

Motor controllers CMMS-ST, for stepper motors

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Motor controllers CMMS-ST, for stepper motors

Key features

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Performance characteristics			
Compactness		Motion control	
• Small dimensions • Full integration of all components for controller and power section, including RS232 and CANopen interface • Integrated brake chopper • Integrated EMC filters		• Automatic actuation for a holding brake • Adheres to the current CE and EN standards without additional external measures (motor cable length of up to 15 m) • Can be operated as a torque, speed or position controller • Integrated positioning controller • Time-optimised (trapezoidal) or jerk-free (S-shaped) positioning • Absolute and relative movements • Point-to-point positioning with and without approximate positioning	
• Position synchronisation • Electronic gear unit • 63 position sets • 8 travel profiles • Wide range of homing methods			
Fieldbus interfaces		Input/output	Integrated sequence control
Integrated: 		• Freely programmable I/Os • High-resolution 12-bit analogue input • Jog/teach mode • Simple linking to a higher-level controller via I/O or fieldbus • Synchronous operation • Master/slave mode	
Optional:  		• Automatic sequence of position sets without a higher-level controller • Linear and cyclic position sequences • Adjustable delay times	
Integrated safety functions		Interpolating multi-axis movement	
• The motor controller CMMS-ST support "Safe Torque off (STO)" and "Safe Stop 1 (SS1)" functions with protection against unexpected startup in accordance with EN 61800-5-2		• Protection against unexpected start-up • Two-channel disconnection of the output stage • Shorter response times in the event of an error • With a suitable controller, the CMMS-ST can perform path movements with interpolation via CANopen. The controller specifies setpoint position values in a fixed	
		time pattern to this end. In between, the servo positioning controller independently interpolates the data values between two data points.	

PROFIBUS®, DeviceNet®, CANopen® is a registered trademark of its respective trademark holder in certain countries.

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Key features

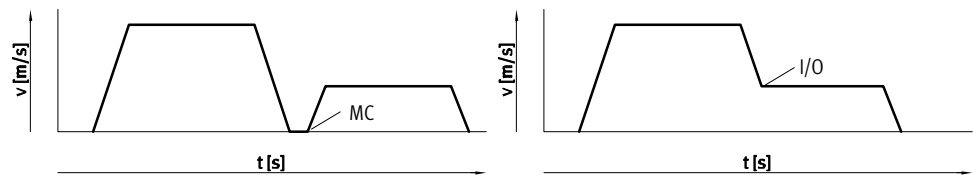
Performance characteristics

Servo mode

- Encoder option (closed loop), in other words no step losses, following errors are corrected

Travel program

- Linking of any number of position sets into a travel program
- Step criteria for the travel program possible via digital inputs, for example
MC – motion complete
I/O – digital inputs



Library for EPLAN



EPLAN macros for fast and reliable planning of electrical projects in combination with motor controllers,

motors and cables. This enables a high level of planning reliability, standardisation of documentation,

no need to create symbols, graphics and master data.

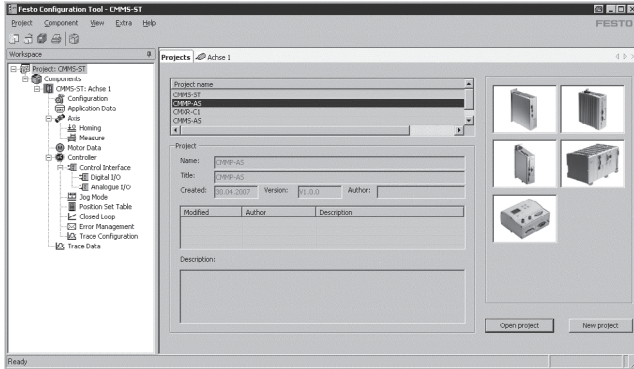
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FCT software – Festo Configuration Tool

Software platform for electric drives from Festo



- All drives in a system can be managed and archived 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
- Working offline at your desk or online at the machine

FHPP – Festo Handling and Positioning Profile

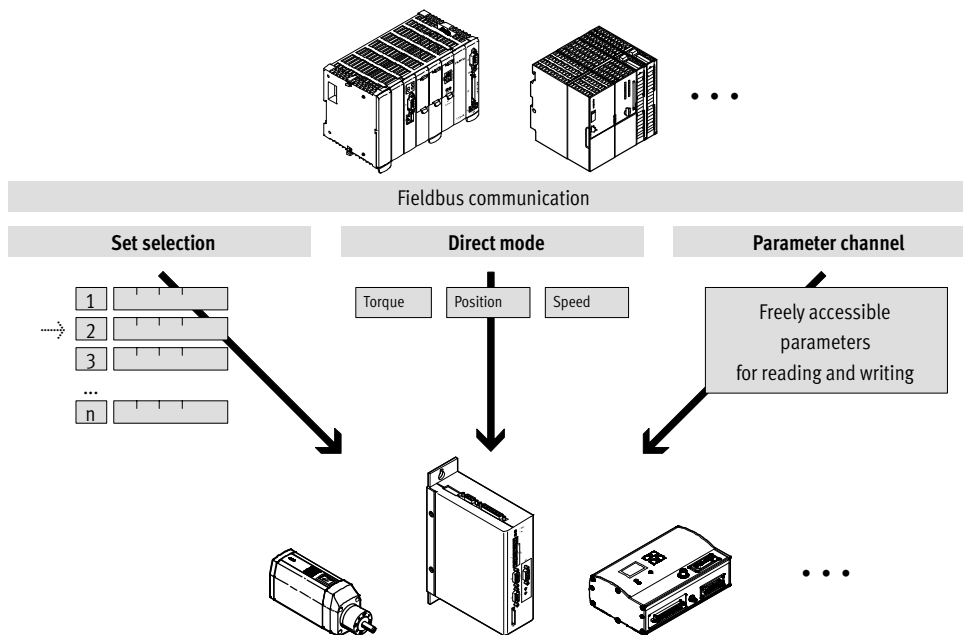
Optimised data profile

Festo has developed an optimised data profile, the “Festo Handling and Positioning Profile (FHPP)”, that is tailored to handling and positioning applications.

The FHPP data profile permits the actuation of Festo motor controllers, using a fieldbus interface, via standardised control and status bytes.

The following are defined, among others:

- Operating modes
- I/O data structure
- Parameter objects
- Sequence control



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Type codes

		CMMS	–	ST	–	C8	–	7	–	G2	
Type											
CMMS	Motor controller, standard										
Motor type											
ST	Stepper motor										
Nominal current											
C8	8 A										
Input voltage											
7	48 V DC										
Generation											
G2	Next generation										

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Technical data

Fieldbus interfaces

CANopen

PROFIBUS

DeviceNet



General technical data	
Type of mounting	Screwed to a mounting plate
Operating mode	PWM MOSFET power amplifier
Motor actuation	Sinusoidal current impressing
Cycle rate [kHz]	Constant 50
Rotary position generator	Encoder
Display	7-segment display
Parameterisation interface	RS232 (9,600 ... 115,000 bits/s)
Encoder interface input	As speed/position specification for the slave drive in synchronous mode RS422
Encoder interface output	Setpoint specification for downstream slave drive
Brake resistor, integrated [Ω]	17
Pulse power of braking resistor [kVA]	0.5
Bus terminating resistor	Integrated
Impedance of setpoint input [kΩ]	20
Number of analogue outputs	1
Operating range of analogue outputs [V]	±10
Characteristics of digital logic outputs	Freely configurable in some cases
Number of analogue inputs	1
Operating range of analogue inputs [V]	±10
Mains filter	Integrated
Product weight [g]	900

Technical data – Fieldbus interface				
Interfaces	I/O	CANopen	PROFIBUS DP	DeviceNet
Communication profile	–	DS301, FHPP	DP-V0 / FHPP	FHPP
	–	DS301, DSP402	–	
Max. fieldbus transmission rate [Mbit/s]	–	1	12	0.5
Interface	Integrated	■	–	–
	Optional	–	■ → 11	■ → 11

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Technical data

Function blocks for PLC programming				
Programming software	Controller manufacturer	Interfaces		
		CANopen	PROFIBUS DP	DeviceNet
CoDeSys	Festo	■	■	■
	Beckhoff			
	Other manufacturers			
RSLogix5000	Rockwell Automation	–	–	■
Step 7	Siemens	–	■	–

Electrical data		
Output connection data		
Output voltage range	[V AC]	0 V up to input voltage
Nominal current setting		Via software
Max. peak current duration	[s]	2
Max. intermediate circuit voltage	[V DC]	48
Output frequency	[Hz]	0 ... 2000
Load supply		
Nominal voltage	[V DC]	24 ... 48
Nominal current	[A]	8
Peak current	[A]	12
Logic supply		
Nominal voltage	[V DC]	24 ±20%
Nominal current	[A]	0.2
Max. current of digital logic outputs	[mA]	100

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 d
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 2
MTTFd	STO/2521 years
PFH	4.53×10^{-8}
Approval	BIA
Certificate issuing authority	BG MFS 09031
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾
	To EC Machinery Directive

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.

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Technical data

Operating and environmental conditions	
Digital logic outputs	Not galvanically isolated
Logic inputs	Galvanically connected to logic potential
Degree of protection	IP20
Protective function	I ² t monitoring
	Intermediate circuit over/undervoltage
	Output stage short circuit
	Standstill monitoring
	Temperature monitoring
Degree of contamination	2
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	−25 ... +70
Relative air humidity [%]	0 ... 90 (non-condensing)
CE marking (see declaration of conformity)	To EU Low Voltage Directive
	To EU EMC Directive ¹⁾
	To EU Machinery Directive
Approval	c UL - Recognised (OL)
	UL listed (OL)
	C-Tick
Note on materials	RoHS-compliant

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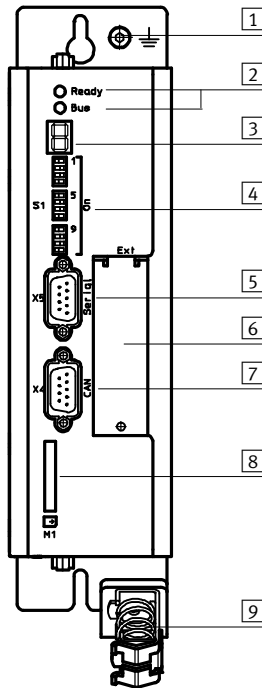
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Technical data

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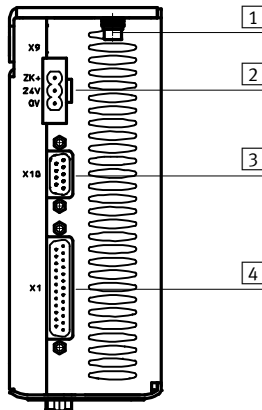
View of motor controller

From the front



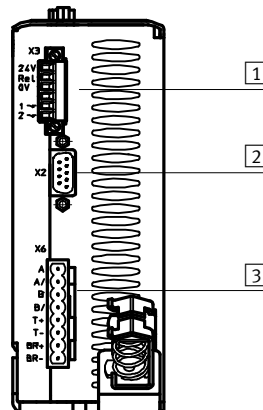
- 1 Earthing
- 2 Ready/bus LED
- 3 Status display
- 4 Fieldbus settings and boot loader
- 5 X5 Interface: RS232/RS485
- 6 X4 Technology module slot
- 7 Interface: CAN bus
- 8 SD memory card
- 9 Screened connection

From above



- 1 Earthing screw
- 2 X9 Power supply
- 3 X10 Incremental encoder interface (bidirectional)
- 4 X1 I/O interface

From underneath



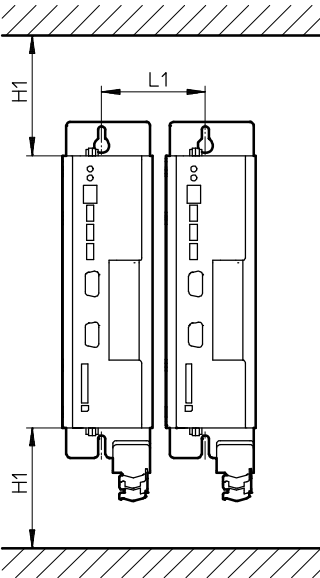
- 1 X3 Safe stop
- 2 X2 Increment encoder input for motor
- 3 X6 Motor connection

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Technical data

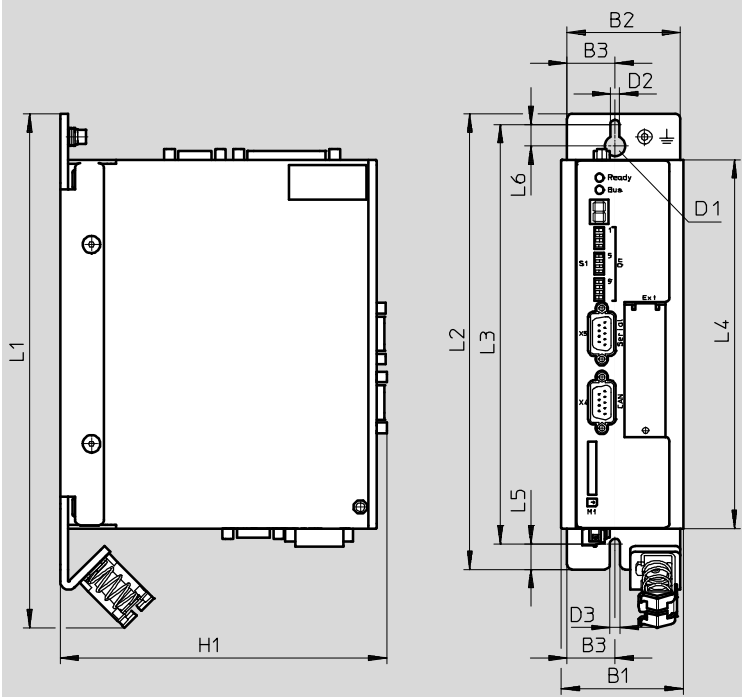
Installation clearance for motor controller



H1	L1
100	69

Dimensions

Download CAD data → www.festo.com



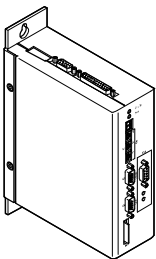
Type	B1	B2	B3	D1	D2	D3	H1
CMMS-ST	60	56	24	10	4.5	5	161

Type	L1	L2	L3	L4	L5	L6
CMMS-ST	252	224	206.25	181	12.5	15.75

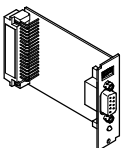
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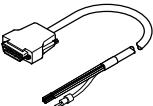
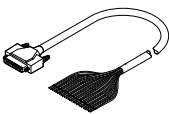
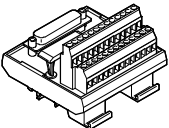
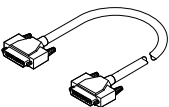
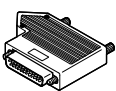
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Technical data and accessories

Ordering data			
	Description	Part No.	Type
	The plug assortment NEKM (→ 12) and the operator package (→ LEERER MERKER) are included in the scope of delivery of the motor controller.	572211	CMMS-ST-C8-7-G2

Accessories

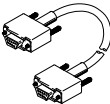
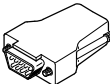
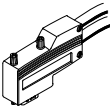
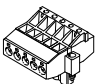
Ordering data – Plug-in cards			
	Description	Part No.	Type
	Interface module, for PROFIBUS interface	547450	CAMC-PB
	Interface module, for DeviceNet interface	547451	CAMC-DN
	Memory card, for data backup and firmware download	1436343	CAMC-M-S-F10-V1

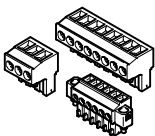
Ordering data – Connection options from I/O interface to controller				
	Description	Cable length [m]	Part No.	Type
Control cable				
	- For I/O interface to any controller - Recommended for analogue signals since the cable is shielded	2.5	552254	NEBC-S1G25-K-2.5-N-LE26
	- For I/O interface to any controller - Cannot be used if the incremental encoder interface (X10 plug) is in use	3.2	8001373	NEBC-S1G25-K-3.2-N-LE25
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
Plug connector				
	25-pin Sub-D plug. Each wire can be individually assembled using screw terminals	–	8001372	NEFC-S1G25-C2W25-S6

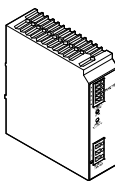
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Ordering data – Cables and plugs				
	Description	Cable length [m]	Part No.	Type
Programming cable				
	–	2.0	160786	PS1-ZK11-NULLMODEM-2,0M
Encoder plug				
	For incremental encoder interface	–	564264	NECC-A-S-S1G9-C2M
Plug connector				
	For PROFIBUS interface	–	533780	FBS-SUB-9-WS-PB-K
	For CANopen interface	–	533783	FBS-SUB-9-WS-CO-K
	For DeviceNet interface	–	525635	FBSD-KL-2X5POL

Ordering data – Plug assortment			
	Description	Part No.	Type
	- Comprising plug for power supply, motor connection and safety function - The plug assortment is included in the scope of delivery of the motor controller	547452	NEKM-C-1

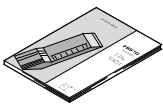
Ordering data – Power supply units						
	Description	Input voltage range [V AC]	Nominal output voltage [V DC]	Nominal output current [A]	Part No.	Type
	Power supply for motor controller	100 ... 240	24	5	2247681	CACN-3A-1-5
				10	2247682	CACN-3A-1-10
			48	5	2247683	CACN-3A-7-5
				10	2247684	CACN-3A-7-10
				20	2247685	CACN-11A-7-20

 Note If a common power supply unit is used to supply the power section and the control section, the voltage tolerances for the supply to the control section cannot be maintained at high braking power. This can result in damage to the control section. Always use separate power supply units to supply the power section and the control section.		
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Accessories

Ordering data – Documentation ¹⁾			
	Language	Part No. Type	Part No. Type
		For motor controller	Festo Handling and Positioning Profile (FHPP) for the motor controller range CMM...
	DE	573124 P.BE-CMMS-ST-G2-HW-DE	555695 P.BE-CMM-FHPP-SW-DE
	EN	573125 P.BE-CMMS-ST-G2-HW-EN	555696 P.BE-CMM-FHPP-SW-EN
	ES	573126 P.BE-CMMS-ST-G2-HW-ES	555697 P.BE-CMM-FHPP-SW-ES
	FR	573127 P.BE-CMMS-ST-G2-HW-FR	555698 P.BE-CMM-FHPP-SW-FR
	IT	573128 P.BE-CMMS-ST-G2-HW-IT	555699 P.BE-CMM-FHPP-SW-IT
		For CANopen interface	For PROFIBUS interface
	DE	554351 P.BE-CMMS-FHPP-CO-SW-DE	554345 P.BE-CMMS-FHPP-PB-SW-DE
	EN	554352 P.BE-CMMS-FHPP-CO-SW-EN	554346 P.BE-CMMS-FHPP-PB-SW-EN
	ES	554353 P.BE-CMMS-FHPP-CO-SW-ES	554347 P.BE-CMMS-FHPP-PB-SW-ES
	FR	554354 P.BE-CMMS-FHPP-CO-SW-FR	554348 P.BE-CMMS-FHPP-PB-SW-FR
	IT	554355 P.BE-CMMS-FHPP-CO-SW-IT	554349 P.BE-CMMS-FHPP-PB-SW-IT
		For DeviceNet interface	
	DE	554357 P.BE-CMMS-FHPP-DN-SW-DE	
	EN	554358 P.BE-CMMS-FHPP-DN-SW-EN	
	ES	554359 P.BE-CMMS-FHPP-DN-SW-ES	
	FR	554360 P.BE-CMMS-FHPP-DN-SW-FR	
	IT	554361 P.BE-CMMS-FHPP-DN-SW-IT	

1) User documentation in paper form is not included in the scope of delivery

Festo - Your Partner in Automation



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