

## Motor controllers CMMS-AS, for servo motors

**FESTO**



## Motor controllers CMMS-AS, for servo motors

Key features

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

- 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
- Adheres to the current CE and EN standards without additional external measures (motor cable length of up to 15 m)

#### Motion control

- Digital absolute shaft encoder in single-turn and multi-turn versions
- Can be operated as a torque, speed or position controller
- Integrated positioning controller
- Time-optimised (trapezoidal) or jerk-free (S-shaped) positioning
- Absolute and relative movements
- Point-to-point positioning with and without approximate positioning
- Position synchronisation
- Electronic gear unit
- 63 position sets
- 8 travel profiles
- Wide range of homing methods

#### Fieldbus interfaces

Integrated:



Optional:



#### Input/output

- Freely programmable I/Os
- High-resolution 12-bit analogue input
- Jog/teach mode
- Simple linking to a higher-level controller via I/O or fieldbus
- Synchronous operation
- Master/slave mode

#### Integrated sequence control

- Automatic sequence of position sets without a higher-level controller
- Linear and cyclic position sequences
- Adjustable delay times

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Key features

### Performance characteristics

#### Integrated safety functions

- The motor controller CMMS-AS support "Safe Torque off (STO)" and, by providing a reliable time delay, also supports "Safe Stop 1 (SS1)" functions with protection against unexpected startup 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

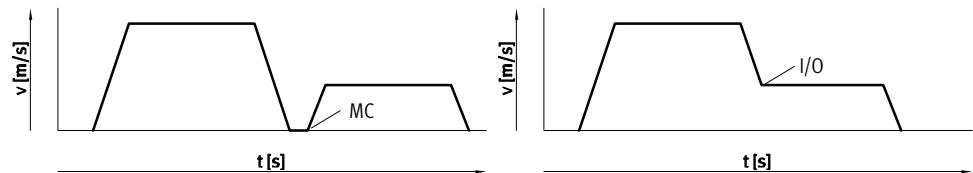
#### Interpolating multi-axis movement

- With a suitable controller, the CMMS-AS can perform path movements with interpolation via CANopen. The controller specifies setpoint position values in a fixed

time pattern to this end. In between, the servo positioning controller independently interpolates the data values between two data points.

### Travel program

- Linking of any number of position sets into a travel program
- Further switching conditions for the travel program possible via digital inputs, for example  
 MC – motion complete  
 I/O – digital inputs



### Library for EPLAN



EPLAN macros for fast and reliable planning of electrical projects in combination with motor controllers,

motors and cables. This enables a high level of planning reliability, standardisation of documentation,

no need to create symbols, graphics and master data.

- 1 - Type discontinued  
Available up until 2016

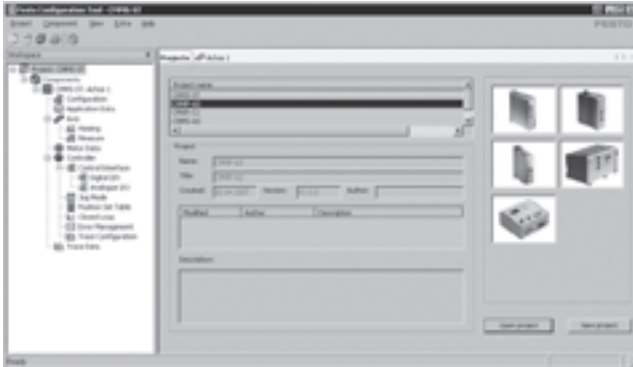
## Motor controllers CMMS-AS, for servo motors

Key features

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### FCT software – Festo Configuration Tool

Software platform for electric drives from Festo



- All drives in a system can be managed and archived 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

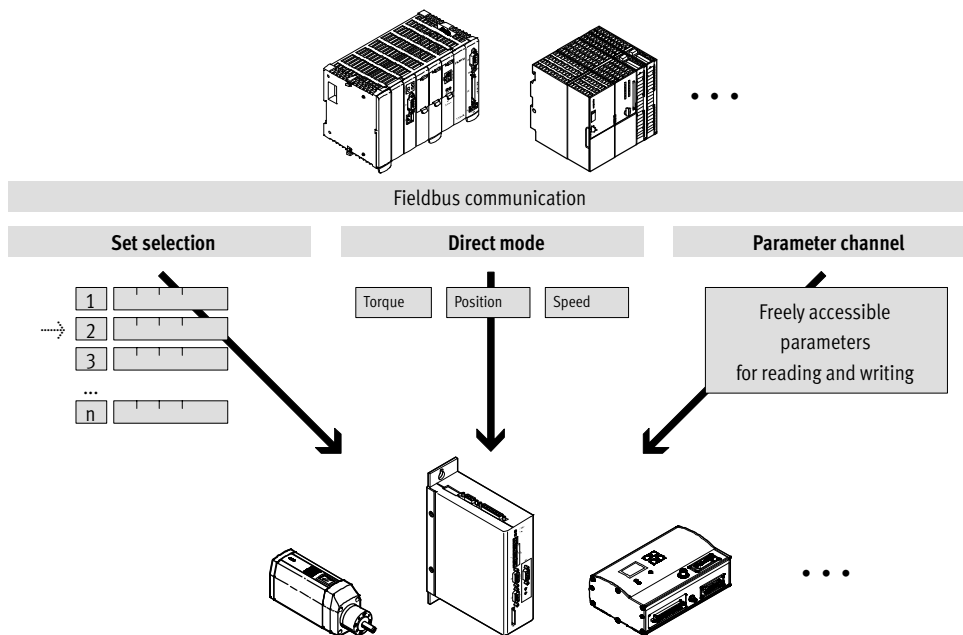
Optimised data profile

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



## Motor controllers CMMS-AS, for servo motors

Type codes

|                  |                            | CMMS | AS | C4 | 3A | G2 |
|------------------|----------------------------|------|----|----|----|----|
| Type             |                            |      |    |    |    |    |
| CMMS             | Motor controller, standard |      |    |    |    |    |
| Motor technology |                            |      |    |    |    |    |
| AS               | AC synchronous             |      |    |    |    |    |
| Nominal current  |                            |      |    |    |    |    |
| C4               | 4 A                        |      |    |    |    |    |
| Input voltage    |                            |      |    |    |    |    |
| 3A               | 230 V AC                   |      |    |    |    |    |
| Generation       |                            |      |    |    |    |    |
| G2               | Next generation            |      |    |    |    |    |

- 1 - Type discontinued  
Available up until 2016

## Motor controllers CMMS-AS, for servo motors

Technical data

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Fieldbus interfaces

CANopen



PROFIBUS



DeviceNet



| General technical data              |                                                                                                                                              |                                    |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Type of mounting                    | Screwed to a mounting plate                                                                                                                  |                                    |
| Display                             | 7-segment display                                                                                                                            |                                    |
| Parameterisation interface          | RS232 (9,600 ... 115,000 bits/s)                                                                                                             |                                    |
| Encoder interface input             | Setpoint position value as encoder signal<br>EnDat V2.1 serial / V2.2                                                                        |                                    |
| Encoder interface output            | Actual value feedback via encoder signals in speed control mode<br>Setpoint specification for downstream slave drive<br>Resolution 4,096 ppr |                                    |
| Braking resistor, integrated        | [Ω]                                                                                                                                          | 230                                |
| Pulse power of braking resistor     | [kVA]                                                                                                                                        | 0.7                                |
| Braking resistor, external          | [Ω]                                                                                                                                          | ≥ 100                              |
| Impedance of setpoint input         | [kΩ]                                                                                                                                         | 20                                 |
| Number of analogue outputs          |                                                                                                                                              | 1                                  |
| Operating range of analogue outputs | [V]                                                                                                                                          | 0 ... 10                           |
| Resolution of analogue outputs      | [Bit]                                                                                                                                        | 8                                  |
| Characteristics of analogue outputs | Short circuit-proof                                                                                                                          |                                    |
| Number of analogue inputs           |                                                                                                                                              | 1                                  |
| Operating range of analogue inputs  | [V]                                                                                                                                          | ±10                                |
| Characteristics of analogue inputs  | Differential inputs<br>Configurable for speed<br>Configurable for torque                                                                     |                                    |
| Mains filter                        | Integrated                                                                                                                                   |                                    |
| Max. length of motor cable          | [m]                                                                                                                                          | 15 (without external mains filter) |
| Product weight                      | [g]                                                                                                                                          | 1,400                              |

| Technical data – Fieldbus interface      |            |                                   |                      |              |           |
|------------------------------------------|------------|-----------------------------------|----------------------|--------------|-----------|
| Interfaces                               |            | I/O                               | CANopen              | Profibus DP  | DeviceNet |
| Number of digital logic outputs          |            | 5                                 |                      |              |           |
| Characteristics of digital logic outputs |            | Freely configurable in some cases |                      |              |           |
| Number of digital logic inputs           |            | 14                                |                      |              |           |
| Operating range of logic inputs [V]      |            | 12 ... 30                         |                      |              |           |
| Characteristics of logic inputs          |            | Freely configurable               |                      |              |           |
| Process coupling                         |            | For 63 position sets              | For 63 position sets |              |           |
| Communication profile                    |            | –                                 | DS301, FHPP          | DP-V0 / FHPP | FHPP      |
|                                          |            | –                                 | DS301, DSP402        | –            |           |
| Max. fieldbus transmission rate [Mbit/s] |            | –                                 | 1                    | 12           | 0.5       |
| Interface                                | Integrated | ■                                 | ■                    | –            | –         |
|                                          | Optional   | –                                 | –                    | ■<br>➔ 11    | ■<br>➔ 11 |

## Motor controllers CMMS-AS, for servo motors

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Technical data

| Function blocks for PLC programming |                         |            |             |           |
|-------------------------------------|-------------------------|------------|-------------|-----------|
| Programming software                | Controller manufacturer | Interfaces |             |           |
|                                     |                         | CANopen    | Profibus DP | DeviceNet |
| CoDeSys                             | Festo                   | ■          | ■           | ■         |
|                                     | Beckhoff                |            |             |           |
|                                     | Other manufacturers     |            |             |           |
| RSLogix5000                         | Rockwell Automation     | –          | –           | ■         |
| Step 7                              | Siemens                 | –          | ■           | –         |

| Electrical data                       |        |                         |
|---------------------------------------|--------|-------------------------|
| Output connection data                |        |                         |
| Output voltage range                  | [V AC] | 0 V up to input voltage |
| Nominal output current                | [A]    | 4                       |
| Peak current                          | [A]    | 10                      |
| Max. peak current duration            | [s]    | 2                       |
| Max. intermediate circuit voltage     | [V DC] | 320                     |
| Output frequency                      | [Hz]   | 0 ... 1,000             |
| Load supply                           |        |                         |
| Nominal voltage phases                |        | 1                       |
| Input voltage range                   | [V AC] | 95 ... 255              |
| Max. nominal input current            | [A]    | 4                       |
| Rated output                          | [VA]   | 600                     |
| Peak output                           | [VA]   | 1,200                   |
| Mains frequency                       | [Hz]   | 50 ... 60               |
| Logic supply                          |        |                         |
| Nominal voltage                       | [V DC] | 24 ±20%                 |
| Nominal current                       | [A]    | 0.35                    |
| Max. current (incl. holding brake)    | [A]    | 1.7                     |
| Max. current of digital logic outputs | [mA]   | 100                     |

| Safety characteristics                                           |                                   |
|------------------------------------------------------------------|-----------------------------------|
| Safety function to EN 61800-5-2                                  | Safe torque off (STO)             |
| Performance Level (PL) to EN ISO 13849-1                         | Category 3, Performance Level d   |
| Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508 | SIL 2                             |
| MTTFd                                                            | STO/2521 years                    |
| PFH                                                              | 4.53 x 10 <sup>-8</sup>           |
| Approval                                                         | BIA                               |
| Certificate issuing authority                                    | BG MFS 09030                      |
| CE marking (see declaration of conformity)                       | To EU Low Voltage Directive       |
|                                                                  | To EU EMC Directive <sup>1)</sup> |
|                                                                  | To EC Machinery Directive         |
| Vibration resistance                                             | To EN 61800-5-1                   |

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

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Technical data

| Operating and environmental conditions     |                                           |
|--------------------------------------------|-------------------------------------------|
| Digital logic outputs                      | Not galvanically isolated                 |
| Logic inputs                               | Galvanically connected to logic potential |
| Degree of protection                       | IP20                                      |
| Protective function                        | I <sup>2</sup> t monitoring               |
|                                            | Intermediate circuit over/undervoltage    |
|                                            | Output stage short circuit                |
|                                            | Standstill monitoring                     |
|                                            | Temperature monitoring                    |
| Ambient temperature [°C]                   | 0 ... +50                                 |
| Note on ambient temperature                | 4% reduction per °C above 40 °C           |
| Storage temperature [°C]                   | -25 ... +70                               |
| Relative air humidity [%]                  | 0 ... 90 (non-condensing)                 |
| CE marking (see declaration of conformity) | To EU Low Voltage Directive               |
|                                            | To EU EMC Directive <sup>1)</sup>         |
|                                            | To EU Machinery Directive                 |
| Approval                                   | c UL - Recognised (OL)                    |
|                                            | UL listed (OL)                            |
|                                            | C-Tick                                    |
| Note on materials                          | RoHS-compliant                            |

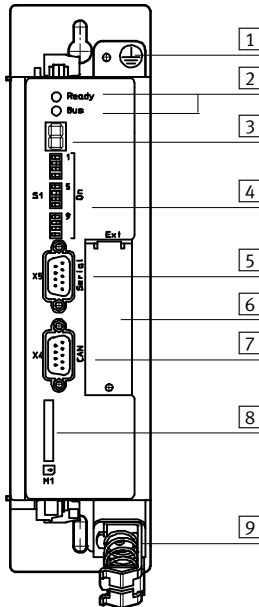
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Technical data

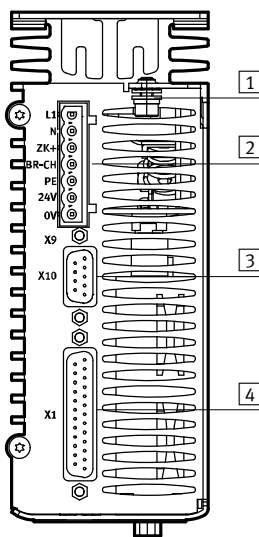
### View of motor controller

From the front



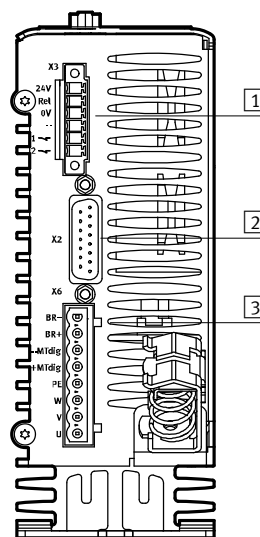
- 1 Earthing
- 2 Ready/bus LED
- 3 Status display
- 4 Fieldbus settings and boot loader
- 5 Interface: RS232/RS485
- 6 Technology module (optional)
- 7 Interface: CAN bus
- 8 SD memory card
- 9 Screened connection

From above



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

From underneath



- 1 Safe stop
- 2 Encoder connection
- 3 Motor connection

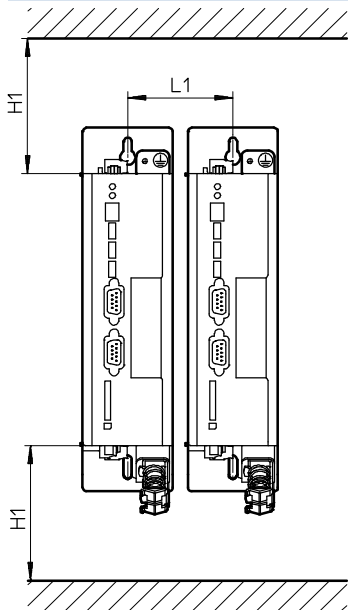
- 2 - Type discontinued  
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## Motor controllers CMMS-AS, for servo motors

Technical data

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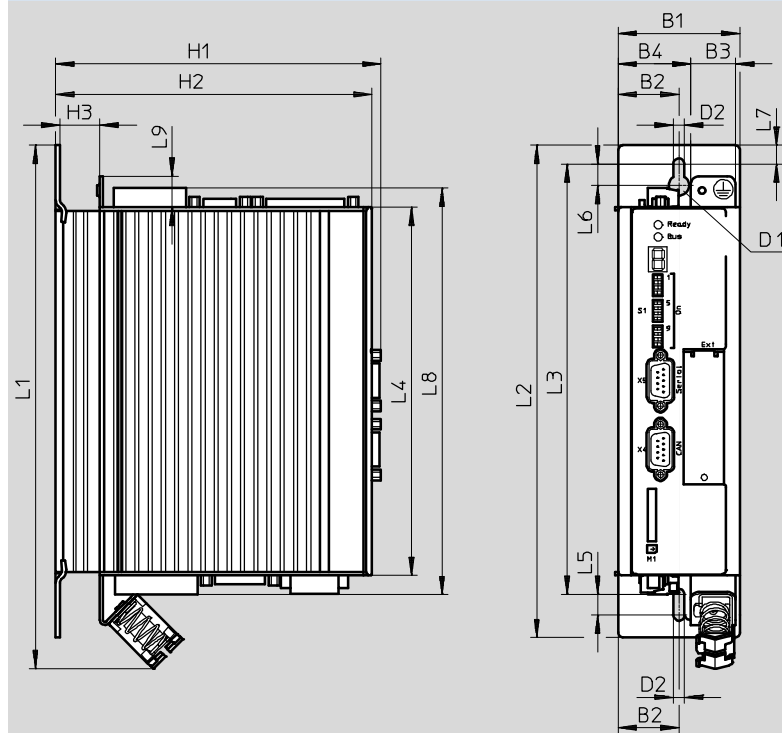
### Installation clearance for motor controller



| H1  | L1 |
|-----|----|
| 100 | 70 |

### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



| Type    | B1 | B2 | B3 | B4   | D1 | D2  | H1  | H2    | H3   |
|---------|----|----|----|------|----|-----|-----|-------|------|
| CMMS-AS | 60 | 30 | 22 | 35.8 | 10 | 5.5 | 160 | 155.5 | 19.7 |

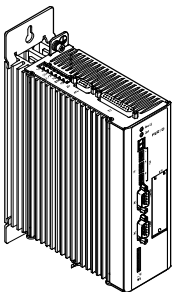
| Type    | L1    | L2    | L3    | L4  | L5 | L6   | L7   | L8  | L9   |
|---------|-------|-------|-------|-----|----|------|------|-----|------|
| CMMS-AS | 257.6 | 242.1 | 211.9 | 181 | 10 | 10.5 | 9.25 | 200 | 15.3 |

- 2 - Type discontinued  
Available up until 2016

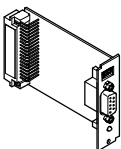
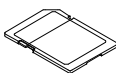
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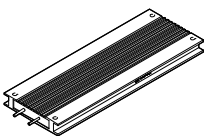
## Motor controllers CMMS-AS, for servo motors

Technical data and accessories

| Ordering data                                                                     |                                                                                                        |               |                         |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|-------------------------|
|                                                                                   | Brief description                                                                                      | Part No.      | Type                    |
|  | The plug assortment NEKM (→ 13) and the operator package (→ 13) are included in the scope of delivery. | <b>572986</b> | <b>CMMS-AS-C4-3A-G2</b> |

### Accessories

| Ordering data – Plug-in cards                                                       |                                                        |                |                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------|----------------|------------------------|
|                                                                                     | Brief description                                      | Part No.       | Type                   |
|   | Interface,<br>for Profibus interface                   | <b>547450</b>  | <b>CAMC-PB</b>         |
|                                                                                     | Interface,<br>for DeviceNet interface                  | <b>547451</b>  | <b>CAMC-DN</b>         |
|  | Memory card,<br>for data backup and firmware downloads | <b>1436343</b> | <b>CAMC-M-S-F10-V1</b> |

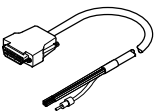
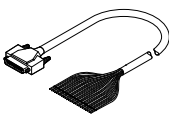
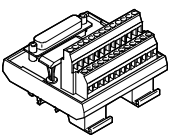
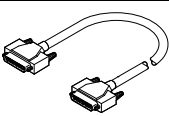
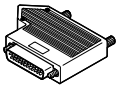
| Ordering data – Braking resistances                                                 |                         |                      |                |                          |
|-------------------------------------------------------------------------------------|-------------------------|----------------------|----------------|--------------------------|
|                                                                                     | Resistance value<br>[Ω] | Nominal power<br>[W] | Part No.       | Type                     |
|  | 100                     | 500                  | <b>1336615</b> | <b>CACR-LE2-100-W500</b> |

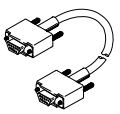
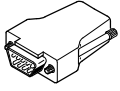
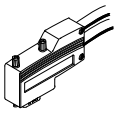
**- 1 - Type discontinued**  
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## Motor controllers CMMS-AS, for servo motors

Accessories

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| Ordering data – Connection options from I/O interface to controller                 |                                                                                                                                                                   |                     |                |                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|---------------------------------|
|                                                                                     | Description                                                                                                                                                       | Cable length<br>[m] | Part No.       | Type                            |
| Control cable                                                                       |                                                                                                                                                                   |                     |                |                                 |
|    | <ul style="list-style-type: none"><li>For I/O interface to any controller</li><li>Recommended for analogue signals since the cable is shielded</li></ul>          | 2.5                 | <b>552254</b>  | <b>NEBC-S1G25-K-2.5-N-LE26</b>  |
|    | <ul style="list-style-type: none"><li>For I/O interface to any controller</li><li>Cannot be used if the incremental encoder interface (input) is in use</li></ul> | 3.2                 | <b>8001373</b> | <b>NEBC-S1G25-K-3.2-N-LE25</b>  |
| Connection block                                                                    |                                                                                                                                                                   |                     |                |                                 |
|    | Ensures simple and clear wiring. The connection to the motor controller is established via the connecting cable NEBC-S1G25-K-...                                  | –                   | <b>8001371</b> | <b>NEFC-S1G25-C2W25-S7</b>      |
| Connecting cable                                                                    |                                                                                                                                                                   |                     |                |                                 |
|   | Connects the motor controller to the connection block                                                                                                             | 1.0                 | <b>8001374</b> | <b>NEBC-S1G25-K-1.0-N-S1G25</b> |
|                                                                                     |                                                                                                                                                                   | 2.0                 | <b>8001375</b> | <b>NEBC-S1G25-K-2.0-N-S1G25</b> |
|                                                                                     |                                                                                                                                                                   | 5.0                 | <b>8001376</b> | <b>NEBC-S1G25-K-5.0-N-S1G25</b> |
| Plug connector                                                                      |                                                                                                                                                                   |                     |                |                                 |
|  | 25-pin Sub-D plug. Each wire can be individually assembled using screw terminals                                                                                  | –                   | <b>8001372</b> | <b>NEFC-S1G25-C2W25-S6</b>      |

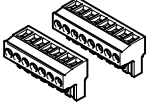
| Ordering data – Cables and plugs                                                    |                                   |                  |               |                                |
|-------------------------------------------------------------------------------------|-----------------------------------|------------------|---------------|--------------------------------|
|                                                                                     | Description                       | Cable length [m] | Part No.      | Type                           |
| Programming cable                                                                   |                                   |                  |               |                                |
|  | –                                 | 1.5              | <b>160786</b> | <b>PS1-ZK11-NULLMODEM-1,5M</b> |
| Encoder plug                                                                        |                                   |                  |               |                                |
|  | For incremental encoder interface | –                | <b>564264</b> | <b>NECC-A-S-S1G9-C2M</b>       |
| Plug connector                                                                      |                                   |                  |               |                                |
|  | For PROFIBUS interface            | –                | <b>533780</b> | <b>FBS-SUB-9-WS-PB-K</b>       |
|                                                                                     | For CANopen interface             | –                | <b>533783</b> | <b>FBS-SUB-9-WS-CO-K</b>       |
|  | For DeviceNet interface           | –                | <b>525635</b> | <b>FBSD-KL-2X5POL</b>          |

- 2 - Type discontinued  
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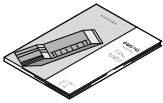
## Motor controllers CMMS-AS, for servo motors

Accessories

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| Ordering data – Plug assortment                                                   |                                                                                                                                                                                                   |               |                 |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|
|                                                                                   | Description                                                                                                                                                                                       | Part No.      | Type            |
|  | <ul style="list-style-type: none"> <li>Comprising plug for power supply and motor connection</li> <li>The plug assortment is included in the scope of delivery of the motor controller</li> </ul> | <b>560504</b> | <b>NEKM-C-4</b> |

| Ordering data – Software and documentation                                        |                                                                                                                                                                                                                                                                                                                                                                                |               |                           |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------------|
|                                                                                   | Description                                                                                                                                                                                                                                                                                                                                                                    | Part No.      | Type                      |
|  | <p>Operator package contains:</p> <ul style="list-style-type: none"> <li>CD-ROM <ul style="list-style-type: none"> <li>With user documentation for the CMMS-AS, in de, en, es, fr, it</li> <li>With FCT (Festo Configuration Tool) configuration software, in de, en</li> <li>Brief description</li> </ul> </li> </ul> <p>The package is included in the scope of delivery</p> | <b>573740</b> | <b>GSIB-CMMS-AS-G2-ML</b> |

| Ordering data – Documentation <sup>1)</sup>                                         |          |                         |                                |                                                                                     |                                |
|-------------------------------------------------------------------------------------|----------|-------------------------|--------------------------------|-------------------------------------------------------------------------------------|--------------------------------|
|                                                                                     | Language | Part No. Type           |                                | Part No. Type                                                                       |                                |
|                                                                                     |          | For motor controller    |                                | Festo Handling and Positioning Profile (FHPP) for the motor controller range CMM... |                                |
|  | DE       | <b>564227</b>           | <b>P.BE-CMMS-AS-3A-HW-DE</b>   | <b>555695</b>                                                                       | <b>P.BE-CMM-FHPP-SW-DE</b>     |
|                                                                                     | EN       | <b>564228</b>           | <b>P.BE-CMMS-AS-3A-HW-EN</b>   | <b>555696</b>                                                                       | <b>P.BE-CMM-FHPP-SW-EN</b>     |
|                                                                                     | ES       | <b>564229</b>           | <b>P.BE-CMMS-AS-3A-HW-ES</b>   | <b>555697</b>                                                                       | <b>P.BE-CMM-FHPP-SW-ES</b>     |
|                                                                                     | FR       | <b>564230</b>           | <b>P.BE-CMMS-AS-3A-HW-FR</b>   | <b>555698</b>                                                                       | <b>P.BE-CMM-FHPP-SW-FR</b>     |
|                                                                                     | IT       | <b>564231</b>           | <b>P.BE-CMMS-AS-3A-HW-IT</b>   | <b>555699</b>                                                                       | <b>P.BE-CMM-FHPP-SW-IT</b>     |
|                                                                                     |          | For CANopen interface   |                                | For PROFIBUS interface                                                              |                                |
|                                                                                     | DE       | <b>554351</b>           | <b>P.BE-CMMS-FHPP-CO-SW-DE</b> | <b>554345</b>                                                                       | <b>P.BE-CMMS-FHPP-PB-SW-DE</b> |
|                                                                                     | EN       | <b>554352</b>           | <b>P.BE-CMMS-FHPP-CO-SW-EN</b> | <b>554346</b>                                                                       | <b>P.BE-CMMS-FHPP-PB-SW-EN</b> |
|                                                                                     | ES       | <b>554353</b>           | <b>P.BE-CMMS-FHPP-CO-SW-ES</b> | <b>554347</b>                                                                       | <b>P.BE-CMMS-FHPP-PB-SW-ES</b> |
|                                                                                     | FR       | <b>554354</b>           | <b>P.BE-CMMS-FHPP-CO-SW-FR</b> | <b>554348</b>                                                                       | <b>P.BE-CMMS-FHPP-PB-SW-FR</b> |
|                                                                                     | IT       | <b>554355</b>           | <b>P.BE-CMMS-FHPP-CO-SW-IT</b> | <b>554349</b>                                                                       | <b>P.BE-CMMS-FHPP-PB-SW-IT</b> |
|                                                                                     |          | For DeviceNet interface |                                |                                                                                     |                                |
|                                                                                     | DE       | <b>554357</b>           | <b>P.BE-CMMS-FHPP-DN-SW-DE</b> |                                                                                     |                                |
|                                                                                     | EN       | <b>554358</b>           | <b>P.BE-CMMS-FHPP-DN-SW-EN</b> |                                                                                     |                                |
|                                                                                     | ES       | <b>554359</b>           | <b>P.BE-CMMS-FHPP-DN-SW-ES</b> |                                                                                     |                                |
|                                                                                     | FR       | <b>554360</b>           | <b>P.BE-CMMS-FHPP-DN-SW-FR</b> |                                                                                     |                                |
|                                                                                     | IT       | <b>554361</b>           | <b>P.BE-CMMS-FHPP-DN-SW-IT</b> |                                                                                     |                                |

1) User documentation in paper form is not included in the scope of delivery

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