

Flow sensors SFE...

FESTO



- Switch output
2xPNP or 2xNPN and analogue
output 1 ... 5 V
- Switching function freely
programmable
- 3-character digital display
- Variants suitable for vacuum

The new standard: Flow sensors SFE3/SFET

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Extremely compact ...

... while nonetheless offering everything that a sensor must: the SFE3 product family provides absolute flow information over a large measuring range. The threshold value and/or switching point can be adjusted either via an integrated or remote display.

Solves many problems

The SFE3 offers solutions for previously unresolved problems in the area of suction monitoring, flow monitoring, contact monitoring and leak checks.

Standardised range

Where previously time and cost-intensive in-house constructions were required, SFE3 and SFET now provide a standardized sensor program!

Flow rate sensors SFE3

Incredibly compact, extremely short response times and a broad measuring range: The perfect solution not only for the electronic, light assembly, optical and pharmaceutical industries.



Compact!



Slim!



Decentralised!

Measure flow – define threshold values – mark switching points

Always the right choice: flow sensors and transmitters SFE3/SFET. Designed for the electronics industry and/or small parts handling.

Advantages for designers

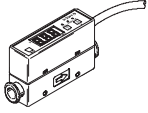
Advantages for users

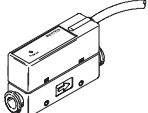
Universal compatibility	There are applications in the areas of suction monitoring, flow monitoring, contact monitoring and leak checks – with a wide measuring range of 0.05 ... 50 l/min.	Quick and easy commissioning	Thanks to the easy to understand display and control interface with handy 3-key operation and remote or integrated display.
Easier problem solving	Where previously complex solutions had to be constructed using pressure sensors, the SFE3 now provides an off-the-shelf solution.	Reliable	The SFE3 is a tested, standardized component, which you can just install and forget.
Reduced design costs	The SFE3 is a ready-to-install component – and the integrated QS push-in connectors make connecting to Festo pneumatics child's play.	Shorter cycle times with simultaneously reliable suction monitoring	These make possible the ultra-fast response times as well as the extremely high signal strokes, in comparison to pressure sensors.

Flow sensors SFE...

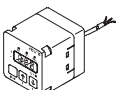
Product range overview

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Function	Design	Type	Operating pressure [bar]	Flow measuring range [l/min]	Switch output
Sensors with digital display		SFE3	-0.7 ... +7	0.05 ... 0.5	2xPNP
				0.1 ... 1 0.5 ... 5 1 ... 10 5 ... 50	2xNPN

Function	Design	Type	Operating pressure [bar]	Flow measuring range [l/min]	Switch output
Sensors with analogue output		SFET-F	-0.7 ... +7	0.05 ... 0.5 0.1 ... 1 0.5 ... 5 1 ... 10 5 ... 50	–

Function	Design	Type	Operating pressure [bar]	Flow measuring range [l/min]	Switch output
Sensors for vacuum with analogue output		SFET-R	-0.9 ... +2	-0.05 ... +0.05 -0.1 ... +0.1 -0.5 ... +0.5 -1 ... +1 -5 ... +5 -10 ... +10	–

Function	Design	Type	Operating pressure [bar]	Indicating range [l/min]		Switch output
				SFEV-F	SFEV-R	
Separate digital display for sensors SFET-F and SFET-R		SFEV-F SFEV-R	–	0.05 ... 0.5	-0.05 ... +0.05	2xPNP
				0.1 ... 1 0.5 ... 5 1 ... 10 5 ... 50	-0.1 ... +0.1 -0.5 ... +0.5 -1 ... +1 -5 ... +5 -10 ... +10	2xNPN

Flow sensors SFE...

Product range overview

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Type	Switching element function (NO/NC)	Switching function (Threshold value/Hysteresis)	Analogue output [V]	Free of copper, PTFE and silicone	→ Page
SFE3	Switchable	Freely programmable	1 ... 5	–	4 / 8.2-9
	Switchable	Freely programmable		–	

Type	Switching element function (NO/NC)	Switching function (Threshold value/Hysteresis)	Analogue output [V]	Free of copper, PTFE and silicone	→ Page
SFET-F	–	–	1 ... 5	–	4 / 8.2-11

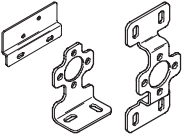
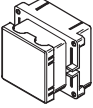
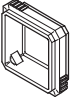
Type	Switching element function (NO/NC)	Switching function (Threshold value/Hysteresis)	Analogue output [V]	Free of copper, PTFE and silicone	→ Page
SFET-R	–	–	1 ... 5	–	4 / 8.2-13

Type	Switching element function (NO/NC)	Switching function (Threshold value/Hysteresis)	Analogue output [V]	Free of copper, PTFE and silicone	→ Page
SFEV-F SFEV-R	Switchable	Freely programmable	1 ... 5	–	4 / 8.2-15
	Switchable	Freely programmable		–	

Flow sensors SFE...

Product range overview – Accessories

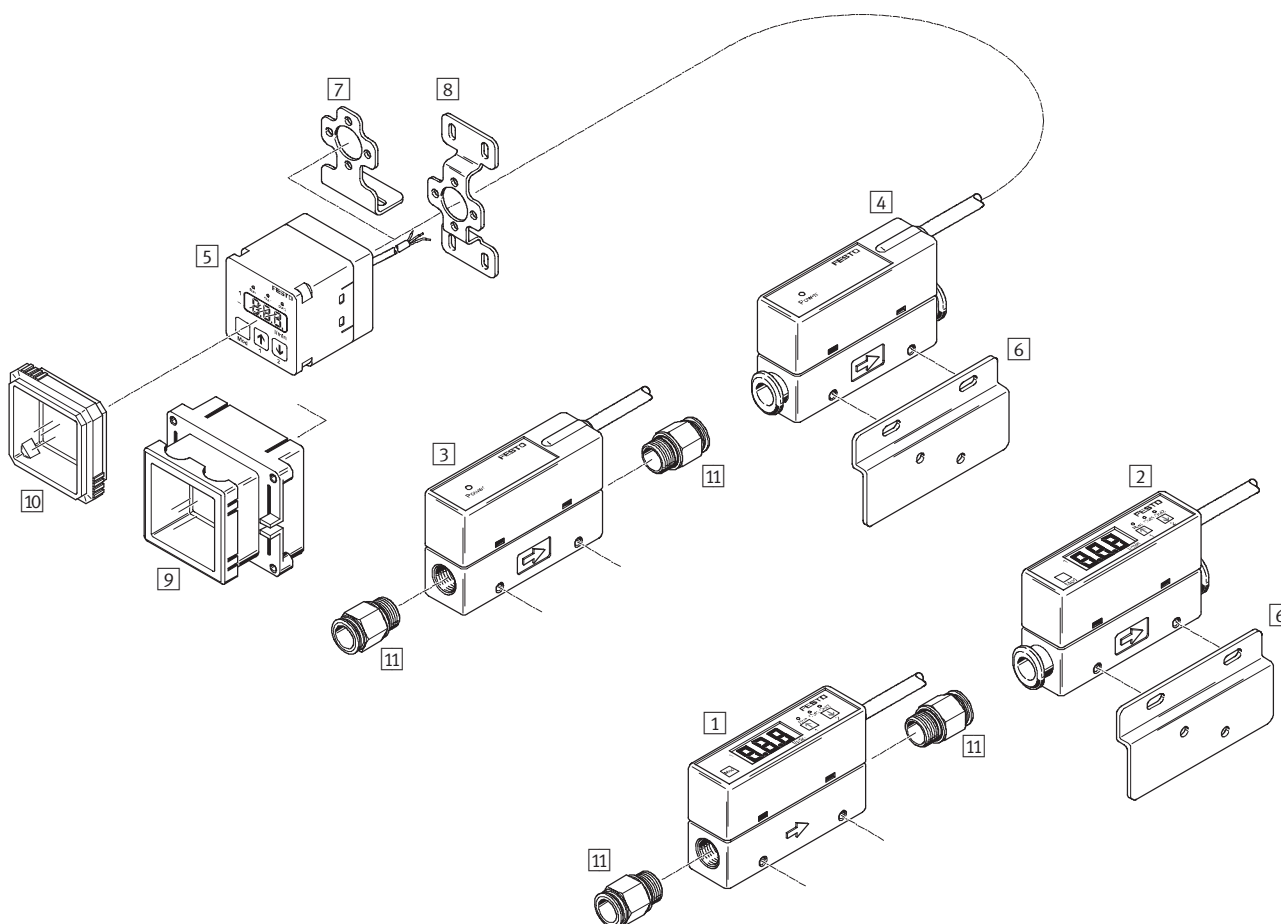
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Function	Design	Description	Free of copper, PTFE and silicone	→ Page
Mounting components		Wall mounting bracket	■	4 / 8.2-17
		Front panel installation kit	■	4 / 8.2-17
		Safety guard	■	4 / 8.2-17

Flow sensors SFE...

Peripherals overview

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Accessories	Brief description	→ Page
Flow sensors		
1 SFE3-...-W18-...	Flow sensors with integrated digital display, with female thread	4 / 8.2-9
2 SFE3-...-WQ...	Flow sensors with integrated digital display, with push-in fitting QS	
3 SFET-...-W18-...	Flow transmitter without display, with female thread	4 / 8.2-11
4 SFET-...-WQ...	Flow transmitter without display, with push-in fitting QS	
5 SFEV-...	Digital display for Flow transmitter	4 / 8.2-15
Mounting attachments		
6 Wall mounting bracket SFEZ-BW1		4 / 8.2-17
7 Wall mounting bracket SFEV-BW1		
8 Wall mounting bracket SFEV-WH1		
9 Front panel installation kit SFEV-FH1		
10 Safety guard SFEV-SH1		
11 Push-in fitting QS-1/8-...		

Flow sensors SFE...

Type codes

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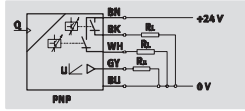
		SFE	3	-	F	100	-	L	-	W	Q6	-	2P	B	-	K1
Type																
SFE	Flow sensor															
Construction																
3	With integrated digital display															
T	Flow transmitter															
V	Separate digital display															
Direction of flow																
F	Mono-directional															
R	Bi-directional															
Flow measuring range [l/min]																
Mono-directional																
005	0.05 ... 0.5															
010	0.1 ... 1															
050	0.5 ... 5															
100	1 ... 10															
500	5 ... 50															
Bi-directional																
0005	-0.05 ... +0.05															
0010	-0.1 ... +0.1															
0050	-0.5 ... +0.5															
0100	-1 ... +1															
0500	-5 ... +5															
1000	-10 ... +10															
Calibration																
L	Air															
Mounting																
W	Wall or surface mounting															
Pneumatic connection																
Q4	Push-in fitting QS-4															
Q6	Push-in fitting QS-6															
18	Female thread G1/8															
Switch output																
2P	2x PNP															
2N	2x NPN															
Analogue output																
B	1 ... 5 V															
D	3 ± 2 V															
Length of the connecting cable																
K1	1 m															
K3	3 m															

Flow sensors SFE3...

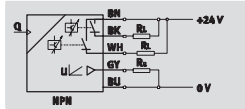
Technical data

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Function¹⁾



- 1) Can be switched between analogue output and switch output 2xPNP



- 1) Can be switched between analogue output and switch output 2xNPN

- Switch output 2x PNP or 2x NPN
- Analogue output 1 ... 5 V
- 3-character digital display



General technical data						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Indicating range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Type of display		3 1/2-character alphanumeric				
Reproducibility, analogue value FS	[%]	1				3
Reproducibility, switching value FS	[%]	1				3
Accuracy FS	[%]	8		5		
Pneumatic connection		QS-6				Female thread G1/8
Ready status display		-				
Type of mounting		Via through-holes				
Assembly position ¹⁾		Horizontal or vertical				

- 1) Measurement inaccuracies can occur if installed at an angle.

Electrical data	
Switch output	2x PNP or 2x NPN
Analogue output	[V] 1 ... 5
Switching element function	Switchable
Switching function	Freely programmable
Operating voltage range	[V DC] 12 ... 24
Load resistance	[kΩ] 50
Response time	[ms] 50
Electrical connection	Cable
Cable length	[m] 1
Protection class to EN 60 529	IP40
CE symbol	89/336/EEC (EMC)

Materials						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Housing		Polyamide				Aluminium
Cable sheath		Polyvinyl chloride				
Material note		Contains PWIS (Paint wetting impairment substances)				

Operating and environmental conditions	
Operating pressure	[bar] -0.7 ... +7
Operating medium	Compressed air, filtered, unlubricated, grade of filtration 0.01 µm
Temperature of medium	[°C] 0 ... 50
Ambient temperature	[°C] 0 ... 50
Corrosion resistance class CRC ¹⁾	2

- 1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

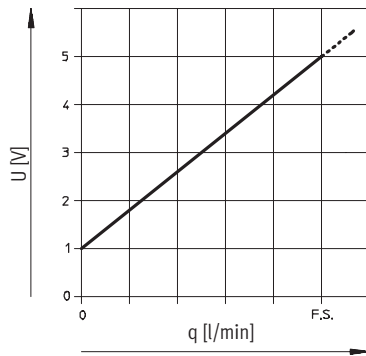
Flow sensors SFE3...

Technical data

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Weights [g]						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
		70				90

Analogue output as a function of flow

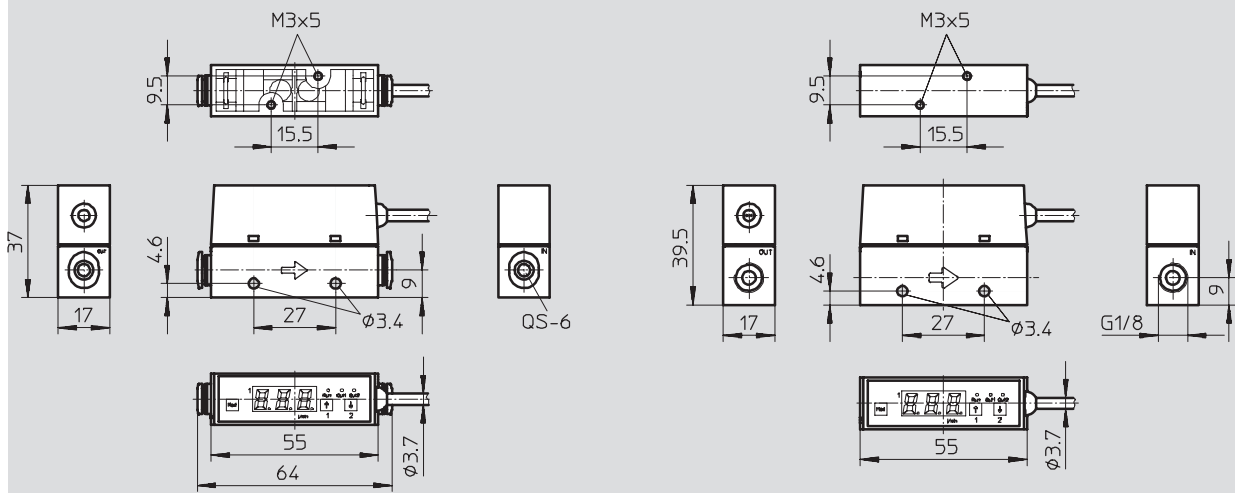


U Analogue output
q Flow

Dimensions

Push-in fitting QS-6

Female thread G $\frac{1}{8}$



Ordering data

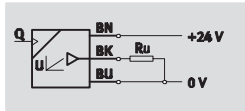
Switch output	Analogue output	Flow measuring range	Pneumatic connection		Part No.	Type
			Push-in fitting QS-6	Female thread G $\frac{1}{8}$		
	[V]	[l/min]				
Pressure range -0.7 ... +7 bar						
2x PNP	1 ... 5	0.05 ... 0.5	■	—	538 519	SFE3-F005-L-WQ6-2PB-K1
		0.1 ... 1	■	—	538 520	SFE3-F010-L-WQ6-2PB-K1
		0.5 ... 5	■	—	538 521	SFE3-F050-L-WQ6-2PB-K1
		1 ... 10	■	—	538 522	SFE3-F100-L-WQ6-2PB-K1
		5 ... 50	—	■	538 523	SFE3-F500-L-W18-2PB-K1
2x NPN	1 ... 5	0.05 ... 0.5	■	—	538 524	SFE3-F005-L-WQ6-2NB-K1
		0.1 ... 1	■	—	538 525	SFE3-F010-L-WQ6-2NB-K1
		0.5 ... 5	■	—	538 526	SFE3-F050-L-WQ6-2NB-K1
		1 ... 10	■	—	538 527	SFE3-F100-L-WQ6-2NB-K1
		5 ... 50	—	■	538 528	SFE3-F500-L-W18-2NB-K1

Flow sensors SFET-F...

Technical data

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Function¹⁾



1) With analogue output

- Analogue output 1 ... 5 V
- To connect a separate digital display SFEV-F...



General technical data						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Indicating range	[l/min]	–				
Type of display		–				
Reproducibility, analogue value FS	[%]	1				3
Reproducibility, switching value FS	[%]	–				–
Linearity error FS	[%]	8	5			
Accuracy FS	[%]	–				
Pneumatic connection		QS-6				Female thread G1/8
Ready status display		LED				
Type of mounting		Via through-holes				
Assembly position ¹⁾		Horizontal or vertical				

1) Measurement inaccuracies can occur if installed at an angle.

Electrical data	
Switch output	–
Analogue output	[V] 1 ... 5
Switching element function	–
Switching function	–
Operating voltage range	[V DC] 12 ... 24
Load resistance	[kΩ] 50
Response time	[ms] 50
Electrical connection	Cable
Cable length	[m] 1
Protection class to EN 60 529	IP40
CE symbol	–

Materials	
Flow measuring range	[l/min] 0.05 ... 0.5 0.1 ... 1 0.5 ... 5 1 ... 10 5 ... 50
Housing	Polyamide Aluminium, polyamide
Cable sheath	Polyvinyl chloride
Material note	Contains PWIS (Paint wetting impairment substances)

Operating and environmental conditions	
Operating pressure	[bar] –0.7 ... +7
Operating medium	Compressed air, filtered, unlubricated, grade of filtration 0.01 µm
Temperature of medium	[°C] 0 ... 50
Ambient temperature	[°C] 0 ... 50
Corrosion resistance class CRC ¹⁾	2

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

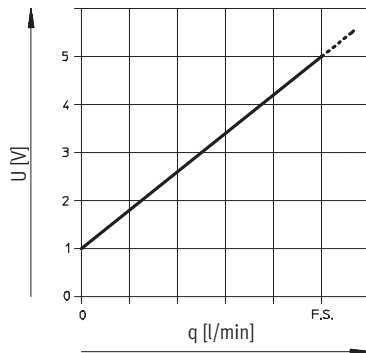
Flow sensors SFET-F...

Technical data

FESTO

Weights [g]						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
		70				90

Analogue output as a function of flow

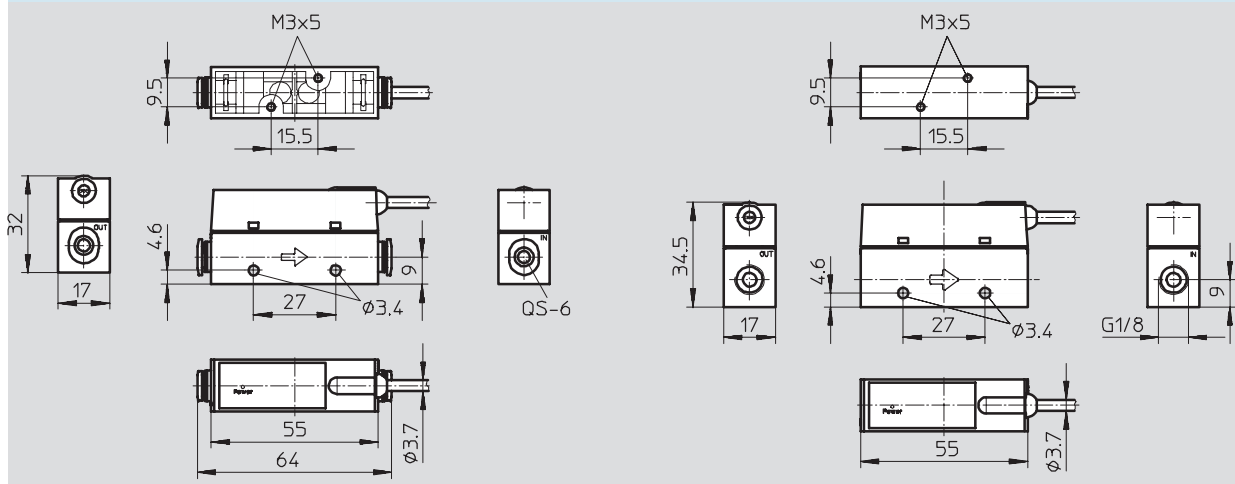


U Analogue output
q Flow

Dimensions

Push-in fitting QS-6

Female thread G1/8



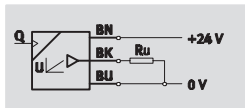
Ordering data						
Switch output	Analogue output [V]	Flow measuring range [l/min]	Pneumatic connection		Part No.	Type
			Push-in fitting QS-6	Female thread G1/8		
Pressure range -0.7 ... +7 bar						
-	1 ... 5	0.05 ... 0.5	■	-	538 529	SFET-F005-L-WQ6-B-K1
		0.1 ... 1	■	-	538 530	SFET-F010-L-WQ6-B-K1
		0.5 ... 5	■	-	538 531	SFET-F050-L-WQ6-B-K1
		1 ... 10	■	-	538 532	SFET-F100-L-WQ6-B-K1
		5 ... 50	-	■	538 533	SFET-F500-L-W18-B-K1

Flow sensors SFET-R...

Technical data

FESTO

Function¹⁾



1) With analogue output

- Suitable for vacuum
- Bi-directional flow
- Analogue output 1 ... 5 V
- To connect a separate digital display SFEV-R...



General technical data							
Flow measuring range	[l/min]	-0.05 ... +0.05	-0.1 ... +0.1	-0.5 ... +0.5	-1 ... +1	-5 ... +5	-10 ... +10
Indicating range	[l/min]	-					
Type of display		-					
Reproducibility, analogue value FS	[%]	1					2
Reproducibility, switching value FS	[%]	-					
Linearity error FS	[%]	5					
Accuracy FS	[%]	-					
Pneumatic connection		QS-4					
Ready status display		LED					
Type of mounting		Via through-holes					
Assembly position ¹⁾		Horizontal or vertical					

1) Measurement inaccuracies can occur if installed at an angle.

Electrical data	
Switch output	-
Analogue output [V]	1 ... 5
Switching element function	-
Switching function	-
Operating voltage range [V DC]	12 ... 24
Load resistance [kΩ]	50
Response time [ms]	5
Electrical connection	Cable
Cable length [m]	3
Protection class to EN 60 529	IP40
CE symbol	89/336/EEC (EMC)

Materials	
Housing	Polyamide
Cable sheath	Polyvinyl chloride
Material note	Contains PWIS (Paint wetting impairment substances)

Flow sensors SFET-R...

Technical data

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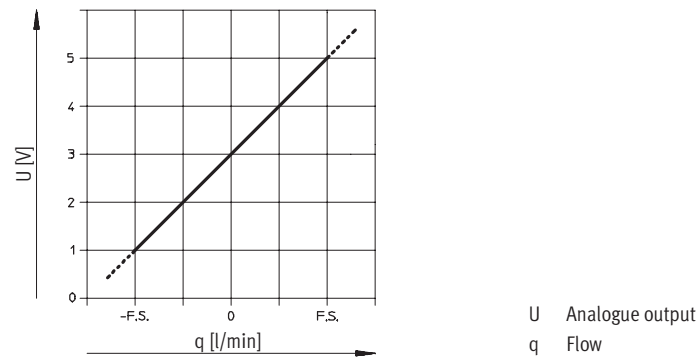
Operating and environmental conditions		
Operating pressure	[bar]	−0.9 ... 2
Operating medium		Compressed air, filtered, unlubricated, grade of filtration 0.01 µm
Temperature of medium	[°C]	0 ... 50
Ambient temperature	[°C]	0 ... 50
Corrosion resistance class CRC ¹⁾		2

1) Corrosion resistance class 2 according to Festo standard 940 070

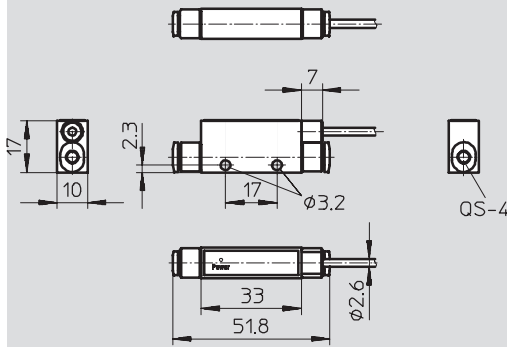
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Weights [g]	
	25

Analogue output as a function of flow



Dimensions



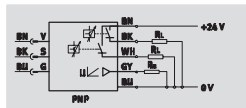
Ordering data					
Switch output	Analogue output [V]	Flow measuring range [l/min]	Pneumatic connection Push-in fitting QS-4	Part No.	Type
Pressure range -0.9 ... +2 bar					
–	1 ... 5	−0.05 ... +0.05	■	538 534	SFET-R0005-L-WQ4-D-K3
		−0.1 ... +0.1	■	538 535	SFET-R0010-L-WQ4-D-K3
		−0.5 ... +0.5	■	538 536	SFET-R0050-L-WQ4-D-K3
		−1 ... +1	■	538 537	SFET-R0100-L-WQ4-D-K3
		−5 ... +5	■	538 538	SFET-R0500-L-WQ4-D-K3
		−10 ... +10	■	538 539	SFET-R1000-L-WQ4-D-K3

Flow sensors SFEV-...

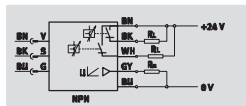
Technical data

FESTO

Function¹⁾



1) Can be switched between analogue output and switch output 2xPNP



1) Can be switched between analogue output and switch output 2xNPN

- Switch output 2x PNP or 2x NPN
- Analogue output 1 ... 5 V
- 3-character digital display
- Separate display for connection with flow sensors SFET-F... or SFET-R...



General technical data								
Indicating range	For SFET-F...	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50	–
	For SFET-R...	[l/min]	–0.05 ... +0.05	–0.1 ... +0.1	–0.5 ... +0.5	–1 ... +1	–5 ... +5	–10 ... +10
Type of display			3 1/2-character alphanumeric					
Reproducibility, analogue value FS		[%]	–					
Reproducibility, switching value FS		[%]	–					
Linearity error FS		[%]	–					
Accuracy FS		[%]	–					
Pneumatic connection			–					
Ready status display			–					
Type of mounting			With mounting bracket					
Assembly position			–					

Electrical data		
Switch output		2x PNP or 2x NPN
Analogue output	[V]	1 ... 5
Switching element function		Switchable
Switching function		Freely programmable
Operating voltage range	[V DC]	12 ... 24
Load resistance	[kΩ]	50
Response time	[ms]	–
Electrical connection		Cable
Cable length	[m]	1
Protection class to EN 60 529		IP40
CE symbol		–

Materials	
Housing	Polyamide
Cable sheath	Polyvinyl chloride
Material note	Contains PWIS (Paint wetting impairment substances)

Operating and environmental conditions		
Operating pressure	[bar]	–
Operating medium		–
Temperature of medium	[°C]	–
Ambient temperature	[°C]	0 ... 50
Corrosion resistance class CRC ¹⁾		2

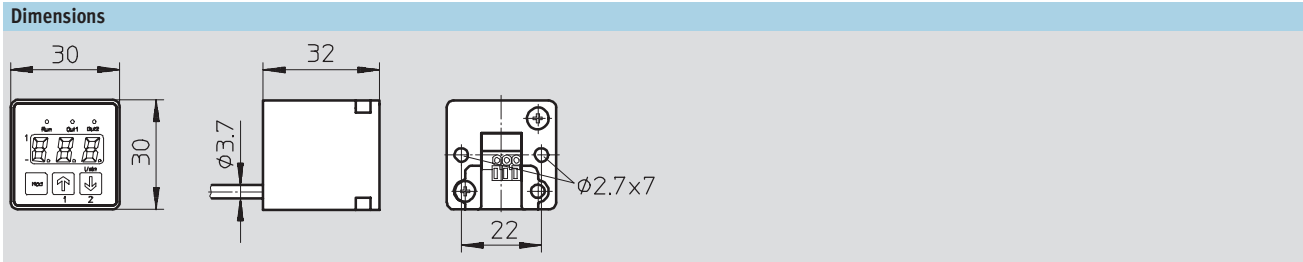
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Flow sensors SFEV--...

Technical data

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Weights [g]	
	70



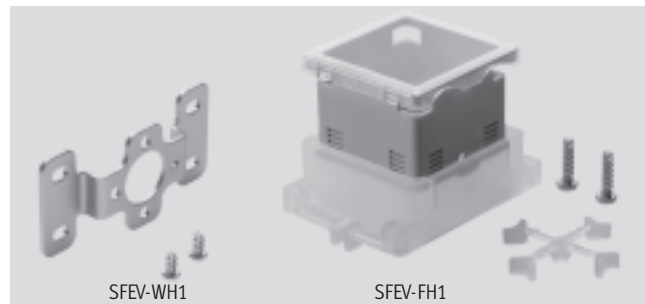
Ordering data				
Switch output	Analogue output [V]	Indicating range [l/min]	Part No.	Type
For sensors SFET-F with analogue output				
2x PNP	1 ... 5	0.05 ... 0.5	538 540	SFEV-F005-L-2PB-K1
		0.1 ... 1	538 541	SFEV-F010-L-2PB-K1
		0.5 ... 5	538 542	SFEV-F050-L-2PB-K1
		1 ... 10	538 543	SFEV-F100-L-2PB-K1
		5 ... 50	538 544	SFEV-F500-L-2PB-K1
2x NPN	1 ... 5	0.05 ... 0.5	538 545	SFEV-F005-L-2NB-K1
		0.1 ... 1	538 546	SFEV-F010-L-2NB-K1
		0.5 ... 5	538 547	SFEV-F050-L-2NB-K1
		1 ... 10	538 548	SFEV-F100-L-2NB-K1
		5 ... 50	538 549	SFEV-F500-L-2NB-K1
For sensors SFET-R with analogue output				
2x PNP	1 ... 5	-0.05 ... +0.05	538 550	SFEV-R0005-L-2PD-K1
		-0.1 ... +0.1	538 551	SFEV-R0010-L-2PD-K1
		-0.5 ... +0.5	538 552	SFEV-R0050-L-2PD-K1
		-1 ... +1	538 553	SFEV-R0100-L-2PD-K1
		-5 ... +5	538 554	SFEV-R0500-L-2PD-K1
		-10 ... +10	538 555	SFEV-R1000-L-2PD-K1
2x NPN	1 ... 5	-0.05 ... +0.05	538 556	SFEV-R0005-L-2ND-K1
		-0.1 ... +0.1	538 557	SFEV-R0010-L-2ND-K1
		-0.5 ... +0.5	538 558	SFEV-R0050-L-2ND-K1
		-1 ... +1	538 559	SFEV-R0100-L-2ND-K1
		-5 ... +5	538 560	SFEV-R0500-L-2ND-K1
		-10 ... +10	538 561	SFEV-R1000-L-2ND-K1

Flow sensors SFE...

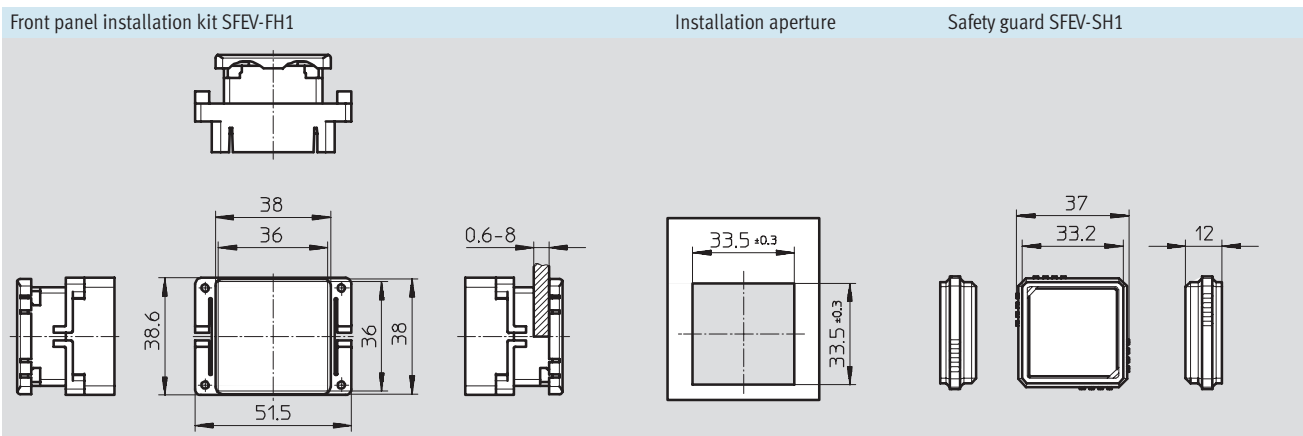
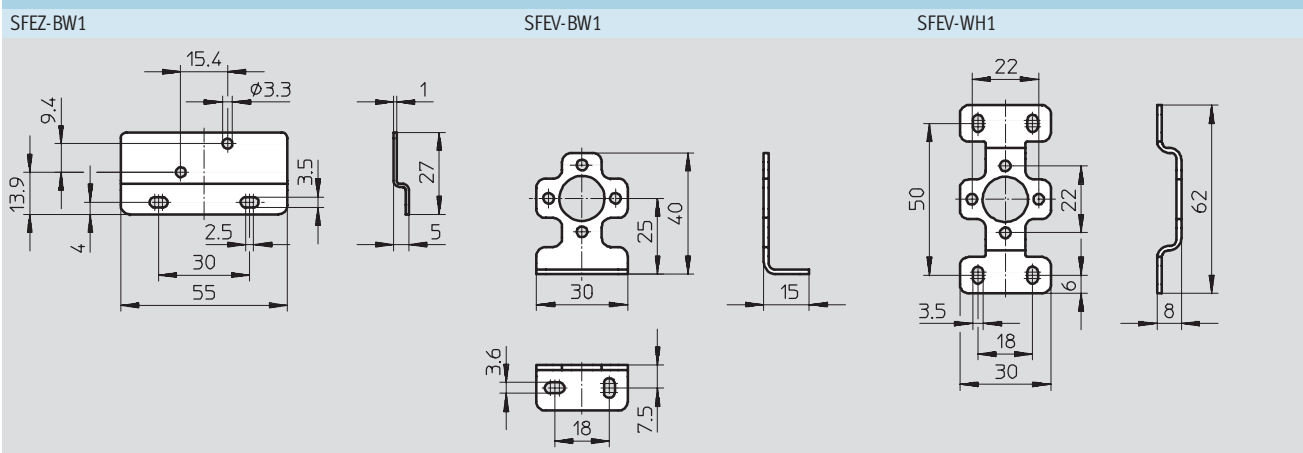
Accessories

FESTO

Mounting components



Dimensions



Ordering data						
Designation	Use	Material	Weight [g]	Free of copper, PTFE and silicone	Part No.	Type
Wall mounting bracket	Flow sensors SFE3, SFET	Steel, nickel-plated	17	■	538 562	SFEZ-BW1
	Digital display SFEV		16	■	538 563	SFEV-BW1
			16	■	538 564	SFEV-WH1
Front panel installation kit	Digital display SFEV	Polyamide, reinforced	18	■	538 565	SFEV-FH1
Safety guard			6	■	538 566	SFEV-SH1