

Motor controllers CMMP-AS, for servo motors



## Motor controllers CMMP-AS, for servo motors

Key features

Comparison of motor controllers				
Motor controller for motor type	CMMD-AS Servo motor	CMMS-AS Servo motor	CMMP-AS Servo motor	CMMS-ST Stepper motor
Positioning records	2 x 63	63	255	63
Measuring system	Incremental/absolute		Analogue/incremental/absolute	Incremental
Extended I/O interface	4 working modes		Flexibly configurable	4 working modes
Notification of remaining distance	1 for n		Separately for all positions	1 for n
Torque reduction	No		Separately for all positions	No
Record linking	Linear		With branching	Linear
STO/SS1	To EN 61800-5-2		To EN 61800-5-2	To EN 61800-5-2

### Features

#### Compactness

- Small dimensions
- Full integration of all components for the controller and power section, including USB interface, Ethernet and CANopen interface
- Integrated brake chopper
- Integrated EMC filters

- Automatic actuation for a holding brake
- Complies with the current CE and EN standards without additional external measures (motor cable length of up to 25 m)

#### Motion control

- Evaluation of digital absolute encoder (EnDat/HIPERFACE) in single-turn or multi-turn versions
- Can be operated as a torque, speed or position controller
- Integrated position controller
- Time-optimised (trapezoidal) or jerk-free (S-shaped) positioning
- Absolute and relative movements
- Point-to-point positioning with and without motion path smoothing
- Position synchronisation
- Electronic gear unit
- 255 positioning records
- Wide range of homing methods

#### Fieldbus interfaces













#### Input/output

- Freely programmable I/Os
- High-resolution 16-bit analogue input
- Jog/teach mode
- Simple connection to a higher-order controller via I/O or fieldbus
- Synchronous operation
- Master/slave mode
- Additional I/Os with the plug-in card CAMC-D-8E8A → 17

#### Integrated sequence control

- Automatic sequence of positioning records without a higher-order controller
- Linear and cyclical position sequences
- Adjustable delay times
- Branches and wait positions
- Overlapping restart possible during the movement

## Motor controllers CMMP-AS, for servo motors

Key features

### Features

#### Integrated safety functions

- The motor controller CMMP-AS supports the "Safe Torque Off (STO)" safety function and, by providing a reliable time delay, also supports "Safe Stop 1 (SS1)" with protection against unexpected start-up in accordance with EN 61800-5-2
- Protection against unexpected

start-up

- Two-channel disconnection of the output stage
- Less external circuitry
- Shorter response times in the event of an error
- Faster restart, intermediate circuit remains charged

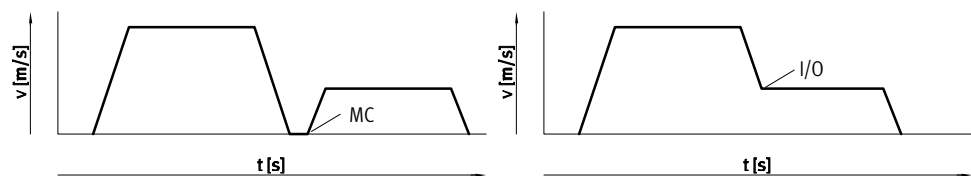
#### Interpolating multi-axis movement

- With a suitable controller, the CMMP-AS can perform path movements with interpolation via CANopen or EtherCAT. The controller specifies position

setpoint values in a fixed time pattern to this end. In between, the servo position controller independently interpolates the data values between two data points.

### Travel program

- Linking of any number of positioning records 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

→ [www.festo.com/eplan](http://www.festo.com/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.

### Cam disc functionality

The "electronic cam disc" application type creates optimised motion profiles that generate less vibration and acceleration force at the machine. In addition, the motion of the motor is always synchronous in position with a master axis, which enables easy definition of overlapping, time-optimised motion sequences. To be able to use the cam disc function, you will need the Festo Configuration Tool (FCT) and also the curve editor → 19.

Key features:

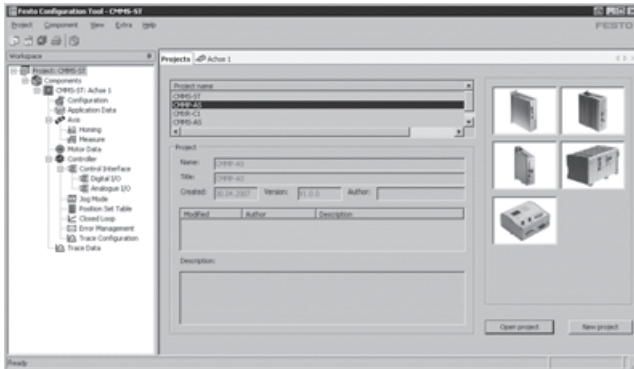
- High flexibility of the system. The mechanism does not need to be modified if the requirements for the curve shapes change.
- User-friendly motion plan editor. All limits for position, speed and acceleration are immediately displayed in the editor.
- Up to 16 cam discs with a total of up to 2,048 data points can be managed. The data points can be randomly distributed along the cam discs.
- There are four digital trip cams coupled with each cam disc.
- Each cam disc can be offset by a certain amount from the master axis.

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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
- Working offline at your desk or online at the machine

### FHPP – Festo Handling and Positioning Profile

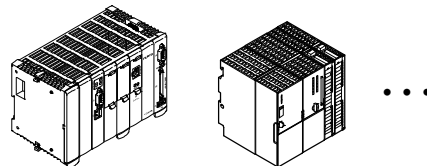
Optimised data profile

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

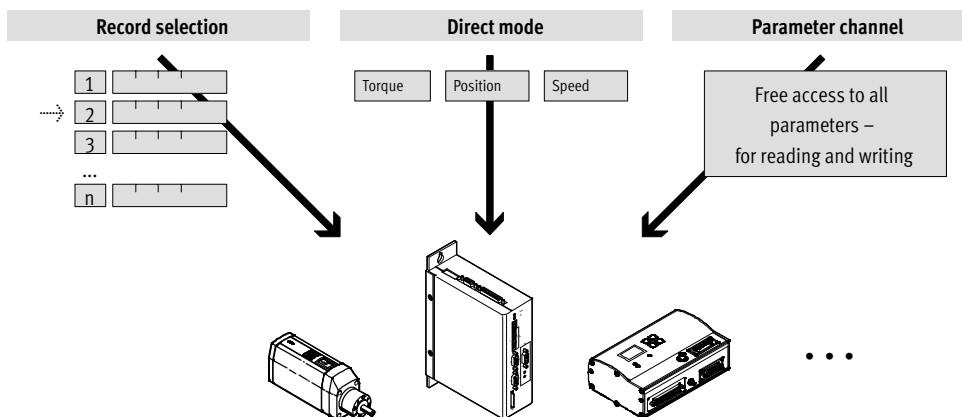
The FHPP data profile permits the actuation of Festo motor controllers, using a fieldbus interface, via standardised control and status bytes.

The following are defined, among others:

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



Fieldbus communication



## Motor controllers CMMP-AS, for servo motors

Product range overview and Type codes

Type	CMMP-AS-...-M0	CMMP-AS-...-M3	CMMP-AS-C20-11A-P3
<b>Fieldbus interface</b>			
Integrated in the controller			
CANopen	■	■	■
Optional via plug-in card			
PROFIBUS DP	-	■	■
DeviceNet	-	■	■
EtherCAT	-	■	■
EtherNet/IP	-	■	-
PROFINET RT	-	■	-
<b>Safety functions</b>			
Integrated in the controller			
Optional via plug-in card	-	■	-

### Type codes

		CMMP	AS	C5	11A	P3	M3
<b>Type</b>							
CMMP	Motor controller, premium						
<b>Motor technology</b>							
AS	AC synchronous						
<b>Nominal current</b>							
C2	2.5 A						
C5	5 A						
C10	10 A						
C20	20 A						
<b>Input voltage</b>							
3A	100 ... 230 V AC						
11A	3x 230 ... 480 V AC						
<b>Number of phases</b>							
-	1-phase						
P3	3-phase						
<b>Number of slots</b>							
M0	Without slot						
-	With 2 slots						
M3	With 3 slots						

## Motor controllers CMMP-AS, for servo motors

Technical data

Fieldbus interfaces



General technical data		C2-3A-...	C5-3A-...	C5-11A-P3-...	C10-11A-P3-...	C20-11A-P3
Type of mounting		Screwed onto mounting plate				
Display		7-segment display				
Parameterisation interface		-				RS232
		USB, Ethernet				-
Active PFC		Yes		-		
DIP switches		Firmware download/fieldbus settings <sup>1)</sup> /CAN terminating resistor				-
SD card slot		Memory card → 18				-
Encoder interface input		Resolver				
		Incremental encoder with analogue or digital tracking signals				
		Absolute encoder with EnDat V2.1 serial/V2.2				
		Absolute encoder with HIPERFACE				
		Additional input for synchronous/cam disc operation				
Encoder interface output		Actual value feedback via encoder signals in speed control mode				
		Setpoint specification for downstream slave drive				
		Resolution up to 16,384 ppr				
Braking resistor, integrated	[Ω]	60		68		47
Pulse power of braking resistor	[kVA]	2.8		8.5		12
Braking resistor, external	[Ω]	≥30		≥40		30 ≤R ≤100
Impedance of setpoint input	[kΩ]	20				
Number of analogue outputs		2				
Operating range of analogue outputs	[V]	±10				
Resolution of analogue outputs		9 bits				
Characteristics of analogue outputs		Short circuit proof				
Number of analogue inputs		3				
Operating range of analogue inputs	[V]	±10				
Characteristics of analogue inputs		1x differential, resolution 16 bits				
		2x single-ended, resolution 10 bits				
		Configurable for speed setpoint value/torque setpoint value/position setpoint value				
Mains filter		Integrated				
Max. motor cable length	[m]	25 (without external mains filter)				
Product weight	[g]	2,100	2,200	3,800		8,000

1) Not in combination with CMMP-AS-...-M0

Function blocks for PLC programming							
Programming software	Controller manufacturer	Interfaces					
		CANopen	PROFIBUS DP	DeviceNet	EtherCAT	EtherNet/IP	PROFINET RT
CoDeSys	Festo						
TwinCAT	Beckhoff	■	■	■	■	■	■
	Other manufacturers						
RSLogix5000	Rockwell Automation	-	-	■	-	■	-
Step 7/TIA Portal	Siemens	-	■	-	-	-	■

# Motor controllers CMMP-AS, for servo motors

Technical data

Technical data – Fieldbus interface								
Interfaces	I/O	CANopen	PROFIBUS DP	DeviceNet	EtherCAT	EtherNet/IP	PROFINET RT	
Number of digital logic outputs	5							
Characteristics of digital logic outputs	Freely configurable							
Number of digital logic inputs	10							
Operating range of logic inputs [V]	8 ... 30							
Characteristics of logic inputs	Freely configurable							
Process coupling	16 positioning records	–						
	255 positioning records <sup>1)</sup>	250 positioning records						
Communication profile	–	DS301, FHPP+	DP-V0/FHP P+	FHPP+	DS301, FHPP+	FHPP+	FHPP+	FHPP+
		DS301, DSP402			CoE: DS301, DSP402			
Max. fieldbus transmission rate [Mbps]	–	1	12	0.5	100	100	100	
Interface								
CMMP-AS-...-M0	Integrated	■	■	–	–	–	–	–
CMMP-AS-...-M3	Integrated	■	■	–	–	–	–	–
	Optional <sup>2)</sup>	–	–	■	■	■	■	■
CMMP-AS-C20-11A-P3	Integrated	■	■	–	–	–	–	–
	Optional <sup>2)</sup>	–	–	■	■	■	–	–

1) With additional I/O plug-in card CAMC-D8E8A → 17

2) Plug-in cards for fieldbus interface → 18

Electrical data						
CMMP-AS-	C2-3A-...	C5-3A-...	C5-11A-P3-...	C10-11A-P3-...	C20-11A-P3	
Output data						
Output voltage range [V AC]	3x 0 ... 270			3x 0 ... 360		
Nominal current [A <sub>eff</sub> ]	2.5	5	5	10	20	
Peak current at [A <sub>eff</sub> ]	5	10	10	20	41.5	
Max. peak current duration [s]	5		3		2	
Peak current at [A <sub>eff</sub> ]	10	20	20	40	–	
Max. peak current duration [s]	0.5		0.5		–	
Max. intermediate circuit voltage [V DC]	320/380 <sup>1)</sup>		560			
Output frequency [Hz]	0 ... 1,000					
Load supply						
Nominal voltage phases	1		3			
Input voltage range [V AC]	100 ... 230 ±10%			3x 230 ... 480 ±10%		
Max. nominal input current [A]	3	6	5.5	11	20	
Rated output [VA]	500	1,000	3,000	6,000	12,000	
Peak output [VA]	1,000	2,000	6,000	12,000	25,000	
Mains frequency [Hz]	50 ... 60					
Logic supply						
Nominal voltage [V DC]	24 ±20%					
Nominal current [A]	0.55/2.05 <sup>2)</sup>	0.65/2.15 <sup>2)</sup>	1/3.5 <sup>2)</sup>			
Max. current of digital logic outputs [mA]	100					

1) Without PFC/with PFC

2) Max. current with brake and I/Os

## Motor controllers CMMP-AS, for servo motors

Technical data

Safety characteristics		
CMMP-AS-	C2/C5/C10-...-M0	C20-11A-P3
Conforms to standard	EN ISO 13849-1	
Safety function	Safe Torque Off (STO)	
Performance Level (PL)	Safe Torque Off (STO)/Category 4, Performance Level e	Safe Torque Off (STO)/Category 3, Performance Level d
Safety integrity level (SIL)	SIL 3/SILCL 3	SIL 2
Certificate issuing authority	TÜV Rheinland	DGUV MFS 10027
Proof test interval	20a	–
Diagnostic coverage [%]	97.07	–
Safe Failure Fraction (SFF) [%]	99.17	–
Hardware fault tolerance	1	–
CE marking (see declaration of conformity)	To EU EMC Directive <sup>1)</sup>	
	To EU Machinery Directive	

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → 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.

Technical data – Connection to the integrated safety module with CMMP-AS-...-M0		
General		
Connection cross section [mm <sup>2</sup> ]	0.25 ... 0.5	
Electrical connection	Screw terminal	
	Straight plug	
Protection against short circuit	No	
Fuse protection	No	
Digital inputs		
Number	2 (STO-A/STO-B)	
Nominal voltage [V DC]	24	
Voltage range [V]	19.2 ... 28.8	
Nominal current at 40 °C [mA]	20	
Max. nominal current [mA]	30	
Starting current [mA]	450	
Debounce time [ms]	0.3	
Properties	Galvanically isolated	
Digital outputs		
Number	8	
Nominal voltage [V DC]	24	
Max. current [mA]	200	
Design	Potential-free signal contact	
Switching logic	Contact closes at STO	

### Note

Safety functions for motor controller CMMP-AS-...-M3 optionally via the plug-in card CAMC-G-S1 → 16



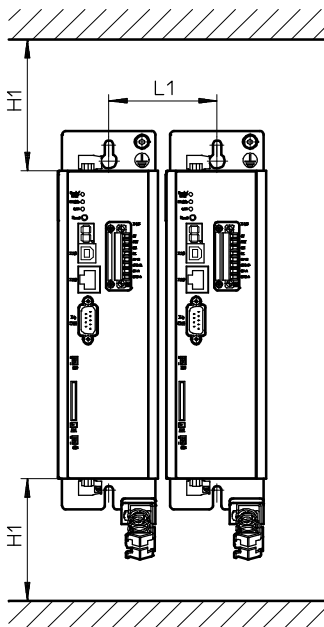
## Motor controllers CMMP-AS, for servo motors

Technical data

Operating and environmental conditions		C2-3A-...	C5-3A-...	C5-11A-P3-...	C10-11A-P3-...	C20-11A-P3
Digital logic outputs		Galvanically isolated				
Logic inputs		Galvanically isolated				
Protection class		IP20				
Protective function		I <sup>2</sup> t monitoring				
		Intermediate circuit over/undervoltage				
		Short circuit in output stage				
		Standstill monitoring				
		Temperature monitoring				
Ambient temperature	[°C]	0 ... +40				
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 <sup>1)</sup>				
		To EU Machinery Directive				
Certification		UL listed (OL)				-
		C-Tick				
Note on materials		Contains PWIS (paint-wetting impairment substances)				
		RoHS-compliant				

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
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### Installation clearance for motor controller



Type	H1 <sup>1)</sup>	L1
CMMP-AS-C2-3A-...	100	71
CMMP-AS-C5-3A-...	100	71
CMMP-AS-C5-11A-P3-...	100	85
CMMP-AS-C10-11A-P3-...	100	85
CMMP-AS-C20-11A-P3	100	95

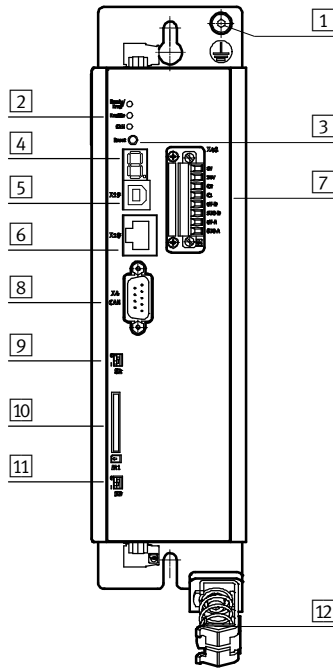
- 1) An installation clearance of 150 mm underneath the motor controller is recommended for optimum wiring of the motor or encoder cable

## Motor controllers CMMP-AS, for servo motors

Technical data

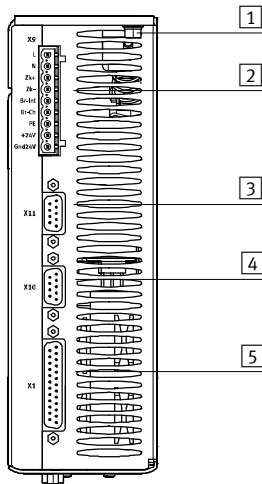
### View of motor controller

CMMP-AS-...-M0



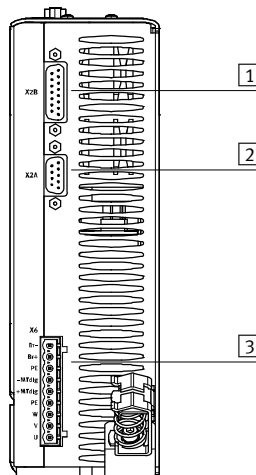
- 1 PE connection
- 2 LEDs
- 3 Reset button
- 4 7-segment display
- 5 USB interface
- 6 Ethernet interface
- 7 Digital I/O interface for controlling the STO function
- 8 CANopen interface
- 9 Activation of CANopen terminating resistor
- 10 SD/MMC card slot
- 11 Activation of firmware download
- 12 Screened connection

### From above



- 1 PE connection
- 2 Power supply
- 3 Incremental encoder interface (output)
- 4 Incremental encoder interface (input)
- 5 I/O interface

### From underneath



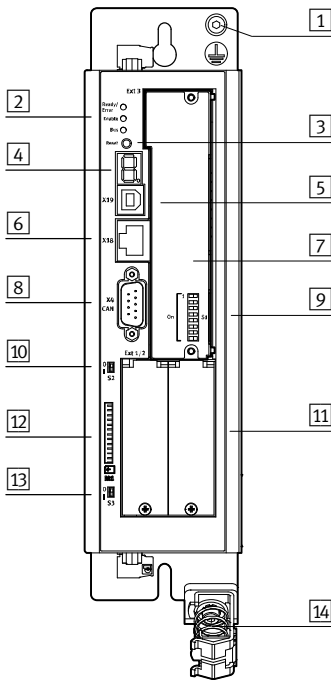
- 1 Encoder connection
- 2 Resolver connection
- 3 Motor connection

# Motor controllers CMMP-AS, for servo motors

Technical data

## View of motor controller

CMMP-AS-...-M3



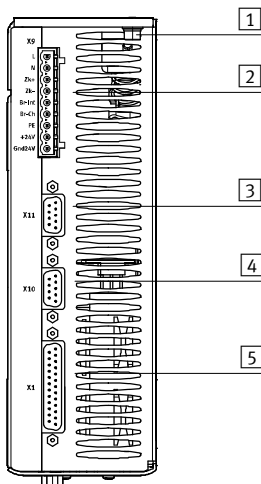
- 1 PE connection
- 2 LEDs
- 3 Reset button
- 4 7-segment display
- 5 USB interface
- 6 Ethernet interface
- 7 Slot for switch or safety module
- 8 CANopen interface
- 9 Fieldbus settings
- 10 Activation of CANopen terminating resistor
- 11 Slots for extension modules
- 12 SD/MMC card slot
- 13 Activation of firmware download
- 14 Screened connection

**Note**

A plug-in card in slot **7** is mandatory for operation of the motor controller.

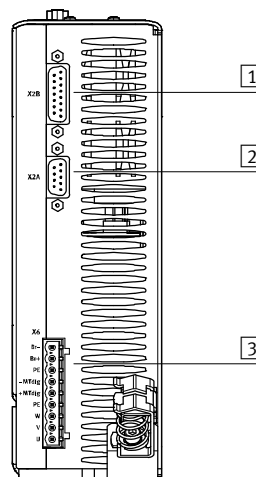
Possible plug-in cards:  
CAMC-DS-M1 → 18  
CAMC-G-S... → 16

## From above



- 1 PE connection
- 2 Power supply
- 3 Incremental encoder interface (output)
- 4 Incremental encoder interface (input)
- 5 I/O interface

## From underneath



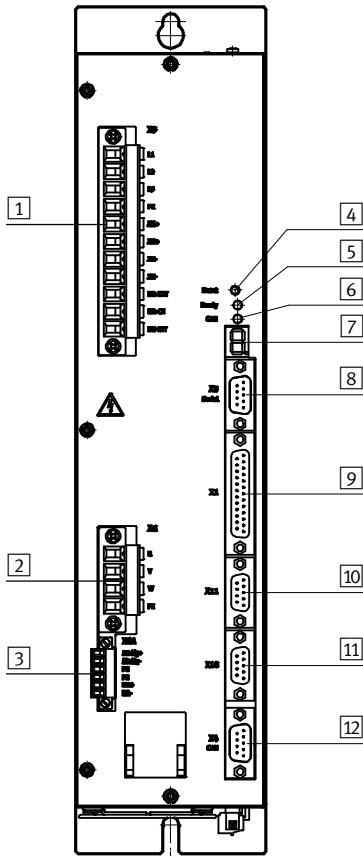
- 1 Encoder connection
- 2 Resolver connection
- 3 Motor connection

## Motor controllers CMMP-AS, for servo motors

Technical data

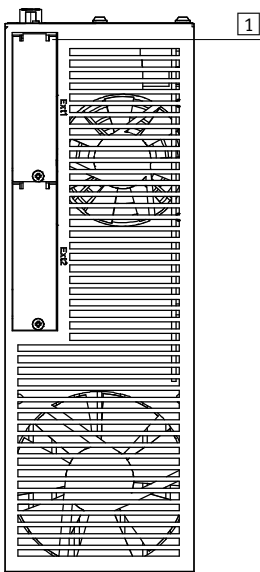
### View of motor controller

CMMP-AS-C20-11A-P3



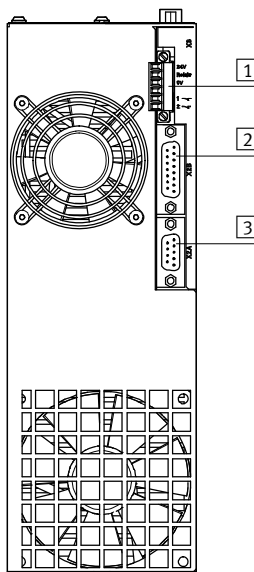
- 1 Power supply
- 2 Motor connection
- 3 Motor connection
- 4 Reset button
- 5 Ready/bus LED
- 6 Bus switched on
- 7 7-segment display
- 8 Interface: RS232
- 9 I/O interface
- 10 Incremental encoder interface (output)
- 11 Incremental encoder interface (input)
- 12 Interface: CAN bus

### From above



- 1 Technology module slots

### From underneath



- 1 Control connection for relay driver supply
- 2 Encoder connection
- 3 Resolver connection

## Motor controllers CMMP-AS, for servo motors

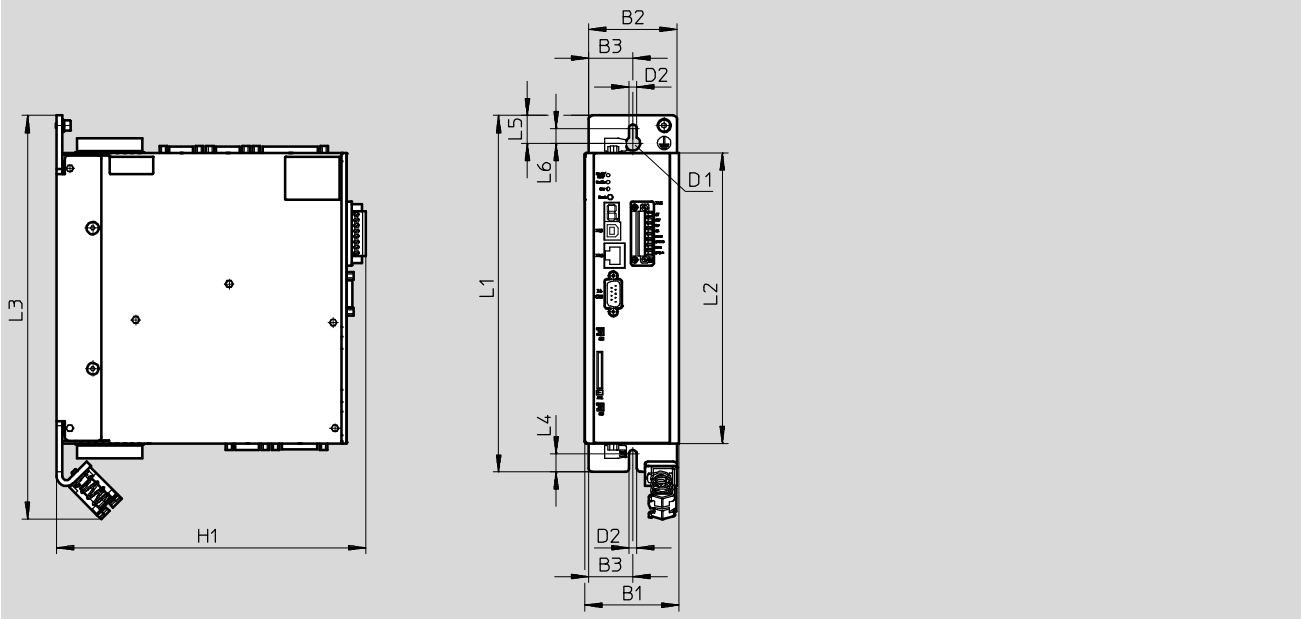
Technical data

**FESTO**

### Dimensions

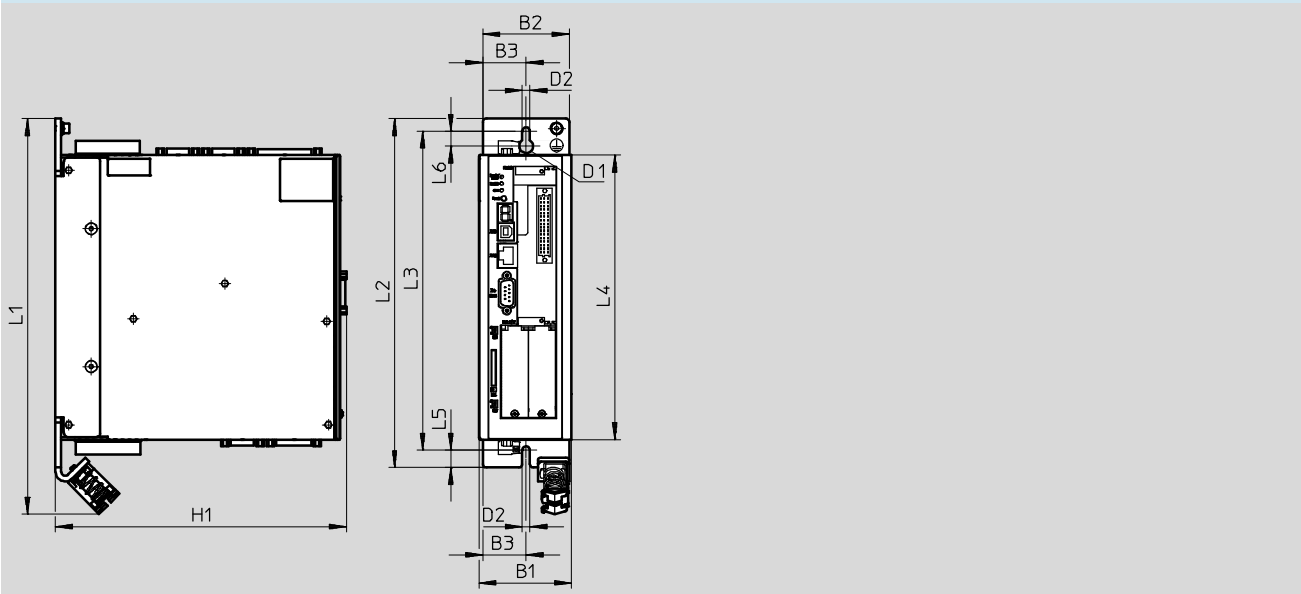
Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)

CMMP-AS-C2/C5-3A-M0, CMMP-AS-C5/C10-11A-P3-M0



Type	B1	B2	B3	D1	D2	H1	L1	L2	L3	L4	L5	L6
CMMP-AS-C2-3A-M0	66	61	30.7	10	5.5	215	248	202	281	12.5	19.5	10.5
CMMP-AS-C5-3A-M0												
CMMP-AS-C5-11A-P3-M0	79	75	37.5	10	5.5	255	297	252	330	12.5	19.8	10.5
CMMP-AS-C10-11A-P3-M0												

CMMP-AS-C2/C5-3A-M3, CMMP-AS-C5/C10-11A-P3-M3



Type	B1	B2	B3	D1	D2	H1	L1	L2	L3	L4	L5	L6
CMMP-AS-C2-3A-M3	66	61	30.7	10	5.5	207	281	248	227	202	12.5	10.5
CMMP-AS-C5-3A-M3												
CMMP-AS-C5-11A-P3-M3	79	75	37.5	10	5.5	247	330	297	276	252	12.5	10.5
CMMP-AS-C10-11A-P3-M3												

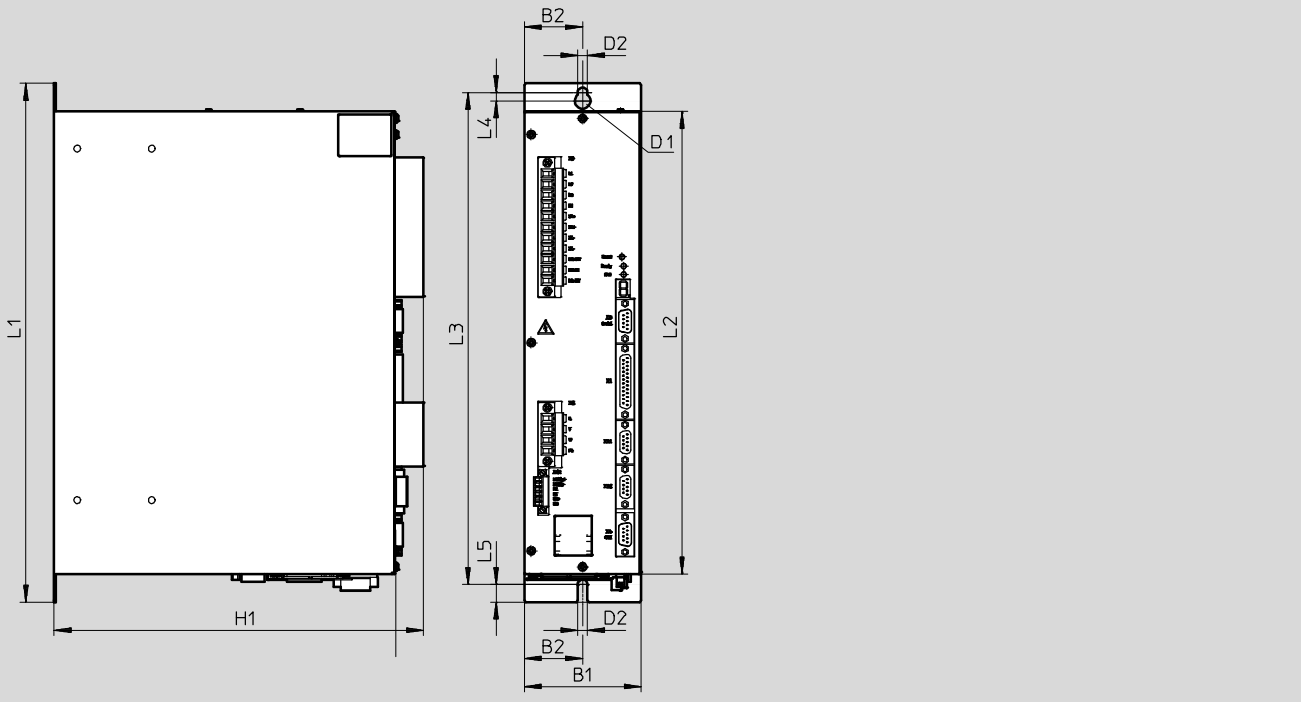
## Motor controllers CMMP-AS, for servo motors

Technical data

**Dimensions**

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)

CMMP-AS-C20-11A-P3

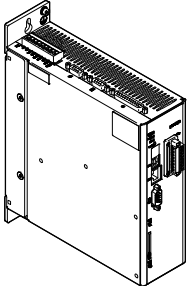
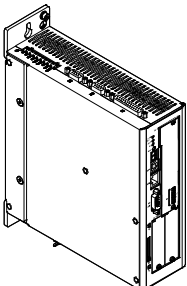
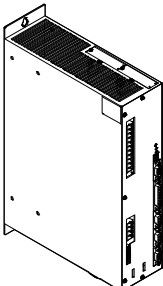


Type	B1	B2	D1 Ø	D2 Ø	H1	L1	L2	L3	L4	L5
CMMP-AS-C20-11A-P3	83	41.5	11	7	263	369	329	350	6	12.5

## Motor controllers CMMP-AS, for servo motors

**FESTO**

Technical data

Ordering data			
	Brief description	Part No.	Type
<b>CMMP-AS-...-M0 – Without slot</b>			
	The plug assortment NEKM (→ 18) is included in the scope of delivery of the motor controller.	<b>1622901</b>	<b>CMMP-AS-C2-3A-M0</b>
		<b>1622902</b>	<b>CMMP-AS-C5-3A-M0</b>
		<b>1622903</b>	<b>CMMP-AS-C5-11A-P3-M0</b>
		<b>1622904</b>	<b>CMMP-AS-C10-11A-P3-M0</b>
<b>CMMP-AS-...-M3 – With 3 slots</b>			
	A plug-in card in slot <span style="border: 1px solid black; padding: 0 2px;">7</span> is mandatory for operation. Possible plug-in cards: <ul style="list-style-type: none"> <li>• CAMC-DS-M1 → 18</li> <li>• CAMC-G-S1 → 16</li> </ul> The plug assortment NEKM (→ 18) is included in the scope of delivery of the motor controller.	<b>1501325</b>	<b>CMMP-AS-C2-3A-M3</b>
		<b>1501326</b>	<b>CMMP-AS-C5-3A-M3</b>
		<b>1501327</b>	<b>CMMP-AS-C5-11A-P3-M3</b>
		<b>1501328</b>	<b>CMMP-AS-C10-11A-P3-M3</b>
<b>CMMP-AS-... – With 2 slots</b>			
	The plug assortment NEKM (→ 18) is included in the scope of delivery of the motor controller.	<b>1366842</b>	<b>CMMP-AS-C20-11A-P3</b>

## Motor controllers CMMP-AS, for servo motors

Accessories

### Safety module CAMC-G-S1

Only for motor controller:  
CMMP-AS-...-M3

The safety module serves as an extension to achieve the safety function.

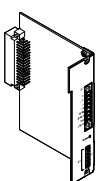
Safe Torque Off.



Safety characteristics	
Conforms to standard	EN ISO 13849-1
Safety function	Safe Torque Off (STO)
Performance Level (PL)	Safe Torque Off (STO)/Category 4, Performance Level e
Safety integrity level (SIL)	SIL 3/SILCL 3
Certificate issuing authority	TÜV 01/205/5165/11
Proof test interval	20a
Diagnostic coverage [%]	97.5
Safe Failure Fraction (SFF) [%]	99.2
Hardware fault tolerance	1
CE marking (see declaration of conformity)	To EU EMC Directive <sup>1)</sup> To EU Machinery Directive

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → 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.

Technical data		
General		
Connection cross section	[mm <sup>2</sup> ]	0.25 ... 0.5
Electrical connection		Screw terminal Straight plug
Display (LED)		Green: normal operation, yellow: STO
Protection against short circuit		No
Fuse protection		No
Digital inputs		
Number		2 (STO-A/STO-B)
Nominal voltage	[V DC]	24
Voltage range	[V]	19.2 ... 28.8
Nominal current at 40 °C	[mA]	20
Max. nominal current	[mA]	30
Starting current	[mA]	450
Debounce time	[ms]	0.3
Properties		Galvanically isolated
Digital outputs		
Number		8
Nominal voltage	[V DC]	24
Max. current	[mA]	200
Design		Potential-free signal contact
Switching logic		Contact closes at STO

Ordering data – Plug-in card			
	Brief description	Part No.	Type
	Safety module: <ul style="list-style-type: none"> <li>• Operation of the motor controller absolutely requires that one of the plug-in cards CAMC-G-S1 or CAMC-DS-M1 be inserted in slot [7].</li> <li>• The plugs are included in the scope of delivery. To reorder plug NEKM → 18</li> </ul>	<b>1501330</b>	<b>CAMC-G-S1</b>



## Product Range and Company Overview

### A Complete Suite and Company Overview

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



**Custom Automation Components**  
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Comprehensive engineering support and on-site services



**Complete Systems**  
Shipment, stocking and storage services

### The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



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**PLCs and I/O Devices**  
PLC's, operator interfaces, sensors and I/O devices

### Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 16,000 employees in 60 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

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Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

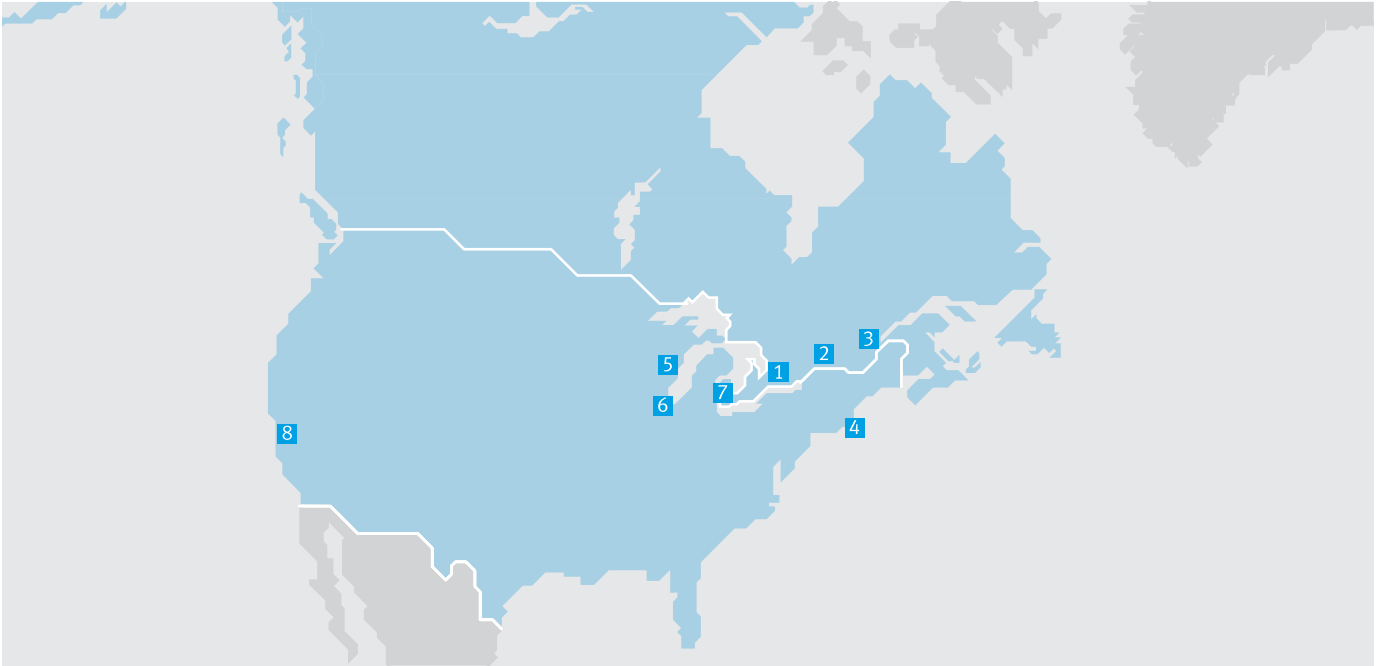


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