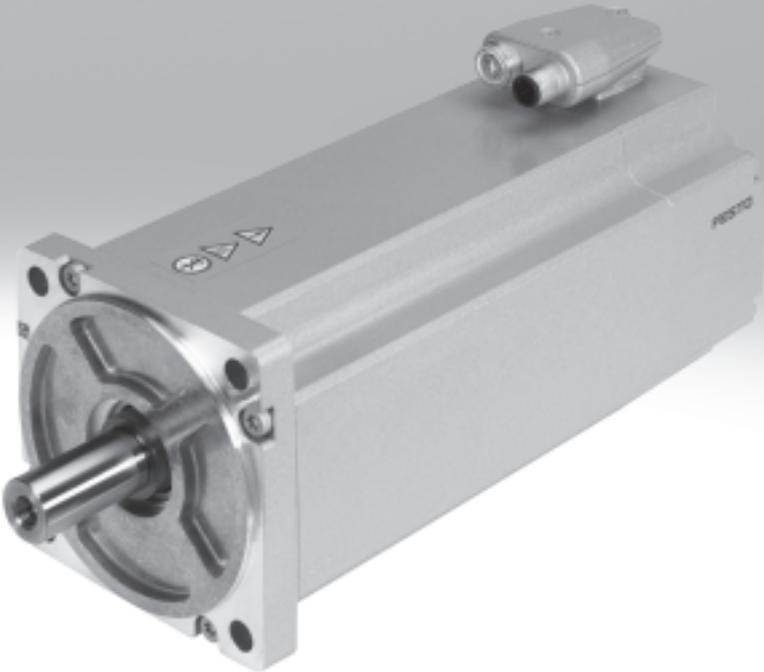


Servo motors EMME-AS



## Servo motors EMME-AS

Key features

**FESTO**

### Everything from a single source

Motors EMME-AS

→ 3



- Brushless, permanently excited synchronous servo motors
- Reliable, dynamic, precise
- Choice of feedback systems:
  - Digital single-turn absolute displacement encoder
  - Digital multi-turn absolute displacement encoder
- Optimised connection technology
- Winding variants
  - For single-phase motor controller
  - For three-phase motor controller
  - Speed-optimised
- Protection class: IP21 (motor shaft)
- Protection class: IP65 (motor housing and connection technology)
- Optional:
  - Holding brake

### Gear units EMGA-EAS/-SAS

→ 16



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

### Motor controllers CMMP-AS

→ Internet: cmm



- Digital servo controller (0.5 kVA ... 12 kVA)
- Actuation of AC servo and linear motors
- Integrated EMC filters
- Integrated brake chopper
- Integrated safety functions
- Position controller with closed-loop position control (256 position sets)
- Speed controller
- Torque control via current controller
- Range of control functions
- Interfaces:
  - I/O interface
  - CANopen, standard
  - PROFIBUS DP, optional module
  - DeviceNet, optional module
  - PROFINET RT, optional module
  - EtherCAT, optional module
  - EtherNet/IP, optional module

### Motor and encoder cables NEBM

→ 18



- Suitable for use with energy chains
- Connection technology on motor side with protection to IP65
- Can be used in a wide temperature range

### Axial and parallel kits EAMM

→ Internet: eamm



- Defined 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 protection to IP65

# Servo motors EMME-AS

Type codes

|                              |  |      |   |    |   |    |   |   |   |    |   |    |
|------------------------------|--|------|---|----|---|----|---|---|---|----|---|----|
|                              |  | EMME | - | AS | - | 60 | - | S | - | LS | - | AM |
| <b>Type</b>                  |  |      |   |    |   |    |   |   |   |    |   |    |
| EMME                         | Motor  |      |   |    |   |    |   |   |   |    |   |    |
| <b>Motor type</b>            |  |      |   |    |   |    |   |   |   |    |   |    |
| AS                           | Servo motor                                  |      |   |    |   |    |   |   |   |    |   |    |
| <b>Motor flange size</b>     |  |      |   |    |   |    |   |   |   |    |   |    |
| 40                           | 40 mm  |      |   |    |   |    |   |   |   |    |   |    |
| 60                           | 60 mm  |      |   |    |   |    |   |   |   |    |   |    |
| 80                           | 80 mm  |      |   |    |   |    |   |   |   |    |   |    |
| 100                          | 100 mm                                       |      |   |    |   |    |   |   |   |    |   |    |
| <b>Length</b>                |  |      |   |    |   |    |   |   |   |    |   |    |
| S                            | Short  |      |   |    |   |    |   |   |   |    |   |    |
| M                            | Medium                                       |      |   |    |   |    |   |   |   |    |   |    |
| <b>Winding</b>               |  |      |   |    |   |    |   |   |   |    |   |    |
| LS                           | Low-voltage, standard                        |      |   |    |   |    |   |   |   |    |   |    |
| LV                           | Low-voltage, speed-optimised                 |      |   |    |   |    |   |   |   |    |   |    |
| HS                           | High-voltage, standard                       |      |   |    |   |    |   |   |   |    |   |    |
| <b>Electrical connection</b> |  |      |   |    |   |    |   |   |   |    |   |    |
| A                            | Angled plug, fixed – outlet direction: shaft |      |   |    |   |    |   |   |   |    |   |    |
| <b>Measuring unit</b>        |  |      |   |    |   |    |   |   |   |    |   |    |
| S                            | Absolute encoder, single-turn                |      |   |    |   |    |   |   |   |    |   |    |
| M                            | Absolute encoder, multi-turn                 |      |   |    |   |    |   |   |   |    |   |    |
| <b>Brake</b>                 |  |      |   |    |   |    |   |   |   |    |   |    |
| -                            | None   |      |   |    |   |    |   |   |   |    |   |    |
| B                            | With brake                                   |      |   |    |   |    |   |   |   |    |   |    |

## Servo motors EMME-AS

Technical data



**Note**

Motors and motor controllers from Festo are specially matched to each other. Fault-free operation cannot be guaranteed in combination with third-party controllers.



| Technical data                          |                      |                |        |
|---|----------------------|----------------|--------|
| Flange size                             |                      | 40             |        |
| Length                                  |                      | S              | M      |
| Winding                                 |                      | LV             | LV     |
| Motor                                   |                      |                |        |
| Nominal voltage                         | [V DC]               | 360            | 360    |
| Nominal current                         | [A]                  | 0.7            | 1.2    |
| Continuous current at standstill        | [A]                  | 0.8            | 1.6    |
| Peak current                            | [A]                  | 3.2            | 6.4    |
| Rated output                            | [W]                  | 110            | 200    |
| Nominal torque                          | [Nm]                 | 0.12           | 0.21   |
| Peak torque                             | [Nm]                 | 0.7            | 1.4    |
| Torque at standstill                    | [Nm]                 | 0.18           | 0.35   |
| Nominal rotational speed                | [rpm]                | 9,000          | 9,000  |
| Max. rotational speed                   | [rpm]                | 10,000         | 10,000 |
| Motor constant                          | [Nm/A]               | 0.171          | 0.175  |
| Winding resistance                      | [Ω]                  | 25.6           | 8.6    |
| Winding inductance                      | [mH]                 | 14.8           | 6.6    |
| Total moment of inertia of drive output |                      |                |        |
| Without brake                           | [kgcm <sup>2</sup> ] | 0.03           | 0.054  |
| With brake                              | [kgcm <sup>2</sup> ] | 0.055          | 0.079  |
| Shaft load at nominal rotational speed  |                      |                |        |
| Radial                                  | [N]                  | 105            | 115    |
| Axial                                   | [N]                  | 21             | 23     |
| Brake                                   |                      |                |        |
| Operating voltage                       | [V DC]               | 24 +6 ... -10% |        |
| Output                                  | [W]                  | 8              |        |
| Holding torque                          | [Nm]                 | 0.4            |        |
| Mass moment of inertia                  | [kgcm <sup>2</sup> ] | 0.014          |        |

## Servo motors EMME-AS

Technical data

| Technical data                          |                      |                |       |
|---|----------------------|----------------|-------|
| Flange size                             |                      | 60             |       |
| Length                                  |                      | S              | M     |
| Winding                                 |                      | LS             | LS    |
| Motor                                   |                      |                |       |
| Nominal voltage                         | [V DC]               | 360            | 360   |
| Nominal current                         | [A]                  | 0.8            | 1.5   |
| Continuous current at standstill        | [A]                  | 0.9            | 1.8   |
| Peak current                            | [A]                  | 3.6            | 7.2   |
| Rated output                            | [W]                  | 190            | 380   |
| Nominal torque                          | [Nm]                 | 0.6            | 1.2   |
| Peak torque                             | [Nm]                 | 2.8            | 6.0   |
| Torque at standstill                    | [Nm]                 | 0.7            | 1.5   |
| Nominal rotational speed                | [rpm]                | 3,000          | 3,000 |
| Max. rotational speed                   | [rpm]                | 5,131          | 4,925 |
| Motor constant                          | [Nm/A]               | 0.75           | 0.80  |
| Winding resistance                      | [Ω]                  | 26.4           | 9.8   |
| Winding inductance                      | [mH]                 | 37.6           | 18.6  |
| Total moment of inertia of drive output |                      |                |       |
| Without brake                           | [kgcm <sup>2</sup> ] | 0.22           | 0.413 |
| With brake                              | [kgcm <sup>2</sup> ] | 0.319          | 0.512 |
| Shaft load at nominal rotational speed  |                      |                |       |
| Radial                                  | [N]                  | 250            | 270   |
| Axial                                   | [N]                  | 50             | 54    |
| Brake                                   |                      |                |       |
| Operating voltage                       | [V DC]               | 24 +6 ... -10% |       |
| Output                                  | [W]                  | 11             |       |
| Holding torque                          | [Nm]                 | 2              |       |
| Mass moment of inertia                  | [kgcm <sup>2</sup> ] | 0.086          |       |

# Servo motors EMME-AS

Technical data

| Technical data                          |                      |                |       |                |       |
|---|----------------------|----------------|-------|----------------|-------|
| Flange size                             |                      | 80             |       |                |       |
| Length                                  |                      | S              |       | M              |       |
| Winding                                 |                      | LS             | HS    | LS             | HS    |
| Motor                                   |                      |                |       |                |       |
| Nominal voltage                         | [V DC]               | 360            | 565   | 360            | 565   |
| Nominal current                         | [A]                  | 2.6            | 1.6   | 3.7            | 2.1   |
| Continuous current at standstill        | [A]                  | 3.1            | 1.8   | 3.9            | 2.2   |
| Peak current                            | [A]                  | 12.4           | 7.2   | 15.6           | 8.8   |
| Rated output                            | [W]                  | 750            | 720   | 1,000          | 1,000 |
| Nominal torque                          | [Nm]                 | 2.4            | 2.3   | 3.2            | 3.2   |
| Peak torque                             | [Nm]                 | 11.2           | 11.2  | 14.0           | 14.0  |
| Torque at standstill                    | [Nm]                 | 2.8            | 2.8   | 3.5            | 3.5   |
| Nominal rotational speed                | [rpm]                | 3,000          | 3,000 | 3,000          | 3,000 |
| Max. rotational speed                   | [rpm]                | 4,690          | 4,192 | 4,627          | 4,097 |
| Motor constant                          | [Nm/A]               | 0.923          | 1.438 | 0.865          | 1.524 |
| Winding resistance                      | [Ω]                  | 4.6            | 14.2  | 2.8            | 9.0   |
| Winding inductance                      | [mH]                 | 11.8           | 36.2  | 8.4            | 26.0  |
| Total moment of inertia of drive output |                      |                |       |                |       |
|   |                      |                |       |                |       |
| Without brake                           | [kgcm <sup>2</sup> ] | 1.4            |       | 1.93           |       |
| With brake                              | [kgcm <sup>2</sup> ] | 1.68           |       | 2.2            |       |
| Shaft load at nominal rotational speed  |                      |                |       |                |       |
|   |                      |                |       |                |       |
| Radial                                  | [N]                  | 350            |       | 360            |       |
| Axial                                   | [N]                  | 70             |       | 72             |       |
| Brake                                   |                      |                |       |                |       |
| Operating voltage                       | [V DC]               | 24 +6 ... -10% |       | 24 +6 ... -10% |       |
| Output                                  | [W]                  | 12             |       | 12             |       |
| Holding torque                          | [Nm]                 | 4.5            |       | 4.5            |       |
| Mass moment of inertia                  | [kgcm <sup>2</sup> ] | 0.222          |       | 0.222          |       |

## Servo motors EMME-AS

Technical data

| Technical data                          |                      |                |       |
|---|----------------------|----------------|-------|
| Flange size                             |                      | 100            |       |
| Length                                  |                      | S              | M     |
| Winding                                 |                      | HS             | HS    |
| Motor                                   |                      |                |       |
| Nominal voltage                         | [V DC]               | 565            | 565   |
| Nominal current                         | [A]                  | 3.0            | 4.1   |
| Continuous current at standstill        | [A]                  | 3.4            | 4.6   |
| Peak current                            | [A]                  | 13.6           | 18.4  |
| Rated output                            | [W]                  | 1,500          | 2,000 |
| Nominal torque                          | [Nm]                 | 4.8            | 6.4   |
| Peak torque                             | [Nm]                 | 22.4           | 30.0  |
| Torque at standstill                    | [Nm]                 | 5.6            | 7.5   |
| Nominal rotational speed                | [rpm]                | 3,000          | 3,000 |
| Max. rotational speed                   | [rpm]                | 3,910          | 3,941 |
| Motor constant                          | [Nm/A]               | 1.6            | 1.561 |
| Winding resistance                      | [Ω]                  | 4.6            | 3.2   |
| Winding inductance                      | [mH]                 | 19.8           | 15.0  |
| Total moment of inertia of drive output |                      |                |       |
| Without brake                           | [kgcm <sup>2</sup> ] | 4.84           | 6.41  |
| With brake                              | [kgcm <sup>2</sup> ] | 5.63           | 7.2   |
| Shaft load at nominal rotational speed  |                      |                |       |
| Radial                                  | [N]                  | 650            | 680   |
| Axial                                   | [N]                  | 130            | 136   |
| Brake                                   |                      |                |       |
| Operating voltage                       | [V DC]               | 24 +6 ... -10% |       |
| Output                                  | [W]                  | 18             |       |
| Holding torque                          | [Nm]                 | 9.0            |       |
| Mass moment of inertia                  | [kgcm <sup>2</sup> ] | 0.654          |       |

# Servo motors EMME-AS

Technical data

| Technical data – Encoders           |  |                           |
|-------------------------------------|--|---------------------------|
| Measuring unit                      | Absolute, single-turn                            | Absolute, multi-turn      |
| Operating voltage [V DC]            | 7 ... 12 (±5%)                                   |                           |
| Interface signals/protocol          |  |                           |
| Process data channel                | SIN, REFSIN, COS, REFCOS (analogue differential) |                           |
| Parameter channel                   | RS485 (digital)                                  |                           |
| Position values per revolution      | 512  |                           |
| Rotor position encoder resolution   | 9 bit  |                           |
| Max. rotational speed               |  |                           |
| For absolute value generation [rpm] | 6,000  |                           |
| Mechanical [rpm]                    | 12,000   |                           |
| Revolutions                         | 1  | 4,096 revolutions, 12 bit |

| Weight [kg]   |     |     |     |     |     |     |     |     |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Flange size   | 40  |     | 60  |     | 80  |     | 100 |     |
| Length        | S   | M   | S   | M   | S   | M   | S   | M   |
| Without brake | 0.6 | 0.7 | 1.7 | 2.2 | 3.4 | 4.1 | 6.3 | 7.3 |
| With brake    | 0.7 | 0.8 | 2.0 | 2.6 | 4.1 | 4.8 | 7.3 | 8.3 |

| Operating and environmental conditions     |  |
|--|--|
| Standard                                   | IEC60034   |
| Protection class                           |  |
| Motor shaft                                | IP21   |
| Motor shaft and connection technology      | IP65   |
| Ambient temperature [°C]                   | -10 ... +40 (up to 100 °C with derating of 1.5% per degree Celsius)                            |
| Storage temperature [°C]                   | -20 ... +70  |
| Insulation protection class                | F (155 °C)   |
| Temperature monitoring                     | Not integrated, only via I <sup>2</sup> t temperature monitoring model of the motor controller |
| Rated class to EN 60034-1                  | S1 (continuous operation)  |
| Thermal class to EN 60034-1                | F (155 °C)   |
| Relative air humidity [%]                  | 0 ... 90 (non-condensing)  |
| CE marking (see declaration of conformity) | To EU Low Voltage Directive<br>To EU EMC Directive <sup>1)</sup>                               |
| Certification                              | cULus Recognized (OL)<br>C-Tick  |
| Note on materials                          | RoHS-compliant<br>Contains PWIS (paint-wetting impairment substances)                          |

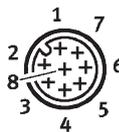
1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com](http://www.festo.com) → Support → User documentation.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

## Pin allocation – Motor side

Motor (M16, pins)



Encoder (M12, pins)



| Pin | Function              |
|-----|-----------------------|
| U   | Phase U               |
| V   | Phase V               |
| W   | Phase W               |
| ⊥   | Protective earth (PE) |
| +   | Brake BR+             |
| -   | Brake BR-             |
| 1   | n.c.                  |
| 2   | n.c.                  |

| Pin | Function           |
|-----|--------------------|
| 1   | 0 V                |
| 2   | Us (7 ... 12 V DC) |
| 3   | Data+ (RS485)      |
| 4   | Data- (RS485)      |
| 5   | SIN+               |
| 6   | SIN- (REFSIN)      |
| 7   | COS+               |
| 8   | COS- (REFCOS)      |

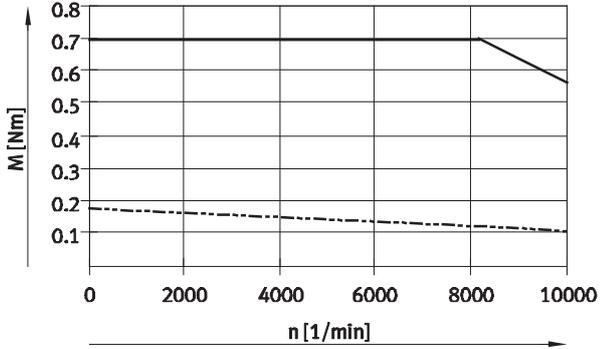
# Servo motors EMME-AS

Technical data

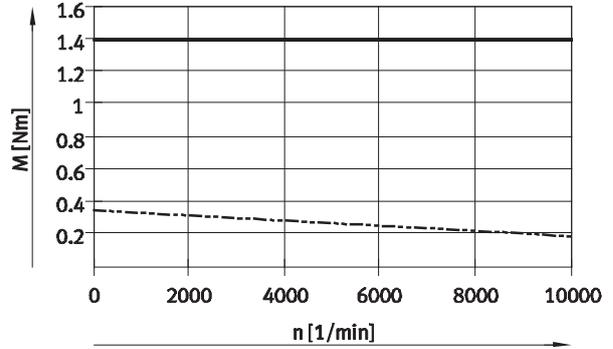
## Torque M as a function of rotational speed n

Flange size 40

Length S  
Winding LV



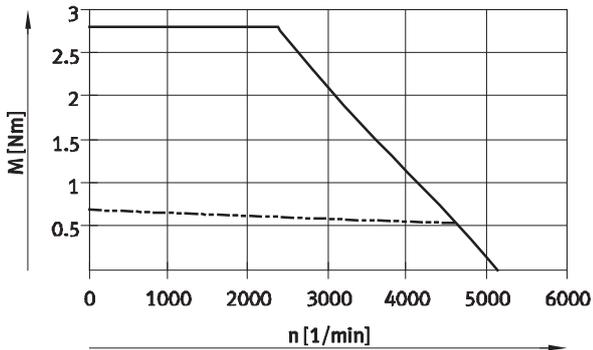
Length M  
Winding LV



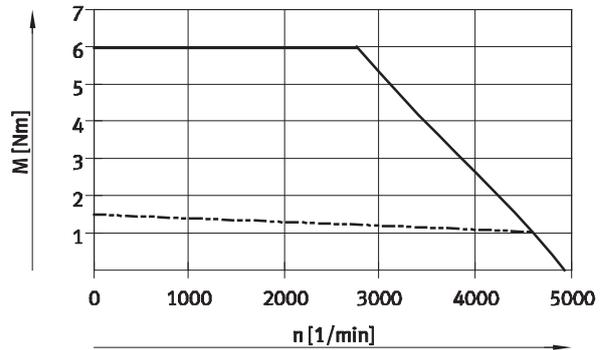
— Peak torque  
- - - Nominal torque

Flange size 60

Length S  
Winding LS



Length M  
Winding LS



— Peak torque  
- - - Nominal torque

### Note

Typical motor characteristic curve with nominal voltage and optimal controller.

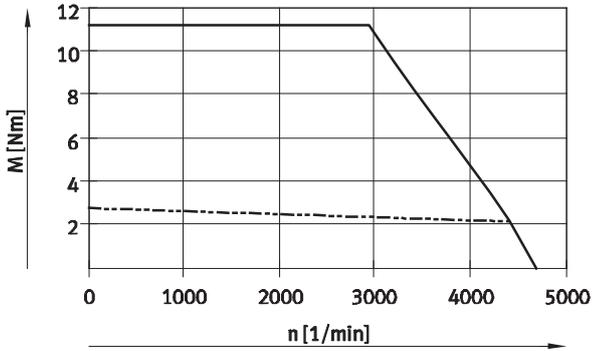
# Servo motors EMME-AS

Technical data

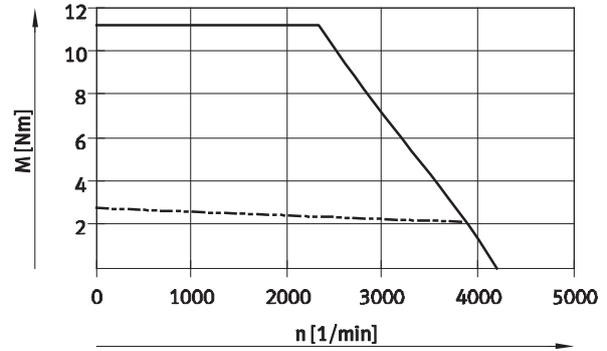
## Torque M as a function of rotational speed n

Flange size 80

Length S  
Winding LS



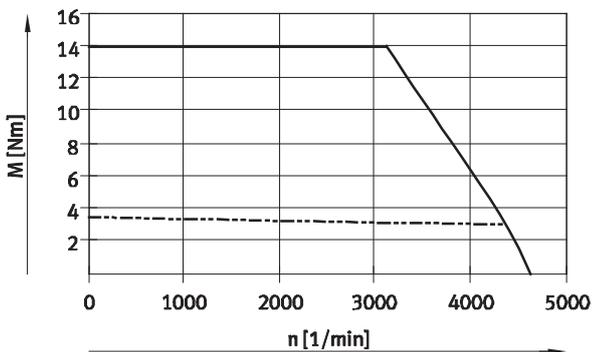
Length S  
Winding HS



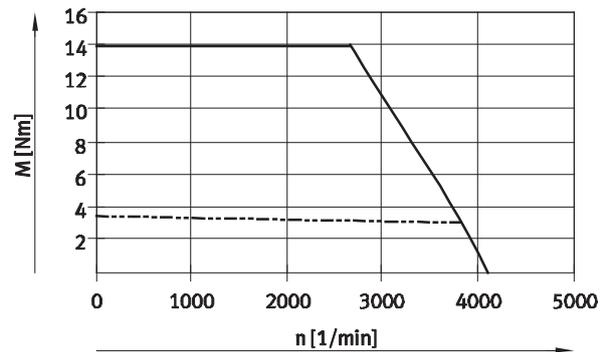
— Peak torque  
- - - - - Nominal torque

Flange size 80

Length M  
Winding LS



Length M  
Winding HS



— Peak torque  
- - - - - Nominal torque

### Note

Typical motor characteristic curve with nominal voltage and optimal controller.

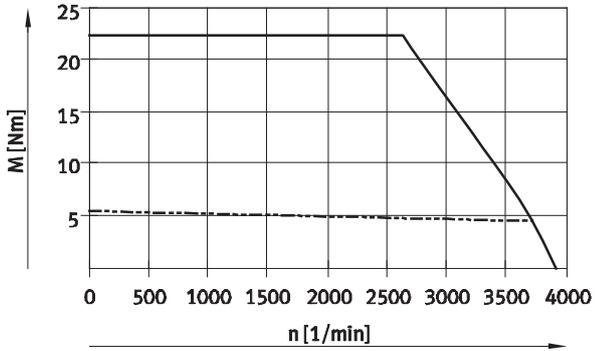
# Servo motors EMME-AS

Technical data

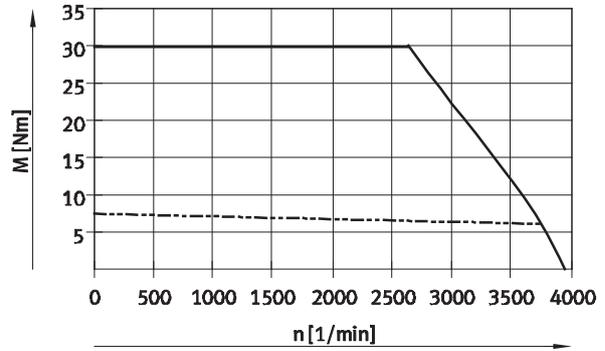
## Torque M as a function of rotational speed n

Flange size 100

Length S  
Winding HS



Length M  
Winding HS



- Peak torque
- - - - - Nominal torque

### Note

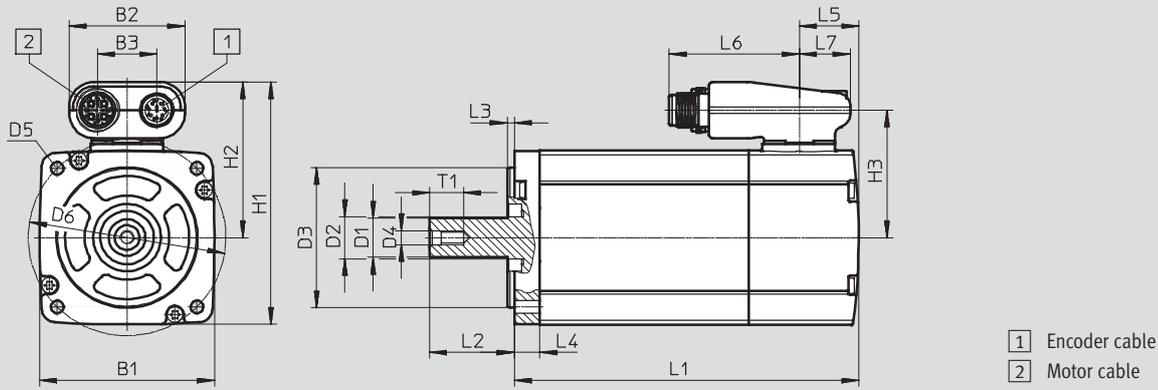
Typical motor characteristic curve with nominal voltage and optimal controller.

# Servo motors EMME-AS

Technical data

**Dimensions**

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



| Flange size | Length | B1  | B2 | B3 | D1<br>Ø<br>h6 | D2<br>Ø | D3<br>Ø<br>h7 | D4 |
|-------------|--------|-----|----|----|---------------|---------|---------------|----|
| 40          | S      | 40  | 41 | 21 | 8             | 10      | 30            | M3 |
|             | M      |     |    |    |               |         |               |    |
| 60          | S      | 62  | 41 | 21 | 14            | 15      | 50            | M5 |
|             | M      |     |    |    |               |         |               |    |
| 80          | S      | 82  | 41 | 21 | 19            | 20      | 70            | M6 |
|             | M      |     |    |    |               |         |               |    |
| 100         | S      | 102 | 41 | 21 | 19            | 25      | 95            | M6 |
|             | M      |     |    |    |               |         |               |    |

| Flange size | Length | D5<br>Ø | D6<br>Ø<br>±0.3 | H1    | H2   | H3   | L1  |                  |
|-------------|--------|---------|-----------------|-------|------|------|-----|------------------|
|             |        |         |                 |       |      |      | ±2  | With brake<br>±2 |
| 40          | S      | 3.4     | 45              | 68.5  | 48.5 | 38.5 | 89  | 124              |
|             | M      |         |                 |       |      |      | 114 | 149              |
| 60          | S      | 4.5     | 70              | 86.5  | 55.5 | 45.5 | 122 | 156              |
|             | M      |         |                 |       |      |      | 152 | 186              |
| 80          | S      | 5.5     | 90              | 106.5 | 65.5 | 55.5 | 158 | 200              |
|             | M      |         |                 |       |      |      | 178 | 220              |
| 100         | S      | 9       | 115             | 126.5 | 75.5 | 65.5 | 200 | 242              |
|             | M      |         |                 |       |      |      | 225 | 267              |

| Flange size | Length | L2          | L3<br>±0.2 | L4<br>±0.3 | L5   | L6   | L7 | T1   |
|-------------|--------|-------------|------------|------------|------|------|----|------|
| 40          | S      | 20+0.5/-0.7 | 2.5        | 4.5        | 25.3 | 46.2 | 18 | 9    |
|             | M      |             |            |            |      |      |    |      |
| 60          | S      | 30+0.5/-0.2 | 2.5        | 9          | 21   | 46.2 | 18 | 12.5 |
|             | M      |             |            |            |      |      |    |      |
| 80          | S      | 35+0.4/-0.2 | 3          | 10         | 23   | 46.2 | 18 | 16   |
|             | M      |             |            |            |      |      |    |      |
| 100         | S      | 40+0.4/-0.2 | 3          | 12         | 25.5 | 46.2 | 18 | 16   |
|             | M      |             |            |            |      |      |    |      |

# Servo motors EMME-AS

Technical data

| Ordering data – Stock items |        |                       |                              |                        |                      |                     |       | Part No. | Type                 |
|-----------------------------|--------|-----------------------|------------------------------|------------------------|----------------------|---------------------|-------|----------|----------------------|
| Length                      |        | Winding               |                              |                        | Measuring unit       |                     | Brake |          |                      |
| Short                       | Medium | Low-voltage, standard | Low-voltage, speed-optimised | High-voltage, standard | Encoder, single-turn | Encoder, multi-turn |       |          |                      |
| Flange size 40              |        |                       |                              |                        |                      |                     |       |          |                      |
| ■                           |        |                       | ■                            |                        | ■                    |                     |       | 2082428  | EMME-AS-40-S-LV-AS   |
| ■                           |        |                       | ■                            |                        | ■                    |                     | ■     | 2082430  | EMME-AS-40-S-LV-ASB  |
| ■                           |        |                       | ■                            |                        |                      | ■                   |       | 2082429  | EMME-AS-40-S-LV-AM   |
| ■                           |        |                       | ■                            |                        |                      | ■                   | ■     | 2082431  | EMME-AS-40-S-LV-AMB  |
|                             | ■      |                       | ■                            |                        | ■                    |                     |       | 2082444  | EMME-AS-40-M-LV-AS   |
|                             | ■      |                       | ■                            |                        | ■                    |                     | ■     | 2082446  | EMME-AS-40-M-LV-ASB  |
|                             | ■      |                       | ■                            |                        |                      | ■                   |       | 2082445  | EMME-AS-40-M-LV-AM   |
|                             | ■      |                       | ■                            |                        |                      | ■                   | ■     | 2082447  | EMME-AS-40-M-LV-AMB  |
| Flange size 60              |        |                       |                              |                        |                      |                     |       |          |                      |
| ■                           |        | ■                     |                              |                        | ■                    |                     |       | 2089698  | EMME-AS-60-S-LS-AS   |
| ■                           |        | ■                     |                              |                        | ■                    |                     | ■     | 2089700  | EMME-AS-60-S-LS-ASB  |
| ■                           |        | ■                     |                              |                        |                      | ■                   |       | 2089699  | EMME-AS-60-S-LS-AM   |
| ■                           |        | ■                     |                              |                        |                      | ■                   | ■     | 2089701  | EMME-AS-60-S-LS-AMB  |
|                             | ■      | ■                     |                              |                        | ■                    |                     |       | 2089730  | EMME-AS-60-M-LS-AS   |
|                             | ■      | ■                     |                              |                        | ■                    |                     | ■     | 2089732  | EMME-AS-60-M-LS-ASB  |
|                             | ■      | ■                     |                              |                        |                      | ■                   |       | 2089731  | EMME-AS-60-M-LS-AM   |
|                             | ■      | ■                     |                              |                        |                      | ■                   | ■     | 2089733  | EMME-AS-60-M-LS-AMB  |
| Flange size 80              |        |                       |                              |                        |                      |                     |       |          |                      |
| ■                           |        | ■                     |                              |                        | ■                    |                     |       | 2093104  | EMME-AS-80-S-LS-AS   |
| ■                           |        | ■                     |                              |                        | ■                    |                     | ■     | 2093106  | EMME-AS-80-S-LS-ASB  |
| ■                           |        | ■                     |                              |                        |                      | ■                   |       | 2093105  | EMME-AS-80-S-LS-AM   |
| ■                           |        | ■                     |                              |                        |                      | ■                   | ■     | 2093107  | EMME-AS-80-S-LS-AMB  |
| ■                           |        |                       |                              | ■                      | ■                    |                     |       | 2093136  | EMME-AS-80-S-HS-AS   |
| ■                           |        |                       |                              | ■                      | ■                    |                     | ■     | 2093138  | EMME-AS-80-S-HS-ASB  |
| ■                           |        |                       |                              | ■                      |                      | ■                   |       | 2093137  | EMME-AS-80-S-HS-AM   |
| ■                           |        |                       |                              | ■                      |                      | ■                   | ■     | 2093139  | EMME-AS-80-S-HS-AMB  |
|                             | ■      | ■                     |                              |                        | ■                    |                     |       | 2093168  | EMME-AS-80-M-LS-AS   |
|                             | ■      | ■                     |                              |                        | ■                    |                     | ■     | 2093170  | EMME-AS-80-M-LS-ASB  |
|                             | ■      | ■                     |                              |                        |                      | ■                   |       | 2093169  | EMME-AS-80-M-LS-AM   |
|                             | ■      | ■                     |                              |                        |                      | ■                   | ■     | 2093171  | EMME-AS-80-M-LS-AMB  |
|                             | ■      |                       |                              | ■                      | ■                    |                     |       | 2093200  | EMME-AS-80-M-HS-AS   |
|                             | ■      |                       |                              | ■                      | ■                    |                     | ■     | 2093202  | EMME-AS-80-M-HS-ASB  |
|                             | ■      |                       |                              | ■                      |                      | ■                   |       | 2093201  | EMME-AS-80-M-HS-AM   |
|                             | ■      |                       |                              | ■                      |                      | ■                   | ■     | 2093203  | EMME-AS-80-M-HS-AMB  |
| Flange size 100             |        |                       |                              |                        |                      |                     |       |          |                      |
| ■                           |        |                       |                              | ■                      | ■                    |                     |       | 2103467  | EMME-AS-100-S-HS-AS  |
| ■                           |        |                       |                              | ■                      | ■                    |                     | ■     | 2103469  | EMME-AS-100-S-HS-ASB |
| ■                           |        |                       |                              | ■                      |                      | ■                   |       | 2103468  | EMME-AS-100-S-HS-AM  |
| ■                           |        |                       |                              | ■                      |                      | ■                   | ■     | 2103470  | EMME-AS-100-S-HS-AMB |
|                             | ■      |                       |                              | ■                      | ■                    |                     |       | 2103499  | EMME-AS-100-M-HS-AS  |
|                             | ■      |                       |                              | ■                      | ■                    |                     | ■     | 2103501  | EMME-AS-100-M-HS-ASB |
|                             | ■      |                       |                              | ■                      |                      | ■                   |       | 2103500  | EMME-AS-100-M-HS-AM  |
|                             | ■      |                       |                              | ■                      |                      | ■                   | ■     | 2103502  | EMME-AS-100-M-HS-AMB |

# Servo motors EMME-AS

Accessories

## Gear unit EMGA



| Technical data                         |                      |                     |       |                   |       |
|--|----------------------|---------------------|-------|-------------------|-------|
| For motor flange size                  |                      | 40                  |       | 60                |       |
| Gear unit type                         |                      | EMGA-40-P-G...-40   |       | EMGA-60-P-G...-60 |       |
| Gear ratio                             | [i]                  | 3                   | 5     | 3                 | 5     |
| Gear unit type                         |                      | Planetary gear unit |       |                   |       |
| Continuous output torque <sup>1)</sup> | [Nm]                 | 11                  | 14    | 28                | 40    |
| Max. output torque <sup>2)</sup>       | [Nm]                 | 17.6                | 22    | 45                | 64    |
| Max. drive speed                       | [rpm]                | 18,000              |       | 13,000            |       |
| Torsional rigidity                     | [Nm/arcmin]          | 1                   |       | 2.3               |       |
| Torsional backlash                     | [deg]                | 0.25                |       | 0.17              |       |
| Mass moment of inertia <sup>3)</sup>   | [kgcm <sup>2</sup> ] | 0.031               | 0.019 | 0.135             | 0.078 |
| Max. efficiency                        | [%]                  | 98                  |       |                   |       |
| Operating temperature <sup>4)</sup>    | [°C]                 | -25 ... +90         |       |                   |       |
| Protection class                       |                      | IP54                |       |                   |       |
| Product weight                         | [g]                  | 350                 |       | 900               |       |

|  |                      |                     |      |                     |      |
|--|----------------------|---------------------|------|---------------------|------|
| For motor flange size                  |                      | 80                  |      | 100                 |      |
| Gear unit type                         |                      | EMGA-80-P-G...-80   |      | EMGA-120-P-G...-100 |      |
| Gear ratio                             | [i]                  | 3                   | 5    | 3                   | 5    |
| Gear unit type                         |                      | Planetary gear unit |      |                     |      |
| Continuous output torque <sup>1)</sup> | [Nm]                 | 85                  | 110  | 115                 | 195  |
| Max. output torque <sup>2)</sup>       | [Nm]                 | 136                 | 176  | 184                 | 312  |
| Max. drive speed                       | [rpm]                | 7,000               |      | 6,500               |      |
| Torsional rigidity                     | [Nm/arcmin]          | 6                   |      | 12                  |      |
| Torsional backlash                     | [deg]                | 0.12                |      | 0.12                |      |
| Mass moment of inertia <sup>3)</sup>   | [kgcm <sup>2</sup> ] | 0.77                | 0.45 | 2.63                | 1.53 |
| Max. efficiency                        | [%]                  | 98                  |      | 96                  |      |
| Operating temperature <sup>4)</sup>    | [°C]                 | -25 ... +90         |      |                     |      |
| Protection class                       |                      | IP54                |      |                     |      |
| Product weight                         | [g]                  | 2,000               |      | 6,000               |      |

- 1) At the output shaft
- 2) The specifications refer to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30 °C
- 3) Referred to the drive shaft
- 4) Note the temperature range of the motor

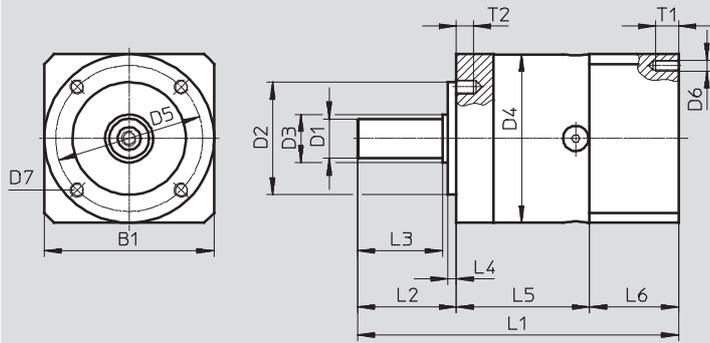
# Servo motors EMME-AS

Accessories

**FESTO**

**Dimensions**

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



| Type                | B1  | D1<br>Ø<br>h7 | D2<br>Ø<br>h7 | D3<br>Ø | D4<br>Ø | D5<br>Ø | D6 | D7  |
|---------------------|-----|---------------|---------------|---------|---------|---------|----|-----|
| EMGA-40-P-G...-40   | 40  | 10            | 26            | 12      | 40      | 34      | M3 | M4  |
| EMGA-60-P-G...-60   | 60  | 14            | 40            | 17      | 60      | 52      | M4 | M5  |
| EMGA-80-P-G...-80   | 80  | 20            | 60            | 25      | 80      | 70      | M5 | M6  |
| EMGA-80-P-G...-100  | 100 | 20            | 60            | 25      | 80      | 70      | M8 | M6  |
| EMGA-120-P-G...-100 | 115 | 25            | 80            | 35      | 115     | 100     | M8 | M10 |

| Type                | L1    | L2 | L3<br>±0.2 | L4<br>±0.2 | L5 | L6   | T1 | T2 |
|---------------------|-------|----|------------|------------|----|------|----|----|
| EMGA-40-P-G...-40   | 93.5  | 26 | 23         | 2          | 39 | 28.5 | 8  | 6  |
| EMGA-60-P-G...-60   | 113.5 | 35 | 30         | 3          | 47 | 31   | 10 | 8  |
| EMGA-80-P-G...-80   | 138.5 | 40 | 36         | 3          | 60 | 38.5 | 12 | 10 |
| EMGA-80-P-G...-100  | 143.5 | 40 | 36         | 3          | 60 | 43.5 | 16 | 10 |
| EMGA-120-P-G...-100 | 176.5 | 55 | 50         | 4          | 74 | 47.5 | 20 | 16 |

**Ordering data**

| For motor flange size | Gear ratio | Part No. | Type                  |
|-----------------------|------------|----------|-----------------------|
| 40                    | 3          | 2297684  | EMGA-40-P-G3-EAS-40   |
|                       | 5          | 2297685  | EMGA-40-P-G5-EAS-40   |
| 60                    | 3          | 2297686  | EMGA-60-P-G3-EAS-60   |
|                       | 5          | 2297687  | EMGA-60-P-G5-EAS-60   |
| 80                    | 3          | 2297690  | EMGA-80-P-G3-EAS-80   |
|                       | 5          | 2297691  | EMGA-80-P-G5-EAS-80   |
| 100                   | 3          | 552194   | EMGA-80-P-G3-SAS-100  |
|                       | 5          | 552195   | EMGA-80-P-G5-SAS-100  |
|                       | 3          | 552196   | EMGA-120-P-G3-SAS-100 |
|                       | 5          | 552197   | EMGA-120-P-G5-SAS-100 |

# Servo motors EMME-AS

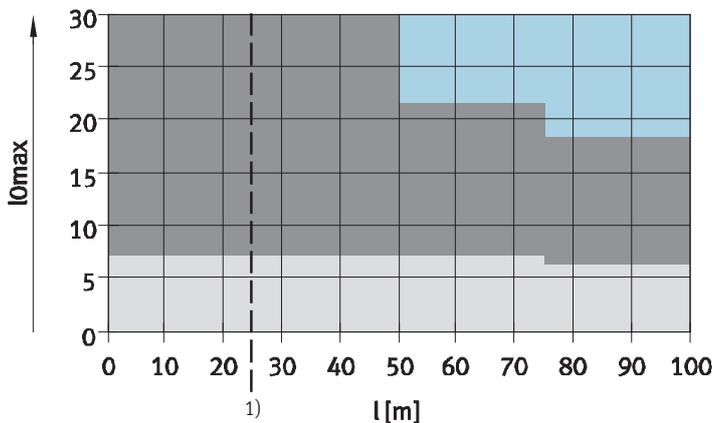
Accessories

| Technical data – Cables                    |   |   |
|--|---|---|
| Designation                                | Motor cable                                       |   |
| For motor                                  | EMME-AS-40/60                                     | EMME-AS-80/100                                    |
| Type                                       | NEBM-M16G8-...-Q7-...                             | NEBM-M16G8-...-Q9-...                             |
| Cable composition                          | 2x (2x 0.25 mm <sup>2</sup> ) (3 A, 48 V, 0.5 KV) | 2x (2x 0.5 mm <sup>2</sup> ) (8 A, 300 V, 2.5 KV) |
|  | 4x 0.75 mm <sup>2</sup> (12 A, 600 V, 2.5 KV)     | 4 x 1.5 mm <sup>2</sup> (16 A, 600 V, 2.5 KV)     |
|  | Screened  |   |
| Degree of contamination                    | 3   |   |
| Min. bending radius [mm]                   | 55  | 64  |
| Ambient temperature [°C]                   | -50 ... +90                                       |   |
| Ambient temperature <sup>1)</sup> [°C]     | -40 ... +90                                       |   |
| Cable characteristics                      | Suitable for use with energy chains               |   |
| Protection class                           | IP65 (in assembled state)                         |   |
| Material                                   | Polyurethane                                      |   |
| Note on materials                          | RoHS-compliant                                    |   |
| CE marking (see declaration of conformity) | To EU Low Voltage Directive                       |   |

| Designation                            | Encoder cable                       |  |
|--|-------------------------------------|--|
| For motor                              | EMME-AS-40/60/80/100                |  |
| Type                                   | NEBM-M12G8-...                      |  |
| Cable composition                      | 4x (2x 0.14 mm <sup>2</sup> )       |  |
|  | Screened                            |  |
| Degree of contamination                | 3                                   |  |
| Min. bending radius [mm]               | 68                                  |  |
| Ambient temperature [°C]               | -40 ... +80                         |  |
| Ambient temperature <sup>1)</sup> [°C] | -5 ... +80                          |  |
| Cable characteristics                  | Suitable for use with energy chains |  |
| Protection class                       | IP65 (in assembled state)           |  |
| Material                               | Polyurethane                        |  |
| Note on materials                      | RoHS-compliant                      |  |

1) With flexible cable installation

### Recommended cable cross section as a function of cable length $l$ and max. motor current $I_0$

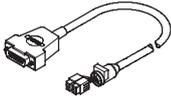


1) Cable lengths > 25 m possible following technical clarification; up to 100 m on request.

- No standard
- 1,5 mm<sup>2</sup>
- 0,75 mm<sup>2</sup>

## Servo motors EMME-AS

Accessories

| Ordering data  |  |          |                          |
|--|--|----------|--------------------------|
|  | Cable length [m]   | Part No. | Type                     |
| <b>Motor cable</b>   |  |          |                          |
|   | For EMME-AS-40/60 (cable cross section: 0.75 mm <sup>2</sup> ) |          |                          |
|  | 2.5  | 8004662  | NEBM-M16G8-E-2.5-Q7-LE8  |
|  | 5  | 8003770  | NEBM-M16G8-E-5-Q7-LE8    |
|  | 7.5  | 8004663  | NEBM-M16G8-E-7.5-Q7-LE8  |
|  | 10   | 8003771  | NEBM-M16G8-E-10-Q7-LE8   |
|  | 15   | 8003772  | NEBM-M16G8-E-15-Q7-LE8   |
|  | X length <sup>1)</sup>   | 8003773  | NEBM-M16G8-E-Q7-LE8      |
|   | For EMME-AS-80/100 (cable cross section: 1.5 mm <sup>2</sup> ) |          |                          |
|  | 2.5  | 8004660  | NEBM-M16G8-E-2.5-Q9-LE8  |
|  | 5  | 8003766  | NEBM-M16G8-E-5-Q9-LE8    |
|  | 7.5  | 8004661  | NEBM-M16G8-E-7.5-Q9-LE8  |
|  | 10   | 8003767  | NEBM-M16G8-E-10-Q9-LE8   |
|  | 15   | 8003768  | NEBM-M16G8-E-15-Q9-LE8   |
|  | X length <sup>1)</sup>   | 8003769  | NEBM-M16G8-E-Q9-LE8      |
| <b>Encoder cable</b>   |  |          |                          |
|  | For EMME-AS-40/60/80/100                                       |          |                          |
|  | 2.5  | 8004664  | NEBM-M12G8-E-2.5-N-S1G15 |
|  | 5  | 8003762  | NEBM-M12G8-E-5-N-S1G15   |
|  | 7.5  | 8004665  | NEBM-M12G8-E-7.5-N-S1G15 |
|  | 10   | 8003763  | NEBM-M12G8-E-10-N-S1G15  |
|  | 15   | 8003764  | NEBM-M12G8-E-15-N-S1G15  |
|  | X length <sup>1)</sup>   | 8003765  | NEBM-M12G8-E-N-S1G15     |

1) Max. 25 m. Cable lengths > 25 m possible following technical clarification; up to 100 m on request.  
Available in 0.1 m increments.

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