

# Positioners CMSX



Festo core product range  
Covers 80% of your automation tasks

Worldwide:

Always in stock

Superb:

Festo quality at an attractive price

Easy:

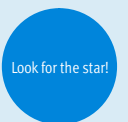
Reduces procurement and storing complexity



Ready for dispatch from the Festo factory in 24 hours  
Held in stock in 13 service centres worldwide  
More than 2200 products



Ready for dispatch in 5 days maximum from stock  
Assembled for you in 4 service centres worldwide  
Up to  $6 \times 10^{12}$  variants per product series



# Positioners CMSX

Key features

FESTO

## 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).

## 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.

## 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.

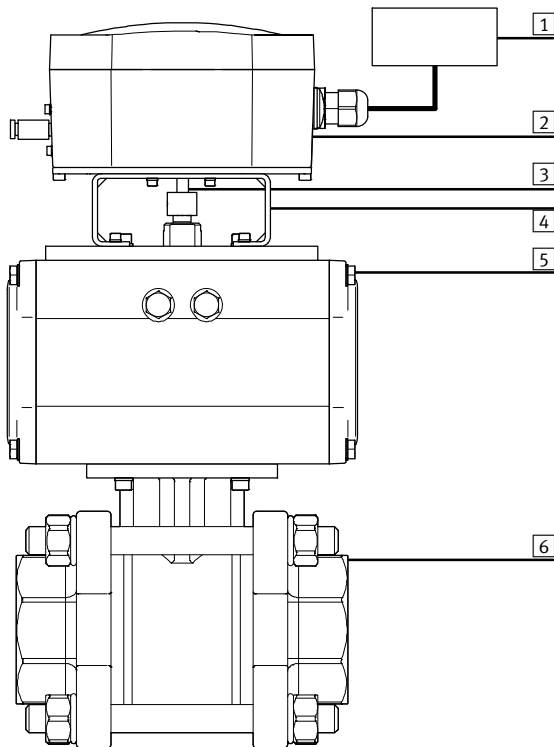
CMSX-...-C

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

# Positioners CMSX

Key features

## System structure



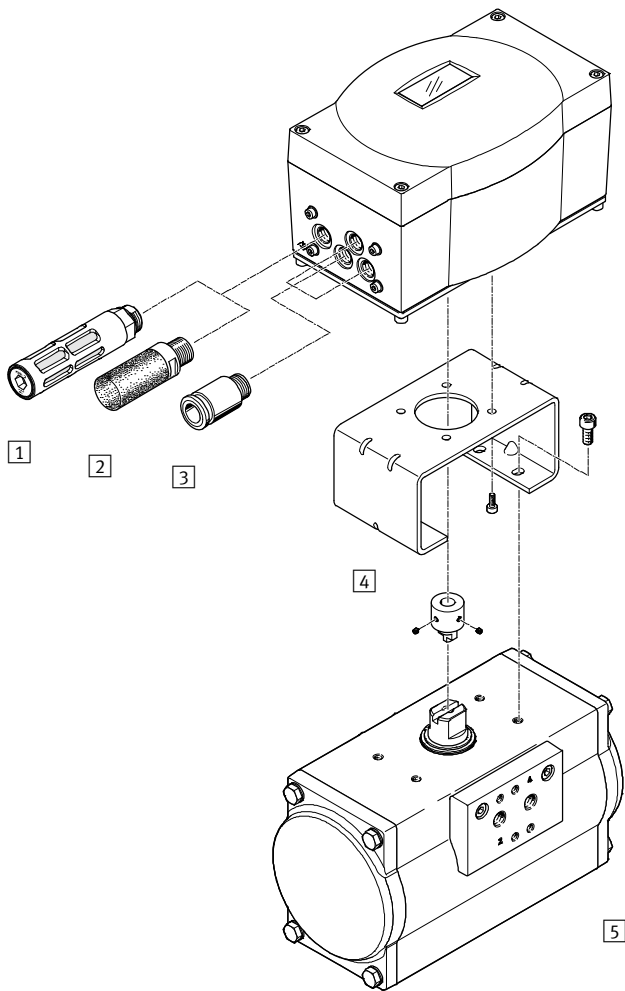
- 1 Higher-level system (PLC/IPC or external setpoint generator)
- 2 Positioner CMSX
- 3 Mechanical coupling
- 4 Mounting bridge DARQ
- 5 Quarter turn actuator (example: DFPD)
- 6 Process valve (example: VZBA)

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

# Positioners CMSX, 1st generation

Peripherals overview

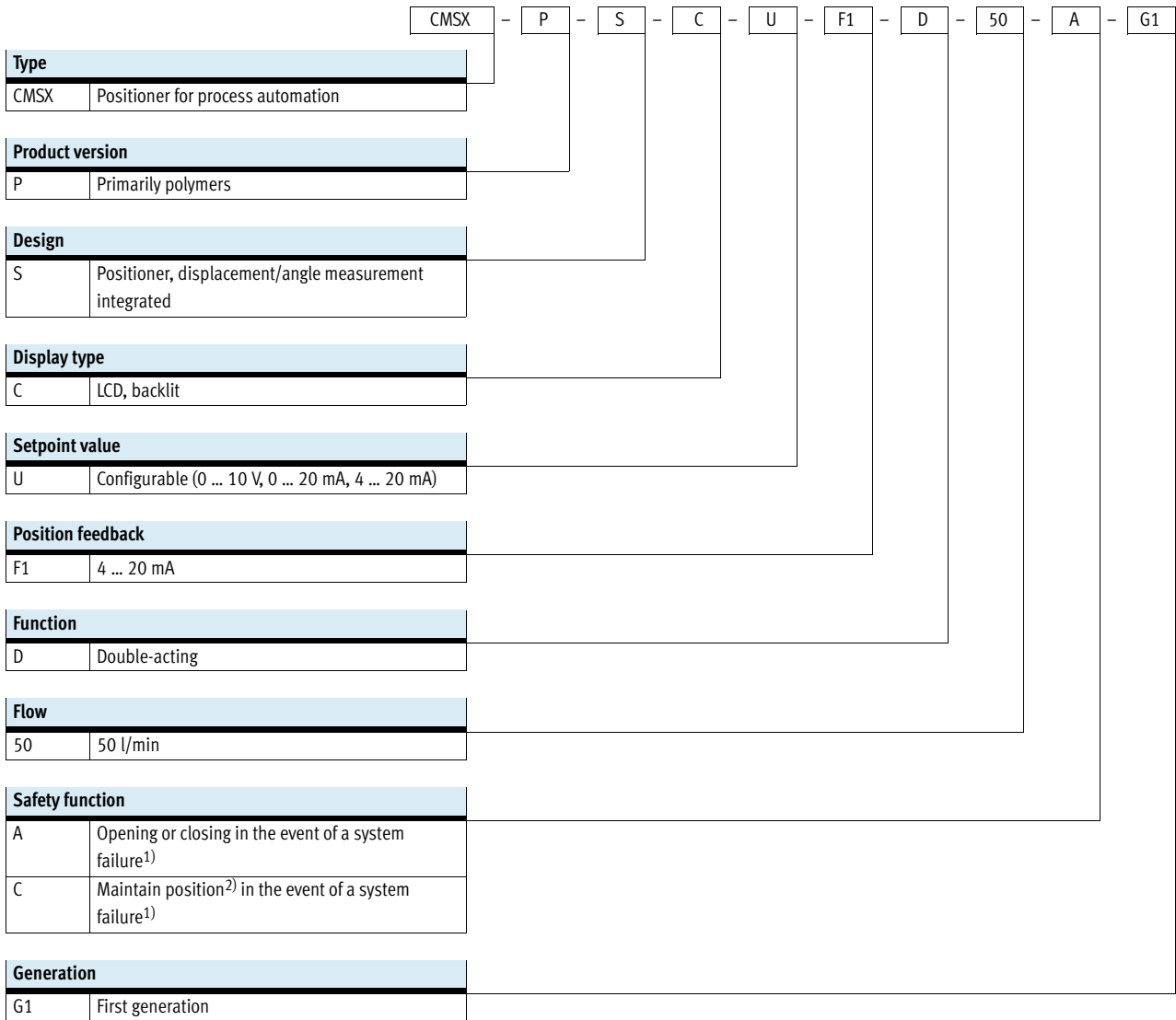
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Mounting components and accessories		
	Brief description	→ Page/Internet
1	Silencer U With polymer, male thread	u
2	Silencer UC For reducing noise at exhaust ports	uc
3	Push-in fittings QS A secure solution for every connection	qs
4	Mounting bridges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

# Positioners CMSX, 1st generation




Type codes

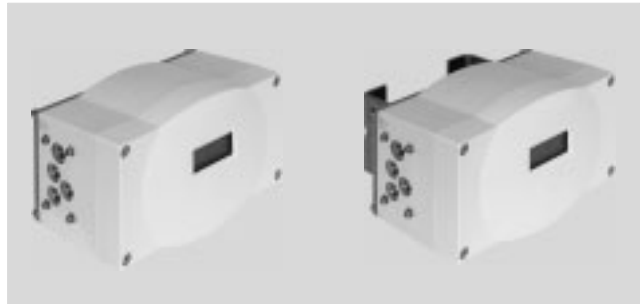


1) Cable fracture or failure of the power supply  
 2) Pressurise quarter turn actuator at both ends

# Positioners CMSX, 1st generation

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	G1/8	
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	
Active direction	Adjustable Rising, falling	
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 ≤ 5
	[V]	Signal 1 ≥ 10
Safety information		
For variant A	Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is opening/closing	
For variant C	Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is holding <sup>1)</sup>	

1) Pressurise quarter turn actuator at both ends

# 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) <sup>2)</sup>		To EU EMC Directive <sup>3)</sup>
Certification		RCM trademark
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.
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://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.
- 3) Additional information [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

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

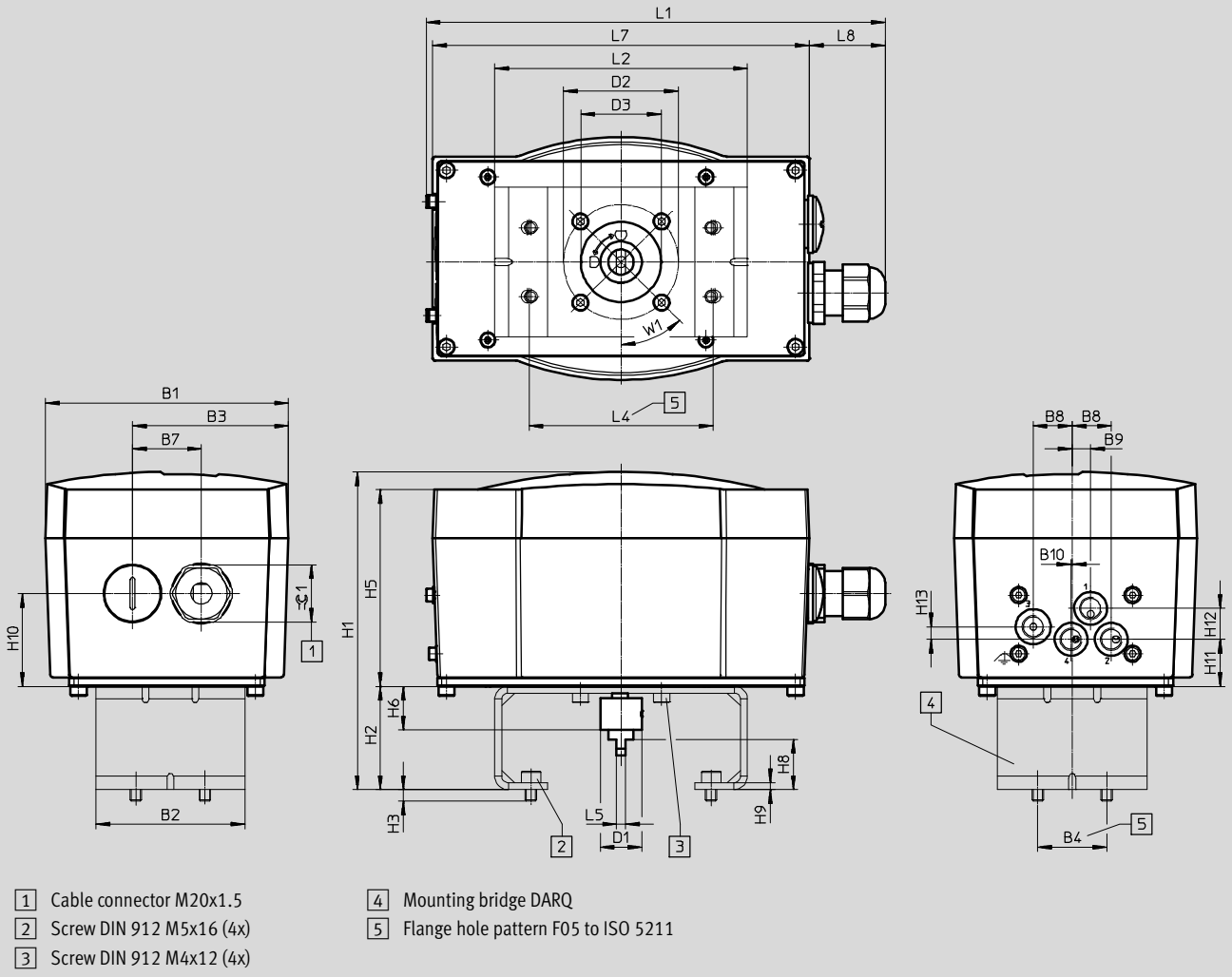
# Positioners CMSX, 1st generation

Technical data

FESTO

## Dimensions

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



Type	B1	B2	B3	B4	B7	B8	B9	B10	D1	D2	D3	H3
CMSX-P-S-C-U-F1-D-50-A-G1	105.8	65	67.9	30	30	17	8	0.5	18	50	35	5
CMSX-P-S-C-U-F1-D-50-C-G1												

Type	H5	H6	H9	H10	H11	H12	L1	L5	L7	W1	≈ 1
CMSX-P-S-C-U-F1-D-50-A-G1	85.8	19	3	40.5	20.5	13.5	200	4	164	45°	25
CMSX-P-S-C-U-F1-D-50-C-G1											


Positioner	Mounting bridge → page 18	H1	H2	H8	L2	L4 ±0.3
CMSX-P-S-C-U-F1-D-50-A-G1	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-C-G1	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




# Positioners CMSX, 1st generation

Technical data

## ★ Core product range

Ordering data					
	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
	Opening or closing in the event of a system failure <sup>1)</sup>	50	0 ... 100	★ 2092434	CMSX-P-S-C-U-F1-D-50-A-G1

Ordering data					
	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
	Maintain position <sup>2)</sup> in the event of a system failure <sup>1)</sup>	50	0 ... 100	2110841	CMSX-P-S-C-U-F1-D-50-C-G1

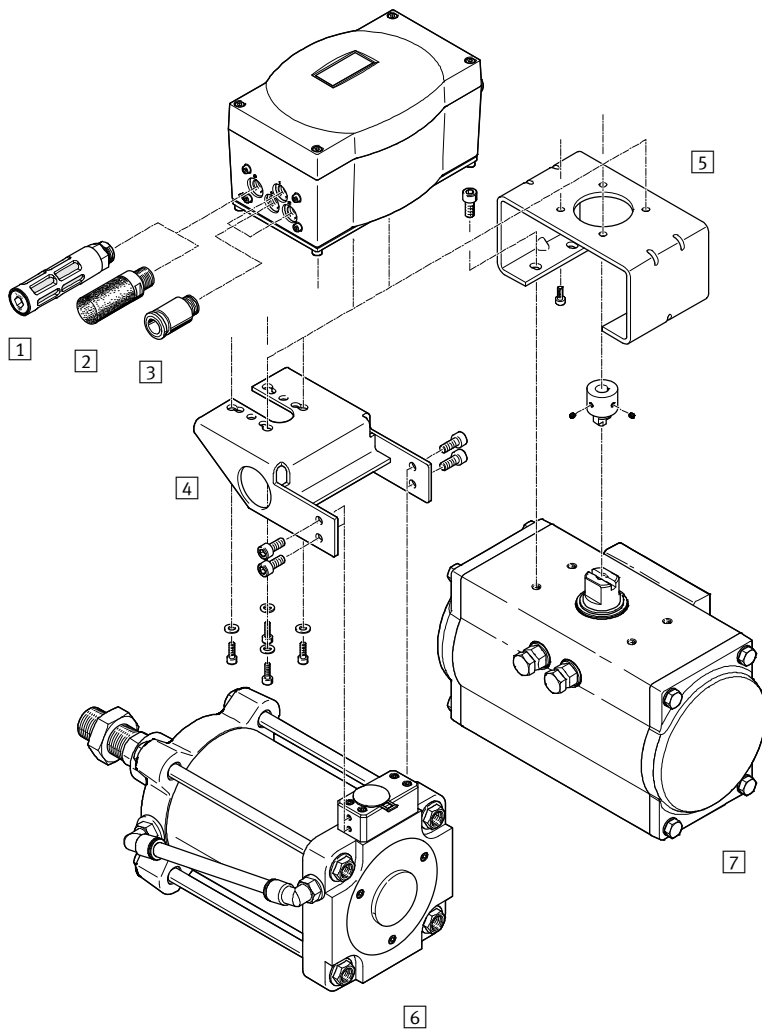
- 1) Cable fracture or failure of the power supply
- 2) Pressurise quarter turn actuator at both ends

Festo core product range

- ★ Ready for dispatch from the Festo factory in 24 hours
- ☆ Ready for dispatch in 5 days maximum from stock

# Positioners CMSX, 2nd generation

Peripherals overview



Mounting components and accessories		
	Brief description	→ Page/Internet
1	Silencer U	With polymer, male thread u
2	Silencer U	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 bridges DARQ	For connecting positioners and actuators for process automation 18
6	Linear actuator DFPI	Actuators for process automation with integrated displacement encoder dfpi
7	Quarter turn actuator DFPD	Actuators for process automation dfpd

# Positioners CMSX, 2nd generation

Type codes

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

**Type**

CMSX	Positioner for process automation
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**Product version**

P	Primarily polymers
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**Design**

S	Positioner, displacement/angle measurement integrated
SE	Positioner, displacement/angle measurement external

**Display type**

C	LCD, backlit
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**Setpoint value**

U	Configurable (0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA)
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**Position feedback**

F1	4 ... 20 mA
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**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 a system failure <sup>1)</sup>
C	Maintain position <sup>2)</sup> in the event of a system failure <sup>1)</sup>




**Generation**

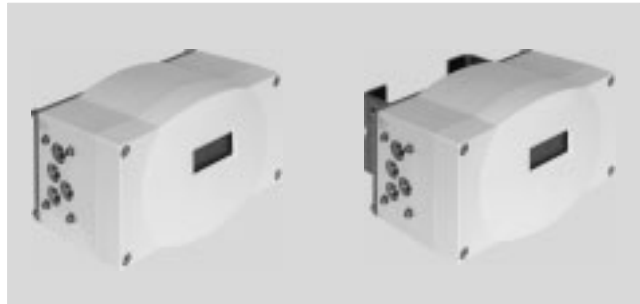
	Second generation
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1) Cable fracture or failure of the power supply  
 2) Pressurise quarter turn actuator at both ends

# 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	G1/8	
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	
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		
	Positioner, displacement/angle measurement integrated	Positioner, displacement/angle measurement external
Measuring principle displacement encoder	-	Potentiometer
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
Connection resistance	[kOhm]	-
Max. output current	[mA]	500
Max. load resistance of current output	[Ohm]	500
Max. current consumption	[A]	1
Idle current	[mA]	90 ... 300
	[V]	Signal 0 ≤ 5
Switching level	[V]	Signal 1 ≥ 10
	[V]	Signal 1 ≥ 10
Safety information		
For variant A	Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is opening/closing	
For variant C	Safety position: In the case of a broken cable or a failure in the operating voltage, the regulating action is holding <sup>1)</sup>	

1) Pressurise quarter turn actuator at both ends

# 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) <sup>3)</sup>		To EU EMC Directive <sup>2)</sup>
Approval certificate		RCM trademark
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.
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://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.
- 3) Additional information [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

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

# Positioners CMSX, 2nd generation

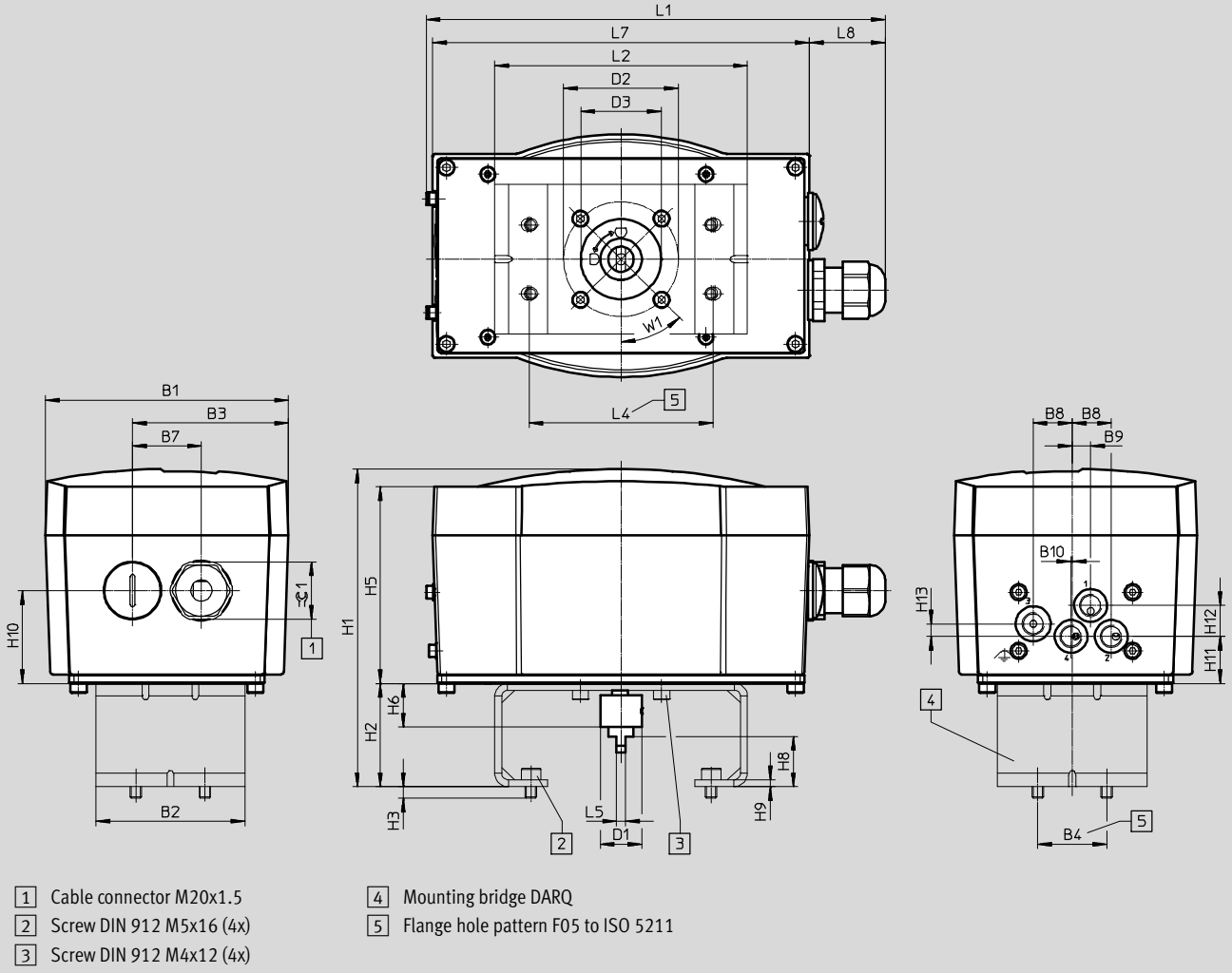
Technical data

FESTO

## 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 ∅	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, 2nd generation

Technical data

Positioner	Mounting bridge → page 18	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

# Positioners CMSX, 2nd generation

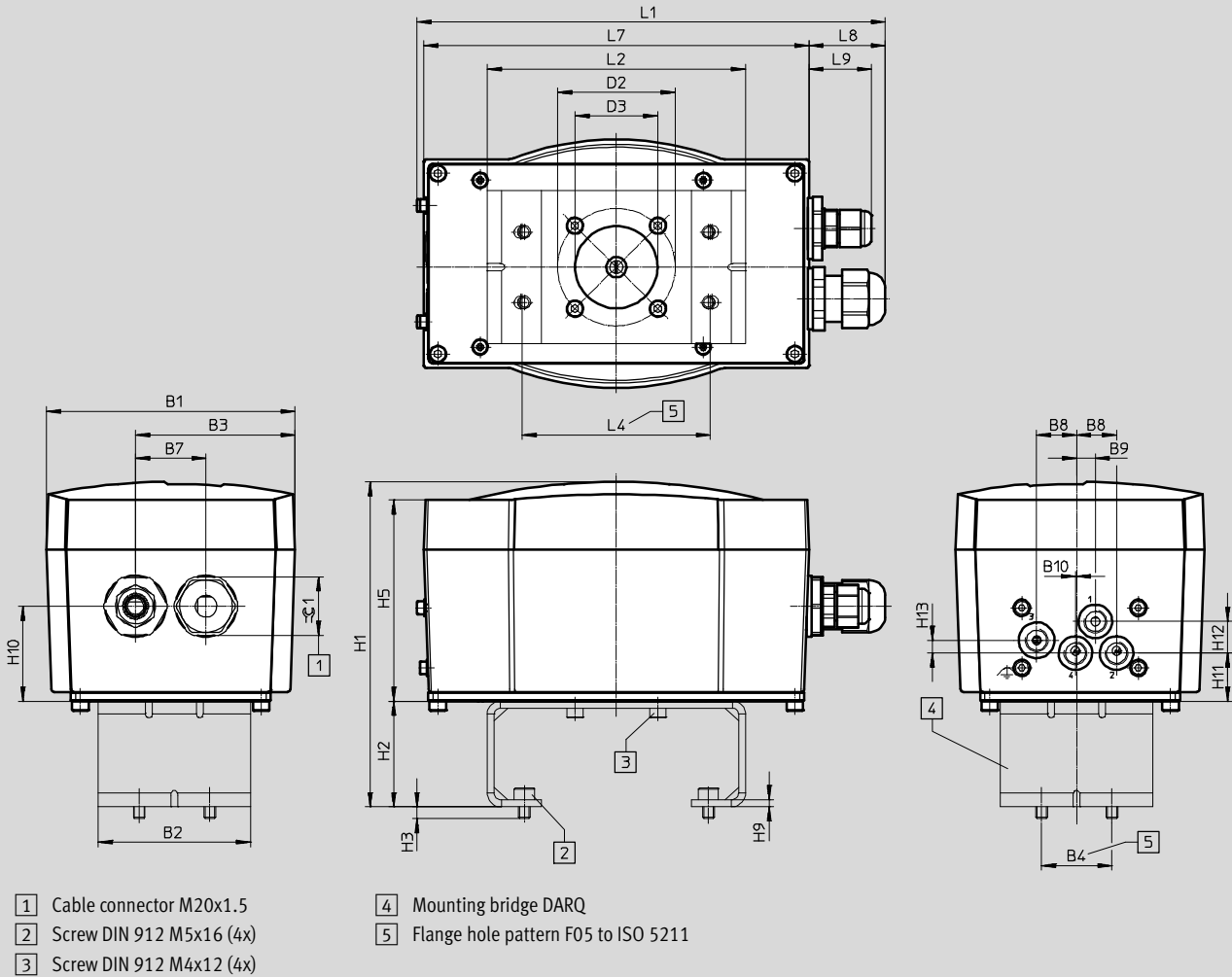
Technical data

FESTO

## 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 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 bridge → page 18	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, 2nd generation

Technical data

FESTO

## ★ Core product range

Ordering data					
	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
Positioner, displacement/angle measurement integrated					
	Can be set to open or close in the event of a system failure <sup>1)</sup>	50	0 ... 100	★ 3929313	CMSX-P-S-C-U-F1-D-50-A
		50		★ 3929370	CMSX-P-S-C-U-F1-S-50-A
Positioner, displacement/angle measurement external					
	Can be set to open or close in the event of a system failure <sup>1)</sup>	130	–	★ 3929539	CMSX-P-SE-C-U-F1-D-130-A

Ordering data					
	Safety setting	Standard nominal flow rate [l/min]	Sensing range in degrees [deg]	Part No.	Type
Positioner, displacement/angle measurement integrated					
	Can be set to open or close in the event of a system failure <sup>1)</sup>	130	0 ... 100	3929312	CMSX-P-S-C-U-F1-D-130-A
				3929369	CMSX-P-S-C-U-F1-S-130-A
	Maintain position in the event of a system failure <sup>1)</sup>	130	0 ... 100	3929314	CMSX-P-S-C-U-F1-D-130-C
		50		3929315	CMSX-P-S-C-U-F1-D-50-C
Positioner, displacement/angle measurement external					
	Maintain position in the event of a system failure <sup>1)</sup>	130	–	3929540	CMSX-P-SE-C-U-F1-D-130-C

1) Cable fracture or failure of the power supply

2) Pressurise quarter turn actuator at both ends

Festo core product range

★ Ready for dispatch from the Festo factory in 24 hours

☆ Ready for dispatch in 5 days maximum from stock

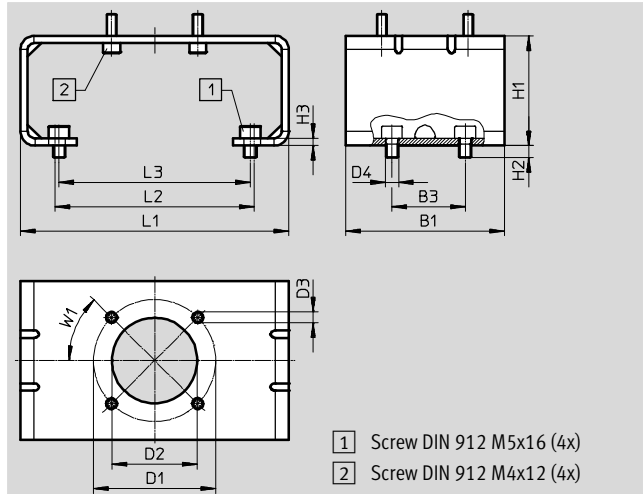
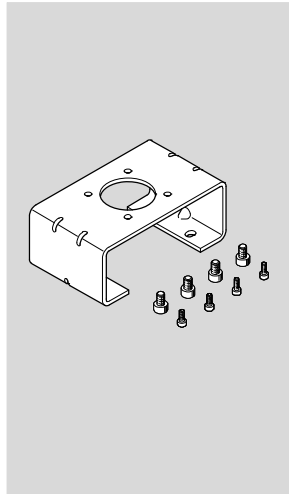
# Positioners CMSX

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			160	131.6	128.4			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.

Festo core product range

- ★ Ready for dispatch from the Festo factory in 24 hours
- ☆ Ready for dispatch in 5 days maximum from stock