In KSS, we always pursue the downsizing of our products that is the mission of the Miniature Ball Screw manufacturer.
MoBo (Direct Motor Drive Ball Screws) is one of our representative product, which combines a Motor Shaft and a Ball Screw. MoBo is the combined product that can achieve shortening the longitudinal dimension by eliminating the Coupling.
Since KSS launched the first version of MoBo in 2001, we continued to add various type of MoBo on our line-up and provides the variety of choices to our customer.
This time KSS integrated all of our MoBo line-up into one catalogue to offer better understanding for the customer.
Now KSS will continue to meet the demand of the customer as much as possible, and will develop a better product in the future, thanking you in advance.

MoBo series can offer many variety of choices, based on its combination of Stepping Motor type (2-phase or 5-phase) and Ball Screw type. Please refer to Table F-1 and Table F-2.
In addition, we can provide Resin Lead Screw type as customized product, which helps you cost saving. Please ask KSS representative if necessary.

<table>
<thead>
<tr>
<th>Type</th>
<th>Ball Screw type</th>
<th>Stepping Motor</th>
<th>Additional Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB</td>
<td>Precision type</td>
<td>JIS C3</td>
<td>○</td>
</tr>
<tr>
<td>TMB</td>
<td>Rolled type</td>
<td>JIS Ct7</td>
<td>○</td>
</tr>
<tr>
<td>SiMB</td>
<td>2-phase Rolled type</td>
<td>JIS C7 equivalent</td>
<td>○</td>
</tr>
<tr>
<td>Hybrid type</td>
<td>JIS C3 / C5</td>
<td>○</td>
<td>Encoder / Memory chip</td>
</tr>
</tbody>
</table>

MoBo is called External type Linear Actuator world-widely, but our product (MoBo) is Ball Screw type integrated with Motor. KSS has a lot of variation for External type Linear Actuator, such as Rolled Ball screw type, Precision Ball Screw type and so on.
The MoBo series provides various types of combination for Screw & Motor ranging from high precision to multipurpose type depending on the customer requirement.

- **5-Phase Rolled type**
- **2-phase Rolled type**
- **5-Phase Precision type**
- **Hybird type**

**Rolled MoBo**
This series is all-round performance drive unit with Rolled Ball Screw and 5-Phase Stepping Motor. Ct7 class Rolled Ball Screws are built in this series.

**MoBo**
This series is high performance, high accurate positioning drive unit with Precision Ball Screw and 5-phase Stepping Motor. C3 class Precision Ball Screws are adopted for this series.

**[Precision Ball Screw type (MB)]**

**[Rolled Ball Screw type (TMB)]**

**[2-phase Motor & Rolled Ball Screw type (2TMB)]**

**[Hybird type (SiMB)]**

**Si- MoBo**
This series have high accurate positioning, ultra smooth drive. and closed loop operation by using Precision Ball Screw with C3 accuracy and Si-servo Motor.

**[Others]**
- We can provide Resin Lead Screw type as customized product, which has high cost performance.
MoBo Series
Rolled Ball Screw type
Linear Actuator External type

MoBo Series
Rolled Ball Screw type
Linear Actuator External type

Linear Actuator External type
Rolled Ball Screw type (TMB)

Rolled MoBo

- **Features**
  - A 5-phase Stepping Motor is mounted directly onto the shaft end of a C17 grade Rolled Ball Screw, which is all-round performance drive unit.
  - 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, and reducing labor cost can be achieved.
  - Recommended Driver for 5-phase Stepping Motor is available.
  - Accessories are also provided as mounting kit, such as Nut block and Motor plate.

---

**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>
</tr>
</thead>
<tbody>
<tr>
<td>TMB0401</td>
<td>д4 DC</td>
<td>0.83</td>
<td>0.75</td>
<td>1.1</td>
<td>0.018</td>
<td>4.2</td>
</tr>
<tr>
<td>TMB0504</td>
<td>д5 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.028</td>
<td>8.3</td>
</tr>
<tr>
<td>TMB0601</td>
<td>д6 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.028</td>
<td>8.8</td>
</tr>
<tr>
<td>TMB0602</td>
<td>д6 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.028</td>
<td>8.7</td>
</tr>
<tr>
<td>TMB0608</td>
<td>д2 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.128</td>
<td>40</td>
</tr>
<tr>
<td>TMB0801</td>
<td>д3 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.128</td>
<td>40</td>
</tr>
<tr>
<td>TMB0802</td>
<td>д3 DC</td>
<td>1.28</td>
<td>0.75</td>
<td>1.7</td>
<td>0.128</td>
<td>40</td>
</tr>
<tr>
<td>TMB0805</td>
<td>д4 DC</td>
<td>1.65</td>
<td>0.75</td>
<td>2.2</td>
<td>0.236</td>
<td>74</td>
</tr>
<tr>
<td>TMB0812</td>
<td>д4 DC</td>
<td>1.65</td>
<td>0.75</td>
<td>2.2</td>
<td>0.236</td>
<td>74</td>
</tr>
</tbody>
</table>

Note 1: Basic step angle is 0.72°

Note 2: Rotor Inertia includes Ball Screw Shaft.

---

**Motor Characteristic**

- **TMB0401**
- **TMB0504 / TMB0601 / TMB0602 / TMB0606**
- **TMB0801 / TMB0802**
- **TMB0805 / TMB0812**

---

**Test condition**

Driver: Maker Standard
Input Voltage: DC 24V
Phase Current: 0.75A

Note: Motor characteristic will vary depending on Driver type, operating conditions.

---

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Shaft Nominal Dia.</th>
<th>Lead</th>
<th>Travel</th>
<th>Travel per pulse</th>
<th>Reference Thrust</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMB0401</td>
<td>д4</td>
<td>1</td>
<td>30</td>
<td>2</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>TMB0504</td>
<td>д5</td>
<td>4</td>
<td>75</td>
<td>3</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>TMB0601</td>
<td>д6</td>
<td>1</td>
<td>75</td>
<td>2</td>
<td>100</td>
<td>180</td>
</tr>
<tr>
<td>TMB0602</td>
<td>д6</td>
<td>2</td>
<td>75</td>
<td>4</td>
<td>50</td>
<td>180</td>
</tr>
<tr>
<td>TMB0604</td>
<td>д6</td>
<td>6</td>
<td>75</td>
<td>4</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>TMB0801</td>
<td>д8</td>
<td>1</td>
<td>150</td>
<td>2</td>
<td>300</td>
<td>320</td>
</tr>
<tr>
<td>TMB0802</td>
<td>д8</td>
<td>2</td>
<td>150</td>
<td>4</td>
<td>150</td>
<td>320</td>
</tr>
<tr>
<td>TMB0805</td>
<td>д8</td>
<td>5</td>
<td>150</td>
<td>10</td>
<td>120</td>
<td>450</td>
</tr>
<tr>
<td>TMB0812</td>
<td>д8</td>
<td>12</td>
<td>150</td>
<td>24</td>
<td>50</td>
<td>450</td>
</tr>
</tbody>
</table>

Repeatability (reference) max. ± 0.01mm
Lost Motion (reference) max. ± 0.01mm

Note 1: Detail specifications & dimensions are shown in drawings from page F117.
Note 2: Travel per pulse represents the value for full step.
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.
**Rolled Ball Screw Type**

**Linear Actuator External Type**

**MoBo Series**

**F117 F118**

**TMB0401**

**Shaft dia. φ4**  
**Lead : 1mm**  
**Travel : 30mm**

**TMB0504**

**Shaft dia. φ5**  
**Lead : 4mm**  
**Travel : 75mm**

**Recommended Drivers**
- KR-A5SC
- KR-A5SM (Micro step)
- KR-A5SM (Micro step / AC-100～220V)

**Recommended accessories**
- Motor side Supporting plate: MP-24A or MP-24B
- Supported side Bracket
- Nut Block: NB-0504R

**Note**  
Refer to page F159, F160 for connection diagram of recommended Drivers.

**Ball Screw Specifications**

<table>
<thead>
<tr>
<th>Accuracy grade</th>
<th>JIS C17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.020mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>50N</td>
</tr>
<tr>
<td>Shaft &amp; Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface Coating</td>
<td>Black Chrome coating on Shaft</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>HRC58～62 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease MSQ No.1</td>
</tr>
</tbody>
</table>

**Motor Specifications**

| Basic step angle | 0.72° |
| Rated Voltage | DC 0.63V |
| Rated current | 0.75A/phase |
| Winding resistance | 1.1Ω |
| Holding Torque | 0.018Nm |
| Rotor inertia | 4.11g cm² |
| Operating temperature | −20°C～50°C |

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

**Dimensions & Specifications**

**TMB Series**

**Standard products in stock**

**TMB0401**

**TMB0504**

**Micro step / AC-100**

**Motor Specifications**

<table>
<thead>
<tr>
<th>Accuracy grade</th>
<th>JIS C17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.020mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>25N</td>
</tr>
<tr>
<td>Shaft &amp; Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface Coating</td>
<td>Black Chrome coating on Shaft</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>HRC58～62 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease MSQ No.1</td>
</tr>
</tbody>
</table>

**Basic step angle | 0.72°**

**Rated Voltage | DC 1.28V**

**Rated current | 0.75A/phase**

**Winding resistance | 1.7Ω**

**Holding Torque | 0.028Nm**

**Rotor inertia | 8.3g cm²**

**Operating temperature | −20°C～50°C**

**Note**  
Only shaft end cutting is available. Other than that, it would be customized order.
**Rolled Ball Screw type**

**MoBo Series**

**TMB0601**

- **Shaft dia. 6 mm**
- **Lead : 1mm**
- **Travel : 75mm**

**TMB0602**

- **Shaft dia. 6 mm**
- **Lead : 2mm**
- **Travel : 75mm**

**Rated Voltage**

DC 1.28 V

**Rated current**

0.75 A/phase

**Winding resistance**

1.7Ω

**Reference Thrust**

50 N

**Holding Torque**

0.028 Nm

**Shaft & Nut material**

Chrome-molybdenum steel

**Surface Coating**

Black Chrome coating on Shaft

**Surface hardness**

HRC58～62 (Thread area)

**Lubricant**

KSS original grease MSG No.1

**Accuracy grade**

JIS C17

**Thread direction**

Right

**Axial play**

0.020 mm or less

**Reference Thrust**

100 N

**Note**

1. Only shaft end cutting is available.
2. Other than that, it would be a customized order.

**Dimensions & Specifications**

**MoBo Series**

**Standard products in stock**

**TMB series**

**Rolled Ball Screw + 5-phase Stepping Motor**

**Recommended Drivers**

KR-ASC
KR-AS5MC (Micro step)
KR-AS5SM (Micro step / AC-100 to 220V)

**Recommended accessories**

Motor side Supporting plate
Supported side Bracket
Nut Block

**Ball Screw Specifications**

<table>
<thead>
<tr>
<th>Accuracy grade</th>
<th>JIS C17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.020 mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>100 N</td>
</tr>
<tr>
<td>Shaft &amp; Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface Coating</td>
<td>Black Chrome coating on Shaft</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>HRC58～62 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease MSG No.1</td>
</tr>
</tbody>
</table>

**Motor Specifications**

| Basic step angle | 0.72° |
| Rated Voltage | DC 1.28 V |
| Rated current | 0.75 A/phase |
| Winding resistance | 1.7Ω |
| Holding Torque | 0.028 Nm |
| Rotor inertia | 8.7 g cm² |
| Operating temperature | −20°C ~ 50°C |

**Note**

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

**Recommended Drivers**

KR-ASC
KR-AS5MC (Micro step)
KR-AS5SM (Micro step / AC-100 to 220V)

**Recommended accessories**

Motor side Supporting plate
Supported side Bracket
Nut Block

**Ball Screw Specifications**

<table>
<thead>
<tr>
<th>Accuracy grade</th>
<th>JIS C17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.020 mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>50 N</td>
</tr>
<tr>
<td>Shaft &amp; Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface Coating</td>
<td>Black Chrome coating on Shaft</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>HRC58～62 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease MSG No.1</td>
</tr>
</tbody>
</table>

**Motor Specifications**

| Basic step angle | 0.72° |
| Rated Voltage | DC 1.28 V |
| Rated current | 0.75 A/phase |
| Winding resistance | 1.7Ω |
| Holding Torque | 0.028 Nm |
| Rotor inertia | 8.7 g cm² |
| Operating temperature | −20°C ~ 50°C |

**Note**

1. Only shaft end cutting is available. Other than that, it would be a customized order.
**Standard products in stock**

**TMB series**

**Rolled Ball Screw + 5-phase Stepping Motor**

**TMB0606**

**Shaft dia. φ6 Lead : 6mm**  
**Travel : 75mm**

**TMB0801**

**Shaft dia. φ8 Lead : 1mm**  
**Travel : 150mm**

---

### TMB0606 Specifications

- **Identification Plate**
- **Rolled Ball Screw type**
- **Linear Actuator External type**
- **MoBo Series**

**TMB0801**

- **Identification Plate**
- **Rolled Ball Screw type**
- **Linear Actuator External type**
- **MoBo Series**

---

### Ball Screw Specifications

- **Shaft dia:** φ6  
- **Lead:** 6mm  
- **Travel:** 75mm

- **Shaft dia:** φ8  
- **Lead:** 1mm  
- **Travel:** 150mm

---

### Motor Specifications

- **Basic step angle:** 0.72°
- **Rated Voltage:** DC 1.28 V
- **Rated current:** 0.75A/phase
- **Winding resistance:** 1.7Ω
- **Holding Torque:** 0.028Nm
- **Shaft & Nut material:** Chrome-molybdenum steel
- **Surface Coating:** Black Chrome coating on Shaft
- **Surface hardness:** HRC58~62 (Thread area)
- **Lubricant:** KSS original grease MSG No.1

---

### Recommended Accessories

- **Motor side Supporting plate:** MP-24A or MP-24B
- **Supported side Bracket:** SP-24
- **Nut Block:** NB-0606R

---

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

---

**Note:** Refer to page F159, F160 for connection diagram of recommended Drivers.
Standard products in stock
TMB series
Rolled Ball Screw + 5-phase Stepping Motor

TMB0812
Shaft dia. φ8  Lead: 12mm
Travel: 150mm

Recommended Drivers:
- KR-A5CC
- KR-A5SMC (Micro step)
- KR-A5SM (Micro step / AC 100 ~ 220V)

Recommended accessories:
- Motor side Supporting plate: MP-42A or MP-42B
- Supported side Bracket: SP-42
- Nut Block: NB-0812R

Note: Refer to page F159, F160 for connection diagram of recommended Drivers.

Ball Screw Specifications:
- Accuracy grade: JIS C17
- Thread direction: Right
- Axial play: 0.020mm or less
- Reference Thrust: 50N
- Shaft & Nut material: Chrome-molybdenum steel
- Surface Coating: Black Chrome coating on Shaft
- Surface hardness: HRC58～62 (Thread area)
- Lubricant: KSS original grease MSG No.1

Motor Specifications:
- Basic step angle: 0.72°
- Rated Voltage: DC 1.65 V
- Rated current: 0.75A/phase
- Winding resistance: 2.2Ω
- Holding Torque: 0.236Nm
- Rotor inertia: 74g·cm²
- Operating temperature: −20°C ~ 50°C

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

MoBo Series
Rolled Ball Screw type
Linear Actuator: External type
Linear Actuator External type
2-phase Motor & Rolled Ball Screw type (2TMB)

**2-phase Rolled MoBo**

**Features**
- A 2-phase Stepping Motor is mounted directly onto the shaft end of a C7 grade Rolled Ball Screw, which means compact and multipurpose type product.
- Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Since combining the Motor Shaft and Ball Screw Shaft, Ball Screw Shaft is ideally constructed to form the Motor Rotor Shaft.
- Recommended Driver for 2-phase Stepping Motor is available.
- Accessories are also provided as mounting kit, such as Nut block and Motor plate.

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Shaft Nominal Dia</th>
<th>Lead</th>
<th>Travel</th>
<th>Travel per pulse</th>
<th>Reference Thrust</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(mm)</td>
<td>(mm)</td>
<td>(mm)</td>
<td>(µm)</td>
<td>(N)</td>
<td>(g)</td>
</tr>
<tr>
<td>2TMB0801</td>
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<td>1</td>
<td>150</td>
<td>5</td>
<td>75</td>
<td>350</td>
</tr>
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<td>2TMB0802</td>
<td>#8</td>
<td>2</td>
<td>150</td>
<td>10</td>
<td>100</td>
<td>400</td>
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<tr>
<td>2TMB0805</td>
<td>#8</td>
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<td>150</td>
<td>25</td>
<td>50</td>
<td>400</td>
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<tr>
<td>2TMB0812</td>
<td>#8</td>
<td>12</td>
<td>150</td>
<td>60</td>
<td>25</td>
<td>400</td>
</tr>
</tbody>
</table>

**Motor Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor size</th>
<th>Rated voltage (V)</th>
<th>Rated current (A/phase)</th>
<th>Winding resistance (Ω)</th>
<th>Holding torque (Nm)</th>
<th>Rotor Inertia (g-cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2TMB0801</td>
<td>#42</td>
<td>DC 2.2</td>
<td>2.0</td>
<td>1.1</td>
<td>0.24</td>
<td>42</td>
</tr>
<tr>
<td>2TMB0802</td>
<td>#42</td>
<td>DC 2.2</td>
<td>2.0</td>
<td>1.1</td>
<td>0.24</td>
<td>42</td>
</tr>
<tr>
<td>2TMB0805</td>
<td>#42</td>
<td>DC 2.2</td>
<td>2.0</td>
<td>1.1</td>
<td>0.24</td>
<td>42</td>
</tr>
<tr>
<td>2TMB0812</td>
<td>#42</td>
<td>DC 2.2</td>
<td>2.0</td>
<td>1.1</td>
<td>0.24</td>
<td>42</td>
</tr>
</tbody>
</table>

**Test condition**

Driver: Maker Standard
Input Voltage: DC24V
Phase Current: 2.0A

Note: Motor characteristic will vary depending on Driver type, operating conditions.

**Schematic**

**End-journal turning & Exclusive Support Unit**

All of KSS 2-phase Rolled MoBo are in stock. In order to meet the request of flexible length, Shaft end journal turning is available. Please note that re-work is only for cutting and turning down. Special profile of Support Unit is required, please ask KSS representative.

**Note**

1) Detail specifications & dimensions are shown in drawings from page F129.
2) Travel per pulse represents the value for full step.
3) Acceleration & Deceleration Rate should be 50ms/KHz or more.
4) Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.

Please note that minimum re-work length is 150mm (except re-work portion) as shown in figure above. Total length shorter than 150mm (except re-work portion) should be used as cantilever. If supported journal with ring groove or total length of less than 150mm is required, it will be available as a customized order.

KSS Exclusive Support Unit for 2-phase Rolled MoBo, please see page F156 (SP-42S). Special profile of Support Unit is required, please ask KSS representative.
Recommended Drivers:

**SD4030B2**

**Recommended accessories**

- Motor side Supporting plate: MP-42A or MP-42B
- Exclusive Support Unit: SP-425
- Nut Block: NB-0801R

**Ball Screw Specifications**

- Accuracy grade: Equivalent to JIS C7
- Thread direction: Right
- Axial play: 0.03mm or less
- Reference Thrust: 75N
- Shaft material: Stainless steel
- Nut material: Chrome-molybdenum steel
- Surface hardness: Min. Hardness (Thread area)
- Lubricant: KSS original grease M50 No.2

**Motor Specifications**

- Basic step angle: 1.8°
- Driving method: 2-phase Bi-polar
- Rated Voltage: DC 2.2 V
- Rated current: DC 2.0 A
- Winding resistance: 1.1Ω
- Holding Torque: 0.24Nm
- Rotor inertia: 42g•cm²
- Operating temperature: −20°C ~ 50°C

Note: Please refer to page F128 about end-journal turning.

---

**Recommended Drivers**

**SD4030B2**

**Recommended accessories**

- Motor side Supporting plate: MP-42A or MP-42B
- Exclusive Support Unit: SP-425
- Nut Block: NB-0801R

**Ball Screw Specifications**

- Accuracy grade: Equivalent to JIS C7
- Thread direction: Right
- Axial play: 0.03mm or less
- Reference Thrust: 100N
- Shaft material: Stainless steel
- Nut material: Chrome-molybdenum steel
- Surface hardness: Min. Hardness (Thread area)
- Lubricant: KSS original grease M50 No.2

**Motor Specifications**

- Basic step angle: 1.8°
- Driving method: 2-phase Bi-polar
- Rated Voltage: DC 2.2 V
- Rated current: DC 2.0 A
- Winding resistance: 1.1Ω
- Holding Torque: 0.24Nm
- Rotor inertia: 42g•cm²
- Operating temperature: −20°C ~ 50°C

Note: Please refer to page F128 about end-journal turning.
**2TMB0805**

**Shaft dia.Ø8**  
**Lead : 5mm**  
**Travel : 150mm**

<table>
<thead>
<tr>
<th>Ball Screw Specifications</th>
<th>Motor Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy grade</td>
<td>Equivalent to JIS Ct7</td>
</tr>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.03mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>50N</td>
</tr>
<tr>
<td>Shaft material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>Min. HRC55 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease M50 No.2</td>
</tr>
<tr>
<td></td>
<td><strong>Basic step angle</strong> 1.8°</td>
</tr>
<tr>
<td></td>
<td><strong>Driving method</strong> 2-phase Bi-polar</td>
</tr>
<tr>
<td></td>
<td><strong>Rated Voltage</strong> DC 2.2 V</td>
</tr>
<tr>
<td></td>
<td><strong>Rated current</strong> DC 2.0 A</td>
</tr>
<tr>
<td></td>
<td><strong>Winding resistance</strong> 1.1Ω</td>
</tr>
<tr>
<td></td>
<td><strong>Holding Torque</strong> 0.24Nm</td>
</tr>
<tr>
<td></td>
<td><strong>Rotor inertia</strong> 42g · cm²</td>
</tr>
<tr>
<td></td>
<td><strong>Operating temperature</strong> −20°C ~ 50°C</td>
</tr>
</tbody>
</table>

**Recommended Drivers**  
SD4030B2

**Note** Refer to page F160 for connection diagram of recommended Drivers.

**Recommended accessories**
- Motor side Supporting plate: MP-42A or MP-42B
- Exclusive Support Unit: SP-42S
- Nut Block: NB-0805R

---

**2TMB0812**

**Shaft dia.Ø8**  
**Lead : 12mm**  
**Travel : 150mm**

<table>
<thead>
<tr>
<th>Ball Screw Specifications</th>
<th>Motor Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy grade</td>
<td>Equivalent to JIS Ct7</td>
</tr>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0.03mm or less</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>25N</td>
</tr>
<tr>
<td>Shaft material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>Min. HRC55 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>KSS original grease M50 No.2</td>
</tr>
<tr>
<td></td>
<td><strong>Basic step angle</strong> 1.8°</td>
</tr>
<tr>
<td></td>
<td><strong>Driving method</strong> 2-phase Bi-polar</td>
</tr>
<tr>
<td></td>
<td><strong>Rated Voltage</strong> DC 2.2 V</td>
</tr>
<tr>
<td></td>
<td><strong>Rated current</strong> DC 2.0 A</td>
</tr>
<tr>
<td></td>
<td><strong>Winding resistance</strong> 1.1Ω</td>
</tr>
<tr>
<td></td>
<td><strong>Holding Torque</strong> 0.24Nm</td>
</tr>
<tr>
<td></td>
<td><strong>Rotor inertia</strong> 42g · cm²</td>
</tr>
<tr>
<td></td>
<td><strong>Operating temperature</strong> −20°C ~ 50°C</td>
</tr>
</tbody>
</table>

**Recommended Drivers**  
SD4030B2

**Note** Refer to page F160 for connection diagram of recommended Drivers.

**Recommended accessories**
- Motor side Supporting plate: MP-42A or MP-42B
- Exclusive Support Unit: SP-42S
- Nut Block: NB-0812R

---
Linear Actuator External type
Hybrid type (SiMB)

Si-MoBo

Features
- A Stepping Servo Motor, what we call Si-servo Motor, is mounted directly onto the Shaft end of a Precision Ball Screw, which is high resolution and precise positioning unit.
- An Encoder and a Memory chip are installed at the end of Motor, high accurate positioning, ultra smooth drive, and closed loop function have been achieved.
- 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, and reducing labor cost can be achieved.
- Exclusive Driver, and Cable are provided for Si-servo Motor.
- Accessories are also provided as mounting kit, such as Nut block and Motor plate.

Database compensation control
Control mechanism of the Si servo is not simply the micro-step control. Both an Encoder and a Memory chip are installed, and the Encoder position for 400pulse resolution per revolution as well as electrical current feedback are standard. Furthermore, data inherent to the Motor is recorded in the Memory at time of shipping from the factory so that high speed and high precision positioning to designated positions can be realized using a precise database revision control method of compensation and control when the Motor starts.

Sampling motor characteristics
Cogging Torque and Torque ripples originate from Motor processing and assembly precision, big factors that can hinder a low vibration, high accuracy positioning. The Si servo, by accurately measuring and storing individual Motor characteristics data inherent to the Motor, we can create a database of the optimal electrical current wave forms for the highest possible rotary precision.

Storing data in memory
The data gained from sampling is stored in Memory within the Motor, which can be transferred to a Driver by using an Encoder cable at the time power is supplied. This makes it possible for the Driver and the Motor to work as an optimal combination.

High precision positioning
This is not just a simple command analysis as with Micro-step controls. It raises the actual precision of halting to a proper 10000 pulse encoder. Furthermore uniform pitch positioning to the pulse, which can not be achieved by Micro-step, has been realized.

(*As one condition, the output Torque of the Motor needs to sufficiently exceed load resistance.)
Low vibrations
Vibrating elements in the Motor have been largely removed thanks to the optimal high-speed revision command currents while the Motor is in operation. Also unlike a standard Servo Motor, there is no searching between Encoder counts when the Motor stops.

Setting time
The Si Servo makes the most of the stepping motor’s advantages including its ability to closely follow the command pulse train. The amount of time until setting within ±1 pulse of 12,800 partitions is only 1ms. Providing superior performance in high response systems.

Surplus Torque
Because the Si Servo is never step out, it is possible to operate continuously at 100% capacity. There is no need to consider the Torque margin as with the Stepping Motor.

Real-time auto-tuning
Even machinery that could not operate smoothly with conventional tuning methods will automatically imitate Inertia and Rigidity, always able to realize the optimal responsive and stable tuning.

Torque controls through stepping
Five steps of Torque control are performed during position control. Optional Torque value settings are possible during the point table operations. A high degree of freedom in control is possible thanks to being able to switch back and forth between position control and torque control. Even during Torque control, differential controls are still being performed internally, so positions will not deviate.

External electronic gear transfer
Using external I/O signals and/or communication commands, switching the electronic gear setting in two steps possible. Even controller that cannot output except on command pulses with low frequencies can be highly functional in a wide range from low speed to high speed operations. *Switching can be performed while the motor is halted.

Note1: Detail specifications & dimensions are shown in drawings from page F147.
Note2: Acceleration & Deceleration Rate should be recommended by 0.5ms/kHz or more. (Abiliby as a Motor itself)
Note3: Reference Thrust may vary depending on the operating condition, please ask KSS for more detail.
### Motor Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>TS3617N705004 (SiMB08xx)</th>
<th>TS3692N61S02 (SiMB0401)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum output torque N·m</td>
<td>0.017</td>
<td>0.24</td>
</tr>
<tr>
<td>Maximum rotating speed rpm</td>
<td>4500</td>
<td>4500</td>
</tr>
<tr>
<td>Rated current A0-p</td>
<td>0.35</td>
<td>2.0</td>
</tr>
<tr>
<td>Rated voltage V</td>
<td>3.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Coil resistance Q</td>
<td>8.5 ± 15%</td>
<td>1.1 ± 15%</td>
</tr>
<tr>
<td>Rotor inductance mH</td>
<td>3.4 ± 20%</td>
<td>1.4 ± 20%</td>
</tr>
<tr>
<td>Rotor inertia 10⁻³ kg·m²</td>
<td>1.9</td>
<td>35</td>
</tr>
<tr>
<td>Shaft run out mm T.I.R</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Thrust play mm max.</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Coil Method —</td>
<td>2-phase hybrid stepping motor Bipolar coil</td>
<td></td>
</tr>
<tr>
<td>Insulation class —</td>
<td>CLASS B</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength V</td>
<td>500 (at AC 1MIN)</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range °C</td>
<td>−20°→+50°C</td>
<td></td>
</tr>
<tr>
<td>Operating humidity range %RH</td>
<td>5%→95%</td>
<td></td>
</tr>
<tr>
<td>Storage temperature range °C</td>
<td>−40°→+70°C</td>
<td></td>
</tr>
</tbody>
</table>

Note: Rotor Inertia includes Ball Screw Shaft.

### Driver Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>S-02DE(SiMB0401)</th>
<th>S-02DE(SiMB08xx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Motor Model</td>
<td>TS3692N61S02</td>
<td>TS3617N705004</td>
</tr>
<tr>
<td>Rated Output Current(A0-p)</td>
<td>0.35</td>
<td>2.0</td>
</tr>
<tr>
<td>Maximum Output Current(A0-p)</td>
<td>1.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Controlling Method</td>
<td>Transistor PWM (Sine Wave Drive)</td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>Incremental Encoder 200 ppr</td>
<td>Incremental Encoder 400 ppr</td>
</tr>
<tr>
<td>Power supply Voltage (V)</td>
<td>DC24V ±10% or DC36V ±10%</td>
<td></td>
</tr>
<tr>
<td>Control power supply</td>
<td>DC24V ±10%</td>
<td></td>
</tr>
<tr>
<td>Power Supply Current (A)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Position Command Method</td>
<td>Communication and Control Input through 3 Mode Pules Lines and RS485</td>
<td></td>
</tr>
<tr>
<td>Conditions for Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature for Use</td>
<td>0°→+50°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>−20°→+85°C</td>
<td></td>
</tr>
<tr>
<td>Humidity for Use or Storage</td>
<td>Under 90%RH (no condensation)</td>
<td></td>
</tr>
<tr>
<td>Resistance Vibrations</td>
<td>0.5G</td>
<td></td>
</tr>
<tr>
<td>Impact Resistance</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Dynamic Braking</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Regenerative Function</td>
<td>Able to connect to external regeneration processing circuit</td>
<td></td>
</tr>
<tr>
<td>Over Trave Prevention</td>
<td>Hard OT, Soft OT (Select ON or OFF parameters)</td>
<td></td>
</tr>
<tr>
<td>Internal Speed Setting</td>
<td>Point Table Transfer Speed, Jog Speed, Reset Speed</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>1-LED (Alarm Display, Servo ON Conditions)</td>
<td></td>
</tr>
<tr>
<td>Input / Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>Command Pulse Input</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 points (Select function parameters)</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Control output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 points (Select parameters), Brake Release Signal</td>
<td></td>
</tr>
<tr>
<td>Protection Functions</td>
<td>EEPROM abnormalities, Encoder abnormalities, System abnormalities, Over Currents, Driver overheating, Excessive location deviation, Motor current abnormalities, Control Current abnormalities</td>
<td></td>
</tr>
<tr>
<td>Zero Return Mode</td>
<td>Zero LS Signal input or using mechanical stopper (Set parameters of 7 methods)</td>
<td></td>
</tr>
<tr>
<td>Multi-axis</td>
<td>Multi-axis of up to 15 axis with RS485</td>
<td></td>
</tr>
<tr>
<td>Settings</td>
<td>Parameters are set through use of a computer (RS485 converter required)</td>
<td></td>
</tr>
<tr>
<td>Standard, Environmental, and Protection Grades</td>
<td>UL conformance / CE (self-declaration) / Corresponds to RoHS / IP40</td>
<td></td>
</tr>
</tbody>
</table>

### Torque Characteristics

![Torque Characteristics](image)

### Driver Outer Dimensions

![Driver Outer Dimensions](image)
Control Input Selection Table

<table>
<thead>
<tr>
<th>Selection Function</th>
<th>Code</th>
<th>Contents</th>
<th>Selection Function</th>
<th>Code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVON</td>
<td>01</td>
<td>Servo ON</td>
<td>SMON</td>
<td>01</td>
<td>Servo ON</td>
</tr>
<tr>
<td>PI00</td>
<td>02</td>
<td>CW J0D</td>
<td>EX0N</td>
<td>1C</td>
<td>Input branching</td>
</tr>
<tr>
<td>NJ00</td>
<td>03</td>
<td>CCW J0D</td>
<td>EMCF</td>
<td>21</td>
<td>Emergency stop (counterclockwise)</td>
</tr>
<tr>
<td>ARST</td>
<td>04</td>
<td>Reset alarm</td>
<td>EMCF</td>
<td>21</td>
<td>Emergency stop (clockwise)</td>
</tr>
<tr>
<td>STR</td>
<td>05</td>
<td>Start</td>
<td>EXN2</td>
<td>23</td>
<td>Input branching 2</td>
</tr>
<tr>
<td>ZSTR</td>
<td>06</td>
<td>Zero start</td>
<td>EXN3</td>
<td>26</td>
<td>Input branching 3</td>
</tr>
<tr>
<td>DEC</td>
<td>07</td>
<td>Deceleration</td>
<td>STRP</td>
<td>25</td>
<td>Stop</td>
</tr>
<tr>
<td>HOLD</td>
<td>08</td>
<td>Hold</td>
<td>ZSTRP</td>
<td>26</td>
<td>Stop</td>
</tr>
<tr>
<td>PO_IN</td>
<td>09</td>
<td>ERST</td>
<td>RSEL</td>
<td>38</td>
<td>Select resolution function</td>
</tr>
<tr>
<td>PI_IN</td>
<td>0A</td>
<td>MFIN</td>
<td>SENS</td>
<td>22</td>
<td>Sensor positioning</td>
</tr>
<tr>
<td>PI3_IN</td>
<td>30</td>
<td>STP</td>
<td>SENS</td>
<td>22</td>
<td>Sensor positioning</td>
</tr>
<tr>
<td>PI4_IN</td>
<td>31</td>
<td>RSEL</td>
<td>STRP</td>
<td>26</td>
<td>Stop</td>
</tr>
<tr>
<td>PI5_IN</td>
<td>32</td>
<td>TSEL0</td>
<td>TSEL1</td>
<td>3A</td>
<td>Stop</td>
</tr>
<tr>
<td>PI6_IN</td>
<td>33</td>
<td>TSEL1</td>
<td>TSEL2</td>
<td>3B</td>
<td>Stop</td>
</tr>
<tr>
<td>PI7_IN</td>
<td>34</td>
<td>TSEL2</td>
<td>TSEL3</td>
<td>3C</td>
<td>Stop</td>
</tr>
<tr>
<td>PI8_IN</td>
<td>35</td>
<td>TSEL3</td>
<td>TSEL4</td>
<td>3D</td>
<td>Stop</td>
</tr>
<tr>
<td>N27</td>
<td>13</td>
<td>CCW OFF</td>
<td>XDR</td>
<td>2E</td>
<td>Input selection for revolution direction</td>
</tr>
</tbody>
</table>

Parameters 65 and 61 refer to the above codes.

Parameter 80: HW1 HW2 HW3 HW4

Parameter 81: HW5 HW6 HW7 HW8

Control Output Selection Table

<table>
<thead>
<tr>
<th>Selection Function</th>
<th>Code</th>
<th>Contents</th>
<th>Selection Function</th>
<th>Code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDY</td>
<td>01</td>
<td>Serve ready</td>
<td>PI0_OUT</td>
<td>04</td>
<td></td>
</tr>
<tr>
<td>INP</td>
<td>02</td>
<td>In position</td>
<td>PI1_OUT</td>
<td>05</td>
<td></td>
</tr>
<tr>
<td>ALM</td>
<td>03</td>
<td>Alarm</td>
<td>PI2_OUT</td>
<td>06</td>
<td></td>
</tr>
<tr>
<td>PRO</td>
<td>11</td>
<td>Program in operation</td>
<td>PI3_OUT</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>FIN</td>
<td>12</td>
<td>Completed</td>
<td>PI4_OUT</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>VZM</td>
<td>14</td>
<td>Velocity agreement</td>
<td>PI5_OUT</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>VZB</td>
<td>18</td>
<td>Zero velocity</td>
<td>PI6_OUT</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>TFIN</td>
<td>1C</td>
<td>Torque completed</td>
<td>PI7_OUT</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>FIN+TFIN</td>
<td>1D</td>
<td>Completed and torque completed</td>
<td>PI8_FIN</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>30</td>
<td>M output</td>
<td>PI9_FIN</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>31</td>
<td>M output</td>
<td>PI10_FIN</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>32</td>
<td>M output</td>
<td>PI11_FIN</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>TLMT</td>
<td>3B</td>
<td>Torque limit</td>
<td>PI12_FIN</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SLMT</td>
<td>39</td>
<td>Speed limit</td>
<td>PI13_FIN</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>POTOUT</td>
<td>3A</td>
<td>Positive drive prohibited</td>
<td>PI14_FIN</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>NOTOUT</td>
<td>3B</td>
<td>Negative drive prohibited</td>
<td>PI15_FIN</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>ZFIN</td>
<td>3C</td>
<td>Zero complete</td>
<td>ZFIN</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>ZERO</td>
<td>3D</td>
<td>Zero position</td>
<td>ZFIN</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

Parameters 63 refer to the above codes.

Parameter 80: OUT OUT OUT OUT

*Parameter number 60, 61, and 63 are 32-bit hexadecimal data, and are divided into 8 bits each, set through the input and output functions. When functions are set, the corresponding terminals are assigned to the set functions.

*When multiple input terminals are assigned to the same function, the one with input performs that function.

*When multiple output terminals are assigned to the same function, the output from that function will be performed at all assigned terminals.
**Control Signals**

**Input Circuit**

- **Pulse Command (5V Line Driver)**
  - Applied voltage: ±30V
  - Electrically current: ±30mA
  - Use twists on P and N sides.

- **Pulse Command (5V Open Collector)**
  - Current used is about 15mA/circuit.

- **Brake Signals**
  - Brake coil
  - Surge absorption element
  - A non-voltage contact output (1a) is used as the braking cancellation signal. The area between BK1 and BK2 shorts circuits when the motor is electrified. The applied voltage of the output terminal and the volume of electrified current are as follows.
    - **Applied voltage:** Under AC 125V, DC 60V
    - **Electrified current:** Under 1A
  - Please be sure to use a surge absorption unit of a varistor type that meets the specifications of the brake coil being used. Not inserting one may cause damage to the relay contact.

**Output Circuit**

- **Pulse Command (5V Open Collector)**
  - Current used is about 15mA/circuit.

**Communication Command Table**

<table>
<thead>
<tr>
<th>Function</th>
<th>Command</th>
<th>Function</th>
<th>Command</th>
<th>Function</th>
<th>Command</th>
<th>Function</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read parameter</td>
<td>PRMR</td>
<td>Initial start ON</td>
<td>ZSTROF</td>
<td>Field selection 6 ON</td>
<td>TSELOF</td>
<td>Torque selection 3 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Write parameter</td>
<td>PRMW</td>
<td>Initial start OFF</td>
<td>ZSTROFF</td>
<td>Field selection 0 ON</td>
<td>TSELOFF</td>
<td>Torque selection 0 ON</td>
<td>TSELOFF</td>
</tr>
<tr>
<td>Read point table</td>
<td>TR</td>
<td>Initial start ON</td>
<td>ZSTRP</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Write point table</td>
<td>TW</td>
<td>Initial deceleration ON</td>
<td>DECOM</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Write EEPROM FLASH</td>
<td>FLECOFF</td>
<td>Initial deceleration OFF</td>
<td>DECOFF</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Serve on</td>
<td>SVON</td>
<td>Step ON</td>
<td>STEP0N</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Serve off</td>
<td>SVOFF</td>
<td>Step OFF</td>
<td>STEP0FF</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Emergency stop ON</td>
<td>EMCON</td>
<td>Step 0 ON</td>
<td>STEP0N</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Emergency stop OFF</td>
<td>EMCOFF</td>
<td>Step 1 ON</td>
<td>STEP1N</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Reset alarm</td>
<td>ARST</td>
<td>Step 2 ON</td>
<td>STEP2N</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Start ON</td>
<td>STRON</td>
<td>Step 3 ON</td>
<td>STEP3N</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Start OFF</td>
<td>STROFF</td>
<td>Hold ON</td>
<td>HOLDON</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Start on edge</td>
<td>STRP</td>
<td>Hold OFF</td>
<td>HOLDOFF</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Stop operations</td>
<td>STOP</td>
<td>Single block ON</td>
<td>SBKON</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
<tr>
<td>Numerical monitor</td>
<td>MSIN</td>
<td>Single block OFF</td>
<td>SBKOFF</td>
<td>Designate point number</td>
<td>PNT</td>
<td>Torque selection 0 ON</td>
<td>TSELOF</td>
</tr>
</tbody>
</table>

**Communication Protocol**

- **Sending (Controller ⇒ Servo)**

- **Replies (Servo ⇒ Controller)**

**Communication Methods**

- **Conforming Standards**
  - 2 wire model
  - 2 line model
  - Modulation tones
  - 2 line model
  - Modulation tones
  - Single line model
  - Hexadecimal

<table>
<thead>
<tr>
<th>Start bit</th>
<th>Data bit</th>
<th>Parity</th>
<th>Stop bit</th>
<th>Thumb check</th>
<th>Maximum data length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bit</td>
<td>8 bit</td>
<td>1 byte</td>
<td>1 bit</td>
<td>None</td>
<td>30 bytes</td>
</tr>
</tbody>
</table>

- **Number of Connections:** 15 axis (No.0 - 14)
MoBo Series
Hybrid type
Linear Actuator External type

### Parameter Table

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter Name</th>
<th>Format</th>
<th>Unit</th>
<th>Default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Axis number</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>01</td>
<td>Preset control input function setting</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>02</td>
<td>Resolution number</td>
<td>P</td>
<td>ppm</td>
<td>100</td>
</tr>
<tr>
<td>03</td>
<td>Resolution denominator</td>
<td>P</td>
<td>ppm</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>Pulse command multi-ply</td>
<td>P</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>05</td>
<td>CW coil voltage</td>
<td>P</td>
<td>ppm</td>
<td>1</td>
</tr>
<tr>
<td>06</td>
<td>Current down time limit</td>
<td>ms</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>07</td>
<td>Preset servo gain selection</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>08</td>
<td>Proportional position gain</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>09</td>
<td>Proportional speed gain</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Differentiated speed gain</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Integral speed gain</td>
<td>U</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>Integral operations in hold condition</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Torque selection 0%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>14</td>
<td>Torque selection 1%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>15</td>
<td>Torque selection 2%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>16</td>
<td>Torque selection 3%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>17</td>
<td>Torque selection 4%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>18</td>
<td>Protect alarm output</td>
<td>U</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Torque selection 7%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>20</td>
<td>Torque selection 8%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>21</td>
<td>Torque selection 9%</td>
<td>U</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>22</td>
<td>CW soft OT</td>
<td>U</td>
<td>ppm</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>CCW soft OT</td>
<td>U</td>
<td>ppm</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>CW extal OT</td>
<td>U</td>
<td>ppm</td>
<td>0</td>
</tr>
</tbody>
</table>

### Note
- Setting changes to parameters with a circle in the "Restart" column are effective after the power supply is restored.

### Cable Specifications

#### Motor cable : Si-MCBM

For Si-02DE, Si-02LDE

<table>
<thead>
<tr>
<th>NO.</th>
<th>Connector Name</th>
<th>MT</th>
<th>Signal</th>
<th>Color</th>
<th>MT</th>
<th>Signal</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MT Connector</td>
<td>1</td>
<td>F-D</td>
<td>Black</td>
<td>2</td>
<td>F-D</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>MT Connector</td>
<td>2</td>
<td>F-D</td>
<td>Black</td>
<td>3</td>
<td>F-D</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>MT Connector</td>
<td>3</td>
<td>F-D</td>
<td>Black</td>
<td>4</td>
<td>F-D</td>
<td>Black</td>
</tr>
</tbody>
</table>

#### I/O cable : Si-I0BM

<table>
<thead>
<tr>
<th>NO.</th>
<th>Connector Name</th>
<th>MT</th>
<th>Signal</th>
<th>Color</th>
<th>MT</th>
<th>Signal</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MT Connector</td>
<td>1</td>
<td>F-D</td>
<td>Black</td>
<td>2</td>
<td>F-D</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>MT Connector</td>
<td>2</td>
<td>F-D</td>
<td>Black</td>
<td>3</td>
<td>F-D</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>MT Connector</td>
<td>3</td>
<td>F-D</td>
<td>Black</td>
<td>4</td>
<td>F-D</td>
<td>Black</td>
</tr>
</tbody>
</table>

#### Regeneration cable : Si-RGVC

<table>
<thead>
<tr>
<th>NO.</th>
<th>Connector Name</th>
<th>MT</th>
<th>Signal</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MT Connector</td>
<td>1</td>
<td>F-D</td>
<td>Black</td>
</tr>
</tbody>
</table>

*Please note the polarity of the power supply. Miswiring may result in damage to the controller.
*If using the Si-RGV style cable, the wiring color will be different. Please inquire.

---

1) Value for Si-02DE (It is 358mA for Si-02LDE)
2) Values for 75 and 76 are 0, but hold the same meaning as 300%.
**Power Supply cable : Si-PWBC M**

For Si-02DE, Si-02LDE

<table>
<thead>
<tr>
<th>Connector Name</th>
<th>PW</th>
<th>EC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal</td>
<td>Signal</td>
<td>Color</td>
</tr>
<tr>
<td>1</td>
<td>TRX+</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>TRX-</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>PW</td>
<td>Red</td>
</tr>
<tr>
<td>4</td>
<td>PW</td>
<td>Shield</td>
</tr>
</tbody>
</table>

*Please note the polarity of the power supply. Mistakes may result in damage to the controller.
*If using the Si-PWBC M style cable, the wiring color will be different. Please inquire.

**RS485 Master cable : Si-RSM M**

<table>
<thead>
<tr>
<th>Connector Name</th>
<th>RM</th>
<th>EC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal</td>
<td>Signal</td>
<td>Color</td>
</tr>
<tr>
<td>1</td>
<td>TRX+</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>TRX-</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>PW</td>
<td>Red</td>
</tr>
<tr>
<td>4</td>
<td>PW</td>
<td>Shield</td>
</tr>
</tbody>
</table>

**RS485 Slave cable : Si-RSS**

**Encoder cable : Si-ECB M**

**Point Table**

- **Absolute Value / Relative Value**
  The set value for “Position / Amount Moved” determines whether this is an absolute position or the amount of relative movement. “0” represents absolute location and “1” represents amount of relative movement.

- **Position / Amount Moved**
  This sets the location and amount of movement with the command unit pulse.

- **Speed Data**
  This sets the motor’s resolution speed (rpm) for movement.

- **Acceleration / Deceleration Data**
  This sets the time for acceleration and deceleration. It is time until 3000 rpm is achieved.

- **Wait Time**
  This sets the wait time until the next point’s operation begins in units of ms. This is ignored in cases of continual operation or when the program is completed.

- **Continual Operation**
  When this setting is on, output of the command pulse for the next branch begins immediately, without waiting for positioning of that point to be completed.

- **Normal Branching**
  This selects the next point number to run upon completion of the move.

- **S Curve**
  This designates the speed curve’s acceleration or deceleration for point positioning to the S in curve (S curve).

- **Input Branch 1-3**
  This designates the branch for when outer input E30N (1-3) are ON.

- **Number of Loops (1-99)**
  The number of loops can be designated according to branch settings when repeated operations are performed.

- **Branching after Loops**
  The branch location can be designated after the set number of loops has completed the loop cycle.

- **Torque Setting**
  This performs the torque setting(%) when moving to this point. (0-300)%

- **Sensor**
  This sets the positioning for sensor position standard when performing positioning. The value set for amount of movement is the distance moved from the sensor.

- **M code**
  An external output code can be designated in 3 bits (1-7). The output timing for when positioning begins and finishes can be designated.

- **Clear Loops**
  Set when the loop counter is cleared to 0.
### SiMB0401

**Shaft dia.**: 4mm  
**Lead**: 1mm  
**Travel**: 30mm

**Motor Specifications**
- **Accuracy grade**: JIS C3
- **Basic step angle**: 1.8°
- **Driving method**: 2-phase Bi-polar
- **Axial play**: 0
- **Reference Thrust**: 30N
- **Shaft material**: Stainless steel
- **Nut material**: Chrome-molybdenum steel
- **Surface hardness**: Min. HRC55
- **Lubricant**: KSS original grease MSG No.1

**Motor Specifications**
- **Encoder**: Incremental 200ppr

**Recommended accessories**
- **Motor side Supporting plate**: MP-20A or MP-20B
- **Supported side Bracket**: —
- **Nut Block**: NB-0401A

**Dimensions & Specifications**
- **Motor power cable length**: 300mm
- **Encoder cable length**: 315mm

**Note1**: Exclusive Driver (Si-02LDE) is required this type.  
**Note2**: Only shaft end cutting is available. Other than that, it would be customized order.

---

### SiMB0801

**Shaft dia.**: 8mm  
**Lead**: 1mm  
**Travel**: 100mm

**Motor Specifications**
- **Accuracy grade**: JIS C3
- **Basic step angle**: 1.8°
- **Driving method**: 2-phase Bi-polar
- **Axial play**: 0
- **Reference Thrust**: 300N
- **Shaft material**: Stainless steel
- **Nut material**: Chrome-molybdenum steel
- **Surface hardness**: Min. HRC55
- **Lubricant**: Multemp PS-2

**Motor Specifications**
- **Encoder**: Incremental 600ppr

**Recommended accessories**
- **Motor side Supporting plate**: MP-42A or MP-42B
- **Supported side Bracket**: SP-42
- **Nut Block**: NB-0801

**Dimensions & Specifications**
- **Motor power cable length**: 300mm
- **Encoder cable length**: 315mm

**Note1**: Exclusive Driver (Si-02LDE) is required this type.  
**Note2**: Only shaft end cutting is available. Other than that, it would be customized order.
### Standard products in stock

#### SiMB series

**Precision Ball Screw + 2-phase Stepping Motor with Encoder**

#### SiMB0802

**Shaft dia. φ8**  
**Lead : 2mm**  
**Travel : 160mm**

**Lubricant** Multemp PS-2

**Nut material** Chrome-molybdenum steel

**Shaft material** Stainless steel

**Reference Thrust** 150N

**Axial play** 0

**Winding resistance** 1.1Ω

**Holding Torque** 0.24N·m

**Rotor inertia** 35g·cm²

**Operating temperature** -20°C ~ 50°C

**Encoder** Incremental 600ppr

**Dimensions & Specifications**

#### SiMB0805

**Shaft dia. φ8**  
**Lead : 5mm**  
**Travel : 150mm**

**Lubricant** Multemp PS-2

**Nut material** Chrome-molybdenum steel

**Shaft material** Stainless steel

**Reference Thrust** 80N

**Axial play** 0

**Winding resistance** 1.1Ω

**Holding Torque** 0.24N·m

**Rotor inertia** 35g·cm²

**Operating temperature** -20°C ~ 50°C

**Encoder** Incremental 600ppr

**Dimensions & Specifications**

### Recommended accessories

<table>
<thead>
<tr>
<th>SiMB0802</th>
<th>SiMB0805</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor side Supporting plate</td>
<td>Motor side Supporting plate</td>
</tr>
<tr>
<td>Supported side Bracket</td>
<td>Supported side Bracket</td>
</tr>
<tr>
<td>Nut Block</td>
<td>Nut Block</td>
</tr>
<tr>
<td>MP-42A or MP-42B</td>
<td>MP-42A or MP-42B</td>
</tr>
</tbody>
</table>

**Note1** Exclusive Driver(Si-02LDE) is required this type.  
**Note2** Only shaft end cutting is available. Other than that, it would be customized order.

**Ball Screw Specifications**

<table>
<thead>
<tr>
<th>Accuracy grade</th>
<th>JIS C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread direction</td>
<td>Right</td>
</tr>
<tr>
<td>Axial play</td>
<td>0</td>
</tr>
<tr>
<td>Reference Thrust</td>
<td>150N</td>
</tr>
<tr>
<td>Shaft material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Nut material</td>
<td>Chrome-molybdenum steel</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>Min. HRC55 (Thread area)</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Multemp PS-2</td>
</tr>
</tbody>
</table>

**Motor Specifications**

<table>
<thead>
<tr>
<th>Basic step angle</th>
<th>1.8°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving method</td>
<td>2-phase Bi-polar</td>
</tr>
<tr>
<td>Rated Voltage</td>
<td>DC 2.2 V</td>
</tr>
<tr>
<td>Rated current</td>
<td>DC 2.0A</td>
</tr>
<tr>
<td>Winding resistance</td>
<td>1.1Ω</td>
</tr>
<tr>
<td>Holding Torque</td>
<td>0.24N·m</td>
</tr>
<tr>
<td>Rotor inertia</td>
<td>35g·cm²</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20°C ~ 50°C</td>
</tr>
<tr>
<td>Encoder</td>
<td>Incremental 600ppr</td>
</tr>
</tbody>
</table>

[Image of SiMB0802 and SiMB0805 diagrams with dimensions and specifications]
Handling precautions for Si-MoBo

Cautions concerning Drivers

• Please arrange for cooling methods, locations, box size, etc., so that the standard temperature is not exceeded, including temperature rises by equipment that has an internal temperature control panel.
• If located near a source of vibration, please arrange it so that vibrations transmitted to the driver do not exceed standard values by attaching shock absorbers or the like.
• If two or more drivers are located together, please attach them with at least 20mm space on either side and at least 50mm space vertically. If there is not enough space, please cool the area by using a fan or the like.
• When reinserting the power supply to the driver, please make the reinsertion after turning off the power supply and checking that the power supply LED has completely gone out. If the power supply is reinserted continuously over a short period of time, the data in the encoder memory may be corrupted.

Cautions concerning Motors

• Do not lift the merchandise by grabbing the lead wires. This may result in damage or injury.
• All lead wires are to be fixed. Do not use them as mobile objects.
• Do not hit the screw axis or increase the thrust load or radial load beyond standards. This may result in damage or injury.
• The motor is not a structure that is either waterproof or oil proof. You cannot use it in a location where water or oil may directly get on the motor or under oil bath conditions.
• Do not use near toxic gases or liquids, or in excessively humid or stamy conditions. Also, please take sufficient care against vibrations or shocks.
• There is a part of the lead wire that is susceptible to damage by static electricity (the part marked for measures against static electricity). Please take measures to prevent static electricity or measures to eliminate static charges by workers.

Cautions concerning wiring

• Please wire so that appropriate electric wire sizes, types and maximum wire length do not exceed standard values.
• Please take note of the following as measures against noise.
  1) Be sure to attach surge absorption circuits to coils such as relays, electromagnetic contact devices and solenoid.
  2) Separate power lines (AC lines, motor lines, etc.) and signal lines by 30cm or more. Do not have them pass through the same duct or bunch them together.
  3) Do not use with the same power supply as electrical welding machinery, electrical discharge machinery or the like. Attach a noise filter to the power supply and the input circuits if a source of high frequency noise is close by, even if the same power supply is not used.
  4) Noise may occur in the signal line because the driver uses a switching amp.
• If problems occur near houses or with radios because this driver does not employ measures against radio interference, insert a line filter into the power supply line.
• The cable used in signal lines is a thin 0.08-0.2mm²; so do not bend the wire or apply tension to it.
MoBo Accessories

**Features**
- Assembling parts of “MoBo series”, Direct Motor Drive Ball Screws series are set up as standard stock.
- Accessories consists of Motor side supporting plate (A-type, B-type), Supported side Bracket or Exclusive Support Unit, and Nut Block.

Please refer to Accessories dimension table for more detail.

MoBo Accessories

Motor side Supporting plate A type

**Applicable Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>Precision (MB)</th>
<th>Rolled (TMB)</th>
<th>2-phase Rolled (2TMB)</th>
<th>Hybrid (SiMB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-20A</td>
<td>MB04005A</td>
<td>MB0401A</td>
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<tr>
<td>MP-24A</td>
<td>MB0401</td>
<td>MB06xx</td>
<td>TMB0401</td>
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<tr>
<td>MP-42A</td>
<td>MB08xx</td>
<td>TMB08xx</td>
<td>2TMB08xx</td>
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</tr>
</tbody>
</table>

Note: Motor side Supporting plate should be fixed after adjusting to ensure smooth movement over entire travel.
Motor side Supporting plate B type

**Applicable MoBo series for Motor side supporting plate B type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Material</th>
<th>Surface coating</th>
<th>Applicable MoBo series</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-20B</td>
<td>Aluminum alloy A5052</td>
<td>Black anodizing</td>
<td>MB04005A MB0401A</td>
</tr>
<tr>
<td>MP-24B</td>
<td>Aluminum alloy A5052</td>
<td>Black anodizing</td>
<td>MB0401 MB06xx</td>
</tr>
<tr>
<td>MP-42B</td>
<td>Aluminum alloy A5052</td>
<td>Black anodizing</td>
<td>MB08xx TMB08xx</td>
</tr>
</tbody>
</table>

Supported side Bracket or Exclusive Support Unit

**Applicable MoBo series for Supported side Bracket or Exclusive Support Unit**

<table>
<thead>
<tr>
<th>Model</th>
<th>Material</th>
<th>Surface coating</th>
<th>Applicable MoBo series</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP-24</td>
<td>Aluminum alloy A5052</td>
<td>Black anodizing</td>
<td>MB06xx TMB06xx</td>
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<tr>
<td>SP-24A</td>
<td>Aluminum alloy A5052</td>
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<td>TMB0504</td>
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<td>SP-42</td>
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<td>Black anodizing</td>
<td>MB08xx TMB08xx</td>
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<tr>
<td>SP-42S</td>
<td>Aluminum alloy A5052</td>
<td>Black anodizing</td>
<td>2TMB08xx</td>
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</tbody>
</table>

Note: Motor side Supporting plate should be fixed after adjusting to ensure smooth movement over entire travel.

**Applicable Model**

**Applicable MoBo series for Motor side supporting plate B type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Precision (MB)</th>
<th>Rolled (TMB)</th>
<th>2-phase Rolled (2TMB)</th>
<th>Hybrid (SiMB)</th>
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</thead>
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<tr>
<td>MP-20B</td>
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<tr>
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<td>TMB0401 TMB0504 TMB0404</td>
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<tr>
<td>MP-42B</td>
<td>MB08xx TMB08xx</td>
<td>2TMB08xx</td>
<td></td>
<td>SiMB08xx</td>
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</table>

**Applicable Model**

**Applicable MoBo series for Supported side Bracket or Exclusive Support Unit**

<table>
<thead>
<tr>
<th>Model</th>
<th>Precision (MB)</th>
<th>Rolled (TMB)</th>
<th>2-phase Rolled (2TMB)</th>
<th>Hybrid (SiMB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP-24</td>
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</tr>
<tr>
<td>SP-24A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SP-42</td>
<td>MB08xx</td>
<td>TMB08xx</td>
<td></td>
<td>SiMB08xx</td>
</tr>
<tr>
<td>SP-42S</td>
<td>MB08xx</td>
<td>2TMB08xx</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Section**

4-M4-П 6.5 depth 3.5 back-facing

4-M4-П 3.4-П 6 depth 3.5 back-facing

4-M4-П 3.4-П 6 depth 4 facing

4-M4-П 3.4-П 6.5 depth 3.5 facing

4-M4-П 3.4-П 6.5 depth 3.5 both side facing

4-M4-П 3.4-П 6.5 depth 3.5 both side facing

**C-type Retaining Ring**

**for shaft**

**Bearing**

624zz
**MoBo Accessories**

**Dimensions & Specifications**

### Nut Block with 2 holes

![Diagram of Nut Block with 2 holes]

- **Material**: Aluminum alloy A5052
- **Surface coating**: Black anodizing

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>D</th>
<th>H</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>K</th>
<th>M x W</th>
<th>C</th>
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</thead>
<tbody>
<tr>
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<td>20</td>
<td>11</td>
<td>18</td>
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<td>10</td>
<td>12</td>
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<td>3</td>
<td>15</td>
<td>2</td>
<td>M26 x 2</td>
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<tr>
<td>NB-0401A</td>
<td>19</td>
<td>11</td>
<td>18</td>
<td>5</td>
<td>9</td>
<td>12</td>
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<td>9</td>
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<td>14</td>
<td>3</td>
<td>16</td>
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<td>M26 x 4</td>
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<tr>
<td>NB-0601</td>
<td>23</td>
<td>12</td>
<td>23</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>17</td>
<td>4</td>
<td>17</td>
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<td>M36 x 5</td>
<td>5</td>
</tr>
<tr>
<td>NB-0801</td>
<td>28</td>
<td>15</td>
<td>33</td>
<td>5</td>
<td>9</td>
<td>16</td>
<td>22</td>
<td>3</td>
<td>22</td>
<td>4</td>
<td>M36 x 5</td>
<td>5</td>
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<tr>
<td>NB-0801</td>
<td>31</td>
<td>25</td>
<td>34</td>
<td>5</td>
<td>18</td>
<td>22</td>
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<td>4</td>
<td>25</td>
<td>4</td>
<td>M36 x 5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Applicable Model**

**MoBo series**
- Linear Actuator External Type

**Applicable MoBo series**
- NB-04005  MB04005A
- NB-0401A  MB0401A
- NB-0601  MB0601
- NB-0602  MB0602
- NB-0801  MB0801
- NB-0802  MB0802
- NB-0805  MB0805

**Dimension table**

- K - M x W
- L2 - L3

**Applicable Model**

**MoBo series**
- Linear Actuator External Type

**Applicable MoBo series**
- NB-0401R  TMB0401
- NB-0504R  TMB0504
- NB-0601R  TMB0601
- NB-0602R  TMB0602
- NB-0606R  TMB0606
- NB-0801R  TMB0801  2TMB0801
- NB-0802R  TMB0802  2TMB0802
- NB-0805R  TMB0805  2TMB0805
- NB-0812R  TMB0812  2TMB0812

---

**MoBo Accessories**

**Dimensions & Specifications**

### Nut Block with 4 holes

![Diagram of Nut Block with 4 holes]

- **Material**: Aluminum alloy A5052
- **Surface coating**: Black anodizing

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>D</th>
<th>H</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>K</th>
<th>M x W</th>
<th>C</th>
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</thead>
<tbody>
<tr>
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<td>23</td>
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<td>23</td>
<td>5</td>
<td>11</td>
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<td>17</td>
<td>7</td>
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<td>M36 x 4</td>
<td>4</td>
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<tr>
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<td>6</td>
<td>12</td>
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<td>18</td>
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<td>M36 x 4</td>
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<tr>
<td>NB-0601R</td>
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<td>19</td>
<td>7</td>
<td>17</td>
<td>2</td>
<td>M36 x 4</td>
<td>4</td>
</tr>
<tr>
<td>NB-0604R</td>
<td>27</td>
<td>9</td>
<td>24</td>
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<tr>
<td>NB-0801R</td>
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<td>14</td>
<td>33</td>
<td>9</td>
<td>16</td>
<td>22</td>
<td>23</td>
<td>7</td>
<td>23</td>
<td>2</td>
<td>M36 x 4</td>
<td>4</td>
</tr>
<tr>
<td>NB-0804R</td>
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<td>22</td>
<td>25</td>
<td>4</td>
<td>17</td>
<td>25</td>
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<td>M36 x 5</td>
</tr>
<tr>
<td>NB-0812R</td>
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<td>18</td>
<td>34</td>
<td>9</td>
<td>18</td>
<td>22</td>
<td>25</td>
<td>4</td>
<td>10</td>
<td>25</td>
<td>4</td>
<td>M36 x 5</td>
</tr>
</tbody>
</table>

- **Applicable Model**

**MoBo series**
- Linear Actuator External Type

**Applicable MoBo series**
- NB-0401R  TMB0401
- NB-0504R  TMB0504
- NB-0601R  TMB0601
- NB-0602R  TMB0602
- NB-0606R  TMB0606
- NB-0801R  TMB0801  2TMB0801
- NB-0804R  TMB0804
- NB-0806R  TMB0806
- NB-0808R  TMB0808
- NB-0812R  TMB0812  2TMB0812

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Connection diagrams

[KR-A5CC]
- Applicable MoBo series
  Precision Ball Screw type (MB)
  Rolled Ball Screw type (TMB)

[KR-A535M]
- Applicable MoBo series
  Precision Ball Screw type (MB)
  Rolled Ball Screw type (TMB)

[KR-A55MC]
- Applicable MoBo series
  Precision Ball Screw type (MB)
  Rolled Ball Screw type (TMB)

[SD4030B2]
- Applicable MoBo series
  2-phase Rolled Ball Screw type (2TMB)

---

Black  | Green  | Orange  | Red  | Blue
---  | ---  | ---  | ---  | ---
GND  | +DC24V  | CCW-  | CCW+  | CW-  | CW+
H.O+  | H.O-  | Z.P-  | Z.P+  | D.S-  | D.S+

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Applicable MoBo series

---

Linear Actuator External type

---

MoBo Series
Connection diagrams
Linear Actuator External type
MoBo Series
Connection diagrams
---
Precaution of handling and operating
Since MoBo series is the product which integrated the Motor Shaft and the Screw Shaft, repair is not possible, if either Motor or Ball Screw is damaged.

Precaution for operating
1. Before use, please read instruction manuals and follow the precautions below.
2. Do not hit or drop the Shaft, do not apply Axial load or Radial load exceeding specifications, it may cause malfunction.
3. Before use, please check that the product has no defect, and product is the same as your order.
4. Do not disassemble each component, dust may get inside the product. It may deteriorate accuracy.
5. Please prevent contamination from dust or swarf. Dust or swarf may cause damage to Ball Screw, which lead to deteriorating the function.
6. Lubrication is required under the Ball Screw operation. Lubricant condition should be checked every 2 to 3 months. If Grease is contaminated, remove old Grease and replace with new one.
7. Do not use MoBo exceeding our specifications in Load or Speed.
8. Care must be taken not to apply Radial load or Moment load directly on Ball Screw. This will lead to shorten the Ball Screw life remarkably. In addition, misalignment between Ball Screw and other components will lead to deterioration of function, such as accuracy, life and so on.
9. Allowing Ball Screw Nut to over-run may result in malfunctioning due to Balls escaping, damage to recirculation parts, and indentation on the raceways. Continued use in this state will lead to rapid wear and damage to recirculation parts. Therefore Ball Screw Nut must never be allowed to over-run.
10. Rotation & Deceleration rate should be followed by recommended number described in each series.
11. Do not hold the Motor lead wire. Motor lead wire is for fixation, do not use the Motor lead wire as movabilities.
12. Keep away from Magnetic memory device.
13. The Motor torque and speed characteristics may vary from the specifications, depending on the load conditions or Driver used. Please adjust as appropriate.
14. The Motor has a resonant point within the specifications. Please avoid the resonant point when in use.

Precaution for safety
1. If abnormal odor, noise, smoke, overheating, or vibration occurs, stop operation immediately and turn the power off.
2. Do not use MoBo exceeding rated current.
3. The Motor may overheat depending on the load condition or Driver used. Make sure that the Motor surface temperature does not exceed 80°C when in use.
4. Check the wire connection type, Drive system, and phase sequence. Inappropriate connection leads to malfunction.
5. A ground connection must be used.
6. Do not bend, pull or pinch the Motor lead wire.
7. Do not touch moving parts during operation.
8. Disconnect from the Controller before performing dielectric withstanding voltage test of the Motor or megger test.
9. Please switch off the Driver, when inspection or maintenance.

Operating environment
1. Operating environment should be 0~40°C in temperature and 20~80%RH in humidity.
2. Do not use MoBo under strong electric field, strong magnetic field.
3. Please prevent from swarf, oil mist, cutting fluid, water/moisture, salt spray, organic solvent and other contamination.
4. MoBo cannot be used under the vibration, impact, vacuum, and other special environment.