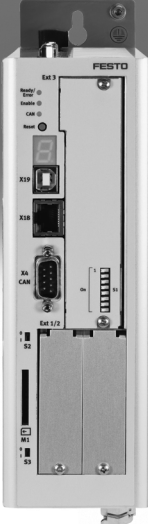


Motor controllers CMMP-AS, for servo motors



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
Position sets	2x 63	63	255	63
Measuring system	Incremental/absolute		Analogue/incremental/ absolute	Incremental
Extended I/O interface	4 working modes		Can be configured flexibly	4 working modes
Remaining distance message	1 for n		Separately for all positions	1 for n
Torque reduction	No		Separately for all positions	No
Set linking	Linear		With branching	Linear
Safety functions to EN 61800-5-2	STO, SS1 (with external safety switching device)		STO, SS1, SBC, SOS, SS2, SLS, SSR, SSM	STO, SS1 (with external safety switching device)

Performance characteristics

Compactness	Motion control
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Automatic activation for a holding brake • Complies with the current CE and EN standards without additional external measures (motor cable length of up to 25 m)
	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> • Absolute and relative movements • Point-to-point positioning with and without motion path smoothing • Position synchronisation • Electronic gear unit • 255 position sets • Wide range of homing methods

Fieldbus interfaces

Fieldbus interfaces	Input/output	Integrated sequence control
  	  	<ul style="list-style-type: none"> • 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 → 20
		<ul style="list-style-type: none"> • Automatic sequence of position sets without a higher-order controller • Linear and cyclical position sequences • Adjustable delay times • Branches and wait positions • Overlapping restart possible during the movement

PROFIBUS®, PROFINET®, DeviceNet®, CANopen®, EtherCAT®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

Motor controllers CMMP-AS, for servo motors

Key features

Performance characteristics

Integrated safety functions

- Depending on the variant or plug-in card, the motor controller supports the following safety functions:
 - Safe torque off (STO)
 - Safe stop 1 (SS1)
 - Safe brake control (SBC)
 - Safe operating stop (SOS)
 - Safe stop 2 (SS2)
 - Safely limited speed (SLS)
 - Safe speed range (SSR)
 - Safe speed monitor (SSM)

Interpolating multi-axis movement

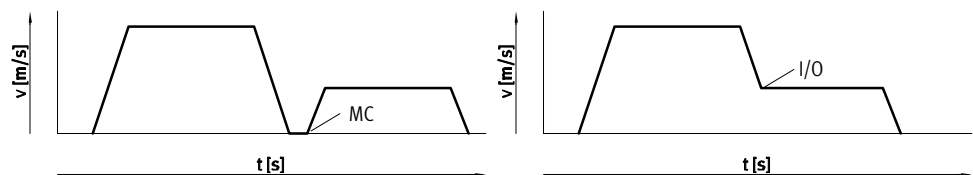
- With a suitable controller, the CMMP-AS can perform path movements with interpolation via CANopen or EtherCat. The controller specifies setpoint position values in a fixed time slot pattern to this end. In between, the servo position controller independently interpolates the data values between two data points.

Travel program

- Linking of any number of position sets into a travel program
- Step enabling conditions for the travel program possible via 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 and standardisation of

documentation with no need to create symbols, graphics and master data.

Cam disc functionality

The "electronic cam disc" application type creates optimised motion profiles that generate reduced vibration and acceleration forces 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 → 23

Features:

- High flexibility of the system. The mechanics do 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 2048 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.

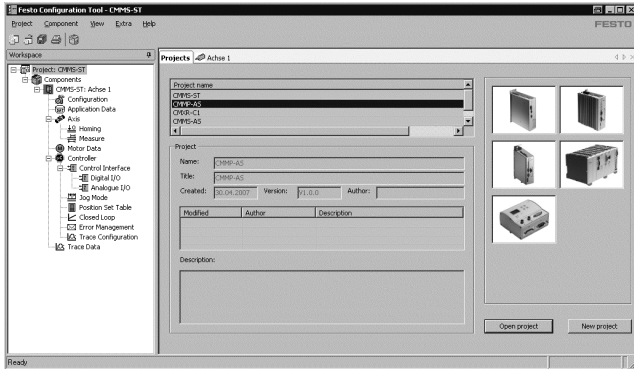
Motor controllers CMMP-AS, for servo motors

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 types of equipment
- Easy to use thanks to graphic support for entering parameters
- Universal mode of operation for all drives
- Work offline at your desk or online at the machine

FHPP – Festo Handling and Positioning Profile

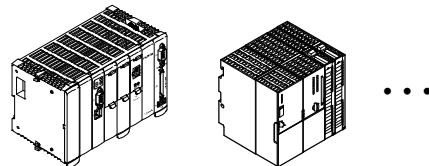
Optimised data profile

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

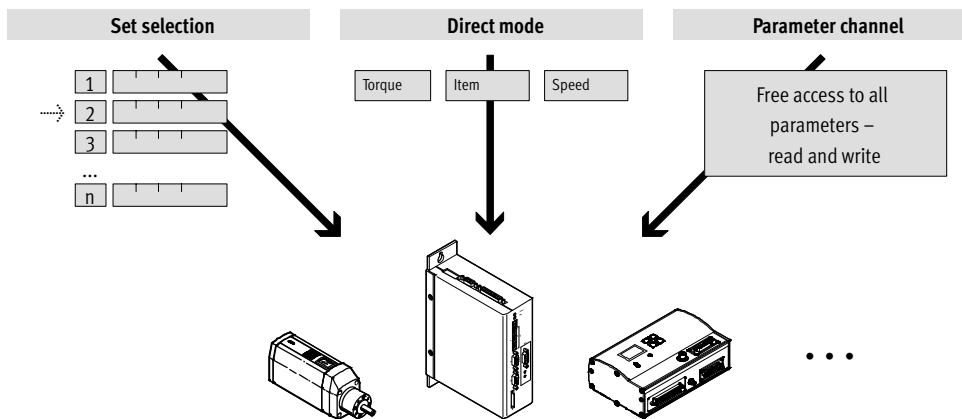
The FHPP data profile permits the activation of Festo motor controllers, using a fieldbus interface, via standardised control and status bytes.

The following are defined, among others:

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



Fieldbus communication

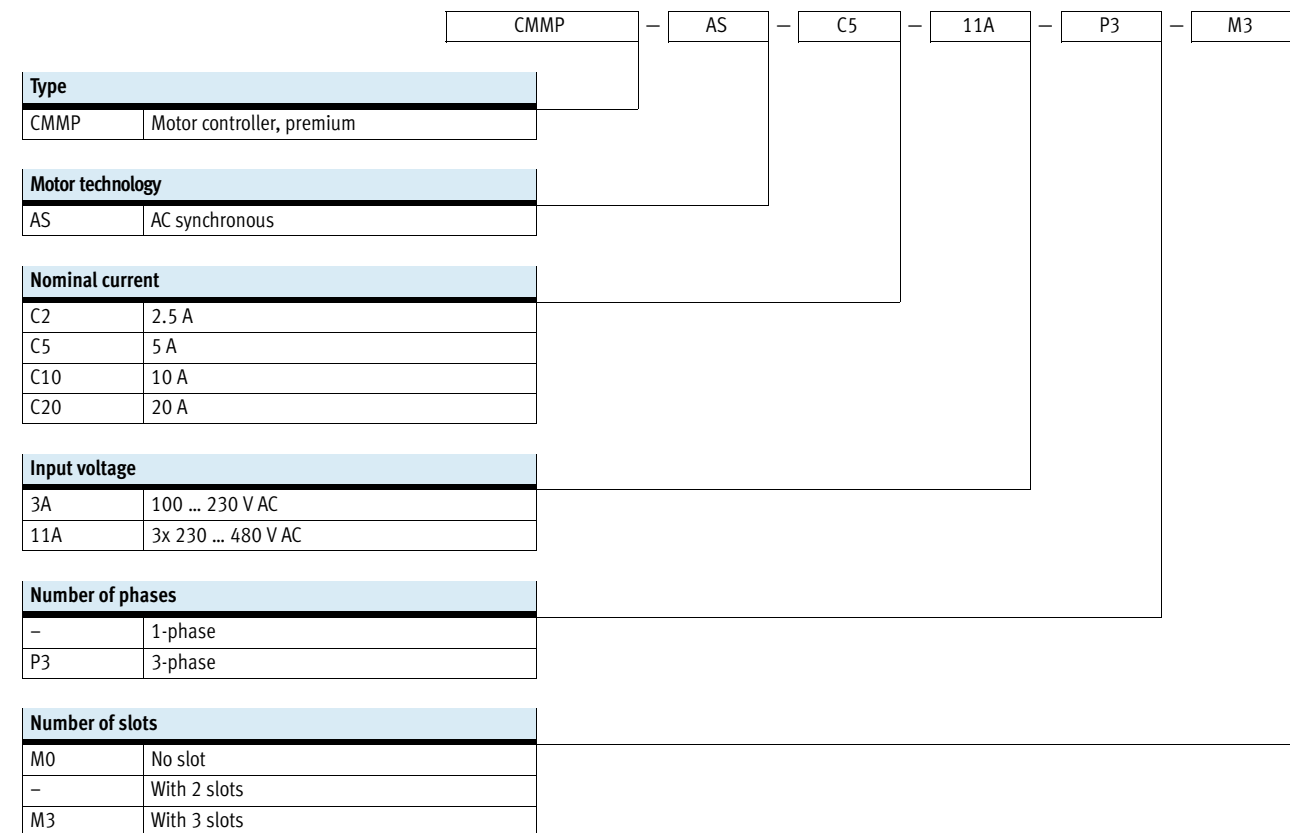


Motor controllers CMMP-AS, for servo motors

Product range overview and type codes

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

Type codes



Motor controllers CMMP-AS, for servo motors

FESTO

Technical data

Fieldbus interfaces



General technical data					
CMMP-AS-	C2-3A-...	C5-3A-...	C5-11A-P3-...	C10-11A-P3-...	C20-11A-P3
Type of mounting	Screwed onto sub-base				
Display	Seven-segment display				
Parameterisation interface	-				RS232
	USB, Ethernet				-
Active PFC	Yes		-		
DIP switches	Firmware download/fieldbus settings ¹⁾ /CAN terminating resistor				-
SD card slot	Memory card → 21				-
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 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 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]	2100	2200	3800	8000

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	Modbus/ TCP	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 input	Freely configurable								
Process interfacing	16 position sets	–							
	255 position sets ¹⁾	250 position sets							
Communication profile	–	DS301, FHPP+ DS301, DSP402	FHPP+	DP-V0/FHPP+	FHPP+	DS301, FHPP+ CoE: DS301, DSP402	FHPP+	FHPP+	
Max. fieldbus transmission rate [Mbit/s]	–	1	100	12	0.5	100	100	100	
Interface									
CMMP-AS-...-M0	Integrated	■	■	■	–	–	–	–	–
CMMP-AS-...-M3	Integrated	■	■	■	–	–	–	–	–
	Optional ²⁾	–	–	–	■	■	■	■	■
CMMP-AS-C20-11A-P3	Integrated	■	■	–	–	–	–	–	–
	Optional ²⁾	–	–	–	■	■	■	–	–

- 1) With additional I/O plug-in card CAMC-DSE8A → 20
 2) Plug-in cards for fieldbus interface → 21

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 _{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	
	[A _{eff}]	10	20	20	40	–
	[s]	0.5		0.5		–
Max. intermediate circuit voltage [V DC]	320/380 ¹⁾			560		
Output frequency [Hz]	0 ... 1000					
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	1000	3000	6000	12000	
Peak power [VA]	1000	2000	6000	12000	25000	
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

Motor controllers CMMP-AS, for servo motors

Technical data

Safety functions to EN 61800-5-2				
Motor controller	CMMP-AS-...-M0	CMMP-AS-...-M3		CMMP-AS-C20-11A-P3
With plug-in card	–	CAMC-G-S1 → 16	CAMC-G-S3 → 17	–
Safe torque off (STO)	■	■	■	■
Safe stop 1 (SS1)	–	–	■	–
Safe brake control (SBC)	■	■	■	■
Safe operating stop (SOS)	–	–	■	–
Safe stop 2 (SS2)	–	–	■	–
Safely limited speed (SLS)	–	–	■	–
Safe speed range (SSR)	–	–	■	–
Safe speed monitor (SSM)	–	–	■	–

Safety characteristics		
CMMP-AS-	C2/C5/C10-...-M0	C20-11A-P3
Safety function to EN 61800-5-2	Safe torque off (STO)	
Performance Level (PL) to EN ISO 13849-1	Category 4, Performance Level e	Category 3, Performance Level d
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 3	SIL 2
Certificate issuing authority	TÜV 01/205/5262/12	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 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/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.

Technical data – Connection to the integrated safety module with CMMP-AS-...-M0		
Control port STO-A/STO-B		
Nominal voltage	[V DC]	24 (related to 0V-A/B)
Operating range	[V]	19.2 ... 28.8
Nominal current	[mA]	20 (typical; max. 30)
Starting current	[mA]	450 (typical, duration approx. 2 ms; max. 600 at 28.8 V)
Maximum positive test impulse length at 0 signal	[ms]	0.3 (related to nominal voltage 24 V and intervals > 2 s between impulses)
Maximum allowable time for test pulse at 24 V signal	[ms]	< 2 ... 6
Properties		Galvanically isolated
Acknowledgement contact C1, C2		
Nominal voltage	[V DC]	24
Max. voltage	[V DC]	< 30 (overvoltage-resistant up to 60 V)
Nominal current	[mA]	< 200 (not short-circuit proof)
Version		Potential-free signal contact
Switching logic		Contact closes at STO

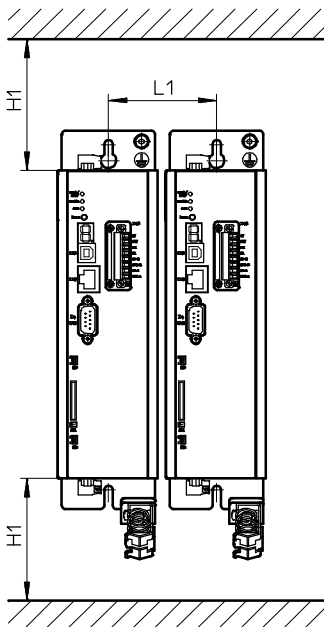
Motor controllers CMMP-AS, for servo motors

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				
Degree of protection		IP20				
Protective function		I ² t monitoring				
		Intermediate circuit over/undervoltage				
		Output stage short circuit				
		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 ¹⁾				
		To EU Machinery Directive				
Certification		c UL us - Listed (OL)				-
		RCM mark				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/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.

Installation clearance for motor controller



Type	H1 ¹⁾	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 is recommended for optimum wiring of the motor or encoder cable on the underside of the motor controller

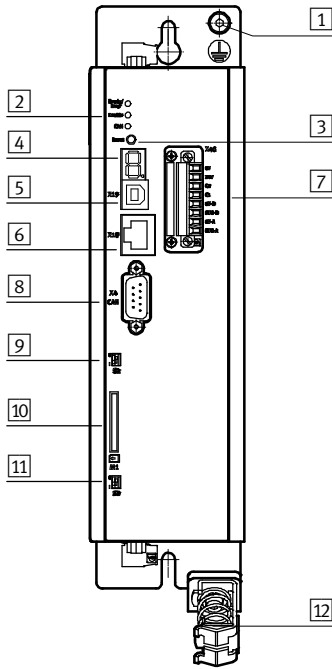
Motor controllers CMMP-AS, for servo motors

Technical data



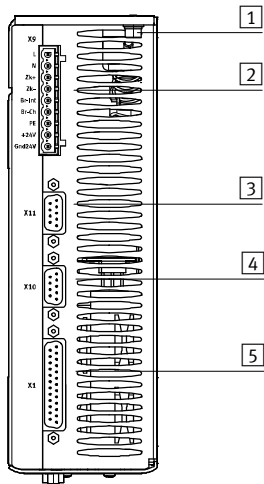
View of motor controller

CMMP-AS-...-M0



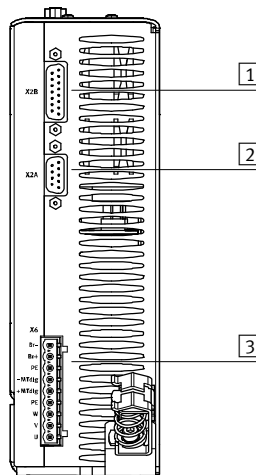
- 1 PE connection
- 2 LEDs
- 3 Reset button
- 4 Seven-segment display
- 5 USB interface
- 6 Ethernet interface
- 7 Digital I/O interface for controlling the STO function
- 8 CANopen interface
- 9 Activation of CANopen terminating resistor
- 10 SD/MMC card slot
- 11 Activation of firmware download
- 12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



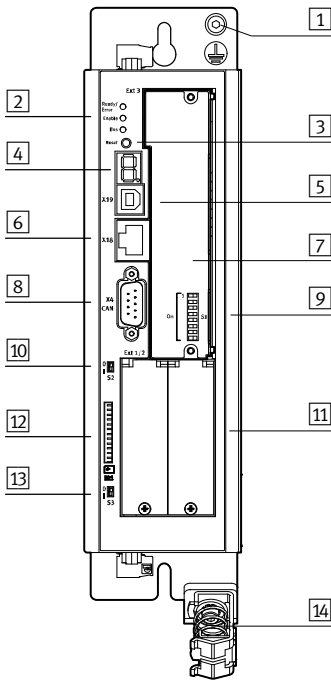
- 1 Encoder connection
- 2 Resolver connection
- 3 Motor connection

Motor controllers CMMP-AS, for servo motors


Technical data

View of motor controller

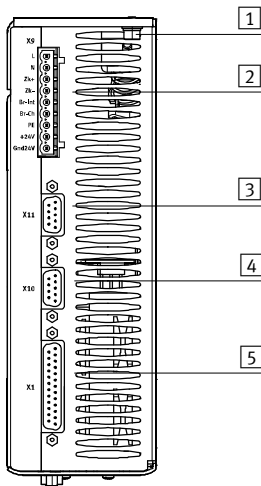
CMMP-AS-...-M3



- 1 PE connection
- 2 LEDs
- 3 Reset button
- 4 Seven-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

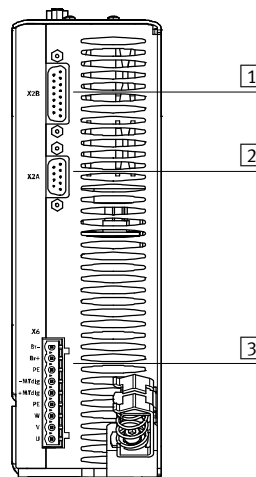
 Note
 A plug-in card must be inserted in slot 7 in order to operate the motor controller.
 Possible plug-in cards:
 CAMC-DS-M1 → 21
 CAMC-G-S1 → 16
 CAMC-G-S3 → 17

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

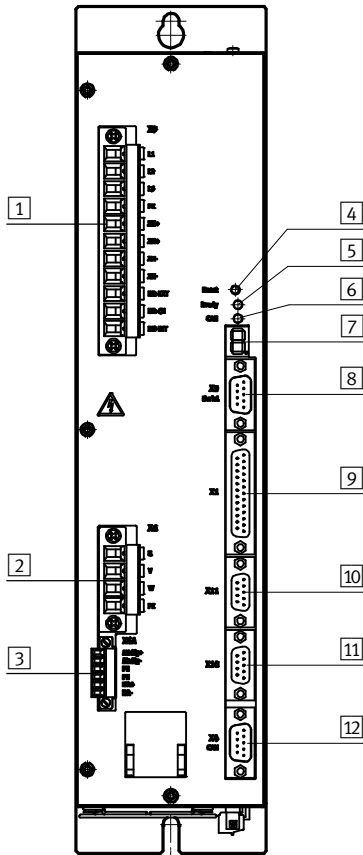
Motor controllers CMMP-AS, for servo motors

Technical data



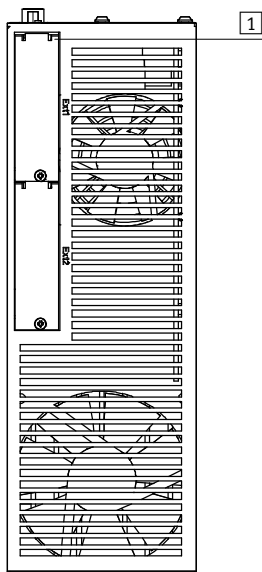
View of motor controller

CMMP-AS-C20-11A-P3



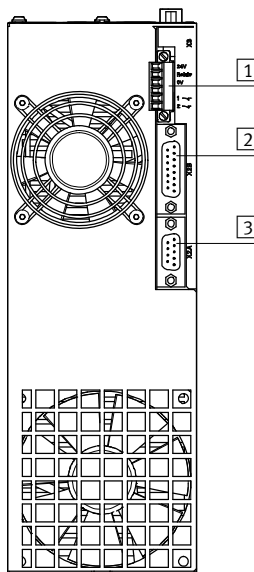
- 1 Power supply
- 2 Motor connection
- 3 Motor connection
- 4 Reset button
- 5 Ready/bus LED
- 6 Bus switched on
- 7 Seven-segment display
- 8 Interface: RS232
- 9 I/O interface
- 10 Incremental encoder interface (output)
- 11 Incremental encoder interface (input)
- 12 Interface: CAN bus

From above



- 1 Technology module slots

From underneath



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

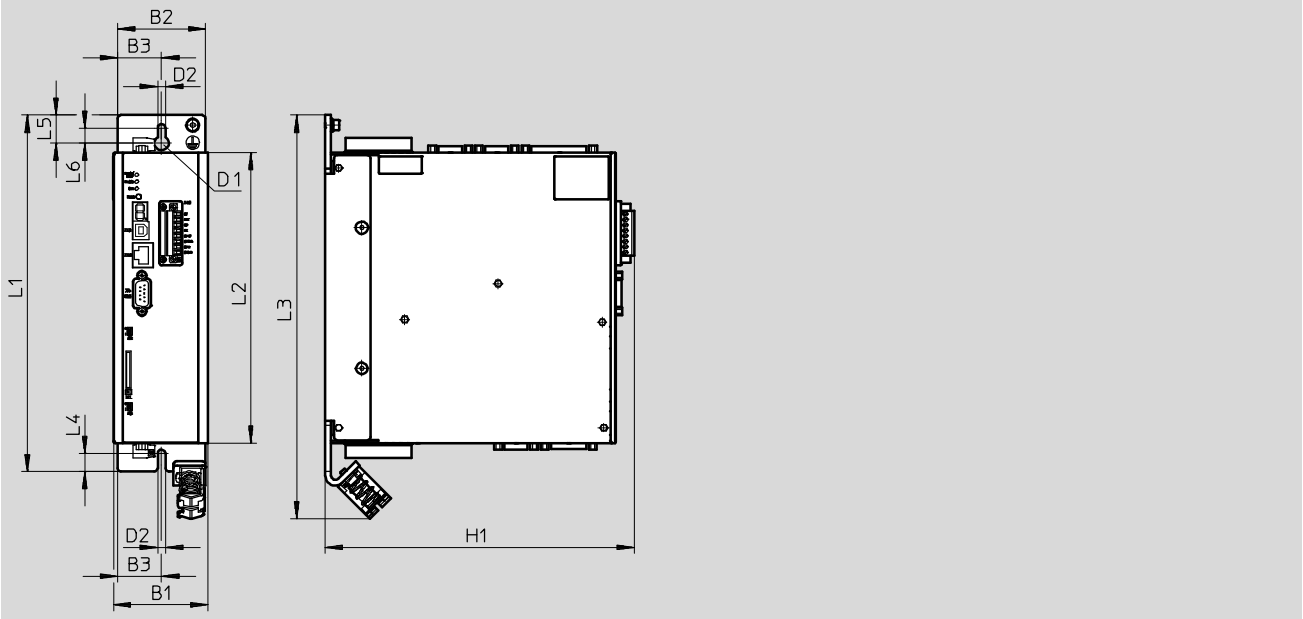
Motor controllers CMMP-AS, for servo motors

Technical data

Dimensions

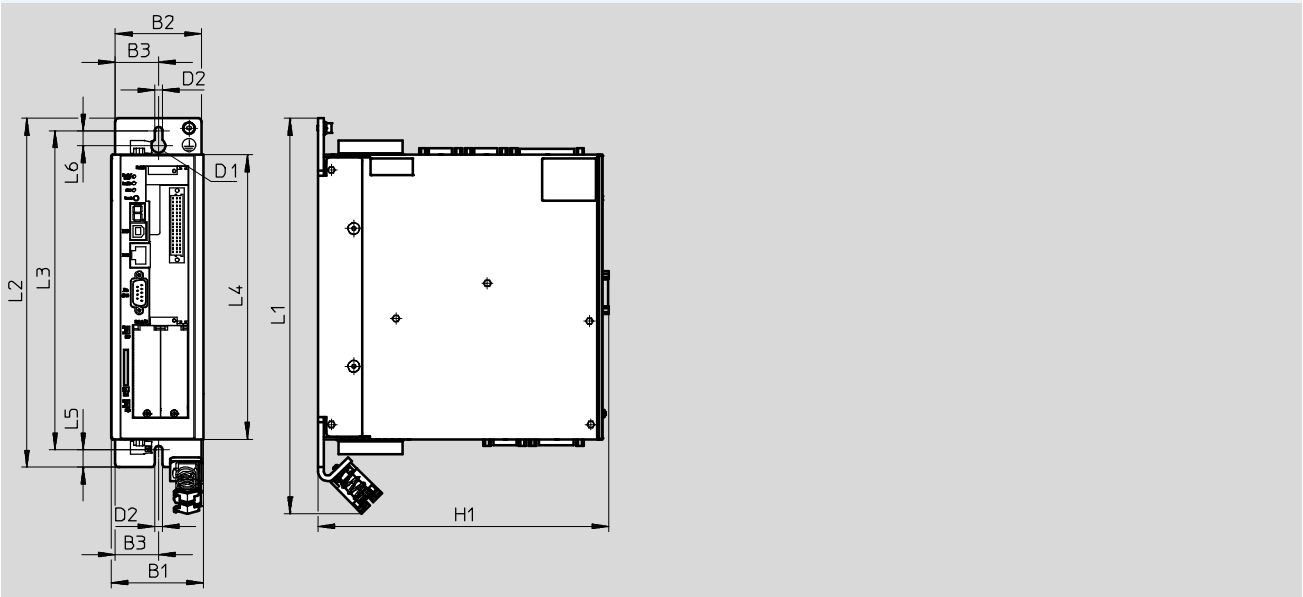
Download CAD data → www.festo.com

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



Type	B1	B2	B3	D1 Ø	D2 Ø	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 Ø	D2 Ø	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

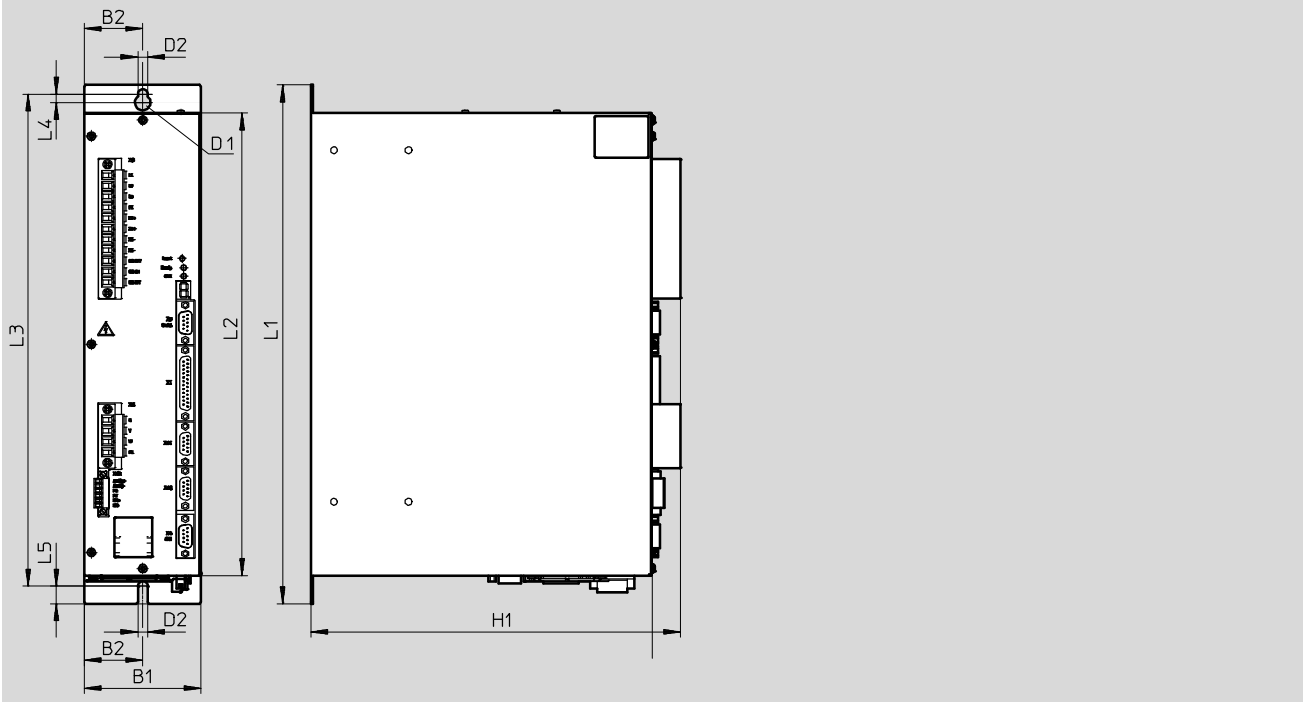
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

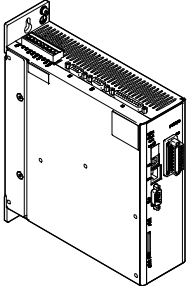
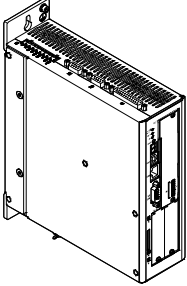
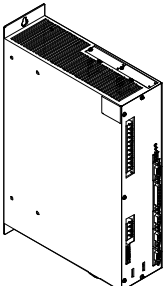
CMMP-AS-C20-11A-P3



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

Technical data

Ordering data		Part No.	Type
CMMP-AS-...-M0 – Without slot			
	The plug assortment NEKM (→ 22) is included in the scope of delivery of the motor controller.	1622901	CMMP-AS-C2-3A-M0
		1622902	CMMP-AS-C5-3A-M0
		1622903	CMMP-AS-C5-11A-P3-M0
		1622904	CMMP-AS-C10-11A-P3-M0
CMMP-AS-...-M3 – With 3 slots			
	A plug-in card must be inserted in slot 7 for operation. Possible plug-in cards: <ul style="list-style-type: none"> • CAMC-DS-M1 → 21 • CAMC-G-S1 → 16 • CAMC-G-S3 → 17 The plug assortment NEKM (→ 22) 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
CMMP-AS-... – With 2 slots			
	The plug assortment NEKM (→ 22) is included in the scope of delivery of the motor controller.	1366842	CMMP-AS-C20-11A-P3

Motor controllers CMMP-AS, for servo motors

Accessories

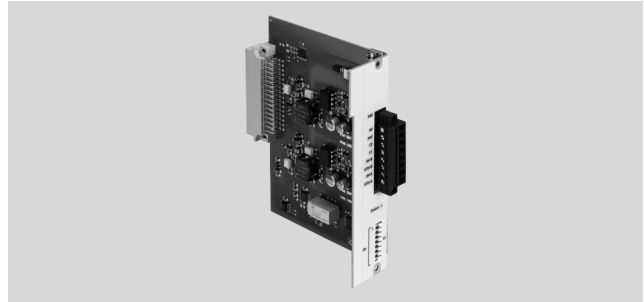
FESTO

Safety module CAMC-G-S1

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

The safety module is used as an expansion to achieve the safety function:

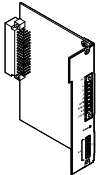
- Safe torque off (STO)



Safety characteristics	
Safety function to EN 61800-5-2	Safe torque off (STO)
Performance Level (PL) to EN ISO 13849-1	Category 4, Performance Level e
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 3
Certificate issuing authority	TÜV 01/205/5165/11
Proof test interval	20a
PFH	1.07×10^{-10}
Diagnostic coverage [%]	97.5
Safe failure fraction (SFF) [%]	99.2
Hardware fault tolerance	1
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/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.

Technical data		
Control port STO-A/STO/B		
Nominal voltage [V DC]		24 (related to 0V-A/B)
Operating range [V]		19.2 ... 28.8
Nominal current [mA]		20 (typical; max. 30)
Maximum positive test impulse length at 0 signal [ms]		0.3 (related to nominal voltage 24 V and intervals > 2 s between impulses)
Maximum allowable time for test pulse at 24 V signal [ms]		< 2 ... 6
Properties		Galvanically isolated
Acknowledgement contact C1, C2		
Nominal voltage [V DC]		24
Max. voltage [V DC]		< 30 (overvoltage-resistant up to 60 V)
Nominal current [mA]		< 200 (not short-circuit proof)
Version		Potential-free signal contact
Switching logic		Contact closes at STO

Ordering data – Plug-in card			
	Description	Part No.	Type
	Safety module: <ul style="list-style-type: none"> • One of the plug-in cards CAMC-G-S1 or CAMC-DS-M1 must be inserted in slot 7 (→ 11) in order to operate the motor controller. • The plug connectors are included in the scope of delivery. To reorder plug connector NEKM → 22 	1501330	CAMC-G-S1

Motor controllers CMMP-AS, for servo motors

Accessories

Safety module CAMC-G-S3

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

The safety module is used as an expansion to achieve the safety functions:

- Safe torque off (STO)
- Safe stop 1 (SS1)
- Safe brake control (SBC)
- Safe operating stop (SOS)
- Safe stop 2 (SS2)
- Safely limited speed (SLS)
- Safe speed range (SSR)
- Safe speed monitor (SSM)



Safety characteristics	
Safety function to EN 61800-5-2	Safe torque off (STO)
	Safe stop 1 (SS1)
	Safe brake control (SBC)
	Safe operating stop (SOS)
	Safe stop 2 (SS2)
	Safely limited speed (SLS)
	Safe speed range (SSR)
	Safe speed monitor (SSM)
Performance Level (PL) to EN ISO 13849-1	Category 4, Performance Level e
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 3
Certificate issuing authority	TÜV 01/205/5165.01/14
Proof test interval	20a
PFH	9.5×10^{-9}
Diagnostic coverage [%]	97.5
Safe failure fraction (SFF) [%]	99.5
Hardware fault tolerance	1
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/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.

Motor controllers CMMP-AS, for servo motors

Accessories

Technical data		
General		
Parameterisation	Using SafetyTool, integrated into the FCT plugin for CMMP-AS-...	
Safe digital inputs DIN 40A/B to DIN 43A/B		
Specification	IEC 61131-2, type 3	
Number of 2-channel inputs	4	
Nominal voltage	[V DC]	24
Operating range	[V]	-3 ... 30
Nominal current	[mA]	15
Max. nominal current	[mA]	200
Properties	Suitable for emergency-stop switchgear, protective door circuit, light curtain, enabling button, two-hand operator unit; Equivalent/antivalent switching of inputs; Test pulses can be configured; Function can be configured	
Safe digital inputs DIN 44 to DIN 49		
Specification	IEC 61131-2, type 3	
Number of 1-channel inputs	6	
Nominal voltage	[V DC]	24
Operating range	[V DC]	-3 ... 30
Nominal current	[mA]	15
Max. nominal current	[mA]	200
Properties	Suitable for start button, brake monitoring, operating modes selector switch, error acknowledgement, restart blocking; Test pulses can be configured; Function can be configured	
Safe digital outputs DOUT 40A/B to 42A/B		
Number of 2-channel outputs	3	
Output	High-side switch with pull-down	
Nominal voltage	[V DC]	24
Operating range	[V DC]	18 ... 30
Permissible output current	[mA]	< 50
Properties	Semiconductor outputs: parameterisable PNP (positive switching) Equivalent/antivalent switching of outputs Test pulses can be configured Function can be configured	
Monitoring contact C1, C2		
Nominal voltage	[V DC]	24
Max. voltage	[V DC]	< 30 (overvoltage-resistant up to 60 V)
Nominal current	[mA]	< 200 (not short-circuit proof)
Version	Potential-free signal contact	
Properties	Suitable for diagnosing safety functions Function can be configured	

Motor controllers CMMP-AS, for servo motors

Accessories

Supported position encoders

- Resolver via X2A
- SIN/COS incremental encoder
- SICK Hiperface shaft encoder (only process data channel)
- Heidenhain ENDAT encoder
- Incremental encoder with digital A/B signals
- BISS position transmitters for linear motors
- Incremental encoder with digital A/B signals

The manufacturers of SIL-certified shaft encoders publish guidelines for the use of these shaft encoders in safety applications.

The safety module CAMC-G-S3 takes the following manufacturer specifications into account when evaluating the encoder signals:

- Implementation Manual HIPERFACE® Safety dated 21.12.2010 (8014120/2010-12-21) → www.sick.com
- Specification of the E/E/PES safety requirements for EnDat-Master dated 19.10.2009 (D533095-04-G-01) → www.heidenhain.de (in preparation)

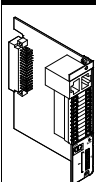
Permissible combinations of position encoders

First encoder	Second encoder	Achievable safety level		Note
Resolver	Other encoder	SIL 3	Cat. 3/PL d; Cat. 3/PL e	–
Resolver	Incremental encoder	SIL 3	Cat. 4/PL e	–
Resolver	None	SIL 2	Cat. 3/PL d	Please see the note below
SIN/COS incremental encoder	None	SIL 3	Cat. 3/PL d	Requires SIL classification of the encoder
SIN/COS incremental encoder	Incremental encoder	SIL 3	Cat. 4/PL e	Please see the note below
Hiperface incremental encoder	Incremental encoder	SIL 3	Cat. 3/PL e	Please see the note below
Hiperface incremental encoder	None	SIL 2 or 3	Cat. 3/PL d; Cat. 4/PL e	Requires SIL classification of the encoder
ENDAT encoder	Incremental encoder	SIL 3	Cat. 4/PL e	Setting, encoder: "Other encoder" Please see the note below
ENDAT encoder	None	SIL 2	Cat. 3/PL d	In preparation. Requires SIL classification of the encoder
Other encoder	Incremental encoder	SIL 2	Cat. 3/PL d	–

Note

- Please check whether your selected position encoder is sufficiently accurate to fulfil the monitoring task, in particular the SOS safety function.
- In applications with only one shaft encoder/position encoder, it must have the SIL classification required in accordance with the risk assessment. In most cases, the classification requires additional requirements or fault exclusions in the mechanical system. Please check carefully that your application meets these requirements and that the appropriate fault exclusions can be performed.
- In applications with only one shaft encoder/position encoder with analogue signal interface (Resolver, SIN-/COS, Hiperface, etc.), the restrictions regarding diagnostic cover and limitations as to the accuracy of rest and speed monitoring that can be achieved must be taken into account.
- When using two functional encoders without SIL classification, the suitability of the encoder combination for use in safe systems up to SIL3 must be proven separately (for example, the following are required: Diversity of the encoder systems with regard to CCF, MTTf_d, etc., suitability of the encoders for the operating and ambient conditions, EMC, etc.).

Ordering data – Plug-in card

Description	Part No.	Type
 <p>Safety module:</p> <ul style="list-style-type: none"> • One of the plug-in cards CAMC-G-S3 or CAMC-DS-M1 must be inserted in slot 7 (→ 11) in order to operate the motor controller. • The plug connectors are included in the scope of delivery. To reorder plug connector NEKM → 22 	1501331	CAMC-G-S3

Motor controllers CMMP-AS, for servo motors

Accessories



Interface CAMC-D-8E8A

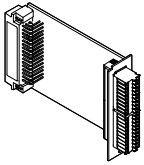
Only for motor controller:
CMMP-AS-...-M3

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

Up to two interfaces are supported simultaneously.

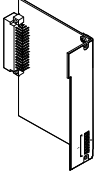


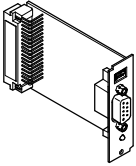
Technical data		
General		
Max. connection cross section	[mm ²]	0.5
Electrical connection		Screw terminal
		Plug connector, straight
Digital inputs		
Number		8
Nominal voltage	[V DC]	24
Voltage range	[V]	-30 ... +30 (protected against reverse polarity and short-circuit proof)
Nominal value for True	[V]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

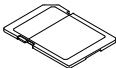
Ordering data – Plug-in card			
	Description	Part No.	Type
	Interface: for additional I/Os (The plug connectors are included in the scope of delivery. To reorder plug connector NEKM → 22)	567855	CAMC-D-8E8A

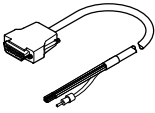
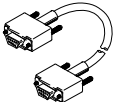
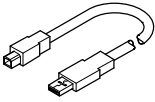
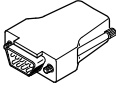
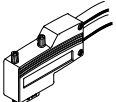

Motor controllers CMMP-AS, for servo motors

Accessories

Ordering data – Plug-in card			
	Description	Part No.	Type
	Switch module: • One of the plug-in cards CAMC-G-S1 or CAMC-DS-M1 must be inserted in slot 7 (→ 11) in order to operate the motor controller CMMP-AS-...-M3.	1501329	CAMC-DS-M1

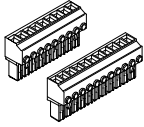
Ordering data – Plug-in cards for fieldbus interface			
	Description	Part No.	Type
	For PROFIBUS DP	547450	CAMC-PB
	For PROFINET RT	1911916	CAMC-F-PN
	For DeviceNet	547451	CAMC-DN
	For EtherCAT	567856	CAMC-EC
	For EtherNet/IP	1911917	CAMC-F-EP

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

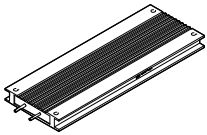
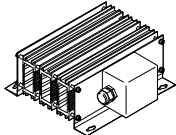
Ordering data – Cables and plug connectors				
	Description	Cable length [m]	Part No.	Type
	Control cable, for I/O interface to any controller	2.5	552254	NEBC-S1G25-K-2.5N-LE26
	Programming cable for CMMP-AS-C20-11A-P3	1.5	160786	PS1-ZK11-NULLMODEM-1,5M
	Programming cable for CMMP-AS-...-M0, CMMP-AS-...-M3	1.8	1501332	NEBC-U1G-K-1.8-N-U2G
	Encoder plug connector, for incremental encoder interface	–	564264	NECC-A-S-S1G9-C2M
	Plug connector for PROFIBUS interface	–	533780	FBS-SUB-9-WS-PB-K
	Plug connector for CANopen interface	–	533783	FBS-SUB-9-WS-CO-K
	Plug connector for DeviceNet interface	–	525635	FBSD-KL-2X5POL

Motor controllers CMMP-AS, for servo motors

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Ordering data – Assortment of plugs			
	Description	Part No.	Type
	Assortment of plugs for:		
	• Motor controller CMMP-AS-C5/-C10-11A-P3-M0	552256	NEKM-C-3 ¹⁾
	• Motor controller CMMP-AS-C5/-C10-11A-P3-M3		
	• Interface CAMC-D-8E8A	569959	NEKM-C-5 ²⁾
	• Motor controller CMMP-AS-C20-11A-P3	1425453	NEKM-C-6 ³⁾
	• Motor controller CMMP-AS-C2/-C5-3A-M0	1659228	NEKM-C-7 ¹⁾
	• Motor controller CMMP-AS-C2/-C5-3A-M3		
	• Safety module CAMC-G-S1	1660640	NEKM-C-8 ⁴⁾
• Motor controller CMMP-AS-...-M0			
• Safety module CAMC-G-S3	1660937	NEKM-C-9 ⁵⁾	


- 1) Plug connectors are included in the scope of delivery of the motor controller CMMP-AS-...-M0, CMMP-AS-...-M3
- 2) Plug connectors are included in the scope of delivery of the plug-in card CAMC-D-8E8A
- 3) Plug connectors are included in the scope of delivery of the motor controller CMMP-AS-C20-11A-P3
- 4) Plug connector is included in the scope of delivery of the plug-in card CAMC-G-S1
Plug connector is included in the scope of delivery of the motor controller CMMP-AS-...-M0
- 5) Plug connector is included in the scope of delivery of the plug-in card CAMC-G-S3


Ordering data – Braking resistors					
	For type	Resistance value [Ω]	Rated output [W]	Part No.	Type
CACR-LE2-...					
	CMMP-AS-C2-3A-...,	50	500	2882342	CACR-LE2-50-W500 ¹⁾
	CMMP-AS-C5-3A-...	72	500	1336611	CACR-LE2-72-W500
CACR-KL2-...					
	CMMP-AS-C5-11A-P3-...,	67	1,800	1336617	CACR-KL2-67-W1800
	CMMP-AS-C10-11A-P3-...	40	2,000	2882343	CACR-KL2-40-W2000 ¹⁾
	CMMP-AS-C20-11A-P3	33	3,600	1336619	CACR-KL2-33-W2400

1) Recommended braking resistor

Motor controllers CMMP-AS, for servo motors

Accessories

Ordering data – Software and documentation		
	Description	→ Internet
	<p>The following descriptions are available on the Festo website:</p> <ul style="list-style-type: none"> – Hardware: assembly and installation for all variants – Functions: instructions on commissioning with FCT + functional description – FHPP: control and parameterisation of the motor controller using the FHPP profile – DS402: control and parameterisation of the motor controller using 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			
	Description	Part No.	Type
	<p>Software package contains:</p> <ul style="list-style-type: none"> – CD-ROM <ul style="list-style-type: none"> – With user documentation in de, en, es, fr, it, sv, ru, zh – With additional functions for the cam disc functionality <p>The software package is not included in the scope of delivery</p>	570903	GSPF-CAM-MC-ML