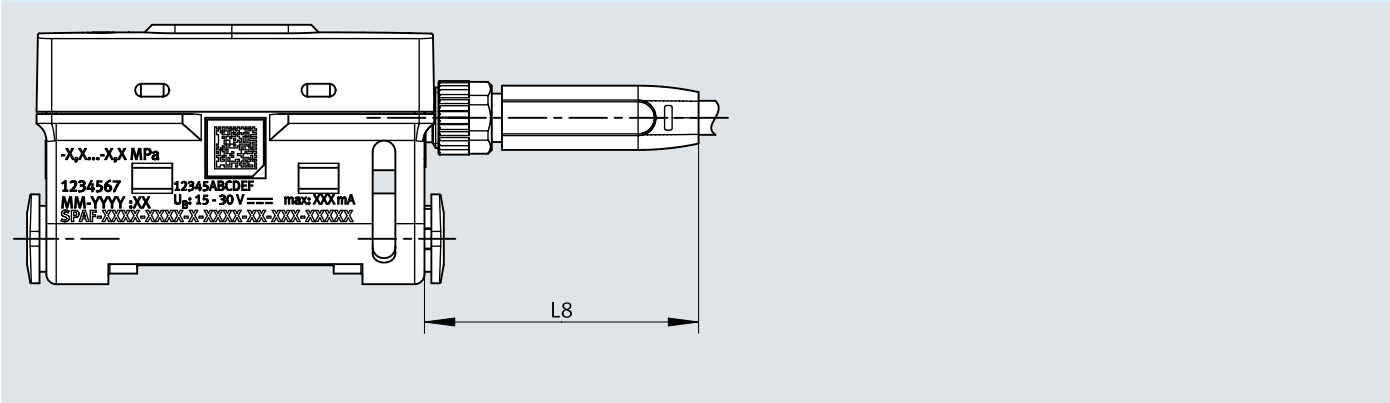


	D4	L7
SPAF-...-M12-...	M12x1	10,2

Dimensions

Dimensions – SPAF-...-M8-...S

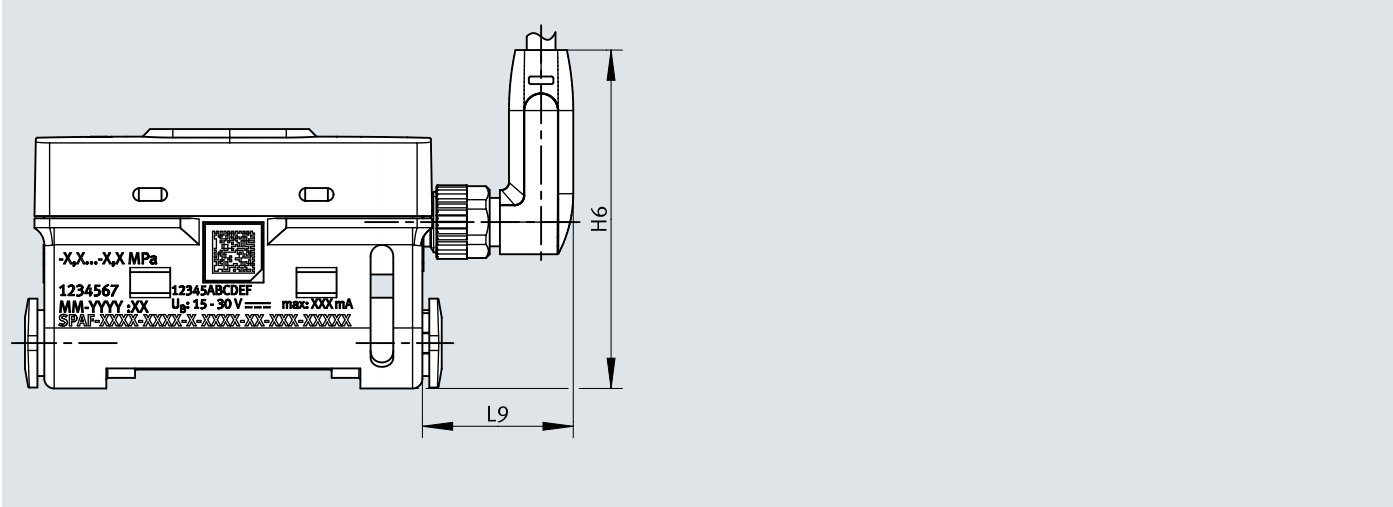
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	L8
SPAF-...-M8-...S	36

Dimensions

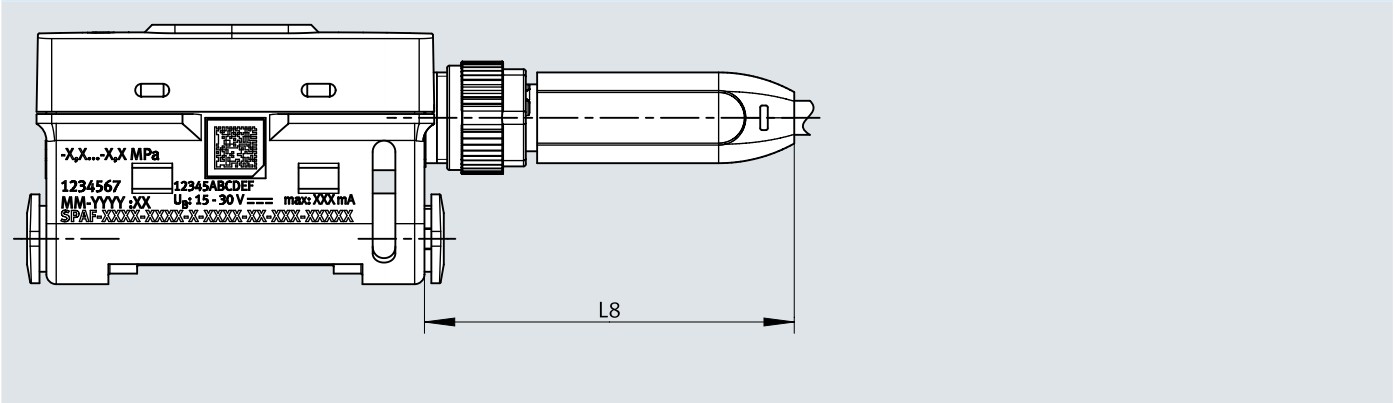
Dimensions – SPAF-...-M8-...A Download CAD data www.festo.com



	H6	L9
SPAF-...-M8-...A	44,8	20

Dimensions

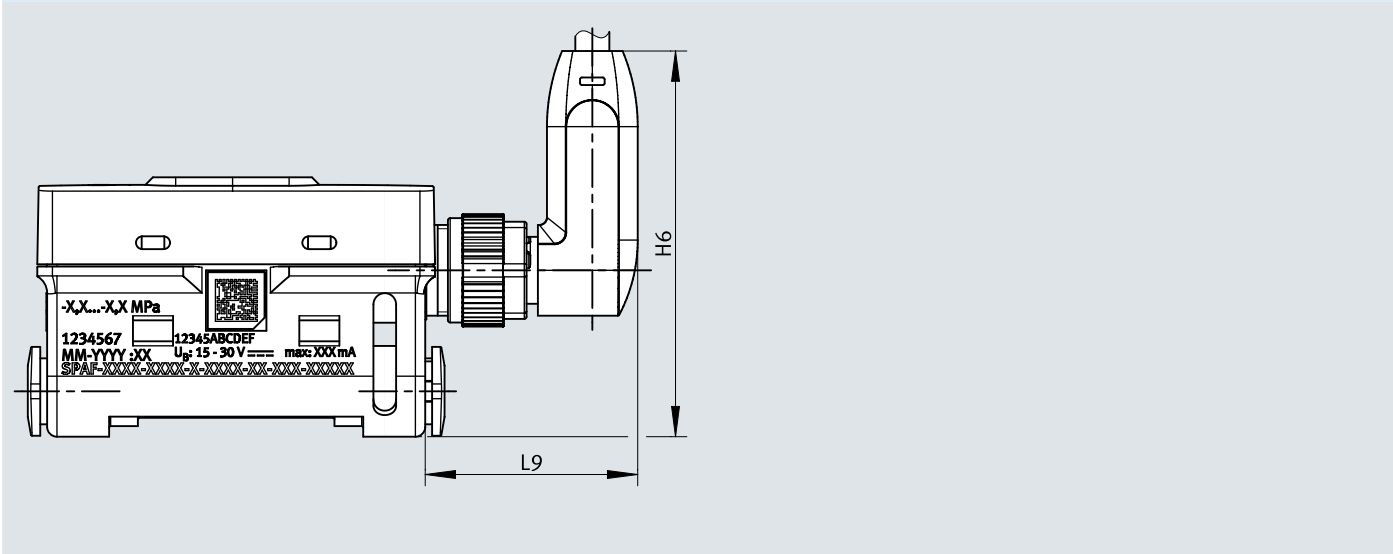
Dimensions – SPAF-...-M12-...S Download CAD data www.festo.com



	L8
SPAF-...-M12-...S	49

Dimensions

Dimensions – SPAF-...-M12-...A Download CAD data www.festo.com

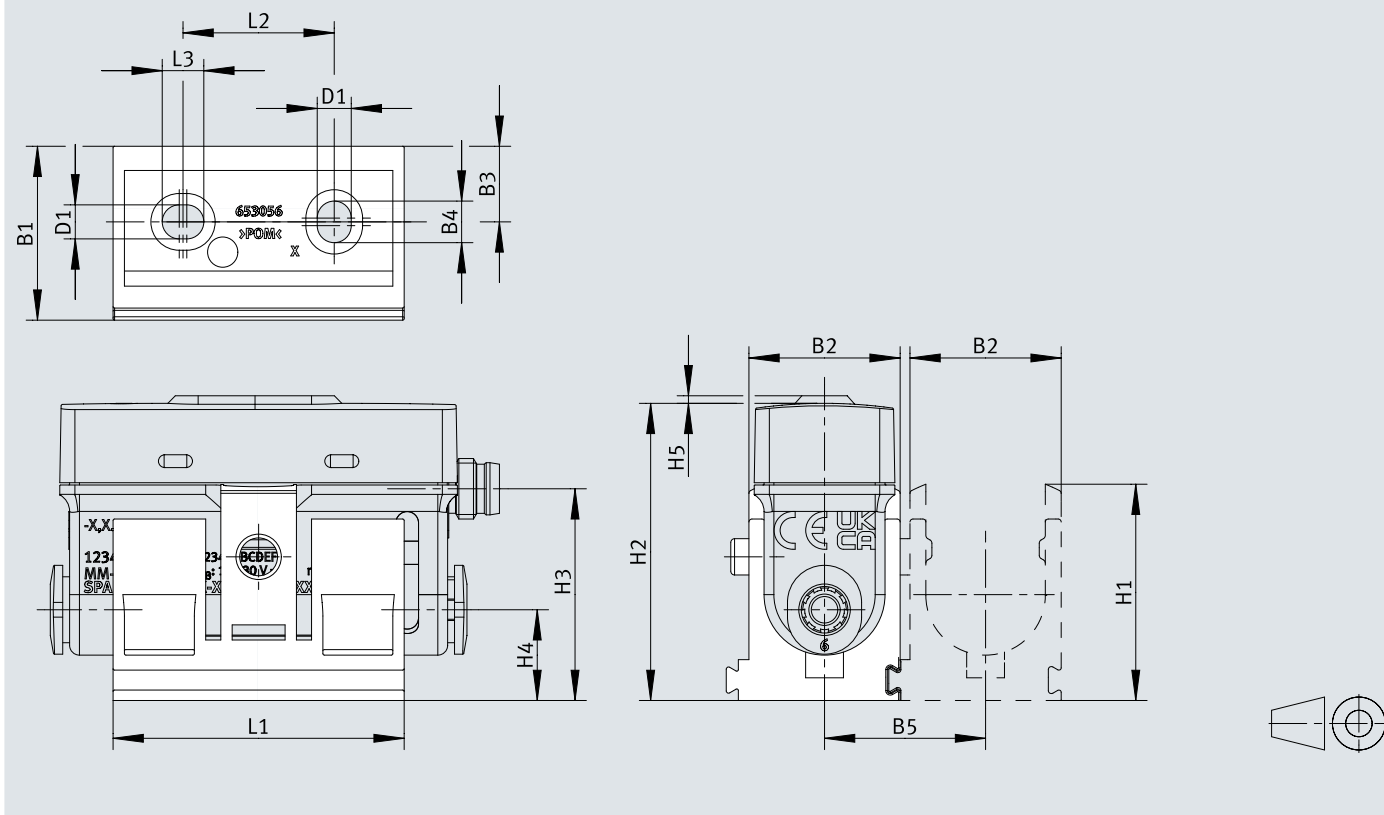


	H6	L9
SPAF-...-M12-...A	51	28

Dimensions

Dimensions – SPAF-...-MC-...

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	B1	B2	B3	B4	B5	D1	H1	H2	H3	H4	H5	L1	L2	L3
SPAF-...-MC-...	23	20	10	5,5	21,3	4,5	28,6	39,3	28	12	1	38,5	20	5,5

Ordering data

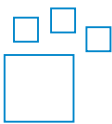
Ordering data with LCD display

	Electrical connection 1, connection technology	Pneumatic connection	Switching output	Type of mounting	Part no.	Type	
	M12x1 A-coded as per EN 61076-2-101	External thread G1/8	PNP/NPN switchable	Alternatively, With external thread, With accessories	8181237	SPAF-P10R-G18M-L-PNLK-VB-M12	
					8181238	SPAF-B11R-G18M-L-PNLK-VB-M12	
					8181236	SPAF-V1R-G18M-L-PNLK-VB-M12	
		QS-4		With accessories	8181230	SPAF-V1R-Q4-L-PNLK-VB-M12	
					8181232	SPAF-B11R-Q4-L-PNLK-VB-M12	
					8181231	SPAF-P10R-Q4-L-PNLK-VB-M12	
		QS-6			8181235	SPAF-B11R-Q6-L-PNLK-VB-M12	
					8181233	SPAF-V1R-Q6-L-PNLK-VB-M12	
					8181234	SPAF-P10R-Q6-L-PNLK-VB-M12	
	M8x1 A-coded as per EN 61076-2-104	External thread G1/8		Alternatively, With external thread, With accessories	8181228	SPAF-P10R-G18M-L-PNLK-VB-M8	
					8181227	SPAF-V1R-G18M-L-PNLK-VB-M8	
				With external thread	8181229	SPAF-B11R-G18M-L-PNLK-VB-M8	
		QS-4		With accessories	8181223	SPAF-B11R-Q4-L-PNLK-VB-M8	
					8181222	SPAF-P10R-Q4-L-PNLK-VB-M8	
					8181221	SPAF-V1R-Q4-L-PNLK-VB-M8	
		QS-6			8181226	SPAF-B11R-Q6-L-PNLK-VB-M8	
					8181225	SPAF-P10R-Q6-L-PNLK-VB-M8	
					8181224	SPAF-V1R-Q6-L-PNLK-VB-M8	

Ordering data with light emitting diode

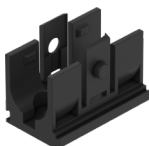
	Electrical connection 1, connection technology	Pneumatic connection	Switching output	Type of mounting	Part no.	Type
	M12x1 A-coded as per EN 61076-2-101	External thread G1/8	PNP/NPN switchable	Alternatively,; With external thread, With accessories	8181220	SPAF-B11R-G18M-N-PNLK-M12
					8181218	SPAF-V1R-G18M-N-PNLK-M12
					With external thread	8181219
		QS-4		With accessories	8181213	SPAF-P10R-Q4-N-PNLK-M12
					8181214	SPAF-B11R-Q4-N-PNLK-M12
					8181212	SPAF-V1R-Q4-N-PNLK-M12
					8181217	SPAF-B11R-Q6-N-PNLK-M12
					8181216	SPAF-P10R-Q6-N-PNLK-M12
					8181215	SPAF-V1R-Q6-N-PNLK-M12
	M8x1 A-coded as per EN 61076-2-104	External thread G1/8	Alternatively,; With external thread, With accessories	With external thread	8181209	SPAF-V1R-G18M-N-PNLK-M8
					8181210	SPAF-P10R-G18M-N-PNLK-M8
					8181211	SPAF-B11R-G18M-N-PNLK-M8
		QS-4	With accessories	8181205	SPAF-B11R-Q4-N-PNLK-M8	
				8181204	SPAF-P10R-Q4-N-PNLK-M8	
				8181203	SPAF-V1R-Q4-N-PNLK-M8	
				8181207	SPAF-P10R-Q6-N-PNLK-M8	
				8181206	SPAF-V1R-Q6-N-PNLK-M8	
				8181208	SPAF-B11R-Q6-N-PNLK-M8	

Ordering data

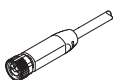
Ordering data – modular product system						
	Pressure measuring range end value	Analog output	Electrical connection 1, connection technology	Pneumatic connection	Part no.	Type
	10 bar	0 - 10 V, 1 - 5 V	M12x1 A-coded as per EN 61076-2-101, M8x1 A-coded as per EN 61076-2-104	External thread G1/8, QS-4, QS-6	8181300	SPAF-

Accessories

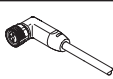
Mounting clip SAMH

	Type of mounting	Information on materials	Note on materials	Suitability for the production of Li-ion batteries	Part no.	Type
	With through-hole for M4 screw	POM	RoHS compliant	Suitable for battery production with reduced Cu/Zn/Ni values (F1a)	8181299	SAMH-PF-MC-1

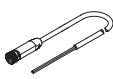
Connecting cable M8x1 socket straight

	Cable design	Cable length	Product weight	Part no.	Type
	3 x 0.25 mm ²	2.5 m	50 g	8078223	NEBA-M8G3-U-2.5-N-LE3
		5 m	96 g	8078224	NEBA-M8G3-U-5-N-LE3
	4 x 0.25 mm ²	2.5 m	66 g	8078227	NEBA-M8G4-U-2.5-N-LE4
		5 m	129 g	8078228	NEBA-M8G4-U-5-N-LE4

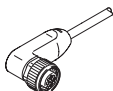
Connecting cable M8x1 socket angled

	Cable design	Cable length	Product weight	Part no.	Type
	3 x 0.25 mm ²	2.5 m	50 g	8078230	NEBA-M8W3-U-2.5-N-LE3
		5 m	96 g	8078231	NEBA-M8W3-U-5-N-LE3
	4 x 0.25 mm ²	2.5 m	66 g	8078233	NEBA-M8W4-U-2.5-N-LE4
		5 m	129 g	8078234	NEBA-M8W4-U-5-N-LE4

Connecting cable M12x1 socket straight

	Cable design	Cable length	Product weight	Part no.	Type
	3 x 0.25 mm ²	2.5 m	55 g	8078236	NEBA-M12G5-U-2.5-N-LE3
		5 m	102 g	8078237	NEBA-M12G5-U-5-N-LE3
	4 x 0.25 mm ²	2.5 m	72 g	8078239	NEBA-M12G5-U-2.5-N-LE4
		5 m	134 g	8078240	NEBA-M12G5-U-5-N-LE4

Connecting cable M12x1 socket angled

	Cable design	Cable length	Product weight	Part no.	Type
	3 x 0.25 mm ²	2.5 m	56 g	8078245	NEBA-M12W5-U-2.5-N-LE3
		5 m	103 g	8078246	NEBA-M12W5-U-5-N-LE3
	4 x 0.25 mm ²	2.5 m	73 g	8078248	NEBA-M12W5-U-2.5-N-LE4
		5 m	135 g	8078249	NEBA-M12W5-U-5-N-LE4