

Flow sensors SFE...

Product overview

FESTO



- Switch outputs 2x PNP or 2x NPN and analogue output 1 ... 5 V
- Switching function freely programmable
- 3½-character digital display
- Variants suitable for vacuum

Detailed product information

→ www.festo.com/catalogue/sfe

Product range overview – Flow sensors						
Operating pressure [bar]	Flow measuring range [l/min]		Pneumatic connection	Type of mounting	Electrical output	
					Digital	Analogue
Flow sensor SFE3 with integrated digital display						
-0.7 ... +7	0.05 ... 0.5	0.1 ... 1	Female thread G1/8 Push-in fitting for tubing OD 6 mm	Via through-hole With mounting bracket	2x PNP 2x NPN	1 ... 5 V
	0.5 ... 5	1 ... 10				
	5 ... 50					
Flow transmitter SFET-F, mono-directional						
-0.7 ... +7	0.05 ... 0.5	0.1 ... 1	Female thread G1/8 Push-in fitting for tubing OD 6 mm	Via through-hole With mounting bracket	2x PNP 2x NPN	1 ... 5 V
	0.5 ... 5	1 ... 10				
	5 ... 50					
Flow transmitter SFET-R, bidirectional						
-0.9 ... +2	-0.05 ... +0.05	-0.1 ... +0.1	Push-in fitting for tubing OD 4 mm	Via through-hole With mounting bracket	2x PNP 2x NPN	1 ... 5 V
	-0.5 ... +0.5	-1 ... +1				
	-5 ... +5	-10 ... +10				

Product range overview – Flow indicator SFEV for SFET-F and SFET-R						
	Indicating range [l/min]		Electrical connection	Type of mounting	Electrical output	
					Digital	Analogue
For flow transmitter SFET-F	0.05 ... 0.5	0.1 ... 1	Cable	With mounting bracket Front panel mounting	2x PNP 2x NPN	1 ... 5 V
	0.5 ... 5	1 ... 10				
	5 ... 50					
For flow transmitter SFET-R	-0.05 ... +0.05	-0.1 ... +0.1	Cable	With mounting bracket Front panel mounting	2x PNP 2x NPN	1 ... 5 V
	-0.5 ... +0.5	-1 ... +1				
	-5 ... +5	-10 ... +10				

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Type codes

SFE 3 - F 100 - L - W Q6 - 2P B - K1

Type	
SFE	Flow sensor

Design	
3	With integrated digital display
T	Flow transmitter
V	Separate digital display

Direction of flow	
F	Mono-directional
R	Bidirectional

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
Bidirectional	
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 connector QS-4
Q6	Push-in connector QS-6
18	Female thread G $\frac{1}{8}$

Switch output	
2P	2x PNP
2N	2x NPN

Analogue output	
B	1 ... 5 V
D	3 \pm 2 V

Length of the connecting cable	
K1	1 m
K3	3 m

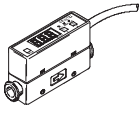
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Technical data – With integrated digital display

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Technical data						
Design						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Pneumatic connection		QS-6				Female thread G $\frac{1}{8}$
Type of display		3 1/2-character alphanumeric				
Accuracy FS ¹⁾	[%]	8	5			
Electrical data						
Switch output		2x PNP				
		2x NPN				
Analogue output	[V]	1 ... 5				
Switching element function		Switchable				
Switching function		Freely programmable				
Operating voltage range DC	[V]	12 ... 24				
Electrical connection		Cable				
Operating and environmental conditions						
Operating pressure	[bar]	-0.7 ... +7				
Operating medium		Filtered compressed air, unlubricated, grade of filtration 0.01 μ m				
Ambient temperature	[°C]	0 ... 50				
CE mark (see declaration of conformity)		In accordance with EU EMC directive				
Protection class		IP40				
Materials						
Housing		Polyamide				Polyamide, aluminium
Cable sheath		Polyvinyl chloride				

1) % FS = % of measuring range's final value (full scale)

Ordering data							
Variant	Operating pressure [bar]	Analogue output [V]	Flow measuring range [l/min]	Switch output			
				2x PNP		2x NPN	
				Part No.	Type	Part No.	Type
	-0.7 ... +7	1 ... 5	0.05 ... 0.5	538 519	SFE3-F005-L-WQ6-2PB-K1	538 524	SFE3-F005-L-WQ6-2NB-K1
			0.1 ... 1	538 520	SFE3-F010-L-WQ6-2PB-K1	538 525	SFE3-F010-L-WQ6-2NB-K1
			0.5 ... 5	538 521	SFE3-F050-L-WQ6-2PB-K1	538 526	SFE3-F050-L-WQ6-2NB-K1
			1 ... 10	538 522	SFE3-F100-L-WQ6-2PB-K1	538 527	SFE3-F100-L-WQ6-2NB-K1
			5 ... 50	538 523	SFE3-F500-L-W18-2PB-K1	538 528	SFE3-F500-L-W18-2NB-K1

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Technical data – Without digital display



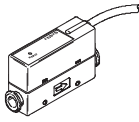
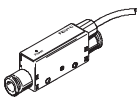
General technical data		
Electrical data		
Analogue output	[V]	1 ... 5
Operating voltage range DC	[V]	12 ... 24
Electrical connection		Cable
Operating and environmental conditions		
Operating medium		Filtered compressed air, unlubricated, grade of filtration 0.01µm
Ambient temperature	[°C]	0 ... 50
Protection class		IP40

Technical data – Mono-directional						
Flow measuring range	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50
Pneumatic connection		QS-6				Female thread G $\frac{1}{8}$
Linearity error FS ¹⁾	[%]	8	5			
Operating pressure	[bar]	-0.7 ... +7				
CE mark (see declaration of conformity)		In accordance with EU EMC directive				
Housing		Polyamide				Polyamide, aluminium
Cable sheath		Polyvinyl chloride				

1) % FS = % of measuring range's final value (full scale)

Technical data – Bidirectional							
Flow measuring range	[l/min]	-0.05 ... +0.05	-0.1 ... +0.1	-0.5 ... +0.5	-1 ... +1	-5 ... +5	-10 ... +10
Pneumatic connection		QS-4					
Linearity error FS ¹⁾	[%]	5					
Operating pressure	[bar]	-0.7 ... +7					
CE mark (see declaration of conformity)		In accordance with EU EMC directive					
Housing		Polyamide					
Cable sheath		Polyvinyl chloride					

1) % FS = % of measuring range's final value (full scale)

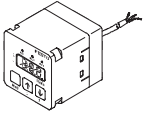
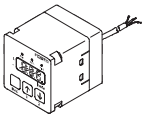
Ordering data						
Variant	Operating pressure [bar]	Analogue output [V]	Flow measuring range [l/min]	Part No.	Type	
Mono-directional						
	-0.7 ... +7	1 ... 5	0.05 ... 0.5	538 529	SFET-F005-L-WQ6-B-K1	
			0.1 ... 1	538 530	SFET-F010-L-WQ6-B-K1	
			0.5 ... 5	538 531	SFET-F050-L-WQ6-B-K1	
			1 ... 10	538 532	SFET-F100-L-WQ6-B-K1	
			5 ... 50	538 533	SFET-F500-L-W18-B-K1	
Bidirectional						
	-0.9 ... +2	3 ± 2	-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	

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Technical data – Flow indicator

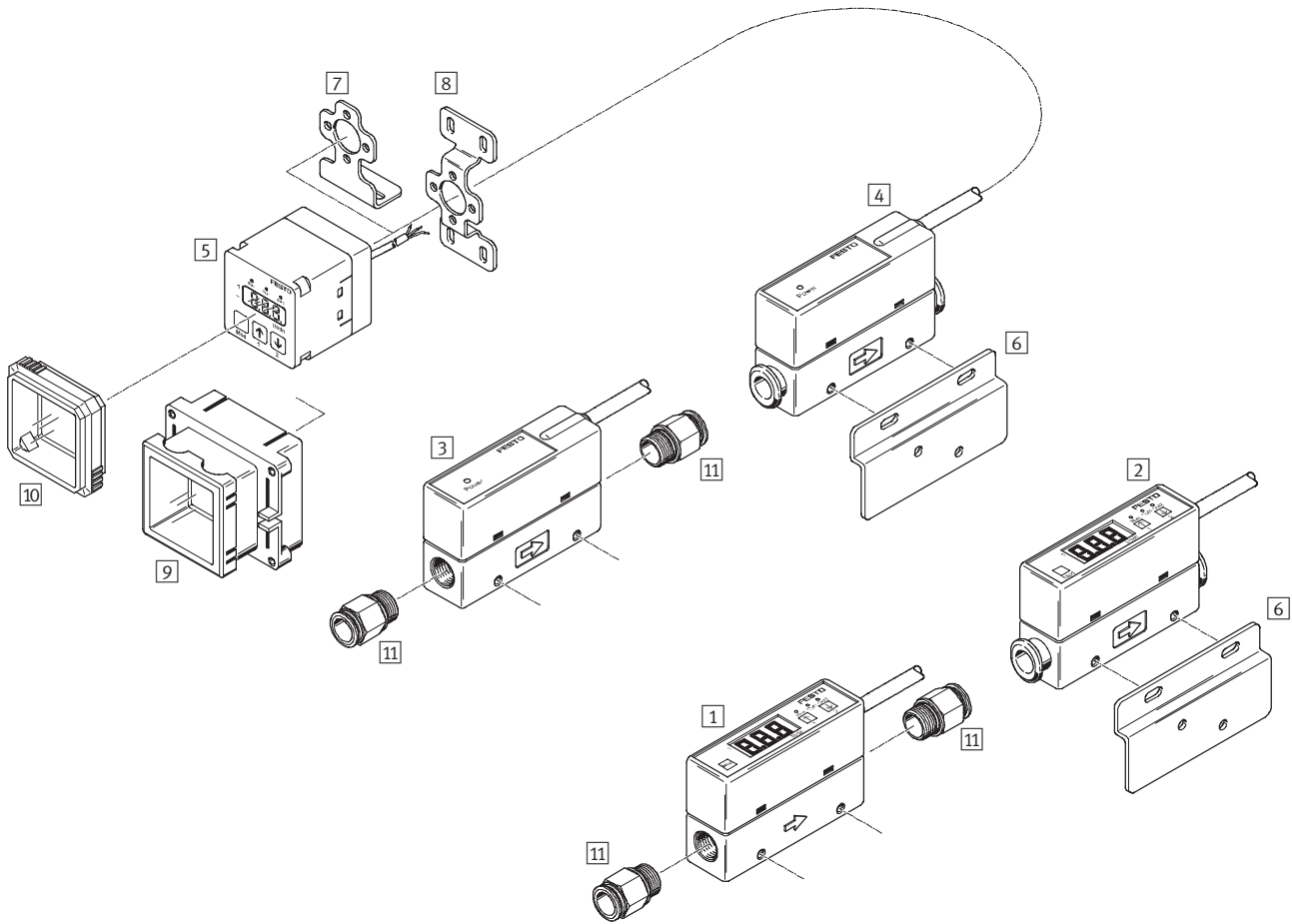
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Technical data								
Design								
Indicating range	For SFET-F	[l/min]	0.05 ... 0.5	0.1 ... 1	0.5 ... 5	1 ... 10	5 ... 50	–
	For SFET-R	[l/min]	–0.05 ... +0.05	–0.1 ... +0.1	–0.5 ... +0.5	–1 ... +1	–5 ... +5	–10 ... +10
Type of display	3 1/2-character alphanumeric							
Electrical data								
Switch output	2x PNP							
	2x NPN							
Analogue output	[V]	1 ... 5						
Switching element function	Switchable							
Switching function	Freely programmable							
Operating voltage range DC	[V]	12 ... 24						
Electrical connection	Cable							
Operating and environmental conditions								
Ambient temperature	[°C]	0 ... 50						
CE mark (see declaration of conformity)	In accordance with EU EMC directive							
Protection class	IP40							
Materials								
Housing	Polyamide							
Cable sheath	Polyvinyl chloride							

Ordering data						
Variant	Analogue output [V]	Indicating range [l/min]	Switch output			
			2x PNP		2x NPN	
			Part No.	Type	Part No.	Type
For sensors SFET-F with analogue output						
	1 ... 5	0.05 ... 0.5	538 540	SFEV-F005-L-2PB-K1	538 545	SFEV-F005-L-2NB-K1
		0.1 ... 1	538 541	SFEV-F010-L-2PB-K1	538 546	SFEV-F010-L-2NB-K1
		0.5 ... 5	538 542	SFEV-F050-L-2PB-K1	538 547	SFEV-F050-L-2NB-K1
		1 ... 10	538 543	SFEV-F100-L-2PB-K1	538 548	SFEV-F100-L-2NB-K1
		5 ... 50	538 544	SFEV-F500-L-2PB-K1	538 549	SFEV-F500-L-2NB-K1
For sensors SFET-R with analogue output						
	3 ± 2	–0.05 ... +0.05	538 550	SFEV-R0005-L-2PD-K1	538 556	SFEV-R0005-L-2ND-K1
		–0.1 ... +0.1	538 551	SFEV-R0010-L-2PD-K1	538 557	SFEV-R0010-L-2ND-K1
		–0.5 ... +0.5	538 552	SFEV-R0050-L-2PD-K1	538 558	SFEV-R0050-L-2ND-K1
		–1 ... +1	538 553	SFEV-R0100-L-2PD-K1	538 559	SFEV-R0100-L-2ND-K1
		–5 ... +5	538 554	SFEV-R0500-L-2PD-K1	538 560	SFEV-R0500-L-2ND-K1
		–10 ... +10	538 555	SFEV-R1000-L-2PD-K1	538 561	SFEV-R1000-L-2ND-K1

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Peripherals overview



Accessories	
1	Flow sensor SFE3-...-W18 with female thread
2	Flow sensor SFE3-...-WQ... with QS push-in connector
3	Flow transmitter SFET-...-W18 with female thread
4	Flow transmitter SFET-...-WQ... with QS push-in connector
5	Digital display SFEV for flow transmitter

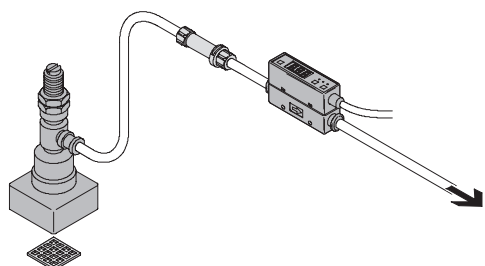
Accessories	
6	Mounting bracket SFEZ-BW1
7	Mounting bracket SFEV-BW1
8	Mounting bracket SFEV-WH1
9	Front panel installation kit SFEV-FH1
10	Safety guard SFEV-SH1
11	Push-in fitting QS-1/8

Ordering data – Accessories			
	Description	Part No.	Type
	Mounting bracket	538 562	SFEZ-BW1
		538 563	SFEV-BW1
		538 564	SFEV-WH1
	Front panel installation kit	538 565	SFEV-FH1
	Safety guard	538 566	SFEV-SH1

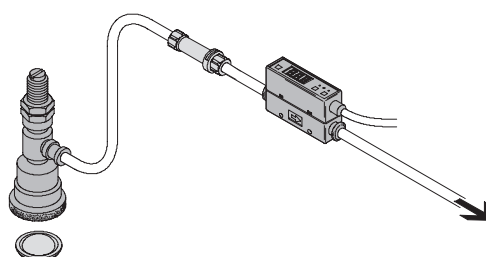
Ordering data – Push-in fittings		Technical data → www.festo.com	
	For tubing O.D. [mm]	Part No.	Type
	4	186 095	QS-G1/8-4
	6	186 096	QS-G1/8-6
	8	186 098	QS-G1/8-8

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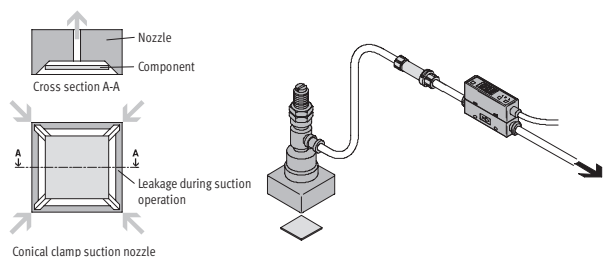
Application examples



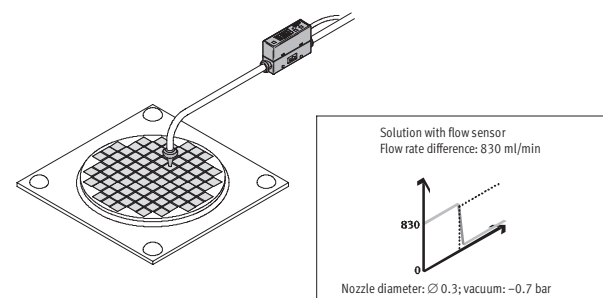
- Placement monitoring of lattice components with a small contact surface



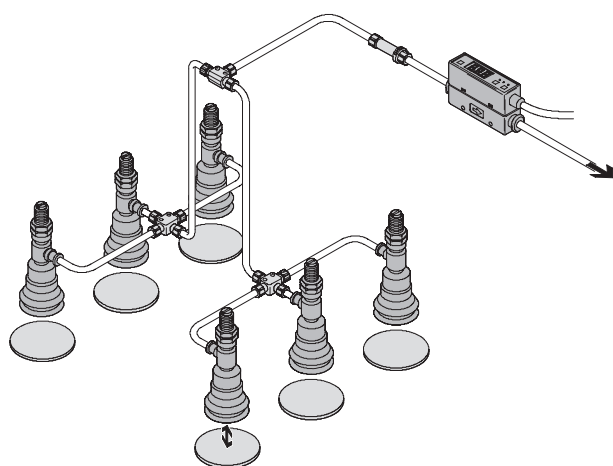
- Placement monitoring of components with delicate surfaces



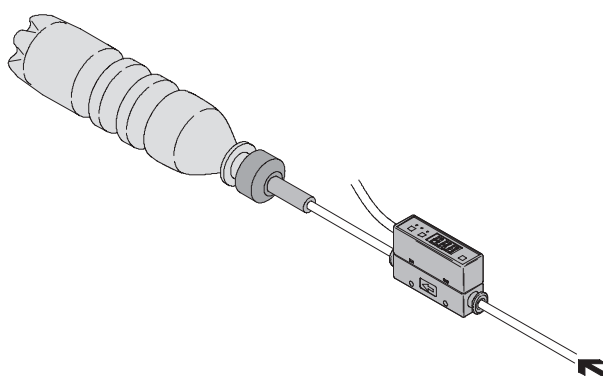
- Placement monitoring of a component with conical clamp nozzle (concentrated support)



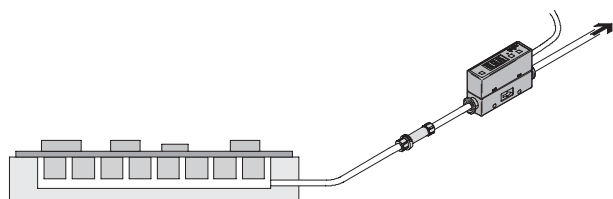
- Detection of very small parts (<1 mm) with a flow sensor suitable for a vacuum.



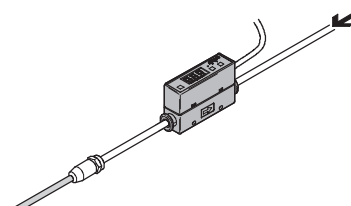
- Vacuum monitoring of multiple components with just one flow sensor on a suction cup array



- Leak testing of plastic bottles



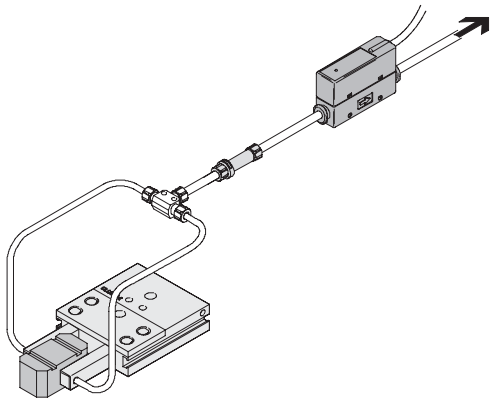
- Used as an air gap sensor for monitoring the gap between the printed circuit board and hotplate



- Checking the continuity and diameter of hypodermic needles

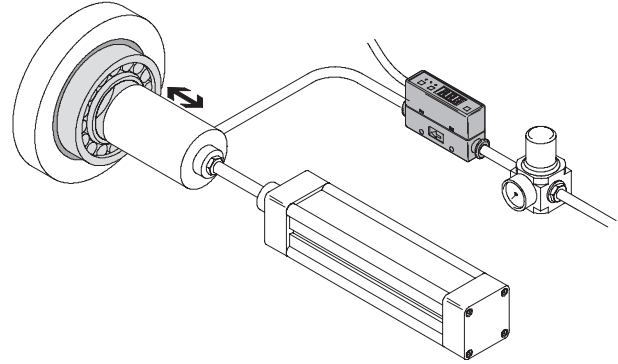
Flow sensors SFE...

Application examples

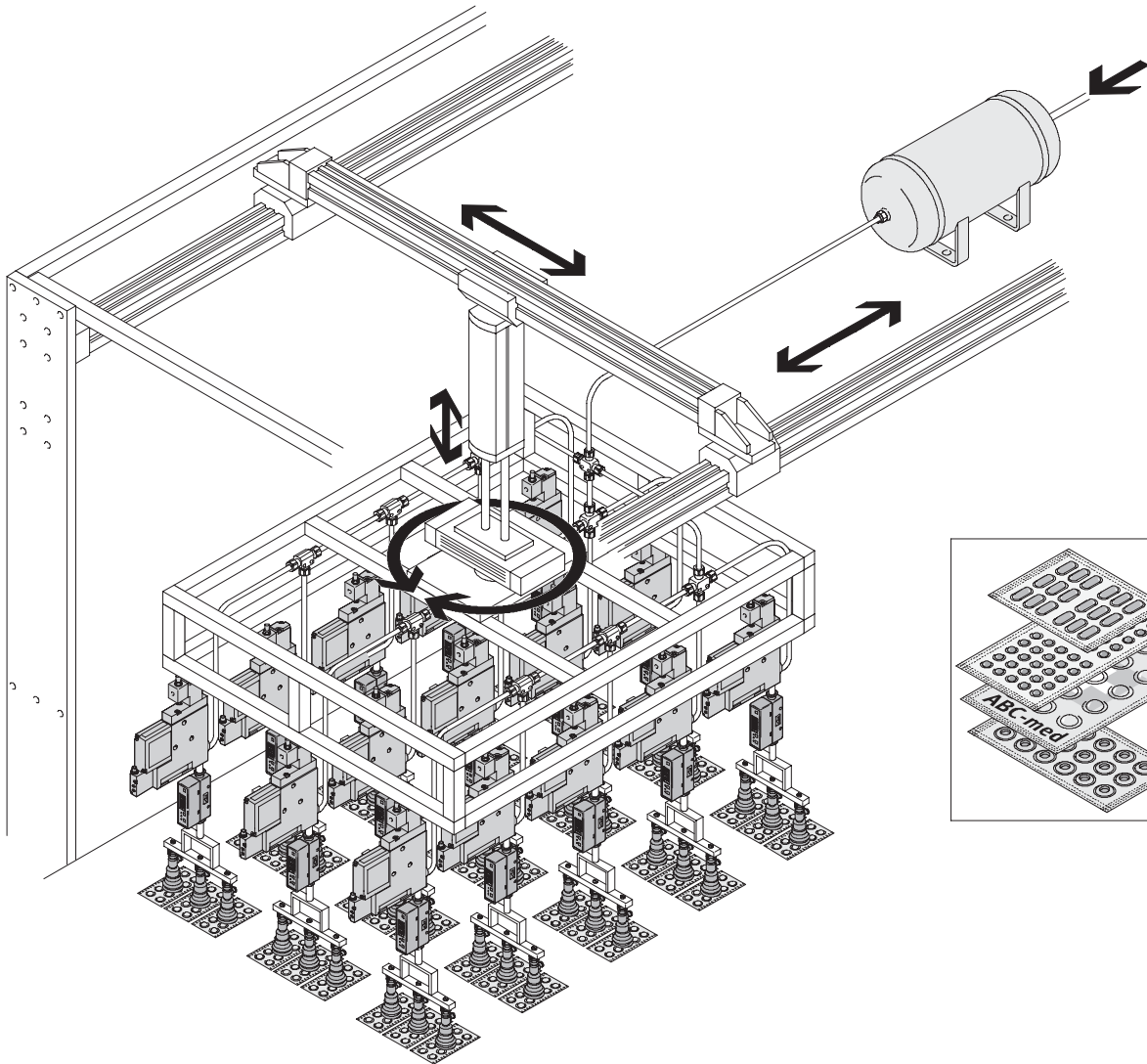


- Gripper sensing with flow sensor SFE3/SFET. Essential, when other

measuring systems cannot be used, e.g. with magnetised components.



- Quality inspection "Seal present and OK" when inserting bearings into the fixture



- Vacuum monitoring of the suction cup arrays, used to handle blister

packaging in the pharmaceuticals industry

