Flow sensors SFAM

FESTO

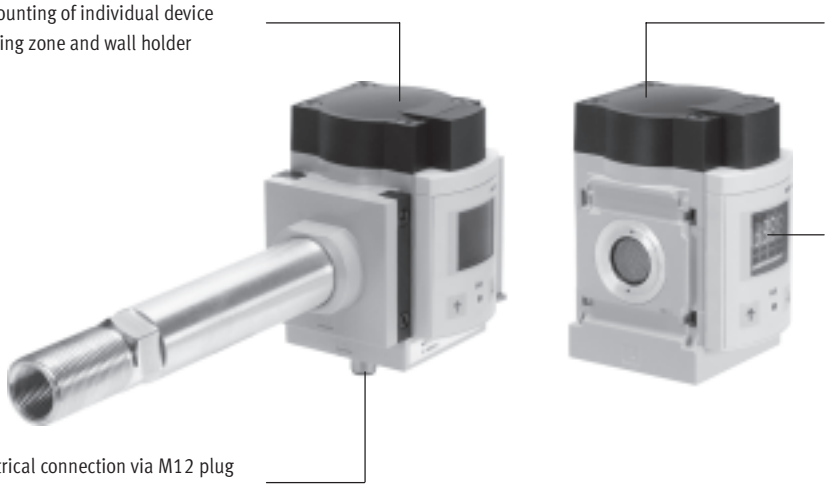
New

Flow sensors SFAM

Key features

At a glance

Threaded mounting of individual device with stabilising zone and wall holder



Central electrical connection via M12 plug

Lockable with MS6 series service unit combination

- Illuminated LCD display with blue background and white 9-segment display
- Bar graph visualises the current measured value
- Switching point-dependent colour changes

Compact and capable of high flow rates

This modular flow sensor can operate either as a standalone unit or can be ideally combined with the MS series service units.
The sensor provides:

- Absolute flow information
  - with threshold values and
  - convenient switching point adjustment via a display
- Accumulated air consumption measurement
- Patented adjustable consumption-based switching impulse for accumulated air consumption measurement via the switching output

Systematically more reliable

With its highly dynamic response of 1:100, the sensor covers an extensive measuring range with a specified accuracy.
It can provide precise information even when flow conditions are fluctuating and unreliable.

Easy to operate

- A large, illuminated LCD display increases the operational safety and makes the currently displayed flow rate and consumption values easy to read
- Measured values outside of the measuring range are visualised – flow rates are displayed flashing
- NPN/PNP can be switched via the software
- Values that fall below or exceed the threshold values can be identified even over long distances or if the sensor is inaccessible by means of a colour change in the display
- Simple checking of the current sensor settings in SHOW mode
- Simple switching between consumption and flow data indicator
- Values shown in the display:
  - can be shown for different standard conditions (DIN 1343, ISO 2533, ISO 6358)
  - can be filtered/averaged independently of the analogue output in the case of high measurement dynamics

Convenient

- Plug and work solution
- Clear and fast menu navigation
- Fast commissioning thanks to easy-to-use, intuitive teach-in function
- Manual consumption measurement with start/stop and reset functionality

Easy to combine

With MS6 series service unit combination thanks to innovative prism clamping technology. This saves additional installation time.

Flexible installation

The SFAM has an extremely compact, space-saving design optimised for flow performance.

Right or left?

The fluid stream of the unidirectional flow sensor can be set from left to right or from right to left.

Flow sensors SFAM

Peripherals overview

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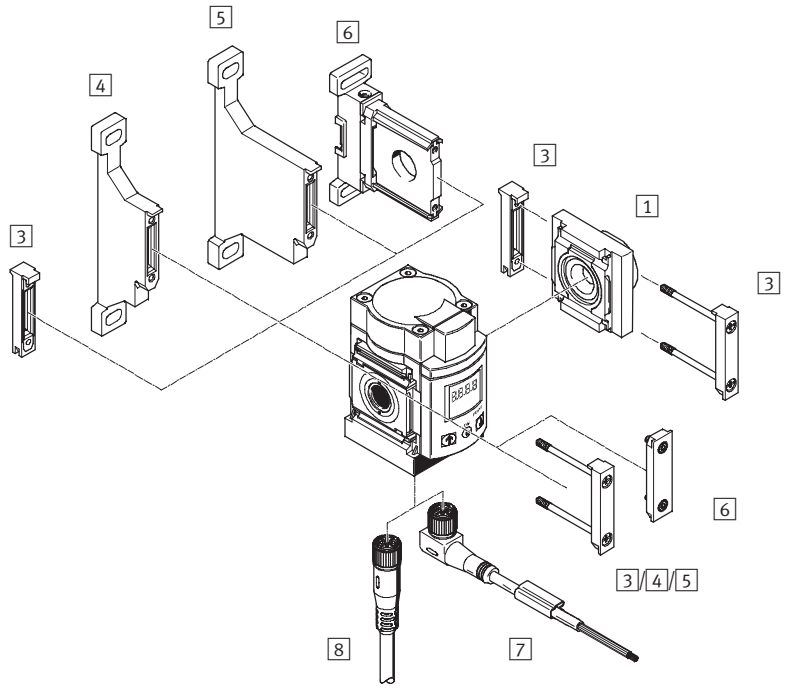
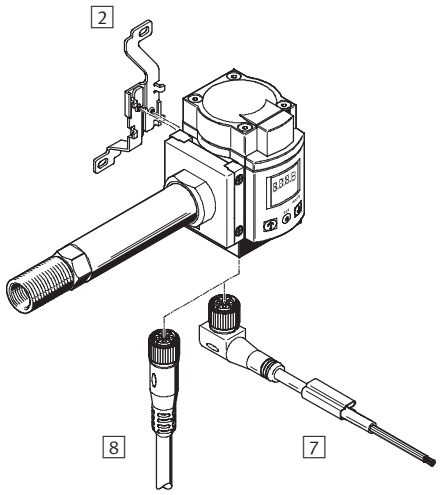
For service unit combination	For individual mounting
with laminar flow cartridge	with connecting plates and stabilising zone





Mounting attachments and accessories			
	In MS series service unit combination	Individual device	➔ Page/Internet
1 Connecting plate MS6-AG...	■	■ Included in scope of delivery	ms6-ag
2 Mounting bracket MS6-WB	–	■ Included in scope of delivery	ms6-wb
3 Module connector MS6-MV	■	–	ms6-mv
4 Mounting bracket MS6-WP	■	–	ms6-wp
5 Mounting bracket MS6-WPB	■	–	ms6-wpb
6 Mounting bracket MS6-WPM	■	–	ms6-wpm
7 Connecting cable NEBU-M12W5, angled socket	■	■	11
8 Connecting cable NEBU-M12G5, straight socket	■	■	11

Note

Additional accessories:

– Module connector for combination with size MS4/MS6 or size MS9
  ➔ Internet: amv, rmv, armv
– Adapter for mounting on profiles
  ➔ Internet: ipm-80, ipm-40-80, ipm-80-80

Flow sensors SFAM

Type codes

Type	
SFAM	Flow sensor

Grid dimension	
62	Grid dimension 62 mm

Flow measuring range [l/min]	
1000	Max. 1000
3000	Max. 3000
5000	Max. 5000

Flow input	
L	Unidirectional from left

Type of mounting	
M	Manifold assembly
T	Threaded mounting

Pneumatic connection	
G12	Female thread G½

Electrical output	
2SA	2x PNP or NPN, 1 analogue output 4 ... 20 mA
2SV	2x PNP or NPN, 1 analogue output 0 ... 10 V

Electrical connection	
M12	Straight plug, M12x1, 5-pin

Additional variants can be ordered using the modular system ➔ 10

- Flow input
- Type of mounting
- Pneumatic connection
- Electrical accessories
- Certification EU (ATEX)

Flow sensors SFAM

Technical data

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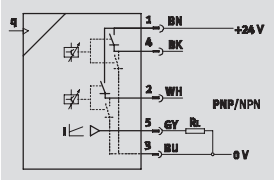
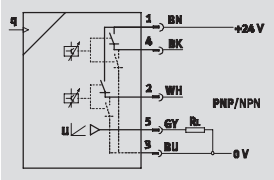
Function

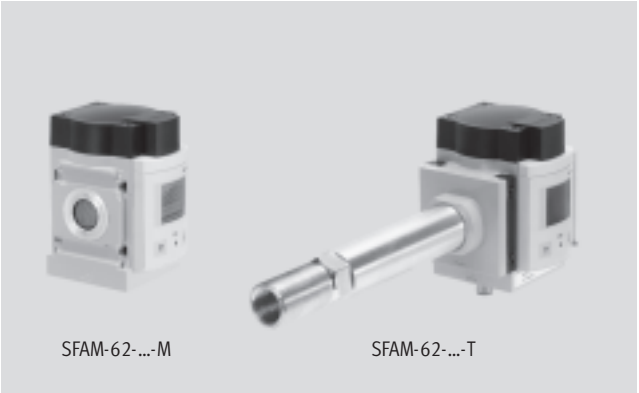
Current output 2SA



Voltage output 2SV



- Flow rate
  10 ... 1,000 l/min
  30 ... 3,000 l/min
  50 ... 5,000 l/min
- Temperature range
  0 ... 50 °C
- Operating pressure
  0 ... 16 bar



SFAM-62-...-M SFAM-62-...-T

- Analogue output 0 ... 10 V, adjustable switching outputs 2x PNP or 2x NPN
- Analogue output 4 ... 20 mA, adjustable switching outputs 2x PNP or 2x NPN
- Freely selectable pulse output for consumption measurement
- Analogue filter for setting the rise time
- Digital filter for smoothing the display values

Note

To comply with the specified accuracies, the SFAM-62-...-T must be supplied via a connection with an inside diameter of at least 10 mm and the SFAM-62-...-M must be supplied via a pneumatic connection of at least G½.

Note

To comply with the specified accuracies, a branching module MS6-FRM must be installed downstream of a filter regulator MS6-LFR or pressure regulator MS6-LR and upstream of the flow sensor SFAM.

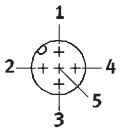
General technical data				
		-1000	-3000	-5000
General information				
Certification		C tick		
CE mark (see declaration of conformity)		To EU EMC Directive		
Note on materials		RoHS-compliant		
Input signal/measuring element				
Measured variable		Flow rate, consumption		
Direction of flow	-L	Unidirectional P1 → P2		
Direction of flow	-R	Unidirectional P2 ← P1		
Measuring principle		Thermal		
Flow measuring range	[l/min]	10 ... 1000	30 ... 3000	50 ... 5000
Operating pressure	[bar]	0 ... 16		
Nominal pressure	[bar]	6		
Operating medium		Air quality class 5:4:3 to DIN ISO 8573-1		
		Nitrogen		
Temperature of medium	[°C]	0 ... 50		
Ambient temperature	[°C]	0 ... 50		
Nominal temperature	[°C]	23		

Flow sensors SFAM

Technical data

Electrical data				
		-1000	-3000	-5000
Output, general[1), 2)]				
Accuracy zero point ±FS	[%]	0.3		
Accuracy margin ±FS	[%]	3		
Repetition accuracy zero point ±FS	[%]	0.2		
Repetition accuracy margin ±FS	[%]	0.8		
Temperature coefficient margin ±FS/K	[%]	≤0.1		
Pressure dependency margin ±FS/bar	[%]	0.5		
Switching output				
Switching output		2x PNP or 2x NPN, adjustable		
Switching function		Window comparator or threshold comparator, adjustable		
Switching element function		N/C or N/O contact, adjustable		
Switch-on time		Adjustable (factory setting: approx. 60 ms)		
Switch-off time		Adjustable (factory setting: approx. 60 ms)		
Max. output current	[mA]	100		
Voltage drop	[V]	Max. 1.5		
Inductive protective circuit		Adapted to MZ, MY, ME coils		
Analogue output				
Characteristic flow rate curve	[l/min]	0 ... 1000	0 ... 3000	0 ... 5000
Output characteristic curve – current	[mA]	4 ... 20		
Output characteristic curve – voltage	[V]	0 ... 10		
Rise time	[ms]	15, 30, 60 (factory setting), 125, 250, 500, 999 adjustable		
Max. load resistance of current output	[ohms]	500		
Min. load resistance of voltage output	[kohms]	10		
Output, other data				
Protection against short circuit		Yes		
Protection against overloading		Yes		
Electronics				
Operating voltage range DC	[v]	15 ... 30		
Protection against polarity reversal		For all electrical connections		
Electromechanical components				
Electrical connection		Straight plug, M12x1, 5-pin		
Max. length of connecting cable	[m]	<10		

1) Accuracy under rated conditions (6 bar, 23 °C and horizontal mounting position)
2) % FS = % of the measuring range final value (full scale)

Pin allocation		
Plug, M12x1, 5-pin	Pin	Meaning
	1	Operating voltage +24 V DC
	2	Binary output B
	3	0 V
	4	Binary output A
	5	Analogue output C

Flow sensors SFAM

Technical data

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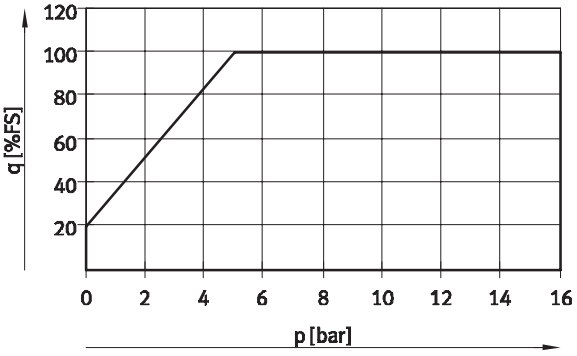
Mechanical components							
		-1000		-3000		-5000	
		-M	-T	-M	-T	-M	-T
Mounting position		Horizontal					
Pneumatic connection		–	G1/2	–	G1/2	–	G1/2
		–	NPT1/2	–	NPT1/2	–	NPT1/2
Product weight	[g]	600	1100	600	1100	600	1100
Materials		Housing					

Display/operation				
		-1000	-3000	-5000
Indicator type		Illuminated LCD, blue		
Displayable units		l/min, scfm, l, m^3, scf		
Setting range threshold value flow rate		1%FS ... 100%FS		
Setting range threshold value consumption impulse	[l]	3 ... 19999	10 ... 19999	15 ... 19999
	[m^3]	1 ... 19999		
	[scf]	0.1 ... 1999.9	0.4 ... 1999.9	0.5 ... 1999.9
Hysteresis setting range		0%FS ... 90%FS		

Immissions/emissions		
Storage temperature	[°C]	–20 ... +80
Protection class		IP65
Pressure drop	[mbar]	<100
Electrical protection class		III

Flow measuring range[1] qn as a function of operating pressure p1



1) For an operating pressure of more than 5 bar, the flow sensor can determine measured values with the specified accuracy over the entire measuring range. For an operating pressure below 5 bar, the measuring range with the specified accuracy is reduced as shown in the diagram.

Flow sensors SFAM

Technical data

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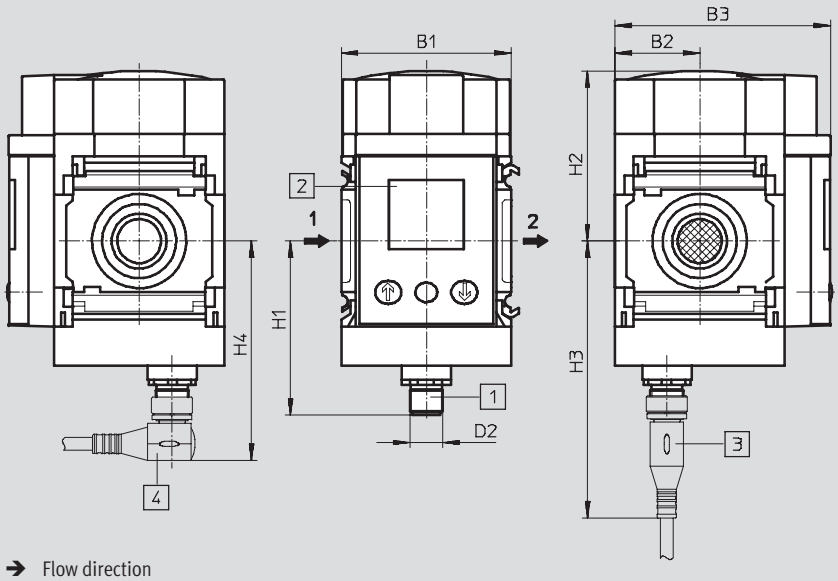
Dimensions Download CAD data ➔ **www.festo.com**

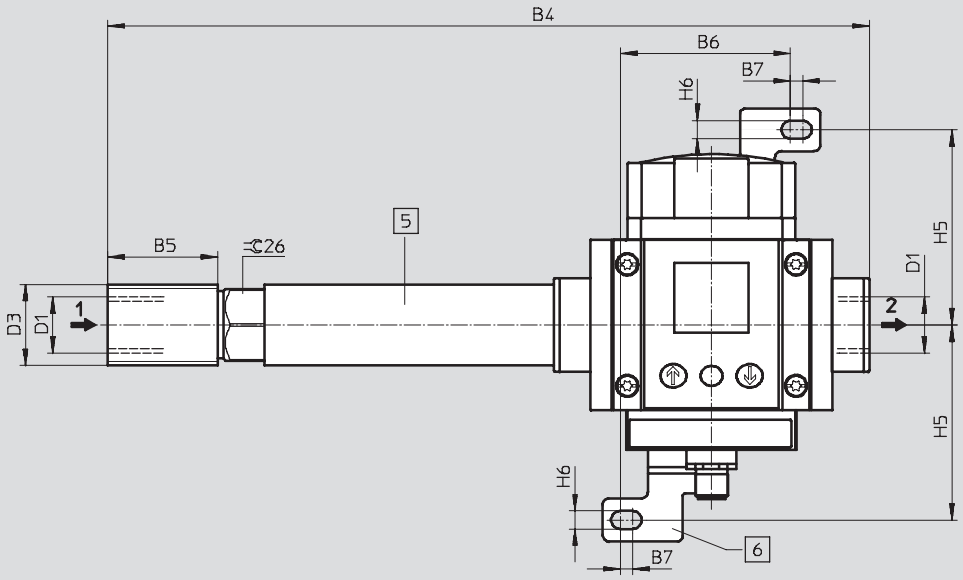
Manifold assembly in MS series service unit combination



➔ Flow direction

1 Plug M12x1 to EN 60947-5-2
2 LCD display
3 Connecting cable, straight socket
4 Connecting cable, angled socket

Threaded mounting of individual device



5 Stabilising zone
6 Wall mounting (only with mounting type -W) Mounting bracket type MS6-WB

Type	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3	H1	H2	H3	H4	H5	H6
SFAM-...-M	62	31	78.7	–	–	–	–	–	M12x1	–	63.5	62.1	101	80	–	–
SFAM-...-T	62	31	78.7	277	40	–	–	G½	M12x1	G¾	63.5	62.1	101	80	–	–
SFAM-...-W						61.9	4.5								71	6.6

Flow sensors SFAM

Technical data

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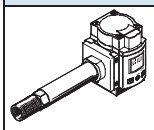
Ordering data				
Version	Electrical output	Flow measuring range [l/min]	Part No.	Type
Manifold assembly in MS series service unit combination				
	2x PNP or 2x NPN, 1 analogue output 4 ... 20 mA	10 ... 1000	**564930**	**SFAM-62-1000L-M-2SA-M12**
		30 ... 3000	**564934**	**SFAM-62-3000L-M-2SA-M12**
		50 ... 5000	**564938**	**SFAM-62-5000L-M-2SA-M12**
	2x PNP or 2x NPN, 1 analogue output 0 ... 10 V	10 ... 1000	**564932**	**SFAM-62-1000L-M-2SV-M12**
		30 ... 3000	**564936**	**SFAM-62-3000L-M-2SV-M12**
		50 ... 5000	**564940**	**SFAM-62-5000L-M-2SV-M12**
Threaded mounting of individual device				
	2x PNP or 2x NPN, 1 analogue output 4 ... 20 mA	10 ... 1000	**565375**	**SFAM-62-1000L-TG12-2SA-M12**
		30 ... 3000	**565379**	**SFAM-62-3000L-TG12-2SA-M12**
		50 ... 5000	**565383**	**SFAM-62-5000L-TG12-2SA-M12**
	2x PNP or 2x NPN, 1 analogue output 0 ... 10 V	10 ... 1000	**565376**	**SFAM-62-1000L-TG12-2SV-M12**
		30 ... 3000	**565380**	**SFAM-62-3000L-TG12-2SV-M12**
		50 ... 5000	**565384**	**SFAM-62-5000L-TG12-2SV-M12**

New

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Ordering data – Modular product

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Ordering table						
			Condi-tions	Code		Enter code
M	Module No.	**563796**				
	Function	Flow sensor		**SFAM**		-SFAM
	Grid dimension [mm]	62		**-62**		62
	Flow measuring range l/min.	Max. 1000		**-1000**		
		Max. 3000		**-3000**		
		Max. 5000		**-5000**		
	Flow input	Unidirectional, from left		**L**		
		Unidirectional, from right		**R**		
	Type of mounting	Manifold assembly		**-M**		
		Threaded mounting		**-T**		
		Wall mounting		**-W**		
O	Pneumatic connection	Not specified				
		G½	1	**G12**		
		½ " NPT	1	**N12**		
M	Electrical output	2x PNP or NPN, 1 analogue output 4 ... 20 mA		**-2SA**		
		2x PNP or NPN, 1 analogue output 0 ... 10 V		**-2SV**		
	Electrical connection	Plug M12, A-coded		**-M12**		M12
O	Electrical accessories	Not specified				
		Angled plug socket, cable 2.5 m		**-2.5A**		
		Straight socket, cable 2.5 m		**-2.5S**		
		Angled plug socket, cable 5 m		**-5A**		
		Straight socket, cable 5 m		**-5S**		
	EU certification	Not specified				
		II 3GD		**- EX2**		

1 **G12, N12** Not with mounting type M
Mandatory data for mounting type T, W

Transfer order code

563796	SFAM	–		–		–	-U	–		–		–		–	M12	–		–		–	

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Accessories

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Ordering data – Connecting cables				Technical data ➔ Internet: nebu
	Number of wires	Cable length [m]	Part No.	Type
M12x1, straight socket				
	5	2.5	**541330**	**NEBU-M12G5-K-2.5-LE5**
		5	**541331**	**NEBU-M12G5-K-5-LE5**
M12x1, angled socket				
	5	2.5	**567843**	**NEBU-M12W5-K-2.5-LE5**
		5	**567844**	**NEBU-M12W5-K-5-LE5**