# Motor controllers CMMS-AS, for servo motors

**FESTO**

# Motor controllers CMMS-AS, for servo motors

Key features

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| Comparison of motor controllers | | | | |
|---|---|---|---|---|
| Motor controller | CMMD-AS | CMMS-AS | CMMP-AS | CMMS-ST |
| for motor type | Servo motor | Servo motor | Servo motor | 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:

**CAN**open

Optional:

**PROFI**

**DeviceNet**

**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

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

# Motor controllers CMMS-AS, for servo motors

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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
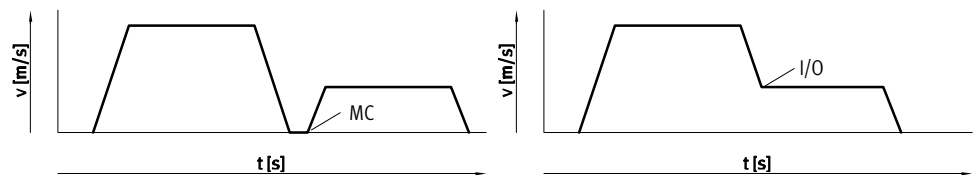


## Library for EPLAN

*ePLAN* electric

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.

ePLAN® is a registered trademark of its respective trademark holder in certain countries.
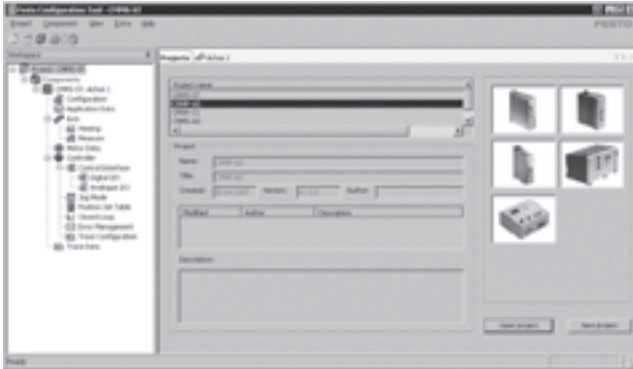
## Motor controllers CMMS-AS, for servo motors

**FESTO**

Key features

### 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

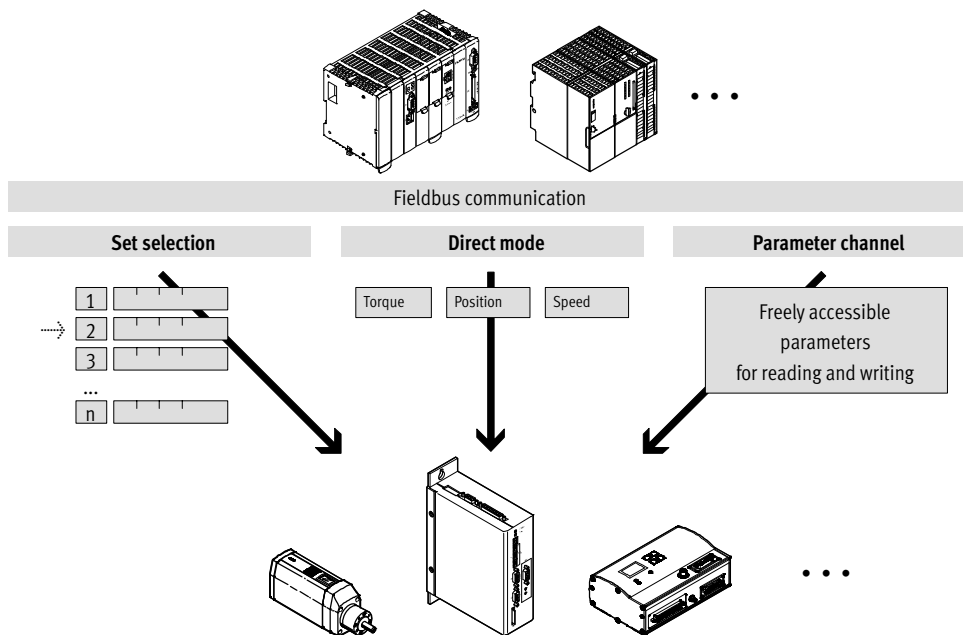### FHPP – Festo Handling and Positioning Profile

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



Fieldbus communication

| Set selection | Direct mode | Parameter channel |
|---|---|---|

| 1 | | Torque | Position | Speed | | Freely accessible parameters for reading and writing |
| 2 | | | | | | |
| 3 | | | | | | |
| ... | | | | | | |
| n | | | | | | |

# Motor controllers CMMS-AS, for servo motors

Type codes

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| 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 |

# Motor controllers CMMS-AS, for servo motors

**FESTO**

Technical data

Fieldbus interfaces

**CAN**open

**PROFI**

*DeviceNet*

**UL LISTED**

c **RU**

| 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 |
| | | EnDat V2.1 serial / V2.2 |
| Encoder interface output | | Actual value feedback via encoder signals in speed control mode |
| | | Setpoint specification for downstream slave drive |
| | | 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 |
| | | Configurable for speed |
| | | 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 | – | – | ■ | ■ |
| | | | | → 11 | → 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 | $4.53 \times 10^{-8}$ |
| Approval | BIA |
| Certificate issuing authority | BG MFS 09030 |
| CE marking (see declaration of conformity) | To EU Low Voltage Directive |
| | To EU EMC Directive[1] |
| | 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 ➔ 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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# Motor controllers CMMS-AS, for servo motors

**FESTO**

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 | $I^2t$ 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[1] | |
| | To EU Machinery Directive | |
| Approval | c UL - Recognised (OL) | |
| | UL listed (OL) | |
| | C-Tick | |
| 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.
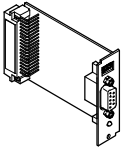
## Motor controllers CMMS-AS, for servo motors

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Technical data

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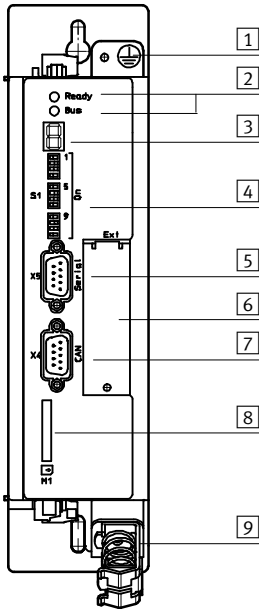
| | |
|---|---|
| 1 | Earthing |
| 2 | Ready/bus LED |
| 3 | Status display |
| 4 | Fieldbus settings and boot loader |
| 5 | Interface: RS232/RS485 |
| 6 | Technology module (optional) |
| 7 | Interface: CAN bus |
| 8 | SD memory card |
| 9 | Screened connection |

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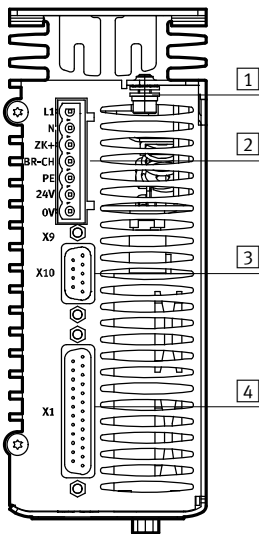
| | |
|---|---|
| 1 | Earthing screw |
| 2 | Power supply |
| 3 | Incremental encoder interface (bidirectional) |
| 4 | I/O interface |

From underneath
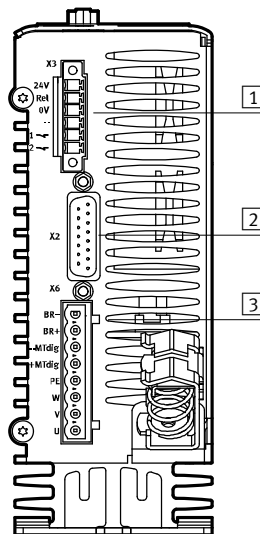
| | |
|---|---|
| 1 | Safe stop |
| 2 | Encoder connection |
| 3 | Motor connection |

➔ Internet: www.festo.com/catalog/...

9

## Motor controllers CMMS-AS, for servo motors
Technical data

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### Installation clearance for motor controller
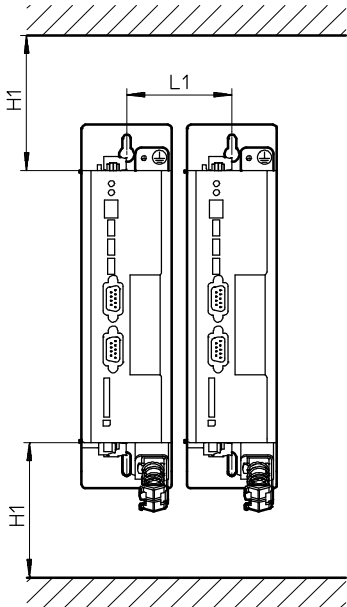


| H1 | L1 |
|---|---|
| 100 | 70 |

### Dimensions

Download CAD data ➔ **www.festo.com**
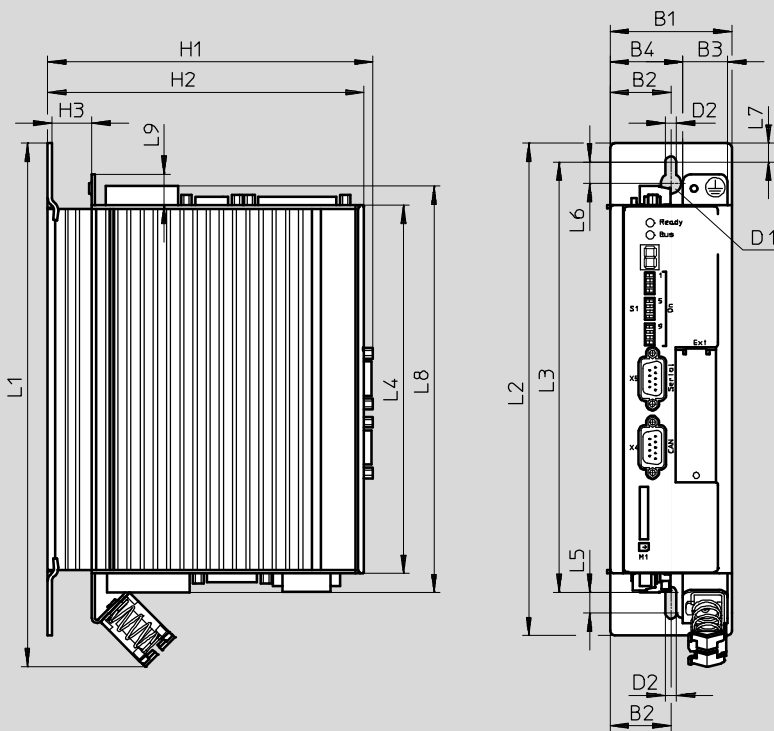


| Type | B1 | B2 | B3 | B4 | D1 ∅ | D2 ∅ | H1 | H2 | H3 |
|---|---|---|---|---|---|---|---|---|---|
| CMMS-AS | 60 | 30 | 22 | 35.8 | 10 | 5.5 | 160 | 155.5 | 19.7 |

| 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 |
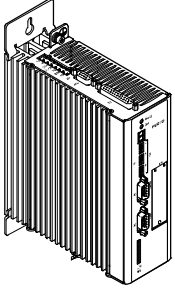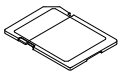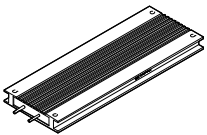
# Motor controllers CMMS-AS, for servo motors

Technical data and accessories

**FESTO**

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

**Accessories**

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

| Ordering data – Braking resistances | | | |
|---|---|---|---|
| | Resistance value [$\Omega$] | Nominal power [W] | Part No. | Type |
|  | 100 | 500 | **1336615** | **CACR-LE2-100-W500** |
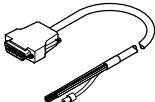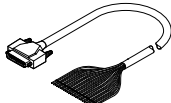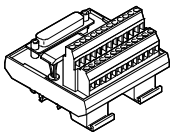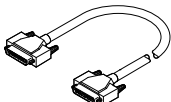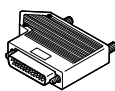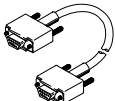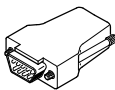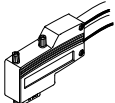
# Motor controllers CMMS-AS, for servo motors
Accessories
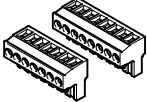
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| Ordering data – Connection options from I/O interface to controller | | | | |
|---|---|---|---|---|
| | Description | Cable length [m] | Part No. | Type |
| **Control cable** | | | | |
| | • For I/O interface to any controller<br>• Recommended for analogue signals since the cable is shielded | 2.5 | **552254** | **NEBC-S1G25-K-2.5-N-LE26** |
| | • For I/O interface to any controller<br>• Cannot be used if the incremental encoder interface (input) 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** | | | | |
| | Connects the motor controller to the connection block | 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 connector** | | | | |
| | 25-pin Sub-D plug. Each wire can be individually assembled using screw terminals | – | **8001372** | **NEFC-S1G25-C2W25-S6** |

| Ordering data – Cables and plugs | | | | |
|---|---|---|---|---|
| | Description | Cable length [m] | Part No. | Type |
| **Programming cable** | | | | |
| | – | 1.5 | **160786** | **PS1-ZK11-NULLMODEM-1,5M** |
| **Encoder plug** | | | | |
| | For incremental encoder interface | – | **564264** | **NECC-A-S-S1G9-C2M** |
| **Plug connector** | | | | |
| | 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** |
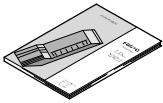
# Motor controllers CMMS-AS, for servo motors
Accessories

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| Ordering data – Plug assortment | | | |
|---|---|---|---|
| | Description | Part No. | Type |
| | • Comprising plug for power supply and motor connection<br>• The plug assortment is included in the scope of delivery of the motor controller | **560504** | **NEKM-C-4** |

| Ordering data – Software and documentation | | | |
|---|---|---|---|
| | Description | Part No. | Type |
| | Operator package contains:<br>– CD-ROM<br>  – With user documentation for the CMMS-AS,<br>    in de, en, es, fr, it<br>  – With FCT (Festo Configuration Tool) configuration software,<br>    in de, en<br>– Brief description<br>The package is included in the scope of delivery | **573740** | **GSIB-CMMS-AS-G2-ML** |

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

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

# Product Range and Company Overview

## A Complete Suite and Company Overview

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.

**Custom Automation Components**
Complete custom engineered solutions

**Custom Control Cabinets**
Comprehensive engineering support and on-site services

**Complete Systems**
Shipment, stocking and storage services

## The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.

**Electromechanical**
Electromechanical actuators, motors, controllers & drivers

**Pneumatics**
Pneumatic linear and rotary actuators, valves, and air supply

**PLCs and I/O Devices**
PLC's, operator interfaces, sensors and I/O devices

**Supporting Advanced Automation... As No One Else Can!**
Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 16,000 employees in 60 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

**Quality Assurance, ISO 9001 and ISO 14001 Certifications**
Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.
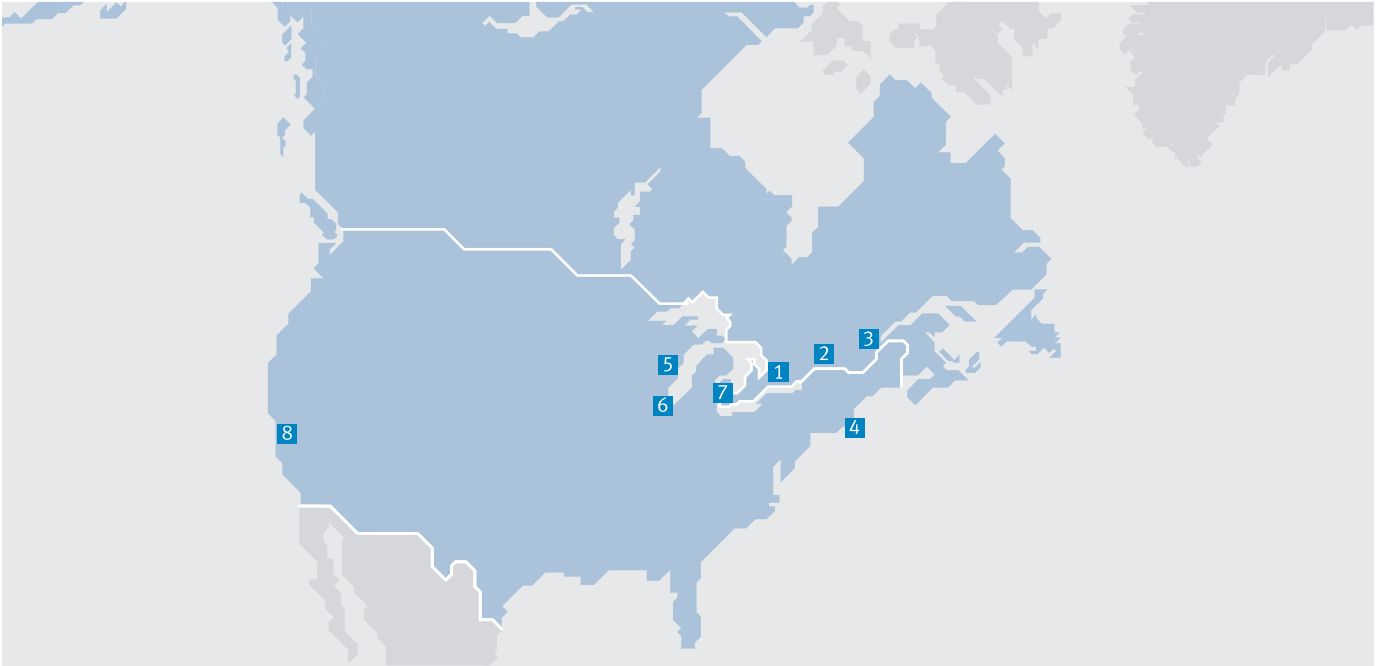
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Subject to change

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