Motor controllers CMMP-AS, for servo motors

FESTO

Motor controllers CMMP-AS, for servo motors

Key features

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

Features

Compactness

- Small dimensions
- Full integration of all components for controller and power section, including RS232 and CANopen interface
- Integrated brake chopper
- Integrated EMC filters

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

Motion control

- Digital absolute shaft encoder (EnDat/HIPERFACE) in single-turn and 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

SERCOS interface

EtherCAT.

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 ➜ 13

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

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

Motor controllers CMMP-AS, for servo motors

Key features

FESTO

Features

Integrated safety functions

- The motor controller CMMP-AS supports the "Safe Torque off (STO)" and, by providing a reliable time delay, also supports "Safe Stop 1 (SS1)" safety functions 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 Sercos. 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

EPLAN electric8

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 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.
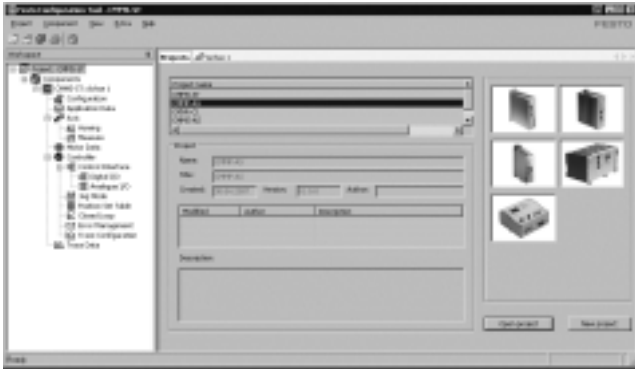- Each cam disc can be offset by a certain amount from the master axis.

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

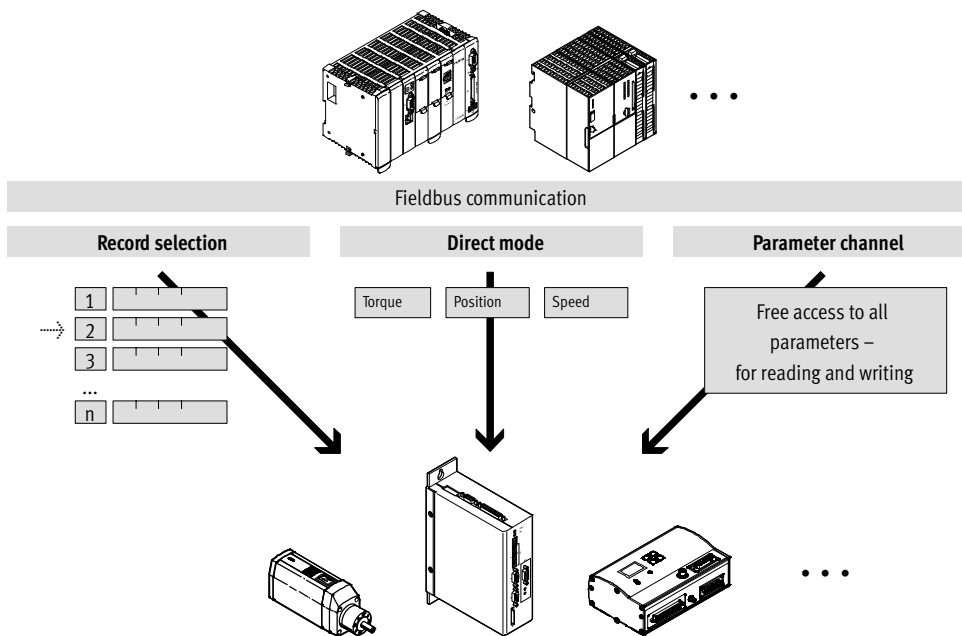## FHPP – Festo Handling and Positioning Profile
Optimised data profile

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.
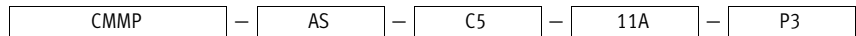
The following are defined, among others:
– Operating modes
– I/O data structure
– Parameter objects
– Sequence control

| Fieldbus communication |

| **Record selection** | **Direct mode** | **Parameter channel** |

1		Torque	Position	Speed		Free access to all parameters – for reading and writing
2				
3				
...				
n				

Motor controllers CMMP-AS, for servo motors

Type codes

FESTO

| CMMP | — | AS | — | C5 | — | 11A | — | P3 |

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

Motor controllers CMMP-AS, for servo motors

Technical data

Fieldbus interfaces

CANopen

SERCOS interface

EtherCAT

DeviceNet

Certification for:
CMMP-AS-C2/-C5/-C10

UL LISTED

General technical data

CMMP-AS-		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 (9600 … 115000 bits/s)				
Active PFC		Yes		–		
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]	165	110	68		47
Pulse power of braking resistor	[kVA]	1.1	1.6	8.5		12
Braking resistor, external	[Ω]	≥100	≥80	≥60		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]	2000	2100	3700		8000

Technical data – Fieldbus interface

Interfaces		I/O	CANopen	EtherCat	Profibus DP	DeviceNet
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[1]	255 positioning records			
Communication profile		–	DS301, FHPP+	DS301, FHPP+	DP-V0/FHPP+	FHPP+
		–	DS301, DSP402	DS301, DSP402	–	
Max. fieldbus transmission rate	[Mbps]	–	1	100	12	0.5
Interface	Integrated	■	■	–	–	–
	Optional	–	–	■	■	■
				➜ 13	➜ 13	➜ 13

1) With additional I/O plug-in card CAMC-D8E8A ➜ 13.

Function blocks for PLC programming

Programming software	Controller manufacturer	Interfaces			
		CANopen	EtherCat	Profibus DP	DeviceNet
CoDeSys	Festo	■	■	■	■
	Beckhoff				
	Other manufacturers				
RSLogix5000	Rockwell Automation	–	–	–	■
Step 7	Siemens	–	–	■	–

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 per phase, effective	[A]	2.5	5	5	10	20
Peak current per phase, effective	[A]	5	10	10	20	41.5
Max. peak current duration	[s]	5		3		2
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 output	[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

Operating and environmental conditions

CMMP-AS-		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		I2t monitoring				
		Intermediate circuit over-/undervoltage				
		Short circuit in output stage				
		Standstill 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		UL listed (OL)				–
		C-Tick				
Certificate issuing authority		BG MFS 10006				DGUV MFS 10027
Safety function		Safe Torque off (STO)				
Safety Integrity Level (SIL)		Safe Torque off (STO)/SIL 2				
Performance Level (PL)		Safe Torque off (STO)/Category 3, Performance Level d				
Note on materials		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.

CoDeSys®, Rockwell Automation® is a registered trademark of its respective trademark holder in certain countries.
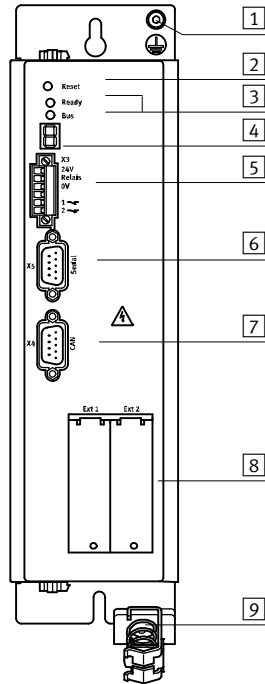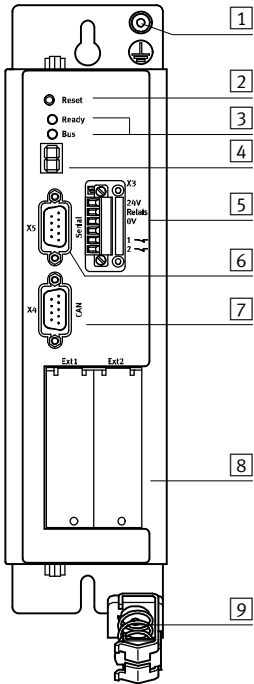
Motor controllers CMMP-AS, for servo motors

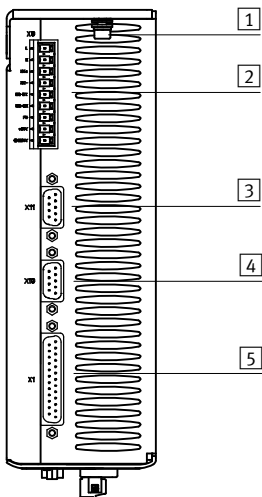Technical data

View of motor controller

CMMP-AS-C2-3A,
CMMP-AS-C5-3A

CMMP-AS-C5-11A-P3,
CMMP-AS-C10-11A-P3

1	Earthing
2	Reset button
3	Ready/Bus LED
4	Status display
5	Control connection for relay driver supply
6	Interface: RS232
7	Interface: CAN bus
8	Technology module slot
9	Screened connection

From above

1	Earthing screw
2	Power supply
3	Incremental encoder interface (output)
4	Incremental encoder interface (input)
4	I/O interface

From underneath
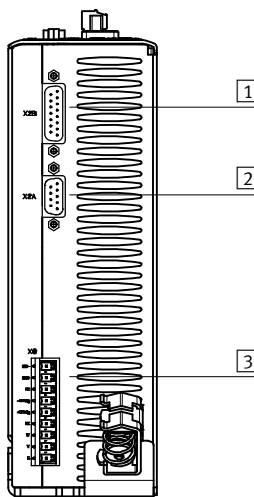
1	Encoder connection
2	Resolver connection
3	Motor connection

Motor controllers CMMP-AS, for servo motors

Technical data
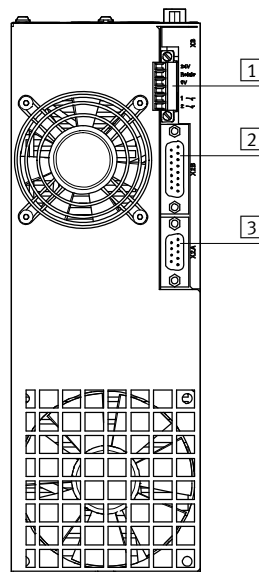
View of motor controller

CMMP-AS-C20-11A-P3
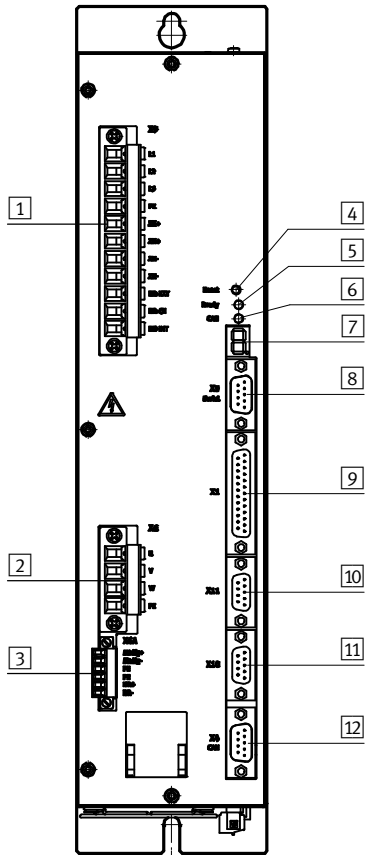
[1] Power supply
[2] Motor connection
[3] Motor connection
[4] Reset button
[5] Ready/Bus LED
[6] Bus switched on
[7] Status display
[8] Interface: RS232
[9] I/O interface
[10] Incremental encoder interface (output)
[11] Incremental encoder interface (input)
[12] Interface: CAN bus
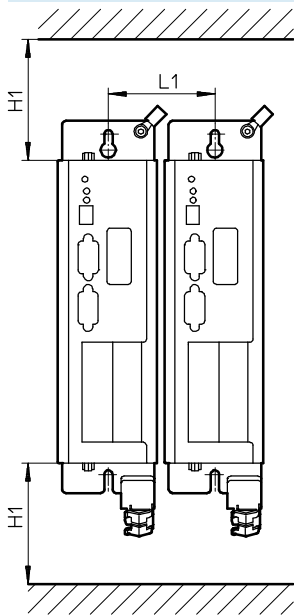
From above
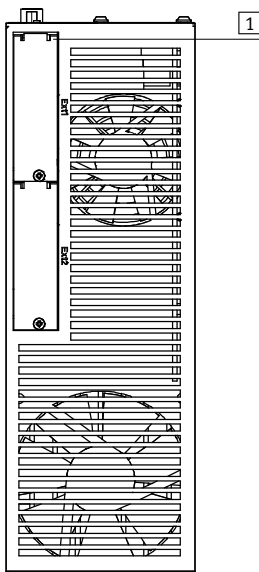
[1] Technology module slots

From underneath

[1] Control connection for relay driver supply
[2] Encoder connection
[3] Resolver connection

Motor controllers CMMP-AS, for servo motors

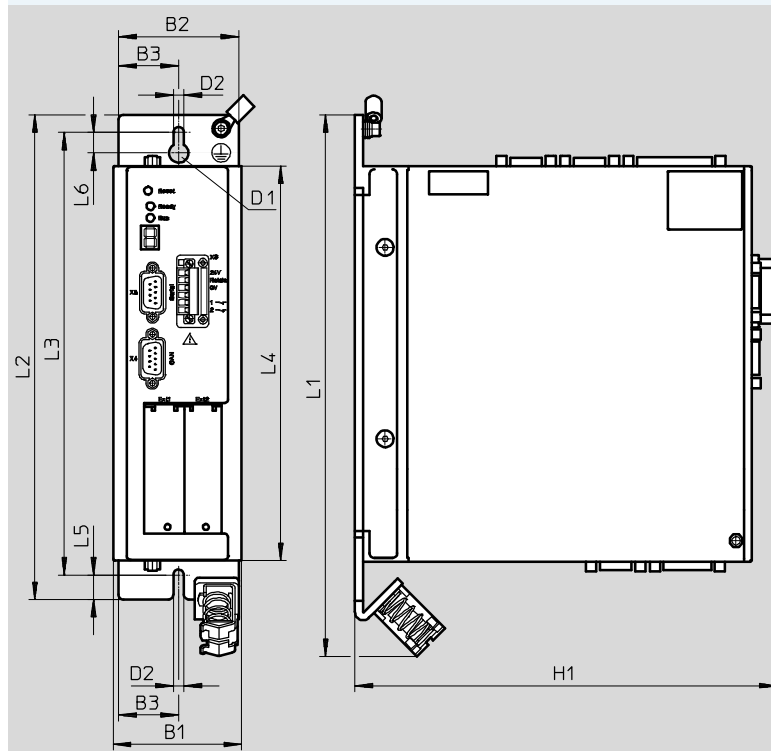Technical data

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Installation clearance for motor controller

Type	H1	L1
CMMP-AS-C2-3A CMMP-AS-C5-3A	100	71
CMMP-AS-C5-11A-P3 CMMP-AS-C10-11A-P3	100	87
CMMP-AS-C20-11A-P3	100	95

Dimensions

Download CAD data ➔ **www.festo.com**

CMMP-AS-C2-3A**,** CMMP-AS-C5-3A

Type	B1	B2	B3	D1 ⌀	D2 ⌀	H1	L1	L2	L3	L4	L5	L6
CMMP-AS-C2-3A CMMP-AS-C5-3A	66	61	30.7	10	5.5	216	277	248	226.5	202	12.5	10.5

Motor controllers CMMP-AS, for servo motors

Technical data

Dimensions	Download CAD data ➜ **www.festo.com**

CMMP-AS-C5-11A-P3, CMMP-AS-C10-11A-P3
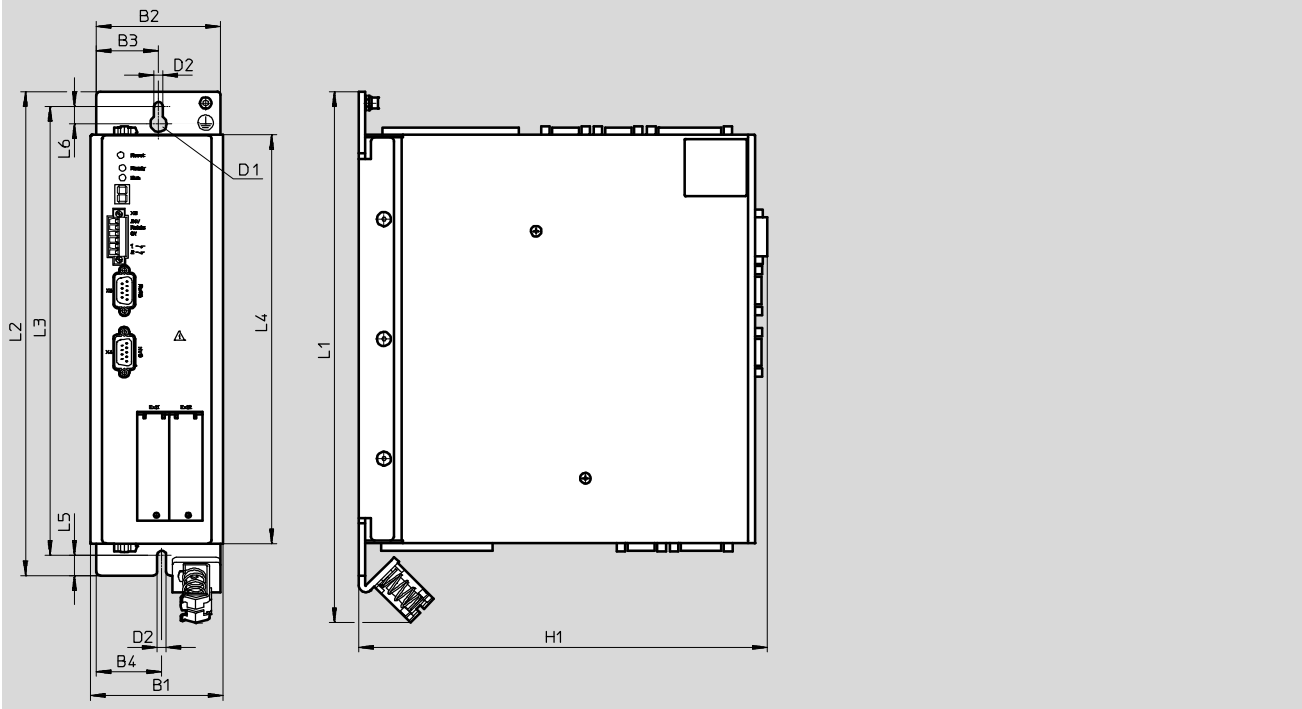
Type	B1	B2	B3	B4	D1 ⌀	D2 ⌀	H1	L1	L2	L3	L4	L5	L6
CMMP-AS-C5-11A-P3 CMMP-AS-C10-11A-P3	81	76	38.1	40.1	10	5.5	251	326	297	275.3	251	12.5	10.5
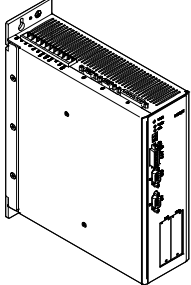
CMMP-AS-C20-11A-P3
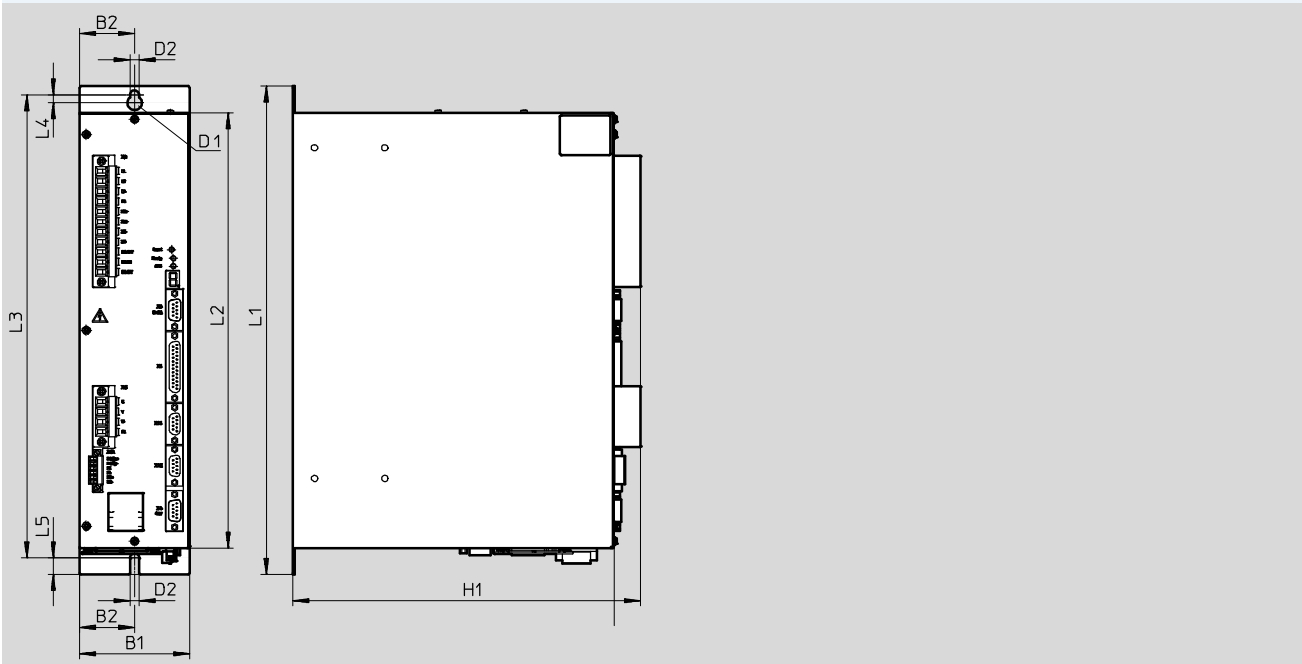
Type	B1	B2	D1 ⌀	D2 ⌀	H1	L1	L2	L3	L4	L5
CMMP-AS-C20-11A-P3	83	41.5	11	7	263	369	329	350	6	12.5

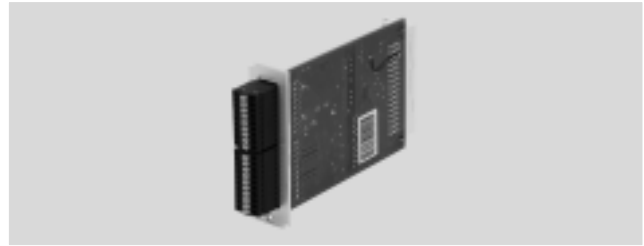| Ordering data			
	Description	Part No.	Type
	The plug assortment NEKM (➔ 14) and the operator package (➔ 15) are included in the scope of delivery.	**550041**	**CMMP-AS-C2-3A**
		550042	**CMMP-AS-C5-3A**
		551023	**CMMP-AS-C5-11A-P3**
		551024	**CMMP-AS-C10-11A-P3**
		1366842	**CMMP-AS-C20-11A-P3**

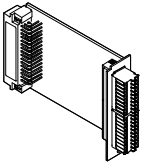# Motor controllers CMMP-AS, for servo motors

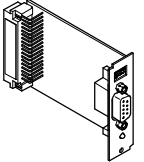Accessories

FESTO

Interface CAMC-D-8E8A

The interface is used to extend the
digital I/Os.
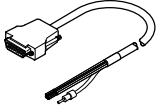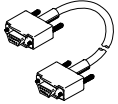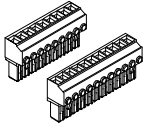Up to two interfaces are supported
simultaneously.
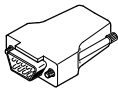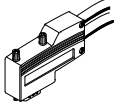
Technical data		
General		
Max. cable cross section	[mm²]	0.5
Digital inputs		
Number		8
Nominal voltage	[V DC]	24
Voltage range	[V]	−30 ... +30 (protected against reverse polarity and short circuit proof)
Nominal value for True	[V]	8
Nominal value for False	[V]	2
Input impedance	[kΩ]	4.7
Digital outputs		
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			
	Description	Part No.	Type
	For additional I/Os (The plugs are included in the scope of delivery. Plug NEKM for reorder ➜ 14)	**567855**	**CAMC-D-8E8A**
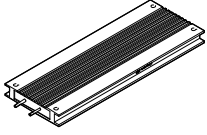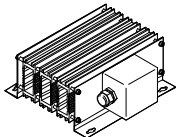
Ordering data – Plug-in cards for fieldbus interface			
	Description	Part No.	Type
	For Profibus interface	**547450**	**CAMC-PB**
	For DeviceNet interface	**547451**	**CAMC-DN**
	For Sercos interface	**552258**	**CAMC-SC**
	For EtherCat interface	**567856**	**CAMC-EC**

Ordering data – Cables and plugs				
	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	1.5	**160786**	**PS1-ZK11-NULLMODEM-1,5M**
	Encoder plug, for incremental encoder interface	–	**564264**	**NECC-A-S-S1G9-C2M**
	Plug assortment for CMMP-AS-C2-3A, CMMP-AS-C5-3A	–	**552255**	**NEKM-C-2**[1]
	Plug assortment for CMMP-AS-C5-11A-P3, CMMP-AS-C10-11A-P3	–	**552256**	**NEKM-C-3**[1]
	Plug assortment for CMMP-AS-C20-11A-P3	–	**1425453**	**NEKM-C-6**[1]
	Plug assortment interface CAMC-D-8E8A	–	**569959**	**NEKM-C-5**[2]
	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**

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.

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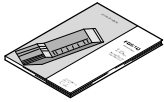
Ordering data – Software and documentation				
	For type	Description	Part No.	Type

	CMMP-AS-C2-3A
	CMMP-AS-C5-3A
	CMMP-AS-C5-11A-P3
	CMMP-AS-C10-11A-P3
		Operator package contains:
		– CD-ROM
		  – with manual for CMMP-AS,
		    in de, en, es, fr, it, sv
		  – with FCT (Festo Configuration Tool) configuration
			558329	**P.BP-CMMP-AS**

	CMMP-AS-C20-11A-P3	software, in de, en – Description The package is included in the scope of delivery	**573687**	**GSIB-CMMP-AS-C20-ML**

Ordering data – Software and documentation for curve editor		
Description	Part No.	Type

Software package contains:
– CD-ROM
  – with manual 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**

Motor controllers CMMP-AS, for servo motors

Accessories

FESTO

	Language	Part No.	Type	Part No.	Type
		For motor controller CMMP-AS-C2-3A, CMMP-AS-C5-3A		For motor controller CMMP-AS-C5-11A-P3, CMMP-AS-C10-11A-P3	
	DE	557325	P.BE-CMMP-AS-3A-HW-DE	557331	P.BE-CMMP-AS-11A-HW-DE
	EN	557326	P.BE-CMMP-AS-3A-HW-EN	557332	P.BE-CMMP-AS-11A-HW-EN
	ES	557327	P.BE-CMMP-AS-3A-HW-ES	557333	P.BE-CMMP-AS-11A-HW-ES
	FR	557328	P.BE-CMMP-AS-3A-HW-FR	557334	P.BE-CMMP-AS-11A-HW-FR
	IT	557329	P.BE-CMMP-AS-3A-HW-IT	557335	P.BE-CMMP-AS-11A-HW-IT
	SV	557330	P.BE-CMMP-AS-3A-HW-SV	557336	P.BE-CMMP-AS-11A-HW-SV
		For motor controller CMMP-AS-C20-11A-P3			
	DE	572594	P.BE-CMMP-AS-C20-11A-DE		
	EN	572595	P.BE-CMMP-AS-C20-11A-EN		
	ES	572596	P.BE-CMMP-AS-C20-11A-ES		
	FR	572597	P.BE-CMMP-AS-C20-11A-FR		
	IT	572598	P.BE-CMMP-AS-C20-11A-IT		
	SV	572599	P.BE-CMMP-AS-C20-11A-SV		
		Festo Handling and Positioning Profile (FHPP) for the motor controller range CMM...			
	DE	555695	P.BE-CMM-FHPP-SW-DE		
	EN	555696	P.BE-CMM-FHPP-SW-EN		
	ES	555697	P.BE-CMM-FHPP-SW-ES		
	FR	555698	P.BE-CMM-FHPP-SW-FR		
	IT	555699	P.BE-CMM-FHPP-SW-IT		
	SV	555700	P.BE-CMM-FHPP-SW-SV		
		For Profibus interface		For DeviceNet interface	
	DE	557337	P.BE-CMMP-FHPP-PB-SW-DE	557349	P.BE-CMMP-FHPP-DN-SW-DE
	EN	557338	P.BE-CMMP-FHPP-PB-SW-EN	557350	P.BE-CMMP-FHPP-DN-SW-EN
	ES	557339	P.BE-CMMP-FHPP-PB-SW-ES	557351	P.BE-CMMP-FHPP-DN-SW-ES
	FR	557340	P.BE-CMMP-FHPP-PB-SW-FR	557352	P.BE-CMMP-FHPP-DN-SW-FR
	IT	557341	P.BE-CMMP-FHPP-PB-SW-IT	557353	P.BE-CMMP-FHPP-DN-SW-IT
	SV	557342	P.BE-CMMP-FHPP-PB-SW-SV	557354	P.BE-CMMP-FHPP-DN-SW-SV
		For CANopen interface		For EtherCat interface	
	DE	557343	P.BE-CMMP-CO-SW-DE	570923	P.BE-CMMX-EC-SW-DE
	EN	557344	P.BE-CMMP-CO-SW-EN	570924	P.BE-CMMX-EC-SW-EN
	ES	557345	P.BE-CMMP-CO-SW-ES	570925	P.BE-CMMX-EC-SW-ES
	FR	557346	P.BE-CMMP-CO-SW-FR	570926	P.BE-CMMX-EC-SW-FR
	IT	557347	P.BE-CMMP-CO-SW-IT	570927	P.BE-CMMX-EC-SW-IT
	SV	557348	P.BE-CMMP-CO-SW-SV	570928	P.BE-CMMX-EC-SW-SV
		For Sercos interface			
	DE	557361	P.BE-CMMP-SC-SW-DE		
	EN	557362	P.BE-CMMP-SC-SW-EN		
	ES	557363	P.BE-CMMP-SC-SW-ES		
	FR	557364	P.BE-CMMP-SC-SW-FR		
	IT	557365	P.BE-CMMP-SC-SW-IT		
	SV	557366	P.BE-CMMP-SC-SW-SV		

Ordering data – Documentation[1]

1) A manual in paper form is not included in the scope of delivery