

Flow sensor SFAB

FESTO



Characteristics

At a glance



IO-Link

- 5 measuring ranges:
- 0.1 ... 10 l/min
- 0.5 ... 50 l/min
- 2 ... 200 l/min
- 6 ... 600 l/min
- 10 ... 1000 l/min

Electrical outputs:

- various switching functions
- Switching outputs (PNP/NPN, NO/NC)
- Analog outputs (0 ... 10 V, 4 ... 20 mA)
- New: Switchable analog outputs (0 ... 10 V, 1 ... 5 V, 4 ... 20 mA)

Intuitive operation:

- Intuitive menu navigation
- New: Clear 2-line display

Medium can be selected:

- Compressed air
- New: Nitrogen, argon, carbon dioxide
- Display can be rotated by 270°

Characteristics

Series

The accurate flow sensor SFAB is suitable for monitoring compressed air, nitrogen, argon and carbon dioxide. The sensor can be used in many industries due to the design in combination with protection class IP65 and rotatable display. The measuring process is based on the thermal heat-loss method. The bypass construction reduces the susceptibility to faults caused by particles and humidity. The flow rate value is transmitted to the connected controller as a switching signal, analog signal or via IO-Link®.

Area of application:

- Process monitoring
- Compressed air consumption monitoring
- Leakage detection of machines
- Leak test
- Pneumatic object monitoring by means of air
- New: Forming gas monitoring

Functions:

- cumulative air volume measurement
- Monitoring and setting of a flow rate threshold, a flow rate range
- Adjustable low-pass filter for smoothing the flow signal
- Min./max value memory
- Output of mass and volumetric flow rate in the common flow rate units
- New: All settings made for a sensor (master) can be transferred (replication) to further identical sensors (device)
- New: Offset adjustment possible
- New: Scaling of the analog output to increase the signal dynamics
- New: Output of the internal temperature value

New: IO-Link®

- Serial communication integrated using IO-Link® 1.1
- According to smart sensor profile 2nd edition
- Cyclic transmission of the flow value and the temperature, and two switching statuses each
- Remote parameterization of the sensor possible using an IO-Link® master
- Easy sensor change with auto-parameterization
- Sensor identification, diagnostics and teach-in possible via IO-Link®

Electrical output 1

[2SA] 2x PNP or NPN, 1 analog output 4 ... 20 mA



- Switching output or volume pulse at pin 4
- Switching output on pin 2
- Current output at pin 5
- Compressed air
- Response time 15 ms with filter OFF
- Volume measurement
- UL certification
- Can be ordered with ATEX approval

[2SV] 2x PNP or NPN, 1 analog output 0 ... 10 V



- Switching output or volume pulse at pin 4
- Switching output on pin 2
- Voltage output at pin 5
- Compressed air
- Response time 15 ms with filter OFF
- Volume measurement
- UL certification
- Can be ordered with ATEX approval

Characteristics

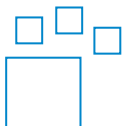
[PNLK]

PNP/NPN/IO-Link



- IO-Link® interface or switching output or volume pulse adjustable at pin 4
- Switching output or current output or voltage output adjustable at pin 2
- Compressed air and other gases adjustable
- Response time 10 ms with filter OFF
- Volume and mass unit adjustable
- Volume measurement
- Temperature detection
- Replicate parameters via IO-Link® interface
- UL approval in progress
- IEC-EX approval in preparation
- Analog output scalable
- Zero point adjustment for vertical mounting position possible

Ordering data - modular system



Configurable product

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

Type code

001	Series	
SFAB	Air flow sensor	
002	Flow measuring range	
10	Max. 10 l/min	
50	Max. 50 l/min	
200	Max. 200 l/min	
600	Max. 600 l/min	
1000	Max. 1000 l/min	
003	Flow input	
U	Unidirectional	
004	Type of mounting	
H	DIN rail attachment	
W	Wall mounting	
005	Pneumatic connection	
Q6	Push-in connector, 6 mm	
Q8	Push-in connector, 8 mm	
Q10	Push-in connector, 10 mm	
Q12	Push-in connector, 12 mm	
T38	Push-in connector 3/8"	
T14	Push-in connector 1/4"	
T516	Push-in connector 5/16"	
006	Electrical output 1	
2SA	2x PNP or NPN, 1 analog output 4 ... 20 mA	
2SV	2x PNP or NPN, 1 analog output 0 ... 10 V	
PNLK	PNP/NPN/IO-Link	

007	Electrical output 2	
	Without	
PNVBA	PNP or NPN or 0 ... 10 V or 1 ... 5 V or 4 ... 20 mA	
008	Electrical connection	
M12	Plug M12, A-coded	
009	Connecting cable, straight socket	
	Without	
2.5S	2.5 m	
5S	5 m	
010	Connecting cable, angled plug socket	
2.5A	2.5 m	
5A	5 m	
	Without	
011	EX certification EU	
	None	
EX2	II 3GD	
012	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	
013	Electrical accessories	
014	Certificate	
	Without	
T	Test report	

Datasheet

General technical data - 2SA/2SV

Certification	RCM compliance mark, c UL us - Listed (OL)
UKCA marking (see declaration of conformity) ²⁾	To UK instructions for EMC, acc. to UK EX instructions, To UK RoHS instructions
Certificate issuing authority	UL E322346
CE marking (see declaration of conformity) ³⁾	As per EU EMC directive, as per EU explosion protection directive (ATEX), As per EU RoHS directive
Note on materials	RoHS compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

2) Please refer to the declaration of conformity for the area of use: www.festo.com/catalogue/sfab → 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.

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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.

General technical data – PNLK-PNVBA

Certification	RCM compliance mark, c UL us - Listed (OL)
UKCA marking (see declaration of conformity) ²⁾	To UK instructions for EMC, To UK RoHS instructions
CE marking (see declaration of conformity) ³⁾	As per EU EMC directive, As per EU RoHS directive
Note on materials	RoHS compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

2) Please refer to the declaration of conformity for the area of use: www.festo.com/catalogue/sfab → 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.

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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 – 2SA/2SV

Flow measuring range end value	1,000 l/min
Flow measuring range start value	10 l/min
Measured variable	Volume, Volumetric flow rate
Flow direction	Unidirectional, P1 -> P2
Measuring principle	Thermal
Operating pressure	0 ... 10 bar
Operating pressure	0 ... 1 MPa
Operating medium	Compressed air as per ISO 8573-1:2010 [7:4:4], Nitrogen
Temperature of medium	0 ... 50°C
Ambient temperature	0 ... 50°C
Nominal temperature	23°C

Input signal - measuring element - PNLK-PNVBA

Flow measuring range end value	10 ... 1,000 l/min
Flow measuring range start value	0.1 ... 10 l/min
Measured variable	Mass flow, Temperature, Volume, Volumetric flow rate
Flow direction	Unidirectional, P1 -> P2
Measuring principle	Thermal
Operating pressure	0 ... 10 bar
Operating pressure	0 ... 1 MPa
Operating medium	Argon, Compressed air as per ISO 8573-1:2010 [6:4:4], Compressed air as per ISO 8573-1:2010 [7:4:4], Carbon dioxide, Nitrogen
Temperature of medium	0 ... 50°C
Ambient temperature	0 ... 50°C
Nominal temperature	23°C

Datasheet

Electrical data – output general – 2SA/2SV

Accuracy of flow rate ¹⁾	±(3% o.m.v. + 0.3% FS)
Zero point repetition accuracy in ± %FS ²⁾	0.2 %FS
Repetition accuracy margin in ± %FS	0.8 %FS

1) The accuracy of the flow rate value applies to nominal conditions (compressed air, 6 bar, 23 °C and horizontal mounting position). For further information on accuracy, see the operating instructions.

2) % FS = % of the measuring range end value (full scale)

Electrical data - Output general - PNK-PNVBA

Accuracy of flow rate ¹⁾	±(3% o.m.v. + 0.3% FS)
Zero point repetition accuracy in ± %FS ²⁾	0.2 %FS
Repetition accuracy margin in ± %FS	0.8 %FS
Accuracy of temperature in ± °C ³⁾	5°C

1) The accuracy of the flow rate value applies under nominal conditions (compressed air, 6 bar, 23°C and horizontal installation position). For further information on accuracy, see operating instructions.

2) % FS = % of the measuring range end value (fullscale)

3) For further information on accuracy, see operating manual

Electrical data – switching output – PNK-PNVBA

Switching output	2 x PNP or 2 x NPN switchable
Switching function	Window comparator, Threshold value comparator
Switching element function	N/C contact/N/O contact, switchable
On time	10 ms
Switch-off time	10 ms
Max. output current	100 mA

Electrical data – analog output – 2SA/2SV

Analog output	4 - 20 mA
Flow characteristic curve, start value	0 l/min
Flow characteristic curve, end value	1,000 l/min
Output characteristic curve initial value	–
End value output characteristic curve	–
Output characteristic curve initial value	4 mA
End value output characteristic curve	20 mA
Max. load resistance of current output	500 Ohm
Min. load resistance of voltage output	–

Datasheet

Electrical data – analog output – PNLK-PNVBA

Analog output	0 - 10 V, 4 - 20 mA, 1 - 5 V
Flow characteristic curve, start value	0 l/min
Flow characteristic curve, end value	10 l/min, 50 l/min, 200 l/min, 600 l/min, 1,000 l/min
Output characteristic curve initial value	0 V
End value output characteristic curve	10 V
Output characteristic curve initial value	4 mA
End value output characteristic curve	20 mA
Max. load resistance of current output	500 Ohm
Min. load resistance of voltage output	20 kOhm

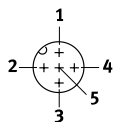
Electrical data – output, further data

Short-circuit protection	Yes
Overload protection	Available

Electrical data – electronics

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

Electrical data – electromechanics – 2SA/2SV

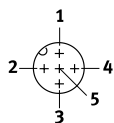


- 1 = Operating voltage + 24 VDC
- 2 = Binary output B
- 3 = 0 V
- 4 = Binary output A
- 5 = analog output

Electrical connection 1, connection type	Plug
Electrical connection 1, type of mounting	Screw-type lock, not rotatable
Electrical connection 1, type of mounting	Compatible with rotatable screw-type lock
Electrical connection 1, connection technology	M12x1 A-coded as per EN 61076-2-101
Electrical connection 1, number of pins/wires	5

Datasheet

Electrical data – electromechanics – PNLK/PNVBA



- 1 = Operating voltage + 24 VDC
- 2 = Binary output B / analog output
- 3 = 0 V
- 4 = Binary output A / IO-Link®
- 5 = Not used

Electrical connection 1, connection type	Plug
Electrical connection 1, type of mounting	Screw-type lock, not rotatable
Electrical connection 1, type of mounting	Compatible with rotatable screw-type lock
Electrical connection 1, connection technology	M12x1 A-coded as per EN 61076-2-101
Electrical connection 1, number of pins/wires	5

Mechanical system

Mounting position	Any
Pneumatic connection	For pneumatic tubing outside diameter 6 mm, For pneumatic tubing outside diameter 8 mm, For pneumatic tubing outside diameter 10 mm, For tubing O.D. 12 mm, for tubing O.D. 1/4", for tubing O.D. 5/16", for tubing O.D. 3/8"
Product weight	160 g
Housing material	PA-reinforced

Display – operation – 2SA/2SV

Display type	Multi-color backlit LCD
Displayable unit(s)	l, l/min, m3, scf, scfm
Setting options	Teach-in, Via display and keys
Protection against tampering	PIN code

Display – operation – PNLK-PNVBA

Display type	Multi-color backlit LCD
Displayable unit(s)	g, g/min, l, l/min, m3, m3/h, scf, scfm
Setting options	IO-Link®, Teach-in, Via display and keys
Protection against tampering	IO-Link®, PIN code

Immission – emission

Degree of protection	IP65
Pressure drop	<100 mbar
Protection class	III
Corrosion resistance class (CRC) ¹⁾	2 - Moderate corrosion stress

1) Further information www.festo.com/x/topic/kbk

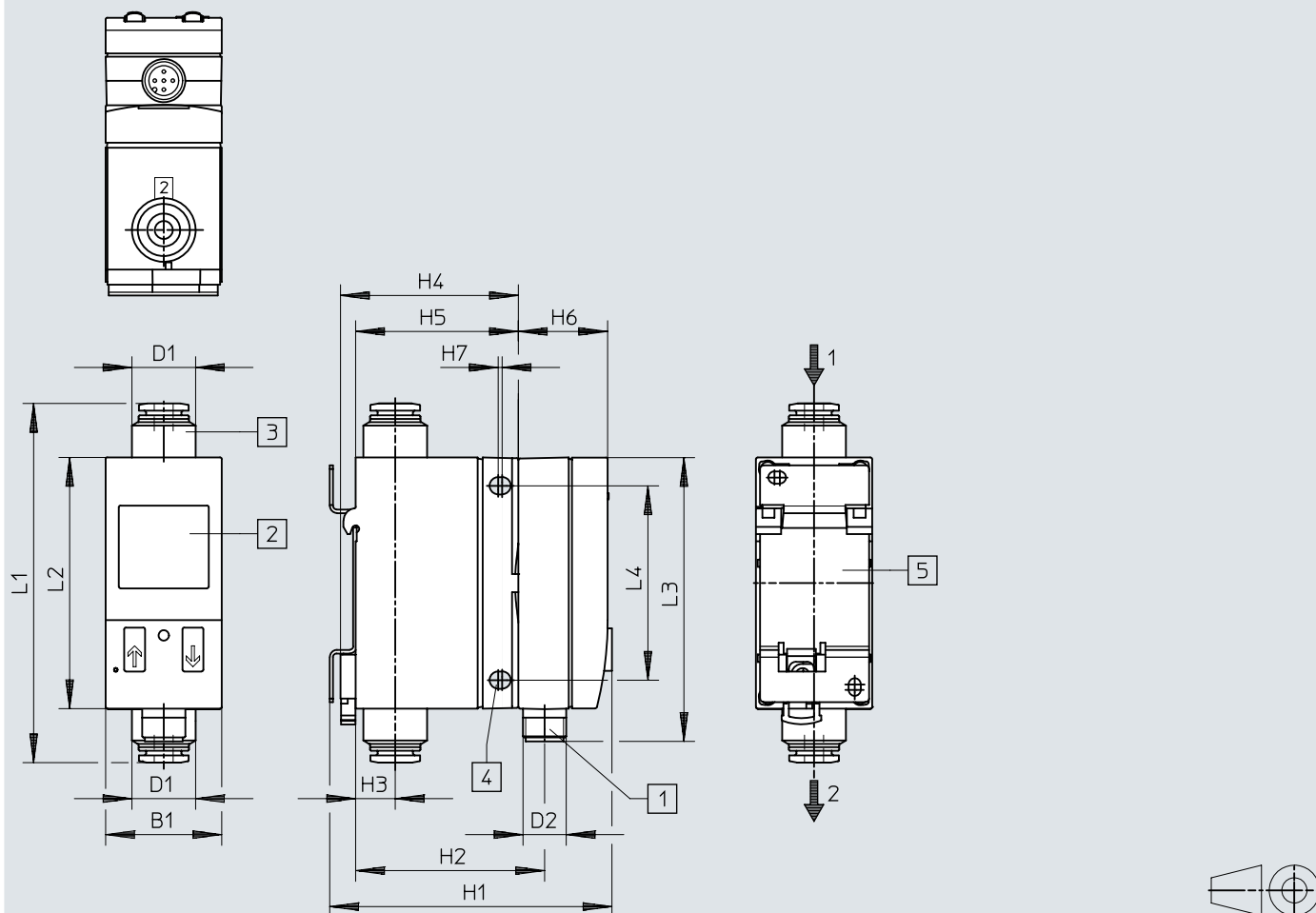
Datasheet

IO-LINK®	
IO-Link, revision ID	V1.1
IO-Link, device profile	Function Extended identification, Function Measurement data, standard resolution, Function Multiple switching signal, Firmware update, Function Locator, Function Product URI, Function Teach single value, Identification and diagnosis, Smart Sensor - SSP 4.1.2
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	64 bit
IO-Link®, process data content IN	Flow-Measured value 16 bit MDC, Flow rate monitoring 2-bit SSC, Temperature measured value 16-bit MDC, Temperature monitoring 2-bit SSC, Volume / mass pulse 1 bit SSC
IO-Link®, service data contents IN	Volume / mass measured value 32-bit
IO-Link®, minimum cycle time	1.2 ms
IO-Link®, data memory required	0.5 KB

Dimensions

Dimensions – SFAB-...-2SA/2SV-...

Download CAD data www.festo.com

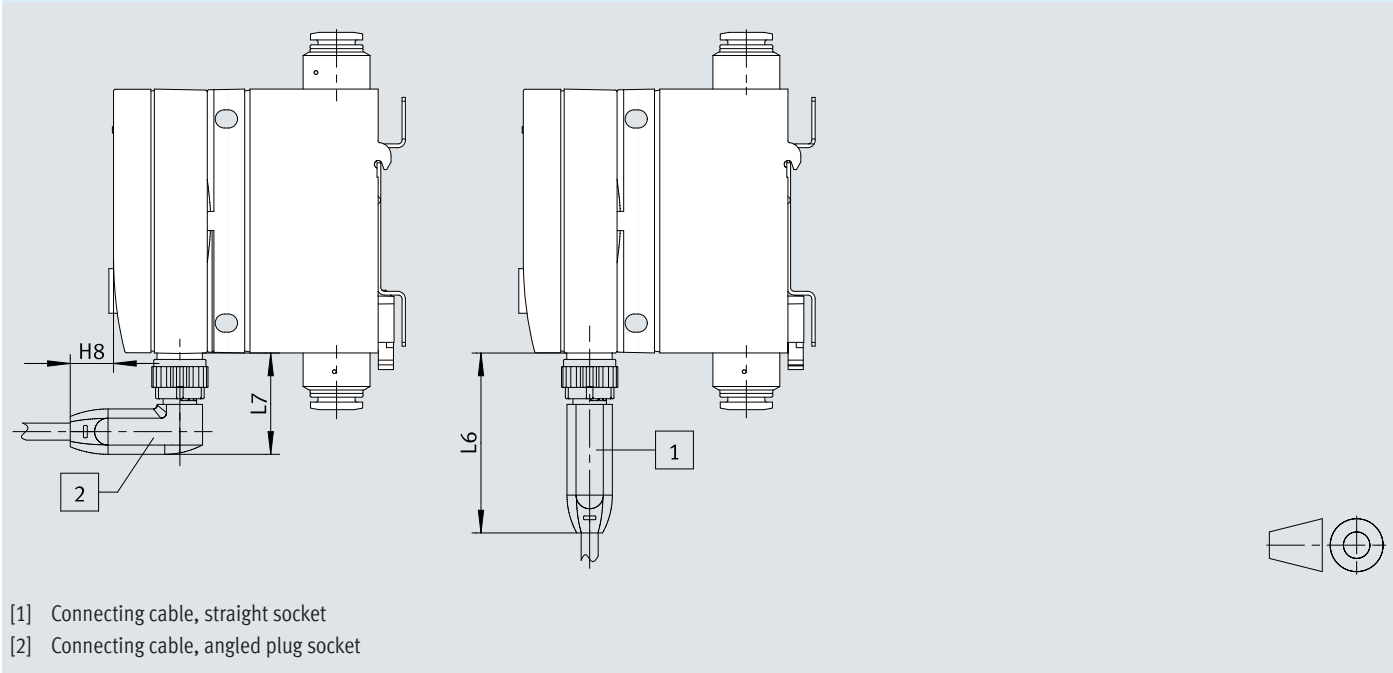


- [1] 5-pin connector M12x1
- [2] LCD display
- [3] Pneumatic connection
- [4] Hole for retaining screw M4
- [5] Adapter plate for wall mounting

	B1	D1	D2	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4
SFAB-...-HQ6	32,3	17,7	M12x1	–	51,6	11	48,5	44,3	24,4	1,1	95,6	69,8	78,9	54
SFAB-...-HQ8											99,8			
SFAB-...-HQ10											119,8			
SFAB-...-HQ12		22									124,4			
SFAB-...-WQ6	32,3	17,7	M12x1	79	51,6	11	48,5	44,3	24,4	1,1	95,6	69,8	78,9	54
SFAB-...-WQ8											99,8			
SFAB-...-WQ10		22									119,8			

Dimensions

Dimensions – SFAB-...-2SA/2SV-... Download CAD data www.festo.com

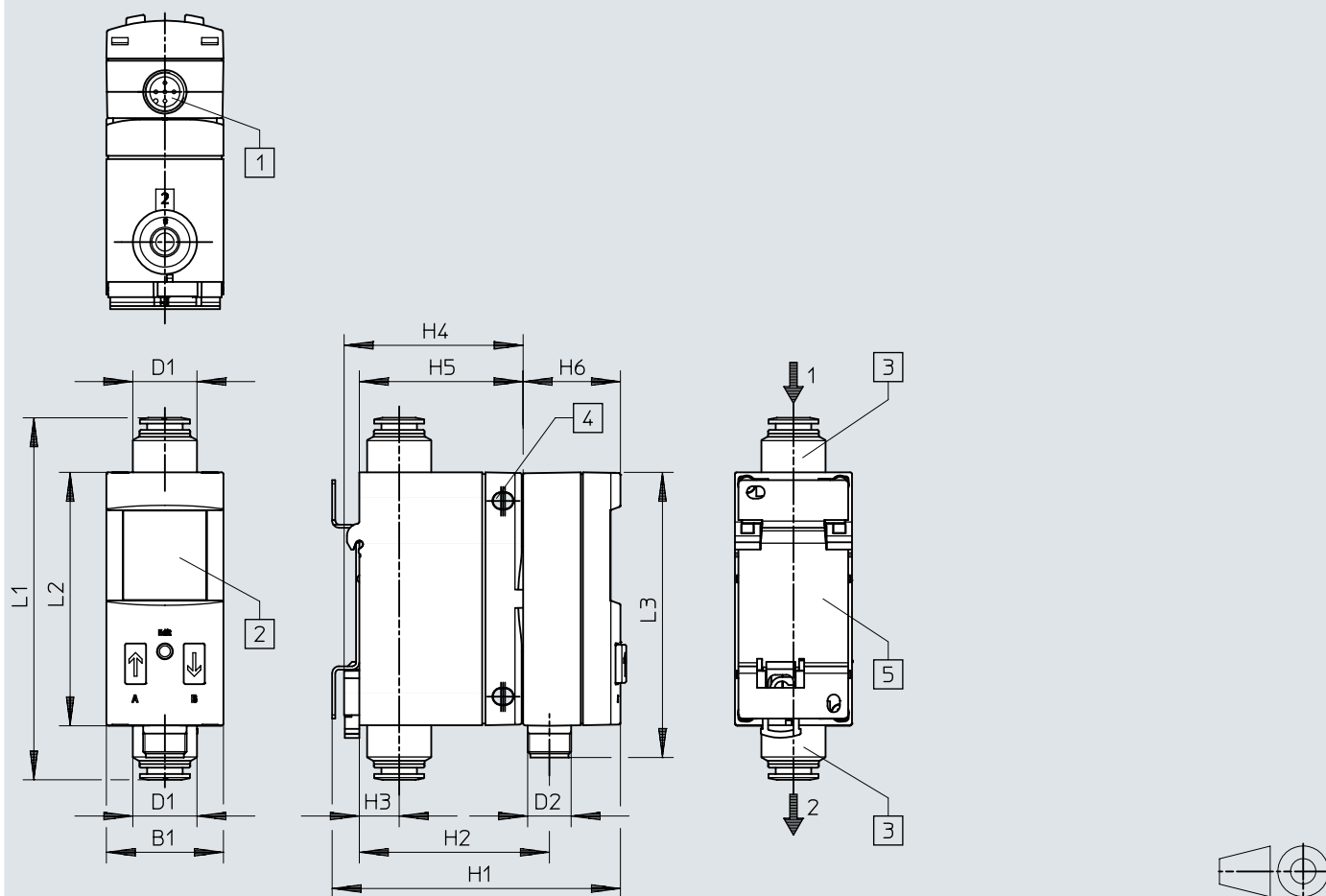


	H8	L6	L7
SFAB-...	~11	~49	~28

Dimensions

Dimensions – SFAB-...-PNLK-...

Download CAD data www.festo.com

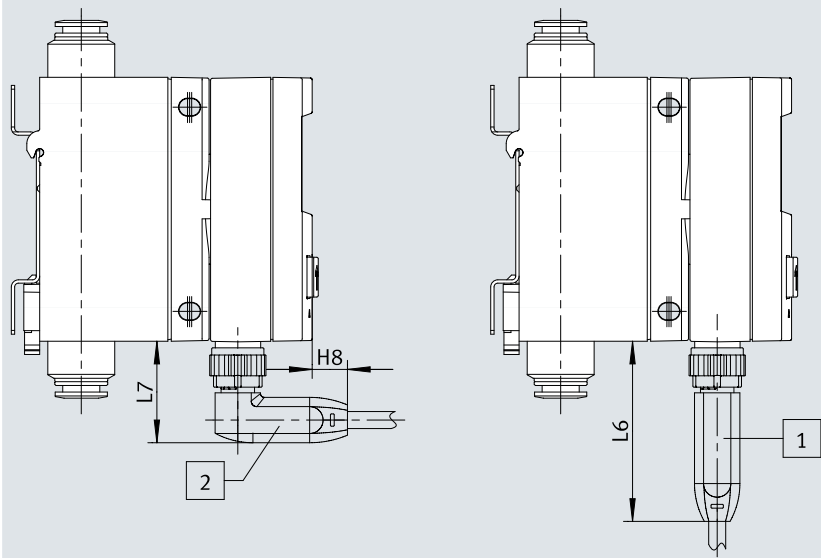


- [1] 5-pin connector M12x1
- [2] LCD display
- [3] Pneumatic connection
- [4] Hole for retaining screw M4
- [5] Adapter plate for wall mounting

	B1	D1 Ø	D2	H1	H2	H3	H4	H5	H6	L1	L2	L3
SFAB-...-Q6-PNLK-PNVBA	32,3	17,7	M12x1	79,6	52,5	11	49,4	45,2	26,9	99,1	69,9	78,7
SFAB-...-Q8-PNLK-PNVBA										99,9		
SFAB-...-Q10-PNLK-PNVBA		22								123,9		
SFAB-...-Q12-PNLK-PNVBA										124,1		

Dimensions

Dimensions – SFAB-...-PNLK-... Download CAD data www.festo.com



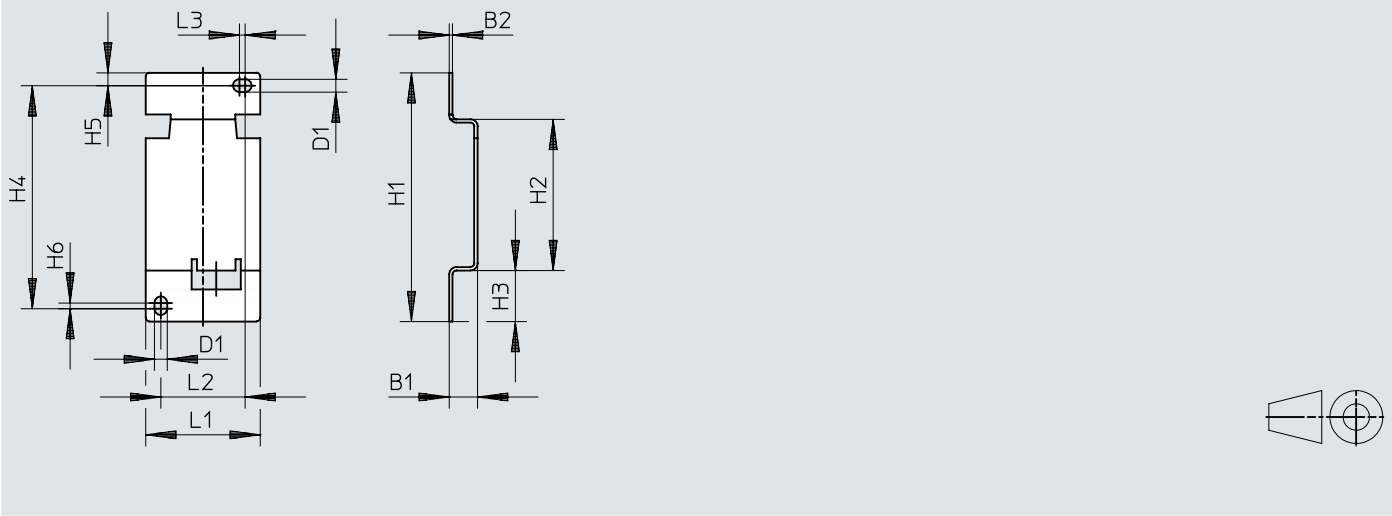
- [1] Angled connection socket M12x1, 5-pin
- [2] Connection box straight M12x1, 5-pole

	H8	L6	L7
SFAB-...-Q6-PNLK-PNVBA-M12	~9	~49	~28
SFAB-...-Q8-PNLK-PNVBA-M12			
SFAB-...-Q10-PNLK-PNVBA-M12			
SFAB-...-Q12-PNLK-PNVBA-M12			

Dimensions

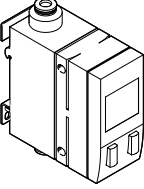
Dimensions – Adapter plate SDE1- ...-W ...

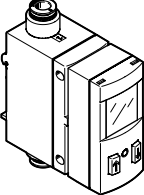
Download CAD data www.festo.com

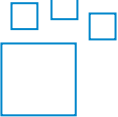


	B1	B2	D1 Ø	H1 ±0,1	H2	H3	H4	H5	H6	L1	L2	L3
SDE-1-...-W..	7,5	0,9	3,4	65,8	40	13,5	59	3,4	1,5	30,3	22,3	1,5

Ordering data

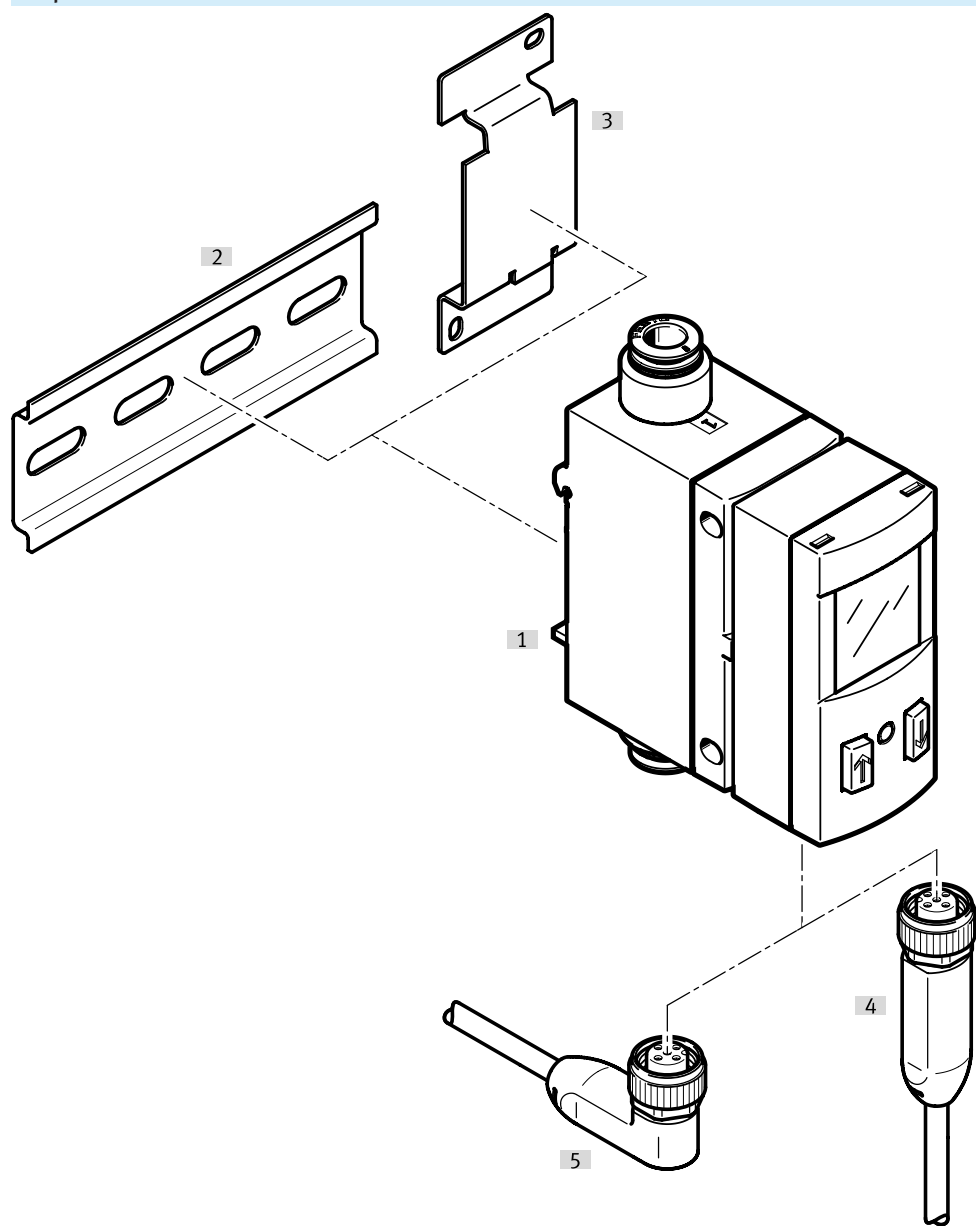
Ordering data					
	Analog output	Flow measuring range start value	Flow measuring range end value	Part no.	Type
	4 - 20 mA	10 l/min	1,000 l/min	565409	SFAB-1000U-HQ12-2SA-M12-EX2

Ordering data – PNLK-PNVBA					
	Analog output	Flow measuring range start value	Flow measuring range end value	Part no.	Type
	0 - 10 V, 4 - 20 mA, 1 - 5 V	0.1 l/min	10 l/min	8162825	SFAB-10U-WQ6-PNLK-PNVBA-M12
				8162824	SFAB-10U-HQ6-PNLK-PNVBA-M12
		0.5 l/min	50 l/min	8162826	SFAB-50U-HQ6-PNLK-PNVBA-M12
				8162827	SFAB-50U-WQ6-PNLK-PNVBA-M12
		2 l/min	200 l/min	8162830	SFAB-200U-HQ10-PNLK-PNVBA-M12
				8162831	SFAB-200U-WQ10-PNLK-PNVBA-M12
				8162828	SFAB-200U-HQ8-PNLK-PNVBA-M12
				8162829	SFAB-200U-WQ8-PNLK-PNVBA-M12
		6 l/min	600 l/min	8162833	SFAB-600U-WQ10-PNLK-PNVBA-M12
				8162832	SFAB-600U-HQ10-PNLK-PNVBA-M12
		10 l/min	1,000 l/min	8162835	SFAB-1000U-WQ10-PNLK-PNVBA-M12
				8162834	SFAB-1000U-HQ10-PNLK-PNVBA-M12

Ordering information – modular product system					
	Flow measuring range	Pneumatic connection	Electrical output 1	Part no.	Type
	Max. 10 l/min, Max. 50 l/min, Max. 200 l/min, Max. 600 l/min, Max. 1000 l/min	For pneumatic tubing outside diameter 6 mm, For pneumatic tubing outside diameter 8 mm, For pneumatic tubing outside diameter 10 mm, For tubing O.D. 12 mm, for tubing O.D. 1/4", for tubing O.D. 5/16", for tubing O.D. 3/8"	2x PNP or NPN, 1 analog output 4 ... 20 mA, 2x PNP or NPN, 1 analog output 0 ... 10 V, PNP/NPN/IO-Link	563795	SFAB-

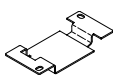
Peripherals overview

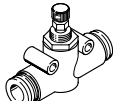
Peripherals overview



Accessories		→ Page/Internet
Type/order code	Description	
[1] Flow sensor SFAB	-	sfab
[2] DIN mounting rail NRH	To DIN EN 60715	nrh
[3] Adapter plate SDE1-...-W-...	Included in the scope of delivery with SFAB-...-W...	18
[4] Connecting cable NEBA-M12	Straight socket	18
[5] Connecting cable NEBA-M12	Angled socket	18

Accessories

Adapter plate SDE1-...-W...				
	Type of mounting	Part no.	Type	
	With through-hole	194297	SDE1-...-W..	

One-way flow control valve				
	Pneumatic connection 1	Operating pressure	Part no.	Type
	QS-4	0.2 ... 10 bar	193967	GR-QS-4
	QS-6		193969	GR-QS-6
	QS-8		193970	GR-QS-8

Connecting cable NEBA-M12					
	Cable design	Cable length	Product weight	Part no.	Type
	5 x 0.25 mm²	2.5 m	76 g	8078251	NEBA-M12W5-U-2.5-N-LE5
			85 g	8078242	NEBA-M12G5-U-2.5-N-LE5
		5 m	142 g	8078243	NEBA-M12G5-U-5-N-LE5
			143 g	8078252	NEBA-M12W5-U-5-N-LE5