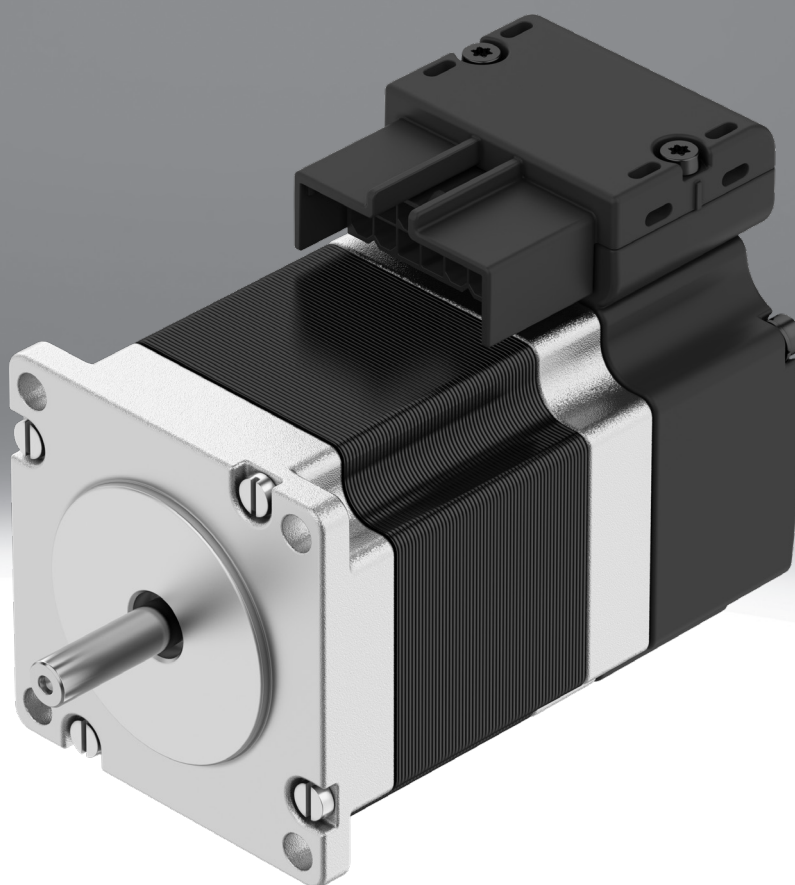


Stepper motor EMMB-ST

FESTO



Characteristics

At a glance

- 2-phase hybrid technology
- 3 flange sizes available: M = 0.25 ... 6.6 Nm

Degree of protection:

- IP20 (motor housing with connection technology)
- IP40 (motor shaft)

Connection technology:

- Simple connection technology (OCP: one cable plug) – hybrid cable: motor cable and connecting cable for supply and encoder in one
- Can be aligned to the front or rear

Digital absolute encoder system:

- Single turn
- Multi-turn

Engineering tools

[Link](#) [electric motion sizing](#)



Save time with engineering tools: Smart engineering for the optimal solution. Our goal is to increase your productivity. Our engineering tools play an integral part in achieving this goal. They help you size your system correctly, tap into unimagined productivity reserves and generate additional productivity along the entire value chain. In every phase of your project, from the initial contact to the modernisation of your machine, you will come across a number of different tools that will be of use to you.

Electric Motion Sizing

- Create the optimum drive package quickly and reliably. Electric Motion Sizing calculates suitable combinations of electric axis, electric motor and servo drive using just a few application details. It provides all the relevant data including the bill of materials and documentation for your selected combination. This avoids design errors and results in significantly improved energy efficiency for the system. A smooth connection to the Festo Automation Suite also makes commissioning easier for you.

Festo Automation Suite

- Parameterisation, programming and commissioning in a clear and user-friendly interface
- Optimal support for complex processes thanks to guided wizards (e.g. for initial commissioning, drive configuration, etc.)
- Quick access to the required documents and further information
- Easy integration of electric drives in the controller programming

Diagrams

[Link](#) [emmb-st](#)



The diagrams shown in this document are also available online. These can be used to display precise values.

Measuring unit

| [S] | Absolute encoder, single turn | [M] | Absolute encoder, multi-turn |
|--|-------------------------------|---|------------------------------|
| <ul style="list-style-type: none"> • The angular position is assigned to a unique value in coded form. • The position is only detected within one turn. All subsequent turns need to be counted by the higher-level device. • When switched off, the position is only sensed within one turn. • Following switch-on, a homing run is required. | | <ul style="list-style-type: none"> • A unique value in coded form is assigned to the angular position and each full turn. • This type counts the full turns until the specified maximum is reached (including when switched off). • Homing is only required once it has been installed in the application. | |

Brake

| [B] | With brake |
|-----|------------|
|-----|------------|

The holding brake should not be used as a safety brake.

Type code

| | | |
|------|--------|--|
| 001 | Series | |
| EMMB | Motor | |

| | | |
|-----|------------------|--|
| 002 | Motor type | |
| ST | Stepper motor ST | |

| | | |
|-----|--------------------------|--|
| 003 | Flange size, motors [mm] | |
| 42 | 42 | |
| 57 | 57 | |
| 87 | 87 | |

| | | |
|-----|--------|--|
| 004 | Length | |
| S | Short | |
| M | Medium | |
| L | Long | |

| | | |
|-----|-----------------------|--|
| 005 | Electrical connection | |
| S | Straight plug | |

| | | |
|-----|-------------------------------|--|
| 006 | Measuring unit | |
| | None | |
| M | Absolute encoder, multi-turn | |
| S | Absolute encoder, single turn | |

| | | |
|-----|------------|--|
| 007 | Brake | |
| | None | |
| B | With brake | |

Datasheet

General technical data - EMMB-ST-42

| | | | | | | |
|--|--------------------------|---------------------------------------|--|-------------|---------------------------------------|--|
| Flange size, motors [mm] | 42 | | | | | |
| Length | Short [S] | | | Long [L] | | |
| Measuring unit | None [] | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] | None [] | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] |
| Nominal operating voltage DC | 48 V | | | | | |
| Nominal motor current | 1.8 A | | | 2.9 A | | |
| Continuous stall current | 2 A | | | 3.7 A | | |
| Peak current | 2 A | | | 4 A | | |
| Nominal power rating of motor | – | 17 W | | – | 49 W | |
| Stepper angle for complete step | 1.8 deg | | | | | |
| Stepping angle tolerance | ±5% | | | | | |
| Motor holding torque | 0.25 Nm | | | 0.63 Nm | | |
| Nominal torque | – | 0.24 Nm | | – | 0.47 Nm | |
| Peak torque | 0.25 Nm | | | 0.63 Nm | | |
| Standstill torque | – | | | | | |
| Nominal rotary speed ¹⁾ | – | 600 rpm | | – | 1,000 rpm | |
| Max. rotational speed | 2,700 rpm | | | 3,200 rpm | | |
| Max. mechanical speed | 9,000 rpm | | | | | |
| Motor constant | 0.133 Nm/A | | | 0.162 Nm/A | | |
| Voltage constant, phase | 12.1 mV/min | | | 10.6 mV/min | | |
| Electric time constant | 1.4 ms | | | 1.3 ms | | |
| Thermal time constant | 22 min | | | 16 min | | |
| Thermal resistance | 3.5 K/W | | | 2.4 K/W | | |
| I ² T time motor | 2 s | | | | | |
| Number of phases | 2 | | | | | |
| Number of pole pairs | 50 | | | | | |
| Phase winding resistance | 2.1 Ohm | | | 0.6 Ohm | | |
| Phase winding inductance | 3 mH | | | 0.8 mH | | |
| Winding longitudinal inductivi- ty Ld (phase) | 1.6 mH | | | 1.45 mH | | |
| Winding cross inductivity Lq (phase) | 3 mH | | | 0.8 mH | | |
| Permissible axial shaft load | 10 N | | | | | |
| Permissible radial shaft load | 28 N | | | | | |
| Measuring flange | 200 x 200 x 15 mm, steel | | | | | |

1) There is no nominal operating point defined for motors without encoders.

Datasheet

General technical data – EMMB-ST-57

| | | | | | | |
|--|-------------------------------|---------------------------------------|--|-------------------------------|---------------------------------------|--|
| Flange size, motors [mm] | 57 | | | | | |
| Length | Medium [M] | | | Long [L] | | |
| Measuring unit | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] |
| Nominal operating voltage DC | 48 V | | | | | |
| Nominal motor current | 5.1 A | | | 5 A | | |
| Continuous stall current | 6.1 A | | | 5.8 A | | |
| Peak current | 8 A | | | | | |
| Nominal power rating of motor | – | 81 W | | – | 83 W | |
| Stepper angle for complete step | 1.8 deg | | | | | |
| Stepping angle tolerance | ±5% | | | | | |
| Motor holding torque | 1.05 Nm | | | 1.8 Nm | | |
| Nominal torque | – | 0.77 Nm | | – | 1.58 Nm | |
| Peak torque | 1.1 Nm | | | 2.1 Nm | | |
| Standstill torque | – | | | | | |
| Nominal rotary speed ¹⁾ | – | 1,000 rpm | | – | 500 rpm | |
| Max. rotational speed | 2,600 rpm | | | 1,500 rpm | | |
| Max. mechanical speed | 8,000 rpm | | | | | |
| Motor constant | 0.152 Nm/A | | | 0.32 Nm/A | | |
| Voltage constant, phase | 13.1 mVmin | | | 22.6 mVmin | | |
| Electric time constant | 2.9 ms | | | 3.7 ms | | |
| Thermal time constant | 28 min | | | 32 min | | |
| Thermal resistance | 1.6 K/W | | | 1.5 K/W | | |
| I²T time motor | 2 s | | | | | |
| Number of phases | 2 | | | | | |
| Number of pole pairs | 50 | | | | | |
| Phase winding resistance | 0.17 Ohm | | | 0.26 Ohm | | |
| Phase winding inductance | 0.5 mH | | | 0.95 mH | | |
| Winding longitudinal inductivi- ty Ld (phase) | 0.7 mH | | | 1.75 mH | | |
| Winding cross inductivity Lq (phase) | 0.5 mH | | | 0.95 mH | | |
| Permissible axial shaft load | 15 N | | | | | |
| Permissible radial shaft load | 75 N | | | | | |
| Measuring flange | 200 x 200 x 15 mm, steel | | | | | |

1) There is no nominal operating point defined for motors without encoders.

Datasheet

General technical data – EMMB-ST-87

| | | | | | | |
|--|--------------------------|---------------------------------------|--|-------------|---------------------------------------|--|
| Flange size, motors [mm] | 87 | | | | | |
| Length | Short [S] | | | Medium [M] | | |
| Measuring unit | None [] | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] | None [] | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] |
| Nominal operating voltage DC | 48 V | | | | | |
| Nominal motor current | 6.9 A | | | 7.5 A | | |
| Continuous stall current | 9.5 A | | | 8.2 A | | |
| Peak current | 12 A | | | | | |
| Nominal power rating of motor | – | 142 W | | – | 87 W | |
| Stepper angle for complete step | 1.8 deg | | | | | |
| Stepping angle tolerance | ±5% | | | | | |
| Motor holding torque | 2.4 Nm | | | 6.6 Nm | | |
| Nominal torque | – | 1.7 Nm | | – | 5.9 Nm | |
| Peak torque | 2.7 Nm | | | 6.8 Nm | | |
| Standstill torque | – | | | | | |
| Nominal rotary speed ¹⁾ | – | 800 rpm | | – | 140 rpm | |
| Max. rotational speed | 2,200 rpm | | | 600 rpm | | |
| Max. mechanical speed | 7,000 rpm | | | | | |
| Motor constant | 0.24 Nm/A | | | 0.79 Nm/A | | |
| Voltage constant, phase | 15.4 mV/min | | | 56.6 mV/min | | |
| Electric time constant | 1.75 ms | | | 8.5 ms | | |
| Thermal time constant | 37 min | | | 33 min | | |
| Thermal resistance | 0.91 K/W | | | 0.88 K/W | | |
| I ² T time motor | 2 s | | | | | |
| Number of phases | 2 | | | | | |
| Number of pole pairs | 50 | | | | | |
| Phase winding resistance | 0.13 Ohm | | | 0.27 Ohm | | |
| Phase winding inductance | 0.35 mH | | | 2.3 mH | | |
| Winding longitudinal inductivi- ty Ld (phase) | 0.56 mH | | | 3.6 mH | | |
| Winding cross inductivity Lq (phase) | 0.35 mH | | | 2.3 mH | | |
| Permissible axial shaft load | 60 N | | | | | |
| Permissible radial shaft load | 220 N | | | | | |
| Measuring flange | 250 x 250 x 15 mm, steel | | | | | |

1) There is no nominal operating point defined for motors without encoders.

Technical data – Brakes

| | | | |
|--|---|-------------------------|------------------------|
| Flange size, motors [mm] | 42 | 57 | 87 |
| Brake holding torque | 0.63 Nm | 1.74 Nm | 4.26 Nm |
| Operating voltage DC for brake | 24 V | | |
| Brake current consumption | 0.34 A | 0.38 A | 0.49 A |
| Power consumption, brake | 8.2 W | 9 W | 12 W |
| Brake coil resistance | 70.9 Ohm | 63.8 Ohm | 49.2 Ohm |
| Brake coil inductivity | 146 mH | 107 mH | 110 mH |
| Brake separation time | 28 ms | 32 ms | 44 ms |
| Brake closing time | 41 ms | 97 ms | 110 ms |
| DC brake response delay | 8 ms | 11 ms | 30 ms |
| Max. brake no-load speed | 9,000 rpm | 8,000 rpm | 7,000 rpm |
| Max. friction per braking process | 1,500 J | 6,000 J | 14,000 J |
| Number of emergency stops per hour | 1 | | |
| Mass moment of inertia of brake | 0.006 kgcm ² | 0.024 kgcm ² | 0.11 kgcm ² |
| Switching cycles holding brake ¹⁾ | 10 million idle actuations (without friction work!) | | |

1) Guide value for the number of switching operations (release/engage) when used exclusively as a holding brake without friction (i.e. clamping at a standstill).

Datasheet

Technical data – Encoder

| | | | | | | |
|---|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| Flange size, motors [mm] | 42 | | 57 | | 87 | |
| Measuring unit | Absolute encoder, single turn [S] | Absolute encoder, multi-turn [M] | Absolute encoder, single turn [S] | Absolute encoder, multi-turn [M] | Absolute encoder, single turn [S] | Absolute encoder, multi-turn [M] |
| Rotor position sensor, encoder measuring principle | Magnetic | | | | | |
| Rotor position encoder interface | BiSS-C | | | | | |
| rotor position sensor, absolute detectable revolutions | 1 | 65,536 | 1 | 65,536 | 1 | 65,536 |
| rotor position sensor, DC operating voltage | 5 V | | | 14 V | 5 V | 14 V |
| rotor position sensor, DC operating voltage range | 4.75 ... 5.25 V | 4.5 ... 5.5 V | 4.75 ... 5.25 V | 4.75 ... 15 V | 4.75 ... 5.25 V | 4.75 ... 15 V |
| Rotor pos. enc., sin/cosin p/r | 2 | | | | | |
| rotor position sensor, position values per revolution | 65,536 | 131,072 | 65,536 | 131,072 | 65,536 | 131,072 |
| Rotor position transducer resolution | 16 bit | 17 bit | 16 bit | 17 bit | 16 bit | 17 bit |
| rotor position sensor, system accuracy of angle measurement | -540 ... 540 arcsec | -310 ... 310 arcsec | -540 ... 540 arcsec | -310 ... 310 arcsec | -540 ... 540 arcsec | -310 ... 310 arcsec |
| rotor position sensor, max. operating speed | 5,500 rpm | 12,000 rpm | 5,500 rpm | 12,000 rpm | 5,500 rpm | 12,000 rpm |
| rotor position sensor, temperature range | -40 ... 105°C | | | | | |
| Mean time to failure (MTTF), subcomponent ¹⁾ | 106 years, rotor position encoder | 20 years, rotor position encoder | 106 years, rotor position encoder | 20 years, rotor position encoder | 106 years, rotor position encoder | 20 years, rotor position encoder |

1) The data provided applies to an encoder temperature/operating temperature of 105 °C.

Total output moment of inertia - EMMB-ST-42

| | | | | | | | | | | | | |
|--|--------------------------|--------------------------|----------------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|--------------------------|----------------------------------|-------------------------|-----------------------------------|--------------------------|
| Flange size, motors [mm] | 42 | | | | | | | | | | | |
| Length | Short [S] | | | | | | Long [L] | | | | | |
| Measuring unit | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | |
| Brake | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] |
| Total mass moment of inertia of output | 0.035 kg-cm ² | 0.041 kg-cm ² | 0.037 kg-cm ² | 0.043 kg-cm ² | 0.035 kg-cm ² | 0.041 kg-cm ² | 0.082 kg-cm ² | 0.088 kg-cm ² | 0.084 kg-cm ² | 0.09 kg-cm ² | 0.082 kg-cm ² | 0.088 kg-cm ² |

Total output moment of inertia - EMMB-ST-57

| | | | | | | | | | | | | |
|--|-----------------------|--------------------------|----------------------------------|-------------------------|-----------------------------------|--------------------------|-------------------------|--------------------------|----------------------------------|-------------------------|-----------------------------------|--------------------------|
| Flange size, motors [mm] | 57 | | | | | | | | | | | |
| Length | Medium [M] | | | | | | Long [L] | | | | | |
| Measuring unit | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | |
| Brake | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] |
| Total mass moment of inertia of output | 0.3 kgcm ² | 0.324 kg-cm ² | 0.306 kg-cm ² | 0.33 kg-cm ² | 0.3 kgcm ² | 0.324 kg-cm ² | 0.48 kg-cm ² | 0.504 kg-cm ² | 0.486 kg-cm ² | 0.51 kg-cm ² | 0.48 kg-cm ² | 0.504 kg-cm ² |

Total output moment of inertia - EMMB-ST-87

| | | | | | | | | | | | | |
|--|---------------------|-------------------------|----------------------------------|--------------------------|-----------------------------------|-------------------------|-----------------------|-------------------------|----------------------------------|--------------------------|-----------------------------------|-------------------------|
| Flange size, motors [mm] | 87 | | | | | | | | | | | |
| Length | Short [S] | | | | | | Medium [M] | | | | | |
| Measuring unit | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | | None [] | | Absolute encoder, multi-turn [M] | | Absolute encoder, single turn [S] | |
| Brake | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] |
| Total mass moment of inertia of output | 1 kgcm ² | 1.11 kg-cm ² | 1.006 kg-cm ² | 1.116 kg-cm ² | 1 kgcm ² | 1.11 kg-cm ² | 1.9 kgcm ² | 2.01 kg-cm ² | 1.906 kg-cm ² | 2.016 kg-cm ² | 1.9 kgcm ² | 2.01 kg-cm ² |

Datasheet

Weight

| | | | | | | | | | | | | |
|------------------------------|-----------|----------------|----------|----------------|------------|----------------|----------|----------------|-----------|----------------|------------|----------------|
| Flange size, motors [mm] | 42 | | | | 57 | | | | 87 | | | |
| Length | Short [S] | | Long [L] | | Medium [M] | | Long [L] | | Short [S] | | Medium [M] | |
| Brake | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] | None [] | With brake [B] |
| Product weight ¹⁾ | 300 g | 520 g | 490 g | 700 g | 810 g | 1,220 g | 1,170 g | 1,580 g | 1,890 g | 2,720 g | 3,320 g | 4,150 g |

1) Product weight / With encoder / With brake / With encoder and brake

Operating and ambient conditions - EMMB-ST-42

| | | | | | | |
|---|--|---------------------------------------|--|--------------------------------|---------------------------------------|--|
| Flange size, motors [mm] | 42 | | | | | |
| Length | Short [S] | | | Long [L] | | |
| Measuring unit | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] |
| Conforms to standard | IEC 60034 | | | | | |
| Motor type to EN 60034-7 | IM B5, IM V1, IM V3 | | | | | |
| Degree of protection | IP20 | | | | | |
| Note on degree of protection | IP40 Motor shaft | | | | | |
| Ambient temperature | 0 ... 40°C | | | -15 ... 40°C | | |
| Note on ambient temperature | Up to 80°C with derating -2%/°C | | | | | |
| Storage temperature | -20 ... 70°C | | | | | |
| Max. winding temperature | 130°C | | | | | |
| Temperature monitoring | – | Dig. motor temp. via BiSS-C | – | Dig. motor temp. via BiSS-C | – | |
| Rating class as per EN 60034-1 | S1 | | | | | |
| Temperature class as per EN 60034-1 | B | | | | | |
| Relative air humidity | 0 - 90%, Non-condensing | | | | | |
| Bearing lifetime under nomi- nal conditions | – | | | | | |
| CE mark (see declaration of conformity) ¹⁾ | To EU EMC Directive In accordance with EU RoHS Directive | | | | | |
| UKCA marking (see declaration of conformity) ²⁾ | To UK instructions for EMC To UK RoHS instructions | | | | | |
| Approval | RCM trademark c UL us - Recognized (OL) | | | | | |
| Certificate issuing authority | UL E342973 | | | | | |
| 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 | | | | | |
| Isolation resistance AC | 0.6 | | | | | |
| LABS (PWIS) conformity | VDMA24364 zone III | | | | | |
| Note on materials | RoHS-compliant | | | | | |

1) More information www.festo.com/catalogue/emms-st → Support/Downloads.

2) More information www.festo.com/catalogue/emms-st → Support/Downloads.

Datasheet

Operating and environmental conditions – EMMT-ST-57

| | | | | | | |
|--|--|----------------------------------|-----------------------------------|-------------------------------|----------------------------------|-----------------------------------|
| Flange size, motors [mm] | 57 | | | | | |
| Length | Medium [M] | | | Long [L] | | |
| Measuring unit | None <input type="checkbox"/> | Absolute encoder, multi-turn [M] | Absolute encoder, single turn [S] | None <input type="checkbox"/> | Absolute encoder, multi-turn [M] | Absolute encoder, single turn [S] |
| Conforms to standard | IEC 60034 | | | | | |
| Motor type to EN 60034-7 | IM B5, IM V1, IM V3 | | | | | |
| Degree of protection | IP20 | | | | | |
| Note on degree of protection | IP40 Motor shaft | | | | | |
| Ambient temperature | -15 ... 40°C | | | | | |
| Note on ambient temperature | Up to 80°C with derating -2%/°C | | | | | |
| Storage temperature | -20 ... 70°C | | | | | |
| Max. winding temperature | 130°C | | | | | |
| Temperature monitoring | – | Dig. motor temp. via BiSS-C | – | Dig. motor temp. via BiSS-C | – | – |
| Rating class as per EN 60034-1 | S1 | | | | | |
| Temperature class as per EN 60034-1 | B | | | | | |
| Relative air humidity | 0 - 90%, Non-condensing | | | | | |
| Bearing lifetime under nominal conditions | – | | | | | |
| CE mark (see declaration of conformity) ¹⁾ | To EU EMC Directive In accordance with EU RoHS Directive | | | | | |
| UKCA marking (see declaration of conformity) ²⁾ | To UK instructions for EMC To UK RoHS instructions | | | | | |
| Approval | RCM trademark c UL us - Recognized (OL) | | | | | |
| Certificate issuing authority | UL E342973 | | | | | |
| 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 | | | | | |
| Isolation resistance AC | 0.6 | | | | | |
| LABS (PWIS) conformity | VDMA24364 zone III | | | | | |
| Note on materials | RoHS-compliant | | | | | |

1) More information www.festo.com/catalogue/emms-st → Support/Downloads.2) More information www.festo.com/catalogue/emms-st → Support/Downloads.

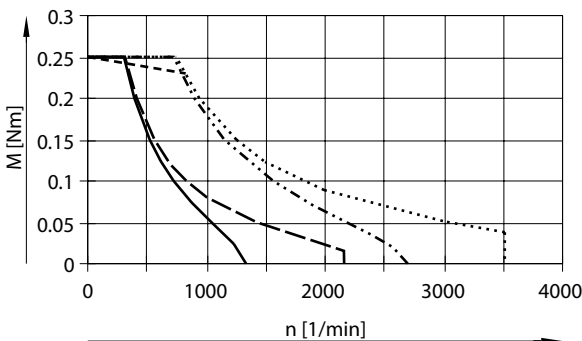
Datasheet

| Operating and ambient conditions - EMMB-ST-87 | | | | | | |
|---|--|---------------------------------------|--|-------------------------------|---------------------------------------|--|
| Flange size, motors [mm] | 87 | | | | | |
| Length | Short [S] | | | Medium [M] | | |
| Measuring unit | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] | None <input type="checkbox"/> | Absolute encoder, mul- ti-turn [M] | Absolute encoder, sin- gle turn [S] |
| Conforms to standard | IEC 60034 | | | | | |
| Motor type to EN 60034-7 | IM B5, IM V1, IM V3 | | | | | |
| Degree of protection | IP20 | | | | | |
| Note on degree of protection | IP40 Motor shaft | | | | | |
| Ambient temperature | -15 ... 40°C | | | | | |
| Note on ambient temperature | Up to 80°C with derating -2%/°C | | | | | |
| Storage temperature | -20 ... 70°C | | | | | |
| Max. winding temperature | 130°C | | | | | |
| Temperature monitoring | – | Dig. motor temp. via BiSS-C | – | | Dig. motor temp. via BiSS-C | – |
| Rating class as per EN 60034-1 | S1 | | | | | |
| Temperature class as per EN 60034-1 | B | | | | | |
| Relative air humidity | 0 - 90%, Non-condensing | | | | | |
| Bearing lifetime under nomi- nal conditions | – | | | | | |
| CE mark (see declaration of conformity) ¹⁾ | To EU EMC Directive In accordance with EU RoHS Directive | | | | | |
| UKCA marking (see declaration of conformity) ²⁾ | To UK instructions for EMC To UK RoHS instructions | | | | | |
| Approval | RCM trademark c UL us - Recognized (OL) | | | | | |
| Certificate issuing authority | UL E342973 | | | | | |
| 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 | | | | | |
| Isolation resistance AC | 0.6 | | | | | |
| LABS (PWIS) conformity | VDMA24364 zone III | | | | | |
| Note on materials | RoHS-compliant | | | | | |

1) More information www.festo.com/catalogue/emms-st → Support/Downloads.

2) More information www.festo.com/catalogue/emms-st → Support/Downloads.

Torque M as a function of rotational speed n for EMMB-ST-42-S



- [1]
- [2]
- [3]
- [4]
- [5]

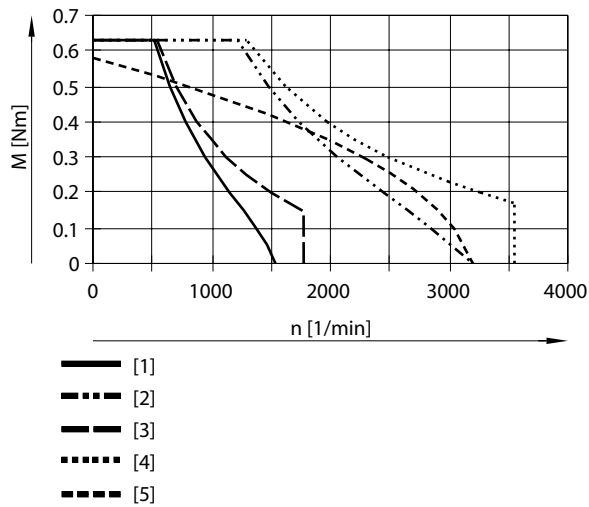
- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor control-
ler.

Observe max. permissible rotational speed for add-on and installation compo-
nents (such as encoders, brakes, etc.)!

Datasheet

Torque M as a function of rotational speed n for EMMB-ST-42-L

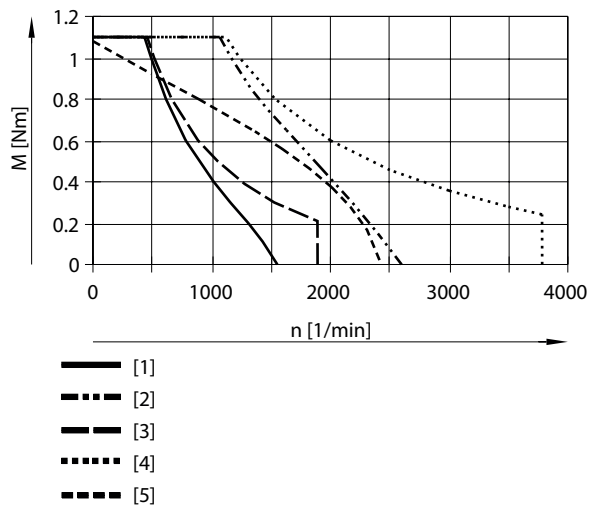


- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe max. permissible rotational speed for add-on and installation components (such as encoders, brakes, etc.)!

Torque M as a function of rotational speed n for EMMB-ST-57-M

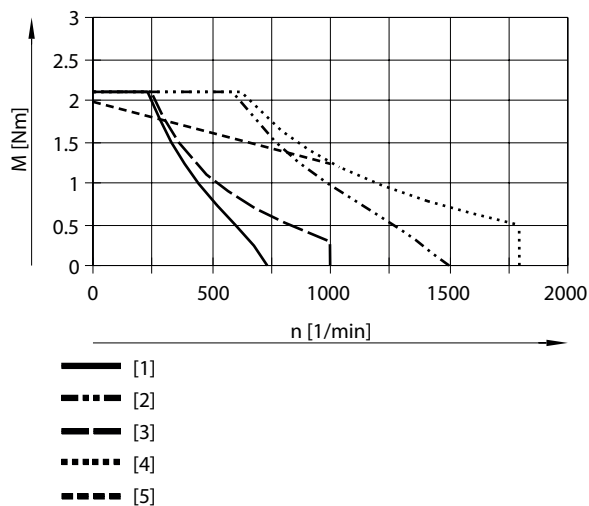


- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe max. permissible rotational speed for add-on and installation components (such as encoders, brakes, etc.)!

Torque M as a function of rotational speed n for EMMB-ST-57-L



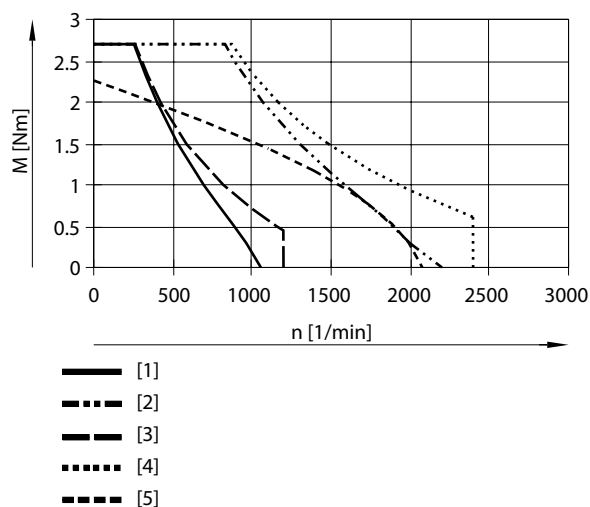
- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe max. permissible rotational speed for add-on and installation components (such as encoders, brakes, etc.)!

Datasheet

Torque M as a function of rotational speed n for EMMB-ST-87-S

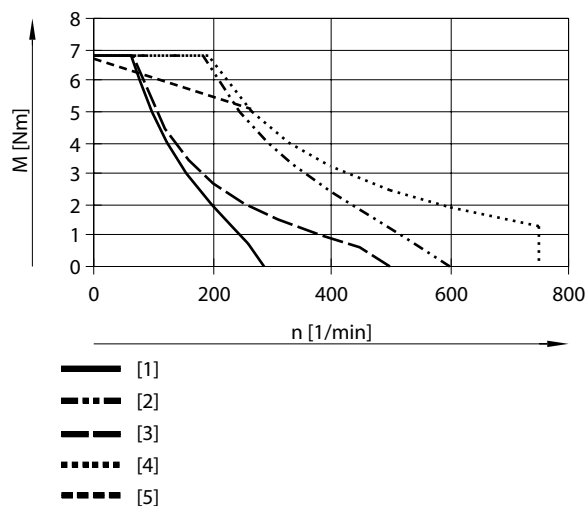


- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe max. permissible rotational speed for add-on and installation components (such as encoders, brakes, etc.)!

Torque M as a function of rotational speed n for EMMB-ST-87-M



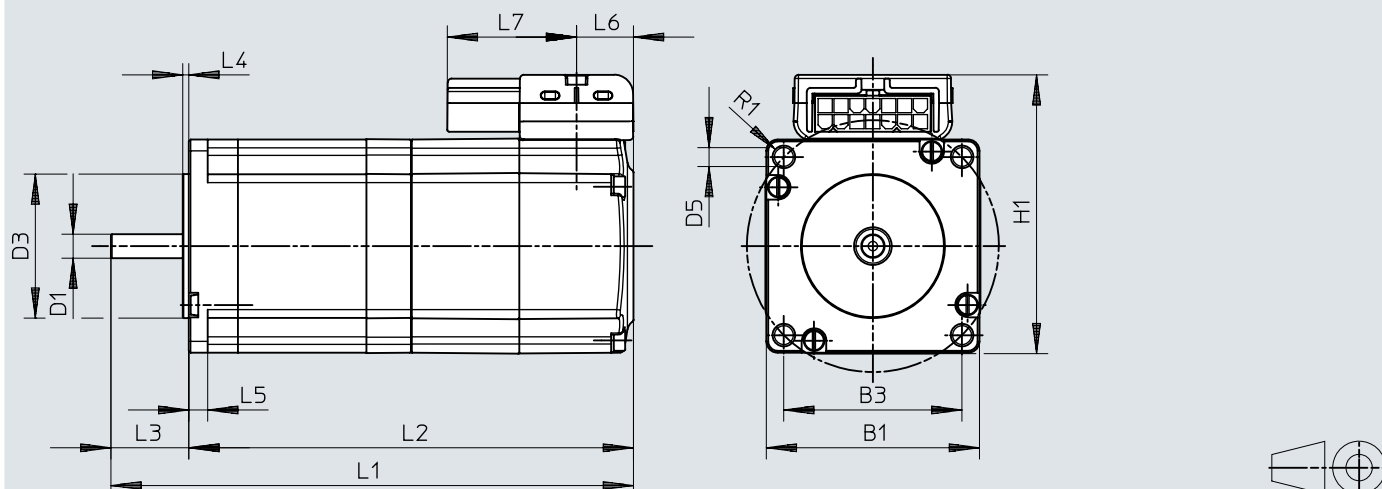
- [1] Peak torque at 24V DC
- [2] Peak torque at 48V DC
- [3] Field weakened peak torque at 24V DC
- [4] Field weakened peak torque at 48V DC
- [5] Nominal torque

Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe max. permissible rotational speed for add-on and installation components (such as encoders, brakes, etc.)!

Dimensions


Dimensions – EMMB-ST


Download CAD data www.festo.com

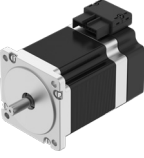
| | | B1 | B3 | D1 Ø h6 | D3 Ø h8 | D5 | H1 | L1 |
|------------|-----|------|------|---------------|---------------|-----|-----|-------|
| EMMB-ST-42 | S | 42 | 31 | 5 | 22 | M3 | 55 | 94 |
| | S-B | | | | | | | 124 |
| | L | | | | | | | 112 |
| | L-B | | | | | | | 142 |
| EMMB-ST-57 | M | 56,4 | 47,1 | 6,35 | 38,1 | 5 | 75 | 108,3 |
| | M-B | | | | | | | 138,3 |
| | L | | | | | | | 129,3 |
| | L-B | | | | | | | 159,3 |
| EMMB-ST-87 | S | 85,9 | 69,5 | 11 | 73 | 6,6 | 104 | 120,7 |
| | S-B | | | | | | | 149,2 |
| | M | | | | | | | 154,2 |
| | M-B | | | | | | | 182,7 |

| | | L2 | L3 | L4 | L5 | L6 | L7 | R1 |
|------------|-----|-------|------|------|----|------|------|-----|
| | | ±2 | ±0,5 | ±0,2 | | | | |
| EMMB-ST-42 | S | 70 | 24 | 2 | – | 15 | 25,6 | 2,3 |
| | S-B | 100 | | | | | | |
| | L | 88 | | | | | | |
| | L-B | 118 | | | | | | |
| EMMB-ST-57 | M | 88 | 20,6 | 1,6 | 5 | 15,1 | 34,2 | 3 |
| | M-B | 118 | | | | | | |
| | L | 109 | | | | | | |
| | L-B | 139 | | | | | | |
| EMMB-ST-87 | S | 93,7 | 27 | 2 | 8 | 15,1 | 34,2 | 5,5 |
| | S-B | 122,2 | | | | | | |
| | M | 127,2 | | | | | | |
| | M-B | 155,7 | | | | | | |

Ordering data

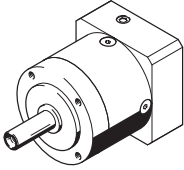
| Flange size 42 | | | | | |
|--|--------------------------|-------------------------------|------------|----------|------------------|
| | Flange size, motors [mm] | Measuring unit | Brake | Part no. | Type |
|  | 42 mm | None | None | 8156125 | EMMB-ST-42-S-S |
| | | | | 8156131 | EMMB-ST-42-L-S |
| | | | With brake | 8156128 | EMMB-ST-42-S-SB |
| | | | | 8156134 | EMMB-ST-42-L-SB |
| | | Absolute encoder, multi-turn | None | 8156133 | EMMB-ST-42-L-SM |
| | | | | 8156127 | EMMB-ST-42-S-SM |
| | | | With brake | 8156130 | EMMB-ST-42-S-SMB |
| | | | | 8156136 | EMMB-ST-42-L-SMB |
| | | Absolute encoder, single turn | None | 8156132 | EMMB-ST-42-L-SS |
| | | | | 8156126 | EMMB-ST-42-S-SS |
| | | | With brake | 8156129 | EMMB-ST-42-S-SSB |
| | | | | 8156135 | EMMB-ST-42-L-SSB |

| Flange size 57 | | | | | |
|---|--------------------------|-------------------------------|------------|----------|------------------|
| | Flange size, motors [mm] | Measuring unit | Brake | Part no. | Type |
|  | 57 mm | None | None | 8156143 | EMMB-ST-57-L-S |
| | | | | 8156137 | EMMB-ST-57-M-S |
| | | | With brake | 8156140 | EMMB-ST-57-M-SB |
| | | | | 8156146 | EMMB-ST-57-L-SB |
| | | Absolute encoder, multi-turn | None | 8156139 | EMMB-ST-57-M-SM |
| | | | | 8156145 | EMMB-ST-57-L-SM |
| | | | With brake | 8156142 | EMMB-ST-57-M-SMB |
| | | | | 8156148 | EMMB-ST-57-L-SMB |
| | | Absolute encoder, single turn | None | 8156144 | EMMB-ST-57-L-SS |
| | | | | 8156138 | EMMB-ST-57-M-SS |
| | | | With brake | 8156141 | EMMB-ST-57-M-SSB |
| | | | | 8156147 | EMMB-ST-57-L-SSB |

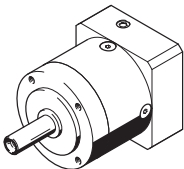
| Flange size 87 | | | | | |
|--|--------------------------|-------------------------------|------------|----------|------------------|
| | Flange size, motors [mm] | Measuring unit | Brake | Part no. | Type |
|  | 87 mm | None | None | 8156149 | EMMB-ST-87-S-S |
| | | | | 8156155 | EMMB-ST-87-M-S |
| | | | With brake | 8156152 | EMMB-ST-87-S-SB |
| | | | | 8156158 | EMMB-ST-87-M-SB |
| | | Absolute encoder, multi-turn | None | 8156151 | EMMB-ST-87-S-SM |
| | | | | 8156157 | EMMB-ST-87-M-SM |
| | | | With brake | 8156160 | EMMB-ST-87-M-SMB |
| | | | | 8156154 | EMMB-ST-87-S-SMB |
| | | Absolute encoder, single turn | None | 8156150 | EMMB-ST-87-S-SS |
| | | | | 8156156 | EMMB-ST-87-M-SS |
| | | | With brake | 8156153 | EMMB-ST-87-S-SSB |
| | | | | 8156159 | EMMB-ST-87-M-SSB |

Accessories

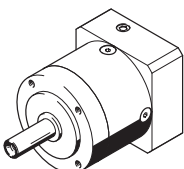
Planetary gear for EMMB-ST-42

| | Gear unit ratio | Note on materials | Product weight | Part no. | Type |
|---|-----------------|-------------------|----------------|----------|----------------------|
|  | 3:1 | RoHS-compliant | 350 g | 549428 | EMGA-40-P-G3-SST-42 |
| | 5:1 | | | 549429 | EMGA-40-P-G5-SST-42 |
| | 8:1 | | 400 g | 8141762 | EMGA-40-P-G8-SST-42 |
| | 12:1 | | 450 g | 8141763 | EMGA-40-P-G12-SST-42 |

Planetary gear for EMMB-ST-57

| | Gear unit ratio | Note on materials | Product weight | Part no. | Type |
|---|-----------------|-------------------|----------------|----------|----------------------|
|  | 3:1 | RoHS-compliant | 900 g | 549430 | EMGA-60-P-G3-SST-57 |
| | 5:1 | | | 549431 | EMGA-60-P-G5-SST-57 |
| | 8:1 | | | 8141764 | EMGA-60-P-G8-SST-57 |
| | 12:1 | | 1,100 g | 8141765 | EMGA-60-P-G12-SST-57 |

Planetary gear for EMMB-ST-87

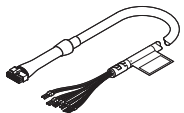
| | Gear unit ratio | Note on materials | Product weight | Part no. | Type |
|--|-----------------|-------------------|----------------|----------|----------------------|
|  | 3:1 | RoHS-compliant | 2,100 g | 549432 | EMGA-80-P-G3-SST-87 |
| | 5:1 | | | 549433 | EMGA-80-P-G5-SST-87 |
| | 8:1 | | | 8141766 | EMGA-80-P-G8-SST-87 |
| | 12:1 | | 2,600 g | 8141767 | EMGA-80-P-G12-SST-87 |

Recommended cable cross-section as a function of cable length and servo drive CMMT-ST

| | ≤ 5 m | ≤ 10 m | ≤ 20 m | ≤ 25 m |
|------------------|-------|--------|--------|--------|
| EMMB-ST-42 S-... | Q6 | Q6 | Q6 | Q6 |
| EMMB-ST-42 L-... | Q6 | Q6 | Q6 | Q6 |
| EMMB-ST-57 M-... | Q6 | Q7 | Q9 | Q9 |
| EMMB-ST-57 L-... | Q6 | Q7 | Q9 | Q9 |
| EMMB-ST-87 S-... | Q7 | Q9 | Q9 | Q9 |
| EMMB-ST-87 M-... | Q7 | Q9 | Q9 | Q9 |

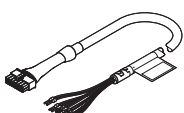
Q6 = 0.5 mm²
 Q7 = 0.75 mm²
 Q9 = 1.5 mm²

Motor cable for EMMB-ST-42 with cable cross-section 0.5 mm² for servo drive CMMT-ST

| | Bending radius, moving cable | Cable characteristic | Ambient temperature | Cable length ¹⁾ | Part no. | Type |
|---|------------------------------|----------------------------|---------------------|----------------------------|----------|----------------------------|
|  | 78.75 mm | Suitable for energy chains | -40 ... 90 °C | 2.5 m | 8181675 | NEBM-L5G14-EH-2.5-Q6N-LE12 |
| | | | | 5 m | 8181664 | NEBM-L5G14-EH-5-Q6N-LE12 |
| | | | | 7.5 m | 8181676 | NEBM-L5G14-EH-7.5-Q6N-LE12 |
| | | | | 10 m | 8181672 | NEBM-L5G14-EH-10-Q6N-LE12 |
| | 78.75 ... 81 mm | | | 0.5 ... 20 m | 8181663 | NEBM-LX/M17- |

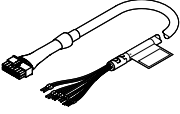
1) For NEBM-LX/M17-...: cable lengths can be selected from 0.5 ... 25 m, in increments of 0.5 m and in all cable cross-sections Q6, Q7, Q9
 For NEBM-LX/M17-...: the extension cables can also be configured via the modular product system.

Motor cable for EMMB-ST-57/87 with cable cross-section 0.5 mm² for servo drive CMMT-ST

| | Bending radius, moving cable | Cable characteristic | Ambient temperature | Cable length ¹⁾ | Part no. | Type |
|---|------------------------------|----------------------------|---------------------|----------------------------|----------|-----------------------------|
|  | 78.75 mm | Suitable for energy chains | -40 ... 90 °C | 2.5 m | 8181677 | NEBM-L10G14-EH-2.5-Q6N-LE12 |

Accessories

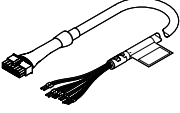
Motor cable for EMMB-ST-57/87 with cable cross-section 0.5 mm² for servo drive CMMT-ST

| | Bending radius, moving cable | Cable character- istic | Ambient temper- ature | Cable length ¹⁾ | Part no. | Type |
|--|---------------------------------|---------------------------------|--------------------------|----------------------------|----------|-----------------------------|
|  | 78.75 mm | Suitable for ener- gy chains | -40 ... 90 °C | 5 m | 8181667 | NEBM-L10G14-EH-5-Q6N-LE12 |
| | | | | 7.5 m | 8181669 | NEBM-L10G14-EH-7.5-Q6N-LE12 |
| | | | | 10 m | 8181665 | NEBM-L10G14-EH-10-Q6N-LE12 |
| | 78.75 ... 81 mm | | | 0.5 ... 20 m | 8181663 | NEBM-LX/M17- |

1) For NEBM-LX/M17-...: cable lengths can be selected from 0.5 ... 25 m, in increments of 0.5 m and in all cable cross-sections Q6, Q7, Q9

For NEBM-LX/M17-...: the extension cables can also be configured via the modular product system.

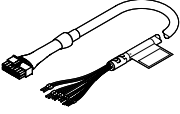
Motor cable for EMMB-ST-57/87 with cable cross-section 0.75 mm² for servo drive CMMT-ST

| | Bending radius, moving cable | Cable character- istic | Ambient temper- ature | Cable length ¹⁾ | Part no. | Type |
|--|---------------------------------|---------------------------------|--------------------------|----------------------------|----------|-----------------------------|
|  | 78.75 mm | Suitable for ener- gy chains | -40 ... 90 °C | 2.5 m | 8181666 | NEBM-L10G14-EH-2.5-Q7N-LE12 |
| | | | | 5 m | 8181671 | NEBM-L10G14-EH-5-Q7N-LE12 |
| | | | | 7.5 m | 8181674 | NEBM-L10G14-EH-7.5-Q7N-LE12 |
| | | | | 10 m | 8181673 | NEBM-L10G14-EH-10-Q7N-LE12 |
| | 78.75 ... 81 mm | | | 0.5 ... 20 m | 8181663 | NEBM-LX/M17- |

1) For NEBM-LX/M17-...: cable lengths can be selected from 0.5 ... 25 m, in increments of 0.5 m and in all cable cross-sections Q6, Q7, Q9

For NEBM-LX/M17-...: the extension cables can also be configured via the modular product system.

Motor cable for EMMB-ST-57/87 with cable cross-section 1.5 mm² for servo drive CMMT-ST

| | Bending radius, moving cable | Cable character- istic | Ambient temper- ature | Cable length ¹⁾ | Part no. | Type |
|--|---------------------------------|---------------------------------|--------------------------|----------------------------|----------|--------------|
|  | 78.75 ... 81 mm | Suitable for ener- gy chains | -40 ... 90 °C | 0.5 ... 20 m | 8181663 | NEBM-LX/M17- |

1) For NEBM-LX/M17-...: cable lengths can be selected from 0.5 ... 25 m, in increments of 0.5 m and in all cable cross-sections Q6, Q7, Q9

For NEBM-LX/M17-...: the extension cables can also be configured via the modular product system.