

Positioners CMSX



★/★
Festo core product range
Covers 80% of your automation tasks

Worldwide: Always in stock
Superb: Festo quality at an attractive price
Easy: Reduces procurement and storing complexity

★ Generally ready for shipping ex works in 24 hours
Held in stock in 13 service centres worldwide
More than 2200 product

★ Generally ready for shipping ex works in 5 days
Assembled for you in 4 service centres worldwide
Up to 6×10^{12} variants per product series



Positioners CMSX

Key features

FESTO

Function and application

The CMSX is a digital electropneumatic positioner. It enables simple and efficient control of the position of process valves actuated by pneumatic actuators. The robust and compact positioner is suitable for attachment to actuators with a mechanical interface in accordance with VDE/VDI 3845-1 (IEC 60534-6-2). Product

variants are available for single or double-acting actuators, different flow rates and safety settings (fail-safe, fail in place). Product variants for the connection of external displacement/angle sensors enable the position of process valves to be controlled remotely. The device can be operated using three pushbuttons inside the

housing and an LCD display. Commissioning is simple and robust thanks to an automated initialisation function. Setpoint specification makes use of 0/4 ... 20 mA current signals or 0 ... 10 V voltage signal, and the analogue position feedback uses a 4 ... 20 mA current signal. The device

status is indicated by a digital alarm output. In addition, a configurable digital input for travel to specific positions and two configurable digital outputs provide feedback on the position limit-values. Several freely configurable software functions make the CMSX flexible for any task.

Innovative

- Sturdy, highly dynamic magnetic valve technology
- No internal air consumption in the controlled state
- Straightforward commissioning thanks to automated initialisation function
- Simple and self-explanatory menu navigation

Versatile

- For single- or double-acting actuators
- Fail-safe or fail-in-place safety function
- Direct attachment to quarter-turn actuators as per VDE/VDI 3845-1 (IEC 60534-6-2) or remote connection with external displacement encoder

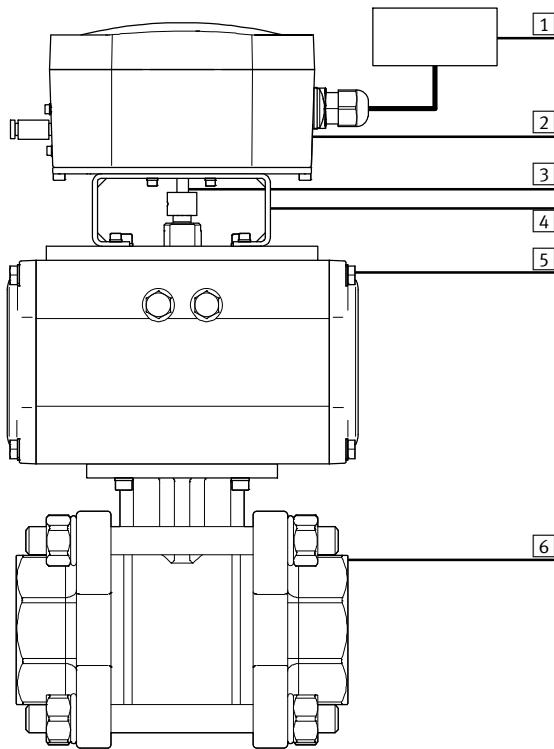
Design

- 4-conductor technology
- Operating voltage 24 V DC
- Setpoint input 0/4 ... 20 mA, 0 ... 10 V
- Position feedback 4 ... 20 mA
- 1 digital input
- 2 digital outputs
- 1 digital alarm output for feedback of the device status
- Compact plastic housing
- Standard nominal flow rate 50 l/min or 130 l/min
- Housing degree of protection IP65

Positioners CMSX

Key features

System structure



- 1 Higher-level system (PLC/IPC or external setpoint generator)
- 2 Positioner CMSX
- 3 Mechanical coupling
- 4 Mounting adapter DARQ
- 5 Quarter-turn actuator (example: DFPD)
- 6 Process valve (example: VZBA)

Positioner/actuator combinations¹⁾

CMSX-...	Quarter-turn actuator		Linear drive
	DFPD	DAPS	DFPI
Flow rate	Piston diameter	Piston diameter	Piston diameter
...-50-...	≥ 160	≥ 180	-
...-130-...	≥ 240	≥ 240	≥ 100

1) The precise selection of the positioner for the actuator is dependent on the specific application. Please consult your local Festo contact.

Positioners CMSX

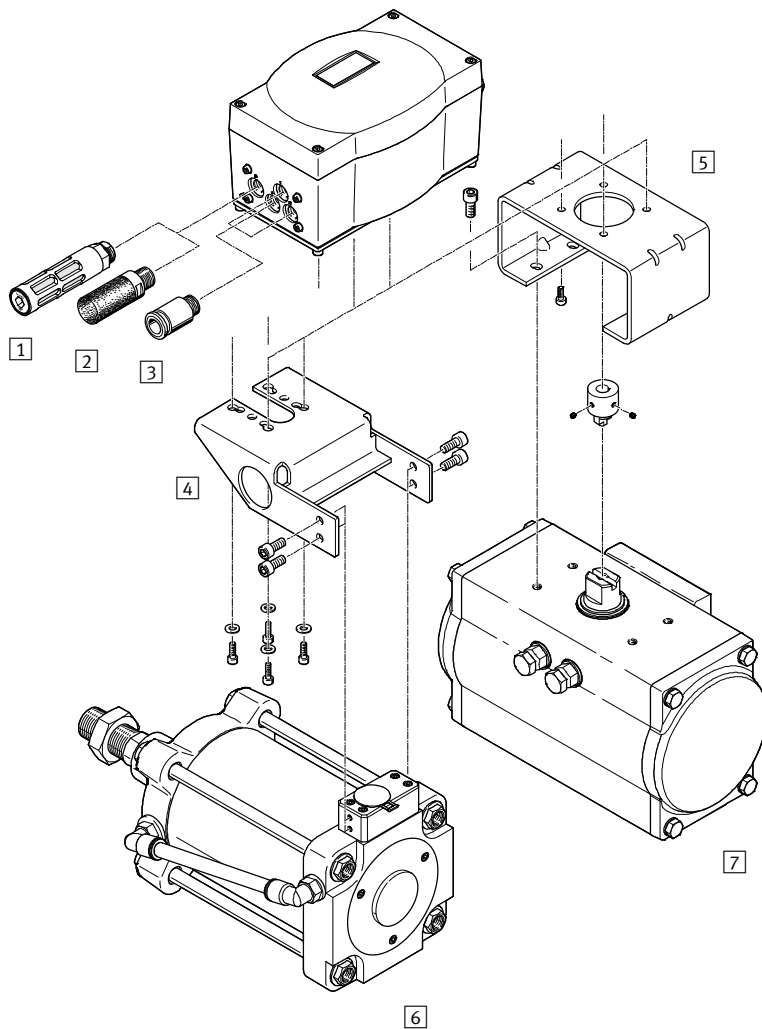
Type codes

		CMSX	-	P	-	S	-	C	-	U	-	F1	-	D	-	50	-	A	
Type																			
CMSX	Positioners for process automation																		
Product version																			
P	Mainly polymer																		
Design																			
S	Positioner, displacement/angle measurement integrated																		
SE	Positioner, displacement/angular detection external																		
Display type																			
C	LCD, backlit																		
Setpoint value																			
U	Configurable (0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA)																		
Position feedback																			
F1	4 ... 20 mA																		
Function																			
D	Double-acting																		
S	Single-acting																		
Flow																			
50	50 l/min																		
130	130 l/min																		
Safety function																			
A	Opening or closing in the event of system failure ¹⁾																		
C	Maintain position in the event of system failure ¹⁾																		

1) Failure of the operating voltage supply or the setpoint specification

Positioners CMSX

Peripherals overview




Mounting components and accessories		
	Brief description	→ Page/Internet
1	Silencer U	With polymer male thread u
2	Silencer UC	For reducing noise at exhaust ports uc
3	Push-in fittings QS	A secure solution for every connection qs
4	Adapter kit DADG	For direct mounting of a positioner on the actuator dadg
5	Mounting adapters DARQ	For connecting positioners and actuators for process automation 14
6	Linear drive DFPI	Actuators for process automation with integrated displacement encoder dfpi
7	Quarter-turn actuator DFPD	Actuators for process automation dfpd

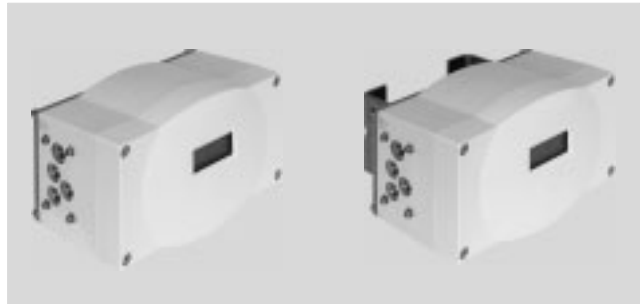
Positioners CMSX

Data sheet

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-  - Flow rate
50 ... 130 l/min

- Product versions for fail-safe or fail-in-place safety function
- Product versions for single- or double-acting actuators



General technical data		
	Direct attachment to quarter-turn actuators with integrated displacement/angular detection CMSX-P-S-...	Remote connection with external displacement/angular detection CMSX-P-SE-...
Design	Digital electropneumatic positioner	
Mode of operation		
CMSX-P-S-C-U-F1-D-...	Double-acting	
CMSX-P-S-C-U-F1-S-...	Single-acting	
Design features		
With safety function A and mode of operation double-acting	Safety position – pneumatic outlet 4 exhausted	–
	Safety position – pneumatic outlet 2 pressurised	–
With safety function A and mode of operation single-acting	Safety position – pneumatic outlet 4 exhausted	–
With safety function C	Safety position - pneumatic outlets closed	–
Mounting position	Any	
Type of mounting	With accessories	
Measuring principle of displacement encoder	Potentiometer	
Sensing range	0 ... 100	–
Display	7-segment	
	LCD display	
	With backlighting	
Setting options	Via display and keys	
Size of dead space [%]	0.5 ... 10	
Dimensions W x L x H	190 x 105 x 130 mm	
Product weight [g]	970	
Pneumatic data		
Standard nominal flow rate q _n		
CMSX-P-S-C-U-F1-...-50-...	[l/min]	50
CMSX-P-S-C-U-F1-...-130-...	[l/min]	130
Pneumatic connection	G1/8	

Positioners CMSX

Data sheet

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General electrical data		
		Direct attachment to quarter-turn actuators with integrated displacement/angular detection CMSX-P-S-... Remote connection with external displacement/angular detection CMSX-P-SE-...
Nominal operating voltage DC	[V]	24
Operating voltage range DC	[V]	21.6 ... 26.4
Max. current consumption	[mA]	600
Reverse polarity protection		For operating voltage connections
Connection resistance	[kOhm]	– ≤ 80

Electrical data		
		Direct attachment to quarter-turn actuators with integrated displacement/angular detection CMSX-P-S-... Remote connection with external displacement/angular detection CMSX-P-SE-...
Analogue inputs		
Signal range	[V]	0 ... 10
	[mA]	0 ... 20
	[mA]	4 ... 20
Linearity error at 25°C	[%]	0.5
Temperature coefficient	[%FS/K]	< 0.02
Resolution	[bit]	16
Overload protection		Yes
Galvanic isolation		No
Analogue outputs		
Signal range	[mA]	4 ... 20
Max. load resistance	[Ohm]	≤ 600
Linearity error at 25 °C	[%]	0.5
Temperature coefficient	[%FS/K]	< 0.02
Resolution	[bit]	12
Reverse polarity protection		Yes
Overload protection		Yes
Short circuit current rating		Yes
Galvanic isolation		No
Digital inputs		
Input characteristics		To IEC 61131-2, type 3
Switching input		PNP
		NPN
Reverse polarity protection		Yes
Electrical isolation		Yes, via optocoupler
Digital outputs		
Switching output		3 x PNP or 3 x NPN, switchable
Output current	[mA]	100
Reverse polarity protection		Yes
Overload protection		Yes
Short circuit current rating		Yes
Electrical isolation		Yes, via optocoupler

Positioners CMSX

Data sheet

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Electromechanical components		
	Direct attachment to quarter-turn actuators with integrated displacement/angular detection CMSX-P-S-...	Remote connection with external displacement/angular detection CMSX-P-SE-...
Electrical connection 1		
Function	Power supply	
	Power supply load	
	Analogue input	
	Analogue output	
	3x digital output	
	2x digital input	
Connection type	Terminal strip	
Connection technology	Screw terminal	
Number of pins/wires	13	
Electrical connection 1, tightening torque	[Nm]	0.6
Conductor cross section	[mm ²]	< 1.5
Electrical connection 2		
Function	–	External path/angle sensor
Connection type	–	Terminal strip
Connection technology	–	Screw terminal
Number of pins/wires	–	3
Electrical connection 2, tightening torque	[Nm]	0.6
Conductor cross section	[mm ²]	< 1.5
Cable connector	M20x1.5 for electrical connection 1	
	–	M12x1.5 for electrical connection 2
Permissible cable diameter	7 ... 13 mm electr. connection 1	
	–	3 ... 6.5 mm electr. connection 2
Max. line length	30 m for electrical connection 1	
	–	3 m for electrical connection 2

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Data sheet

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Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation not possible
Ambient temperature	[°C]	-5 ... +60
Storage temperature	[°C]	-20 ... +60
Relative humidity	[%]	93
Degree of contamination		3
Shock resistance		Shock test with severity level 1 to FN 942017-5 and EN 60068-2-27
		In accordance with EN 60068-2-29
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6
		In accordance with EN 60068-2-6
CE marking (see declaration of conformity) ¹⁾		To EU EMC Directive ²⁾
		To EU RoHS Directive
Approval certificate		RCM compliance mark
Degree of protection		IP65

1) Additional information www.festo.com/sp → Certificates.

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → Certificates.

If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials		
	Direct attachment to quarter-turn actuators with integrated displacement/angular detection CMSX-P-S-...	Remote connection with external displacement/angular detection CMSX-P-SE-...
Housing	Reinforced PC	
Inspection window	PC	
Base plate	Anodised wrought aluminium alloy	
Shaft	High-alloy stainless steel	
Coupling	High-alloy stainless steel	
Screws	High-alloy stainless steel	
Seals	NBR	
Cable connector	PA	
Blanking plug	PA	-
Note on materials	RoHS-compliant	

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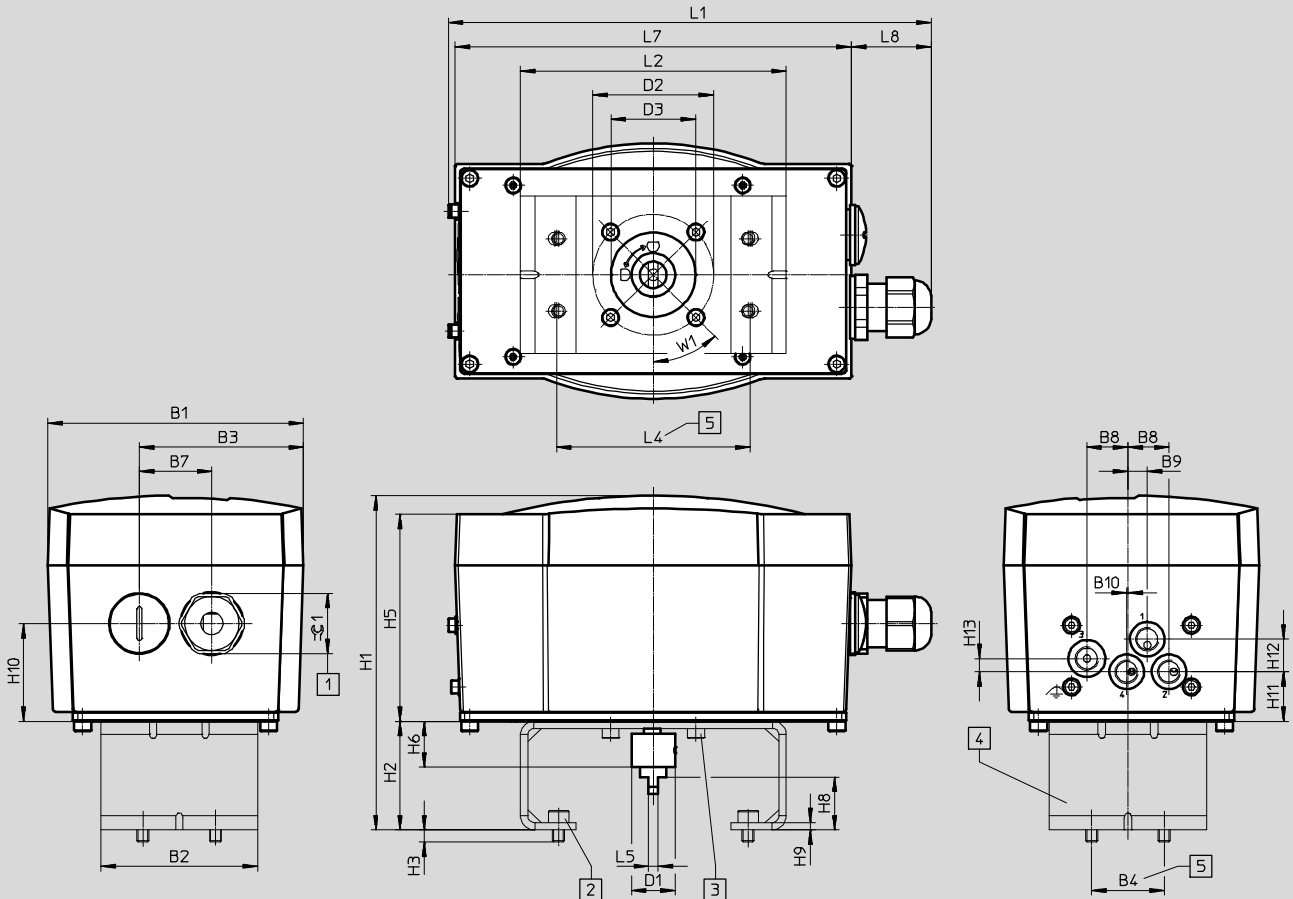
Data sheet



Dimensions

Download CAD data → www.festo.com

Direct attachment to quarter-turn actuators as per VDE/VDI 3845-1 (IEC 60534-6-2)



- 1 Cable connector M20x1.5
- 2 Screw DIN 912 M5x16 (4x)
- 3 Screw DIN 912 M4x12 (4x)
- 4 Mounting bridge DARQ
- 5 Flange hole pattern F05 to ISO 5211

Type	B1	B2	B3	B4	B7	B8	B9	B10	D1 Ø	D2 Ø	D3 Ø	H3	H5
CMSX-P-S-C-U-F1-D-130-...	105.8	65	67.9	30	30	17	8	0.5	18	50	35	5	85.8
CMSX-P-S-C-U-F1-D-50-...													
CMSX-P-S-C-U-F1-S-50-...													
CMSX-P-S-C-U-F1-S-130-...													

Type	H6	H9	H10	H11	H12	L1	L5	L7	L8	W1	∠ 1
CMSX-P-S-C-U-F1-D-130-...	19	40.5	20.5	13.5	5.5	200	4	164	32.5	45°	25
CMSX-P-S-C-U-F1-D-50-...											
CMSX-P-S-C-U-F1-S-50-...											
CMSX-P-S-C-U-F1-S-130-...											

Positioners CMSX

Data sheet



Positioner	Mounting adapters → Page 14	H1	H2	H8	L2	L4 ±0.3
CMSX-P-S-C-U-F1-D-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	130
CMSX-P-S-C-U-F1-D-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	130
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	80
CMSX-P-S-C-U-F1-S-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	130
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	130
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	80
CMSX-P-S-C-U-F1-S-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	20	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	30	110	130
	DARQ-K-P-A2-F05-30-R1	148.5	55	30	160	130

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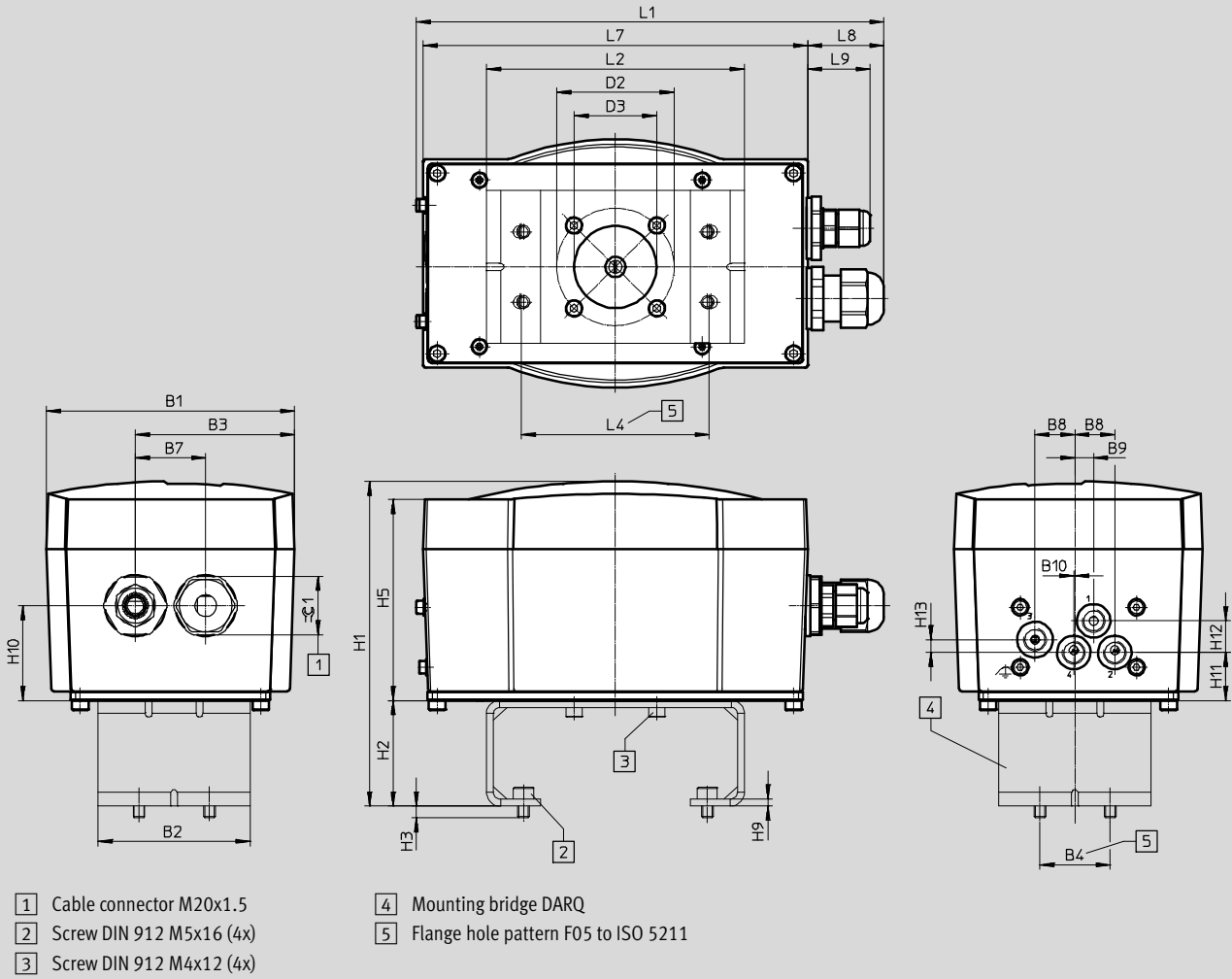
Data sheet



Dimensions

Download CAD data → www.festo.com

Remote connection with external displacement encoder



Type	B1	B2	B3	B4	B7	B8	B9	B10	D2 Ø	D3 Ø	D4 Ø	H3
CMSX-P-SE-C-U-F1-D-...	105.8	65	67.9	30	30	17	8	0.5	50	35	5.4	5

Type	H5	H9	H10	H11	H12	H13	L1	L7	L8	L9	≈ 1
CMSX-P-SE-C-U-F1-D-...	85.8	3	40.5	20.5	13.5	5.5	200	164	32.5	25.6	25



Positioner	Mounting adapters → Page 14	H1	H2	L2	L4 ±0.3
CMSX-P-SE-C-U-F1-D-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	80
	DARQ-K-P-A1-F05-30-R1	148.5	55	110	80
	DARQ-K-P-A2-F05-30-R1	148.5	55	160	130




Positioners CMSX

Data sheet

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★ Core product range

Ordering data					
	Safety position	Standard nominal flow rate [l/min]	Function	Part no.	Type
Direct attachment to quarter-turn actuators as per VDE/VDI 3845-1 (IEC 60534-6-2)					
	Can be set to open or close in the event of system failure ¹⁾	50	Double-acting	★ 3929313	CMSX-P-S-C-U-F1-D-50-A
		50	Single-acting	★ 3929370	CMSX-P-S-C-U-F1-S-50-A
Remote connection with external displacement encoder					
	Can be set to open or close in the event of system failure ¹⁾	130	Double-acting	★ 3929539	CMSX-P-SE-C-U-F1-D-130-A

Ordering data					
	Safety position	Standard nominal flow rate [l/min]	Function	Part no.	Type
Direct attachment to quarter-turn actuators as per VDE/VDI 3845-1 (IEC 60534-6-2)					
	Can be set to open or close in the event of system failure ¹⁾	130	Double-acting	3929312	CMSX-P-S-C-U-F1-D-130-A
		130	Single-acting	3929369	CMSX-P-S-C-U-F1-S-130-A
	Maintain position in the event of system failure ¹⁾	130	Double-acting	3929314	CMSX-P-S-C-U-F1-D-130-C
		50	Double-acting	3929315	CMSX-P-S-C-U-F1-D-50-C
Remote connection with external displacement encoder					
	Maintain position in the event of system failure ¹⁾	130	Double-acting	3929540	CMSX-P-SE-C-U-F1-D-130-C

1) Failure of the operating voltage supply or the setpoint specification

Festo core product range

★ Generally ready for shipping ex works in 24 hours

☆ Generally ready for shipping ex works in 5 days

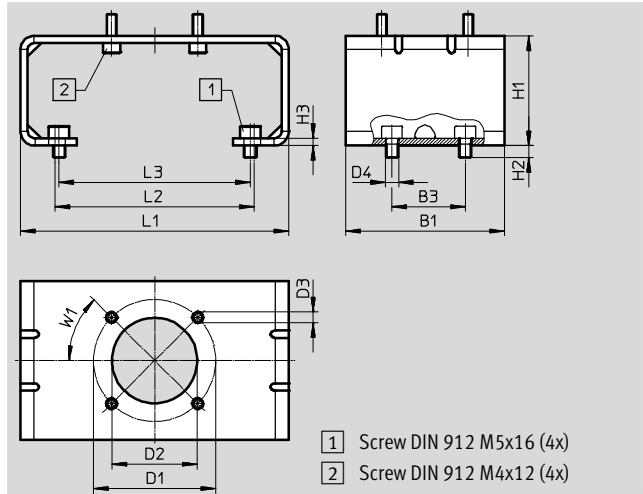
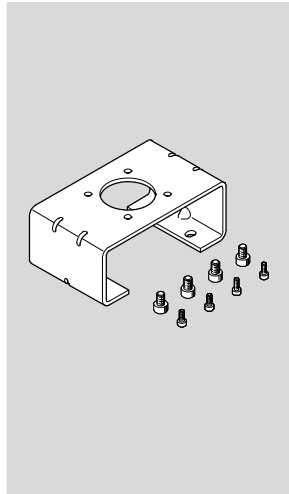
Positioners CMSX

Accessories



Mounting adapter DARQ-K-P...

- Mounting adapter for mounting on standard actuators to VDI/VDE 3845
- Mounting screws included in the scope of delivery
- Material: High-alloy stainless steel
- Contains paint-wetting impairment substances, RoHS-compliant

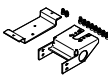


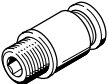

Dimensions and ordering data																
B1	B3	D1	D2	D3	D4	H1	H2	H3	L1	L2	L3	W1	CRC ¹⁾	Weight [g]	Part no.	Type
		∅	∅	∅	∅											
65	30	50	35	4.5	5.4	45	5	3	110	81.6	78.4	45°	2	350	★ 2197135	DARQ-K-P-A1-F05-20-R1
						55								380	★ 2197136	DARQ-K-P-A1-F05-30-R1
						55			160	131.6	128.4			460	2197137	DARQ-K-P-A2-F05-30-R1

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
 Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.


Positioners CMSX

Accessories

Ordering data – Adapter kit			Technical data → Internet: dadg	
	Description	For Ø	Part no.	Type
	For direct mounting of an external positioner on the actuator DFPI-...-E-NB3...	100 ... 320 mm	3179433	DADG-AK-F6-A2

Ordering data – Push-in fitting					Technical data → Internet: qs	
	Connection	Nominal size [mm]	Tubing O.D. [mm]	PU ¹⁾	Part no.	Type
R thread						
	R1/8	2.6	4	10	★ 153012	QS-1/8-4-I
				100	133191	QS-1/8-4-I-100
		4.2	6	10	★ 153013	QS-1/8-6-I
				100	133186	QS-1/8-6-I-100
	5.3	8	50	133187	QS-1/8-8-I-50	
G thread with sealing ring						
	G1/8	2.6	4	10	★ 186106	QS-G1/8-4-I
				100	133008	QS-G1/8-4-I-100
		4.2	6	10	★ 186107	QS-G1/8-6-I
				100	133009	QS-G1/8-6-I-100
			5.3	8	10	★ 186109

1) Packaging unit

Ordering data – Silencer			Technical data → Internet: silencer	
	Description	PU ¹⁾	Part no.	Type
	Version PE	1	161419	UC-1/8
		50	534219	UC-1/8-50

1) Packaging unit

Festo core product range

- ★ Generally ready for shipping ex works in 24 hours
- ☆ Generally ready for shipping ex works in 5 days