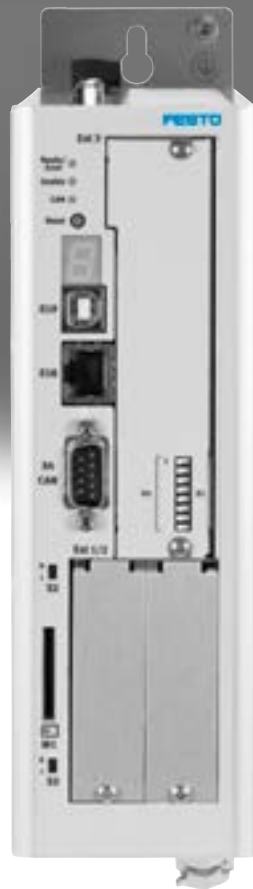


Motor controllers CMMP-AS, for servo motors

FESTO



Festo core product range
Covers 80% of your automation tasks

Worldwide:

Always in stock

Superb:

Festo quality at an attractive price

Easy:

Simplified procurement and warehousing

★ Generally ready for dispatch from the factory within 24 hours

In stock at 13 Service Centres worldwide

More than 2200 products

★ Generally ready for dispatch from the factory within 5 days

Assembled for you in 4 Service Centres worldwide

Up to 6×10^{12} variants per product family

Just look
for the
star!

Key features

Features

Compact

- Extremely small dimensions
- Full integration of all components for the controller and power unit, including USB interface, Ethernet and CANopen interface
- Integrated brake chopper
- Integrated EMC filters
- Automatic actuation for a holding brake
- Compliance with the current CE and EN standards without additional external measures (→ page 6)

Motion control

- Evaluation of digital absolute encoders (EnDat/HIPERFACE) in single-turn or multi-turn versions
- Can be operated as a torque, rotational speed or position controller
- Integrated positioning control
- 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 position sets
- Wide range of homing methods

Bus protocols

CANopen

EtherCAT

PROFIBUS

EtherNet/IP

DeviceNet

PROFINET

Modbus

Input/output

- Freely programmable I/Os
- High-resolution 16-bit analogue input
- Jog/teach mode
- Easy 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 → page 18

Integrated sequence control

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

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. To do this, the controller specifies set-point position values in a fixed time pattern. In between, the servo position controller independently interpolates the data values between two interpolation points.

Key features

Motion program

- Linking of any number of position sets into a motion program
- Step enabling conditions for the motion 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 and standardisation of documentation without the need to create symbols, graphics and master data.

Cam disc functionality

The "electronic cam disc" application type creates optimised motion profiles that generate less vibration and lower acceleration forces at the machine. In addition, the movement of the motor is always synchronised with the position of a master axis so that overlapping, time-optimised motion sequences can be easily defined. To be able to use the cam disc function, you will need the Festo Configuration Tool (FCT) and also the cam editor → Page 4.

Key features:

- High flexibility of the system. The mechanical system does not need to be modified if the requirements for the cam 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 interpolation points can be managed. The interpolation 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.

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 graphically supported parameter entry
- 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 specifically tailored to handling and positioning applications.

With the FHPP data profile, Festo motor controllers can be controlled 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

Product range overview and type codes

| Type | CMMP-AS-...-M0 | CMMP-AS-...-M3 |
|-------------------------------------|----------------|----------------|
| Bus protocols | | |
| 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

| 001 | Series |
|------|---------------------------|
| CMMP | Motor controller, premium |

| 002 | Motor type |
|-----|----------------|
| AS | AC synchronous |

| 003 | Nominal current |
|-----|-----------------|
| C2 | 2 A |
| C5 | 5 A |
| C10 | 10 A |
| C15 | 15 A |

| 004 | Nominal input voltage |
|-----|-----------------------|
| 3A | 230 V AC/50-60Hz |
| 11A | 400 V AC |

| 005 | Number of phases |
|-----|------------------|
| | Single-phase |
| P3 | Three-phase |

| 006 | Number of slots |
|-----|-----------------|
| M0 | Without slots |
| M3 | With 3 slots |

Data sheet

Bus protocols



| General technical data | | C2-3A... | C5-3A... | C5-11A-P3... | C10-11A-P3... | C15-11A-P3... |
|---------------------------------------|-------|--|----------|--------------|---------------|------------------------|
| CMMP-AS- | | | | | | |
| Type of mounting | | Screwed onto connection plate | | | | |
| Display | | Seven-segment display | | | | |
| Parameterisation interface | | USB, Ethernet | | | | |
| Active PFC | | Yes | | - | | |
| DIP switch | | Firmware download/fieldbus settings ¹⁾ /CAN terminating resistor | | | | |
| SD card slot | | Memory card → page 19 | | | | |
| 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 | | | | |
| Encoder interface output | | Additional input for synchronous/cam disc operation | | | | |
| | | Actual value feedback via encoder signals in rotational speed control mode | | | | |
| | | Setpoint specification for downstream slave drive | | | | |
| Braking resistor, integrated | [Ω] | 60 | | 68 | | |
| Pulse power of braking resistor | [kVA] | 2.8 | | 8.5 | | |
| Braking resistor, external | [Ω] | ≥ 50 | | ≥ 40 | | |
| 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 rotational speed setpoint value/torque setpoint value/position setpoint value | | | | |
| Mains filter | | Integrated | | | | External ²⁾ |
| Max. motor cable length ³⁾ | [m] | 25 | | | | - |
| Product weight | [g] | 2100 | 2200 | 3800 | | 3450 |

- 1) Not in combination with CMMP-AS-...-M0
- 2) The mains filter is mandatory for compliance with the CE and EN standards → page 21
- 3) Without external mains filter

| 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 | - | ■ | - | - | - | ■ |

Data sheet

| Technical data – Bus protocols/control | | | | | | | | | | |
|--|--------------------------------------|------------------------------|-------------------------------|------------|-----------------|-----------|---------------------------------------|-------------|-------------|-------|
| Interfaces | I/O | Additional I/O ¹⁾ | CANopen | Modbus TCP | PROFIBUS DP | DeviceNet | EtherCAT | EtherNet/IP | PROFINET RT | |
| Number of digital logic outputs | 5 | 8 | 5 | | | | | | | |
| Characteristics of digital logic outputs | Freely configurable | | | | | | | | | |
| Number of digital logic inputs | 10 | 8 | 10 | | | | | | | |
| Characteristics of logic inputs | Freely configurable | | | | | | | | | |
| Process interfacing | 16 (127) position sets ²⁾ | 255 position sets | 250 position sets | | | | | | | |
| Communication profile | – | – | DS301; FHPP+ DS301; DSP402 | FHPP+ | DP-V0/ FHPP+ | FHPP+ | DS301; FHPP+ CoE: DS301; DSP402 | FHPP+ | FHPP+ | FHPP+ |
| Max. fieldbus transmission rate [Mbps] | – | – | 1 | 100 | 12 | 0.5 | 100 | 100 | 100 | |
| Interface | | | | | | | | | | |
| CMMP-AS-...-M0 | Integrated | ■ | – | ■ | ■ | – | – | – | – | – |
| CMMP-AS-...-M3 | Integrated | ■ | – | ■ | ■ | – | – | – | – | – |
| | Optional ³⁾ | – | ■ | – | – | ■ | ■ | ■ | ■ | ■ |

1) With the plug-in card CAMC-D8E8A → page 18

2) Can be extended with configurable logic inputs up to max. 127 position sets

3) Plug-in cards can be ordered separately → page 18

| Electrical data | | C2-3A... | C5-3A... | C5-11A-P3... | C10-11A-P3... | C15-11A-P3... |
|---------------------------------------|---------------------|-------------------------|-------------------------|---------------------|---------------|---------------|
| Output connection data | | | | | | |
| Output voltage range | [V AC] | 3x 0 ... 270 | | 3x 0 ... 360 | | |
| Nominal current | [A _{eff}] | 2.5 | 5 | 5 | 10 | 15 |
| Peak current | [A _{eff}] | 5 | 10 | 10 | 20 | 30 |
| at max. peak current duration | [s] | 5 | | | | |
| | [A _{eff}] | 10 | 20 | 20 | 40 | 45 |
| | [s] | 0.5 | | | | |
| Max. DC link 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 | 13 |
| Nominal power | [VA] | 500 | 1000 | 3000 | 6000 | 9000 |
| Peak power | [VA] | 1000 | 2000 | 6000 | 12000 | 18000 |
| 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

Data sheet

| Safety functions to EN 61800-5-2 | | | |
|----------------------------------|------------------------------|------------------------|------------------------|
| Motor controller | CMMP-AS- C2/C5/C10-...-M0 | C2/C5/C10/C15-...-M3 | |
| With plug-in card | - | CAMC-G-S1 → Page 14 | CAMC-G-S3 → Page 15 |
| 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 data | |
|--|--|
| CMMP-AS- | C2/C5/C10-...-M0 |
| 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 | German Technical Control Board (TÜV) 01/205/5162.02/19 |
| Proof test interval | 20a |
| Diagnostic coverage [%] | 97 |
| 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 area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

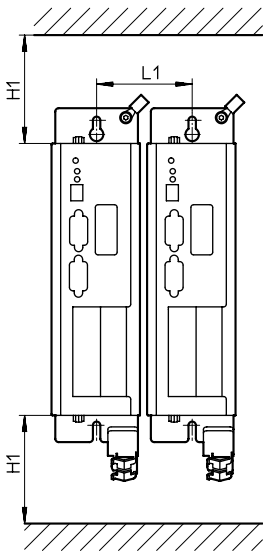
| Technical data – Connection to the integrated safety module with CMMP-AS-...-M0 | | |
|---|--------|--|
| Control input STO-A/STO-B | | |
| Nominal voltage | [V DC] | 24 (related to 0V-A/B) |
| Operating range | [V] | 19.2 ... 28.8 |
| Nominal current | [mA] | 20 (typical; max. 30) |
| Starting current | [mA] | 450 (typical, duration approx. 2 ms; max. 600 at 28.8 V) |
| Max. positive test pulse length with logic 0 | [ms] | 0.3 (related to nominal voltage 24 V and intervals > 2 s between pulses) |
| Max. allowable time for test pulses at 24 V signal | [ms] | < 2 ... 6 |
| Key features | | Galvanically isolated |
| 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) |
| Design | | Potential-free signal contact |
| Switching logic | | Contact closes at STO |

Data sheet

| Operating and environmental conditions | | C2-3A-... | C5-3A-... | C5-11A-P3-... | C10-11A-P3-... | C15-11A-P3-... |
|--|------|--|-----------|---------------|----------------|----------------|
| Digital logic outputs | | Galvanically isolated | | | | |
| Logic inputs | | Galvanically isolated | | | | |
| Degree of protection | | | | | | |
| With plug at X6 and X9 | | IP20 | | | | |
| Without plug at X6 and X9 | | IP10 | | | | |
| 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 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 compliance mark | | | | |
| Note on materials | | | | | | |
| | | Contains paint-wetting impairment substances | | | | |
| | | RoHS-compliant | | | | |

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Installation clearance for motor controller



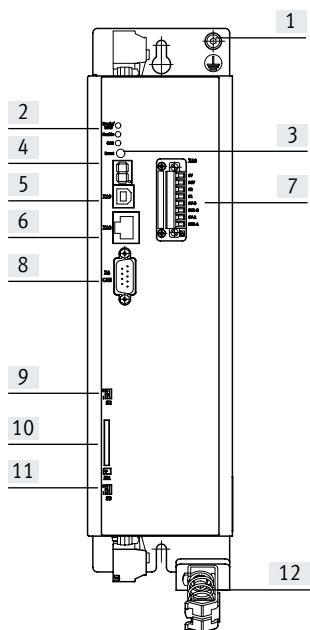
| Type | H1 ¹⁾ | L1 |
|------------------------|------------------|----|
| CMMP-AS-C2-3A-... | 100 | 71 |
| CMMP-AS-C5-3A-... | | |
| CMMP-AS-C5-11A-P3-... | 100 | 85 |
| CMMP-AS-C10-11A-P3-... | | |
| CMMP-AS-C15-11A-P3-... | | |

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

Data sheet

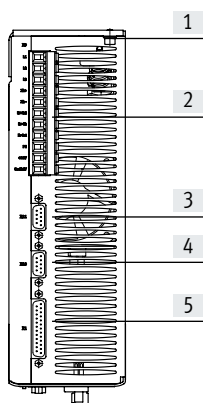
View of motor controller

CMMP-AS-...-M0



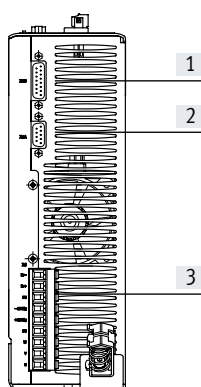
- [1] PE connection
- [2] LEDs
- [3] Reset button
- [4] Seven-segment display
- [5] X19 USB interface
- [6] X18 Ethernet interface
- [7] X40 digital I/O interface for controlling the STO function
- [8] X4 CANopen interface
- [9] Activation of CANopen terminating resistor
- [10] SD/MMC card slot
- [11] Activation of firmware download
- [12] Shield connection

From above



- [1] PE connection
- [2] X9 power supply
- [3] X11 incremental encoder interface (output)
- [4] X10 incremental encoder interface (input)
- [5] X1 I/O interface

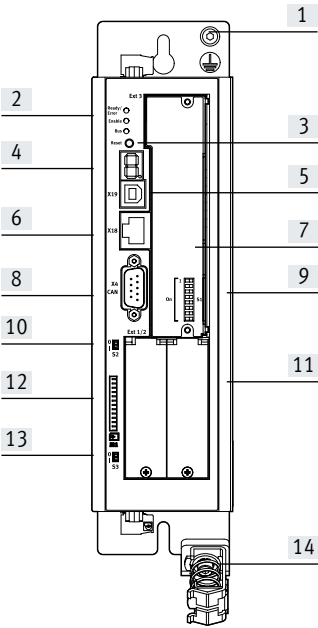
From underneath



- [1] X2B encoder connection
- [2] X2A resolver connection
- [3] X6 motor connection

Data sheet

View of motor controller
CMMP-AS-...-M3

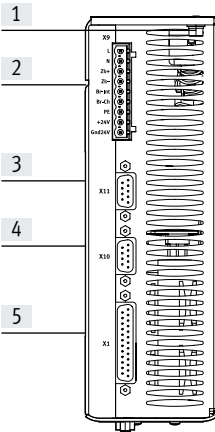


- [1] PE connection
- [2] LEDs
- [3] Reset button
- [4] Seven-segment display
- [5] X19 USB interface
- [6] X18 Ethernet interface
- [7] Slot for switch or safety module
- [8] X4 CANopen interface
- [9] Fieldbus settings
- [10] Activation of CANopen terminating resistor
- [11] Slots for extension modules
- [12] SD/MMC card slot
- [13] Activation of firmware download
- [14] Shield connection

Note
One of the plug-in cards must be inserted in slot [7] in order to operate the motor controller.

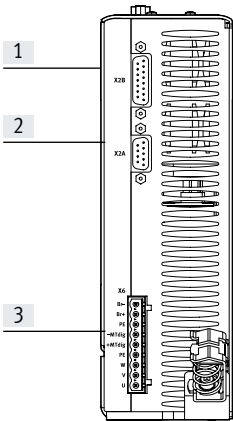
Possible plug-in cards:
CAMC-DS-M1 → page 19
CAMC-G-S1 → page 14
CAMC-G-S3 → page 15

From above



- [1] PE connection
- [2] X9 power supply
- [3] X11 incremental encoder interface (output)
- [4] X10 incremental encoder interface (input)
- [5] X1 I/O interface

From underneath



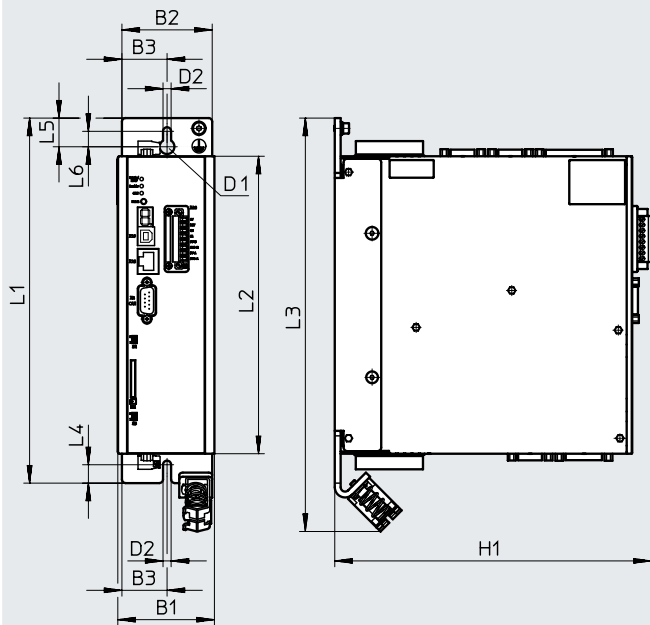
- [1] X2B encoder connection
- [2] X2A resolver connection
- [3] X6 motor connection

Data sheet

Dimensions

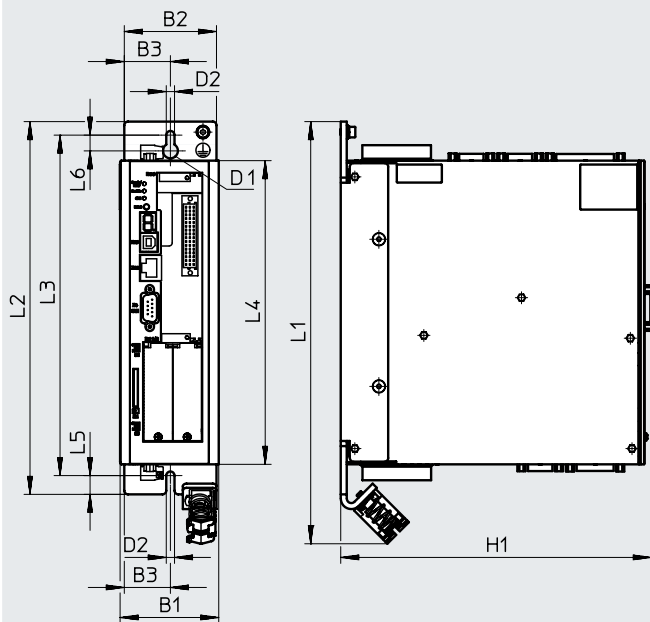
Download CAD data → www.festo.com

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



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

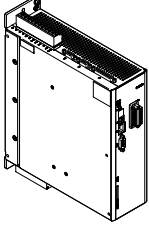
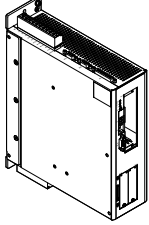
CMMP-AS-C2/C5-3A-M3, CMMP-AS-C5/C10/-C15-11A-P3-M3



| Type | B1 | B2 | B3 | D1 ∅ | D2 ∅ | H1 | L1 | L2 | L3 | L4 | L5 | L6 |
|-----------------------|----|----|------|---------|---------|-----|-----|-----|-----|-----|------|------|
| CMMP-AS-C2-3A-M3 | 66 | 61 | 30.7 | 10 | 5.5 | 207 | 281 | 248 | 227 | 202 | 12.5 | 10.5 |
| CMMP-AS-C5-3A-M3 | | | | | | | | | | | | |
| CMMP-AS-C5-11A-P3-M3 | 79 | 75 | 37.5 | 10 | 5.5 | 247 | 330 | 297 | 276 | 252 | 12.5 | 10.5 |
| CMMP-AS-C10-11A-P3-M3 | | | | | | | | | | | | |
| CMMP-AS-C15-11A-P3-M3 | | | | | | | | | | | | |

Data sheet

★ Core product range

| Ordering data | Description | Part no. | Type |
|---|--|---|--|
| CMMP-AS-...-M0 – Without slot | | | |
|  | The plug assortment NEKM (→ page 20) is included in the scope of delivery of the motor controller. | 1622901 1622902 1622903 1622904 | CMMP-AS-C2-3A-M0 CMMP-AS-C5-3A-M0 CMMP-AS-C5-11A-P3-M0 CMMP-AS-C10-11A-P3-M0 |
| CMMP-AS-...-M3 – With 3 slots | | | |
|  | <ul style="list-style-type: none"> • One of the plug-in cards must be inserted in slot [7] (→ page 11) in order to operate the motor controller. Possible plug-in cards: <ul style="list-style-type: none"> – CAMC-DS-M1 → page 19 – CAMC-G-S1 → page 14 – CAMC-G-S3 → page 15 • The mains filter is mandatory with CMMP-AS-C15... for compliance with the CE and EN standards (→ page 21). • The plug assortment NEKM (→ page 20) is included in the scope of delivery of the motor controller. | ★ 1501325 ★ 1501326 ★ 1501327 ★ 1501328 3215473 | CMMP-AS-C2-3A-M3 CMMP-AS-C5-3A-M3 CMMP-AS-C5-11A-P3-M3 CMMP-AS-C10-11A-P3-M3 CMMP-AS-C15-11A-P3-M3 |

Festo core product range

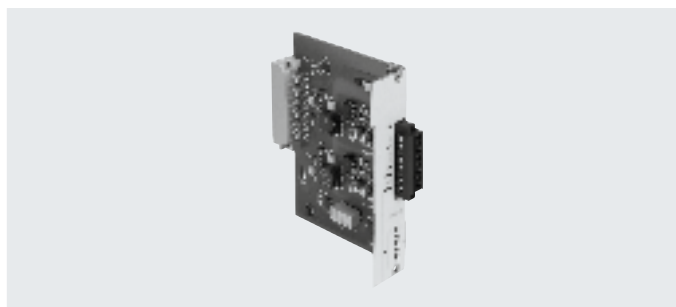


Generally ready for dispatch from the factory within 24 hours
 Generally ready for dispatch from the factory within 5 days

Accessories

Safety module CAMC-G-S1

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



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

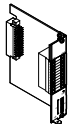
- Safe torque off (STO)

| Safety data | |
|--|--|
| 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 | German Technical Control Board (TÜV) 01/205/5165.02/19 |
| Proof test interval | 20a |
| PFH | 1.27×10^{-10} |
| Diagnostic coverage [%] | 97 |
| 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 area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

| Technical data | |
|---|--|
| Control input STO-A/STO-B | |
| Nominal voltage [V DC] | 24 (related to OV-A/B) |
| Operating range [V] | 19.2 ... 28.8 |
| Nominal current [mA] | 20 (typical; max. 30) |
| Max. positive test pulse length with logic 0 [ms] | 0.3 (related to nominal voltage 24 V and intervals > 2 s between pulses) |
| Max. allowable time for test pulses at 24 V signal [ms] | < 2 ... 6 |
| Key features | Galvanically isolated |
| 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) |
| Design | 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, CAMC-G-S3 or CAMC-DS-M1 must be inserted in slot [7] (→ page 11) in order to operate the motor controller. • The plugs are included in the scope of delivery. To reorder plug NEKM → page 20 | ★ 1501330 | CAMC-G-S1 |

Festo core product range



Generally ready for dispatch from the factory within 24 hours

Generally ready for dispatch from the factory within 5 days

Accessories

Safety module CAMC-G-S3

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

The safety module serves as an extension 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 data | |
|--|--|
| 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 | Up to category 4, Performance Level e |
| Safety Integrity Level (SIL) to EN 61800-5-2, EN 62061, EN 61508 | SIL 3 |
| Certificate issuing authority | German Technical Control Board (TÜV) 01/205/5165.02/19 |
| 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 area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Accessories

| Technical data | | |
|---|---|---|
| General | | |
| Parameterisation | Using SafetyTool, integrated into the FCT plug-in for CMMP-AS-... | |
| Digital safe 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 |
| Key features | Suitable for emergency-stop switchgear, protective door circuit, light curtain, enabling button, two-hand operator unit; Inputs switching equivalently/antivalently; Test pulses can be configured; Function can be configured | |
| Digital safe 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 |
| Key features | Suitable for start button, brake feedback, mode selector, error acknowledgement, restart blocking; Test pulses can be configured; Function can be configured | |
| Digital safe 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 |
| Key features | Semiconductor outputs: parameterisable PNP (positive switching) Outputs switching equivalently/antivalently 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) |
| Design | Potential-free signal contact | |
| Key features | Suitable for the diagnostics of safety functions Function can be configured | |

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 sensors for linear motors
- Incremental encoder with digital A/B signals

The manufacturers of SIL-certified shaft encoders publish guidelines for their use 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 (801412 0/2010-12-21) → 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

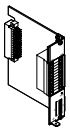
| First encoder | Second encoder | Achievable safety level | | Note |
|-------------------------------|---------------------|-------------------------|--------------------------|---|
| Resolver | Other encoder | SIL 3 | Cat. 3/PL d; Cat. 3/PL e | – |
| Resolver | Incremental encoder | SIL 3 | Cat. 4/PL 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 | Encoder setting: "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 these requirements are fulfilled in your application 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 on diagnostic coverage as well as the restrictions on the achievable accuracy of standstill and speed monitoring 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, MTTFd, etc., suitability of the encoders for the operating and ambient conditions, EMC, etc.).

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, CAMC-G-S3 or CAMC-DS-M1 must be inserted in slot [7] (→ page 11) in order to operate the motor controller. • The plugs are included in the scope of delivery. To reorder plug NEKM → page 20 | ★ 1501331 | CAMC-G-S3 |

Festo core product range



Generally ready for dispatch from the factory within 24 hours
Generally ready for dispatch from the factory within 5 days

Accessories

Interface CAMC-D-8E8A

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

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

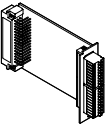
Up to two interfaces are supported simultaneously.



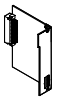
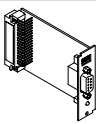
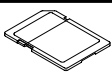
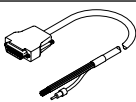
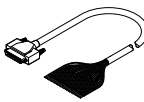
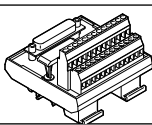
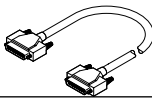

Technical data

| General | | |
|---------------------------------------|--------------------|---|
| Max. connection cross-section | [mm ²] | 0.5 |
| Electrical connection | | Screw terminal |
| | | 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

| | Description | Part no. | Type |
|--|---|---------------|--------------------|
|  | Interface: for additional I/Os (The plugs are included in the scope of delivery. To reorder plug NEKM → page 20) | 567855 | CAMC-D-8E8A |

Accessories

| Ordering data – Plug-in card | | | | |
|---|---|------------------|-----------------|--------------------------|
| | Description | Part no. | Type | |
|  | Switch module: • One of the plug-in cards CAMC-G-S1, CAMC-G-S3 or CAMC-DS-M1 must be inserted in slot [7] (→ page 11) in order to operate the motor controller CMMP-AS-...-M3. | ★ 1501329 | CAMC-DS-M1 | |
| Ordering data – Plug-in cards for bus protocols | | | | |
| | 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 – Connection options from I/O interface to the controller | | | | |
| | Description | Cable length [m] | Part no. | Type |
| Control cable | | | | |
|  | <ul style="list-style-type: none"> For I/O interface to any controller Recommended for analogue signals since the cable is shielded | 2.5 | 552254 | NEBC-S1G25-K-2.5-N-LE26 |
|  | <ul style="list-style-type: none"> For I/O interface to any controller Cannot be used if the incremental encoder interface (plug X10) is in use | 3.2 | ★ 8001373 | NEBC-S1G25-K-3.2-N-LE25 |
| Connection block | | | | |
|  | Ensures simple and clear wiring. The connection to the motor controller is established via the connecting cable NEBC-S1G25-K-... | – | 8001371 | NEFC-S1G25-C2W25-S7 |
| Connecting cable | | | | |
|  | <ul style="list-style-type: none"> Connects the motor controller to the manifold block. Cannot be used if the incremental encoder interface (input) is in use | 1.0 | 8001374 | NEBC-S1G25-K-1.0-N-S1G25 |
| | | 2.0 | 8001375 | NEBC-S1G25-K-2.0-N-S1G25 |
| | | 5.0 | 8001376 | NEBC-S1G25-K-5.0-N-S1G25 |
| Plug | | | | |
|  | <ul style="list-style-type: none"> 25-pin Sub-D plug. Each single core can be individually assembled using screw terminals. Cannot be used if the incremental encoder interface (input) is in use | – | ★ 8001372 | NEFC-S1G25-C2W25-S6 |

Festo core product range

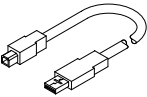





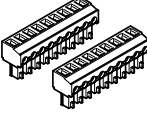

Generally ready for dispatch from the factory within 24 hours



Generally ready for dispatch from the factory within 5 days

Accessories

| Ordering data – Cables and plugs | | | | |
|--|------------------------------------|------------------|----------|------------------------|
| | Description | Cable length [m] | Part no. | Type |
| Programming cable | | | | |
|  | For CMMP-AS-...-M0, CMMP-AS-...-M3 | 1.8 | 1501332 | NEBC-U1G4-K-1.8-N-U2G4 |
| Encoder plug | | | | |
|  | For incremental encoder interface | – | 564264 | NECC-A-S-S1G9-C2M |
| Plugs | | | | |
|  | For PROFIBUS interface | – | 533780 | FBS-SUB-9-WS-PB-K |
| | For CANopen interface | – | 533783 | FBS-SUB-9-WS-CO-K |
|  | For DeviceNet interface | – | 525635 | FBSD-KL-2X5POL |

| Ordering data – 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/-C15-11A-P3-M3 | | | |
| | • Interface CAMC-D-8E8A | 569959 | NEKM-C-5 ²⁾ | |
| | • 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 ³⁾ | |
| | • Motor controller CMMP-AS-...-M0 | | | |
| | • Safety module CAMC-G-S3 | ★ 1660937 | NEKM-C-9 ⁴⁾ | |

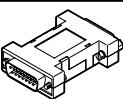
- 1) Plugs are included in the scope of delivery of the motor controller CMMP-AS-...-M0, CMMP-AS-...-M3
- 2) Plugs are included in the scope of delivery of the plug-in card CAMC-D-8E8A
- 3) Plug is included in the scope of delivery of the plug-in card CAMC-G-S1
Plug is included in the scope of delivery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

Ordering data – EMC filter for servo motors EMME-AS

Data sheets → Internet: emme-as

For cable lengths ≥ 10 m, the use of the EMC filter is recommended to reduce EMC interference.

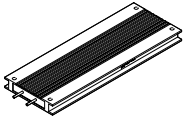
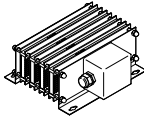
For encoder cables ≥ 10 m, the filter is included in the scope of delivery of the cable.

| | Degree of protection | Ambient temperature | Part no. | Type |
|--|----------------------------|---------------------|----------|------------|
|  | IP30 (in mounted state) | –40 ... +80°C | 4825847 | CAMF-C5-FC |

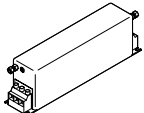
Festo core product range


- ★ Generally ready for dispatch from the factory within 24 hours
- ★ Generally ready for dispatch from the factory within 5 days

Accessories


| Ordering data – Braking resistors | | | | Data sheets → Internet: cacr | |
|---|------------------------|-------------------------|----------------------|------------------------------|---------------------------------|
| | For type | Resistance value [Ω] | Nominal power [W] | Part no. | Type |
| CACR-LE2-... | | | | | |
|  | CMMP-AS-C2-3A-... | 50 | 200 | 2882342 | CACR-LE2-50-W500 ¹⁾ |
| | CMMP-AS-C5-3A-... | 72 | 200 | 1336611 | CACR-LE2-72-W500 |
| CACR-KL2-... | | | | | |
|  | CMMP-AS-C5-11A-P3-... | 67 | 720 | 1336617 | CACR-KL2-67-W1800 |
| | CMMP-AS-C10-11A-P3-... | 40 | 800 | 2882343 | CACR-KL2-40-W2000 ¹⁾ |
| | CMMP-AS-C15-11A-P3-... | | | | |


1) Recommended braking resistor

| Ordering data – Mains filter | | | | | | |
|--|------------------------|--------------------------|----------------------|--|----------|-----------------|
| | For type | Operating voltage [V] | Input current [A] | Dimensions [mm] | Part no. | Type |
|  | CMMP-AS-C15-11A-P3-... | 520/300 | 16 | Length: 230 Width: 50 Height: 70 | 3947275 | CADF-C15-11A-P3 |

 **Note**

Regardless of the length of the motor cable, the mains filter is mandatory for compliance with the CE and EN standards.

| 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: mounting and installation of 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 the cam 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, 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 |