

# Stepper motor EMMT-ST-42-S-RMB

Part number: 8156166

**FESTO**



 General operating condition

## Data sheet

| Feature                                              | Value                                                                            |
|------------------------------------------------------|----------------------------------------------------------------------------------|
| Ambient temperature                                  | 0 °C ... 40 °C                                                                   |
| Note on ambient temperature                          | Up to 80°C with derating -2%/°C                                                  |
| Max. installation height                             | 4000 m                                                                           |
| Note on max. installation height                     | As of 1,000 m: only with derating of -1.0% per 100 m                             |
| Storage temperature                                  | -20 °C ... 70 °C                                                                 |
| Relative air humidity                                | Non-condensing                                                                   |
| Conforms to standard                                 | IEC 60034                                                                        |
| Temperature class as per EN 60034-1                  | B                                                                                |
| Max. winding temperature                             | 130 °C                                                                           |
| Rating class as per EN 60034-1                       | S1                                                                               |
| Temperature monitoring                               | Digital Motor temp. via BiSS-C                                                   |
| Motor type to EN 60034-7                             | IM V1<br>IM V3                                                                   |
| Mounting position                                    | Any                                                                              |
| Degree of protection                                 | IP40                                                                             |
| Note on degree of protection                         | IP40 motor shaft<br>IP65 for motor housing, incl. connection technology          |
| Interface code, motor out                            | 42A                                                                              |
| Electrical connection 1, connection type             | Hybrid plug                                                                      |
| Electrical connection 1, connector system            | M17x0.75                                                                         |
| Electrical connection 1, number of connections/cores | 12                                                                               |
| Electrical connection 1, connection pattern          | 00997532                                                                         |
| Note on materials                                    | RoHS compliant                                                                   |
| Corrosion resistance class CRC                       | 0 - No corrosion stress                                                          |
| LABS (PWIS) conformity                               | VDMA24364 zone III                                                               |
| Vibration resistance                                 | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6 |
| Shock resistance                                     | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                |
| Approval                                             | RCM<br>c UL us - Recognised (Oil)                                                |
| CE mark (see declaration of conformity)              | To EU EMC Directive<br>In accordance with EU RoHS Directive                      |
| UKCA marking (see declaration of conformity)         | To UK RoHS instructions                                                          |
| Certificate issuing authority                        | UL E342973                                                                       |
| Nominal operating voltage DC                         | 48 V                                                                             |
| Number of pole pairs                                 | 50                                                                               |
| Motor holding torque                                 | 0.25 Nm                                                                          |

| Feature                                                     | Value                                               |
|-------------------------------------------------------------|-----------------------------------------------------|
| Nominal torque                                              | 0.24 Nm                                             |
| Peak torque                                                 | 0.25 Nm                                             |
| Nominal rotary speed                                        | 600 rpm                                             |
| Max. rotational speed                                       | 2700 rpm                                            |
| Max. mechanical speed                                       | 9000 rpm                                            |
| Stepper angle for complete step                             | 1.8 deg                                             |
| Stepping angle tolerance                                    | ±5%                                                 |
| Nominal power rating of motor                               | 17 W                                                |
| Continuous stall current                                    | 2 A                                                 |
| Nominal motor current                                       | 1.8 A                                               |
| Peak current                                                | 2 A                                                 |
| Motor constant                                              | 0.133 Nm/A                                          |
| Voltage constant, phase                                     | 12.1 mVmin                                          |
| Phase winding resistance                                    | 2.1 Ohm                                             |
| Phase winding inductance                                    | 0.3 mH                                              |
| Winding longitudinal inductivity Ld (phase)                 | 1.6 mH                                              |
| Winding cross inductivity Lq (phase)                        | 3 mH                                                |
| Electric time constant                                      | 1.4 ms                                              |
| Thermal time constant                                       | 22 min                                              |
| Thermal resistance                                          | 3.5 K/W                                             |
| Measuring flange                                            | 200 x 200 x 15 mm, steel                            |
| Total mass moment of inertia of output                      | 0.043 kgcm <sup>2</sup>                             |
| Product weight                                              | 590 g                                               |
| Permissible axial shaft load                                | 10 N                                                |
| Permissible radial shaft load                               | 28 N                                                |
| Rotor position sensor                                       | Absolute encoder, multi-turn                        |
| rotor position sensor, manufacturer designation             | KCD-BC33B-1617-JP4F-GRQ-009                         |
| rotor position sensor, absolute detectable revolutions      | 65536                                               |
| Rotor position encoder interface                            | BiSS-C                                              |
| Rotor position sensor, encoder measuring principle          | magnetic                                            |
| rotor position sensor, DC operating voltage                 | 5 V                                                 |
| rotor position sensor, DC operating voltage range           | 4.5 V ... 5.5 V                                     |
| Rotor pos. enc., sin/cosin p/r                              | 2                                                   |
| rotor position sensor, position values per revolution       | 131072                                              |
| Rotor position transducer resolution                        | 17 bit                                              |
| rotor position sensor, system accuracy of angle measurement | -310 arcsec ... 310 arcsec                          |
| Brake holding torque                                        | 0.63 Nm                                             |
| Operating voltage DC for brake                              | 24 V                                                |
| Brake current consumption                                   | 0.34 A                                              |
| Power consumption, brake                                    | 8.2 W                                               |
| Brake coil resistance                                       | 70.9 Ohm                                            |
| Brake coil inductivity                                      | 146 mH                                              |
| Brake separation time                                       | ≤28 ms                                              |
| Brake closing time                                          | ≤41 ms                                              |
| DC brake response delay                                     | ≤8 ms                                               |
| Max. brake no-load speed                                    | 9000 rpm                                            |
| Max. friction per braking process                           | 1500 J                                              |
| Number of emergency stops per hour                          | 1                                                   |
| Mass moment of inertia of brake                             | 0.006 kgcm <sup>2</sup>                             |
| Switching cycles holding brake                              | 10 million idle actuations (without friction work!) |
| Mean time to failure (MTTF), subcomponent                   | 20 years, rotor position encoder                    |