

Air gap sensors SOPA

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Product range overview

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Key features

General

Lightweight, compact and highly precise, this pneumatic solution offers impressive scope for integration: SOPA features a control module, compressed air regulation, measurement air switch-off and air jet function as well as up to four measuring modules. All in all, an attractively priced solution for low tolerances.

Precise

The air gap sensor SOPA senses exactly in the μm range whether the workpiece is lying flat or resting against other workpieces before clamping and whether the machining tool is exactly aligned on the spindle. Two different distance values can be sensed with one measuring module. The solution for two-stage workpiece machining with different surface finishes.

Easy to use

Lightweight, compact and simple into the bargain: thanks to parameterisation via teach-in or numerical setting using three buttons. Simple assembly and commissioning thanks to the inclusion of virtually unregulated compressed air and an integrated air jet function that needs no additional peripheral devices.

Reliable and flexible

The multi-coloured LCD display with clear operating status indication ensures maximum reliability, while selectable monitoring points (1 to 4) and further functions make the application extremely flexible.

Individual sensor module



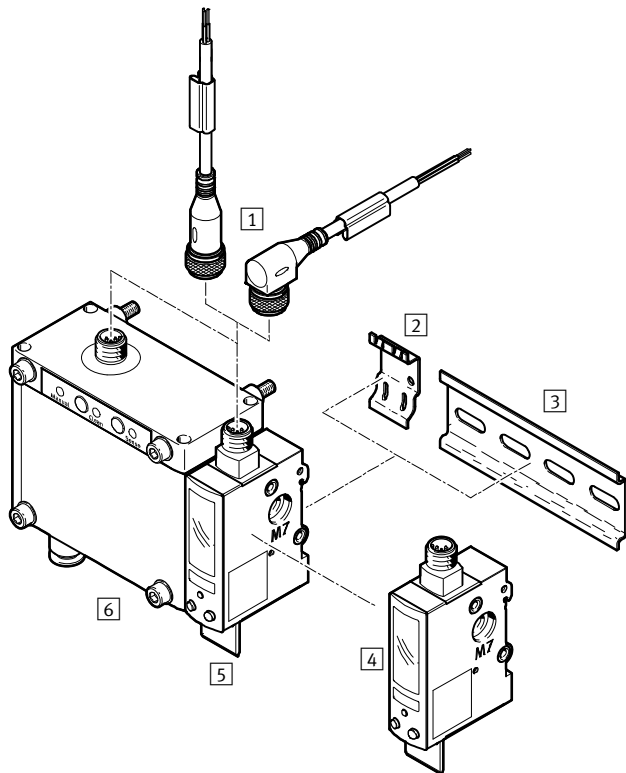
- Sensing range 20 ... 200 μm
- Switch outputs 2x PNP or 2x NPN
- Sensing of two distance values possible
- Integrated air jet function
- Two-colour LCD display
- 2 distance thresholds, for teach-in

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Peripherals overview



Peripherals overview



Accessories

1	Connecting cable for switch output
2	Adapter plate SXE3-W (2 included in scope of delivery with SOPA-...-W-...)
3	Mounting rail to DIN EN 60715
4	Sensor module SOPA-M1-...
5	Inscription label holder SXE3 (included in scope of delivery)
6	Control module with one sensor module SOPA-CM1-...

Ordering data – Connecting cables M12x1

Technical data → Internet: [nebu](#)

	Number of wires	Cable length [m]	Part No.	Type
Straight socket				
	4	2.5	550326	NEBU-M12G5-K-2.5-LE4
		5	541328	NEBU-M12G5-K-5-LE4
Angled socket				
	4	2.5	550325	NEBU-M12W5-K-2.5-LE4
		5	541329	NEBU-M12W5-K-5-LE4

Ordering data – Adapter plate

	Part No.	Type
	540214	SXE3-W

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Type codes

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		SOPA	-	CM1	H	-	R1	-	H	Q6	-	2P	-	M12	-	E1															
Function																															
SOPA	Air gap sensor for contact and distance monitoring via LCD display																														
Modules																															
CM1	Control module with one sensor module																														
CM2	Control module with two sensor modules, pneumatically interlinked																														
CM3	Control module with three sensor modules, pneumatically interlinked																														
CM4	Control module with four sensor modules, pneumatically interlinked																														
M1	Sensor module																														
Manual override for control module																															
H	With manual override																														
Distance sensing range																															
R1	20 ... 200 µm																														
Type of mounting																															
H	H-rail mounting/through-hole																														
W	Additional wall mounting																														
Pneumatic connection																															
Q6	Push-in connector QS-6																														
Electrical output																															
2P	2 switch outputs PNP																														
2N	2 switch outputs NPN																														
Electrical connection																															
M12	Plug M12x1, A-coded																														
Electrical accessories																															
E1	Straight socket, cable 2.5 m																														
E2	Straight socket, cable 5 m																														
E3	Angled socket, cable 2.5 m																														
E4	Angled socket, cable 5 m																														

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Technical data

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Technical data				
Type	SOPA-M1-...		SOPA-CM...-...-H...	SOPA-CM...-...-W...
Sensing range	[µm]	20 ... 200		
Repetition accuracy of switching point ¹⁾		± 2.5 µm: sensing range 30 µm to 150 µm ± 5µm: sensing range 20 µm to 200 µm		
Setting options		Teach-in via display and buttons		
Protection against manipulation		Electronic lock		
Type of display		Multi-coloured illuminated LCD		
Type of mounting		Alternatively: Via H-rail Via through-holes Via wall/surface bracket ²⁾		Alternatively: Via H-rail Via through-holes Via wall/surface bracket ³⁾
Sensing principle		Pneumatic		
Pneumatic connection		QS-6		
Operating voltage range	[V DC]	15 ... 30	22.8 ... 26.4	
Max. output current	[mA]	100		
Electrical connection		Plug M12x1, 5-pin, round design to EN 60947-5-2		
Protection against short circuit		Pulsed		
Protection against polarity reversal		For all electrical connections		
Protection class		IP65 to IEC 60529		

1) Under constant operating conditions (temperature and supply pressure) and nominal measuring nozzle diameter (2 mm).

2) Adapter plate SXE3 must be ordered separately as an accessory → 3.

3) 2 adapter plates SXE3-W included in scope of delivery.

Operating and environmental conditions		
Type	SOPA-M1-...	SOPA-CM...-...
Operating pressure [bar]	–	4 ... 7
Supply pressure [bar]	0.8 ... 1.6	–
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Ambient temperature [°C]	0 ... +50	
CE mark (see declaration of conformity)	In accordance with EU EMC directive	
Certification	RCM trademark c UL us - Recognized (OL)	

Weight					
	SOPA-M1-...	SOPA-CM1-...	SOPA-CM2...	SOPA-CM3...	SOPA-CM4...
Product weight [g]	60	510	570	630	690

Materials	
Housing	Reinforced polyamide
Note on materials	Free of copper and PTFE Conforms to RoHS

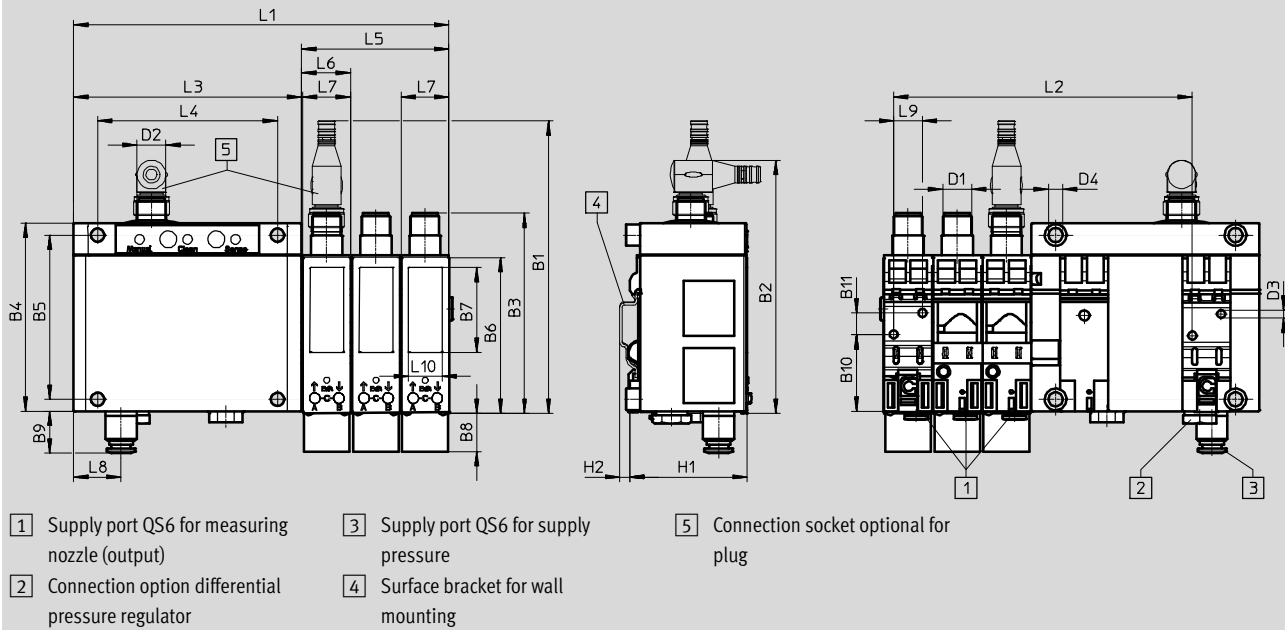
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Technical data

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Dimensions

Download CAD data → www.festo.com



	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	D1	D2	D3 Ø	D4 Ø
SOPA-CM1H-...	122	106	82.9	78.5	68.5	65	35.4	16.8	17.4	32	9	M12x1	M12x1	3.4	5.5
SOPA-CM2H-...															
SOPA-CM3H-...															
SOPA-CM4H-...															
SOPA-...															

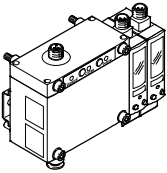
	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
SOPA-CM1H-...	49	4.2	115.5	83.5	95	75	20.5	20.5	20	19.8	12	14
SOPA-CM2H-...			136	104			41					
SOPA-CM3H-...			156.5	124.5			61.5					
SOPA-CM4H-...			177	145			82					
SOPA-...			95+(n x 20.5)	83.5+(n-1) x 20.5			n x 20.5					

n = Number of sensor modules

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Technical data

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Ordering data						
Version	Type of mounting	Number of sensor modules	Switch output PNP		Switch output NPN	
			Part No.	Type	Part No.	Type
Control module with sensor modules						
	Via H-rail	1	552130	SOPA-CM1H-R1-HQ6-2P-M12	552134	SOPA-CM1H-R1-HQ6-2N-M12
		2	552131	SOPA-CM2H-R1-HQ6-2P-M12	552135	SOPA-CM2H-R1-HQ6-2N-M12
		3	552132	SOPA-CM3H-R1-HQ6-2P-M12	552136	SOPA-CM3H-R1-HQ6-2N-M12
		4	552133	SOPA-CM4H-R1-HQ6-2P-M12	552137	SOPA-CM4H-R1-HQ6-2N-M12
	Via wall/surface bracket ¹⁾	1	552138	SOPA-CM1H-R1-WQ6-2P-M12	552142	SOPA-CM1H-R1-WQ6-2N-M12
		2	552139	SOPA-CM2H-R1-WQ6-2P-M12	552143	SOPA-CM2H-R1-WQ6-2N-M12
		3	552140	SOPA-CM3H-R1-WQ6-2P-M12	552144	SOPA-CM3H-R1-WQ6-2N-M12
		4	552141	SOPA-CM4H-R1-WQ6-2P-M12	552145	SOPA-CM4H-R1-WQ6-2N-M12
Individual sensor module						
	Via H-rail	1	552146	SOPA-M1-R1-HQ6-2P-M12	552147	SOPA-M1-R1-HQ6-2N-M12

1) 2 adapter plates SXE3-W included in scope of delivery.

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Ordering data – Modular products

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M Mandatory data			O Options		M Mandatory data					O Options	
Module No.	Function		Control module override	Distance sensing range		Pneumatic connection		Electrical connection	Electrical accessories		
549902	Modules		H	Type of mounting		Electrical output		M12	E1 E2 E3 E4		
	SOPA	CM1 CM2 CM3 CM4 M1		R1	H W	Q6	2P 2N				
Ordering example											
549902	SOPA	- M1		- R1	- H	Q6	- 2P	- M12	+	E3	

Ordering table				Condi- tions	Code	Enter code
M	Module No.	549 902				
	Function	Air gap sensor for contact and distance monitoring with LCD display			SOPA	SOPA
	Modules	Control module with one sensor module			-CM1	
		Control module with two sensor modules, pneumatically interlinked			-CM2	
		Control module with three sensor modules, pneumatically interlinked			-CM3	
		Control module with four sensor modules, pneumatically interlinked			-CM4	
		Sensor module			-M1	
O	Control module override	With manual override for control module		1	H	
M	Distance sensing range [µm]	20 ... 200			-R1	-R1
	Type of mounting	H-rail mounting/through-hole			-H	
		Additional wall mounting			-W	
	Pneumatic connection	Push-in connector 6 mm			Q6	Q6
	Electrical output	2 switch outputs PNP			-2P	
		2 switch outputs NPN			-2N	
	Electrical connection	Plug M12, A-coded			-M12	-M12
O	Electrical accessories	Straight socket, cable 2.5 m			+E1	
		Straight socket, cable 5 m			+E2	
		Angled socket, cable 2.5 m			+E3	
		Angled socket, cable 5 m			+E4	

1 H Not with module M1 (sensor module)

Transfer order code

549902 SOPA - - R1 - Q6 - - M12 +