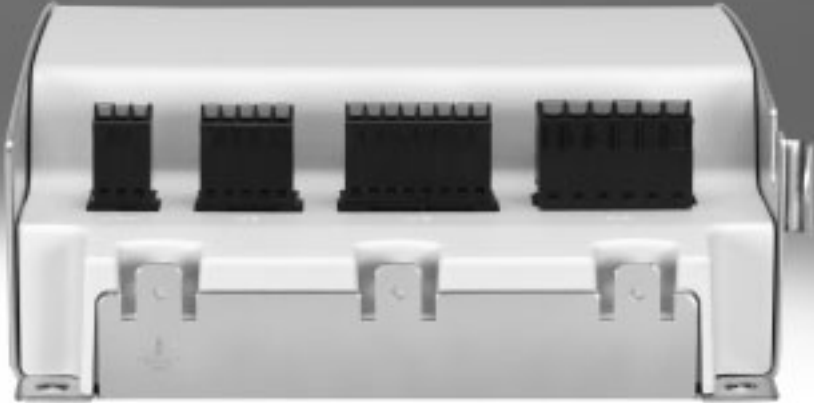


Motor controllers CMMO-ST



Motor controllers CMMO-ST

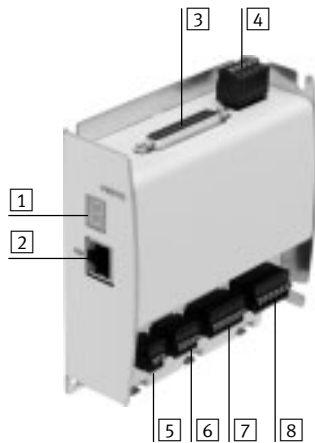
Key features

FESTO

At a glance

- The motor controller CMMO-ST serves as a closed-loop and open-loop position controller
 - Separate load and logic supply
 - Supports the "Safe Torque Off" (STO) safety function
 - Easy actuation via:
 - I/O interface
 - Monitoring of freely definable position zones
 - Backup file enables seamless device replacement
 - H-rail mounting possible
 - Encoder option (closed loop), in other words no step losses, following errors are corrected
- Parameterisation possible via:
- FCT (Festo Configuration Tool) configuration package
 - Ethernet interface with integrated web server

Description of the interfaces



- 1 7-segment display
- 2 Ethernet interface (RJ45)
- 3 I/O interface
- 4 Power supply
- 5 Reference switch
- 6 STO safety function
- 7 Encoder
- 8 Motor
- 9 Mounting bracket to fit onto an H-rail

For actuating

Electric cylinder EPCO



Stepper motor EMMS-ST



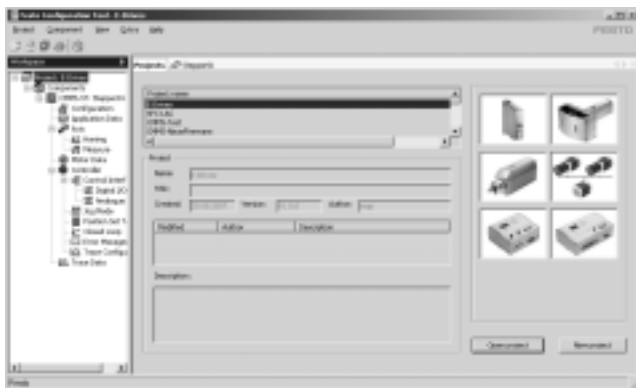
Motor controllers CMMO-ST

Key features



FCT software – Festo Configuration Tool

Software platform for electric drives from Festo



- All drives in a system can be managed and saved in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically-supported parameter entry
- Universal mode of operation for all drives
- Work offline at your desk or online at the machine

Mechanical reference positions and limit positions



- Reference positions can be either edited or taught in
- Flexible adaptation to installation conditions
- Settings are displayed clearly

Positioning record table



- 31 positioning records ensure flexibility in positioning
- Absolute or relative positioning values can be used
- The following parameters can be set flexibly for each application:
 - Position
 - Speed
 - Acceleration
 - Braking ramps
- Force control
- Complete function test

Motor controllers CMMO-ST

Type codes



CMMO – ST – C5 – 1 – DIO – P

Type	
CMMO	Motor controller
Motor technology	
ST	Stepper motor
Nominal current	
C5	5 A
Input voltage	
1	24 V DC
Bus protocol/activation	
DIO	Digital I/O interface
Switching input/output	
N	NPN
P	PNP

Motor controllers CMMO-ST

Technical data

FESTO



General technical data		
Mode		Cascade controller with PI speed controller PI current controller P position controller PWM MOSFET power end stage
Operating mode		
Open-loop operation		Micro step, 12,800 steps/rev
Closed-loop operation		Sinusoidal current control, within the cascade controller
Rotary position encoder		Encoder
Display		7-segment display
Parameterisation interface		Ethernet
Ethernet, supported protocols		TCP/IP
Encoder interface input		RS422
Process coupling		I/O coupling for 32 positioning records
Number of digital logic inputs		11
Number of digital logic outputs		11
Characteristics of digital logic outputs		Freely configurable in some cases
Adjustable current reduction		Via software
Nominal current setting		Via software
Braking resistor	[Ω]	15
Pulse power of braking resistor	[kVA]	0.1
Mains filter		Integrated
Type of mounting		Screwed onto connecting plate, lying down or upright Via H-rail
Product weight	[g]	290

Electrical data		
General		
Max. intermediate circuit voltage	[V DC]	28
Nominal output current	[A]	5.7
Load supply		
Nominal voltage	[V DC]	24 ±15%
Nominal current	[A]	6
Peak current	[A]	8
Logic supply		
Nominal voltage	[V DC]	24 ±15%
Nominal current	[A]	0.3
Operating range of logic input	[V]	24
Max. current per output (digital logic outputs)	[mA]	100
Switching logic, input/output		
CMMO-ST-...-DIOP		PNP
CMMO-ST-...-DION		NPN

Motor controllers CMMO-ST

Technical data



Safety characteristics	
Safety function to EN 61800-5-2	Safe Torque Off (STO)
Performance Level (PL) to EN ISO 13849-1	Category 3, Performance Level e
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 3/SIL CL 3
Certificate issuing authority	TÜV 01/205/5252/12
Proof test interval	20a
PFH	1.3×10^{-10}
Diagnostic coverage [%]	90
Safe failure fraction (SFF) [%]	99.8
Hardware fault tolerance	1
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾
	To EC Machinery Directive
Shock resistance	To EN 60068-2-29
Vibration resistance	To EN 60068-2-6

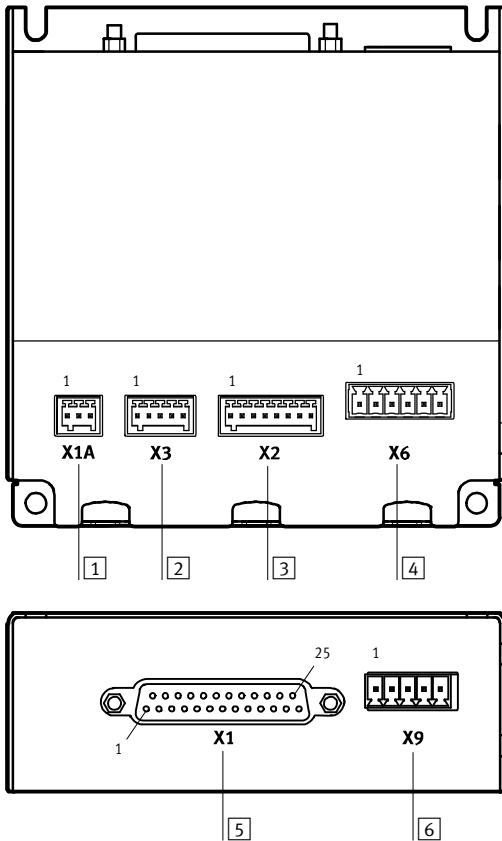
- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Operating and environmental conditions	
Characteristics of digital logic outputs	Not galvanically isolated
Characteristics of logic inputs	Galvanically connected to logic potential
Logic input specification	Based on IEC 61131-2
Protection class	IP40
Protective function	I ² t monitoring
	Following error monitoring
	Software end-position detection
	Voltage failure detection
	Current monitoring
	Temperature monitoring
Ambient temperature [°C]	0 ... +50
UL ambient temperature [°C]	0 ... +40
Storage temperature [°C]	-25 ... +75
Relative air humidity [%]	0 ... 90 (non-condensing)
Certification	cULus listed (OL)
	C-Tick
Note on materials	Contains PWIS (paint-wetting impairment substances)
	RoHS-compliant

Motor controllers CMMO-ST

Technical data

Pin allocation



1 Reference switch

Pin	Function
1	+24 V (logic output)
2	Signal
3	0 V

2 STO safety function

Pin	Function
1	+24 V (logic output)
2	STO 1
3	STO 2
4	Diagnostics 1
5	Diagnostics 2

3 Encoder

Pin	Function
1	A
2	A/
3	B
4	B/
5	N
6	N/
7	+5 V (output)
8	0 V

4 Motor

Pin	Function
1	String A
2	String A/
3	String B
4	String B/
5	Brake +24 V (switched output)
6	Brake 0 V

5 I/O interface, 25-pin Sub-D plug

Pin	Function
1	Input 1
2	Input 2
3	Input 3
4	Input 4
5	Input 5
6	Input 6
7	Input 7
8	Input 8
9	Input 9
10	Input 10
11	Input 11
12	Output 1
13	Output 2
14	Output 3
15	Output 4
16	Output 5
17	Output 6
18	Output 7
19	Output 8
20	Output 9
21	Output 10
22	Output 11
23	n.c.
24	+24 V (logic output)
25	0 V

6 Power supply

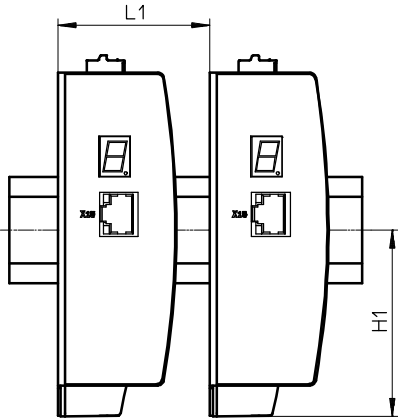
Pin	Function
1	n.c.
2	n.c.
3	+24 V (logic)
4	0 V
5	+24 V (load)

Motor controllers CMMO-ST

Technical data



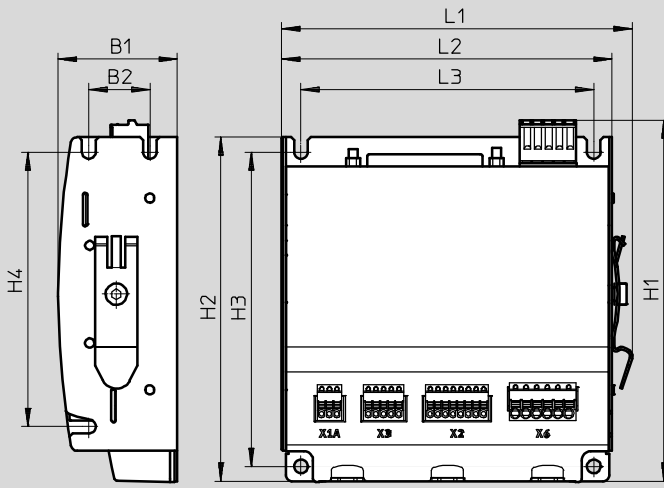
Minimum distance between two motor controllers



Type	L1	H1
CMMO-ST-...	41	61.35

Dimensions

Download CAD data → www.festo.com



Type	B1	B2	H1	H2	H3	H4	L1	L2	L3
CMMO-ST-...	39	20	118.7	113.1	103.1	90	115	108.8	96

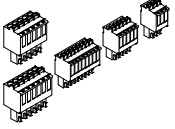
Ordering data

Motor controller	Brief description	Part No.	Type
	With I/O interface		
	Switching input/output PNP	1512316	CMMO-ST-C5-1-DIOP
	Switching input/output NPN	1512317	CMMO-ST-C5-1-DION

Motor controllers CMMO-ST

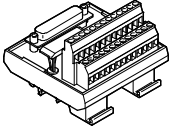
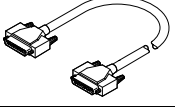
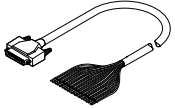
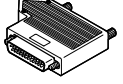
Accessories

FESTO

Ordering data			
	Description	Part No.	Type
Plug			
	Plug assortment for motor cable, encoder cable, power supply, reference switch, STO safety function	576005	NEKM-C-10²⁾

1) Comprising plug for power supply and plug for motor connection. The plug assortment is included in the scope of delivery of the motor controller.

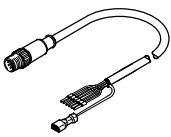
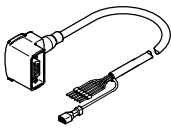
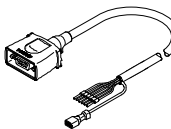
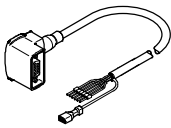
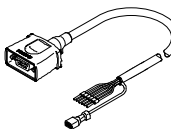
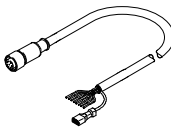
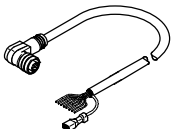
2) Plugs are included in the scope of delivery of the motor controller.

Ordering data – Connection options from I/O interface to controller				
	Description	Cable length [m]	Part No.	Type
Connection block				
	Ensures simple and clear wiring. The connection to the motor controller is established via the connecting cable NEBC-S1G25-K-...	–	8001371	NEFC-S1G25-C2W25-S7
Connecting cable				
	Connects the motor controller to the connection block	1.0	8001374	NEBC-S1G25-K-1.0-N-S1G25
		2.0	8001375	NEBC-S1G25-K-2.0-N-S1G25
		5.0	8001376	NEBC-S1G25-K-5.0-N-S1G25
Control cable				
	Is connected to the motor controller. The other end comprises individual flying leads	3.2	8001373	NEBC-S1G25-K-3.2-N-LE25
Plug				
	25-pin sub-D plug. Each wire can be individually assembled using screw terminals	–	8001372	NEFC-S1G25-C2W25-S6

Motor controllers CMMO-ST

Accessories

FESTO

Ordering data – Cables ¹⁾					
	For type	Description	Cable length [m]	Part No.	Type
Motor cable					
	EPCO-16 EMMS-ST-28	Straight plug – Min. bending radius: 62 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1449600	NEBM-M12G8-E-1.5-Q5-LE6
			2.5	1449601	NEBM-M12G8-E-2.5-Q5-LE6
			5	1449602	NEBM-M12G8-E-5-Q5-LE6
			7	1449603	NEBM-M12G8-E-7-Q5-LE6
			10	1449604	NEBM-M12G8-E-10-Q5-LE6
	EPCO-25/40 EMMS-ST-42/-57	Angled plug – Min. bending radius: 62 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1450736	NEBM-S1W9-E-1.5-Q5-LE6
			2.5	1450737	NEBM-S1W9-E-2.5-Q5-LE6
			5	1450738	NEBM-S1W9-E-5-Q5-LE6
			7	1450739	NEBM-S1W9-E-7-Q5-LE6
			10	1450740	NEBM-S1W9-E-10-Q5-LE6
	EPCO-25/40 EMMS-ST-42/-57	Straight plug – Min. bending radius: 62 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1450368	NEBM-S1G9-E-1.5-Q5-LE6
			2.5	1450369	NEBM-S1G9-E-2.5-Q5-LE6
			5	1450370	NEBM-S1G9-E-5-Q5-LE6
			7	1450371	NEBM-S1G9-E-7-Q5-LE6
			10	1450372	NEBM-S1G9-E-10-Q5-LE6
	EMMS-ST-87	Angled plug – Min. bending radius: 80 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1450943	NEBM-S1W15-E-1.5-Q7-LE6
			2.5	1450944	NEBM-S1W15-E-2.5-Q7-LE6
			5	1450945	NEBM-S1W15-E-5-Q7-LE6
			7	1450946	NEBM-S1W15-E-7-Q7-LE6
			10	1450947	NEBM-S1W15-E-10-Q7-LE6
	EMMS-ST-87	Straight plug – Min. bending radius: 80 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1450834	NEBM-S1G15-E-1.5-Q7-LE6
			2.5	1450835	NEBM-S1G15-E-2.5-Q7-LE6
			5	1450836	NEBM-S1G15-E-5-Q7-LE6
			7	1450837	NEBM-S1G15-E-7-Q7-LE6
			10	1450838	NEBM-S1G15-E-10-Q7-LE6
Encoder cable					
	EPCO-16/-25/-40 EMMS-ST-28/-42/ -57/-87	Straight plug – Min. bending radius: 68 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1451586	NEBM-M12G8-E-1.5-LE8
			2.5	1451587	NEBM-M12G8-E-2.5-LE8
			5	1451588	NEBM-M12G8-E-5-LE8
			7	1451589	NEBM-M12G8-E-7-LE8
			10	1451590	NEBM-M12G8-E-10-LE8
	EPCO-25/40 EMMS-ST-42/-57/-87	Angled plug – Min. bending radius: 68 mm – Suitable for use with energy chains – Ambient temp.: –40 ... +80 °C	1.5	1451674	NEBM-M12W8-E-1.5-LE8
			2.5	1451675	NEBM-M12W8-E-2.5-LE8
			5	1451676	NEBM-M12W8-E-5-LE8
			7	1451677	NEBM-M12W8-E-7-LE8
			10	1451678	NEBM-M12W8-E-10-LE8

1) Other cable lengths on request.