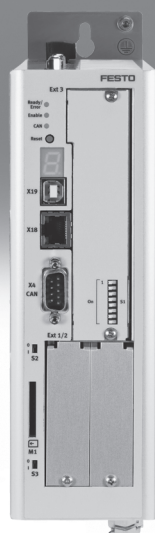


Motor controllers CMMP-AS-M3, for servo motors

FESTO



Motor controllers CMMP-AS-M3, for servo motors

FESTO

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
Remaining distance message	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

- Very 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

Integrated:

CANopen

Optional:

PROFIBUS

DeviceNet

EtherCAT

Not with CMMP-AS-C20:

PROFINET

EtherNet/IP

Input/output

- Freely programmable I/Os
- High-resolution 16-bit analogue input
- Jog/teach mode
- Simple linking to a higher-level controller via I/O or fieldbus
- Synchronous operation
- Master/slave mode
- Additional I/Os with the plug-in card CAMC-D-8E8A → 14

Integrated sequence control

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

Motor controllers CMMP-AS-M3, for servo motors

FESTO

Key features

Features

Integrated safety functions

- With the optional plug-in card CAMC-G-S1, 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

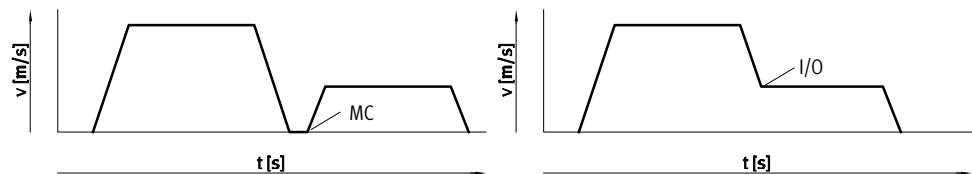
Interpolating multi-axis movement

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



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

→ 15

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 → 15.

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.

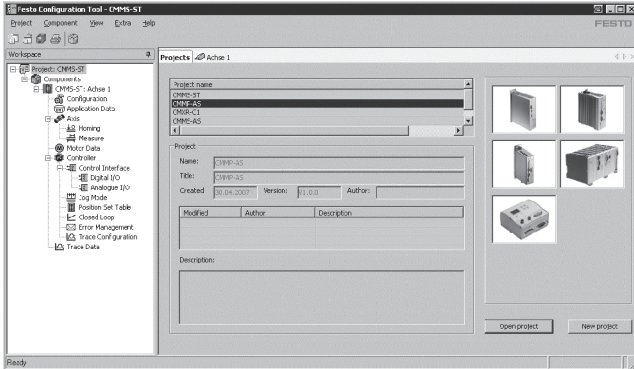
Motor controllers CMMP-AS-M3, for servo motors

Key features

FESTO

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

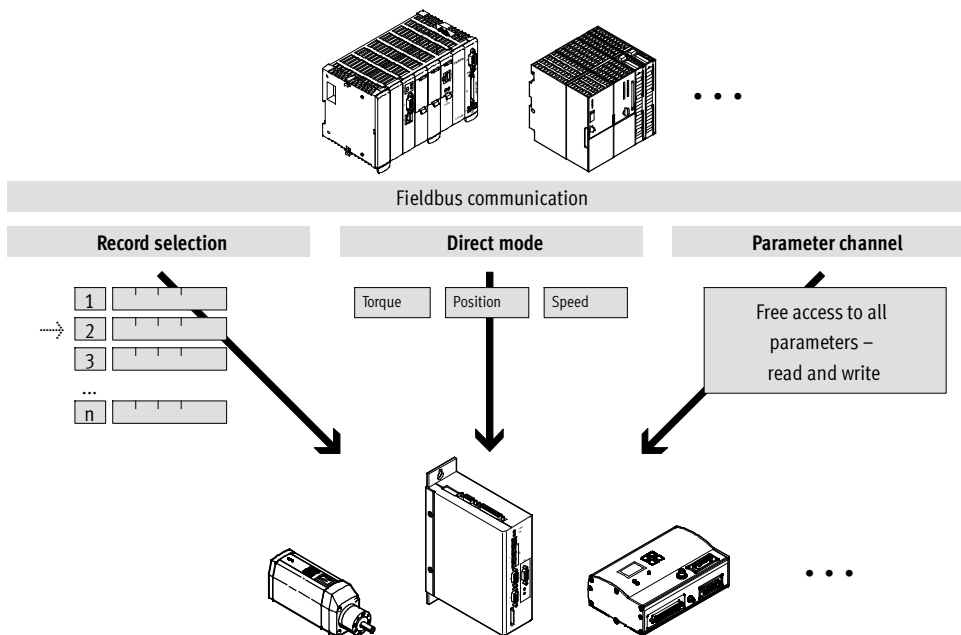
Optimised data profile

Festo has developed an optimised data profile, the "Festo Handling and Positioning Profile (FHPP)", which is especially 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



Motor controllers CMMP-AS-M3, for servo motors

Type codes

		CMMP	–	AS	–	C5	–	11A	–	P3	–	M3
Type												
CMMP	Motor controller, premium											
Motor technology												
AS	AC synchronous											
Nominal current												
C2	2.5 A											
C5	5 A											
C10	10 A											
C20	20 A											
Input voltage												
3A	100 ... 230 V AC											
11A	3x 230 ... 480 V AC											
Number of phases												
–	1-phase											
P3	3-phase											
No. of slots												
M3	With 3 slots											

Motor controllers CMMP-AS-M3, for servo motors

Technical data

FESTO

Fieldbus interfaces

CANopen

PROFI
POWERLINE
BUS

DeviceNet
CONFORMANCE TESTED

EtherCAT

Not with CMMP-AS-C20:

PROFI
INDUSTRIAL ETHERNET
NET

EtherNet/IP

UL LISTED



General technical data					
CMMP-AS-	C2-3A-M3	C5-3A-M3	C5-11A-P3-M3	C10-11A-P3-M3	C20-11A-P3
Type of mounting	Screwed onto connecting plate				
Display	7-segment display				
Parameterisation interface	–				RS232
	USB, Ethernet				–
Active PFC	Yes		–		
Safety function	Optional → 13				Integrated → table below
DIP switch	Firmware download/fieldbus settings/CAN terminating resistor				
SD card slot	Memory card → 15				–
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]	≥ 50	≥ 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 bit			
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 bit			
		2x single-ended, resolution 10 bit			
		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

Safety characteristics	
CMMP-AS-	C20-11A-P3
Conforms to	EN ISO 13849-1
Safety function	Safe Torque Off (STO)
Performance level (PL)	Safe Torque Off (STO)/Category 3, Performance level d
Safety integrity level (SIL)	SIL 2
Certificate issuing authority	DGUV MFS 10027
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾
	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 → 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.

Motor controllers CMMP-AS-M3, for servo motors

Technical data

Electrical data						
CMMP-AS-		C2-3A-M3	C5-3A-M3	C5-11A-P3-M3	C10-11A-P3-M3	C20-11A-P3
Output data						
Output voltage range	[V AC]	3x 0 ... 270		3x 0 ... 360		
Nominal current	[A _{eff}]	2.5	5	5	10	20
Peak current at	[A _{eff}]	5	10	10	20	41.5
max. peak current duration	[s]	5		3		2
Peak current at	[A _{eff}]	10	20	20	40	–
max. peak current duration	[s]	0.5		0.5		–
Max. intermediate circuit voltage	[V DC]	320/380 ¹⁾		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 power	[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 ²⁾	0.65/2.15 ²⁾	1/3.5 ²⁾		
Max. current of digital logic outputs	[mA]	100				

1) Without PFC/with PFC

2) Max. current with brake and I/Os

Technical data – Fieldbus interface								
Interfaces	I/O	CANopen	Profibus DP	DeviceNet	EtherCAT	EtherNet/IP ¹⁾	Profinet RT ¹⁾	
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 ²⁾	250 positioning records						
Communication profile	–	DS301, FHPP+ DS301, DSP402	DP-V0 / FHPP+	FHPP+	DS301, FHPP+ CoE: DS301, DSP402	FHPP+	FHPP+	
Max. fieldbus transmission rate	[Mbps]	–	1	12	0.5	100	100	100
Interface	Integrated	■	■	–	–	–	–	–
	Optional	–	–	■ → 15	■ → 15	■ → 15	■ → 15	■ → 15

1) Not available with CMMP-AS-C20-...

2) With additional I/O plug-in card CAMC-D8E8A → 14.

Function blocks for PLC programming							
Programming software	Controller manufacturer	Interfaces					
		CANopen	Profibus DP	DeviceNet	EtherCAT	EtherNet/IP	Profinet RT
CoDeSys	Festo						
	Beckhoff	■	■	■	■	■	■
	Other manufacturers						
RSLogix5000	Rockwell Automation	–	–	■	–	■	–
Step 7	Siemens	–	■	–	–	–	■

CoDeSys®, Rockwell Automation® is a registered trademark of its respective trademark holder in certain countries.

Motor controllers CMMP-AS-M3, for servo motors

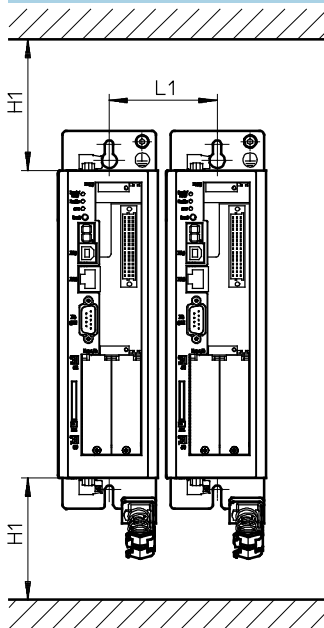
FESTO

Technical data

Operating and environmental conditions					
CMMP-AS-	C2-3A-M3	C5-3A-M3	C5-11A-P3-M3	C10-11A-P3-M3	C20-11A-P3
Digital logic outputs	Galvanically isolated				
Logic inputs	Galvanically isolated				
Protection class	IP20				
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 ¹⁾				
	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 → 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.

Installation clearance for motor controller



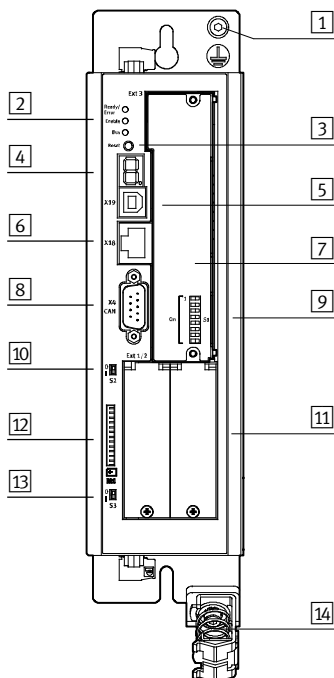
Type	H1	L1
CMMP-AS-C2-3A-M3	100	71
CMMP-AS-C5-3A-M3		
CMMP-AS-C5-11A-P3-M3	100	85
CMMP-AS-C10-11A-P3-M3		
CMMP-AS-C20-11A-P3	100	95

Motor controllers CMMP-AS-M3, for servo motors

Technical data

View of motor controller

CMMP-AS-C2-... / CMMP-AS-C5-... / CMMP-AS-C10-...



- 1 PE connection
- 2 Ready/bus LED
- 3 Reset button
- 4 Status 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

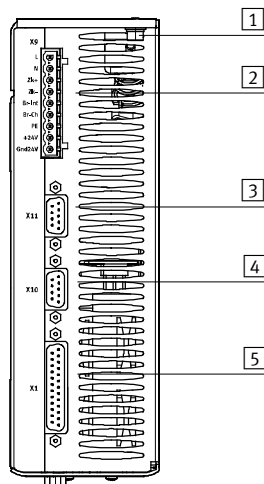
Operation of the motor controller absolutely requires that a plug-in card be inserted in slot **7**.

Possible plug-in cards:

CAMC-DS-M1 → 15

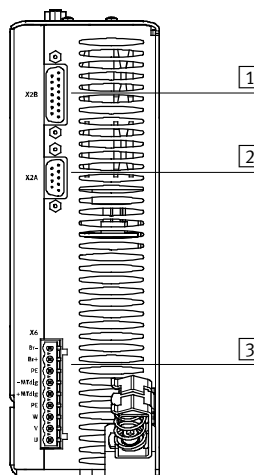
CAMC-G-S... → 13

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

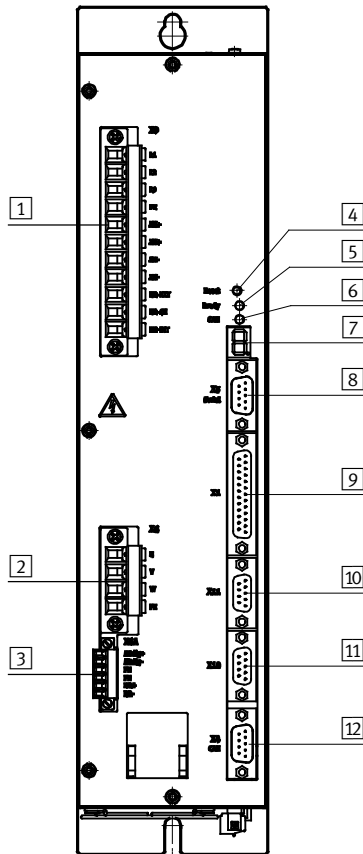
Motor controllers CMMP-AS-M3, for servo motors

Technical data

FESTO

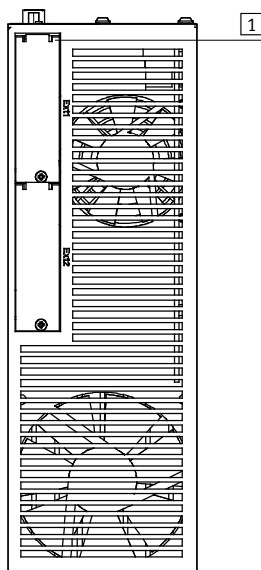
View of motor controller

CMMP-AS-C20-...



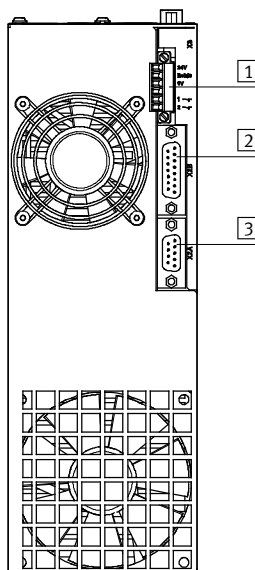
- 1 Power supply
- 2 Motor connection
- 3 Motor connection
- 4 Reset button
- 5 Ready/bus LED
- 6 Bus switched on
- 7 Status display
- 8 Interface: RS232
- 9 I/O interface
- 10 Incremental encoder interface (output)
- 11 Incremental encoder interface (input)
- 12 Interface: CAN bus

From above



- 1 Technology module slots

From underneath



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

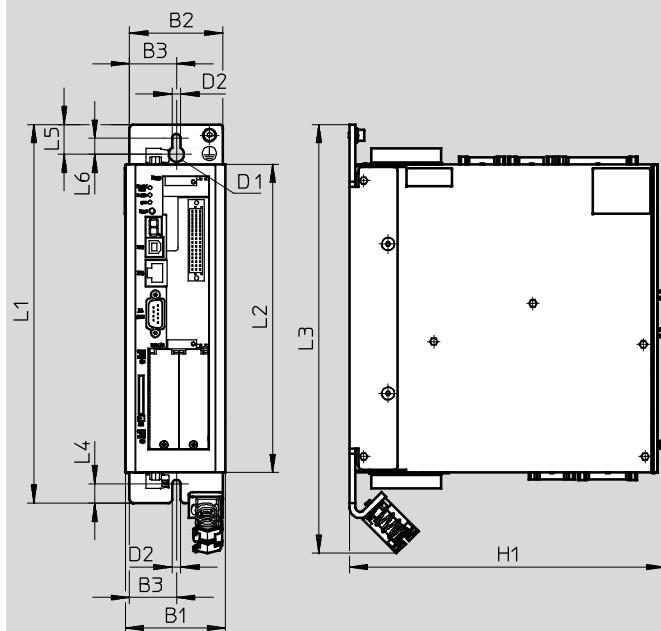
Motor controllers CMMP-AS-M3, for servo motors

Technical data

Dimensions

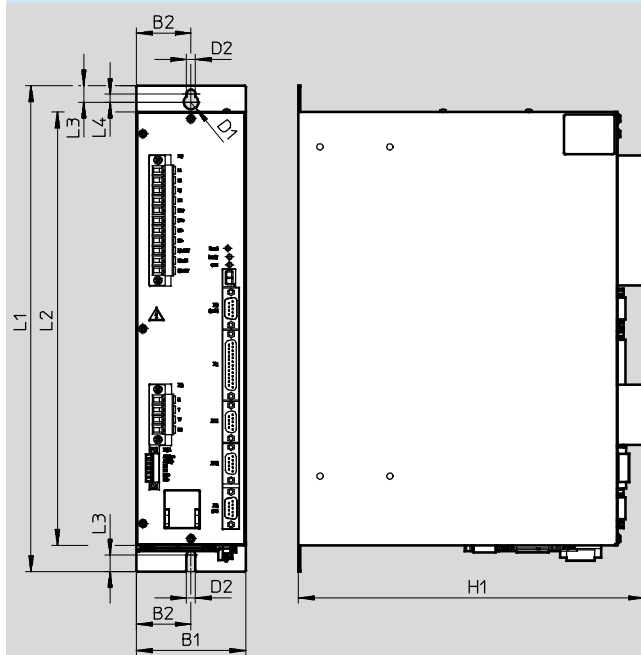
Download CAD data → www.festo.com

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



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

CMMP-AS-C20-11A-P3

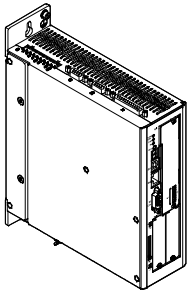


Type	B1	B2	D1 Ø	D2 Ø	H1	L1	L2	L3	L4
CMMP-AS-C20-11A-P3	83	41.5	11	7	263	369	329	12.5	6

Motor controllers CMMP-AS-M3, for servo motors

FESTO

Technical data

Ordering data		Part No.	Type
	Brief description The plug assortment NEKM (→ 15) is included in the scope of delivery of the motor controller	1501325	CMMP-AS-C2-3A-M3
		1501326	CMMP-AS-C5-3A-M3
		1501327	CMMP-AS-C5-11A-P3-M3
		1501328	CMMP-AS-C10-11A-P3-M3
		1366842	CMMP-AS-C20-11A-P3

 Note

Operation of the motor controller CMMP-AS-C2/-C5/-C10 absolutely requires that a plug-in card be inserted in slot **7**.

Possible plug-in cards:

CAMC-DS-M1 → 15

CAMC-G-S... → 13

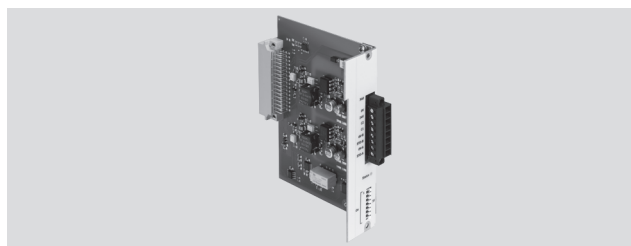
Motor controllers CMMP-AS-M3, for servo motors

Accessories

Safety module CAMC-G-S1

Only for motor controller:
CMMP-AS-C2/-C5/-C10

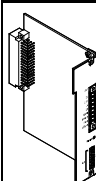
The safety module serves as an extension to achieve the safety function
Safe Torque Off



Safety characteristics	
Conforms to	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
Certification	TÜV
PFH	1.07×10^{-10}
Proof test interval	20a
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾
	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 → 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 ²]	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
Version		Potential-free signal contact
Switching logic		Contact closes at STO

Ordering data – Plug-in card			
	Brief description	Part No.	Type
	Safety module:	1501330	CAMC-G-S1
	- 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 - The plugs are included in the scope of delivery. Plug NEKM for reorder → 15		

Motor controllers CMMP-AS-M3, for servo motors

Accessories

FESTO

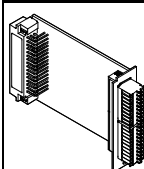
Interface CAMC-D-8E8A

The interface is used to extend the digital I/Os.

Up to two interfaces are supported simultaneously.

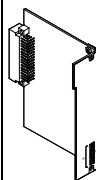


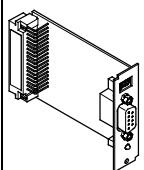
Technical data		
General		
Max. connection cross section	[mm ²]	0.5
Electrical connection		Screw terminal
		Straight plug
Digital inputs		
Number		8
Nominal voltage	[V DC]	24
Voltage range	[V]	−30 ... +30 (protected against reverse polarity and short circuit proof)
Nominal value for True	[V]	8
Nominal value for False	[V]	2
Input impedance	[kΩ]	4.7
Digital outputs		
Number		8
Nominal voltage	[V DC]	24
Voltage range	[V]	+18 ... +30 (protected against reverse polarity and short circuit proof, protection in the event of thermal overload)
Output current	[mA]	100
Short circuit, overcurrent protection	[mA]	500

Ordering data – Plug-in card			
	Brief description	Part No.	Type
	Interface: for additional I/Os (The plugs are included in the scope of delivery. Plug NEKM for reorder → 15)	567855	CAMC-D-8E8A

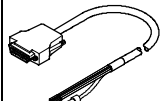
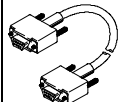
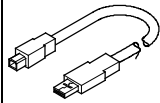
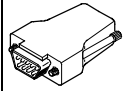
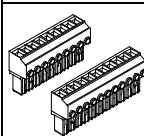
Motor controllers CMMP-AS-M3, for servo motors

Accessories

Ordering data – Plug-in card			
	Brief description	Part No.	Type
	Switch module: • 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	1501329	CAMC-DS-M1

Ordering data – Plug-in cards for fieldbus interface			
	Brief description	Part No.	Type
	For Profibus DP	547450	CAMC-PB
	Profinet RT	1911916	CAMC-F-PN
	For DeviceNet	547451	CAMC-DN
	For EtherCat	567856	CAMC-EC
	For EtherNet/IP	1911917	CAMC-F-EP

Ordering data – Memory card			
	Brief description	Part No.	Type
	Memory card, for data backup and firmware download	1436343	CAMC-M-S-F10-V1

Ordering data – Cables and plugs				
	Brief description	Cable length [m]	Part No.	Type
	Control cable, for I/O interface to any controller	2.5	552254	NEBC-S1G25-K-2.5N-LE26
	Programming cable for CMMP-AS-C20-11A-P3	1.5	160786	PS1-ZK11-NULLMODEM-1,5M
	Programming cable for CMMP-AS-C2-3A-M3, CMMP-AS-C5-3A-M3, CMMP-AS-C5-11A-P3-M3, CMMP-AS-C10-11A-P3-M3	1.8	1501332	NEBC-U1G-K-1.8-N-U2G
	Encoder plug, for incremental encoder interface	–	564264	NECC-A-S-S1G9-C2M
	Plug assortment for CMMP-AS-C2-3A-M3, CMMP-AS-C5-3A-M3	–	1659228	NEKM-C-7 ¹⁾
	Plug assortment for CMMP-AS-C5-11A-P3-M3, CMMP-AS-C10-11A-P3-M3	–	552256	NEKM-C-3 ¹⁾
	Plug assortment for CMMP-AS-C20-11A-P3	–	1425453	NEKM-C-6 ¹⁾
	Plug assortment for interface CAMC-D-8E8A	–	569959	NEKM-C-5 ²⁾
	Plug assortment for safety module CAMC-G-S1	–	1660640	NEKM-C-8 ³⁾

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.

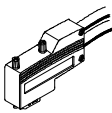
2) Plugs are included in the scope of delivery of the plug-in card CAMC-D-8E8A.

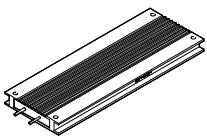
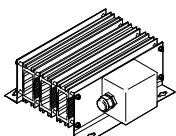
3) Plug is included in the scope of delivery of the plug-in card CAMC-G-S1.

Motor controllers CMMP-AS-M3, for servo motors

Accessories

FESTO

Ordering data – Cables and plugs					
	Brief description	Cable length [m]	Part No.	Type	
	Plug for Profibus interface	–	533780	FBS-SUB-9-WS-PB-K	
	Plug for CANopen interface	–	533783	FBS-SUB-9-WS-CO-K	
	Plug for DeviceNet interface	–	525635	FBSD-KL-2X5POL	

Ordering data – Braking resistors					
	For type	Resistance value [Ω]	Rated output [W]	Part No.	Type
CACR-LE2-...					
	CMMP-AS-C2-3A-M3	100	500	1336615	CACR-LE2-100-W500
	CMMP-AS-C5-3A-M3	100	500	1336615	CACR-LE2-100-W500
CACR-KL2-...					
	CMMP-AS-C5-11A-P3-M3	67	1,800	1336617	CACR-KL2-67-W1800
	CMMP-AS-C10-11A-P3-M3	67	1,800	1336617	CACR-KL2-67-W1800
	CMMP-AS-C20-11A-P3	33	3,600	1336619	CACR-KL2-33-W2400

Ordering data – Software and documentation		
	Brief description	→ Internet
	The following descriptions are available on the Festo website: – Hardware: Assembly and installation for all variants – Functions: Instructions on commissioning with FCT + functional description – FHPP: Control and parameterisation of the motor controller via the FHPP profile – DS402: Control and parameterisation of the motor controller via the device profile CiA 402 (DS402) – CAM editor: Cam disc functionality (CAM) of the motor controller – Safety module: Functional safety engineering for the motor controller with the safety function STO	www.festo.com/net/SupportPortal

Ordering data – Software and documentation for curve editor			
	Brief description	Part No.	Type
	Software package contains: – CD-ROM – with user documentation in de, en, es, fr, it, sv, ru, zh – with additional functions for the cam disc functionality The software package is not included in the scope of delivery	570903	GSPF-CAM-MC-ML