Air gap sensors SOPA

Product range overview

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- Sensing range 20 ... 200 µm
- Switch outputs PNP or NPN
- Integrated air jet function
- Two-colour LCD display

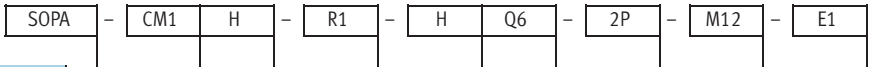
Detailed product information
➔ www.festo.com/catalogue/sopa

Key features

General	Precise	Easy to use	Reliable and flexible
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.	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.	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.	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.

Air gap sensors SOPA

Type codes



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

Air gap sensors SOPA

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	–	
Operating voltage	[V DC]	–	24	
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 ➔ 184.
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		Filtered compressed air, grade of filtration 40µm, lubricated or unlubricated	
Ambient temperature	[°C]	0 ... 50	
CE mark (see declaration of conformity)		In accordance with EU EMC directive	
Certification		C tick	

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

Air gap sensors SOPA

Technical data

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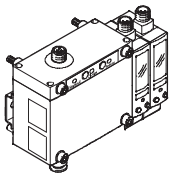
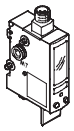
Ordering data						
Version	Type of mounting	Number of sensor modules	Switch output PNP		Switch output NPN	
			Part No.	Type	Part No.	Type
Control module with sensor modules						
	Via H-rail	1	**552 130**	**SOPA-CM1H-R1-HQ6-2P-M12**	**552 134**	**SOPA-CM1H-R1-HQ6-2N-M12**
		2	**552 131**	**SOPA-CM2H-R1-HQ6-2P-M12**	**552 135**	**SOPA-CM2H-R1-HQ6-2N-M12**
		3	**552 132**	**SOPA-CM3H-R1-HQ6-2P-M12**	**552 136**	**SOPA-CM3H-R1-HQ6-2N-M12**
		4	**552 133**	**SOPA-CM4H-R1-HQ6-2P-M12**	**552 137**	**SOPA-CM4H-R1-HQ6-2N-M12**
	Via wall/surface bracket[1)]	1	**552 138**	**SOPA-CM1H-R1-WQ6-2P-M12**	**552 142**	**SOPA-CM1H-R1-WQ6-2N-M12**
		2	**552 139**	**SOPA-CM2H-R1-WQ6-2P-M12**	**552 143**	**SOPA-CM2H-R1-WQ6-2N-M12**
		3	**552 140**	**SOPA-CM3H-R1-WQ6-2P-M12**	**552 144**	**SOPA-CM3H-R1-WQ6-2N-M12**
		4	**552 141**	**SOPA-CM4H-R1-WQ6-2P-M12**	**552 145**	**SOPA-CM4H-R1-WQ6-2N-M12**
Individual sensor module						
	Via H-rail	1	**552 146**	**SOPA-M1-R1-HQ6-2P-M12**	**552 147**	**SOPA-M1-R1-HQ6-2N-M12**

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

Air gap sensors SOPA

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
	Modules			Type of mounting		Electrical output				
549 902	SOPA	CM1 CM2 CM3 CM4 M1	H	R1	H W	Q6	2P 2N	M12		E1 E2 E3 E4
Ordering example										
549 902	SOPA	– M1		– R1	– H	Q6	– 2P	– M12	+	E3

Ordering table

			Conditions	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

549 902	SOPA	–			–	R1	–		Q6	–		–	M12	+	

Air gap sensors SOPA

Peripherals overview, sample applications

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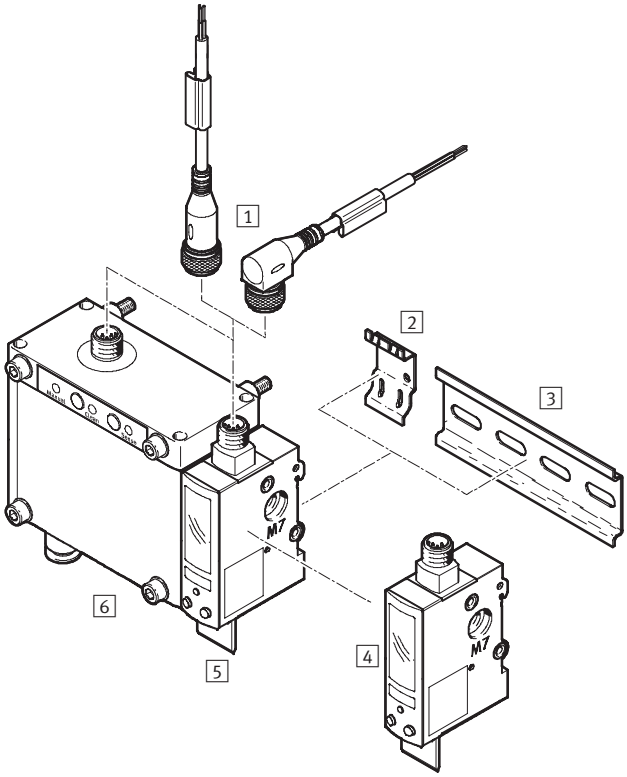
Peripherals overview



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

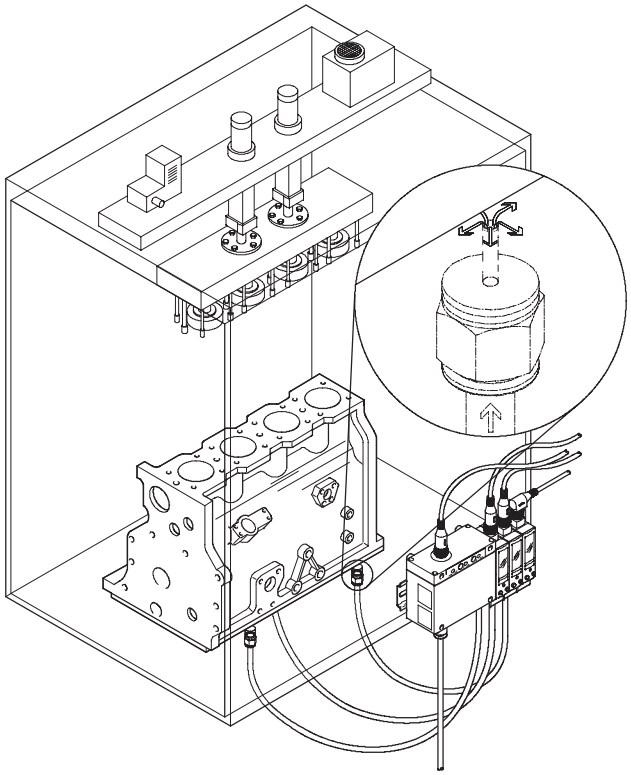
Technical data ➔ 264

	Number of wires	Cable length [m]	Part No.	Type
Straight socket				
	4	2.5	**550 326**	**NEBU-M12G5-K-2.5-LE4**
		5	**541 328**	**NEBU-M12G5-K-5-LE4**
Angled socket				
	4	2.5	**550 325**	**NEBU-M12W5-K-2.5-LE4**
		5	**541 329**	**NEBU-M12W5-K-5-LE4**

Ordering data – Adapter plate

	Part No.	Type
	**540 214**	**SXE3-W**

Application example



- Air gap sensor SOPA for contact monitoring (illustration: typical arrangement with 3 monitoring points, nozzle diameter from 0.8 ... 2 mm) within the engine manufacturing arm of the automotive industry. Simply put, the air gap sensor checks whether the engine components to be machined are lying flat and not resting against adjacent components down to gaps of < 50 µm.