MB Series
Precision Ball Screw + 5 Phase Stepping Motor

Features
- A 5-phase Stepping Motor is mounted directly onto the shaft end of a C3 grade precision Ball Screw, which is suitable for high accurate positioning system.
- Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Coupling-less, saving total length, low lost-motion can be achieved.
- Recommended Driver for 5-phase Stepping Motor is available.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Shaft Nominal Dia.</th>
<th>Lead</th>
<th>Travel</th>
<th>Travel per pulses</th>
<th>Reference Thrust</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB04005A</td>
<td>Φ4</td>
<td>0.5</td>
<td>20</td>
<td>1</td>
<td>10</td>
<td>84</td>
</tr>
<tr>
<td>MB0401A</td>
<td>Φ4</td>
<td>1</td>
<td>30</td>
<td>2</td>
<td>20</td>
<td>84</td>
</tr>
<tr>
<td>MB0601</td>
<td>Φ6</td>
<td>1</td>
<td>75</td>
<td>2</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>MB0602</td>
<td>Φ6</td>
<td>2</td>
<td>75</td>
<td>4</td>
<td>50</td>
<td>170</td>
</tr>
<tr>
<td>MB0801</td>
<td>Φ8</td>
<td>1</td>
<td>150</td>
<td>2</td>
<td>300</td>
<td>310</td>
</tr>
<tr>
<td>MB0802</td>
<td>Φ8</td>
<td>2</td>
<td>150</td>
<td>4</td>
<td>150</td>
<td>320</td>
</tr>
</tbody>
</table>

Repeatability(reference) max. ±0.005mm
Lost Motion(reference) max. 0.005mm

The reference value about Repeatability and Lost Motion represents when the MB built into KSS original Stage. Please make a contact to KSS for actual value.

Motor Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor size</th>
<th>Rated voltage</th>
<th>Rated current</th>
<th>Winding resistance</th>
<th>Holding torque</th>
<th>Rotor Inertia</th>
<th>Load limit in Vertical Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB04005A</td>
<td>NEMA 08 (4)</td>
<td>DC 1.05</td>
<td>0.75</td>
<td>1.4</td>
<td>0.010</td>
<td>3.9</td>
<td>230</td>
</tr>
<tr>
<td>MB0401A</td>
<td>NEMA 08 (4)</td>
<td>DC 1.05</td>
<td>0.75</td>
<td>1.4</td>
<td>0.010</td>
<td>3.9</td>
<td>230</td>
</tr>
<tr>
<td>MB0601</td>
<td>NEMA 10 (6)</td>
<td>DC 1.05</td>
<td>0.83</td>
<td>1.1</td>
<td>0.018</td>
<td>8.2</td>
<td>230</td>
</tr>
<tr>
<td>MB0602</td>
<td>NEMA 10 (6)</td>
<td>DC 1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.028</td>
<td>8.9</td>
<td>230</td>
</tr>
<tr>
<td>MB0801</td>
<td>NEMA 17 (8)</td>
<td>DC 1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.128</td>
<td>41</td>
<td>300</td>
</tr>
<tr>
<td>MB0802</td>
<td>NEMA 17 (8)</td>
<td>DC 1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.128</td>
<td>41</td>
<td>300</td>
</tr>
</tbody>
</table>

Motor Characteristic

Test Condition
Driver: Maker Standard
Input Voltage: DC24V
Phase Current: 0.75A

Note 1: Basic step angle is 0.72°
Note 2: Rotor Inertia includes Ball Screw Shaft.

Note 3: Acceleration & Deceleration Rate should be 20ms/kHz or more.
Note 4: Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.
Model number notation for customized MB series is as follows.

In case of standard style, model number is described in catalogue from page P132 to page P135.

MB 04 01 - 30 R 80 C3 - 0

1. Series No.
   MB: Precision Ball Screw + 5-phase Stepping Motor
2. Screw nominal diameter (mm)
3. Lead (mm)
4. 01 means 1mm
5. Screw thread length (mm)
   L1: See below
6. Thread direction (R=Right-hand)
7. Screw shaft total length (mm)
   L2: See below
8. Accuracy grade
9. Axial play (μm)

Definition of Screw length

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Traverse</th>
<th>Reference Thrust (N)</th>
<th>L1</th>
<th>L2</th>
<th>Lr</th>
<th>D</th>
<th>Dr</th>
<th>V</th>
<th>Dp</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB04005A</td>
<td>0.5</td>
<td>20</td>
<td>10</td>
<td>95</td>
<td>50</td>
<td>38.5</td>
<td>10</td>
<td>20</td>
<td>12</td>
<td>15</td>
<td>84</td>
</tr>
<tr>
<td>MB0401A</td>
<td>1</td>
<td>30</td>
<td>20</td>
<td>105</td>
<td>60</td>
<td>48.5</td>
<td>9</td>
<td>19</td>
<td>11</td>
<td>14</td>
<td>84</td>
</tr>
</tbody>
</table>

Recommended Drivers
- KR-AS05CC (Micro step)
- KR-AS05MC (Micro step / AC: 100~220V)

Ball Screw Specifications
- Accuracy grade: JIS C3
- Thread direction: Right
- Axial play: MB04005A: 0.005mm or less
- MB0401A: 0mm
- Shaft material: Stainless steel
- Nut material: Chrome-molybdenum steel
- Surface hardness: Min. HRC55 (Thread area)
- Lubricant: KSS original grease MS50 No.1

Motor Specifications
- Basic step angle: 0.72°
- Rated Voltage: DC 1.05 V
- Rated current: DC 0.75 A/phase
- Winding resistance: 1.6Ω
- Holding Torque: 0.010 Nm
- Rotor inertia: 3.9g cm²
- Operating temperature: −20°C ~ 50°C

Note: Only shaft end cutting is available. Other than that, it would be customized order.
Standard products in stock MB series

Dimensions & Specifications

Precision Ball Screw + 5-Phase Stepping Motor

MB □24 / NEMA 10

Shaft dia. □4

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.

Ball Screw Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Travel</th>
<th>Reference Thrust (N)</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB0401</td>
<td>1</td>
<td>15</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

Recommended Drivers

- KR-ASSC
- KR-ASSMC (Micro step)
- KR-ASSMM (Micro step / AC-100~220V)

Motor Specifications

- Accuracy grade: JIS C3
- Basic step angle: 0.72°
- Rated Voltage: DC 0.83 V
- Rated current: DC 0.75 A/phase
- Winding resistance: 1.1Ω
- Holding Torque: 0.018N·m
- Rotor inertia: 4.2g·cm²
- Operating temperature: -20°C～50°C

Recommended Drivers

- KR-ASSC
- KR-ASSMC (Micro step)
- KR-ASSMM (Micro step / AC-100~220V)

Note) Only shaft end cutting is available. Other than that, it would be customized order.

Unit:mm

Model  Lead  Travel  Reference Thrust (N)  Mass (g)
---  ----  ----  -----------------  ---------
MB0401   1   15     50                        100     

Model  Lead  Travel  Reference Thrust (N)  Mass (g)
---  ----  ----  -----------------  ---------
MB0402   1   15     50                        100     

Note) Refer to page P162 or P163 for connection diagram of recommended Drivers.

Ball Screw Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Travel</th>
<th>D</th>
<th>F</th>
<th>L1</th>
<th>L2</th>
<th>V</th>
<th>Dp</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB0401</td>
<td>1</td>
<td>15</td>
<td>11</td>
<td>23</td>
<td>23.5</td>
<td>14.5</td>
<td>11</td>
<td>13</td>
<td>179</td>
</tr>
<tr>
<td>MB0402</td>
<td>2</td>
<td>15</td>
<td>15</td>
<td>28</td>
<td>28</td>
<td>17</td>
<td>13</td>
<td>17</td>
<td>180</td>
</tr>
</tbody>
</table>

Recommended Drivers

- KR-ASSC
- KR-ASSMC (Micro step)
- KR-ASSMM (Micro step / AC-100~220V)

Note) Only shaft end cutting is available. Other than that, it would be customized order.
**Standard products in stock MB series**

**Dimensions & Specifications**

**Precision Ball Screw + 5-Phase Stepping Motor**

**MB 42 / NEMA 17**

Shaft dia. 8

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### Ball Screw Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Travel</th>
<th>Reference Thrust (N)</th>
<th>D</th>
<th>Df</th>
<th>L3</th>
<th>L4</th>
<th>V</th>
<th>Dp</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB0801</td>
<td>1</td>
<td>150</td>
<td>300</td>
<td>13</td>
<td>26</td>
<td>15</td>
<td>11</td>
<td>15</td>
<td>20</td>
<td>310</td>
</tr>
<tr>
<td>MB0802</td>
<td>2</td>
<td>150</td>
<td>150</td>
<td>15</td>
<td>28</td>
<td>18</td>
<td>14</td>
<td>17</td>
<td>22</td>
<td>320</td>
</tr>
</tbody>
</table>

**Note:** Refer to page P162 or P163 for connection diagram of recommended Drivers.

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### Motor Specifications

<table>
<thead>
<tr>
<th>Basic step angle</th>
<th>0.72°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Voltage</td>
<td>DC 1.28 V</td>
</tr>
<tr>
<td>Rated current</td>
<td>DC 0.75 A/phase</td>
</tr>
<tr>
<td>Winding resistance</td>
<td>1.7Ω</td>
</tr>
<tr>
<td>Holding Torque</td>
<td>0.128Nm</td>
</tr>
<tr>
<td>Rotor inertia</td>
<td>41g·cm²</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>−20°C~50°C</td>
</tr>
</tbody>
</table>

**Note:** Only shaft end cutting is available. Other than that, it would be customized order.

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**Recommended Drivers**

- KR-A5CC
- KR-A55MC (Micro step)
- KR-A535M (Micro step / AC-100~220V)