

## Positioners CMSX

**FESTO**



# Positioners CMSX

Key features

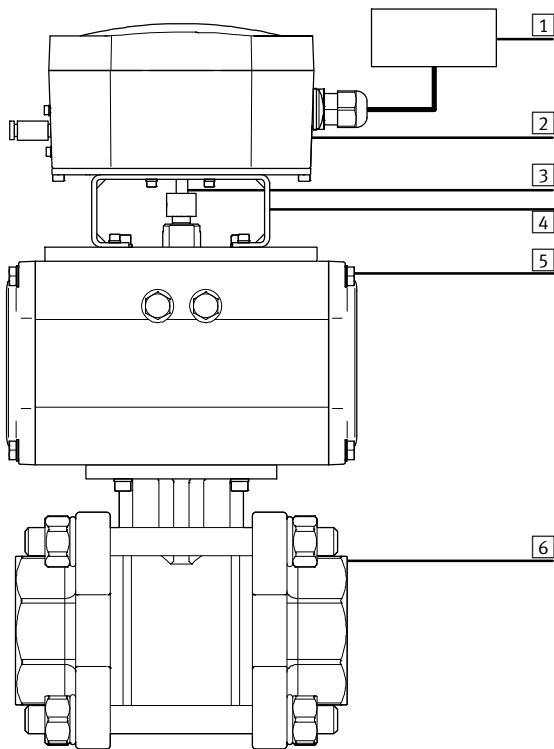


## Function and application

The positioner CMSX is used to control the position of single- and double-acting pneumatic actuators and double-acting linear actuators in process automation systems. It is suitable for operation with actuators that have a swivel angle of approx. 90° and a mechanical interface in accordance with VDI/VDE Directive 3845. The CMSX enables simple and efficient position control based on the PID control algorithm. Positions are specified via a setpoint signal. The integrated

potentiometer senses the current position of the quarter turn actuator via the shaft and forwards the measured value to the internal regulator. The regulator compares the setpoint value specified by analogue means with the measured value and actuates the solenoid valves accordingly via pulse-width modulation (PWM).

## System structure



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

CMSX-...	Piston Ø [mm]	Drives	Sizes	1st generation	2nd generation
<b>Semi-rotary drives</b>					
single-acting	≥ 63	DAPS	≥ 53	-	■
		DFPD	≥ 40		
double-acting	53 ... 63	DFPD	20 ... 40	■	-
	≥ 63	DAPS	≥ 60	-	■
		DFPD	≥ 40		
<b>Linear drives</b>					
double-acting	≥ 63	DFPI	100 ... 320	-	■
<b>→ Page/Internet</b>				6	12

# Positioners CMSX

Key features

FESTO

## Variants

CMSX-...-A

On this product variant, working port 4 is exhausted and working port 2 is pressurised. The process valve is opened or closed depending on the tubing connections between the CMSX-...-A and the quarter turn actuator.

CMSX-...-C

On the product variant CMSX-...-C, working ports 2 and 4 are pressurised to maintain the current position of the quarter turn actuator.

## Security

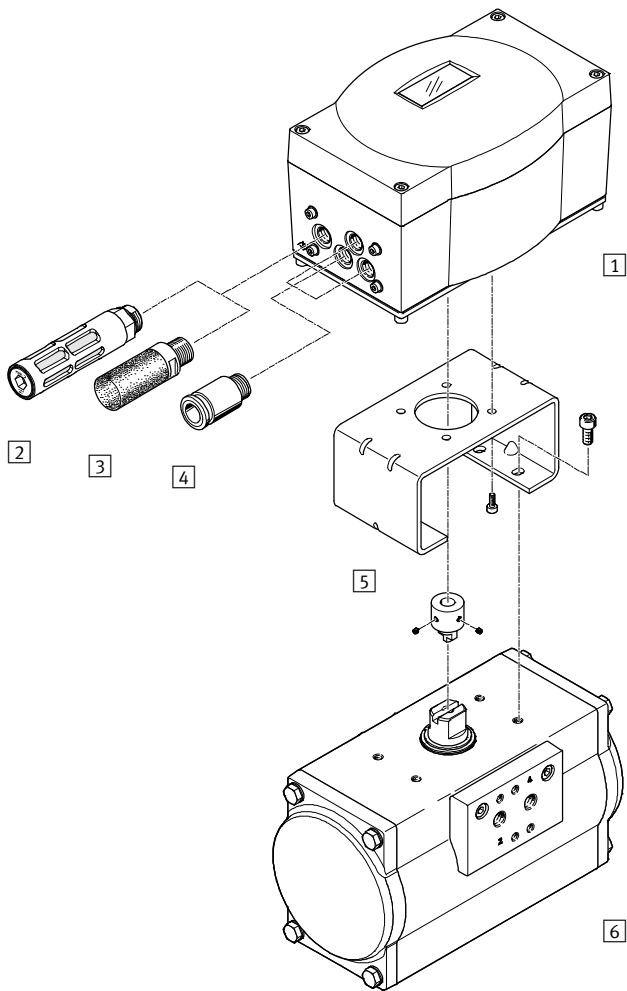
Several freely programmable safety positions in case of current failure, additional digital error signal for emergency shut-down.  
Several freely configurable, analogue input signals for each task, for reliable monitoring of the actual position via the analogue feedback signal.

## Economic efficiency

Via integrated, analogue feedback functions and the definable safety positions.  
No air consumption if the actuator is not moving.

# Positioners CMSX, 1st generation

Peripherals overview



Mounting components and accessories		
	Brief description	→ Page/Internet
1	CMSX Positioner For position control of single- and double-acting quarter turn actuators in process automation	6
2	U-Silencer With polymer, male thread	u
3	UC-Silencer For reducing noise at exhaust ports	uc
4	QS Push-in fittings A secure solution for every connection	qs
5	DARQ Mounting bridges For connecting positioners/actuators for process automation	18
6	DFPD Quarter turn actuators Actuators for process automation	dfpd, drd, daps

# Positioners CMSX, 1st generation

Type codes

CMSX - P - S - C - U - F1 - D - 50 - A - G1

**Type**

CMSX Positioner for process automation

**Product version**

P Primarily polymers

**Design**

S Positioner, displacement/angle measurement integrated

**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

**Flow**

50 50 l/min

**Safety function**

A Opening or closing in the event of a system failure<sup>1)</sup>

C Maintain position<sup>2)</sup> in the event of a system failure<sup>1)</sup>

**Generation**




G1 First generation

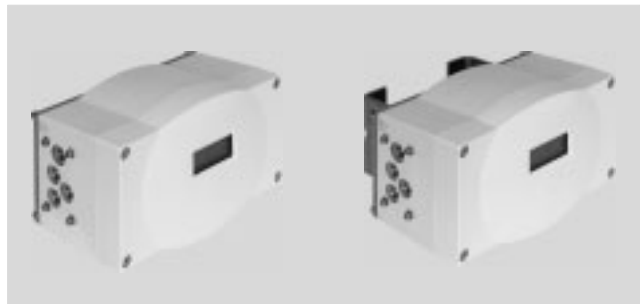
1) Failure of the power supply  
 2) Pressurise quarter turn actuator at both ends

# Positioners CMSX, 1st generation

FESTO

Technical data

-  Voltage  
21.6 ... 26.4 V DC
-  Temperature range  
-5 ... +60 °C
-  Flow rate  
50 l/min



General technical data		
Type	CMSX-P-S-C-U-F1-D-50-A-G1	CMSX-P-S-C-U-F1-D-50-C-G1
Pneumatic connection	G $\frac{1}{8}$	
Conforms to standard	VDI/VDE 3845 (NAMUR)	
Cable connector	M20x1.5	
Type of mounting	On flange to ISO 5211, via accessories	
Type of process valve characteristic curves	Freely adjustable over 21 support points Linear, equal percentage (1:25, 1:33, 1:50)	
Leakproof characteristics	Automatic Adjustable	
Control range adaptation	Adjustable	
Alarm for exceeding limit value	No	
Active direction	Adjustable Rising, falling	
Safety precaution	Adjustable	-
	-	Retaining
	Opening	-
	Closing	-
UV resistance	Yes	
Display type	Backlit LCD	
Setting options	Via display and keys	
Standard nominal flow rate	[l/min]	50
Sensing range in degrees	[deg]	0 ... 100
Size of the dead zone	[%]	0.1 ... 10
Product weight	[g]	970

Electrical data		
Protection against short circuit	Yes	
Protection against incorrect polarity	For operating voltage connections	
	For setpoint value	
Operating voltage range DC	[V]	21.6 ... 26.4
Setpoint value	[V]	0 ... 10
	[mA]	0 ... 20
	[mA]	4 ... 20
Max. output current	[mA]	500
Max. load resistance of current output	[ohms]	500
Max. current consumption	[A]	1
Idle current	[mA]	100 ... 300
Switching level	[V]	Signal 0 $\leq$ 5
	[V]	Signal 1 $\geq$ 10

# Positioners CMSX, 1st generation

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation not possible
Ambient temperature	[°C]	-5 ... 60
Temperature of medium	[°C]	-5 ... 60
Storage temperature	[°C]	-20 ... 60
Corrosion resistance class CRC <sup>1)</sup>		2
CE marking (see declaration of conformity)		To EU EMC Directive
Approval certificate		C-Tick
Degree of protection		IP65

1) Corrosion resistance class 2 according to Festo standard 940070  
 Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with the surrounding industrial environment or media such as coolants or lubricating agents.

Materials	
Housing	PC
Threaded coupling	High-alloy stainless steel
Adapter plate	Aluminium
Plate	Aluminium
Seals	NBR
Cable connection	PA
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

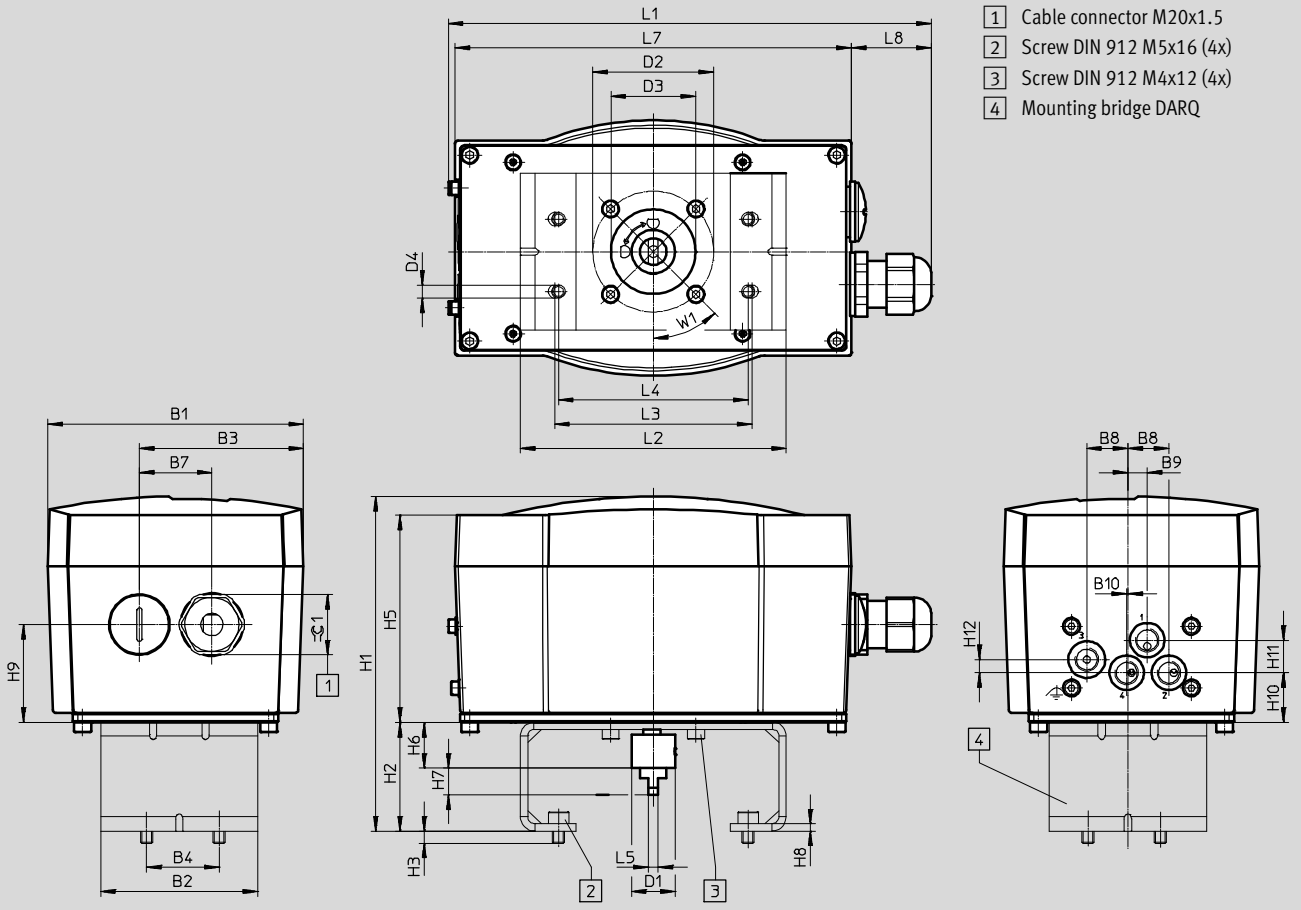
# Positioners CMSX, 1st generation

Technical data



## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



- 1 Cable connector M20x1.5
- 2 Screw DIN 912 M5x16 (4x)
- 3 Screw DIN 912 M4x12 (4x)
- 4 Mounting bridge DARQ

Type	B1	B2	B4	B7	B8	B9	B10	D1	D2	D3	D4	H3	H5
CMSX-P-S-C-U-F1-D-50-A-G1	105.8	65	30	30	17	8	0.5	18	50	35	5.4	5	85.8
CMSX-P-S-C-U-F1-D-50-C-G1													


Type	H6	H7	H8	H9	H10	H11	H12	L1	L5	L7	W1	∠1
CMSX-P-S-C-U-F1-D-50-A-G1	19	11	3	40.5	20.5	13.5	5.5	200	4	164	45°	25
CMSX-P-S-C-U-F1-D-50-C-G1												

Positioner	Mounting bridge	H1	H2	L2	L3	L4
CMSX-P-S-C-U-F1-D-50-A-G1	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55	110	81.6	78.4
	DARQ-K-P-A2-F05-30-R1	148.5	55	160	131.6	128.4
CMSX-P-S-C-U-F1-D-50-C-G1	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55	110	81.6	78.4
	DARQ-K-P-A2-F05-30-R1	148.5	55	160	131.6	128.4



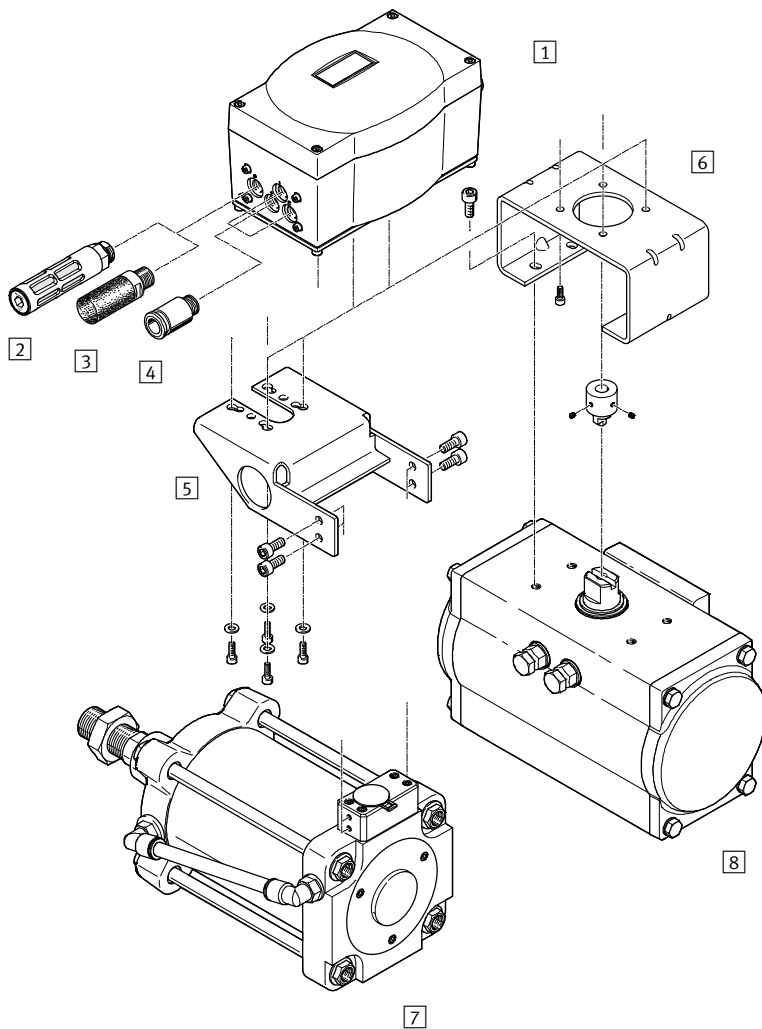
# Positioners CMSX, 1st generation

Technical data

Ordering data					
Positioner		Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
	Opening or closing in the event of a system failure	50	0 ... 100	2092434	CMSX-P-S-C-U-F1-D-50-A-G1
	Maintain position in the event of a system failure	50	0 ... 100	2110841	CMSX-P-S-C-U-F1-D-50-C-G1

# Positioners CMSX, 2nd generation

Peripherals overview



Mounting components and accessories		
	Brief description	→ Page/Internet
1	CMSX Positioner For controlling the position of single- and double-acting quarter turn actuators in process automation	6
2	U-Silencer With polymer, male thread	u
3	UC-Silencer For reducing noise at exhaust ports	uc
4	QS Push-in fittings A secure solution for every connection	qs
5	DADG Adapter kit For direct mounting of a positioner on the actuator	dadg
6	DARQ Mounting bridges For connecting positioners/actuators for process automation	18
7	DFPI Linear actuator Actuators for process automation with integrated displacement encoder	dfpi
8	DFPD Quarter turn actuator Actuators for process automation	dfpd

# Positioners CMSX, 2nd generation




Type codes

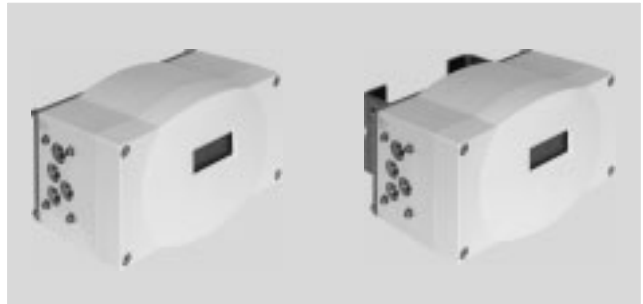
		CMSX	-	P	-	S	-	C	-	U	-	F1	-	D	-	50	-	A	
<b>Type</b>																			
CMSX	Positioner for process automation																		
<b>Product version</b>																			
P	Primarily polymers																		
<b>Design</b>																			
S	Positioner, displacement/angle measurement integrated																		
SE	Positioner, displacement/angle measurement external																		
<b>Display type</b>																			
C	LCD, backlit																		
<b>Setpoint value</b>																			
U	Configurable (0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA)																		
<b>Position feedback</b>																			
F1	4 ... 20 mA																		
<b>Function</b>																			
D	Double-acting																		
S	Single-acting																		
<b>Flow</b>																			
50	50 l/min																		
130	130 l/min																		
<b>Safety function</b>																			
A	Opening or closing in the event of a system failure <sup>1)</sup>																		
C	Maintain position <sup>2)</sup> in the event of a system failure <sup>1)</sup>																		
<b>Generation</b>																			
	Second generation																		

1) Failure of the power supply  
 2) Pressurise quarter turn actuator at both ends

## Positioners CMSX, 2nd generation

Technical data

-  Voltage  
21.6 ... 26.4 V DC
-  Temperature range  
-5 ... +60 °C
-  Flow rate  
50 ... 130 l/min



General technical data	
Pneumatic connection	G $\frac{1}{8}$
Conforms to standard	VDI/VDE 3845 (NAMUR)
Cable connector	M20x1.5
Type of mounting	On flange to ISO 5211, via accessories
Type of process valve characteristic curves	Freely adjustable over 21 support points Linear, equal percentage (1:25, 1:33, 1:50)
Leakproof characteristics	Automatic Adjustable
Control range adaptation	Adjustable
Alarm for exceeding limit value	No
Active direction	Adjustable Rising, falling
UV resistance	Yes
Display type	Backlit LCD
Setting options	Via display and keys
Size of the dead zone	[%] 0.5 ... 10
Product weight	[g] 970

Electrical data	
Protection against short circuit	Yes
Protection against incorrect polarity	For operating voltage connections For setpoint value
Operating voltage range DC	[V] 21.6 ... 26.4
Setpoint value	[V] 0 ... 10
	[mA] 0 ... 20
	[mA] 4 ... 20
Max. output current	[mA] 500
Max. load resistance of current output	[ohms] 500
Max. current consumption	[A] 1
Idle current	[mA] 90 ... 300
Switching level	[V] Signal 0 $\leq$ 5
	[V] Signal 1 $\geq$ 10

## Positioners CMSX, 2nd generation

Technical data

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Lubricated operation not possible
Ambient temperature	[°C]	-5 ... 60
Temperature of medium	[°C]	-5 ... 60
Storage temperature	[°C]	-20 ... 60
Corrosion resistance class CRC <sup>1)</sup>		2
CE marking (see declaration of conformity)		To EU EMC Directive
Approval certificate		C-Tick
Protection class		IP65

- 1) Corrosion resistance class 2 according to Festo standard 940070  
 Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with the surrounding industrial environment or media such as coolants or lubricating agents.

Materials	
Housing	PC
Threaded coupling	High-alloy stainless steel
Adapter plate	Aluminium
Plate	Aluminium
Seals	NBR
Cable connection	PA
Note on materials	Contains paint-wetting impairment substances
	RoHS compliant

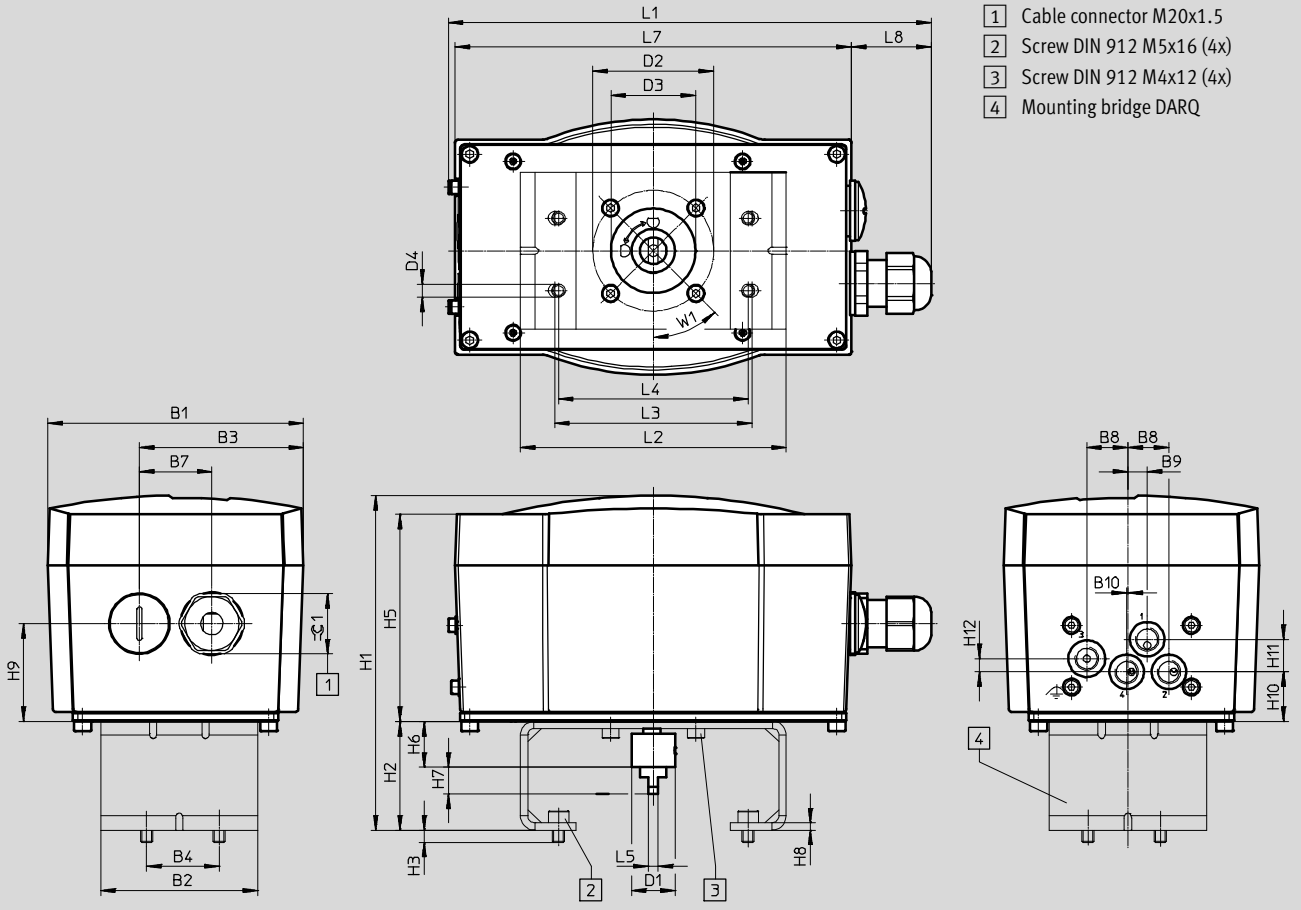
# Positioners CMSX, 2nd generation

Technical data

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)

Displacement/angle measurement integrated



Type	B1	B2	B3	B4	B7	B8	B9	B10	D1 ∅	D2 ∅	D3 ∅	D4 ∅	H3	H5
CMSX-P-S-C-U-F1-D-130-...	105.8	65	67.9	30	30	17	8	0.5	18	50	35	5.4	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	H7	H8	H9	H10	H11	H12	L1	L5	L7	L8	W1	∠ 1
CMSX-P-S-C-U-F1-D-130-...	19	11	3	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, 2nd generation

Technical data

Positioner	Mounting bridge	H1	H2	L2	L3	L4
CMSX-P-S-C-U-F1-D-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55			
	DARQ-K-P-A2-F05-30-R1			168.5	75	160
	DARQ-K-P-A2-F05-50-R1	160	131.6			128.4
CMSX-P-S-C-U-F1-D-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55			
	DARQ-K-P-A2-F05-30-R1			168.5	75	160
	DARQ-K-P-A2-F05-50-R1	160	131.6			128.4
CMSX-P-S-C-U-F1-S-50-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55			
	DARQ-K-P-A2-F05-30-R1			168.5	75	160
	DARQ-K-P-A2-F05-50-R1	160	131.6			128.4
CMSX-P-S-C-U-F1-S-130-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55			
	DARQ-K-P-A2-F05-30-R1			168.5	75	160
	DARQ-K-P-A2-F05-50-R1	160	131.6			128.4

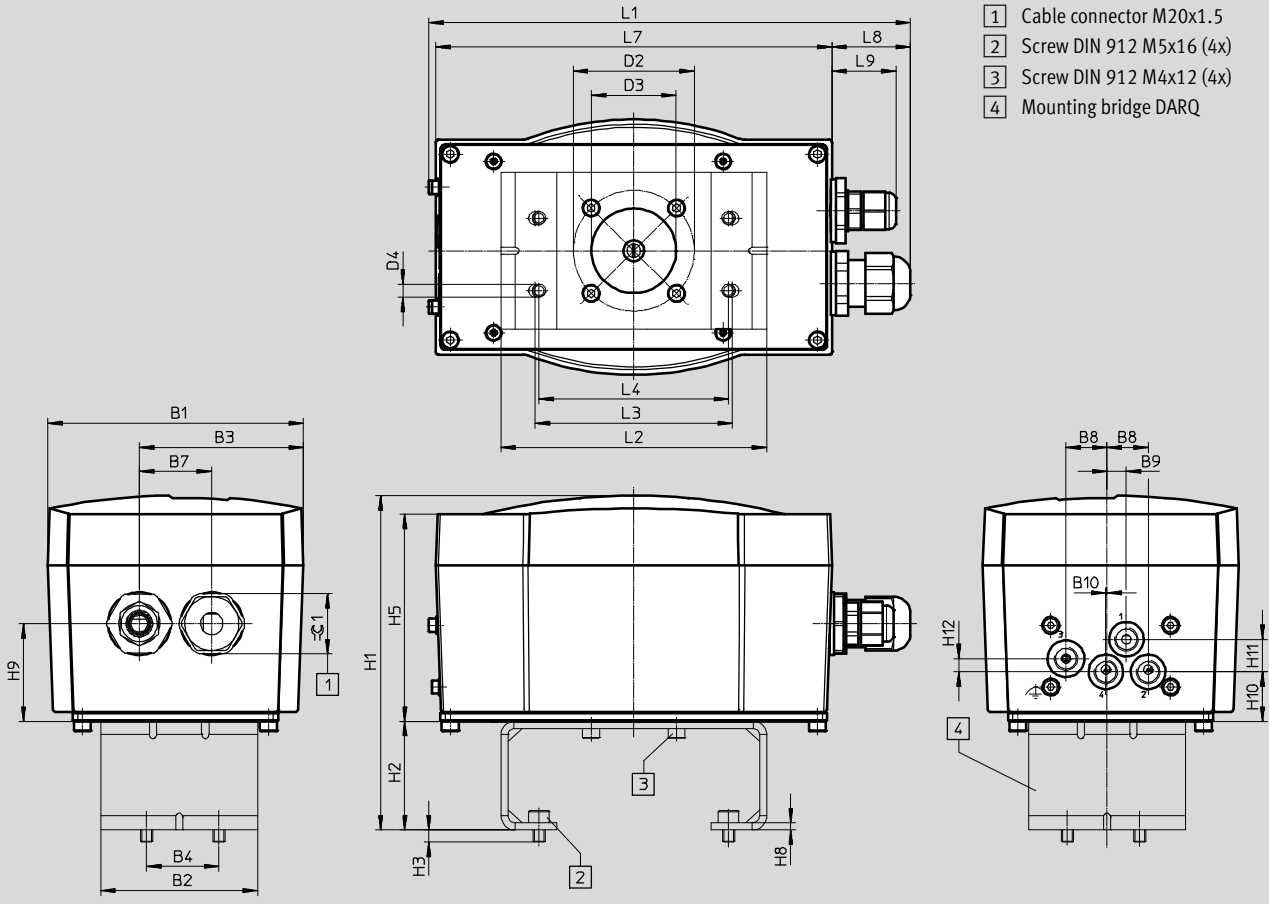
# Positioners CMSX, 2nd generation

Technical data

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)

Displacement/angle measurement external



Type	B1	B2	B3	B4	B7	B8	B9	B10	D2	D3	D4	H3
CMSX-P-S-A1-C-U-F1-D-...	105.8	65	67.9	30	30	17	8	0.5	50	35	5.4	5



Type	H5	H8	H9	H10	H11	H12	L1	L7	L8	L9	⌀ 1
CMSX-P-S-A1-C-U-F1-D-...	85.8	3	40.5	20.5	13.5	5.5	200	164	32.5	25.6	25

Positioner	Mounting bridge	H1	H2	L2	L3	L4
CMSX-P-S-A1-C-U-F1-D-...	DARQ-K-P-A1-F05-20-R1	138.5	45	110	81.6	78.4
	DARQ-K-P-A1-F05-30-R1	148.5	55			
	DARQ-K-P-A2-F05-30-R1		160	131.6	128.4	
	DARQ-K-P-A2-F05-50-R1	168.5				75



## Positioners CMSX, 2nd generation

Technical data

Ordering data					
Positioner		Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
	Can be set to open or close in the event of a system failure	130	0 ... 100	<b>3929312</b>	<b>CMSX-P-S-C-U-F1-D-130-A</b>
		50		<b>3929313</b>	<b>CMSX-P-S-C-U-F1-D-50-A</b>
		130		<b>3929369</b>	<b>CMSX-P-S-C-U-F1-S-130-A</b>
		50		<b>3929370</b>	<b>CMSX-P-S-C-U-F1-S-50-A</b>
		130	–	<b>3929539</b>	<b>CMSX-P-SE-C-U-F1-D-130-A</b>
	Maintain position in the event of a system failure	130	–	<b>3929540</b>	<b>CMSX-P-SE-C-U-F1-D-130-C</b>
		50	0 ... 100	<b>3929314</b>	<b>CMSX-P-S-C-U-F1-D-130-C</b>
				<b>3929315</b>	<b>CMSX-P-S-C-U-F1-D-50-C</b>

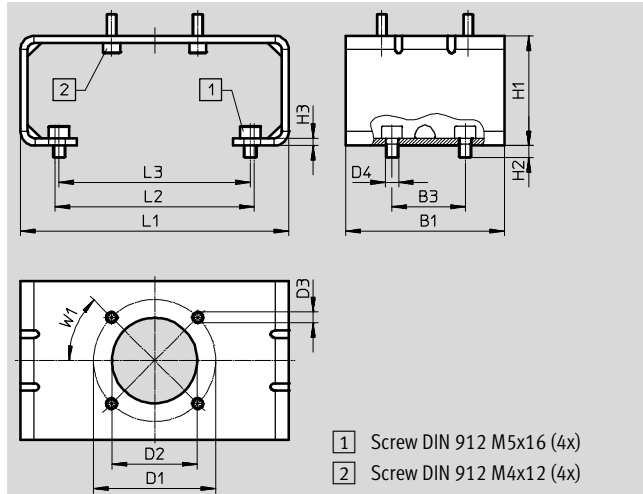
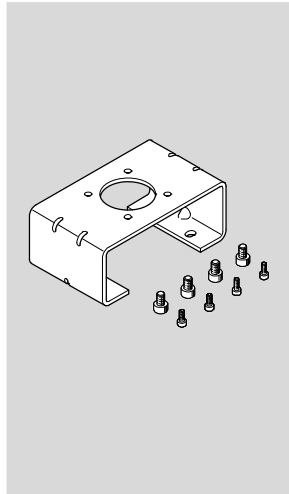
# Positioners CMSX

Accessories



## Mounting bridge DARQ-K-P-...

- Mounting bridge for mounting on standard actuators as per 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 <sup>1)</sup>	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								460	2197137	DARQ-K-P-A2-F05-30-R1

1) Corrosion resistance class 2 according to Festo standard 940070  
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with the surrounding industrial environment or media such as coolants or lubricating agents.