

Servo motors EMMB-AS

FESTO



Key features

Everything from a single source

Motors EMMB-AS

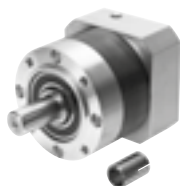
→ Page 4



- Brushless, permanently excited synchronous servo motors
- Reliable, dynamic, precise
- Digital absolute displacement encoder with single turn, multi-turn optional
- Optimised connection technology
- Winding variants
 - For single-phase motor controller
 - Optimised for rotational speed
- Holding brake

Gear unit EMGA-EAS/-SAS

→ Page 10



- Low-backlash planetary gear
- Gear ratio $i = 3$ and 5 , available from stock
- Life-time lubrication
- Degree of protection: IP54
- Other gear unit types, ratios, designs and versions on request

Servo drive CMMT-AS

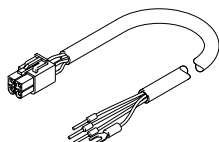
→ Internet: cmm



- Universal servo drive for synchronous servo motors
- Integrated EMC filters
- Integrated brake chopper
- Integrated braking resistor
- Integrated safety functions
- Position controller
- Speed controller
- Force controller
- Range of control functions
- Interfaces:
 - EtherCAT
 - PROFINET

Motor, encoder and connecting cables NEBM

→ Page 11



- Suitable for energy chains
- Connection technology on motor side with degree of protection to IP20
- Can be used in a wide temperature range

Axial and parallel kits EAMM

→ Internet: eamm



- Specific kits for all electromechanical axes from Festo
- Each kit includes the relevant necessary coupling housing, couplings and motor flange as well as all screws
- Optionally with degree of protection IP65

Type codes

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

| | | |
|-----------|----------------|--|
| 002 | Motor type | |
| AS | AC synchronous | |

| | | |
|-----------|---------------------|--|
| 003 | Flange size, motors | |
| 40 | 40 | |
| 60 | 60 | |
| 80 | 80 | |

| | | |
|-----------|-------------------|--|
| 004 | Performance class | |
| 01 | 100 W | |
| 02 | 200 W | |
| 04 | 400 W | |
| 07 | 750 W | |

| | | |
|----------|-------------------|--|
| 005 | Output shaft | |
| | Smooth shaft | |
| K | Shaft to DIN 6885 | |

| | | |
|----------|-----------------------|--|
| 006 | Electrical connection | |
| S | Straight plug | |

| | | |
|-----------|-------------------|--|
| 007 | Cable length [cm] | |
| 30 | 30 cm | |

| | | |
|----------|-------------------------------|--|
| 008 | Measuring unit | |
| S | Absolute encoder, single turn | |
| M | Absolute encoder, multi-turn | |

| | | |
|----------|------------|--|
| 009 | Brake | |
| | None | |
| B | With brake | |

Data sheet



Note
Motors and motor controllers from Festo have been specially designed to be used together. Trouble-free operation cannot be guaranteed in combination with third-party controllers.



| Technical data | | | | | |
|------------------------------------|----------------------|-------|-------|-------|-------|
| Flange size | | 40 | 60 | 80 | |
| Performance class | | 01 | 02 | 04 | 07 |
| Motor | | | | | |
| Nominal voltage | [V DC] | 300 | 300 | 300 | 300 |
| Nominal current | [A] | 1.3 | 1.4 | 2.4 | 3.8 |
| Continuous stall current | [A] | 1.43 | 1.5 | 2.6 | 4.2 |
| Peak current | [A] | 3.9 | 4.2 | 7.2 | 11.4 |
| Nominal power | [W] | 100 | 200 | 400 | 750 |
| Nominal torque | [Nm] | 0.32 | 0.64 | 1.27 | 2.39 |
| Peak torque | [Nm] | 0.96 | 1.92 | 3.81 | 7.17 |
| Stall torque | [Nm] | 0.352 | 0.7 | 1.4 | 2.63 |
| Nominal rotary speed | [rpm] | 3000 | 3000 | 3000 | 3000 |
| Max. rotational speed | [rpm] | 6000 | 6000 | 6000 | 5000 |
| Motor constant | [Nm/A] | 0.265 | 0.48 | 0.562 | 0.662 |
| Voltage constant (phase-to-phase) | [mV/min] | 16.2 | 29 | 34 | 40 |
| Number of pole pairs | | 5 | 3 | 3 | 3 |
| Winding resistance | [Ω] | 7.9 | 11.2 | 5.8 | 2.1 |
| Winding inductance | [mH] | 10.5 | 20.9 | 11.5 | 10.5 |
| Total output moment of inertia | | | | | |
| Without brake | [kgcm ²] | 0.059 | 0.214 | 0.405 | 0.942 |
| With brake | [kgcm ²] | 0.063 | 0.234 | 0.425 | 0.978 |
| Shaft load at nominal rotary speed | | | | | |
| Radial | [N] | 120 | 180 | 180 | 335 |
| Axial | [N] | 60 | 90 | 90 | 167.5 |
| Brake | | | | | |
| Operating voltage | [V DC] | 24 | 24 | 24 | 24 |
| Power | [W] | 5.9 | 7.2 | 7.2 | 11.5 |
| Holding torque | [Nm] | 0.32 | 1.3 | 1.3 | 3.2 |
| Mass moment of inertia | [kgcm ²] | 0.004 | 0.004 | 0.004 | 0.012 |
| Weights [kg] | | | | | |
| Flange size | | 40 | 60 | 80 | |
| Performance class | | 01 | 02 | 04 | 07 |
| Without brake | | 0.8 | 1.1 | 1.6 | 2.8 |
| With brake | | 1 | 1.6 | 2.1 | 3.5 |

Data sheet

| Technical data – Encoder | | | |
|--|----------|---|----------------------|
| Measuring unit | | Absolute, single turn | Absolute, multi-turn |
| Interface/protocol | | Nikon A format | |
| Operating voltage | [V DC] | 5 (±5%) | |
| Operating voltage range | [V DC] | 4.75 ... 5.25 | |
| Measuring principle | | Optical | |
| Position values per revolution | | 1048576 | |
| Resolution | [bit] | 20 | |
| Absolute detectable revolutions | | 1 | 65536, 16 bits |
| System accuracy of angle measurement | [arcsec] | ±120 | |
| Operating and environmental conditions | | | |
| Flange size | | 40 | 60 80 |
| Conforms to standard | | IEC60034 | |
| Degree of protection | | | |
| Motor shaft (without rotary shaft seal) | | IP40 | |
| Motor shaft (with rotary shaft seal) ¹⁾ | | IP54 | |
| Motor housing (without connection technology) | | IP65 | |
| Ambient temperature | [°C] | -15 ... +40 | |
| Note on ambient temperature | | Up to 60 °C with derating of -1.5% per degree Celsius | |
| Storage temperature | [°C] | -20 ... +55 | |
| Max. setup altitude | [m] | 4000 | |
| Note on max. setup altitude | | As of 1000 m only with derating of -1.0% per 100 m | |
| Insulation class | | F (up to 155 °C) | |
| Temperature monitoring | | Digital motor temperature transmission via Nikon A format | |
| Rating class to EN 60034-1 | | S1 (continuous operation) | |
| Relative humidity | [%] | 0 ... 90 (non-condensing) | |
| 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 | |
| CE marking (see declaration of conformity) | | To EU Low Voltage Directive To EU-EMC Directive ²⁾ To EU RoHS Directive | |
| UKCA marking (see declaration of conformity) | | To UK instructions for EMC To UK RoHS instructions To UK regulations for electrical equipment | |
| Certification | | c UL us - Recognized (OL) | |
| Note on materials | | RoHS-compliant Contains paint-wetting impairment substances | |

1) The rotary shaft seal is included in the scope of delivery of the motor.

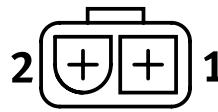
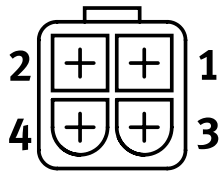
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet

Pin allocation – Motor side

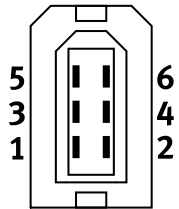
Motor Brake



| PIN | Function |
|-----|------------------------|
| 1 | U Phase |
| 2 | V Phase |
| 3 | W Phase |
| 4 | PE Protective earthing |

| PIN | Function |
|-----|----------|
| 1 | BR+ |
| 2 | BR- |

Encoder



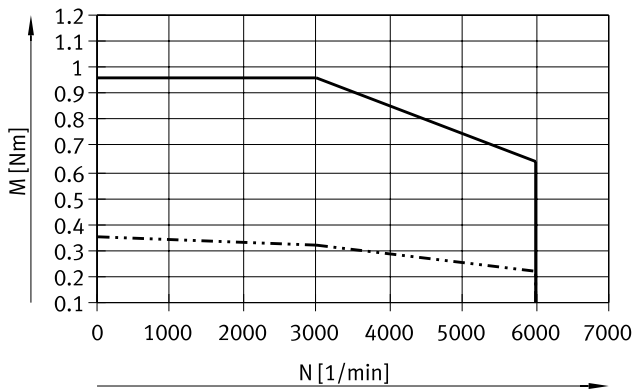
| PIN | Function |
|-----|----------|
| 1 | Vcc |
| 2 | GND |
| 3 | BAT+ |
| 4 | BAT- |
| 5 | SD+ |
| 6 | SD- |

Data sheet

Torque M as a function of rotational speed n

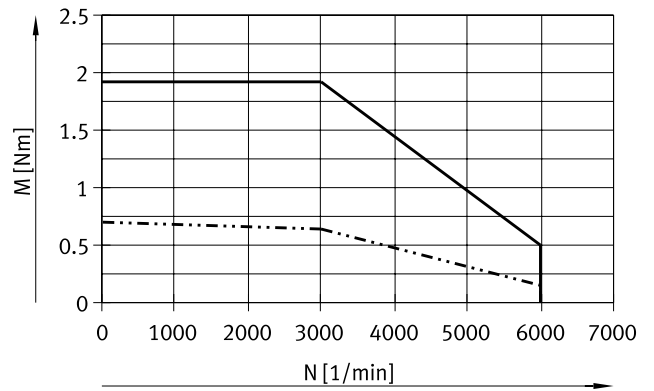
Flange size 40

Performance class 01



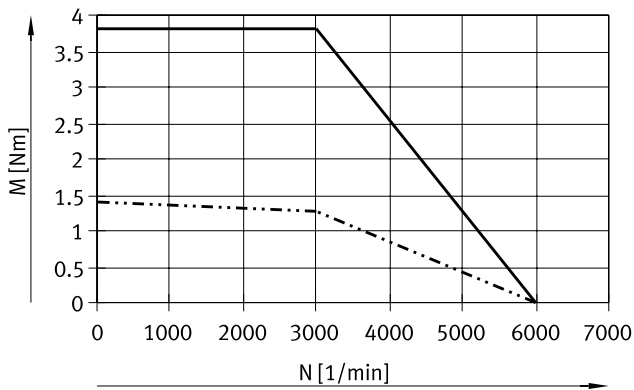
Flange size 60

Performance class 02



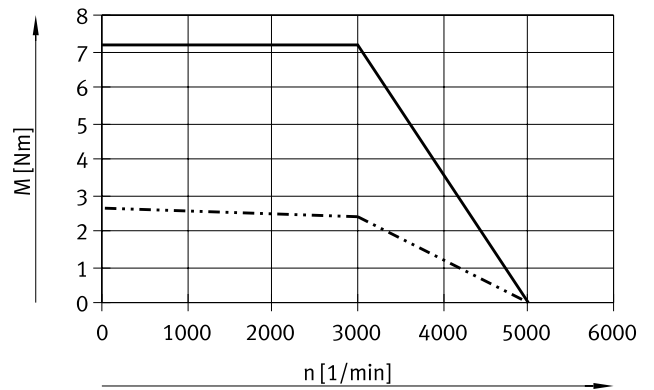
Flange size 60

Performance class 04



Flange size 80

Performance class 07



— Peak torque
 - - - - - Nominal torque

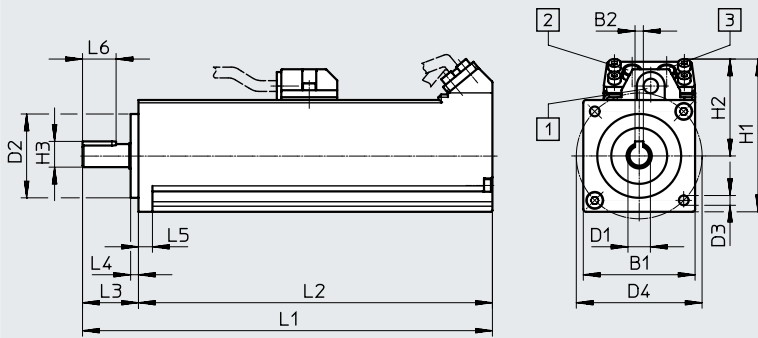
Note
 Typical motor characteristic curve with nominal voltage and optimal motor controller.

Data sheet

Dimensions

Download CAD data → www.festo.com

EMMB-AS-40



- [1] Electrical connection for motor
- [2] Electrical connection for brake
- [3] Electrical connection for encoder

| Type | Featherkey | B1 | B2 | D1 ∅ | D2 ∅ | D3 ∅ | D4 ∅ |
|------------|------------|----|--------|---------|---------|---------|---------|
| | | | -0.014 | -0.013 | -0.021 | | ±0.2 |
| EMMB-AS-40 | Without | 40 | - | 8 | 30 | 3.5 | 45 |
| | With | | 3 | | | | |

| Type | Featherkey | H1 max. | H2 max. | H3 | L1 | | L2 | |
|------------|------------|------------|------------|-----|----------------------------|-------------------------|---------------------|------------------|
| | | | | | Without brake +1.5/-1.7 | With brake +1.5/-1.7 | Without brake ±1 | With brake ±1 |
| EMMB-AS-40 | Without | 70 | 50 | - | 116.6 | 146.6 | 96.6 | 126.6 |
| | With | | | 9.7 | | | | |

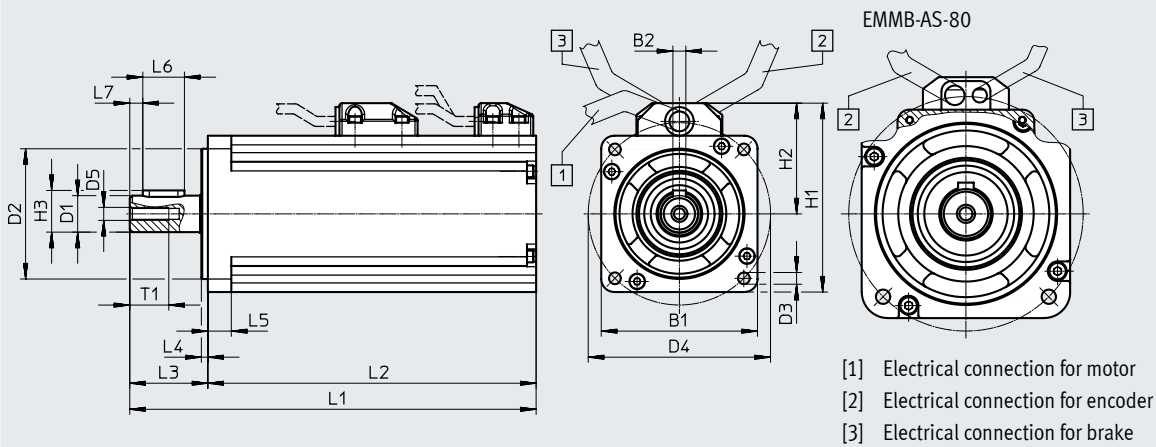
| Type | Featherkey | L3 | L4 | L5 | L6 |
|------------|------------|-----------|-----|----|----|
| | | +0.5/-0.7 | | | |
| EMMB-AS-40 | Without | 20 | 2.8 | 5 | - |
| | With | | | | 12 |

Data sheet

Dimensions

EMMB-AS-60/-80

Download CAD data → www.festo.com



| Type | Featherkey | B1 | B2 | D1 ∅ | D2 ∅ | D3 ∅ | D4 ∅ ±0.1 | D5 ∅ |
|---------------|------------|----|----|----------------------|----------------------|---------|-----------------|---------|
| EMMB-AS-60-02 | Without | 60 | - | 14 _{-0.011} | 50 _{-0.016} | 4.5 | 70 | 5 |
| | With | | 5 | | | | | |
| EMMB-AS-60-04 | Without | 60 | - | 14 _{-0.011} | 50 _{-0.016} | 4.5 | 70 | 5 |
| | With | | 5 | | | | | |
| EMMB-AS-80-07 | Without | 80 | - | 19 _{-0.013} | 70 _{-0.02} | 5.5 | 90 | 6 |
| | With | | 5 | | | | | |

| Type | Featherkey | H1 | H2 | H3 -0.13 | L1 | | L2 | |
|---------------|------------|------|------|-------------|------------------------|--------------------------|-----------------------|--------------------|
| | | | | | Without brake | With brake | Without brake ±1.5 | With brake ±1.5 |
| EMMB-AS-60-02 | Without | 72.5 | 42.5 | 16 | 124 _{+2.5} | 156 _{+2.5} | 94 | 126 |
| | With | | | | | | | |
| EMMB-AS-60-04 | Without | 72.5 | 42.5 | 16 | 150 _{+2.5} | 182 _{+2.5} | 120 | 152 |
| | With | | | | | | | |
| EMMB-AS-80-07 | Without | 94 | 54 | 21.5 | 164 _{+2.4/-2} | 193.5 _{+2.4/-2} | 129.5 | 159 |
| | With | | | | | | | |

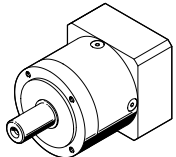
| Type | Featherkey | L3 | L4 | L5 ±1 | L6 | L7 | T1 |
|---------------|------------|---------------------------|-----|----------|----|----|----|
| | | | | | | | |
| With | 16 | 5 | | | | | |
| EMMB-AS-60-04 | Without | 30 _{±1} | 2.5 | 9 | - | - | 15 |
| | With | | | | 16 | 5 | |
| EMMB-AS-80-07 | Without | 34.5 _{+0.9/-0.5} | 3 | 10 | - | - | 15 |
| | With | | | | 22 | 4 | |

Data sheet

| Ordering data | | | | Measuring unit | | Variant | | Part no. | Type |
|-----------------------|-----|-----|-----|----------------------|---------------------|-----------------|------------|----------|-----------------------|
| Nominal power [W] | | | | Encoder, single turn | Encoder, multi-turn | With featherkey | With brake | | |
| 100 | 200 | 400 | 750 | | | | | | |
| Flange size 40 | | | | | | | | | |
| ■ | | | | ■ | | | | 8097163 | EMMB-AS-40-01-S30S |
| ■ | | | | ■ | | | ■ | 8097164 | EMMB-AS-40-01-S30SB |
| ■ | | | | ■ | | ■ | | 8097165 | EMMB-AS-40-01-K-S30S |
| ■ | | | | ■ | | ■ | ■ | 8097166 | EMMB-AS-40-01-K-S30SB |
| ■ | | | | | ■ | | | 8097167 | EMMB-AS-40-01-S30M |
| ■ | | | | | ■ | | ■ | 8097168 | EMMB-AS-40-01-S30MB |
| ■ | | | | | ■ | ■ | | 8097169 | EMMB-AS-40-01-K-S30M |
| ■ | | | | | ■ | ■ | ■ | 8097170 | EMMB-AS-40-01-K-S30MB |
| Flange size 60 | | | | | | | | | |
| | ■ | | | ■ | | | | 8097171 | EMMB-AS-60-02-S30S |
| | ■ | | | ■ | | | ■ | 8097172 | EMMB-AS-60-02-S30SB |
| | ■ | | | ■ | | ■ | | 8097173 | EMMB-AS-60-02-K-S30S |
| | ■ | | | ■ | | ■ | ■ | 8097174 | EMMB-AS-60-02-K-S30SB |
| | ■ | | | | ■ | | | 8097175 | EMMB-AS-60-02-S30M |
| | ■ | | | | ■ | | ■ | 8097176 | EMMB-AS-60-02-S30MB |
| | ■ | | | | ■ | ■ | | 8097177 | EMMB-AS-60-02-K-S30M |
| | ■ | | | | ■ | ■ | ■ | 8097178 | EMMB-AS-60-02-K-S30MB |
| | | ■ | | ■ | | | | 8097179 | EMMB-AS-60-04-S30S |
| | | ■ | | ■ | | | ■ | 8097180 | EMMB-AS-60-04-S30SB |
| | | ■ | | ■ | | ■ | | 8097181 | EMMB-AS-60-04-K-S30S |
| | | ■ | | ■ | | ■ | ■ | 8097182 | EMMB-AS-60-04-K-S30SB |
| | | ■ | | | ■ | | | 8097183 | EMMB-AS-60-04-S30M |
| | | ■ | | | ■ | | ■ | 8097184 | EMMB-AS-60-04-S30MB |
| | | ■ | | | ■ | ■ | | 8097185 | EMMB-AS-60-04-K-S30M |
| | | ■ | | | ■ | ■ | ■ | 8097186 | EMMB-AS-60-04-K-S30MB |
| Flange size 80 | | | | | | | | | |
| | | | ■ | ■ | | | | 8097187 | EMMB-AS-80-07-S30S |
| | | | ■ | ■ | | | ■ | 8097188 | EMMB-AS-80-07-S30SB |
| | | | ■ | ■ | | ■ | | 8097189 | EMMB-AS-80-07-K-S30S |
| | | | ■ | ■ | | ■ | ■ | 8097190 | EMMB-AS-80-07-K-S30SB |
| | | | ■ | | ■ | | | 8097191 | EMMB-AS-80-07-S30M |
| | | | ■ | | ■ | | ■ | 8097192 | EMMB-AS-80-07-S30MB |
| | | | ■ | | ■ | ■ | | 8097193 | EMMB-AS-80-07-K-S30M |
| | | | ■ | | ■ | ■ | ■ | 8097194 | EMMB-AS-80-07-K-S30MB |

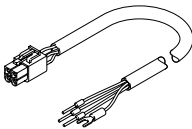
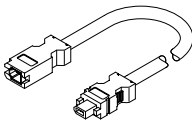
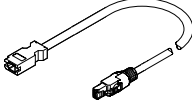
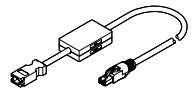
Accessories

Ordering data – Gear unit

|  | For motor flange size | Gear ratio | Part no. | Type |
|--|-----------------------|------------|----------|---------------------|
| | | 40P | 3 | 2297684 |
| 5 | | | 2297685 | EMGA-40-P-G5-EAS-40 |
| 60P | | 3 | 2297686 | EMGA-60-P-G3-EAS-60 |
| | | 5 | 2297687 | EMGA-60-P-G5-EAS-60 |
| 80P | | 3 | 2297690 | EMGA-80-P-G3-EAS-80 |
| | | 5 | 2297691 | EMGA-80-P-G5-EAS-80 |

Accessories

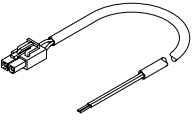
| Technical data – Cables | | | |
|--|------|--|--|
| Designation | | Motor cable | Encoder cable |
| Type | | NEBM-H6G4-E... | NEBM-REG6-E... |
| Cable composition | | 4x 0.79 mm ² | 2x 0.51 mm ² + 4x 0.205 mm ² |
| Cable diameter | [mm] | 7.3 | 7.4 |
| Pollution degree | | 3 | 3 |
| Bending radius | | | |
| Fixed cable installation | [mm] | ≥ 55 | ≥ 55 |
| Flexible cable installation | [mm] | ≥ 55 | ≥ 55 |
| Ambient temperature | | | |
| Standard | [°C] | -25 ... +90 | -40 ... +80 |
| Flexible cable installation | [°C] | -25 ... +90 | -10 ... +80 |
| Cable characteristic | | Suitable for energy chains | Suitable for energy chains |
| Degree of protection | | IP20 (in mounted state) | IP20 (in mounted state) |
| CE marking (see declaration of conformity) | | To EU Low Voltage Directive | To EU Low Voltage Directive |
| Material | | PVC | PVC |
| Note on materials | | RoHS-compliant | RoHS-compliant |
| | | Contains paint-wetting impairment substances | Contains paint-wetting impairment substances |

| Ordering data | | | |
|---|--|------------------------|---------------------------|
| | Cable length [m] | Part no. | Type |
| Motor cable | | | |
|  | 2.5 | 5219197 | NEBM-H6G4-E-2.5-Q13N-LE4 |
| | 5 | 5219198 | NEBM-H6G4-E-5-Q13N-LE4 |
| | 7.5 | 5219199 | NEBM-H6G4-E-7.5-Q13N-LE4 |
| | 10 | 5219200 | NEBM-H6G4-E-10-Q13N-LE4 |
| | 15 | 8097203 | NEBM-H6G4-E-15-Q13N-LE4 |
| | 20 | 8097204 | NEBM-H6G4-E-20-Q13N-LE4 |
| | 25 | 8097205 | NEBM-H6G4-E-25-Q13N-LE4 |
| Encoder cable | | | |
|  | 2.5 | 5219213 | NEBM-REG6-E-2.5-Q14N-REG6 |
| | 5 | 5219214 | NEBM-REG6-E-5-Q14N-REG6 |
| | 7.5 | 5219215 | NEBM-REG6-E-7.5-Q14N-REG6 |
| | 10 | 5219216 | NEBM-REG6-E-10-Q14N-REG6 |
| | 15 | 8097200 | NEBM-REG6-E-15-Q14N-REG6 |
| | 20 | 8097201 | NEBM-REG6-E-20-Q14N-REG6 |
| | 25 | 8097202 | NEBM-REG6-E-25-Q14N-REG6 |
| Adapter for encoder cable (absolutely essential) | | | |
|  | For single turn with CMMT-AS | | |
| | 0.5 | 8097197 | NEFM-REG6-K-0.5-R3G8 |
|  | For multi-turn with CMMT-AS ¹⁾ | | |
| | 0.5 | 8097195 | NEFM-REG6-K-0.5-B-R3G8 |
| | For multi-turn with CMM-B-AS ¹⁾ | | |
| 0.5 | 8097196 | NEFM-REG6-K-0.5-B-REG6 | |

1) The battery is not included in the scope of delivery

Accessories

| Technical data – Cables | | |
|--|--|--|
| Designation | Connecting cable for brake | |
| Type | NEBM-H7G2-E-... | |
| Cable composition | 2x 0.51 mm ² | |
| Cable diameter [mm] | 5.1 | |
| Pollution degree | 3 | |
| Bending radius | | |
| Fixed cable installation [mm] | ≥ 21 | |
| Flexible cable installation [mm] | ≥ 51 | |
| Ambient temperature | | |
| Standard [°C] | -40 ... +80 | |
| Flexible cable installation [°C] | -10 ... +80 | |
| Cable characteristic | Suitable for energy chains | |
| Degree of protection | IP20 (in mounted state) | |
| CE marking (see declaration of conformity) | To EU Low Voltage Directive | |
| Material | PVC | |
| Note on materials | RoHS-compliant | |
| | Contains paint-wetting impairment substances | |

| Ordering data | | | |
|---|------------------|----------|--------------------------|
| | Cable length [m] | Part no. | Type |
| Connecting cable for brake | | | |
|  | 2.5 | 5219205 | NEBM-H7G2-E-2.5-Q14N-LE2 |
| | 5 | 5219206 | NEBM-H7G2-E-5-Q14N-LE2 |
| | 7.5 | 5219207 | NEBM-H7G2-E-7.5-Q14N-LE2 |
| | 10 | 5219208 | NEBM-H7G2-E-10-Q14N-LE2 |
| | 15 | 8097206 | NEBM-H7G2-E-15-Q14N-LE2 |
| | 20 | 8097207 | NEBM-H7G2-E-20-Q14N-LE2 |
| | 25 | 8097208 | NEBM-H7G2-E-25-Q14N-LE2 |