

# Low Inertia Servo Motors - SMB / SMH

## Overview

### Description

The SMB / SMH\* Series of highly-dynamic brushless servo motors have been design to combine the cutting-edge technology of Parker Hannifin products with an extremely high performance. Thanks to the innovative “salient pole” technology, the motor’s dimensions are considerably reduced with significant advantages in terms of specific torque, overall dimensions and dynamic performance. Compared to traditional-technology brushless servo motors, the specific torque is approximately 30 % higher, overall dimensions are considerably reduced and, consequently rotor inertias are extremely low. Thanks to the high quality of Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the SMB/H motors can achieve very high acceleration and withstand high overloads without risk of demagnetisation or detachment of the magnets. Specific applications for the SMB/H Series include all types especially those for the packaging and handling industry, and all those applications where very high dynamic performances and very low inertias are required.

### Features

- High number of feedback options
- Customised windings/voltages
- Increased Inertia option
- Multiple connection options

### Application

- Food, Pharma & Beverage
- Packaging Machines
- Material Forming
- Material Handling
- Factory Automation
- Life Science Diagnostic
- Automotive Industry / In-Plant
- Printing Industry
- Textile Machines
- Robotics
- Servo Hydraulic Pumps



### Technical Characteristics - Overview

|                                      |                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------|
| <b>Motor Type</b>                    | Permanent magnets synchronous servomotor                                          |
| <b>Rotor Design</b>                  | Rotor with surface rare earth magnets                                             |
| <b>Number of poles</b>               | 10 for SM_ 42<br>8 for SM_ 60-82-100-115-142                                      |
| <b>Power Range</b>                   | 0.2 – 5.3 kW                                                                      |
| <b>Torque Range</b>                  | 0.35 – 17 Nm                                                                      |
| <b>Speed Range</b>                   | 0 – 7500 min <sup>-1</sup>                                                        |
| <b>Mounting</b>                      | Flange with smooth holes                                                          |
| <b>Shaft End</b>                     | Plain keyed shaft<br>Plain smooth shaft (option)                                  |
| <b>Cooling</b>                       | Natural ventilation                                                               |
| <b>Protection Level (IEC60034-5)</b> | IP64<br>IP65 (option)                                                             |
| <b>Feedback sensor</b>               | Resolver<br>Absolute Endat or Hiperface<br>Incremental Encoder                    |
| <b>Other options</b>                 | Brake<br>Thermal protection (PTC for SMB and KTY for SMH)<br>Increased inertia    |
| <b>Marking</b>                       | CE / UL                                                                           |
| <b>Voltage Supply</b>                | 230 / 400 VAC<br>other voltage uder request                                       |
| <b>Temperature Class</b>             | Class F                                                                           |
| <b>Connections</b>                   | Connectors<br>Flying cables<br>Terminal Box<br>(see table option for combination) |

\* SMB: for Drives TPD-M, SLVD-N, TWIN-N, SPD-N, Hi-Drive  
SMH: for Drive Compax3



# Technical Characteristics

## Technical Data

### 230 VAC supply voltage

| Model <sup>(4)</sup> | Size | Stall <sup>(1)</sup>                         |                         | Nominal <sup>(1)</sup>    |                           |                          | Peak <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2) (3)</sup> | Kt <sup>(2) (3)</sup> |
|----------------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|---------------------|---------------------------|---------------------------|-----------------------|-----------------------|
|                      |      | Torque                                       | Current                 | Torque                    | Speed                     | Current                  | Torque              | No brake                  | With brake                |                       |                       |
|                      |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] |                     | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] |                       |                       |
| SM_42 60 0.35        | 42   | 0.35<br>0.45                                 | 0.78                    | 0.15                      | 6000                      | 0.38                     | 0.9                 | 13                        | n.a.                      | 0.29                  | 0.46                  |
| SM_60 30 0.55        | 60   | 0.55<br>(0.68)                               | 0.7                     | 0.50                      | 3000                      | 0.66                     | 1.7                 | 18                        | 30.5                      | 0.44                  | 0.76                  |
| SM_60 45 0.55        |      |                                              | 1.0                     | 0.39                      | 4500                      | 0.74                     |                     |                           |                           | 0.30                  | 0.53                  |
| SM_60 60 0.55        |      |                                              | 1.4                     | 0.24                      | 6000                      | 0.60                     |                     |                           |                           | 0.23                  | 0.40                  |
| SM_60 16 1.4         |      | 1.4<br>(1.7)                                 | 0.95                    | 1.35                      | 1600                      | 0.91                     | 4.4                 | 30                        | 42.5                      | 0.85                  | 1.48                  |
| SM_60 30 1.4         |      |                                              | 1.73                    | 1.20                      | 3000                      | 1.50                     |                     |                           |                           | 0.47                  | 0.81                  |
| SM_60 45 1.4         |      |                                              | 2.37                    | 1.00                      | 4500                      | 1.69                     |                     |                           |                           | 0.34                  | 0.59                  |
| SM_60 60 1.4         |      |                                              | 2.98                    | 0.80                      | 6000                      | 1.70                     |                     |                           |                           | 0.27                  | 0.47                  |
| SM_60 75 1.4         |      |                                              | 3.85                    | 0.15                      | 7500                      | 0.41                     |                     |                           |                           | 0.21                  | 0.36                  |
| SM_82 10 03          | 82   | 3 (3.7)                                      | 1.2                     | 2.9                       | 1000                      | 1.2                      | 9                   | 140                       | 183                       | 1.43                  | 2.48                  |
| SM_82 16 03          |      |                                              | 1.8                     | 2.9                       | 1600                      | 1.7                      |                     |                           |                           | 0.96                  | 1.66                  |
| SM_82 30 03          |      |                                              | 3.1                     | 2.7                       | 3000                      | 2.8                      |                     |                           |                           | 0.55                  | 0.96                  |
| SM_82 33 03          |      |                                              | 3.5                     | 2.4                       | 3300                      | 2.8                      |                     |                           |                           | 0.49                  | 0.85                  |
| SM_82 45 03          |      |                                              | 4.7                     | 2.2                       | 4500                      | 3.4                      |                     |                           |                           | 0.37                  | 0.64                  |
| SM_82 60 03          |      |                                              | 6.1                     | 1.5                       | 6000                      | 3.1                      |                     |                           |                           | 0.28                  | 0.49                  |
| SM_82 75 03          |      |                                              | 7.5                     | 0.6                       | 7500                      | 1.6                      |                     |                           |                           | 0.23                  | 0.40                  |
| SM_100 16 06         | 100  | 6 (9)                                        | 3.7                     | 5.8                       | 1600                      | 3.6                      | 18                  | 336                       | 440                       | 0.92                  | 1.60                  |
| SM_100 30 06         |      |                                              | 5.9                     | 5.0                       | 3000                      | 4.9                      |                     |                           |                           | 0.59                  | 1.02                  |
| SM_100 45 06         |      |                                              | 9.4                     | 3.5                       | 4500                      | 5.5                      |                     |                           |                           | 0.37                  | 0.64                  |
| SM_100 55 06         |      |                                              | 11.8                    | 2.6                       | 5500                      | 5.1                      |                     |                           |                           | 0.29                  | 0.51                  |
| SM_100 75 06         |      |                                              | 14.7                    | 0.6                       | 7500                      | 1.5                      |                     |                           |                           | 0.24                  | 0.41                  |
| SM_115 16 10         | 115  | 10 (12.5)                                    | 6.0                     | 9.0                       | 1600                      | 5.4                      | 32                  | 900                       | 1000                      | 0.96                  | 1.66                  |
| SM_115 30 10         |      |                                              | 10.5                    | 8.0                       | 3000                      | 8.4                      |                     |                           |                           | 0.55                  | 0.95                  |
| SM_115 40 10         |      |                                              | 14.7                    | 7.6                       | 4000                      | 11.2                     |                     |                           |                           | 0.39                  | 0.68                  |
| SM_115 54 10         |      |                                              | 18.2                    | 7.1                       | 5400                      | 12.9                     |                     |                           |                           | 0.32                  | 0.55                  |
| SM_142 18 15         | 142  | 15 (19)                                      | 9.7                     | 13.3                      | 1800                      | 8.6                      | 47                  | 1400                      | 1600                      | 0.89                  | 1.54                  |
| SM_142 30 15         |      |                                              | 16.0                    | 12.5                      | 3000                      | 13.4                     |                     |                           |                           | 0.54                  | 0.94                  |

<sup>(1)</sup> Data referred to motor mounted on a steel flange in horizontal position with dim. 200x230x20 mm (for SM\_60,82), dim. 200x270x20 mm (for SM\_100,115,142). Stall torques refer to motor turning at 100 min<sup>-1</sup>

<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %

<sup>(4)</sup> SMB: for Drives TPD-M, SLVD-N, TwinN, SPDN, Hi-Drive  
SMH: for Drive Compax3

## 400 VAC power supply

| Model <sup>(4)</sup> | Size | Stall <sup>(1)</sup>                         |                         | Nominal <sup>(1)</sup>    |                           |                          | Peak <sup>(1)</sup>      | Inertia                   |                           | Ke <sup>(2) (3)</sup> | Kt <sup>(2) (3)</sup>        |
|----------------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|--------------------------|---------------------------|---------------------------|-----------------------|------------------------------|
|                      |      | Torque                                       | Current                 | Torque                    | Speed                     | Current                  | Torque                   | No brake                  | With brake                |                       |                              |
|                      |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm] | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]            | Kt<br>[Nm/A <sub>rms</sub> ] |
| SM_60 30 1.4         | 60   | 1.4<br>(1.7)                                 | 0.95                    | 1.2                       | 3000                      | 0.81                     | 4.4                      | 30                        | 42.5                      | 0.81                  | 1.48                         |
| SM_60 45 1.4         |      |                                              | 1.37                    | 1.0                       | 4500                      | 0.98                     |                          |                           |                           | 0.59                  | 1.02                         |
| SM_60 60 1.4         |      |                                              | 1.73                    | 0.8                       | 6000                      | 0.99                     |                          |                           |                           | 0.68                  | 0.81                         |
| SM_60 75 1.4         |      |                                              | 2.15                    | 0.15                      | 7500                      | 0.23                     |                          |                           |                           | 0.38                  | 0.65                         |
| SM_82 30 03          | 82   | 3<br>(3.7)                                   | 1.8                     | 2.7                       | 3000                      | 1.6                      | 9                        | 140                       | 183                       | 0.96                  | 1.66                         |
| SM_82 45 03          |      |                                              | 2.7                     | 2.2                       | 4500                      | 2.0                      |                          |                           |                           | 0.64                  | 1.11                         |
| SM_82 56 03          |      |                                              | 3.1                     | 1.6                       | 5600                      | 1.7                      |                          |                           |                           | 0.55                  | 0.96                         |
| SM_82 60 03          |      |                                              | 3.5                     | 1.7                       | 6000                      | 2.0                      |                          |                           |                           | 0.49                  | 0.85                         |
| SM_82 75 03          |      |                                              | 4.4                     | 0.6                       | 7500                      | 0.9                      |                          |                           |                           | 0.39                  | 0.68                         |
| SM_100 30 06         | 100  | 6<br>(9)                                     | 3.7                     | 5.0                       | 3000                      | 3.1                      | 18                       | 336                       | 440                       | 0.92                  | 1.60                         |
| SM_100 45 06         |      |                                              | 5.6                     | 3.5                       | 4500                      | 3.3                      |                          |                           |                           | 0.62                  | 1.07                         |
| SM_100 56 06         |      |                                              | 5.9                     | 2.5                       | 5600                      | 2.4                      |                          |                           |                           | 0.59                  | 1.02                         |
| SM_100 75 06         |      |                                              | 9.4                     | 0.6                       | 7500                      | 0.9                      |                          |                           |                           | 0.37                  | 0.64                         |
| SM_115 20 10         | 115  | 10<br>(12.5)                                 | 4.5                     | 9.0                       | 2000                      | 4.06                     | 32                       | 900                       | 1000                      | 1.28                  | 2.22                         |
| SM_115 30 10         |      |                                              | 6.0                     | 8.0                       | 3000                      | 4.82                     |                          |                           |                           | 0.96                  | 1.66                         |
| SM_115 40 10         |      |                                              | 8.0                     | 7.6                       | 4000                      | 6.05                     |                          |                           |                           | 0.73                  | 1.26                         |
| SM_115 56 10         |      |                                              | 10.5                    | 6.0                       | 5600                      | 6.30                     |                          |                           |                           | 0.55                  | 0.95                         |
| SM_142 20 15         | 142  | 15<br>(19)                                   | 6.4                     | 13.0                      | 2000                      | 5.5                      | 47                       | 1400                      | 1600                      | 1.36                  | 2.35                         |
| SM_142 30 15         |      |                                              | 9.7                     | 12.5                      | 3000                      | 8.1                      |                          |                           |                           | 0.89                  | 1.54                         |
| SM_142 45 15         |      |                                              | 14.4                    | 10.9                      | 4500                      | 10.5                     |                          |                           |                           | 0.60                  | 1.04                         |
| SM_142 56 15         |      |                                              | 16.0                    | 9.2                       | 5600                      | 9.8                      |                          |                           |                           | 0.54                  | 0.94                         |
| SM_170 10 36         | 170  | available on request                         |                         |                           |                           |                          |                          |                           |                           |                       |                              |
| SM_170 27 36         |      |                                              |                         |                           |                           |                          |                          |                           |                           |                       |                              |

<sup>(1)</sup> Data referred to motor mounted on a steel flange in horizontal position with dim. 200x230x20 mm (for SM\_60,82), dim. 200x270x20 mm (for SM\_100,115,142). Stall torques refer to motor turning at 100 min<sup>-1</sup>

<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %

<sup>(4)</sup> SMB: for Drives TPD-M, SLVD-N, TwinN, SPDN, Hi-Drive  
SMH: for Drive Compax3

## STANDARDS

In compliance with: 73/23/CEE and 93/68/CEE

- EN60034-1
- EN60034-5
- EN60034-5/A1
- EN60034-9
- EN60034-14

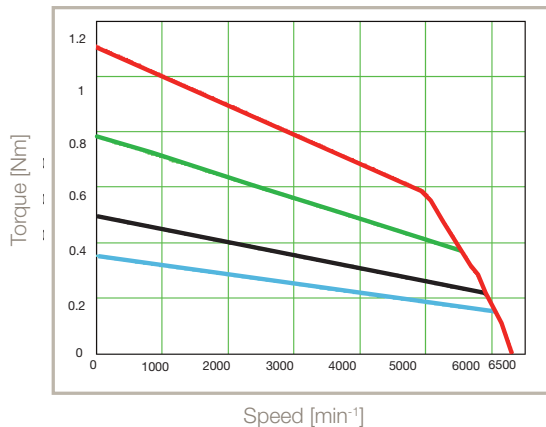
Marked  Marked  (except SM\_42)



## Speed Torque Curves

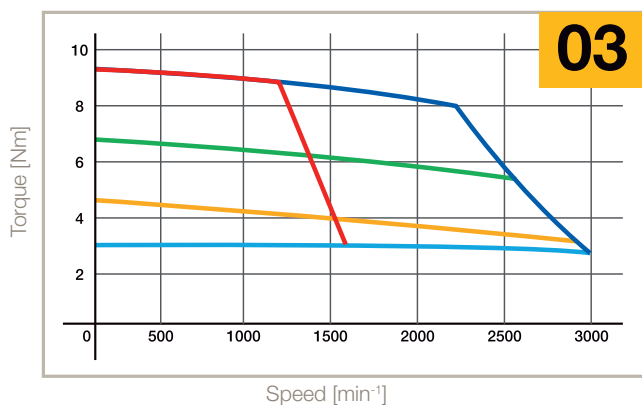
### SMB/H42

6000 min<sup>-1</sup> 230 V

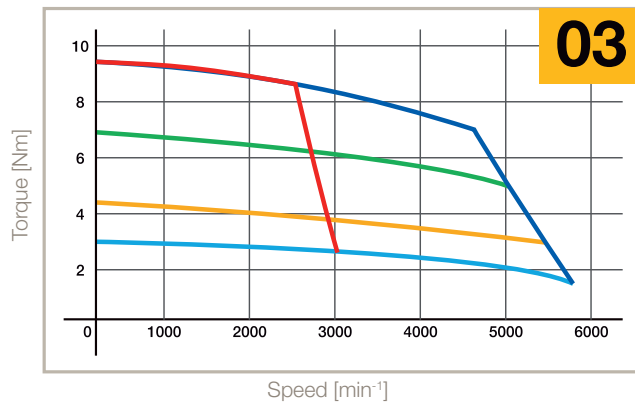


### SMB/H82

1600 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V

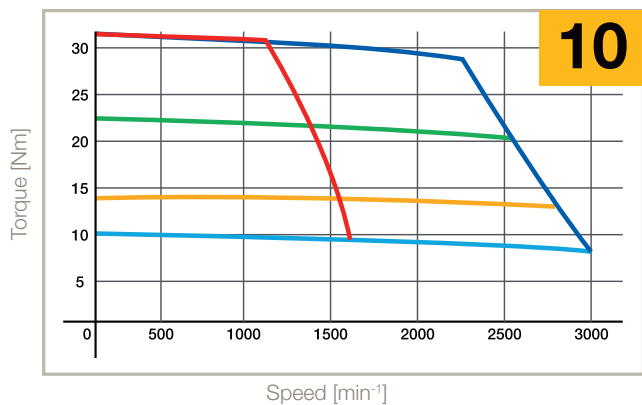


3000 min<sup>-1</sup> 230 V - 5600 min<sup>-1</sup> 400 V

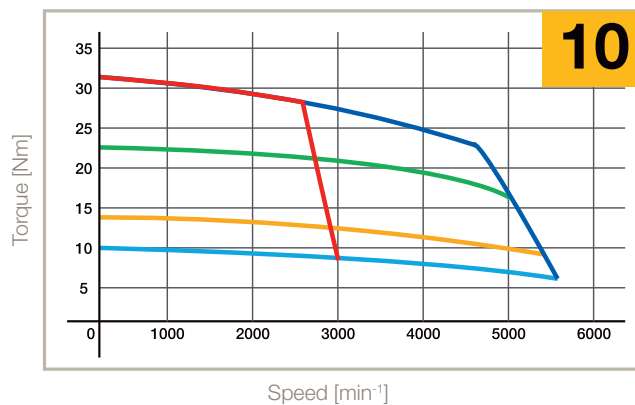


### SMB/H115

1600 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



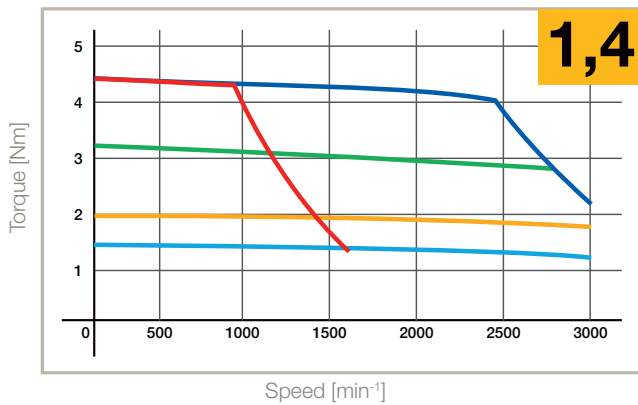
3000 min<sup>-1</sup> 230 V - 5600 min<sup>-1</sup> 400 V



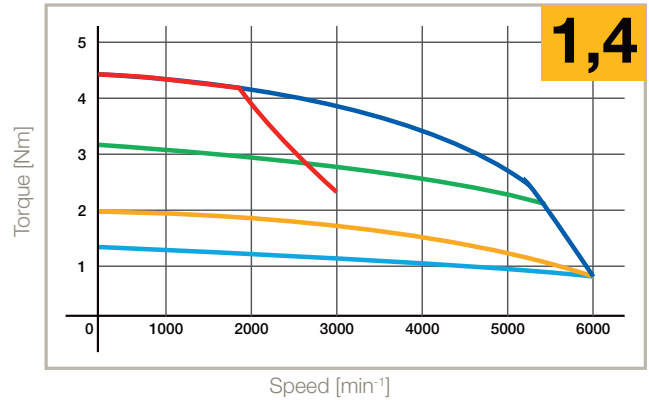
- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

### SMB/H60

1600 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V

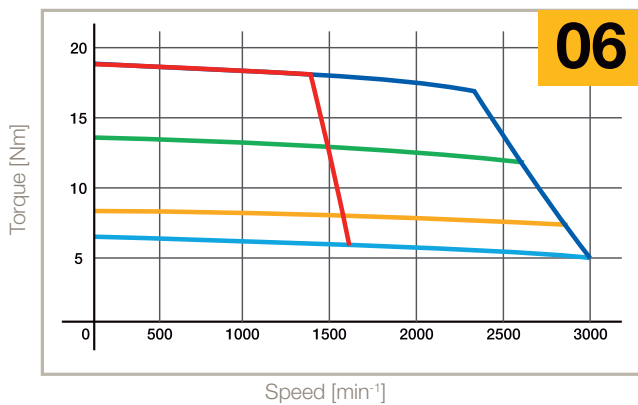


3000 min<sup>-1</sup> 230 V - 6000 min<sup>-1</sup> 400 V

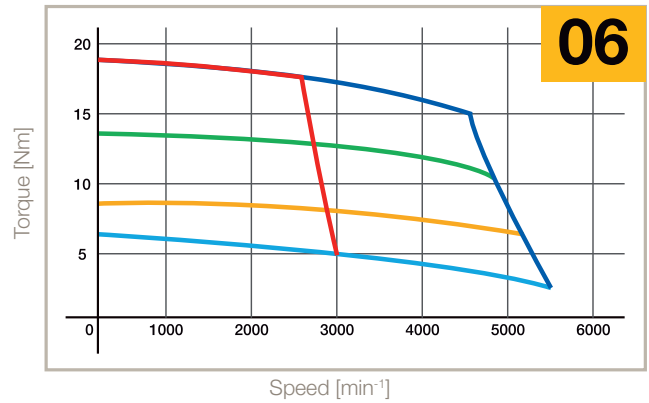


### SMB/H100

1600 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V

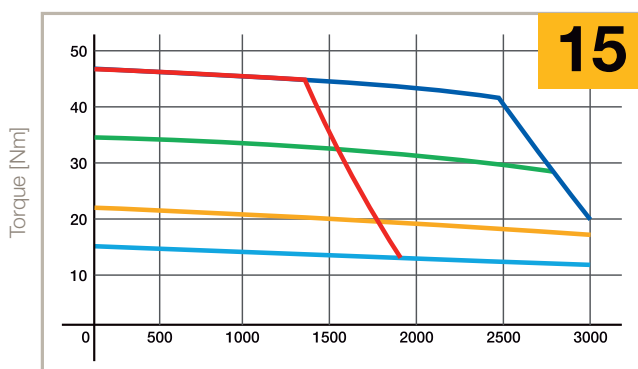


3000 min<sup>-1</sup> 230 V - 5600 min<sup>-1</sup> 400 V

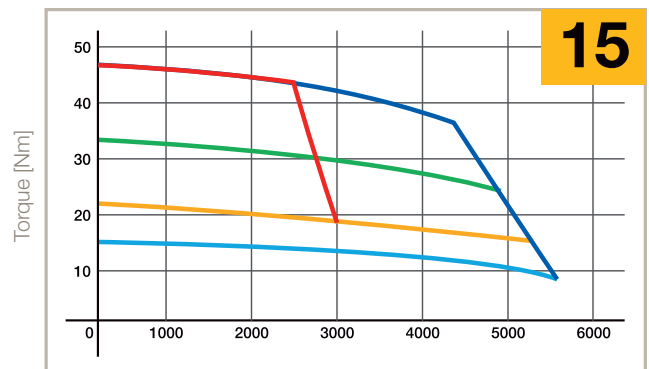


### SMB/H142

1800 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



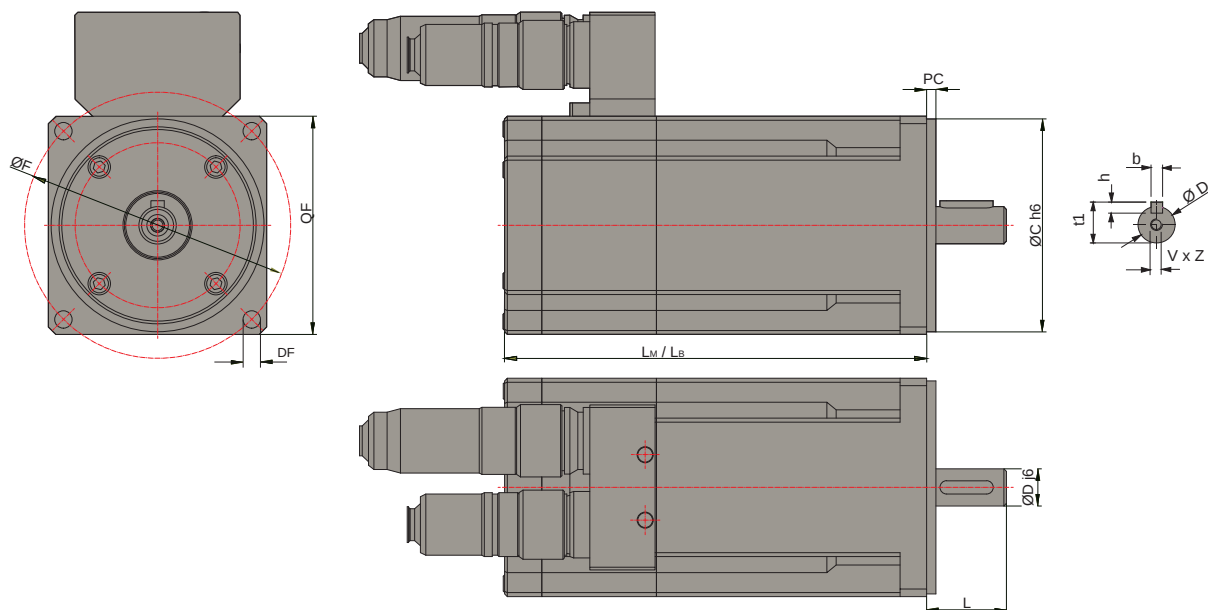
3000 min<sup>-1</sup> 230 V - 5600 min<sup>-1</sup> 400 V



— S1 65 K, ΔT  
 — S3 10 %, 5 min, 230 V  
 — S3 10 %, 5 min, 400 V  
 — S3 50 %, 5 min  
 — S3 20 %, 5 min



## Dimensions



| Motors Size |     |      | LM<br>LB       | Weight | DxL                                                   | bxh               | t1               | VxZ                       | C        | F          | DF       | G          | PC         | QF         | Order<br>Code QF |
|-------------|-----|------|----------------|--------|-------------------------------------------------------|-------------------|------------------|---------------------------|----------|------------|----------|------------|------------|------------|------------------|
| SMB / H     | 42  | 0.35 | 110            | 0.85   | 9x25                                                  | -                 | -                | M3x9                      | 30       | 50         | 3.2      | 57         | 2.5        | 42         | 5                |
|             |     | 0.55 | 88<br>137      | -<br>1 | 9x20<br>11x23                                         | 3x3<br>4x4        | 10.2<br>12.5     | -<br>M4x10                | 40<br>60 | 63<br>75   | 5.5<br>6 | 74<br>90   | -<br>2.5   | 60<br>70   | 8<br>5           |
|             | 60  | 1.4  | 129.5<br>161   | 1.5    | 9x20<br>11x23                                         | 3x3<br>4x4        | 10.2<br>12.5     | M4x10                     | 40<br>60 | 63<br>75   | 5.5<br>6 | 74<br>90   | 2.5<br>2.5 | 60<br>70   | 8<br>5           |
|             |     |      |                |        |                                                       |                   |                  |                           |          |            |          |            |            |            |                  |
|             | 82  | 03   | 159<br>202     | 3.6    | 11x23 <sup>(2)</sup><br>14x30                         | 4x4               | 12.5             | M4x12                     | 60       | 75         | 6        | 90         | 3.5        | 70         | 7                |
|             |     |      | 163.5<br>206.5 | 3.6    | 11x23 <sup>(2)</sup><br>14x30<br>19x40 <sup>(1)</sup> | 5x5<br>6x6        | 16<br>21.5       | M4x12<br>M5x12.5<br>M6x16 | 80<br>95 | 100<br>115 | 6.5<br>9 | 112<br>135 | 3.5<br>3.5 | 82<br>100  | 8<br>5           |
|             |     |      |                |        |                                                       |                   |                  |                           |          |            |          |            |            |            |                  |
|             | 100 | 06   | 191.5<br>238.5 | 4.7    | 19x40<br>24x50                                        | 6x6<br>8x7        | 21.5<br>27       | M6x16<br>M8x19            | 80<br>95 | 100<br>115 | 7<br>9   | 135<br>135 | 3.5<br>3.5 | 100<br>100 | 8<br>5           |
|             |     |      |                |        |                                                       |                   |                  |                           |          |            |          |            |            |            |                  |
|             | 115 | 10   | 220<br>265     | 7.7    | 19x40<br>24x50<br>28x60                               | 6x6<br>8x7<br>8x7 | 21.5<br>27<br>31 | M6x16<br>M8x19<br>M10x22  | 95       | 115        | 9        | 156        | 3.5        | 115        | 9                |
|             |     |      |                |        |                                                       |                   |                  |                           | 95       | 130        | 9        | 156        | 3.5        | 115        | 8                |
|             |     |      |                |        |                                                       |                   |                  |                           | 110      | 130        | 9        | 156        | 3.5        | 130        | 7                |
|             |     |      |                |        |                                                       |                   |                  |                           | 130      | 165        | 11       | 196.5      | 3.5        | 145        | 5                |
|             | 142 | 15   | 243<br>293     | 13     | 19x40<br>24x50<br>28x60                               | 6x6<br>8x7<br>8x7 | 21.5<br>27<br>31 | M6x16<br>M8x19<br>M10x22  | 130      | 165        | 11       | 192.5      | 3.5        | 142        | 5                |

**LM:** motor's length without brake and with resolver

**LB:** motor's length with brake and resolver

**DxL:** Shaft

**bxh:** Key

**t1:** Overall shaft height

**VxZ:** Shaft hole depth

**C:** Center

**DF:** Fixing holes

**QF:** Mounting flange

**F:** Pitch circle diameter

**G:** Diagonal Dimension

**PC:** Centre Depth

<sup>(1)</sup> not available with flange 7

<sup>(2)</sup> only for torque <2 Nm

## Accessories and Options

### Brake

| Motor  | Voltage [V] | Current [A] | Torque @ 20 °C [Nm] | Added lenght [mm] | Added weight [kg] |
|--------|-------------|-------------|---------------------|-------------------|-------------------|
| SM_60  | 24          | 0.34        | 2.2                 | 31.5              | 0.3               |
| SM_82  | 24          | 0.5         | 5                   | 45.5              | 0.7               |
| SM_100 | 24          | 0.67        | 11                  | 47                | 0.6               |
| SM_115 | 24          | 0.67        | 11                  | 45                | 2                 |
| SM_142 | 24          | 0.75        | 22                  | 50                | 3                 |

### Medium Inertia

| Motor  | Added inertia [kgmm <sup>2</sup> ] | Added lenght [mm] | Added weight [kg] |
|--------|------------------------------------|-------------------|-------------------|
| SM_60  | 29                                 | 31.5              | 0.32              |
| SM_82  | 270                                | 43                | 0.91              |
| SM_100 | 284                                | 47                | 0.68              |
| SM_115 | 900                                | 45                | 2.28              |
| SM_142 | 690                                | 50                | 2.49              |

### Feedback

#### Resolver

|                       |                |
|-----------------------|----------------|
| Poles                 | 2              |
| Transformation ratio  | 0.5            |
| Operating temperature | -50 .. +150 °C |
| SM_ associations      | All Sizes      |

#### Incremental Encoder with Hall Sensor

| Code                           | A1                                 | A2   | A3               | B3                | C4   | D3               |
|--------------------------------|------------------------------------|------|------------------|-------------------|------|------------------|
| Resolution [C/T]               | 2000                               | 2048 | 4096             | 2048              | 5000 | 5000             |
| Poles                          | 8                                  |      |                  |                   |      |                  |
| System accuracy                | ±32"                               | ±32" | ±16"             | ±32"              | ±13" | ±13"             |
| Voltage                        | +5 VDC ±5 % - 200 mA               |      |                  |                   |      |                  |
| Reference mark                 | Yes                                |      |                  |                   |      |                  |
| Max speed [min <sup>-1</sup> ] | 6000                               |      |                  |                   |      |                  |
| Output circuit                 | Line drive differential mode 20 mA |      |                  |                   |      |                  |
| Operating temperature          | -20 °C .. +100 °C                  |      | -20 °C .. +85 °C | -20 °C .. +100 °C |      | -20 °C .. +85 °C |
| SM_ motors associations        |                                    |      |                  |                   |      |                  |
| SM_42                          | N                                  | N    | N                | N                 | N    | N                |
| SM_60                          | N                                  | N    | N                | Y                 | N    | Y                |
| SM_82                          | Y                                  | Y    | Y                | N                 | Y    | N                |
| SM_100                         | Y                                  | Y    | Y                | N                 | Y    | N                |
| SM_115                         | Y                                  | Y    | Y                | N                 | Y    | N                |
| SM_142                         | Y                                  | Y    | Y                | N                 | Y    | N                |



## Hiperface Absolute Encoder

| Code                           | S1                                      | S2    | S3                | S4    | A6                | A7    | C6                | C7    | G4                | G5    |
|--------------------------------|-----------------------------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|
| Type                           | Optical                                 |       |                   |       |                   |       |                   |       | Capacitive        |       |
| Turn                           | Single                                  | Multi | Single            | Multi | Single            | Multi | Single            | Multi | Multi             | Multi |
| Incremental signals            | 1 V <sub>PP</sub>                       |       |                   |       |                   |       |                   |       |                   |       |
| Line count                     | 1024                                    |       | 128               |       | 1024              |       | 128               |       | 16                | 16    |
| Resolution                     | 32 768 (15 bit)                         |       | 4096 (12 bit)     |       | 32 768 (15 bit)   |       | 4096 (12 bit)     |       |                   |       |
| Absolute rotation              | 1                                       | 4096  | 1                 | 4096  | 1                 | 4096  | 1                 | 4096  | 512               | 512   |
| System accuracy                | ±45"                                    |       | ±320"             |       | ±45"              |       | ±320"             |       | ±288"             |       |
| Power supply                   | 8 VDC                                   |       |                   |       |                   |       |                   |       |                   |       |
| Max speed [min <sup>-1</sup> ] | 6000                                    |       | 12 000            | 9000  | 6000              |       | 12 000            | 9000  | 6000              |       |
| Temperature                    | -20 °C .. +115 °C                       |       | -20 °C .. +110 °C |       | -20 °C .. +115 °C |       | -20 °C .. +110 °C |       | -20 °C .. +115 °C |       |
| Safety integrity level:        | SIL2 (IEC 61508),<br>SILCL2 (IEC 62061) |       |                   |       | Not Available     |       |                   |       |                   |       |
| SM_ motors associations        |                                         |       |                   |       |                   |       |                   |       |                   |       |
| SM_42                          | N                                       | N     | N                 | N     | N                 | N     | N                 | Y     | N                 | N     |
| SM_60                          | O                                       | O     | Y                 | Y     | O                 | O     | Y                 | Y     | Y                 | N     |
| SM_82                          | Y                                       | Y     | N                 | N     | Y                 | Y     | N                 | N     | N                 | Y     |
| SM_100                         | Y                                       | Y     | N                 | N     | Y                 | Y     | N                 | N     | N                 | Y     |
| SM_115                         | Y                                       | Y     | N                 | N     | Y                 | Y     | N                 | N     | N                 | Y     |
| SM_142                         | Y                                       | Y     | N                 | N     | Y                 | Y     | N                 | N     | N                 | Y     |

## EnDat Absolute Encoder

| Code                           | B9                | C1                | D5                | F2                | F4               |
|--------------------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| Type                           | Inductive         | Optical           |                   |                   | Inductive        |
| Turn                           | Multi             | Single            | Multi             |                   |                  |
| Incremental signals            | 1 V <sub>PP</sub> |                   |                   |                   |                  |
| Line count                     | 32                | 512               |                   |                   | 16               |
| Positions per revolutions      | 131 072 (17 bit)  | 8192 (13 bit)     |                   |                   | 262 144 (18 bit) |
| Distinguishable revolutions    | 4096              | 1                 | 4096              |                   |                  |
| System accuracy                | ±400″             | ±60″              |                   |                   | ±480″            |
| Power supply                   | 5 VDC             |                   |                   |                   |                  |
| Max speed [min <sup>-1</sup> ] | 12 000            |                   | 7000              | 12 000            |                  |
| Temperature                    | -20 °C .. +115 °C | -40 °C .. +115 °C | -30 °C .. +115 °C | -40 °C .. +115 °C | -20 °C .. +115°C |
| Absolute position values       | EnDat 2.1         | EnDat 2.2         |                   |                   | EnDat 2.1        |
| Safety integrity level:        | Not Available     |                   |                   |                   |                  |
| SM_ motors associations        |                   |                   |                   |                   |                  |
| SM_42                          | N                 | N                 | N                 | N                 | N                |
| SM_60                          | Y                 | Y                 | N                 | Y                 | Y                |
| SM_82                          | Y                 | Y                 | Y                 | N                 | N                |
| SM_100                         | Y                 | Y                 | Y                 | N                 | N                |
| SM_115                         | Y                 | Y                 | Y                 | N                 | N                |
| SM_142                         | Y                 | Y                 | Y                 | N                 | N                |

## Associated Drives

### 230 VAC supply voltage

| Motor                  | Rated Speed<br>[min <sup>-1</sup> ] | Stall Current<br>[A] | SLVD-N     | TPD-M      | Compax3     | 638            |
|------------------------|-------------------------------------|----------------------|------------|------------|-------------|----------------|
| 230 VAC supply voltage |                                     |                      |            |            |             |                |
| SM_42 60 0.35          | 6000                                | 0.78                 | SLVD1N...  | TPD-M02... | C3S025V2... | 638A-01-3-F... |
| SM_60 30 0.55          | 3000                                | 0.7                  | SLVD1N...  | TPD-M02... | C3S025V2... | 638A-01-3-F... |
| SM_60 45 0.55          | 4500                                | 1                    | SLVD1N...  | TPD-M02... | C3S025V2... | 638A-01-3-F... |
| SM_60 60 0.55          | 6000                                | 1.4                  | SLVD2N...  | TPD-M02... | C3S025V2... | 638A-02-3-F... |
| SM_60 16 1.4           | 1600                                | 0.95                 | SLVD1N...  | TPD-M02... | C3S025V2... | 638A-01-3-F... |
| SM_60 30 1.4           | 3000                                | 1.73                 | SLVD2N...  | TPD-M02... | C3S025V2... | 638A-02-3-F... |
| SM_60 45 1.4           | 4500                                | 2.37                 | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_60 60 1.4           | 6000                                | 2.98                 | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_60 75 1.4           | 7500                                | 3.85                 | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_82 10 03            | 1000                                | 1.2                  | SLVD2N...  | TPD-M02... | C3S025V2... | 638A-02-3-F... |
| SM_82 16 03            | 1600                                | 1.8                  | SLVD2N...  | TPD-M02... | C3S025V2... | 638A-02-3-F... |
| SM_82 30 03            | 3000                                | 3.1                  | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_82 33 03            | 3300                                | 3.5                  | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_82 45 03            | 4500                                | 4.7                  | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-06-3-F... |
| SM_82 60 03            | 6000                                | 6.1                  | SLVD7N...  | TPD-M08... | C3S063V2... | 638B-08-3-F... |
| SM_82 75 03            | 7500                                | 7.5                  | SLVD7N...  | TPD-M08... | C3S100V2... | 638B-08-3-F... |
| SM_100 16 06           | 1600                                | 3.7                  | SLVD5N...  | TPD-M05... | C3S063V2... | 638A-04-3-F... |
| SM_100 30 06           | 3000                                | 5.9                  | SLVD7N...  | TPD-M08... | C3S063V2... | 638A-06-3-F... |
| SM_100 45 06           | 4500                                | 9.4                  | SLVD10N... | TPD-M10... | C3S100V2... | 638B-10-3-F... |
| SM_100 55 06           | 5500                                | 11.8                 | SLVD15N... | TPD-M15... | C3S150V2... | 638B-15-3-F... |
| SM_100 75 06           | 7500                                | 14.7                 | SLVD15N... | TPD-M15... | C3S150V2... | 638B-15-3-F... |
| SM_115 16 10           | 1600                                | 6                    | SLVD7N...  | TPD-M08... | C3S063V2... | 638A-06-3-F... |
| SM_115 30 10           | 3000                                | 10.5                 | SLVD10N... | TPD-M10... | C3S100V2... | 638B-10-3-F... |
| SM_115 40 10           | 4000                                | 14.7                 | SLVD15N... | TPD-M15... | C3S150V2... | 638B-15-3-F... |
| SM_115 54 10           | 5400                                | 18.2                 | n.a.       | TPD-M30... | n.a.        | n.a.           |
| SM_142 18 15           | 1800                                | 9.7                  | SLVD10N... | TPD-M10... | C3S100V2... | 638B-10-3-F... |
| SM_142 30 15           | 3000                                | 16                   | SLVD17N... | TPD-M30... | n.a.        | n.a.           |

### 400 VAC supply voltage

| Motor                  | Rated Speed<br>[min <sup>-1</sup> ] | Stall Current<br>[A] | SPD-N/TWIN-N     | TPD-M     | Compax3    | 638            |
|------------------------|-------------------------------------|----------------------|------------------|-----------|------------|----------------|
| 400 VAC supply voltage |                                     |                      |                  |           |            |                |
| SM_60 30 1.4           | 3000                                | 0.95                 | SPD2N.. / TWIN2N | TPD-M02.. | C3S015V4.. | 638B-03-6-F... |
| SM_60 45 1.4           | 4500                                | 1.37                 | SPD2N.. / TWIN2N | TPD-M02.. | C3S015V4.. | 638B-03-6-F... |
| SM_60 60 1.4           | 6000                                | 1.73                 | SPD2N.. / TWIN2N | TPD-M02.. | C3S038V4.. | 638B-03-6-F... |
| SM_60 75 1.4           | 7500                                | 2.15                 | SPD5N.. / TWIN5N | TPD-M05.. | C3S038V4.. | 638B-03-6-F... |
| SM_82 30 03            | 3000                                | 1.8                  | SPD2N.. / TWIN2N | TPD-M02.. | C3S038V4.. | 638B-03-6-F... |
| SM_82 45 03            | 4500                                | 2.7                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S038V4.. | 638B-05-6-F... |
| SM_82 56 03            | 5600                                | 3.1                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S038V4.. | 638B-05-6-F... |
| SM_82 60 03            | 6000                                | 3.5                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S038V4.. | 638B-05-6-F... |
| SM_82 75 03            | 7500                                | 4.4                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S075V4.. | 638B-05-6-F... |
| SM_100 30 06           | 3000                                | 3.7                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S038V4.. | 638B-05-6-F... |
| SM_100 45 06           | 4500                                | 5.6                  | SPD8N.. / TWIN8N | TPD-M08.. | C3S075V4.. | 638B-08-6-F... |
| SM_100 56 06           | 5600                                | 5.9                  | SPD8N.. / TWIN8N | TPD-M08.. | C3S075V4.. | 638B-08-6-F... |
| SM_100 75 06           | 7500                                | 9.4                  | SPD16N..         |           | C3S150V4.. | 638B-10-6-F... |
| SM_115 20 10           | 2000                                | 4.5                  | SPD5N.. / TWIN5N | TPD-M05.. | C3S075V4.. | 638B-05-6-F... |
| SM_115 30 10           | 3000                                | 6.0                  | SPD8N.. / TWIN8N | TPD-M08.. | C3S075V4.. | 638B-08-6-F... |
| SM_115 40 10           | 4000                                | 8.0                  | SPD8N.. / TWIN8N | TPD-M08.. | C3S150V4.. | 638B-10-6-F... |
| SM_115 56 10           | 5600                                | 10.5                 | SPD16N..         | TPD-M15.. | C3S150V4.. | 638B-15-6-F... |
| SM_142 20 15           | 2000                                | 6.4                  | SPD8N.. / TWIN8N | TPD-M08.. | C3S075V4.. | 638B-08-6-F... |
| SM_142 30 15           | 3000                                | 9.7                  | SPD16N..         | TPD-M10.. | C3S150V4.. | 638B-10-6-F... |
| SM_142 45 15           | 4500                                | 14.4                 | SPD16N..         | TPD-M15.. | C3S150V4.. | 638B-15-6-F... |
| SM_142 56 15           | 5600                                | 16                   | SPD16N..         | TPD-M30.. | C3S300V4.. | n.a.           |

## Order Code

### Serie SMB

|               | 1   | 2 | 3  | 4  | 5   | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---------------|-----|---|----|----|-----|---|---|---|----|----|----|----|----|----|----|----|
| Order example | SMB | A | 60 | 30 | 1.4 | 5 | 9 |   | 2I |    | 64 | A6 |    | M  |    | 2  |

#### 1 Type Of Motor (mandatory field)

|            |                                        |
|------------|----------------------------------------|
| <b>SME</b> | Standard Motor with Encoder MB Series  |
| <b>SMB</b> | Standard Motor with Resolver MB Series |

#### 2 Brake Option

|          |                                                                   |
|----------|-------------------------------------------------------------------|
|          | No Brake Option (empty field)                                     |
| <b>A</b> | Motor with Holding Brake<br>(brakes when the supply voltage is 0) |

#### 3 Motor Frame Size (mandatory field)

|            |                                            |
|------------|--------------------------------------------|
| <b>42</b>  | Torque 0,35 Nm                             |
| <b>60</b>  | Torque range 0,55...1.4 Nm                 |
| <b>82</b>  | Torque 3 Nm                                |
| <b>100</b> | Torque range 6 Nm                          |
| <b>115</b> | Torque range 10 Nm                         |
| <b>142</b> | Torque range 15...17 Nm                    |
| <b>170</b> | Torque range 36...60 Nm (Provisional data) |

#### 4 Winding (mandatory field)

|           |                          |
|-----------|--------------------------|
| <b>nn</b> | min <sup>-1</sup> (x100) |
|-----------|--------------------------|

#### 5 Motor Torque (mandatory field)

|           |             |
|-----------|-------------|
| <b>nn</b> | Torque [Nm] |
|-----------|-------------|

#### 6 Flange (mandatory field)

|              |                                    |
|--------------|------------------------------------|
| <b>5</b>     | B5 Flange                          |
| <b>7</b>     | Only for Frame 82 and 115          |
| <b>8</b>     | Only for Frame 60, 82, 100 and 115 |
| <b>9</b>     | Only for Frame 115                 |
| <b>A B C</b> | Special Flange                     |

#### 7 Shaft (mandatory field)

|           |                                           |
|-----------|-------------------------------------------|
| <b>9</b>  | 9x25 mm for size 42 - 9x20 mm for size 60 |
| <b>11</b> | 11x23 mm for size 60                      |
| <b>14</b> | 14x30 mm for size 82                      |
| <b>19</b> | 19x40 mm for size 82/100/115/142          |
| <b>24</b> | 24x50 mm for size 100/115/142             |
| <b>28</b> | 28x60 mm for size 115/142                 |
| <b>A*</b> | Special shaft under request               |

#### 8 Key Shaft option

|          |                              |
|----------|------------------------------|
|          | Shaft with Key (empty field) |
| <b>S</b> | Shaft without key            |

#### 9 Layout - Connectors (mandatory field)

|            |                                                       |
|------------|-------------------------------------------------------|
| <b>0V</b>  | Cable exit and Molex Flying connectors - 200 mm above |
| <b>2I</b>  | Rotatable Interconnectron receptacles                 |
| <b>2IB</b> | 90° Interconnectron receptacles - forward facing      |
| <b>2ID</b> | 90° Interconnectron receptacles - rear facing         |
| <b>DC</b>  | Special Customer Layout                               |

#### 10 Female connectors option

|          |                                               |
|----------|-----------------------------------------------|
|          | With Female / flying connectors (empty field) |
| <b>W</b> | Without Female / flying connectors            |

#### 11 Protection Degree (mandatory field)

|           |      |
|-----------|------|
| <b>64</b> | IP64 |
| <b>65</b> | IP65 |

#### 12 Feedback

|            |                                                                                   |
|------------|-----------------------------------------------------------------------------------|
| <b>Exx</b> | Prearrangement for external encoder mounting<br>Where xx is the model of feedback |
| <b>A1</b>  | Encoder 1024 ppr + Hall - TAMAGAWA OIH48                                          |
| <b>A2</b>  | Encoder 2048 ppr + Hall - TAMAGAWA OIH48                                          |
| <b>A3</b>  | Encoder 4096 ppr + Hall - TAMAGAWA OIH48                                          |
| <b>A6</b>  | SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50/52                          |
| <b>A7</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50/52                           |
| <b>B3</b>  | Encoder 2048 ppr + Hall - TAMAGAWA OIH35                                          |
| <b>B9</b>  | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1331                              |
| <b>C1</b>  | SinCos EnDat Encoder Single-Turn - HEIDENHAIN EQI1113                             |
| <b>C4</b>  | Encoder 5000 ppr + Hall - TAMAGAWA OIH48                                          |
| <b>C6</b>  | SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36                             |
| <b>C7</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36                              |
| <b>D3</b>  | Encoder 5000ppr + Hall - TAMAGAWA OIH35                                           |
| <b>D5</b>  | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1325                              |
| <b>F2</b>  | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1125                              |
| <b>F4</b>  | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1130                              |
| <b>G4</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL37                              |
| <b>G5</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL52                              |
| <b>S1</b>  | SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S                            |
| <b>S2</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50S                             |
| <b>S3</b>  | SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36S                            |
| <b>S4</b>  | SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36S                             |

#### 13 Option Resolver

|          |                                 |
|----------|---------------------------------|
|          | Standard Resolver (empty field) |
| <b>H</b> | High Accuracy Resolver          |



|    |                |                                                                          |
|----|----------------|--------------------------------------------------------------------------|
| 14 | Option Inertia |                                                                          |
|    |                | Standard Inertia (empty field)                                           |
|    | M              | Medium Inertia                                                           |
| 15 | Special Option |                                                                          |
|    |                | No Special Option (empty field)                                          |
|    | 1Bxx           | Motor with 2-side output shaft, where xx is the diameter of second shaft |
| 16 | Voltage        |                                                                          |
|    | 0A             | 24 V                                                                     |
|    | 0B             | 34 V                                                                     |
|    | 0C             | 48 V                                                                     |
|    | 0D             | 50 V                                                                     |
|    | 0E             | 60 V                                                                     |
|    | 0F             | 72 V                                                                     |
|    | 0G             | 74 V                                                                     |
|    | 0              | 80 V                                                                     |
|    | 0H             | 96 V                                                                     |
|    | 1A             | 108-110 V                                                                |
|    | 1D             | 120 V                                                                    |
|    | 1B             | 125 V                                                                    |
|    | 1C             | 150 V                                                                    |
|    | 1              | 180 V                                                                    |
|    | 2              | 220-230 V                                                                |
|    | 2A             | 222 V                                                                    |
|    | 2B             | 200 V                                                                    |
|    | 3              | 330 V                                                                    |
|    | 4              | 380-400 V                                                                |
|    | 4A             | 425 V                                                                    |
|    | 4C             | 460 V                                                                    |
|    | 4B             | 490 V                                                                    |

# Order Code

## Serie SMH

|               | 1   | 2 | 3  | 4  | 5   | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 |
|---------------|-----|---|----|----|-----|---|---|---|----|----|----|----|----|
| Order example | SMH | A | 60 | 30 | 1.4 | 5 | 9 |   | 2I | 64 | A6 | M  | 2  |

|          |                                                                   |
|----------|-------------------------------------------------------------------|
| <b>1</b> | <b>Type Of Motor (mandatory field)</b>                            |
| SMH      | Standard Motor with Resolver MH Series                            |
| <b>2</b> | <b>Brake Option</b>                                               |
|          | No Brake Option (empty field)                                     |
| A        | Motor with Holding Brake<br>(brakes when the supply voltage is 0) |
| <b>3</b> | <b>Motor Frame Size (mandatory field)</b>                         |
| 42       | Torque 0,35 Nm                                                    |
| 60       | Torque range 0,55...1.4 Nm                                        |
| 82       | Torque 3 Nm                                                       |
| 100      | Torque range 6 Nm                                                 |
| 115      | Torque range 10 Nm                                                |
| 142      | Torque range 15...17 Nm                                           |
| <b>4</b> | <b>Winding (mandatory field)</b>                                  |
| nn       | min <sup>-1</sup> (x100)                                          |
| <b>5</b> | <b>Motor Torque (mandatory field)</b>                             |
| nn       | Torque [Nm]                                                       |
| <b>6</b> | <b>Flange (mandatory field)</b>                                   |
| 5        | B5 Flange                                                         |
| 7        | Only for Frame 82 and 115                                         |
| 8        | Only for Frame 60, 82, 100 and 115                                |
| 9        | Only for Frame 115                                                |
| A B C    | Special Flange                                                    |
| <b>7</b> | <b>Shaft (mandatory field)</b>                                    |
| 9        | 9x25 mm for size 42 - 9x20 mm for size 60                         |
| 11       | 11x23 mm for size 60                                              |
| 14       | 14x30 mm for size 82                                              |
| 19       | 19x40 mm for size 82/100/115/142                                  |
| 24       | 24x50 mm for size 100/115/142                                     |
| 28       | 28x60 mm for size 115/142                                         |
| <b>8</b> | <b>Key Shaft option</b>                                           |
|          | Shaft with Key (empty field)                                      |
| S        | Shaft without key                                                 |
| <b>9</b> | <b>Layout - Connectors (mandatory field)</b>                      |
| 0V       | Cable exit and Molex Flying connectors -<br>200 mm above          |
| 2I       | Rotatable Interconnectron receptacles                             |
| 2IB      | 90° Interconnectron receptacles - forward<br>facing               |
| 2ID      | 90° Interconnectron receptacles - rear facing                     |

|           |                                                             |
|-----------|-------------------------------------------------------------|
| <b>10</b> | <b>Protection Degree (mandatory field)</b>                  |
| 64        | IP64                                                        |
| 65        | IP65                                                        |
| <b>11</b> | <b>Feedback</b>                                             |
| A6        | SinCos Hiperface Encoder Single-Turn -<br>STEGMANN SRS50/52 |
| A7        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SRS50/52  |
| C6        | SinCos Hiperface Encoder Single-Turn -<br>STEGMANN SKS36    |
| C7        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SKM36     |
| G4        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SEL37     |
| G5        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SEL52     |
| S1        | SinCos Hiperface Encoder Single-Turn -<br>STEGMANN SRS50S   |
| S2        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SRS50S    |
| S3        | SinCos Hiperface Encoder Single-Turn -<br>STEGMANN SKS36S   |
| S4        | SinCos Hiperface Encoder Multi-Turn -<br>STEGMANN SKM36S    |
| <b>12</b> | <b>Option Inertia</b>                                       |
|           | Standard Inertia (empty field)                              |
| M         | Medium Inertia                                              |
| <b>13</b> | <b>Voltage</b>                                              |
| 2         | 220-230 V                                                   |
| 4         | 380-400 V                                                   |

## Order Code

### Motor Power Cable for SMB Motors

|                           | 1                                                          | 2 | 3   | 4 | 5  | 6 | 7  |
|---------------------------|------------------------------------------------------------|---|-----|---|----|---|----|
| Order example             | CAVOMOT                                                    | A | 1,5 | 5 | PM | I | 40 |
| <b>1 CAVOMOT</b>          |                                                            |   |     |   |    |   |    |
| CAVOMOT                   | Power cable drive - motor                                  |   |     |   |    |   |    |
| <b>2 Brake wire</b>       |                                                            |   |     |   |    |   |    |
| empty field               | without brake wire                                         |   |     |   |    |   |    |
| A                         | Brake wire                                                 |   |     |   |    |   |    |
| <b>3 Section [mm²]</b>    |                                                            |   |     |   |    |   |    |
| 1,5                       | 1,5 mm²                                                    |   |     |   |    |   |    |
| 2,5                       | 2,5 mm²                                                    |   |     |   |    |   |    |
| 4, 6, 10, 25              | 4 mm², 6 mm², 10 mm², 25 mm² (not for "PF" type)           |   |     |   |    |   |    |
| <b>4 Length [m]</b>       |                                                            |   |     |   |    |   |    |
| 1, ...                    | Length in metre                                            |   |     |   |    |   |    |
| <b>5 Application Type</b> |                                                            |   |     |   |    |   |    |
| PM                        | Standard cable                                             |   |     |   |    |   |    |
| PF                        | High flex cable                                            |   |     |   |    |   |    |
| <b>6 Motor Connector</b>  |                                                            |   |     |   |    |   |    |
| M                         | Military Connector (Mil) [All Layout except 08 and 5]      |   |     |   |    |   |    |
| 8                         | Military Connector (Mil) [All Layout 8]                    |   |     |   |    |   |    |
| I                         | Interconnectron Connector (all layout)                     |   |     |   |    |   |    |
| 3                         | Terminal Connection Box (all layout except 3M/3MB/3MC/3MA) |   |     |   |    |   |    |
| S                         | Terminal Connection Box layout 3M/3M/3MC/3MA               |   |     |   |    |   |    |
| SY                        | Terminal Connection for MBX motors (Cable no ATEX)         |   |     |   |    |   |    |
| SL                        | Terminal connection box layout 6i only for MB205 motor     |   |     |   |    |   |    |
| F                         | Fast Connector (layout SMB42 0V)                           |   |     |   |    |   |    |
| A                         | Amphenol Connector (layout SM_40 0P, 1A, 1C, 2DA, ...)     |   |     |   |    |   |    |
| T                         | Trilogy Connector                                          |   |     |   |    |   |    |
| SL                        | Terminal connection box layout 6i only for MB205 motor     |   |     |   |    |   |    |
| PRM                       | Patch Cord Military Connector (Mil) [All Layout except 08] |   |     |   |    |   |    |
| <b>7 Motor Size</b>       |                                                            |   |     |   |    |   |    |
| 40..265                   | Motor Size                                                 |   |     |   |    |   |    |
| M50                       | Trilogy Motor                                              |   |     |   |    |   |    |
| NX                        | Motors NX2-3-4-6 type NX----AKR70--                        |   |     |   |    |   |    |

### Feedback Cable for SMB Motors

|                            | 1                                                              | 2 | 3  | 4 | 5     |
|----------------------------|----------------------------------------------------------------|---|----|---|-------|
| Order example              | CAVORES                                                        | 4 | PM | I | SLVDN |
| <b>1 Signal Cable type</b> |                                                                |   |    |   |       |
| CAVORES                    | Resolver                                                       |   |    |   |       |
| CAVOENC                    | Incremental encoder                                            |   |    |   |       |
| CAVOABS                    | Absolute Encoder EnDat+SinCos                                  |   |    |   |       |
| CAVOHIP                    | Absolute Encoder Hiperface+SinCos                              |   |    |   |       |
| CAVOSIN                    | SinCos Encoder                                                 |   |    |   |       |
| CAVOHAL                    | SinCos Encoder + Hall sensor                                   |   |    |   |       |
| <b>2 Length [m]</b>        |                                                                |   |    |   |       |
| 1, ...                     | Length in metre                                                |   |    |   |       |
| <b>3 Application Type</b>  |                                                                |   |    |   |       |
| PM                         | Moving Application                                             |   |    |   |       |
| <b>4 Motor Connector</b>   |                                                                |   |    |   |       |
| M                          | Military Connector (Mil) [All Layout except 08]                |   |    |   |       |
| 8                          | Military Connector (Mil) [All Layout 8]                        |   |    |   |       |
| I                          | Interconnectron Connector (all layout)                         |   |    |   |       |
| S                          | Terminal Connection Box layout 3M/3M/3MC/3MA and motor MBX     |   |    |   |       |
| F                          | Fast Connector (layout SMB40 0V)                               |   |    |   |       |
| A                          | Amphenol Connecotr (layout SMB40 0P, 1A, 1C, 2DA, ...)         |   |    |   |       |
| T                          | Trilogy Connector                                              |   |    |   |       |
| NX                         | Motors NX2-3-4-6-8 type NX----AKR7---                          |   |    |   |       |
| E                          | Free signal cable for EX motors                                |   |    |   |       |
| PRM                        | Patch Cord Military Connector (Mil) [All Layout except 08] 08] |   |    |   |       |
| <b>5 Drive Type</b>        |                                                                |   |    |   |       |
| LVD                        | LVD Drive                                                      |   |    |   |       |
| HPD                        | HPD Drive                                                      |   |    |   |       |
| SLVD                       | SLVD e SLVD-N Drive                                            |   |    |   |       |
| SLVDN                      | SLVD-N Drive                                                   |   |    |   |       |
| TPD                        | TPD-M                                                          |   |    |   |       |
| SPD/TWIN                   | TWIN_N e SPD_N Drive or wire without connector drive side      |   |    |   |       |
| <b>HIDRIVE</b>             | Hi-Drive                                                       |   |    |   |       |
| 631                        | Servodrives 631                                                |   |    |   |       |
| 638                        | Servodrives 638                                                |   |    |   |       |
| 637F                       | Servodrives 637F                                               |   |    |   |       |



## Order Code

### Motor Power Cable for SMH Motors

|                | 1          | 2            |
|----------------|------------|--------------|
| Order example: | <b>MOK</b> | <b>55/02</b> |

| 1                            | Cable                                                    |
|------------------------------|----------------------------------------------------------|
| <b>MOK</b>                   | Motor cable <sup>(2)</sup>                               |
| 2                            | Type                                                     |
|                              | for SMH / MH56 / MH70 / MH105 <sup>(3)</sup>             |
| <b>55/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A                       |
| <b>54/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A<br>Moving application |
| <b>56/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A                       |
| <b>57/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A<br>Moving application |
|                              | for MH145 / MH205 <sup>(4)</sup>                         |
| <b>60/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A                       |
| <b>63/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A<br>Moving application |
| <b>59/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A                       |
| <b>64/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A<br>Moving application |
| <b>61/....<sup>(1)</sup></b> | 6 mm <sup>2</sup> ; up to 32,3 A<br>Moving application   |
| <b>62/....<sup>(1)</sup></b> | 10 mm <sup>2</sup> ; up to 47,3 A<br>Moving application  |

MOK55 and MOK54 are also possible for linear motors LXR406, LXR412 and BLMA.

### Length code for cables

<sup>(1)</sup> Length code 1 (Example: SSK01/09 = length 25 m)

| Length [m] | 1,0 | 2,5 | 5,0 | 7,5 | 10,0 | 12,5 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|------------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| Order code | 01  | 02  | 03  | 04  | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   |

<sup>(2)</sup> Color according to DESINA

<sup>(3)</sup> with motor connector

<sup>(4)</sup> with cable eye for motor terminal box

### Feedback Cable for SMH Motors

|                | 1               |
|----------------|-----------------|
| Order example: | <b>REK42/02</b> |

| 1                               | Zubehör                                                       |
|---------------------------------|---------------------------------------------------------------|
|                                 | for MH/SMH-Motors                                             |
| <b>REK42/....<sup>(1)</sup></b> | Resolver cable <sup>(2)</sup>                                 |
| <b>REK41/....<sup>(1)</sup></b> | Resolver cable <sup>(2)</sup> Moving application              |
| <b>GBK24/....<sup>(1)</sup></b> | SinCos© Feedback cable <sup>(2)</sup><br>Moving application   |
| <b>GBK38/....<sup>(1)</sup></b> | EnDat 2.1 Feedback cable <sup>(2)</sup><br>Moving application |
| <b>GBK23/....<sup>(1)</sup></b> | Encoder cable <sup>(2)</sup>                                  |
|                                 | for linear motors                                             |
| <b>GBK33/....<sup>(1)</sup></b> | Feedback cable for LXR<br>Moving application                  |
| <b>GBK32/....<sup>(1)</sup></b> | Feedback cable for BLMA<br>Moving application                 |

# Servo Motor - MB / MH

## Overview

### Description

The MB / MH <sup>(1)</sup> series caters for torques in the range of 0.2 to 285 Nm, speeds up to 10000 min<sup>-1</sup> and includes a total of 75 models available across 6 frame sizes. Thanks to the high quality and performance of the Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the MB / MH series of motors can achieve very high accelerations and withstand high overload without the risk of demagnetisation or detachment of the magnets.

Furthermore, shaft and flange size flexibility on all models provides the user with the possibility to optimise their motor selection for any given application.

Adequate mechanical over-sizing, low inertia in an extra-strong mechanism and a broad range of models permits the application of the MB / MH series in all fields where high dynamic performance and utmost reliability are crucial features.

Typical applications include any type of automatic machinery, especially in the product packaging and handling industry, and wherever the demand exists for axis speed and position synchronisation.

### Features

- Large set of feedback option
- Customization
- Increase inertia option
- ATEX certification for MB/MH105/145
- Options
  - Flying cables
  - Terminal box (power and resolver)
  - External encoder
  - Increased inertia
  - Brake
  - Feedback - resolver/incremental/ SinCos/absolute encoder
  - Thermal protection (PTC for MB and KTY for MH)
  - Second shaft

### Application

- Food, Pharma & Beverage
- Packaging Machines
- Material Forming
- Material Handling
- Factory Automation
- Life Science Diagnostic
- Automotive Industry / In-Plant
- Printing Industry
- Textile Machines
- Robotics
- Servo Hydraulic Pumps



### Technical Characteristics - Overview

|                                         |                                                                                                                                                                 |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Motor Type</b>                       | Permanent magnets synchronous servo motor                                                                                                                       |
| <b>Rotor Design</b>                     | Rotor with surface rare earth magnets                                                                                                                           |
| <b>Power supply</b>                     | 230 VAC or 400 VAC                                                                                                                                              |
| <b>Operating temperature</b>            | -10/+40 °C                                                                                                                                                      |
| <b>Number of poles</b>                  | 4 for M_ 56-70<br>8 for M_ 105-145-205-265                                                                                                                      |
| <b>Power Range</b>                      | 0.05...67 kW                                                                                                                                                    |
| <b>Torque Range</b>                     | 0.2...285 Nm                                                                                                                                                    |
| <b>Speed Range</b>                      | 0...10000 min <sup>-1</sup>                                                                                                                                     |
| <b>Mounting</b>                         | Flange with smooth holes B14, B3 option                                                                                                                         |
| <b>Shaft End</b>                        | Plain keyed shaft<br>Plain smooth shaft (option)                                                                                                                |
| <b>Cooling</b>                          | Natural ventilation<br>Self-ventilation (option for size 105-145-205)<br>Forced Ventilation (option for size 105-145-205)<br>Water cooled (option for size 145) |
| <b>Protection Level (IEC60034-5)</b>    | IP64<br>IP65 (option)                                                                                                                                           |
| <b>Feedback sensor</b>                  | Resolver<br>Absolute Endat or Hiperface<br>Incremental Encoder                                                                                                  |
| <b>Voltage Supply</b>                   | 230 / 400 VAC                                                                                                                                                   |
| <b>Temperature Class</b>                | Class F                                                                                                                                                         |
| <b>Connections</b>                      | Connectors<br>Flying cables<br>Terminal Box<br>(see table option for combination)                                                                               |
| <b>Marking</b>                          | CE                                                                                                                                                              |
| <b>Standards</b><br>In compliance with: | 73/23/CEE e 93/68/CEE<br>EN60034-1<br>EN60034-5<br>EN60034-5/A1<br>EN60034-9<br>EN60034-14                                                                      |

<sup>(1)</sup> MB: for Drives TPD-M, SLVD-N, Twin-N, SPD-N, Hi-Drive / MH: for Drive Compax3



## Technical Characteristics

### MB / MH Motors, Size 56 - 0.2...0.6 Nm

#### 230 VAC

| Model         | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak<br>Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)/(3)</sup> | Kt <sup>(2)/(3)</sup>        |
|---------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|-------------------------------|---------------------------|---------------------------|-----------------------|------------------------------|
|               |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                               | No brake                  | With brake                |                       |                              |
|               |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]      | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]            | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 56 25 0.2  | 56   | 0.2<br>(0.40)                                | 0.27                    | 0.21                      | 2500                      | 0.26                     | 1.3                           | 11                        | 28                        | 0.48                  | 0.83                         |
| M_ 56 50 0.2  |      |                                              | 0.46                    | 0.19                      | 5000                      | 0.42                     |                               |                           |                           | 0.28                  | 0.48                         |
| M_ 56 100 0.2 |      |                                              | 0.84                    | 0.15                      | 10000                     | 0.60                     |                               |                           |                           | 0.15                  | 0.26                         |
| M_ 56 25 0.4  |      | 0.4<br>(0.80)                                | 0.49                    | 0.40                      | 2500                      | 0.46                     | 2.5                           | 16                        | 33                        | 0.52                  | 0.91                         |
| M_ 56 50 0.4  |      |                                              | 0.84                    | 0.35                      | 5000                      | 0.71                     |                               |                           |                           | 0.30                  | 0.53                         |
| M_ 56 100 0.4 |      |                                              | 1.52                    | 0.21                      | 10000                     | 0.81                     |                               |                           |                           | 0.17                  | 0.29                         |
| M_ 56 25 0.6  |      | 0.6<br>(1.14)                                | 0.67                    | 0.60                      | 2500                      | 0.63                     | 3.6                           | 21                        | 38                        | 0.57                  | 0.99                         |
| M_ 56 50 0.6  |      |                                              | 1.21                    | 0.51                      | 5000                      | 0.98                     |                               |                           |                           | 0.32                  | 0.55                         |
| M_ 56 100 0.6 |      |                                              | 2.18                    | 0.18                      | 10000                     | 0.71                     |                               |                           |                           | 0.18                  | 0.31                         |

#### 400 VAC

| Model        | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak<br>Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)/(3)</sup> | Kt <sup>(2)/(3)</sup>        |
|--------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|-------------------------------|---------------------------|---------------------------|-----------------------|------------------------------|
|              |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                               | No brake                  | With brake                |                       |                              |
|              |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]      | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]            | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 56 50 0.2 | 56   | 0.2<br>(0.40)                                | 0.27                    | 0.19                      | 5000                      | 0.24                     | 1.3                           | 11                        | 28                        | 0.48                  | 0.83                         |
| M_ 56 95 0.2 |      |                                              | 0.46                    | 0.16                      | 9500                      | 0.36                     |                               |                           |                           | 0.28                  | 0.48                         |
| M_ 56 50 0.4 |      | 0.4<br>(0.80)                                | 0.49                    | 0.34                      | 5000                      | 0.40                     | 2.5                           | 16                        | 33                        | 0.52                  | 0.91                         |
| M_ 56 95 0.4 |      |                                              | 0.84                    | 0.23                      | 9500                      | 0.48                     |                               |                           |                           | 0.30                  | 0.53                         |
| M_ 56 50 0.6 |      | 0.6<br>(1.14)                                | 0.67                    | 0.50                      | 5000                      | 0.54                     | 3.6                           | 21                        | 38                        | 0.57                  | 0.99                         |
| M_ 56 95 0.6 |      |                                              | 1.21                    | 0.25                      | 9500                      | 0.51                     |                               |                           |                           | 0.32                  | 0.55                         |

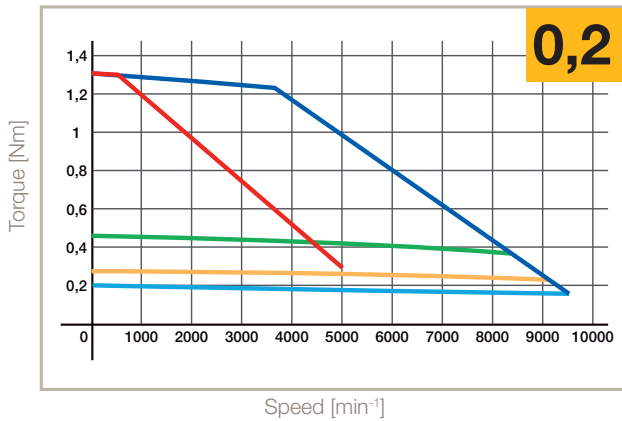
<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

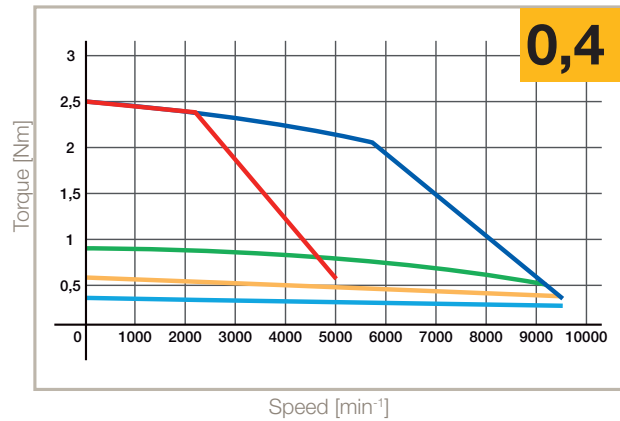
<sup>(3)</sup> Tolerance data ±10 %

## Speed Torque Curves

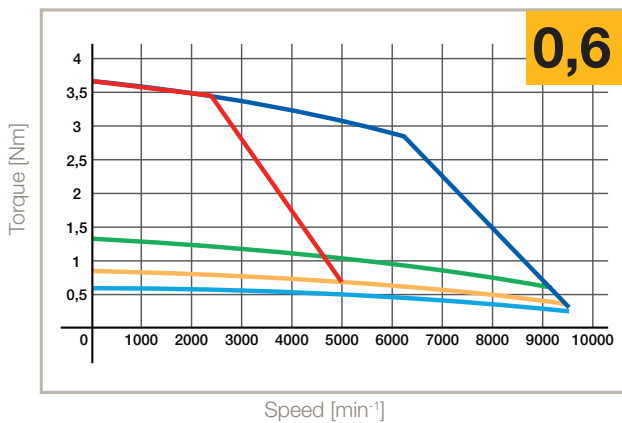
5000 min<sup>-1</sup> 230 V - 9500 min<sup>-1</sup> 400 V



5000 min<sup>-1</sup> 230 V - 9500 min<sup>-1</sup> 400 V



5000 min<sup>-1</sup> 230 V - 9500 min<sup>-1</sup> 400 V



- S1 65 K,  $\Delta T$
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min



## MB / MH Motors, Size 70 - 0.5...2.5 Nm

### 230 VAC

| Model        | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|--------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|---------------------------|---------------------------|----------------------|------------------------------|
|              |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                  | With brake                |                      |                              |
|              |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 70 20 0.5 | 70   | 0.5<br>(0.9)                                 | 0.44                    | 0.5                       | 2000                      | 0.43                     | 2.8                        | 26                        | 55                        | 0.67                 | 1.17                         |
| M_ 70 38 0.5 |      |                                              | 0.72                    | 0.4                       | 3800                      | 0.66                     |                            |                           |                           | 0.41                 | 0.71                         |
| M_ 70 75 0.5 |      |                                              | 1.37                    | 0.4                       | 7500                      | 1.00                     |                            |                           |                           | 0.22                 | 0.38                         |
| M_ 70 20 01  |      | 1.0<br>(1.6)                                 | 0.84                    | 1.0                       | 2000                      | 0.80                     | 5.1                        | 40                        | 69                        | 0.72                 | 1.25                         |
| M_ 70 38 01  |      |                                              | 1.39                    | 0.8                       | 3800                      | 1.23                     |                            |                           |                           | 0.42                 | 0.72                         |
| M_ 70 75 01  |      |                                              | 2.65                    | 0.5                       | 7500                      | 1.43                     |                            |                           |                           | 0.23                 | 0.39                         |
| M_ 70 20 1.5 |      | 1.5<br>(2.2)                                 | 1.23                    | 1.5                       | 2000                      | 1.18                     | 6.8                        | 54                        | 83                        | 0.73                 | 1.27                         |
| M_ 70 38 1.5 |      |                                              | 2.25                    | 1.4                       | 3800                      | 1.96                     |                            |                           |                           | 0.42                 | 0.72                         |
| M_ 70 75 1.5 |      |                                              | 4.07                    | 0.7                       | 7500                      | 1.85                     |                            |                           |                           | 0.23                 | 0.39                         |
| M_ 70 20 02  |      | 2.0<br>(2.7)                                 | 1.55                    | 1.9                       | 2000                      | 1.47                     | 8.4                        | 68                        | 97                        | 0.78                 | 1.36                         |
| M_ 70 38 02  |      |                                              | 2.82                    | 1.7                       | 3800                      | 2.40                     |                            |                           |                           | 0.43                 | 0.75                         |
| M_ 70 75 02  |      |                                              | 5.36                    | 0.6                       | 7500                      | 1.74                     |                            |                           |                           | 0.23                 | 0.39                         |
| M_ 70 20 2.5 |      | 2.5<br>(3.1)                                 | 1.90                    | 2.4                       | 2000                      | 1.82                     | 9.8                        | 81                        | 11                        | 0.79                 | 1.36                         |
| M_ 70 38 2.5 |      |                                              | 3.56                    | 2.1                       | 3800                      | 3.01                     |                            |                           |                           | 0.42                 | 0.73                         |
| M_ 70 75 2.5 |      |                                              | 6.77                    | 0.6                       | 7500                      | 1.77                     |                            |                           |                           | 0.22                 | 0.38                         |

### 400 VAC

| Model        | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                                   |                                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|--------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|-------------------------------------------|-------------------------------------------|----------------------|------------------------------|
|              |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                                  | With brake                                |                      |                              |
|              |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[10 <sup>-3</sup> kgm <sup>2</sup> ] | J<br>[10 <sup>-3</sup> kgm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 70 37 0.5 | 70   | 0.5<br>(0.9)                                 | 0.44                    | 0.5                       | 3700                      | 0.41                     | 2.8                        | 26                                        | 55                                        | 0.67                 | 1.17                         |
| M_ 70 70 0.5 |      |                                              | 0.72                    | 0.4                       | 7000                      | 0.55                     |                            |                                           |                                           | 0.41                 | 0.71                         |
| M_ 70 37 01  |      | 1.0<br>(1.6)                                 | 0.84                    | 0.9                       | 3700                      | 0.74                     | 5.1                        | 40                                        | 69                                        | 0.72                 | 1.25                         |
| M_ 70 70 01  |      |                                              | 1.39                    | 0.6                       | 7000                      | 0.85                     |                            |                                           |                                           | 0.42                 | 0.72                         |
| M_ 70 37 1.5 |      | 1.5<br>(2.2)                                 | 1.23                    | 1.3                       | 3700                      | 1.07                     | 6.8                        | 54                                        | 83                                        | 0.73                 | 1.27                         |
| M_ 70 70 1.5 |      |                                              | 2.25                    | 0.8                       | 7000                      | 1.27                     |                            |                                           |                                           | 0.42                 | 0.72                         |
| M_ 70 37 2.0 |      | 2.0<br>(2.7)                                 | 1.55                    | 1.7                       | 3700                      | 1.32                     | 8.4                        | 68                                        | 97                                        | 0.78                 | 1.36                         |
| M_ 70 70 2.0 |      |                                              | 2.82                    | 0.9                       | 7000                      | 1.35                     |                            |                                           |                                           | 0.43                 | 0.75                         |
| M_ 70 37 2.5 |      | 2.5<br>(3.1)                                 | 1.90                    | 2.1                       | 3700                      | 1.60                     | 9.8                        | 81                                        | 110                                       | 0.79                 | 1.36                         |
| M_ 70 70 2.5 |      |                                              | 3.56                    | 1.2                       | 7000                      | 1.73                     |                            |                                           |                                           | 0.42                 | 0.73                         |

<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

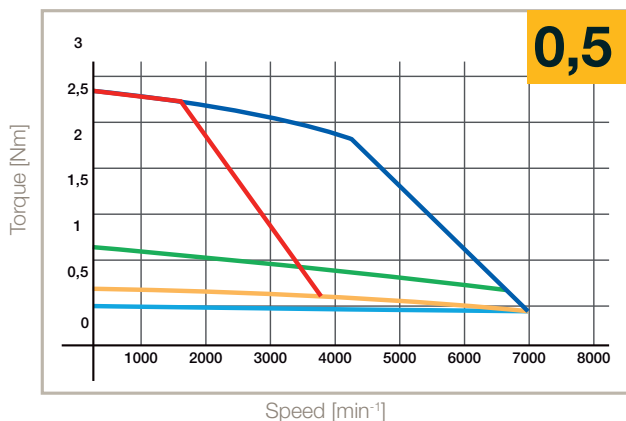
<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %

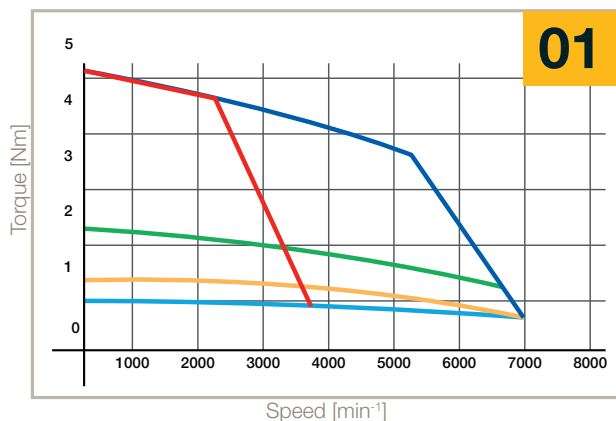
## Speed Torque Curves

### MB/H70

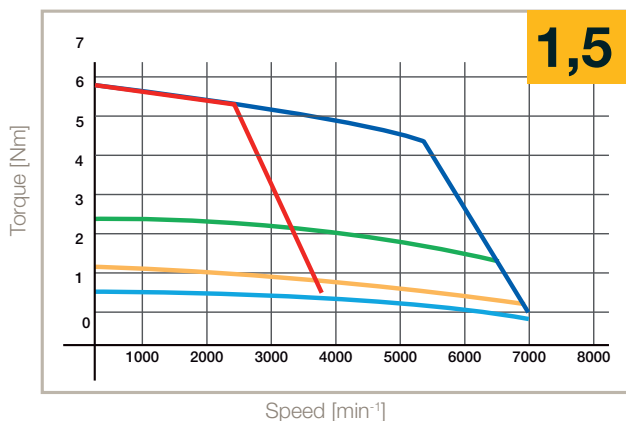
3800 min<sup>-1</sup> 230 V - 7000 min<sup>-1</sup> 400 V



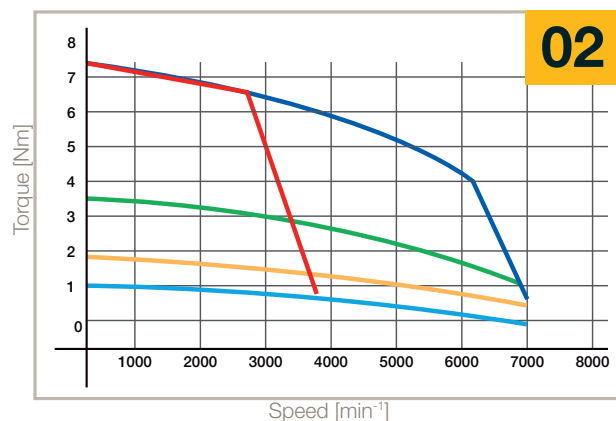
3800 min<sup>-1</sup> 230 V - 7000 min<sup>-1</sup> 400 V



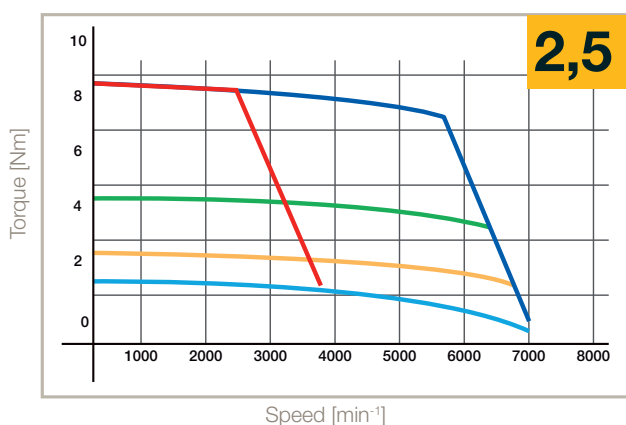
3800 min<sup>-1</sup> 230 V - 7000 min<sup>-1</sup> 400 V



3800 min<sup>-1</sup> 230 V - 7000 min<sup>-1</sup> 400 V



3800 min<sup>-1</sup> 230 V - 7000 min<sup>-1</sup> 400 V



— S1 65 K, ΔT  
— S3 10 %, 5 min, 400 V  
— S3 20 %, 5 min, 230 V  
— S3 50 %, 5 min



## MB / MH Motors, Size 105 - 2.2...8 Nm

### 230 VAC

| Model        | Size | Stall                                     |                      | Nominal                |                        |                       | Peak Torque <sup>(1)</sup> | Inertia                |                        | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>      |
|--------------|------|-------------------------------------------|----------------------|------------------------|------------------------|-----------------------|----------------------------|------------------------|------------------------|----------------------|---------------------------|
|              |      | Torque <sup>(1)</sup>                     | Current              | Torque <sup>(1)</sup>  | Speed                  | Current               |                            | No brake               | With brake             |                      |                           |
|              |      | T <sub>065</sub> (T <sub>105</sub> ) [Nm] | I <sub>065</sub> [A] | T <sub>n065</sub> [Nm] | n [min <sup>-1</sup> ] | I <sub>n065</sub> [A] | T <sub>max</sub> [Nm]      | J [kgmm <sup>2</sup> ] | J [kgmm <sup>2</sup> ] | Ke [Vs]              | Kt [Nm/A <sub>rms</sub> ] |
| M_ 105 16 02 | 105  | 2.2 (3.5)                                 | 1.5                  | 2.2                    | 1600                   | 1.4                   | 11.0                       | 190                    | 253                    | 0.9                  | 1.63                      |
| M_ 105 25 02 |      |                                           | 2.1                  | 2.1                    | 2500                   | 2.0                   |                            |                        |                        | 0.6                  | 1.11                      |
| M_ 105 30 02 |      |                                           | 2.8                  | 2.1                    | 3000                   | 2.6                   |                            |                        |                        | 0.5                  | 0.83                      |
| M_ 105 50 02 |      |                                           | 4.3                  | 1.8                    | 5000                   | 3.5                   |                            |                        |                        | 0.3                  | 0.55                      |
| M_ 105 16 04 |      | 4.0 (6.1)                                 | 2.6                  | 4.0                    | 1600                   | 2.5                   | 19.5                       | 340                    | 403                    | 1.0                  | 1.65                      |
| M_ 105 25 04 |      |                                           | 3.8                  | 3.7                    | 2500                   | 3.5                   |                            |                        |                        | 0.7                  | 1.13                      |
| M_ 105 30 04 |      |                                           | 5.0                  | 3.6                    | 3000                   | 4.4                   |                            |                        |                        | 0.5                  | 0.85                      |
| M_ 105 50 04 |      |                                           | 7.4                  | 2.7                    | 5000                   | 5.0                   |                            |                        |                        | 0.3                  | 0.58                      |
| M_ 105 16 06 |      | 6.0 (8.3)                                 | 3.9                  | 5.9                    | 1600                   | 3.7                   | 26.2                       | 480                    | 543                    | 1.0                  | 1.65                      |
| M_ 105 25 06 |      |                                           | 5.6                  | 5.5                    | 2500                   | 5.0                   |                            |                        |                        | 0.7                  | 1.15                      |
| M_ 105 30 06 |      |                                           | 7.4                  | 5.2                    | 3000                   | 6.4                   |                            |                        |                        | 0.5                  | 0.87                      |
| M_ 105 50 06 |      |                                           | 11.2                 | 3.6                    | 5000                   | 6.7                   |                            |                        |                        | 0.3                  | 0.58                      |
| M_ 105 16 08 |      | 8.0 (10.0)                                | 5.2                  | 7.8                    | 1600                   | 5.0                   | 31.7                       | 620                    | 0,683                  | 1.0                  | 1.65                      |
| M_ 105 25 08 |      |                                           | 7.5                  | 7.2                    | 2500                   | 6.6                   |                            |                        |                        | 0.7                  | 1.15                      |
| M_ 105 30 08 |      |                                           | 9.7                  | 6.8                    | 3000                   | 8.2                   |                            |                        |                        | 0.5                  | 0.88                      |
| M_ 105 50 08 |      |                                           | 14.2                 | 4.4                    | 5000                   | 7.9                   |                            |                        |                        | 0.4                  | 0.61                      |

### 400 VAC

| Model        | Size | Stall                                     |                      | Nominal                |                        |                       | Peak Torque <sup>(1)</sup> | Inertia                |                        | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>      |
|--------------|------|-------------------------------------------|----------------------|------------------------|------------------------|-----------------------|----------------------------|------------------------|------------------------|----------------------|---------------------------|
|              |      | Torque <sup>(1)</sup>                     | Current              | Torque <sup>(1)</sup>  | Speed                  | Current               |                            | No brake               | With brake             |                      |                           |
|              |      | T <sub>065</sub> (T <sub>105</sub> ) [Nm] | I <sub>065</sub> [A] | T <sub>n065</sub> [Nm] | n [min <sup>-1</sup> ] | I <sub>n065</sub> [A] | T <sub>max</sub> [Nm]      | J [kgmm <sup>2</sup> ] | J [kgmm <sup>2</sup> ] | Ke [Vs]              | Kt [Nm/A <sub>rms</sub> ] |
| M_ 105 30 02 | 105  | 2.2 (3.5)                                 | 1.5                  | 2.1                    | 3000                   | 1.4                   | 11.0                       | 190                    | 253                    | 0.9                  | 1.63                      |
| M_ 105 45 02 |      |                                           | 2.1                  | 1.9                    | 4500                   | 1.8                   |                            |                        |                        | 0.6                  | 1.11                      |
| M_ 105 60 02 |      |                                           | 2.8                  | 1.7                    | 6000                   | 2.2                   |                            |                        |                        | 0.5                  | 0.83                      |
| M_ 105 30 04 |      | 4.0 (6.1)                                 | 2.6                  | 3.6                    | 3000                   | 2.3                   | 19.5                       | 340                    | 403                    | 1.0                  | 1.65                      |
| M_ 105 45 04 |      |                                           | 3.8                  | 3.0                    | 4500                   | 2.8                   |                            |                        |                        | 0.7                  | 1.13                      |
| M_ 105 60 04 |      |                                           | 5.0                  | 2.4                    | 6000                   | 3.0                   |                            |                        |                        | 0.5                  | 0.85                      |
| M_ 105 30 06 |      | 6.0 (8.3)                                 | 3.9                  | 5.3                    | 3000                   | 3.4                   | 26.2                       | 480                    | 543                    | 1.0                  | 1.65                      |
| M_ 105 45 06 |      |                                           | 5.6                  | 4.1                    | 4500                   | 3.8                   |                            |                        |                        | 0.7                  | 1.15                      |
| M_ 105 60 06 |      |                                           | 7.4                  | 3.0                    | 6000                   | 3.7                   |                            |                        |                        | 0.5                  | 0.87                      |
| M_ 105 30 08 |      | 8.0 (10.0)                                | 5.2                  | 6.9                    | 3000                   | 4.4                   | 31.7                       | 620                    | 683                    | 1.0                  | 1.65                      |
| M_ 105 45 08 |      |                                           | 7.5                  | 5.2                    | 4500                   | 4.9                   |                            |                        |                        | 0.7                  | 1.15                      |
| M_ 105 60 08 |      |                                           | 9.7                  | 3.6                    | 6000                   | 4.4                   |                            |                        |                        | 0.5                  | 0.88                      |

<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

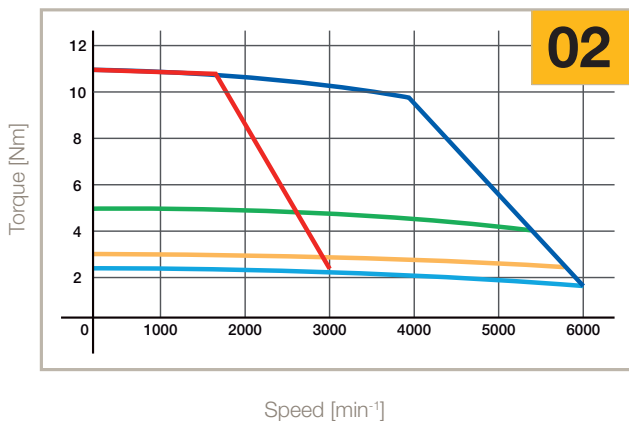
<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %

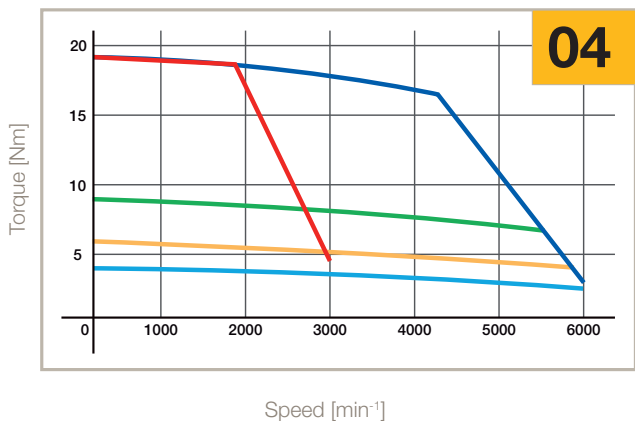
## Speed Torque Curves

### MB/H105

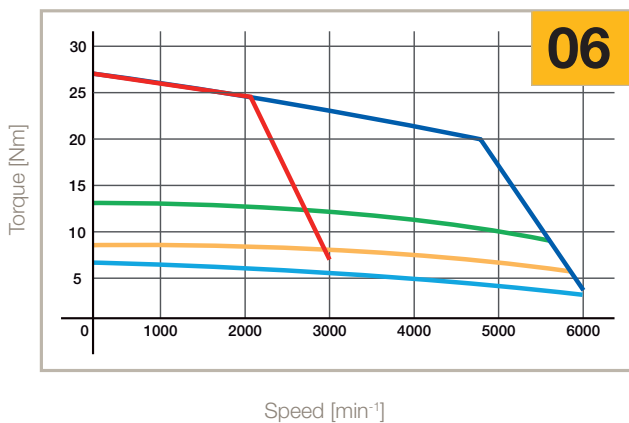
3000 min<sup>-1</sup> 230 V - 6000 min<sup>-1</sup> 400 V



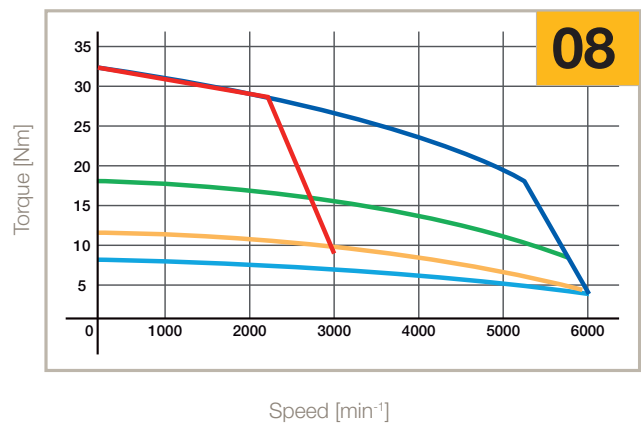
3000 min<sup>-1</sup> 230 V - 6000 min<sup>-1</sup> 400 V



3000 min<sup>-1</sup> 230 V - 6000 min<sup>-1</sup> 400 V



3000 min<sup>-1</sup> 230 V - 6000 min<sup>-1</sup> 400 V



— S1 65 K, ΔT  
— S3 10 %, 5 min, 400 V  
— S3 10 %, 5 min, 230 V  
— S3 50 %, 5 min  
— S3 20 %, 5 min



## MB / MH Motors, Size 145 - 4.5...28 Nm

### 230 VAC

| Model         | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|---------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|---------------------------|---------------------------|----------------------|------------------------------|
|               |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                  | With brake                |                      |                              |
|               |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 145 5.5 04 | 145  | 4.5<br>(9)                                   | 1.1                     | 4.6                       | 550                       | 1.1                      | 28                         | 780                       | 975                       | 2.1                  | 3.65                         |
| M_ 145 11 04  |      |                                              | 2.3                     | 4.6                       | 1100                      | 2.4                      |                            |                           |                           | 1.2                  | 2.03                         |
| M_ 145 16 04  |      |                                              | 3.4                     | 4.5                       | 1600                      | 3.3                      |                            |                           |                           | 0.8                  | 1.42                         |
| M_ 145 25 04  |      |                                              | 4.7                     | 4.3                       | 2500                      | 4.5                      |                            |                           |                           | 0.6                  | 1.01                         |
| M_ 145 40 04  |      |                                              | 8.1                     | 4.1                       | 4000                      | 7.2                      |                            |                           |                           | 0.4                  | 0.60                         |
| M_ 145 5.5 08 |      | 8.7<br>(16)                                  | 2.0                     | 8.7                       | 550                       | 2.0                      | 49                         | 1050                      | 1245                      | 2.7                  | 4.69                         |
| M_ 145 11 08  |      |                                              | 3.7                     | 8.7                       | 1100                      | 3.6                      |                            |                           |                           | 1.4                  | 2.49                         |
| M_ 145 16 08  |      |                                              | 5.4                     | 8.6                       | 1600                      | 5.2                      |                            |                           |                           | 1.0                  | 1.70                         |
| M_ 145 25 08  |      |                                              | 8.2                     | 8.1                       | 2500                      | 7.4                      |                            |                           |                           | 0.7                  | 1.14                         |
| M_ 145 40 08  |      |                                              | 12.3                    | 7.0                       | 4000                      | 9.7                      |                            |                           |                           | 0.4                  | 0.76                         |
| M_ 145 5.5 15 |      | 15.0<br>(27)                                 | 3.3                     | 15.0                      | 550                       | 3.2                      | 86                         | 1600                      | 1795                      | 2.9                  | 4.94                         |
| M_ 145 11 15  |      |                                              | 6.2                     | 14.7                      | 1100                      | 5.9                      |                            |                           |                           | 1.5                  | 2.59                         |
| M_ 145 16 15  |      |                                              | 9.1                     | 14.3                      | 1600                      | 8.5                      |                            |                           |                           | 1.0                  | 1.78                         |
| M_ 145 25 15  |      |                                              | 14.2                    | 13.6                      | 2500                      | 12.5                     |                            |                           |                           | 0.7                  | 1.14                         |
| M_ 145 40 15  |      |                                              | 21.3                    | 10.9                      | 4000                      | 15.0                     |                            |                           |                           | 0.4                  | 0.76                         |
| M_ 145 5.5 22 |      | 22.0<br>(37)                                 | 4.7                     | 21.9                      | 550                       | 4.6                      | 117                        | 2150                      | 2345                      | 2.9                  | 5.03                         |
| M_ 145 11 22  |      |                                              | 8.9                     | 21.3                      | 1100                      | 8.4                      |                            |                           |                           | 1.5                  | 2.65                         |
| M_ 145 16 22  |      |                                              | 13.1                    | 20.8                      | 1600                      | 12.1                     |                            |                           |                           | 1.0                  | 1.80                         |
| M_ 145 25 22  |      |                                              | 20.8                    | 19.1                      | 2500                      | 17.6                     |                            |                           |                           | 0.7                  | 1.13                         |
| M_ 145 40 22  |      |                                              | 31.1                    | 13.4                      | 4000                      | 18.6                     |                            |                           |                           | 0.4                  | 0.76                         |
| M_ 145 5.5 28 |      | 28.0<br>(45)                                 | 5.9                     | 27.8                      | 550                       | 5.8                      | 143                        | 2700                      | 2895                      | 2.9                  | 5.07                         |
| M_ 145 11 28  |      |                                              | 11.3                    | 26.9                      | 1100                      | 10.6                     |                            |                           |                           | 1.5                  | 2.65                         |
| M_ 145 16 28  |      |                                              | 17.0                    | 26.2                      | 1600                      | 15.5                     |                            |                           |                           | 1.0                  | 1.78                         |
| M_ 145 25 28  |      |                                              | 26.5                    | 23.2                      | 2500                      | 21.4                     |                            |                           |                           | 0.7                  | 1.13                         |
| M_ 145 40 28  |      |                                              | 39.6                    | 14.1                      | 4000                      | 19.7                     |                            |                           |                           | 0.4                  | 0.76                         |

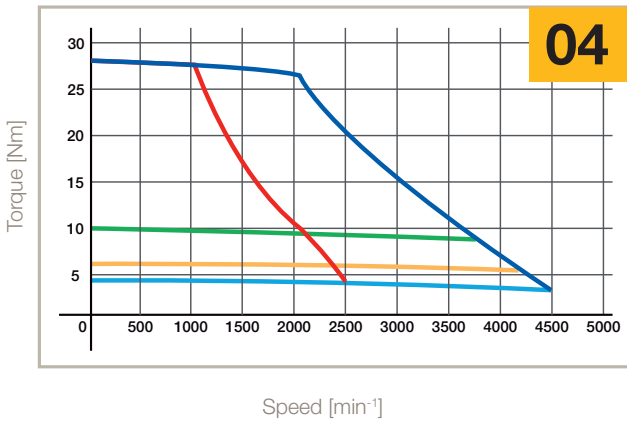
### 400 VAC

| Model        | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|--------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|---------------------------|---------------------------|----------------------|------------------------------|
|              |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                  | With brake                |                      |                              |
|              |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_ 145 10 04 | 145  | 4.5<br>(9)                                   | 1.1                     | 4.5                       | 1000                      | 1.1                      | 28                         | 780                       | 975                       | 2.1                  | 3.65                         |
| M_ 145 20 04 |      |                                              | 2.3                     | 4.5                       | 2000                      | 2.3                      |                            |                           |                           | 1.2                  | 2.03                         |
| M_ 145 30 04 |      |                                              | 3.4                     | 4.3                       | 3000                      | 3.2                      |                            |                           |                           | 0.8                  | 1.42                         |
| M_ 145 45 04 |      |                                              | 4.7                     | 3.9                       | 4500                      | 4.0                      |                            |                           |                           | 0.6                  | 1.01                         |
| M_ 145 10 08 |      |                                              | 2.0                     | 8.7                       | 1000                      | 1.9                      | 49                         | 1050                      | 1245                      | 2.7                  | 4.69                         |
| M_ 145 20 08 |      | 8.7<br>(16)                                  | 3.7                     | 8.4                       | 2000                      | 3.5                      |                            |                           |                           | 1.4                  | 2.49                         |
| M_ 145 30 08 |      |                                              | 5.4                     | 7.9                       | 3000                      | 4.8                      |                            |                           |                           | 1.0                  | 1.70                         |
| M_ 145 45 08 |      |                                              | 8.2                     | 7.1                       | 4500                      | 6.6                      |                            |                           |                           | 0.7                  | 1.14                         |
| M_ 145 10 15 |      |                                              | 3.3                     | 14.8                      | 1000                      | 3.1                      | 86                         | 1600                      | 1795                      | 2.9                  | 4.94                         |
| M_ 145 20 15 |      | 15.0<br>(27)                                 | 6.2                     | 13.7                      | 2000                      | 5.5                      |                            |                           |                           | 1.5                  | 2.59                         |
| M_ 145 30 15 |      |                                              | 9.1                     | 12.7                      | 3000                      | 7.5                      |                            |                           |                           | 1.0                  | 1.78                         |
| M_ 145 45 15 |      |                                              | 14.2                    | 9.8                       | 4500                      | 9.1                      |                            |                           |                           | 0.7                  | 1.14                         |
| M_ 145 10 22 |      |                                              | 4.7                     | 21.4                      | 1000                      | 4.5                      | 117                        | 2150                      | 2345                      | 2.9                  | 5.03                         |
| M_ 145 20 22 |      | 22.0<br>(37)                                 | 8.9                     | 19.4                      | 2000                      | 7.6                      |                            |                           |                           | 1.5                  | 2.65                         |
| M_ 145 30 22 |      |                                              | 13.1                    | 17.3                      | 3000                      | 10.1                     |                            |                           |                           | 1.0                  | 1.80                         |
| M_ 145 45 22 |      |                                              | 20.8                    | 11.6                      | 4500                      | 10.8                     |                            |                           |                           | 0.7                  | 1.13                         |
| M_ 145 10 28 |      |                                              | 5.9                     | 27.1                      | 1000                      | 5.6                      | 143                        | 2700                      | 2895                      | 2.9                  | 5.07                         |
| M_ 145 20 28 |      | 28.0<br>(45)                                 | 11.3                    | 23.9                      | 2000                      | 9.4                      |                            |                           |                           | 1.5                  | 2.65                         |
| M_ 145 30 28 |      |                                              | 17.0                    | 21.1                      | 3000                      | 12.5                     |                            |                           |                           | 1.0                  | 1.78                         |
| M_ 145 45 28 |      |                                              | 26.5                    | 10.0                      | 4500                      | 9.4                      |                            |                           |                           | 0.7                  | 1.13                         |

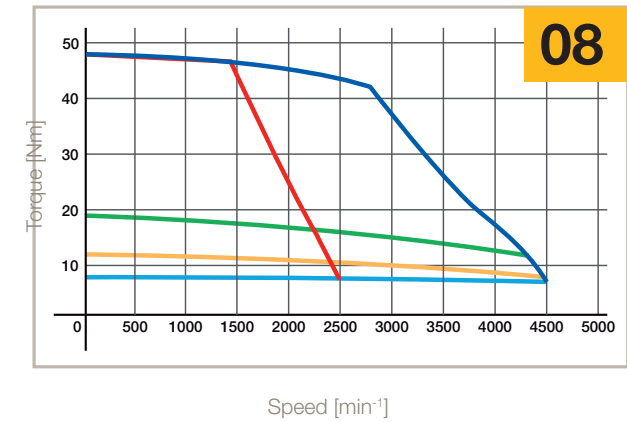
## Speed Torque Curves

### MB/H145

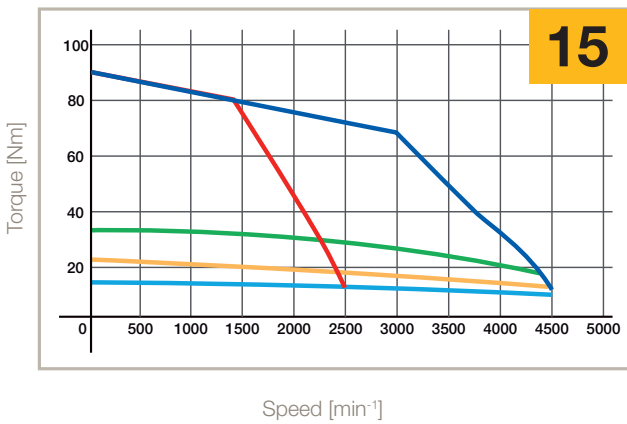
2500 min<sup>-1</sup> 230 V - 4500 min<sup>-1</sup> 400 V



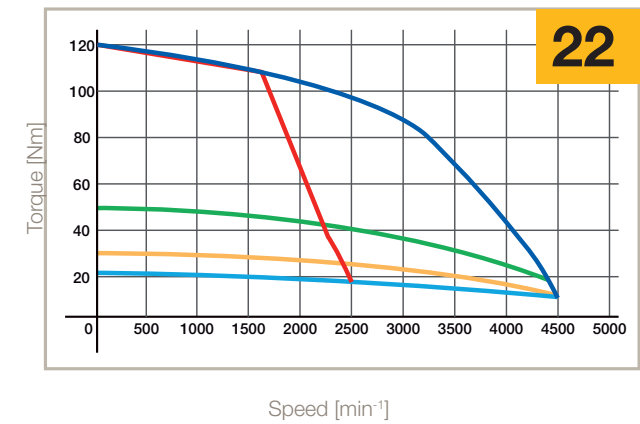
2500 min<sup>-1</sup> 230 V - 4500 min<sup>-1</sup> 400 V



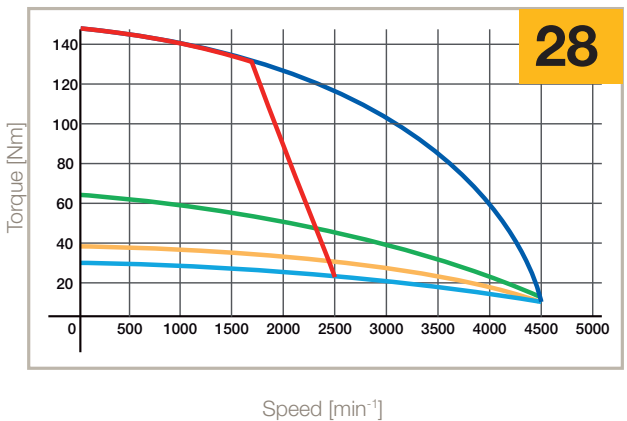
2500 min<sup>-1</sup> 230 V - 4500 min<sup>-1</sup> 400 V



2500 min<sup>-1</sup> 230 V - 4500 min<sup>-1</sup> 400 V



2500 min<sup>-1</sup> 230 V - 4500 min<sup>-1</sup> 400 V



— S1 65 K, ΔT — S3 50 %, 5 min  
— S3 10 %, 5 min, 400 V — S3 20 %, 5 min  
— S3 10 %, 5 min, 230 V

<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %



## MB / MH Motors, Size 205 - 15...90 Nm

### 230 VAC

| Model        | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|--------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|---------------------------|---------------------------|----------------------|------------------------------|
|              |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                  | With brake                |                      |                              |
|              |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_205 11 15  | 205  | 15                                           | 6.3                     | 14.7                      | 1150                      | 6.2                      | 69                         | 3500                      | 4035                      | 1.4                  | 2.38                         |
| M_205 17 15  |      | (22)                                         | 8.6                     | 14.4                      | 1700                      | 8.3                      |                            |                           |                           | 1                    | 1.74                         |
| M_205 5.5 28 |      | 28<br>(39)                                   | 6.9                     | 28.6                      | 550                       | 6.9                      | 123                        | 5000                      | 5535                      | 2.5                  | 4.35                         |
| M_205 11 28  |      |                                              | 13.0                    | 28.2                      | 1150                      | 12.7                     |                            |                           |                           | 1.3                  | 2.31                         |
| M_205 17 28  |      |                                              | 20.1                    | 27.6                      | 1700                      | 19.3                     |                            |                           |                           | 0.9                  | 1.50                         |
| M_205 5.5 50 |      | 50<br>(70)                                   | 12.4                    | 51.3                      | 550                       | 12.3                     | 222                        | 8000                      | 8535                      | 2.5                  | 4.35                         |
| M_205 11 50  |      |                                              | 22.1                    | 50.0                      | 1150                      | 21.3                     |                            |                           |                           | 1.4                  | 2.45                         |
| M_205 17 50  |      |                                              | 33.1                    | 48.0                      | 1700                      | 30.8                     |                            |                           |                           | 0.9                  | 1.63                         |
| M_205 5.5 70 |      | 70<br>(98)                                   | 16.8                    | 71.1                      | 550                       | 16.5                     | 310                        | 11000                     | 11535                     | 2.6                  | 4.49                         |
| M_205 11 70  |      |                                              | 30.7                    | 68.6                      | 1150                      | 29.3                     |                            |                           |                           | 1.4                  | 2.45                         |
| M_205 17 70  |      |                                              | 46.1                    | 65.0                      | 1700                      | 41.7                     |                            |                           |                           | 0.9                  | 1.63                         |
| M_205 5.5 90 |      | 90<br>(126)                                  | 22.1                    | 90.9                      | 550                       | 21.8                     | 398                        | 14000                     | 14535                     | 2.5                  | 4.35                         |
| M_205 11 90  |      |                                              | 44.3                    | 87.0                      | 1150                      | 41.8                     |                            |                           |                           | 1.3                  | 2.18                         |
| M_205 17 90  |      |                                              | 59                      | 81.7                      | 1700                      | 52.4                     |                            |                           |                           | 0.9                  | 1.63                         |

### 400 VAC

| Model       | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup> | Kt <sup>(2)(3)</sup>         |
|-------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|----------------------------|---------------------------|---------------------------|----------------------|------------------------------|
|             |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                            | No brake                  | With brake                |                      |                              |
|             |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>065</sub><br>[A] | T <sub>n065</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n065</sub><br>[A] | T <sub>max</sub><br>[Nm]   | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] | Ke<br>[Vs]           | Kt<br>[Nm/A <sub>rms</sub> ] |
| M_205 20 15 | 205  | 15                                           | 6.3                     | 14.1                      | 2000                      | 5.9                      | 69                         | 3500                      | 4035                      | 1.4                  | 2.38                         |
| M_205 30 15 |      | (22)                                         | 8.6                     | 13.4                      | 3000                      | 7.7                      |                            |                           |                           | 1                    | 1.74                         |
| M_205 10 28 |      | 28<br>(39)                                   | 6.9                     | 28.2                      | 1000                      | 6.8                      | 123                        | 5000                      | 5535                      | 2.5                  | 4.35                         |
| M_205 20 28 |      |                                              | 13.0                    | 27.3                      | 2000                      | 12.3                     |                            |                           |                           | 1.3                  | 2.31                         |
| M_205 30 28 |      |                                              | 20.1                    | 25.7                      | 3000                      | 18.0                     |                            |                           |                           | 0.9                  | 1.50                         |
| M_205 10 50 |      | 50<br>(70)                                   | 12.4                    | 50.4                      | 1000                      | 12.1                     | 222                        | 8000                      | 8535                      | 2.5                  | 4.35                         |
| M_205 20 50 |      |                                              | 22.1                    | 47.0                      | 2000                      | 20.1                     |                            |                           |                           | 1.4                  | 2.45                         |
| M_205 30 50 |      |                                              | 33.1                    | 41.7                      | 3000                      | 26.8                     |                            |                           |                           | 0.9                  | 1.63                         |
| M_205 10 70 |      | 70<br>(98)                                   | 16.8                    | 69.4                      | 1000                      | 16.1                     | 310                        | 11000                     | 11535                     | 2.6                  | 4.49                         |
| M_205 20 70 |      |                                              | 30.7                    | 62.9                      | 2000                      | 26.9                     |                            |                           |                           | 1.4                  | 2.45                         |
| M_205 30 70 |      |                                              | 46.1                    | 52.3                      | 3000                      | 33.7                     |                            |                           |                           | 0.9                  | 1.63                         |
| M_205 10 90 |      | 90<br>(126)                                  | 22.1                    | 88.2                      | 1000                      | 21.2                     | 398                        | 14000                     | 14535                     | 2.5                  | 4.35                         |
| M_205 20 90 |      |                                              | 44.3                    | 78.3                      | 2000                      | 37.7                     |                            |                           |                           | 1.3                  | 2.18                         |
| M_205 30 90 |      |                                              | 59.0                    | 61.6                      | 3000                      | 39.7                     |                            |                           |                           | 0.9                  | 1.63                         |

<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

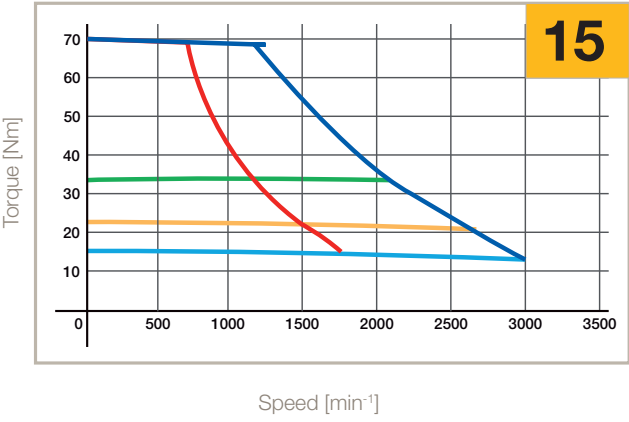
<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

<sup>(3)</sup> Tolerance data ±10 %

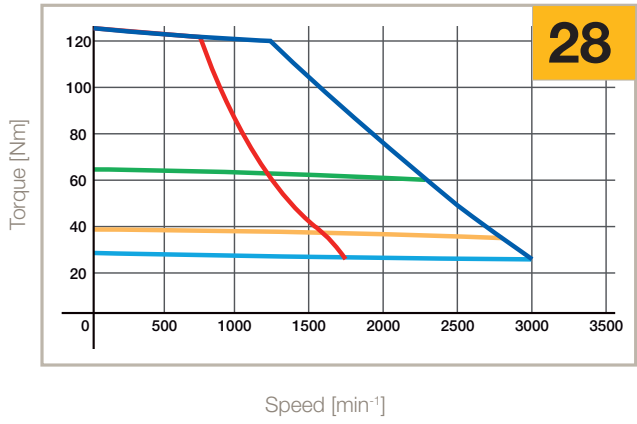
Speed Torque Curves

MB/H205

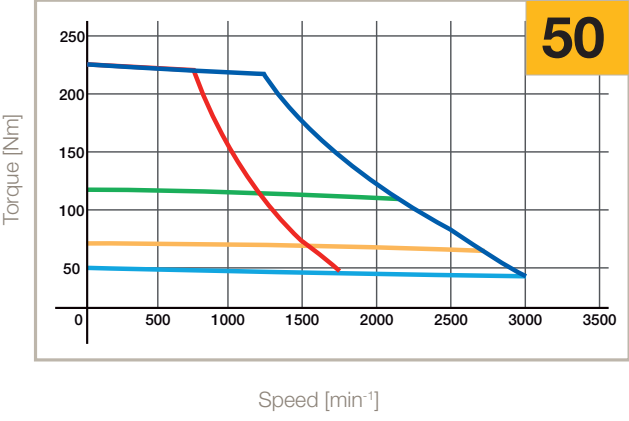
1700 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



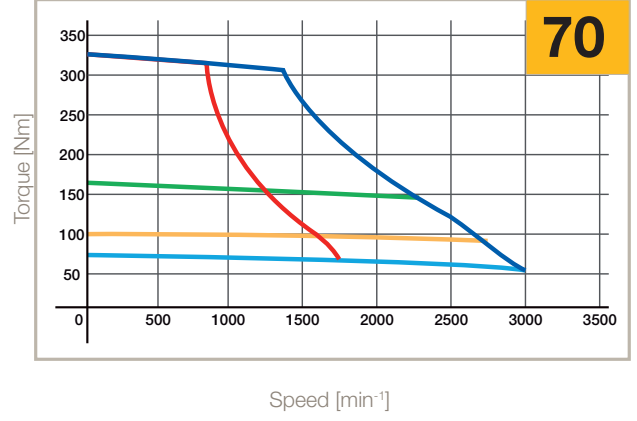
1700 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



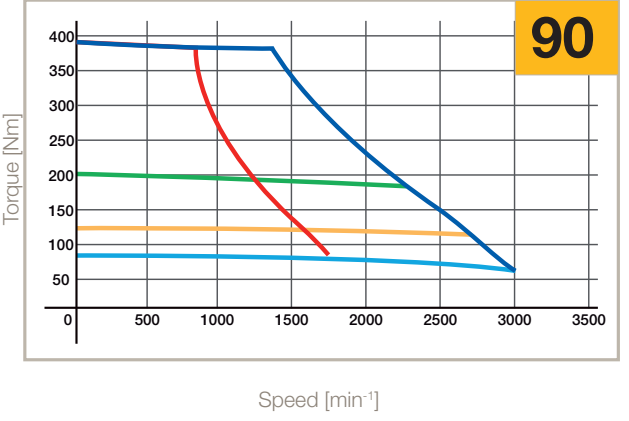
1700 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



1700 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



1700 min<sup>-1</sup> 230 V - 3000 min<sup>-1</sup> 400 V



- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min



## MB / MH Motors, Size 265 - 75...270 Nm

400 VAC

| Model         | Size | Stall                                        |                         | Nominal                   |                           |                          | Peak<br>Torque <sup>(1)</sup> | Inertia                   |                           | Ke <sup>(2)(3)</sup><br>[Vs] | Kt <sup>(2)(3)</sup><br>[Nm/A <sub>rms</sub> ] |
|---------------|------|----------------------------------------------|-------------------------|---------------------------|---------------------------|--------------------------|-------------------------------|---------------------------|---------------------------|------------------------------|------------------------------------------------|
|               |      | Torque <sup>(1)</sup>                        | Current                 | Torque <sup>(1)</sup>     | Speed                     | Current                  |                               | No brake                  | With brake                |                              |                                                |
|               |      | T <sub>065</sub> (T <sub>105</sub> )<br>[Nm] | I <sub>105</sub><br>[A] | T <sub>n105</sub><br>[Nm] | n<br>[min <sup>-1</sup> ] | I <sub>n105</sub><br>[A] | T <sub>max</sub><br>[Nm]      | J<br>[kgmm <sup>2</sup> ] | J<br>[kgmm <sup>2</sup> ] |                              |                                                |
| M_ 265 10 75  | 265  | 75 (94)                                      | 20                      | 94                        | 1000                      | 20.1                     | 235                           | 22 000                    | 30 100                    | 2.86                         | 4.71                                           |
| M_ 265 20 75  |      | 74 (92)                                      | 39                      | 92                        | 2000                      | 39                       |                               |                           |                           | 1.43                         | 2.35                                           |
| M_ 265 30 75  |      |                                              | 59                      | 87                        | 3000                      | 55                       |                               |                           |                           | 0.95                         | 1.57                                           |
| M_ 265 10 150 |      | 142 (176)                                    | 37                      | 176                       | 1000                      | 37                       | 451                           | 36 000                    | 44 100                    | 2.86                         | 4.71                                           |
| M_ 265 20 150 |      | 144 (179)                                    | 86                      | 170                       | 2000                      | 81                       |                               |                           |                           | 1.27                         | 2.09                                           |
| M_ 265 30 150 |      | 141 (175)                                    | 112                     | 144                       | 3000                      | 92                       |                               |                           |                           | 0.95                         | 1.57                                           |
| M_ 265 10 220 |      | 206 (255)                                    | 54                      | 254                       | 1000                      | 54                       | 657                           | 49 000                    | 61 960                    | 2.86                         | 4.71                                           |
| M_ 265 20 220 |      | 206 (255)                                    | 108                     | 231                       | 2000                      | 98                       |                               |                           |                           | 1.43                         | 2.35                                           |
| M_ 265 30 220 |      | 205 (254)                                    | 162                     | 185                       | 3000                      | 118                      |                               |                           |                           | 0.95                         | 1.57                                           |
| M_ 265 10 285 |      | 267 (332)                                    | 64                      | 325                       | 1000                      | 62                       | 857                           | 63 000                    | 75 960                    | 3.18                         | 5.23                                           |
| M_ 265 20 285 |      | 267 (332)                                    | 159                     | 288                       | 2000                      | 138                      |                               |                           |                           | 1.27                         | 2.09                                           |
| M_ 265 30 285 |      | 269 (334)                                    | 213                     | 215                       | 3000                      | 137                      |                               |                           |                           | 0.95                         | 1.57                                           |

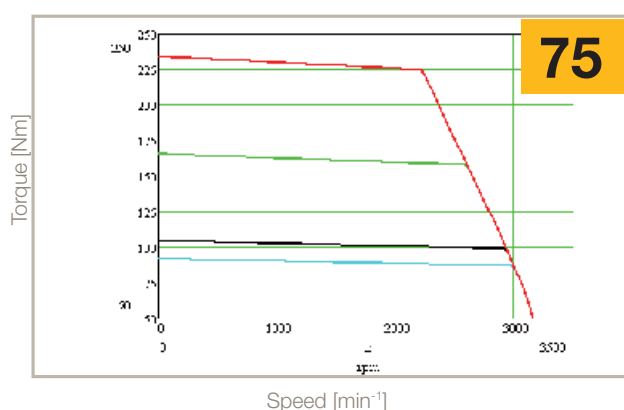
<sup>(1)</sup> Data referred to motor suspend in horizontal position in free still air, 20 °C ambient temperature

<sup>(2)</sup> Data measured at 20 °C. When "hot" consider 5 % derating

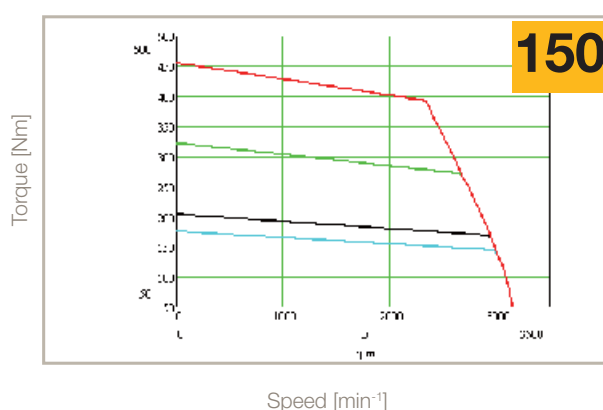
<sup>(3)</sup> Tolerance data ±10 %

### Speed Torque Curves

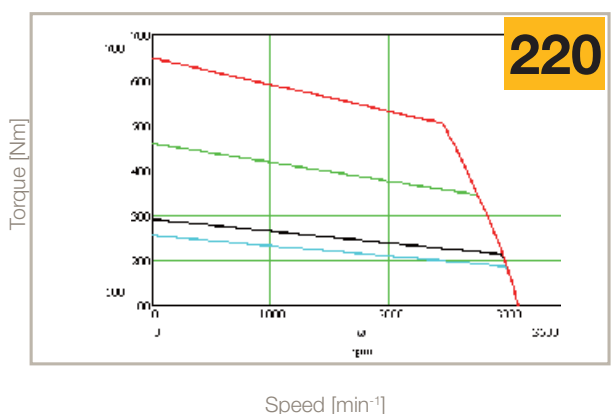
3000 min<sup>-1</sup> 400 V



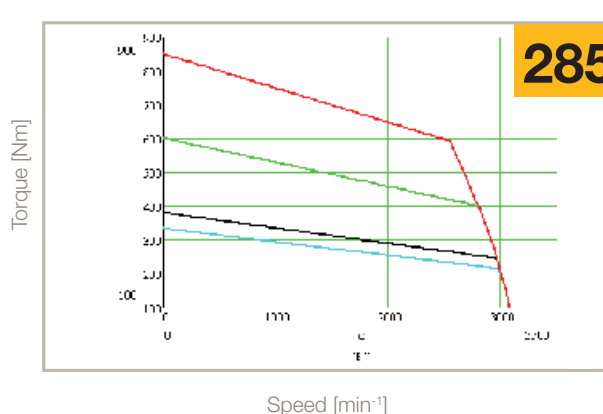
3000 min<sup>-1</sup> 400 V



3000 min<sup>-1</sup> 400 V

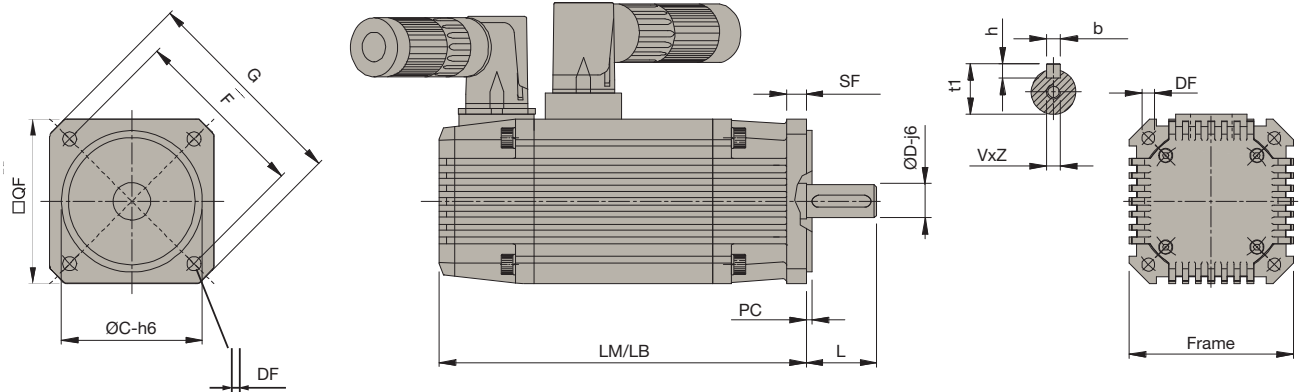


3000 min<sup>-1</sup> 400 V



— S1 65 K, ΔT  
— S3 10 %, 5 min, 400 V  
— S3 10 %, 5 min, 230 V  
— S3 50 %, 5 min  
— S3 20 %, 5 min

## Dimensions



| Motor - Size |     |     | LM/LB       | Weight | DxL                     | bxh          | t1               | VxZ                      | C   | F   | DF   | G   | SF  | PC  | QF  | Order code QF |
|--------------|-----|-----|-------------|--------|-------------------------|--------------|------------------|--------------------------|-----|-----|------|-----|-----|-----|-----|---------------|
| MB / MH      | 56  | 0.2 | 130.5/181.5 | 0.7    | 9x20<br>11x23           | 3x3<br>4x4   | 10.2<br>12.5     | M4x10                    | 40  | 63  | 5.5  | 74  | 6.5 | 2.5 | 56  | 5             |
|              |     | 0.4 | 150.5/201.5 | 1      |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 0.6 | 170.5/221.5 | 1.3    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              | 70  | 0.5 | 158/214     | 2      | 11x23<br>14x30          | 4x4<br>5x5   | 12.5<br>16       | M4x10<br>M4x12.5         | 60  | 75  | 6    | 90  | 8.5 | 2.5 | 70  | 5             |
|              |     | 01  | 188/244     | 2.8    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 1.5 | 218/274     | 3.5    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 02  | 248/304     | 4.3    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 2.5 | 278/334     | 5.1    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              | 105 | 02  | 186/250     | 5      | 19x40<br>24x50          | 6x6<br>8x7   | 21.5<br>27       | M6x16<br>M8x19           | 95  | 115 | 9.5  | 140 | 10  | 3.5 | 105 | 5             |
|              |     | 04  | 229/293     | 7      |                         |              |                  |                          | 95  | 115 | 9.5  | 140 | 10  | 3.5 | 105 | 4             |
|              |     | 06  | 273/337     | 9      |                         |              |                  |                          | 80  | 115 | 9.5  | 140 | 10  | 3.5 | 105 | 9             |
|              |     | 08  | 317/381     | 11     |                         |              |                  |                          | 110 | 115 | 9.5  | 140 | 10  | 3.5 | 105 | 6             |
|              | 145 | 04  | 200/274     | 8      | 19x40<br>24x50<br>28x60 | 6x6<br>8x7   | 21.5<br>27<br>31 | M6x16<br>M8x19<br>M10x22 | 130 | 165 | 11.5 | 200 | 12  | 3.5 | 145 | 5             |
|              |     | 08  | 231/305     | 12     |                         |              |                  |                          | 130 | 165 | 11.5 | 200 | 12  | 3.5 | 145 | 4             |
|              |     | 15  | 292/366     | 18     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 22  | 354/428     | 23     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 28  | 416/490     | 28     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              | 205 | 15  | 239/338     | 20     | 38x80<br>42x110         | 10x8<br>12x8 | 41<br>45         | M12x32<br>M16x40         | 180 | 215 | 14   | 250 | 18  | 4   | 205 | 5             |
|              |     | 28  | 273/372     | 29     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 50  | 342/441     | 44     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 70  | 411/510     | 59     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 90  | 480/579     | 74     |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              | 265 | 75  | 340/475     | 89     | 48X110                  | 14x9         | 51.5             | M16x40                   | 250 | 300 | 19   | 342 | 35  | 4   | 264 | 5             |
|              |     | 150 | 447/582     | 126    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 220 | 554/689     | 164    |                         |              |                  |                          |     |     |      |     |     |     |     |               |
|              |     | 285 | 661/796     | 203    |                         |              |                  |                          |     |     |      |     |     |     |     |               |

**LM:** motor lenght without brake with resolver  
**LB:** motor lenght with brake with resolver  
**DxL:** Shaft  
**bxh:** Key  
**t1:** Overall shaft height  
**VxZ:** Shaft hole depth  
 mm for dimensions, kg for weight

**C:** Center  
**F:** distance between center of holes clamp  
**DF:** Fixing holes  
**G:** dimension in diagonal  
**SF:** flange thickness  
**PC:** centering dept  
**QF:** flange square



## Options

Parker Mx family motors are available with standard and custom options to adapt motor on your application. If the option for your application is not listed, please consult our technical department.

### Holding Brake

All MB, MH motors are available with an optional holding brake. Two different brake types exist, standard holding brake (option A) and special brake (option B) depending on the features of your application needs. Incorporated into the motor is the fail-safe holding brake (supply voltage 24VDC  $\pm$ 10%) which is applied when no voltage is present. Because of the power taken by the brake, torque values must be reduced by 5% (10% for size 265). The holding brake shall be used with the motor only at a standstill and not for dynamic braking. When used normally they are maintenance free.

| Holding Brake <sup>(1)</sup> | Option | Voltage<br>[V] | Current<br>@ 20°C<br>[A] | Torque @<br>20°C<br>[Nm] | Added Lenght<br>[mm] | Added<br>Weight<br>[kg] | Torque derating<br>of motor |  |  |
|------------------------------|--------|----------------|--------------------------|--------------------------|----------------------|-------------------------|-----------------------------|--|--|
| M_56_A                       | A      | 24 ±10%        | 0.32                     | 0.6                      | 51                   | 0.8                     | 5%                          |  |  |
| M_56_B                       | B      | n.a.           |                          |                          |                      |                         |                             |  |  |
| M_70_A)                      | A      | 24 ±10%        | 0.53                     | 2                        | 56                   | 1.1                     | 5%                          |  |  |
| M_70_B                       | B      | n.a.           |                          |                          |                      |                         |                             |  |  |
| M_105_A                      | A      | 24 ±10%        | 1.1                      | 10                       | 64                   | 3                       | 5%                          |  |  |
| M_105_B                      | B      | n.a.           |                          |                          |                      |                         |                             |  |  |
| M_145_A_04                   | A      | 24 ±10%        | 1.8                      | 4                        | 74                   | 5                       | 5%                          |  |  |
| M_145_A_08                   |        |                |                          | 8                        |                      |                         |                             |  |  |
| M_145_A_15                   |        |                |                          | 15                       |                      |                         |                             |  |  |
| M_145_A_22                   |        |                |                          | 22                       |                      |                         |                             |  |  |
| M_145_A_28                   |        |                |                          | 28                       |                      |                         |                             |  |  |
| M_145_B                      | B      | 24 ±10%        | 0.75                     | 22                       | 74                   | 5                       | 5%                          |  |  |
| M_205_A                      | A      | 24 ±10%        | 1.35                     | 90                       | 99                   | 14                      | 5%                          |  |  |
| M_205_B                      | B      | 24 ±10%        | 1.2                      | 120                      | 99                   | 14                      | 5%                          |  |  |
| M_265_A_75                   | A      | 24 ±10%        | 2.9                      | 225                      | 135                  | 30                      | 10%                         |  |  |
| M_265_A_150                  |        |                |                          | 450                      |                      | 35                      |                             |  |  |
| M_265_A_220                  |        |                |                          |                          |                      |                         |                             |  |  |
| M_265_A_285                  |        |                |                          |                          |                      |                         |                             |  |  |
| M_265_B                      | B      | n.a.           |                          |                          |                      |                         |                             |  |  |

<sup>(1)</sup> If more than one option is required, please check with our technical department the feasibility.

### Fan cooling

For high duty cycle applications, Parker offer 3 different types of cooling option: servo-ventilated, self ventilated and water cooled. With servo-ventilated the motors (order Code M\_SV), an increase of 25 % torque and current based on nominal values (except for the maximum torque and current data) is provided. The servo-ventilated 205 motor is equipped with an external condenser for starting the fan.

With the self-ventilated option (order Code M\_V), the torque is increased proportionally to the nominal speed. For water-cooled motors (order code M\_W, available only for size 145), consider a performance increase of approx. 100 % in the torque and current, except peak data.

| Motor MB / MH | Option <sup>(1)</sup> | Voltage                        | Current [A] | Frequency [Hz] | speed [min <sup>-1</sup> ] | Added Length [mm] | Added Weight [kg] | Torque increasing of motor |
|---------------|-----------------------|--------------------------------|-------------|----------------|----------------------------|-------------------|-------------------|----------------------------|
| 105           | SV                    | 24 VDC $\pm$ 10%               | 0.17        | n.a.           | 3000                       | 64                | 1                 | 25%                        |
|               | V                     | n.a.                           | n.a.        | n.a.           | n.a.                       | 34                | 0.25              | Depending of speed         |
| 145           | SV                    | 230 VAC Single Phase $\pm$ 10% | 0.35        | 50             | 3000                       | 97                | 2                 | 25%                        |
|               | V                     | n.a.                           | n.a.        | n.a.           | n.a.                       | 44                | 0.55              | Depending of speed         |
| 205           | SV                    | 230 VAC Single Phase $\pm$ 10% | 0.22        | 50             | 3000                       | 109               | 2.2               | 25%                        |
|               | V                     | n.a.                           | n.a.        | n.a.           | n.a.                       | 54                | 1.1               | Depending of speed         |
| 265           | SV                    | 230 VAC Single Phase $\pm$ 10% | 0.22        | 50             | 3000                       | 109               | 2.2               | 25%                        |

<sup>(1)</sup> If more than one option is required, please check with our technical department the feasibility.

## Feedback options

M\_ motors are available with standard resolver feedback, but for different type of application we can offer the following types of feedback:

- Incremental Encoder with hall sensors
- Hiperface absolute encoder (single or multi-turn)
- EnDat absolute encoder (single or multi-turn)

### Resolver

|                       |                |
|-----------------------|----------------|
| Poles                 | 2              |
| Transformation ratio  | 0.5            |
| Operating temperature | -50 .. +150 °C |
| Motor associations    | All Sizes      |

### Incremental Encoder with Hall Sensor

| Code                           | A1                                 | A2               | A3                | B1      | C4   |
|--------------------------------|------------------------------------|------------------|-------------------|---------|------|
| Resolution [C/T]               | 2000                               | 2048             | 4096              | 3000    | 5000 |
| Poles                          | 8                                  |                  |                   | 4       | 8    |
| System Accuracy                | ±32"                               | ±32"             | ±16"              | ±22"    | ±13" |
| Voltage                        | +5 VDC ±5 % - 200 mA               |                  |                   |         |      |
| Reference Mark                 | Yes                                |                  |                   |         |      |
| Max Speed [min <sup>-1</sup> ] | 6000                               |                  |                   |         |      |
| Output Circuit                 | Line drive differential mode 20 mA |                  |                   |         |      |
| Operating Temperature          | -20 °C .. +100 °C                  | -20 °C .. +85 °C | -20 °C .. +100 °C |         |      |
| M_ Motors Associations         |                                    |                  |                   |         |      |
| M_56                           | -                                  | -                | -                 | -       | -    |
| M_70                           | -                                  | -                | -                 | Δ 10 mm | -    |
| M_105                          | ✓                                  | ✓                | ✓                 | -       | ✓    |
| M_145                          | ✓                                  | ✓                | ✓                 | -       | ✓    |
| M_205                          | ✓                                  | ✓                | ✓                 | -       | ✓    |
| M_265                          | -                                  | -                | -                 | -       | -    |

- Not possible

✓ Possible without increment

Δ Possible with increment motor length

### Hiperface Absolute Encoder

| Code                           | S1                                   | S2     | A6             | A7     |
|--------------------------------|--------------------------------------|--------|----------------|--------|
| Type                           | Optical                              |        |                |        |
| Turn                           | Single                               | Multi  | Single         | Multi  |
| Incremental Signals            | 1 V <sub>PP</sub>                    |        |                |        |
| Line Count                     | 1024                                 |        |                |        |
| Resolution                     | 32768 (15 bit)                       |        | 32768 (15 bit) |        |
| Absolute rotation              | 1                                    | 4096   | 1              | 4096   |
| System Accuracy                | ±45"                                 |        |                |        |
| Power Supply                   | 8 VDC                                |        |                |        |
| Max Speed [min <sup>-1</sup> ] | 6000                                 |        |                |        |
| Temperature                    | -20°C .. +115°C                      |        |                |        |
| Safety integrity level:        | SIL2 (IEC 61508), SILCL2 (IEC 62061) |        | Not Available  |        |
| MB / MH Motors Associations    |                                      |        |                |        |
| M_56                           | -                                    | -      | -              | -      |
| M_70                           | Δ 10mm                               | Δ 10mm | Δ 10mm         | Δ 10mm |
| M_105                          | Δ 19mm                               | Δ 19mm | Δ 19mm         | Δ 19mm |
| M_145                          | Δ 19mm                               | Δ 19mm | Δ 19mm         | Δ 19mm |
| M_205                          | Δ 19mm                               | Δ 19mm | Δ 19mm         | Δ 19mm |
| M_265                          | -                                    | -      | -              | -      |

- Not possible

✓ Possible without increment

Δ Possible with increment motor length



## EnDat Absolute Encoder

| Code                           | B9                | C1                | D5                |
|--------------------------------|-------------------|-------------------|-------------------|
| Type                           | Inductive         | Optical           |                   |
| Turn                           | Multi             | Single            | Multi             |
| Incremental Signals            | 1V <sub>PP</sub>  |                   |                   |
| Line Count                     | 32                | 512               |                   |
| Positions per revolutions      | 131 072 (17 bit)  | 8192 (13 bit)     |                   |
| Distinguishable revolutions    | 4096              | 1                 | 4096              |
| System Accuracy                | ±400"             | ±60"              |                   |
| Power Supply                   | 5 VDC             |                   |                   |
| Max Speed [min <sup>-1</sup> ] | 12 000            |                   | 7000              |
| Temperature                    | -20 °C .. +115 °C | -40 °C .. +115 °C | -30 °C .. +115 °C |
| Absolute position values       | EnDat 2.1         | EnDat 2.2         |                   |
| Safety integrity level:        | Not Available     |                   |                   |
| M_ Motors Associations         |                   |                   |                   |
| M_56                           | -                 | -                 | -                 |
| M_70                           | -                 | -                 | -                 |
| M_105                          | Δ 19 mm           | Δ 19 mm           | Δ 19 mm           |
| M_145                          | ✓                 | Δ 19 mm           | Δ 19 mm           |
| M_205                          | Δ 19 mm           | Δ 19 mm           | Δ 19 mm           |
| M_265                          | -                 | -                 | ✓                 |

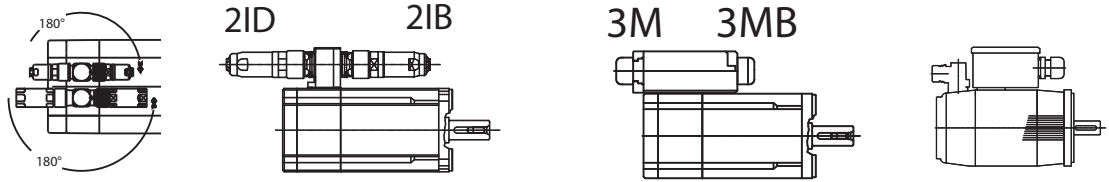
- Not possible
- ✓ Possible without increment
- Δ Possible with increment motor length

## Technical specifications for High inertia

| Option Inertia | Added ... | Unit                 | 105   |     |     |     | 145   |     |    |    |    | 205    |    |    |    |    | 265        |     |     |     |
|----------------|-----------|----------------------|-------|-----|-----|-----|-------|-----|----|----|----|--------|----|----|----|----|------------|-----|-----|-----|
|                |           |                      | 0.2   | 0.4 | 0.6 | 0.8 | 0.4   | 0.8 | 15 | 22 | 28 | 15     | 28 | 50 | 70 | 90 | 75         | 150 | 205 | 270 |
| M              | Inertia   | [kgmm <sup>2</sup> ] | 140   |     |     |     | 790   |     |    |    |    | 4400   |    |    |    |    | On request |     |     |     |
|                | length    | [mm]                 | 0     |     |     |     | 0     |     |    |    |    | 0      |    |    |    |    | On request |     |     |     |
|                | Weight    | [kg]                 | 0.340 |     |     |     | 0.990 |     |    |    |    | 2.065  |    |    |    |    | On request |     |     |     |
| ML             | Inertia   | [kgmm <sup>2</sup> ] | 530   |     |     |     | 1770  |     |    |    |    | 12 100 |    |    |    |    | n.a.       |     |     |     |
|                | Length    | [mm]                 | 64    |     |     |     | 74    |     |    |    |    | 99     |    |    |    |    | n.a.       |     |     |     |
|                | Weight    | [kg]                 | 1.5   |     |     |     | 3.3   |     |    |    |    | 7.6    |    |    |    |    | 11.9       |     |     |     |

## Layout and connectors

M\_ motors are available with different combinations of connectors and layout, depending of size of motor and the application



|        | 2x Parallel upright connectors 2I | 2x Forward facing connectors 2IB | 2x Rear facing connectors 2ID | Terminal box rear facing 3M | Terminal box forward facing 3MB | Terminal box forward facing 3I |
|--------|-----------------------------------|----------------------------------|-------------------------------|-----------------------------|---------------------------------|--------------------------------|
| MB_56  | -                                 | ✓                                | ✓                             | -                           | -                               | -                              |
| MB_70  | ✓                                 | -                                | -                             | ✓                           | ✓                               | -                              |
| MB_105 | ✓                                 | -                                | -                             | ✓                           | ✓                               | -                              |
| MB_145 | ✓                                 | -                                | -                             | ✓                           | ✓                               | ✓                              |
| MB_205 | -                                 | -                                | -                             | ✓                           | ✓                               | ✓                              |
| MB_265 | -                                 | -                                | -                             | ✓                           | -                               | -                              |
| MH_56  | -                                 | ✓                                | ✓                             | -                           | -                               | -                              |
| MH_70  | ✓                                 | -                                | -                             | -                           | -                               | -                              |
| MH_105 | ✓                                 | -                                | -                             | -                           | -                               | -                              |
| MH_145 | -                                 | -                                | -                             | -                           | -                               | ✓                              |
| MH_205 | -                                 | -                                | -                             | -                           | -                               | ✓                              |
| MH_265 | -                                 | -                                | -                             | ✓                           | -                               | -                              |
| ME_70  | ✓                                 | -                                | -                             | -                           | -                               | -                              |
| ME_105 | ✓                                 | -                                | -                             | -                           | -                               | -                              |
| ME_145 | ✓                                 | -                                | -                             | -                           | -                               | ✓                              |
| ME_205 | -                                 | -                                | -                             | -                           | -                               | ✓                              |
| ME_265 | -                                 | -                                | -                             | ✓                           | -                               | -                              |

- Not possible
- ✓ Possible without increment
- Δ Possible with increment motor length

## Shaft

M\_ motors are available with or without key option; shafts are available in different sizes suitable for your existing machine or gearbox

## Increased Safety

M\_ motors size 105 and 145 are also available with increased safety which conform to ATEX.... directive 94/9/CE  II 2G Ex e II T3 with environment temperature between -20 and +40°C only with drive HIDX. The feature and characteristics of the MBX motors are different from the standard version. For more info please consult technical department of Parker EME.

## Custom options

### Flange and shafts

In addition to the standard product it is possible to specify a fully customized mechanical interface for the motor ie flange, shaft and mounting holes. This option requires technical collaboration between the customer and Parker.

### KIT (frameless) options

We can also supply our motors as only stator + rotor. Our mechanical team will develop / propose the right solution for your mechanical application which integrates into the existing elements of the machine.

A second output shaft / external encoder mount

Certain applications need a second shaft on the rear of motor; for this reason with M\_ motors we offer alternative solutions for adding existing feedback or other mechanical accessories. For more details contact your Parker sales engineer



## Order Code

### MB / MH Motors

To ensure that you select the correct motor we recommend that you have the following information.

- Diagram speed / time of load cycle to identify the type of the cycle (S1, S3 or others)
- Information about inertia load system
- Check the duty cycle - acceleration/deceleration
- Calculate the average torque and peak torque of the system
- Calculate the average speed and maximum speed of the cycle
- Check the temperature and altitude of environment / application
- Check the mechanical compatibility

With these preliminary data you can start to choose the motor (with the correct drive) for your application.

|               | 1  | 2 | 3 | 4 | 5   | 6  | 7  | 8 | 9 | 10 | 11  | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---------------|----|---|---|---|-----|----|----|---|---|----|-----|----|----|----|----|----|----|----|
| Order example | MB | x | A | V | 205 | 11 | 28 | 5 | 9 |    | 2IB |    |    | 64 | A1 |    |    | 2  |

#### 1 Type Of Motor (mandatory field)

|           |                               |
|-----------|-------------------------------|
| <b>ME</b> | Motor with Encoder MB Series  |
| <b>MB</b> | Motor with Resolver MB Series |
| <b>MH</b> | Motor with Resolver MH Series |

#### 2 eX Protection

|             |                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| empty field | Standard Motor No EX Certification                                                                                                                                       |
| <b>x</b>    | Motor with EX Certification (increased protection safety) (only for 105 and 145 without the holding brake at 3000 min <sup>-1</sup> ) (only to be use only with HIDX...) |

#### 3 Brake Option

|             |                                                                |
|-------------|----------------------------------------------------------------|
| empty field | No Brake Option                                                |
| <b>A</b>    | Motor with Holding Brake (brakes when the supply voltage is 0) |
| <b>B</b>    | Motor with BINDER Holding Brake (size 145 up to 15Nm and 205)  |

#### 4 Cooling Option

|             |                                                 |
|-------------|-------------------------------------------------|
| empty field | No Cooling option                               |
| <b>V</b>    | Motor with shaft-drive fan cooling              |
| <b>SV</b>   | Motor with (single-phase) motorised fan cooling |
| <b>W</b>    | Water cooled motor (only size 145)              |

#### 5 Motor Frame Size (mandatory field)

|            |                           |
|------------|---------------------------|
| <b>56</b>  | Torque range 0.2...0.6 Nm |
| <b>70</b>  | Torque range 0.5...2.5 Nm |
| <b>105</b> | Torque range 2.2...8 Nm   |
| <b>145</b> | Torque range 4.5...28 Nm  |
| <b>205</b> | Torque range 15...90 Nm   |
| <b>265</b> | Torque range 75...265 Nm  |

#### 6 Winding (mandatory field)

|           |                                                                                      |
|-----------|--------------------------------------------------------------------------------------|
| <b>nn</b> | min <sup>-1</sup> (x100) except for size 205 1150 min <sup>-1</sup> which is only 11 |
|-----------|--------------------------------------------------------------------------------------|

#### 7 Motor Torque (mandatory field)

|           |           |
|-----------|-----------|
| <b>nn</b> | Torque Nm |
|-----------|-----------|

#### 8 Flange (mandatory field)

|          |                                   |
|----------|-----------------------------------|
| <b>5</b> | B5 Flange                         |
| <b>6</b> | 116 mm Flange, only for frame 105 |
| <b>9</b> | 96 mm Flange, only for frame 105  |

#### 9 Shaft (mandatory field)

|           |                             |
|-----------|-----------------------------|
| <b>9</b>  | 9x20 mm for size 56         |
| <b>11</b> | 11x23 mm for size 56/70     |
| <b>14</b> | 14x30 mm for size 70        |
| <b>19</b> | 19x40 mm for size 105/145   |
| <b>24</b> | 24x50 mm for size 105/145   |
| <b>28</b> | 28x60 mm for size 145       |
| <b>38</b> | 38x80 mm for size 205       |
| <b>42</b> | 42x110 mm for size 205      |
| <b>48</b> | 48x110 mm for size 265      |
| <b>A*</b> | Special shaft under request |

#### 10 Key Shaft option

|             |                   |
|-------------|-------------------|
| empty field | Shaft with Key    |
| <b>S</b>    | Shaft without key |

#### 11 Layout - Connectors (mandatory field)

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| <b>2I</b>   | Interconnectron rotatables receptacles (not for size 56 - 265 and 205 with Brake) |
| <b>3M</b>   | Terminal Box - opposite shaft glands                                              |
| <b>3MB</b>  | Terminal Box -toward shaft glands                                                 |
| <b>2IB</b>  | 90° Interconnectron receptacles - forward facing                                  |
| <b>2ID</b>  | 90° Interconnectron receptacles - rear facing                                     |
| <b>3I</b>   | Terminal Box + Interconnectron 90° (not for size 56-265)                          |
| <b>3MBS</b> | Terminal Box + Interconnectron 90° (only for size 265)                            |

#### 12 Female connectors option

|             |                                    |
|-------------|------------------------------------|
| empty field | With Female / flying connectors    |
| <b>W</b>    | Without Female / flying connectors |

#### 13 Form Option

|             |                        |
|-------------|------------------------|
| empty field | No Foot Mount Option   |
| <b>3</b>    | B3 - Foot Mount Option |

#### 14 Protection Degree (mandatory field)

|           |             |
|-----------|-------------|
| <b>64</b> | IP64 Degree |
| <b>65</b> | IP65 Degree |

## 15 Feedback

|           |                                                             |
|-----------|-------------------------------------------------------------|
| <b>A1</b> | Tamagawa OIH48 2000ppr / Under Request - Not Stock          |
| <b>A2</b> | Tamagawa OIH48 2048ppr for size 105/145/205                 |
| <b>A3</b> | Tamagawa OIH48 4096ppr for size 105/145/205                 |
| <b>A6</b> | Stegman SRS50 Hiperface Single-Turn for size 70/105/145/205 |
| <b>A7</b> | Stegman SRM50 Hiperface Multi-Turn for size 70/105/145/205  |
| <b>B1</b> | Encoder 3000ppr + Hall - TAMAGAWA OIH35                     |
| <b>B9</b> | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1331        |
| <b>C1</b> | SinCos EnDat Encoder Single-Turn - HEIDENHAIN EQI1113       |
| <b>C4</b> | Encoder 5000ppr + Hall - TAMAGAWA OIH48                     |
| <b>D5</b> | SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1325        |
| <b>S1</b> | SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S      |
| <b>S2</b> | SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50S       |

## 16 Option Inertia

|             |                  |
|-------------|------------------|
| empty field | Standard Inertia |
| <b>M</b>    | Medium Inertia   |
| <b>ML</b>   | High Inertia     |

## 17 Special Option

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| empty field | No Special Option                                                               |
| <b>1Bxx</b> | Motor with 2-side output shaft Where xx is the diameter of second shaft         |
| <b>Exx</b>  | Prearrangement for external encoder mounting; where xx is the model of feedback |

## 18 Voltage

|           |          |
|-----------|----------|
| <b>0A</b> | 24V      |
| <b>0B</b> | 34V      |
| <b>0C</b> | 48V      |
| <b>0D</b> | 50V      |
| <b>0E</b> | 60V      |
| <b>0F</b> | 72V      |
| <b>0G</b> | 74V      |
| <b>0</b>  | 80V      |
| <b>0H</b> | 96V      |
| <b>1A</b> | 108-110V |
| <b>1D</b> | 120V     |
| <b>1B</b> | 125V     |
| <b>1C</b> | 150V     |
| <b>1</b>  | 180V     |
| <b>2</b>  | 220-230V |
| <b>2A</b> | 222V     |
| <b>2B</b> | 200V     |
| <b>3</b>  | 330V     |
| <b>4</b>  | 380-400V |
| <b>4A</b> | 425V     |
| <b>4C</b> | 460V     |
| <b>4B</b> | 490V     |



Cables and connectors are part of the accessories required for Parker motors; for different combination we offer propose different types of cables for signals and power. Below you will find the code structure.

## Motor Power Cable for MB Motors

|               | 1       | 2 | 3   | 4 | 5  | 6 | 7  |
|---------------|---------|---|-----|---|----|---|----|
| Order example | CAVOMOT | A | 1,5 | 5 | PM | I | 40 |

|          |                                                                |
|----------|----------------------------------------------------------------|
| <b>1</b> | <b>CAVOMOT</b>                                                 |
|          | CAVOMOT Power cable drive - motor                              |
| <b>2</b> | <b>Brake wire</b>                                              |
|          | empty field without brake wire                                 |
|          | A Brake wire                                                   |
| <b>3</b> | <b>Section [mm²]</b>                                           |
|          | 1,5 1,5 mm²                                                    |
|          | 2,5 2,5 mm²                                                    |
|          | 4, 6, 10, 25 4 mm², 6 mm², 10 mm², 25 mm² (not for "PF" type)  |
| <b>4</b> | <b>Length [m]</b>                                              |
|          | 1, ... Length in metre                                         |
| <b>5</b> | <b>Application Type</b>                                        |
|          | PM Standard cable                                              |
|          | PF High flex cable                                             |
| <b>6</b> | <b>Motor Connector</b>                                         |
|          | M Military Connector (Mil) [All Layout except 08 and 5]        |
|          | 8 Military Connector (Mil) [All Layout 8]                      |
|          | I Interconnectron Connector (all layout)                       |
|          | 3 Terminal Connection Box (all layout except 3M/3MB/3MC/3MA)   |
|          | S Terminal Connection Box layout 3M/3M/3MC/3MA                 |
|          | SY Terminal Connection for MBX motors (Cable no ATEX)          |
|          | SL Terminal connection box layout 6i only for MB / MH205 motor |
|          | F Fast Connector                                               |
|          | A Amphenol Connector (layout 0P, 1A, 1C, 2DA, ...)             |
|          | T Trilogy Connector                                            |
|          | SL Terminal connection box layout 6i only for MB / MH205 motor |
|          | PRM Patch Cord Military Connector (Mil) [All Layout except 08] |
| <b>7</b> | <b>Motor Size</b>                                              |
|          | 40..265 Motor Size                                             |
|          | M50 Trilogy Motor                                              |
|          | NX Motors NX2-3-4-6 type NX----AKR70--                         |

## Feedback Cable for MB Motors

|               | 1       | 2 | 3  | 4 | 5     |
|---------------|---------|---|----|---|-------|
| Order example | CAVORES | 4 | PM | I | SLVDN |

|          |                                                                    |
|----------|--------------------------------------------------------------------|
| <b>1</b> | <b>Signal Cable type</b>                                           |
|          | CAVORES Resolver                                                   |
|          | CAVOENC Incremental encoder                                        |
|          | CAVOABS Absolute Encoder EnDat+SinCos                              |
|          | CAVOHIP Absolute Encoder Hiperface+SinCos                          |
|          | CAVOSIN SinCos Encoder                                             |
|          | CAVOHAL SinCos Encoder + Hall sensor                               |
| <b>2</b> | <b>Length [m]</b>                                                  |
|          | 1, ... Length in metre                                             |
| <b>3</b> | <b>Application Type</b>                                            |
|          | PM Moving Application                                              |
| <b>4</b> | <b>Motor Connector</b>                                             |
|          | M Military Connector (Mil) [All Layout except 08]                  |
|          | 8 Military Connector (Mil) [All Layout 8]                          |
|          | I Interconnectron Connector (all layout)                           |
|          | S Terminal Connection Box layout 3M/3M/3MC/3MA and motor MBX       |
|          | F Fast Connector                                                   |
|          | A Amphenol Connector (layout 0P, 1A, 1C, 2DA, ...)                 |
|          | T Trilogy Connector                                                |
|          | NX Motors NX2-3-4-6-8 type NX----AKR7---                           |
|          | E Free signal cable for EX motors                                  |
|          | PRM Patch Cord Military Connector (Mil) [All Layout except 08]     |
| <b>5</b> | <b>Drive Type</b>                                                  |
|          | LVD LVD Drive                                                      |
|          | HPD HPD Drive                                                      |
|          | SLVD SLVD e SLVD-N Drive                                           |
|          | SLVDN SLVD-N Drive                                                 |
|          | TPD TPD-M                                                          |
|          | SPD/TWIN TWIN_N e SPD_N Drive or wire without connector drive side |
|          | HIDRIVE Hi-Drive                                                   |
|          | 631 Servodrives 631                                                |
|          | 638 Servodrives 638                                                |
|          | 637F Servodrives 637F                                              |

## Motor Power Cable for MH Motors

|               | 1          | 2            |
|---------------|------------|--------------|
| Order example | <b>MOK</b> | <b>55/02</b> |

| 1                            | Cable                                                    |
|------------------------------|----------------------------------------------------------|
| <b>MOK</b>                   | Motor cable <sup>(2)</sup>                               |
| 2                            | Type                                                     |
|                              | <b>for SMH / MH56 / MH70 / MH105 <sup>(3)</sup></b>      |
| <b>55/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A                       |
| <b>54/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A<br>Moving application |
| <b>56/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A                       |
| <b>57/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A<br>Moving application |
|                              | <b>for MH145 / MH205 <sup>(4)</sup></b>                  |
| <b>60/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A                       |
| <b>63/....<sup>(1)</sup></b> | 1,5 mm <sup>2</sup> ; up to 13,8 A<br>Moving application |
| <b>59/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A                       |
| <b>64/....<sup>(1)</sup></b> | 2,5 mm <sup>2</sup> ; up to 18,9 A<br>Moving application |
| <b>61/....<sup>(1)</sup></b> | 6 mm <sup>2</sup> ; up to 32,3 A<br>Moving application   |
| <b>62/....<sup>(1)</sup></b> | 10 mm <sup>2</sup> ; up to 47,3 A<br>Moving application  |

MOK55 and MOK54 are also possible for linear motors LXR406, LXR412 and BLMA.

### Length code for cables

<sup>(1)</sup> Length code 1 (Example: SSK01/09 = length 25 m)

| Length [m] | 1,0 | 2,5 | 5,0 | 7,5 | 10,0 | 12,5 | 15,0 | 20,0 | 25,0 | 30,0 | 35,0 | 40,0 | 45,0 | 50,0 |
|------------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| Order code | 01  | 02  | 03  | 04  | 05   | 06   | 07   | 08   | 09   | 10   | 11   | 12   | 13   | 14   |

<sup>(2)</sup> Color according to DESINA

<sup>(3)</sup> with motor connector

<sup>(4)</sup> with cable eye for motor terminal box

## Feedback Cable for MH Motors

|               | 1               |
|---------------|-----------------|
| Order example | <b>REK42/02</b> |

| 1                               | Zubehör                                                       |
|---------------------------------|---------------------------------------------------------------|
|                                 | <b>for MH/SMH-Motors</b>                                      |
| <b>REK42/....<sup>(1)</sup></b> | Resolver cable <sup>(2)</sup>                                 |
| <b>REK41/....<sup>(1)</sup></b> | Resolver cable <sup>(2)</sup> Moving application              |
| <b>GBK24/....<sup>(1)</sup></b> | SinCos© Feedback cable <sup>(2)</sup><br>Moving application   |
| <b>GBK38/....<sup>(1)</sup></b> | EnDat 2.1 Feedback cable <sup>(2)</sup><br>Moving application |
| <b>GBK23/....<sup>(1)</sup></b> | Encoder cable <sup>(2)</sup>                                  |
|                                 | <b>for linear motors</b>                                      |
| <b>GBK33/....<sup>(1)</sup></b> | Feedback cable for LXR<br>Moving application                  |
| <b>GBK32/....<sup>(1)</sup></b> | Feedback cable for BLMA<br>Moving application                 |



# Rotary Motors

## SM Series Servo Motors



The slotless design also creates a higher rotor inertia, which is ideal for applications involving high inertial loads (such as lead screws and belt drives). This higher rotor inertia simplifies tuning and increases system stiffness.

The SM Series motors also feature a rugged anodized aluminum body and connector housing. An IP65 rating can be obtained on motors with PS connectors and an optional shaft seal. All SM motors are CE (LVD) compliant.

Parker's wide range of planetary gearheads are well-suited for the SM Series motor. Easy sizing and selection can be done using Parker's MotionSizer.

- **NEMA size 16 and 23**
- **0.19 to 1.2 Nm (1.7 to 10.6 in-lb) continuous stall torque**
- **0.57 to 3.6 Nm (5.0 to 31.9 in-lb) peak torque**
- **Up to 7500 RPM rated speed**
- **Brushless construction**
- **Slotless design**
  - Negligible detent torque
  - Reduced torque ripple
  - High inertia
- **High-performance neodymium magnets**
- **Thermostat protected**
- **TENV housing**
- **IP65 option**
- **Feedback options**
  - Encoder/Hall effect
  - Smart encoder
  - Resolver
- **CE compliant**

The SM Series brushless servo motors feature a slotless stator design eliminating all detent torque in the motor to provide extremely smooth motion, especially at low speeds.

### Rotary Servo Motor Family Attributes

| Series                                    | SM                           | BE                             | MPP/MPJ                                                  |
|-------------------------------------------|------------------------------|--------------------------------|----------------------------------------------------------|
| <b>Application Advantages</b>             | Smooth motion, high inertia  | Rapid moves, high acceleration | Rapid moves, high acceleration                           |
| <b>Frame Sizes</b>                        | NEMA 16, 23                  | NEMA 16, 23, 34                | 7 sizes, 92 to 270 mm                                    |
| <b>Continuous Torque Range Nm (in-lb)</b> | 0.19 to 1.2<br>(1.7 to 10.6) | 0.15 to 4.9<br>(1.3 to 43.4)   | 1.5 to 158<br>(13 to 1398)                               |
| <b>Speed Range</b>                        | 0 to 7500 rpm                | 0 to 5000 rpm                  | 0 to 7000 rpm                                            |
| <b>Feedback</b>                           | Encoder/Resolver             | Encoder/Resolver               | Encoder/Resolver/SinCos<br>- Hyperface/Sincos<br>- Endat |
| <b>Drive Family</b>                       | Aries, Compax3               | Aries, Compax3                 | Aries, Compax3                                           |

## BE Series Servo Motors



BE Series brushless servo motors produce high continuous stall torque in a cost-reduced package.

The exceptional torque of the BE Series motors is the result of an increased number of magnetic poles on the rotor.

Traditional motors in these frame sizes have four magnetic poles, while the BE Series motors have eight poles.

The BE motors incorporate Parker's proven bridged stator design. This two-piece lamination design simplifies the winding process, creating cost savings. The bridged stator construction also results in less audible noise generated by the motor.

Parker's wide range of planetary gearheads are well-suited for the BE Series motor. Easy sizing and selection can be done using Parker's MotionSizer.

- **NEMA 16, 23, and 34 sizes**

- **0.15 to 4.9 Nm (1.3 to 43.4 in-lb) continuous stall torque**
- **0.45 to 14.6 Nm (4.0 to 129.2 in-lb) peak torque**
- **Up to 5000 RPM rated speed**
- **Brushless construction**
- **Eight-pole open-lamination design provides increased torque and lower cost**
- **High torque density packaging**
- **Bridged stator design – quiet operation**
- **High-performance neodymium magnets**
- **Thermoswitch protection**
- **Feedback options**
  - Encoder/Hall effect
  - Smart encoder
  - Resolver
- **CE compliant**

## MPP/MPJ Series Rotary Servo Motors



The MaxPlusPlus (MPP) family of brushless servo motors is redefining performance, flexibility, and reliability. The industry's highest-performing servo motor uses eight-pole segmented lamination technology, which produces more torque in a shorter package. Use MaxPlusPlus motors for higher torque applications, customization options, or when high performance is required.

When higher inertia is desired to improve system performance, the MPJ is the perfect choice. It includes all the same features and benefits of the MPP, but increases the rotor inertia by 3 to 8 times over the standard MPP.

- **MPP – 92 to 270 mm frame sizes**
- **MPJ – 92 to 142 mm frame sizes**
- **1.5 to 158 Nm (13 to 1398 in-lb) continuous stall torque**
- **4.3 to 402 Nm (38.1 to 3558 in-lb) peak torque**
- **Very high torque-to-inertia ratio**
- **Right-angle rotatable connectors**
- **Seven different feedback devices including encoder, serial encoder, resolver, Heidenhain and Stegmann single and multi-turn absolute encoders**
- **IP64 standard, IP65 optional**
- **Special shaft, front flange, and feedback devices available**
- **CE and UL**





## K Series Frameless Kit Motors



Frameless kit motors are the ideal solution for machine designs that require high performance in small spaces. Kit motors are directly integrated with the drive train, resulting in a smaller, more reliable motor package. Direct drive motion construction also gives equipment designers the advantages of lower costs, increased reliability and improved performance.



### When to Use

- **A significant cost savings**
- **Reduced mechanical complexity**
- **Greater design flexibility**
- **High performance in a compact package**
- **Improved dynamic response and settling**
- **Minimum motor size per application space**
- **Low cogging for smooth operation**
- **Low inertia for high acceleration**

### Features

- **High peak torque up to 93.37 Nm (826.4 in-lb)**
- **High speeds up to 50,000 RPM**
- **Superior performance – high stiffness and better response**
- **High reliability – no mechanical couplings**
- **Compact design – minimizes product size**
- **Low cogging - special orientation of the laminations and odd slot count**
- **Very low torque ripple at low speeds for smooth and precise rotary motion**



### Specialty Rotary Servo Motor Family Attributes

| Series                                    | K                                                                             | EX                                                     | HW/HKW                                                       | TMW/TMA                                          |
|-------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|
| <b>Application Advantages</b>             | Direct integration with a mechanical transmission; very high system stiffness | Rapid moves, high acceleration, explosive environments | Direct integration into machine, high speeds, constant power | Direct drive, low speed, high torque             |
| <b>Frame Sizes</b>                        | 10 sizes, 32 to 254 mm                                                        | 4 sizes, 92 to 145 mm                                  | 6 sizes, 85 to 310 mm                                        | 3 sizes, 360 to 762 mm                           |
| <b>Continuous Torque Range Nm (in-lb)</b> | 0.044 to 58.35 (0.39 to 516.4)                                                | 1.75 to 35 (15.5 to 311)                               | 4.9 to 1080 (43.4 to 9558.8)                                 | 670 to 21,000 (5969 to 187,110)                  |
| <b>Speed Range</b>                        | 0 to 50,000 rpm                                                               | 0 to 4000 rpm                                          | 0 to 50,000 rpm                                              | 0 to 330 rpm                                     |
| <b>Feedback</b>                           | Hall sensors, customer-supplied                                               | Resolver/SinCos<br>- Hyperface/Sincos<br>- Endat       | Customer-supplied                                            | Resolver/SinCos<br>- Hyperface/Sincos<br>- Endat |
| <b>Drive Family</b>                       | Compax3, Aries                                                                | Compax3                                                | Compax3                                                      | Compax3H                                         |



## EX Series Explosion Proof Servo Motors



The EX Servo motors are designed to function in Category II, Group II explosive atmospheres in respect to the EN 50014 standard. These servo motors are certified according to directive ATEX 94/9/CE and are available in a Gas or Gas-Dust version. The motors differ in that the Gas-Dust version is equipped with a special lip seal on the customer end shaft.

- **Explosion-proof material "D" according to directive ATEX 94/9/CE**
- **Stall torque from 1.75 to 35 Nm (15.5 to 311 in-lb)**
- **Rated speeds up to 4000 RPM**
- **Extremely compact**
- **High dynamics**
- **Integrated resolver does not require an additional encoder**
- **Maintenance-free, lubricated for life bearings**



## HW/HKW Series Synchronous Water Cooled Spindle Motors



The HW servomotors are water-cooled brushless synchronous motors delivered as individual components (rotor, stator and resolver) to make a complete spindle unit. These motors are driven by Compax3 Series servo drives.

- **Permanent magnet cold rotor**
- **Compact size with low rotor inertia**
- **Stable balancing**
- **Speed range to 50000 RPM**
- **Reduced maintenance**
- **High torque at zero speed**
- **Positioning capability**



## TMW/TMA Series Torque Motors



The torque motor is a permanent magnet brushless motor, optimized to operate at low speeds. It is particularly suitable for direct drive applications requiring high torque capabilities at low speeds.

As a replacement for asynchronous or direct current motors coupled with a gearbox, torque motors are advantageous with their more compact, quieter, maintenance-free design.

- **No more gearbox**
- **No maintenance**
- **Energy savings**
- **Silent operation (European directive 2003/20/Ce)**
- **Better speed regulation**
- **Compact design**
- **Stall torque from 391 to 21,000 Nm (289 to 15,540 ft-lb)**
- **Rated speeds up to 800 RPM**
- **TMA Series air cooled, without fan; TMW Series water cooled with anticorrosive**
- **IP55 rating**
- **Sincos Hiperface, Sincos Endat feedback**



# Rotary Motors

## LV/HV Series Rotary Stepper Motors



The LV (Low Voltage) and HV (High Voltage) motor series provides outstanding performance at a competitive price. The LV motors are available in five frame sizes, and the HV are available in three frame sizes, so it is easy to choose the optimal speed and torque combination.

The LV motors are rated for use with drives running up to 80 VDC; the HV are rated for use with drives running off of 120 VAC power.

The LV/HV Series is optimized for use with the E-Series microstepping drives.

- **High performance**
- **Cost effective**
- **Optimized motors for both low-voltage and high-voltage applications**
- **Static torques from 6.5 to 1285 in-oz)**
- **LV – 11, 14, 17, 23, and 34 frame sizes**  
**HV – 17, 23, and 34 frame sizes**
- **Single, double, or triple stack lengths available**
- **LV – up to 80 VDC windings**  
**HV – up to 170 VDC windings**
- **Single or double shaft options**
- **Flying leads or 10-foot cable options**
- **Customization available**
- **Encoder options available**
- **CE (LVD)**

Rotary Stepper Motor Family Attributes

| Series                                    | LV                            | HV                          |
|-------------------------------------------|-------------------------------|-----------------------------|
| <b>Application Advantages</b>             | Low voltage, up to 80 VDC     | High voltage, 120 VAC       |
| <b>Frame Sizes</b>                        | 11, 14, 17, 23, 34            | 17, 23, 34                  |
| <b>Static Torque Range<br/>Nm (in-oz)</b> | 0.05 to 9.07<br>(6.5 to 1285) | 0.4 to 9.07<br>(56 to 1285) |
| <b>Speed Range</b>                        | Up to 3000 rpm                | 0 to 5000 rpm               |
| <b>Feedback</b>                           | Encoder optional              | Encoder optional            |
| <b>Drive Family</b>                       | E-DC, iOn, ViX                | E-AC, OEMZL                 |