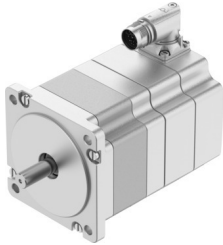


# Stepper motor EMMT-ST-87-S-RSB

Part number: 8156189

FESTO



 General operating condition

## Data sheet

| Feature                                              | Value                                                                                                 |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Ambient temperature                                  | -15 °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                                | 0 - 90%<br>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                                                                                                    |
| Motor type to EN 60034-7                             | IM B5<br>IM V1<br>IM V3                                                                               |
| Mounting position                                    | optional                                                                                              |
| Degree of protection                                 | IP40                                                                                                  |
| Note on degree of protection                         | IP40 for motor shaft without rotary shaft seal<br>IP65 for motor housing, incl. connection technology |
| Interface code, motor out                            | 87A                                                                                                   |
| 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 trademark<br>c UL us - Recognized (OL)                                                            |
| 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 instructions for EMC<br>To UK RoHS instructions                                                 |
| Certificate issuing authority                        | UL E342973                                                                                            |
| Nominal operating voltage DC                         | 48 V                                                                                                  |
| Number of pole pairs                                 | 50                                                                                                    |

| Feature                                                     | Value                                               |
|-------------------------------------------------------------|-----------------------------------------------------|
| Motor holding torque                                        | 2.4 Nm                                              |
| Nominal torque                                              | 1.9 Nm                                              |
| Peak torque                                                 | 2.7 Nm                                              |
| Nominal rotary speed                                        | 800 rpm                                             |
| Max. rotational speed                                       | 2200 rpm                                            |
| Max. mechanical speed                                       | 7000 rpm                                            |
| Stepper angle for complete step                             | 1.8 deg                                             |
| Stepping angle tolerance                                    | ±5%                                                 |
| Nominal power rating of motor                               | 159 W                                               |
| Continuous stall current                                    | 9.5 A                                               |
| Nominal motor current                                       | 7.8 A                                               |
| Peak current                                                | 12 A                                                |
| Motor constant                                              | 0.24 Nm/A                                           |
| Voltage constant, phase                                     | 15.4 mVmin                                          |
| Phase winding resistance                                    | 0.13 Ohm                                            |
| Phase winding inductance                                    | 0.35 mH                                             |
| Winding longitudinal inductivity Ld (phase)                 | 0.56 mH                                             |
| Winding cross inductivity Lq (phase)                        | 0.35 mH                                             |
| Electric time constant                                      | 1.75 ms                                             |
| Thermal time constant                                       | 35 min                                              |
| Thermal resistance                                          | 0.89 K/W                                            |
| Measuring flange                                            | 250 x 250 x 15 mm, steel                            |
| Total mass moment of inertia of output                      | 1.11 kgcm <sup>2</sup>                              |
| Product weight                                              | 2890 g                                              |
| Permissible axial shaft load                                | 60 N                                                |
| Permissible radial shaft load                               | 220 N                                               |
| Rotor position sensor                                       | Absolute single-turn encoder                        |
| rotor position sensor, manufacturer designation             | Festo iC-MHM                                        |
| rotor position sensor, absolute detectable revolutions      | 1                                                   |
| 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           | 4.75 V ... 5.25 V                                   |
| Rotor pos. enc., sin/cosin p/r                              | 2                                                   |
| rotor position sensor, position values per revolution       | 65536                                               |
| Rotor position transducer resolution                        | 16 bit                                              |
| rotor position sensor, system accuracy of angle measurement | -540 arcsec ... 540 arcsec                          |
| Brake holding torque                                        | 4.26 Nm                                             |
| Operating voltage DC for brake                              | 24 V                                                |
| Brake current consumption                                   | 0.49 A                                              |
| Power consumption, brake                                    | 12 W                                                |
| Brake coil resistance                                       | 49.2 Ohm                                            |
| Brake coil inductivity                                      | 110 mH                                              |
| Brake separation time                                       | ≤44 ms                                              |
| Brake closing time                                          | ≤110 ms                                             |
| DC brake response delay                                     | ≤30 ms                                              |
| Max. brake no-load speed                                    | 7000 rpm                                            |
| Max. friction per braking process                           | 14000 J                                             |
| Number of emergency stops per hour                          | 1                                                   |
| Mass moment of inertia of brake                             | 0.11 kgcm <sup>2</sup>                              |
| Switching cycles holding brake                              | 10 million idle actuations (without friction work!) |
| Mean time to failure (MTTF), subcomponent                   | 9666 years, rotor position encoder                  |