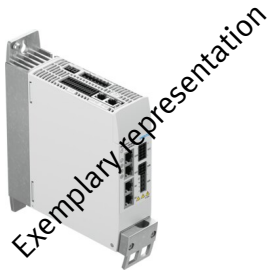


# Servo drive CMMT-AS-...-3A-...

Part number: 5111184

**FESTO**



 [General operating condition](#)

## Data sheet

Overall data sheet – Individual values depend upon your configuration.

| Feature                                      | Value                                                                                                                                                                                             |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of mounting                             | Mounting plate, screwed on                                                                                                                                                                        |
| Mounting position                            | Free convection<br>Vertical                                                                                                                                                                       |
| Product weight                               | 1300 g ... 1400 g                                                                                                                                                                                 |
| Display                                      | LED green/yellow/red                                                                                                                                                                              |
| Control elements                             | Optional: CDSB operating unit                                                                                                                                                                     |
| Conforms to standard                         | EN 61800-3<br>EN 61800-5-1<br>EN 61800-5-2<br>EN ISO 13849-1                                                                                                                                      |
| Based on norm                                | EN 50581<br>EN 60204-1<br>EN 61508-1<br>EN 61508-2<br>EN 61508-3<br>EN 61508-4<br>EN 61508-5<br>EN 61508-6<br>EN 61508-7<br>EN 61800-2<br>EN 62061                                                |
| Certification                                | RCM compliance mark<br>German Technical Control Board (TÜV)<br>c UL us - Listed (OL)                                                                                                              |
| KC characters                                | KC EMC                                                                                                                                                                                            |
| CE marking (see declaration of conformity)   | As per EU EMC directive<br>as per EU machinery directive<br>As per EU RoHS directive                                                                                                              |
| UKCA marking (see declaration of conformity) | To UK instructions for EMC<br>To UK instructions for machines<br>To UK RoHS instructions                                                                                                          |
| Certificate issuing authority                | German Technical Control Board (TÜV) Rheinland UK Ltd.<br>01/205U/5640.01/23<br>German Technical Control Board (TÜV) Rheinland 01/205/5640.01/23<br>TÜV Rheinland 01/205/6032.00/25<br>UL E331130 |
| Storage temperature                          | -25 °C ... 55 °C                                                                                                                                                                                  |
| Ambient temperature                          | 0 °C ... 50 °C                                                                                                                                                                                    |
| Note on ambient temperature                  | Above an ambient temperature of 40 °C, the power must be reduced by 3%/°C.                                                                                                                        |
| UL-ambient temperature                       | 0 °C ... 50 °C                                                                                                                                                                                    |

| Feature                                                               | Value                                  |
|-----------------------------------------------------------------------|----------------------------------------|
| Relative air humidity                                                 | 5 - 90 %<br>Non-condensing             |
| Max. installation height                                              | 2000 m                                 |
| Information on max. installation height                               | 1% power reduction/100 m above 1000 m. |
| Degree of protection                                                  | IP20                                   |
| Protection class                                                      | I                                      |
| Overvoltage category                                                  | III                                    |
| Contamination level                                                   | 2                                      |
| Surge resistance                                                      | 6 kV                                   |
| Note on materials                                                     | RoHS-compliant                         |
| LABS (PWIS) conformity                                                | VDMA24364 zone III                     |
| Nominal operating voltage phases                                      | 1-phase                                |
| Nominal operating voltage AC                                          | 230 V                                  |
| Permissible voltage fluctuations                                      | -20 % / +15 %                          |
| Input voltage range AC                                                | 100 V ... 230 V                        |
| Mains frequency                                                       | 48 Hz ... 62 Hz                        |
| Nominal current load supply                                           | 2.8 A ... 5.6 A                        |
| Peak current, load supply                                             | 8.4 A ... 16.8 A                       |
| Active PFC                                                            | no                                     |
| Line filter                                                           | Integrated                             |
| System voltage to EN 61800-5-1                                        | 300 V                                  |
| Max. short circuit protection of mains                                | 100 kA                                 |
| Mains types                                                           | TT<br>TN<br>IT                         |
| Nominal voltage, load supply DC                                       | 320 V                                  |
| Load supply permissible range                                         | -20 %/+15 %                            |
| Max. DC link voltage                                                  | 395 V                                  |
| Braking resistor, integrated                                          | 100 Ohm                                |
| Pulse power of braking resistor                                       | 1.6 kVA                                |
| Pulse energy for braking resistor                                     | 230 Ws                                 |
| Braking resistor nominal power (IEC)                                  | 23 W                                   |
| Braking resistor, external                                            | 70 Ohm ... 160 Ohm                     |
| Max. continuous output of the external braking resistor (IEC)         | 180 W ... 350 W                        |
| Nominal voltage, logic supply DC                                      | 24 V                                   |
| Permissible range of logic voltage                                    | ± 20 %                                 |
| Max. current consumption for logic supply without clamping brake      | 0.5 A                                  |
| Max. current consumption for logic supply with parking brake          | 1.5 A                                  |
| Max. current consumption for logic supply with clamping brake and I/O | 2.3 A                                  |
| Output voltage range AC                                               | 3x (0 – input) V                       |
| Nominal current per phase, effective                                  | 2 A ... 4 A                            |
| Peak current per phase, effective                                     | 6 A ... 12 A                           |
| Max. peak current duration                                            | 2 s                                    |
| Controller nominal power                                              | 350 VA ... 700 VA                      |
| Peak power                                                            | 1000 VA ... 2000 VA                    |
| Output frequency                                                      | 0 Hz ... 599 Hz                        |
| Max. length of motor cable without ext. mains filter                  | 25 m                                   |
| Max. output current of holding brake                                  | 1 A                                    |
| Max. voltage drop from logic supply to brake output                   | 0.8 V                                  |
| Number of inputs for motor temperature sensor                         | 1                                      |

| Feature                                   | Value                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller operating mode                 | Cascade control<br>P position controller<br>PI speed controller<br>PI current regulator for F or M<br>Profile operation with block mode and direct mode<br>Interpolating mode via fieldbus<br>Synchronous operating modes<br>Reference travel<br>Setup mode<br>Autotuning                                                              |
| Mode of operation                         | Field-oriented regulation<br>Position resolution 24 bit/rev.<br>Sampling rate 16 kHz<br>PWM with 8 or 16 KHz<br>Vector modulation with 3rd harmonic<br>Real-time data acquisition<br>2x input capture (x, v, F)<br>2x output trigger (x, v, F)<br>2x position sensor input<br>1x SYNC interface for encoder emulation or encoder input |
| Ethernet interface, function              | Parameterization and commissioning                                                                                                                                                                                                                                                                                                     |
| Ethernet interface, protocol              | TCP/IP                                                                                                                                                                                                                                                                                                                                 |
| Fieldbus interface, protocol              | EtherCAT<br>EtherNet/IP<br>Modbus®/TCP<br>PROFINET IRT<br>PROFINET RT                                                                                                                                                                                                                                                                  |
| Fieldbus interface, function              | Bus connection, incoming/forwarding<br>EtherCAT® slave<br>PROFINET slave<br>EtherNet/IP slave                                                                                                                                                                                                                                          |
| Fieldbus coupling                         | EtherCAT<br>EtherNet/IP<br>PROFINET                                                                                                                                                                                                                                                                                                    |
| Communication profile                     | CiA402<br>CoE (CANopen over EtherCAT)<br>EoE (Ethernet over EtherCAT)<br>FoE (File over EtherCAT)<br>PROFIdrive<br>DriveProfile                                                                                                                                                                                                        |
| Secure communication profile              | PROFIsafe                                                                                                                                                                                                                                                                                                                              |
| Process interfacing                       | AC1: Adjustable-Speed Drives<br>AC3: drives with positioning function<br>AC4: Synchronous Servo Application<br>Adjustable-Speed Drives<br>Drives with positioning function<br>I/O mode for 256 positioning blocks<br>Interpolated mode CSP<br>Interpolated mode CST<br>Interpolated mode CSV                                           |
| Fieldbus interface, transmission rate     | 100 Mbit/s                                                                                                                                                                                                                                                                                                                             |
| Fieldbus interface, connection type       | 2x socket                                                                                                                                                                                                                                                                                                                              |
| Fieldbus interface, connection technology | RJ45                                                                                                                                                                                                                                                                                                                                   |
| Encoder interface, function               | EnDat® 2.1 encoder<br>EnDat® 2.2 encoder<br>Hiperface encoder<br>Incremental encoder<br>Nikon<br>SIN/COS encoder                                                                                                                                                                                                                       |
| Encoder interface 2, function             | Incremental encoder<br>SIN/COS encoder                                                                                                                                                                                                                                                                                                 |
| Synchronization interface, function       | Encoder emulation A/B/Z<br>Encoder input A/B/Z                                                                                                                                                                                                                                                                                         |
| Encoder interface output, characteristics | 1 MHz maximum output frequency<br>max. 16384 ppr                                                                                                                                                                                                                                                                                       |
| Encoder interface input, characteristics  | 1 MHz maximum output frequency<br>max. 16384 ppr                                                                                                                                                                                                                                                                                       |

| Feature                                         | Value                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of digital logic inputs                  | 12                                                                                                                                                                                                                                                                                         |
| Input switching logic                           | PNP (positive switching)                                                                                                                                                                                                                                                                   |
| Characteristics of logic input                  | Freely configurable in some cases<br>Safety inputs in some cases<br>Not galvanically isolated                                                                                                                                                                                              |
| Logic input specification                       | Based on IEC 61131-2, type 3                                                                                                                                                                                                                                                               |
| Work range of logic input                       | -3 V ... 30 V                                                                                                                                                                                                                                                                              |
| Number of high-speed logic inputs               | 2                                                                                                                                                                                                                                                                                          |
| Time resolution of high-speed logic inputs      | 1 µs                                                                                                                                                                                                                                                                                       |
| Number of digital logic outputs 24 V DC         | 6                                                                                                                                                                                                                                                                                          |
| Switching logic at outputs                      | PNP (positive switching)                                                                                                                                                                                                                                                                   |
| Characteristics of digital logic outputs        | Freely configurable in some cases<br>Not galvanically isolated<br>Diagnostic outputs in some cases                                                                                                                                                                                         |
| Max. current of digital logic outputs           | 20 mA                                                                                                                                                                                                                                                                                      |
| Number of high-speed switching outputs          | 2                                                                                                                                                                                                                                                                                          |
| Time resolution of high-speed switching outputs | 1 µs                                                                                                                                                                                                                                                                                       |
| Number of floating switching outputs            | 1                                                                                                                                                                                                                                                                                          |
| Max. current of the floating switching outputs  | 50 mA                                                                                                                                                                                                                                                                                      |
| Number of analog setpoint inputs                | 1                                                                                                                                                                                                                                                                                          |
| Characteristics of setpoint inputs              | Differential inputs<br>Configurable for rotational speed<br>Configurable for current/force                                                                                                                                                                                                 |
| Work range of setpoint input                    | ± 10 V                                                                                                                                                                                                                                                                                     |
| Operating range of analog inputs                | ± 10 V                                                                                                                                                                                                                                                                                     |
| Impedance of setpoint input                     | 70 kOhm                                                                                                                                                                                                                                                                                    |
| Safety function                                 | Safe brake control (SBC)<br>Safe torque off (STO)<br>Safely limited speed (SLS)<br>Safe operating stop (SOS)<br>Safe stop 1 (SS1)<br>Safe stop 2 (SS2)<br>Safe maximum speed (SMS)                                                                                                         |
| Safety integrity level (SIL)                    | Safe brake control (SBC)/SIL 3/SILCL 3<br>Safe torque off (STO)/SIL 3/SILCL 3                                                                                                                                                                                                              |
| Safety sub-functions up to SIL3                 | Safe torque off<br>Safe stop 1 with deceleration ramp monitoring<br>Safe stop 1 with time control<br>Safe stop 2 deceleration ramp monitoring<br>Safe stop 2 with time control<br>Safe operating stop<br>Safely limited rotational speed/speed<br>Safe brake control<br>Safe maximum speed |
| Performance Level (PL)                          | Safe brake control (SBC)/category 3, performance level e<br>Safe torque off (STO)/category 4, performance level e                                                                                                                                                                          |
| Safety sub-function up to PL e, Cat. 3          | Safely limited rotational speed/speed<br>Safe operating stop<br>Safe stop 1 with deceleration ramp monitoring<br>Safe stop 2 deceleration ramp monitoring<br>Safe maximum speed                                                                                                            |
| Safety sub-function up to PL e, Cat. 3 4        | Safe brake control<br>Safe stop 1 with time control<br>Safe torque off                                                                                                                                                                                                                     |
| Diagnostic coverage                             | 97 %                                                                                                                                                                                                                                                                                       |
| SFF safe failure fraction                       | 99 %                                                                                                                                                                                                                                                                                       |
| Hardware fault tolerance                        | 1                                                                                                                                                                                                                                                                                          |
| Number of safe 2-pin inputs                     | 2 ... 4                                                                                                                                                                                                                                                                                    |
| Number of diagnostic outputs                    | 2 ... 4                                                                                                                                                                                                                                                                                    |