Quick Ship Program
Linear Actuator

KR

U.S. STOCK AVAILABLE!

ES/EC

CAT. NO. US-101E
FOUR-WAY EQUAL LOADING
Mountable in any orientation

COMPACT
LM Guide, Ball Screw, and support unit into one structure

HIGH ACCURACY
Circular-arc groove to allow a high accuracy feed

ROBUST
Easy to configure into a 2 or 3 axis system

* KR Actuators available for Quick-Ship are either in stock in U.S. or modified from in stock parts. Precautions on using KR actuator: Please refer to general catalog or 209E catalog. Inventory is subject to availability. Product spec is subject to change without notice.
**DETERMINE KR QUICK-SHIP PART NUMBER**

### Step 1: Determine Model Number & Ball Screw Lead

#### LOAD CAPACITY CHART

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>BALL SCREW LEAD</th>
<th>BLOCK TYPE</th>
<th>STROKE</th>
<th>ACCURACY</th>
<th>MOTOR OPTION</th>
<th>COVER</th>
<th>SENSOR</th>
<th>HOUSING</th>
<th>SAMPLE PART NUMBER</th>
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<tbody>
<tr>
<td>KR20</td>
<td>10</td>
<td>B</td>
<td>-</td>
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<td>P</td>
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<td>1</td>
<td>J</td>
<td>A0</td>
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<td>P</td>
<td>0</td>
<td>1</td>
<td>J</td>
<td>A0</td>
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<td>-</td>
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<td>0</td>
<td>1</td>
<td>J</td>
<td>A0</td>
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<td>B</td>
<td>0100</td>
<td>0325</td>
<td>P</td>
<td>0</td>
<td>1</td>
<td>J</td>
<td>A0</td>
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</table>

*6mm = 06  
A = Single Block  
B = Double Block  
*Load Capacity is the value for single block type.  
*Load Capacity is at rated speed under .3G. (0.15G if lead 6mm or less).

### Step 2: Determine Block Type

#### STATIC PERMISSIBLE MOMENT

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>BLOCK TYPE</th>
<th>STATIC PERMISSIBLE MOMENT (Nm)</th>
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<tbody>
<tr>
<td>KR20</td>
<td>A</td>
<td>31 83</td>
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<td></td>
<td>B</td>
<td>176 165</td>
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<td>KR26</td>
<td>A</td>
<td>84 208</td>
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<td></td>
<td>B</td>
<td>480 416</td>
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<td>KR33</td>
<td>A</td>
<td>166 428</td>
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<tr>
<td></td>
<td>B</td>
<td>908 857</td>
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<td>KR46</td>
<td>A</td>
<td>547 1400</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2940 2940</td>
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</tbody>
</table>

* The values for double block are when blocks are in close contact.

### Step 3: Determine Stroke & Other Options

#### STROKE (mm)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>BALL SCREW LEAD (mm)</th>
<th>MAXIMUM SPEED (mm/s)</th>
<th>POSITIONING REPEatability (mm)</th>
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<tr>
<td></td>
<td>BLOCK</td>
<td>SINGLE BLOCK</td>
<td>DOUBLE BLOCK</td>
</tr>
<tr>
<td>30</td>
<td>01</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>06</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>110</td>
<td>200</td>
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<td>06</td>
<td>110</td>
<td>590</td>
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<tr>
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<td></td>
<td>06</td>
<td>110</td>
<td>590</td>
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</table>

#### OTHER OPTIONS

- **COVER**: NO COVER, WITH COVER
- **SENSOR**: No Sensor, Rail Sensor Only, Photo Sensor, Proximity Sensor, Proximity Sensor, Proximity Sensor
- **HOUSING**: Standard
- **MOTOR OPTION**: Standard, No Motor

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*The rated speed is the value when revolution of the motor is 3000 rpm.  
The maximum speed is the value restricted by the motor rotation (at 6,000 rpm), or by the rotation speed of the ball screw.*
### KR20

**Without Cover**

<table>
<thead>
<tr>
<th>STROKE (mm) (STROKE BTWN MECHANICAL STOPPERS)</th>
<th>OVERALL LENGTH L(mm)</th>
<th>OUTER RAIL LENGTH (mm)</th>
<th>G (mm)</th>
<th>n</th>
<th>OVERALL MAIN UNIT MASS (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE A</td>
<td>TYPE B*</td>
<td>TYPE A</td>
<td>TYPE B*</td>
<td>TYPE A</td>
<td>TYPE B*</td>
</tr>
<tr>
<td>30(41.5)</td>
<td>—</td>
<td>199</td>
<td>100</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>80(91.5)</td>
<td>35(45.5)</td>
<td>209</td>
<td>150</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>130(141.5)</td>
<td>85(95.5)</td>
<td>299</td>
<td>200</td>
<td>40</td>
<td>3</td>
</tr>
</tbody>
</table>

**With Cover**

<table>
<thead>
<tr>
<th>STROKE (mm) (STROKE BTWN MECHANICAL STOPPERS)</th>
<th>OVERALL LENGTH L(mm)</th>
<th>OUTER RAIL LENGTH (mm)</th>
<th>OVERALL MAIN UNIT MASS (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE A</td>
<td>TYPE B*</td>
<td>TYPE A</td>
<td>TYPE B*</td>
</tr>
<tr>
<td>30(41.5)</td>
<td>—</td>
<td>199</td>
<td>100</td>
</tr>
<tr>
<td>80(91.5)</td>
<td>35(45.5)</td>
<td>209</td>
<td>150</td>
</tr>
<tr>
<td>130(141.5)</td>
<td>85(95.5)</td>
<td>299</td>
<td>200</td>
</tr>
</tbody>
</table>

*Indicates a value when two inner blocks are in close contact with each other.

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**Dimensions and Specifications**

- **STROKE** (mm) (STROKE BTWN MECHANICAL STOPPERS):
  - Type A: 30, 80, 130
  - Type B*: 41.5, 45.5, 91.5

- **OVERALL LENGTH L (mm)**:
  - Type A: 199, 209, 299
  - Type B*: 100, 150, 200

- **OUTER RAIL LENGTH (mm)**:
  - Type A: 20, 15, 40
  - Type B*: 20

- **G (mm)**:
  - Type A: 20, 15, 40
  - Type B*: 20

- **n**:
  - Type A: 2, 3
  - Type B*: 3

- **OVERALL MAIN UNIT MASS (kg)**:
  - Type A: 0.45, 0.58, 0.72
  - Type B*: —, 0.655, 0.795

- **STROKE (mm)** (STROKE BTWN MECHANICAL STOPPERS):
  - Type A: 30, 80, 130
  - Type B*: 41.5, 45.5, 91.5

- **OVERALL LENGTH L (mm)**:
  - Type A: 199, 209, 299
  - Type B*: 100, 150, 200

- **OVERALL MAIN UNIT MASS (kg)**:
  - Type A: 0.51, 0.66, 0.8
  - Type B*: 0.78, 0.92

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*Indicates a value when two inner blocks are in close contact with each other.

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**Notes**

1. **Distance between the mechanical stopper and the stroke starting position.**
2. **Indicates the inner block length when calculating the available stroke range.** The length in model KR-B (with two long-type inner blocks) is 90 mm.

**Refer to Pages 3-4 to Determine KR Part No.**
### Quick Ship Linear Actuators

#### KR26 (without cover)

**Type A (10.3)**
- Outer rail length: L₁ = 25 mm
- Stroke: 60 mm
- Outer rail length: 64 mm
- G = 4 mm
- n = 2
- Overall main unit mass: Type A = 0.99 kg, Type B = 1.12 kg

**Type B (11.3)**
- Outer rail length: L₁ = 25 mm
- Stroke: 60 mm
- Outer rail length: 64 mm
- G = 4 mm
- n = 2
- Overall main unit mass: Type A = 1.12 kg, Type B = 1.34 kg

#### KR26 (with cover)

**Type A (17.6)**
- Outer rail length: L₁ = 25 mm
- Stroke: 60 mm
- Outer rail length: 64 mm
- G = 4 mm
- n = 4
- Overall main unit mass: Type A = 1.78 kg, Type B = 2.045 kg

**Type B (18.6)**
- Outer rail length: L₁ = 25 mm
- Stroke: 60 mm
- Outer rail length: 64 mm
- G = 4 mm
- n = 4
- Overall main unit mass: Type A = 1.78 kg, Type B = 2.045 kg

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**Table:**

<table>
<thead>
<tr>
<th>STROKE (mm) (STROKE BTWN MECHANICAL STOPPERS)</th>
<th>OVERALL LENGTH L₁ (mm)</th>
<th>OUTER RAIL LENGTH (mm)</th>
<th>G (mm)</th>
<th>n</th>
<th>OVERALL MAIN UNIT MASS (kg)</th>
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</thead>
<tbody>
<tr>
<td>TYPE A</td>
<td>TYPE B*</td>
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<td></td>
<td></td>
<td>Type A</td>
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<td></td>
<td></td>
<td>1.2</td>
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<td>160(169)</td>
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<td>1.41</td>
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<td>210(219)</td>
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<td>110(119)</td>
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<td></td>
<td></td>
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<td>1.78</td>
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</table>

*Indicates a value when two inner blocks are in close contact with each other.

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**Diagram:**

- **A arrow view:**
  - 4-M4 through hole, 8-φ counter bore depth 4
- **B-B cross section:**
  - 4-M3 depth 6
  - 4-M3 depth 6
  - 4-M3 depth 6

*1 Distance between the mechanical stopper and the stroke starting position.

*2 Indicates the inner block length when calculating the available stroke range.

The length in model KR-B (with two long-type inner blocks) is 126 mm.

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**Notes:**

- *Indicates a value when two inner blocks are in close contact with each other.
Quick Ship Linear Actuators

<table>
<thead>
<tr>
<th>Type A</th>
<th>Type B*</th>
</tr>
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<tbody>
<tr>
<td>50(61.5)</td>
<td>—</td>
</tr>
<tr>
<td>100(110.5)</td>
<td>—</td>
</tr>
<tr>
<td>200(211.5)</td>
<td>125(135.5)</td>
</tr>
<tr>
<td>300(311.5)</td>
<td>225(235.5)</td>
</tr>
<tr>
<td>400(411.5)</td>
<td>325(335.5)</td>
</tr>
<tr>
<td>500(511.5)</td>
<td>425(435.5)</td>
</tr>
<tr>
<td>600(611.5)</td>
<td>525(535.5)</td>
</tr>
</tbody>
</table>

**STROKE (mm)**

**OVERALL LENGTH**

**OUTER RAIL LENGTH**

**INNER RAIL LENGTH**

**OVERALL MAIN UNIT MASS (kg)**

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*1 Distance between the mechanical stopper and the stroke starting position.

*2 Indicates the inner block length when calculating the available stroke range.

The length in model KR-B (with two long-type inner blocks) is 148 mm.

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*Indicates a value when two inner blocks are in close contact with each other.

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Refer to pages 3-4 to determine KR part no.
Quick Ship Linear Actuators

**STROKE (mm)** (STROKE BTWN MECHANICAL STOPPERS)  |  **OVERALL LENGTH L (mm)**  |  **OUTER RAIL LENGTH (mm)**  |  **n**  |  **OVERALL MAIN UNIT MASS (kg)**  
--- | --- | --- | --- | ---
190(208) | 80(98) | 440.5 | 340 | 3 | 7.7 | 8.3
290(308) | 180(198) | 540.5 | 440 | 4 | 9 | 10.2
390(408) | 280(298) | 640.5 | 540 | 5 | 10.3 | 11.5
490(508) | 380(398) | 740.5 | 640 | 6 | 11.6 | 12.8
590(608) | 480(498) | 840.5 | 740 | 7 | 12.8 | 14
690(708) | 580(598) | 940.5 | 840 | 8 | 14.1 | 15.3
790(808) | 680(698) | 1040.5 | 940 | 9 | 15.3 | 16.5

*1 Distance between the mechanical stopper and the stroke starting position.

*2 Indicates the inner block length when calculating the available stroke range.

*Indicates a value when two inner blocks are in close contact with each other.

**STROKE (mm)** (STROKE BTWN MECHANICAL STOPPERS)  |  **OVERALL LENGTH L (mm)**  |  **OUTER RAIL LENGTH (mm)**  |  **n**  |  **OVERALL MAIN UNIT MASS (kg)**  
--- | --- | --- | --- | ---
190(208) | 80(98) | 440.5 | 340 | 3 | 7.7 | 8.3
290(308) | 180(198) | 540.5 | 440 | 4 | 9 | 10.2
390(408) | 280(298) | 640.5 | 540 | 5 | 10.3 | 11.5
490(508) | 380(398) | 740.5 | 640 | 6 | 11.6 | 12.8
590(608) | 480(498) | 840.5 | 740 | 7 | 12.8 | 14
690(708) | 580(598) | 940.5 | 840 | 8 | 14.1 | 15.3
790(808) | 680(698) | 1040.5 | 940 | 9 | 15.3 | 16.5

*Indicates a value when two inner blocks are in close contact with each other.

Note - It must be noted that the cover-mounting bolt is 0.2mm higher than the top face of the sub table.

REFER TO PAGES 3-4 TO DETERMINE KR PART NO.
### Intermediate Flanges

Intermediate flanges are also in stock for varieties of motors. THK's intermediate flanges are provided with surface coating that provides excellent corrosion resistance. Refer to the corresponding chart to determine Part No. and Product Code.

**Intermediate Flange**

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<thead>
<tr>
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<th>SYMBOL</th>
<th>THK PART NO.</th>
<th>PRODUCT CODE</th>
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### Motor Type

<table>
<thead>
<tr>
<th>MOTOR TYPE</th>
<th>WATTAGE (W)</th>
<th>PEAK TORQUE (Nm)</th>
<th>FLANGE SIZE (mm)</th>
<th>MAX INPUT TORQUE [Nm]</th>
<th>0.207</th>
<th>0.622</th>
<th>1.244</th>
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<tr>
<td>MPL-A/B 1510V</td>
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<td>MPL-A/B 1520U</td>
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<td>55</td>
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<td>MPL-A/B 220T</td>
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<td>TLY/TLY-110 (AA, METRIC)</td>
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<td>Q33</td>
<td>Q46</td>
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<td>TLY/TLY-220 (AA, METRIC)</td>
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<td>60</td>
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<td>V46</td>
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<td>X26B</td>
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<td>X46C</td>
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<td>VLP-A/VL033</td>
<td>440</td>
<td>4.1</td>
<td>55</td>
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<td>X46C</td>
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<td>VLP-A/VL075</td>
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<td>70</td>
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### Special Motor Types

- **AKM1AN**
  - AKM11B: 140 Nm (Q20, Q26, Q33, Q46)
  - AKM12C: 230 Nm (Q20, Q26, Q33, Q46)
  - AKM13C: 300 Nm (Q20, Q26, Q33, Q46)
  - AKM21C: 320 Nm (Q20, Q26, Q33, Q46)
  - AKM22C: 290 Nm (Q20, Q26, Q33, Q46)
  - AKM23D: 530 Nm (Q20, Q26, Q33, Q46)
  - AKM24D: 540 Nm (Q20, Q26, Q33, Q46)
  - AKM31C: 290 Nm (Q20, Q26, Q33, Q46)
  - AKM32H: 1060 Nm (Q20, Q26, Q33, Q46)
  - AKM33E: 550 Nm (Q20, Q26, Q33, Q46)

- **OMNUC G5**
  - RM8M-K05030: 50 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K10030: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K20030: 200 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K40030: 400 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K05050: 50 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K10050: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G01030: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G02030: 200 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G40030: 400 Nm (Q20, Q26, Q33, Q46)

- **OMNUC G**
  - RM8M-K05030: 50 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K10030: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K20030: 200 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K40030: 400 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K05050: 50 Nm (Q20, Q26, Q33, Q46)
  - RM8M-K10050: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G01030: 100 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G02030: 200 Nm (Q20, Q26, Q33, Q46)
  - RM8M-G40030: 400 Nm (Q20, Q26, Q33, Q46)

### Motor Size

- **NEMA 11**: 28.2 (S20, S26, S33, S46)
- **NEMA 14**: 35.3 (S20, S26, S33, S46)
- **NEMA 17**: 42 (R20, R26, R33, R46)
- **NEMA 23**: 57.15 (X20A, X20A, T3S, X46A)
- **NEMA 34**: 86.1 (X30B, X46B)

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*May Require Torque Limit*
### Quick Ship Linear Actuators

**More KR Options:**
Contact THK or refer to KR Catalog No. 209E for details

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<th>MAX INPUT TORQUE [Nm]</th>
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</table>

- May Require Torque Limit
- Contact THK

### KR Families:

- **SKR:** Caged Ball Type
- **KRF:** Full Enclosed Type
- **KR:** Full Enclosed + High Speed
- **KSF:** Full Enclosed + High Speed
- **CKRF/CKSF:** Clean Room Type of KRF/KSF
**ELECTRIC ACTUATORS**

**Stepper Motor & Drive**

**COMPACT & LIGHTWEIGHT**
Simple structure with aluminum frame

**LONG-TERM MAINTENANCE FREE**
Utilization of Caged Ball LM Guides and QZ Lubricators

**COST EFFECTIVE**
Less components necessary

**FULLY ENCLOSED**
Protection from outside elements with Strip seal (ES) and LaCS seal (EC)

**Application Examples:**
Stocked blank controller can be configured for a specific actuator and shipped quickly.

**ES SLIDER TYPE**

- Stepping Motor (Inside Cover)
- Strip Seal
- Table
- Housing A
- Slide Cover

**EC CYLINDER TYPE**

- Stepping Motor (Inside Cover)
- Grease Lid
- Base
- Rod
- Housing A
- Housing B

**Precautions on using ES/EC actuator:** Please refer to 660E Catalog.
Inventory is subject to availability. Product spec is subject to change without notice.
Quick Ship Linear Actuators

**ES SLIDER TYPE**
- Caged-Ball LM Guide
- Ball Screw with QZ Lubricator
- Strip Seal

**EC CYLINDER TYPE**
- Ball Screw with QZ Lubricator
- LaCS Seal (Laminated Contact Scraper)

**TSC STEPPER DRIVER CONTROLLER**
For Single Axis / Position Type

- Higher PLC, etc.
- An I/O connector is provided with TSC
- TDO Digital Operator
  - (Available in English and Japanese)
- D-STEP PC Setup Tool
  - The PC Setup tool can be freely downloaded after logging into the technical support website.
  - (Available in Japanese, English and Simplified Chinese)

Note 1) Power supply to be provided by customer. A power supply connector is provided with TSC.
Note 2) To use a 10m actuator cable, please insert noise filter.

Wiring provided by customer
Separate order required
Wiring provided with product

External 24V DC Power Supply

Actuator!
## DETERMINE ES-EC QUICK-SHIP PART NUMBER

### Step 1-3: Determine Model Number, Ball Screw Lead, Stroke and Motor Spec

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BALL SCREW LEAD (mm)</th>
<th>STROKE (mm)</th>
<th>MOTOR TYPE</th>
<th>MAXIMUM LOAD CAPACITY *1 *2 (kg)</th>
<th>MAXIMUM SPEED FOR EACH STROKE *1 *2 (mm/s)</th>
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<td>HORIZONTAL MOUNT</td>
<td>VERTICAL MOUNT</td>
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<td>Stepper Motor 35</td>
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<td>50 - 600</td>
<td>Stepper Motor 35</td>
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<td>2</td>
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*1 This specification shows the value when combining with stepper driver controller TSC.
*2 Load capacity and maximum speed vary depending on use conditions. For details, see "Speed and Load Capacity".

### Step 4: HOME POSITION, CABLE LENGTH, SAMPLE PART NUMBER

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<thead>
<tr>
<th>HOME POSITION</th>
<th>CABLE LENGTH</th>
<th>SAMPLE PART NUMBER</th>
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<td>D00 = Standard, Motor Slide</td>
<td>S3 = Standard, 3m</td>
<td>ES4-12-0300B-TS/28P-D00-S3</td>
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</table>

### Notes
- *6mm = 06
- **100 mm = 0100
- B = Standard
- TS = Stepper Driver Controller TSC
- 28P = ES3
- 35P = ES4/EC3
- 42P = ES5/ES6/EC4
- D00 = Standard, Motor Slide
- S3 = Standard, 3m
### Basic Specifications:

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<th>CONTROL DEVICE TYPE</th>
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<td>MOTOR</td>
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<td>BALL SCREW LEAD (mm)</td>
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<td>POSITIONING REPEATABILITY (mm)</td>
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<td>LOST MOTION (mm)</td>
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<td>STATIC PERMISSIBLE MOMENT *2 (N·m)</td>
<td>Mx: 6.0, My: 7.5, Mz: 5.9</td>
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</table>

*1 Service life is based on below conditions. Conditions: Horizontal or vertical, under the maximum load capacity, overhang length A=6mm, B and C=0mm, 0.3G for horizontal, 0.2G for vertical, stroke 50mm.

*2 Maximum permissible moment when unit is stationary. Applied point of moment load for MA and MC are the top face of the table, and that for MB is the center of the table.

### Speed & Load Capacity Comparison:

#### Horizontal

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<tr>
<th>Speed [mm/s]</th>
<th>Load capacity [kg]</th>
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<td>300</td>
<td>0.6</td>
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</table>

#### Vertical

<table>
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<th>Load capacity [kg]</th>
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<td>0.0</td>
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<tr>
<td>200</td>
<td>0.4</td>
</tr>
<tr>
<td>300</td>
<td>0.6</td>
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</table>

### Dimensions:

**Permissible Overhang Length**:

![Diagram showing permissible overhang lengths](image)

**Static Permissible Moment**:

![Diagram showing static permissible moment](image)

### Speed & Load Capacity Comparison:

- **Horizontal Use**
  - Load 6: 1.1 (1.5)
  - Load 7: 1.3 (1.5)

- **Vertical Use**
  - Load 6: 1.1 (1.4)
  - Load 7: 1.0 (1.4)

### Dimensions:

- **STROKE (STROKE BTWN MECHANICAL STOPPERS)**: 50 (56), 100 (106), 150 (156), 200 (206), 250 (256), 300 (306)
- **BALL SCREW LEAD (mm)**: 6
- **MAX. SPEED *1 (mm/s)**: 4.0
- **BALL SCREW LENGTH (mm)**: 300

**WEIGHT *3 (kg)**:

- 1.1 (1.3)
- 1.4 (1.4)
- 1.1 (1.4)
- 1.1 (1.5)
- 1.3 (1.5)
- 1.3 (1.6)

*1 Load capacity and maximum speed vary dependent on usage conditions. For details, see “Speed & Load Capacity”.

*2 Dependent on permissible rotational speed of ball screw.

*3 Values when a brake is installed are shown in parentheses.
### Basic Specifications:

<table>
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<tr>
<th>CONTROL DEVICE TYPE</th>
<th>TSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOR</td>
<td>≤35</td>
</tr>
<tr>
<td>BALL SCREW LEAD (mm)</td>
<td>6  12</td>
</tr>
<tr>
<td>MAX. LOAD WEIGHT</td>
<td>0.3G 9 7.5</td>
</tr>
<tr>
<td>HORIZONTAL ACCELERATION/DECELERATION RATES</td>
<td>0.2G 4 1.5</td>
</tr>
<tr>
<td>VERTICAL MOUNT</td>
<td>0.1</td>
</tr>
<tr>
<td>RUNNING LIFE * (km)</td>
<td>5000</td>
</tr>
<tr>
<td>POSITIONING REPEATABILITY (mm)</td>
<td>≤0.020</td>
</tr>
<tr>
<td>LOST MOTION (mm)</td>
<td>0.1</td>
</tr>
<tr>
<td>STATIC PERMISSIBLE MOMENT * (N·m)</td>
<td>Ma: 9.3, Mc: 13.5, Mc: 17.7</td>
</tr>
</tbody>
</table>

*1 Service life is based on below conditions. Conditions: Horizontal or vertical, under the maximum load capacity, B and C=0mm, 0.3G for horizontal, 0.2G for vertical, stroke 50mm.

*2 Maximum permissible moment when unit is stationary. Applied point of moment load for MA and MC are the top face of the table, and that for MB is the center of the table.

### Permissible Overhang Length*:

- **Horizontal Use**
  - Load 6
  - Lead 6
  - Load 12
  - Lead 12

- **Vertical Use**
  - Load 6
  - Lead 6
  - Load 12
  - Lead 12

### Speed & Load Capacity Comparison:

**Horizontal**

- Load 6
- Lead 6
- Load 12
- Lead 12

**Vertical**

- Load 6
- Lead 6
- Load 12
- Lead 12

### Dimensions:

- Stroke in **Blue**: Stock Available for 6mm ball screw lead
- Stroke in **Red**: Stock Available for 12mm ball screw lead

### Additional Information:

- **STATIC PERMISSIBLE MOMENT**:

- **Maximum permissible moment when unit is stationary**:
  - Applied point of moment load for MA and MC are the top face of the table, and that for MB is the center of the table.

- **Service life** is based on below conditions. Conditions: Horizontal or vertical, under the maximum load capacity, B and C=0mm, 0.3G for horizontal, 0.2G for vertical, stroke 50mm.

- **Permissible Overhang Length**:
  - **Horizontal**
  - **Vertical**

- **Static Permissible Moment**:

- **Load capacity and maximum speed vary dependent on usage conditions.** For details, see “Speed & Load Capacity”.

- **Dependent on permissible rotational speed of ball screw.**

- **Values when a brake is installed are shown in parentheses.**
ES5 SLIDER TYPE  
TSC SPECIFICATION  
DIRECT MOTOR COUPLING

**Basic Specifications:**

<table>
<thead>
<tr>
<th>Control Device Type</th>
<th>TSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>≤42</td>
</tr>
</tbody>
</table>

| Ball Screw Lead (mm) | 6  | 12 |

<table>
<thead>
<tr>
<th>Max. Load Weight</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accleration</td>
<td>0.3G</td>
</tr>
<tr>
<td>Deceleration</td>
<td>0.2G</td>
</tr>
<tr>
<td>Horizontal</td>
<td>10</td>
</tr>
<tr>
<td>Vertical</td>
<td>5</td>
</tr>
<tr>
<td>Mount</td>
<td>6</td>
</tr>
</tbody>
</table>

| Running Life (km)    | 5000 |

<table>
<thead>
<tr>
<th>Positioning Repeatability (mm)</th>
<th>≤0.020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Motion (mm)</td>
<td>0.1</td>
</tr>
</tbody>
</table>

| Static Permissible Moment (N-m) | Ma: 10.5, Mc: 22, M: 22.1 |

1. Service life is based on below conditions: Horizontal or vertical, under the maximum load capacity, overhang length A=6mm, B and C=0mm, 0.3G for horizontal, 0.2G for vertical, Stroke 50mm.

2. Maximum permissible moment when unit is stationary. Applied point of moment load for MA and MC are the top face of the table, and that for MB is the center of the table.

**Permissible Overhang Length:**

* Distance from the center of the top face of the table to the load center of gravity position under the following conditions: 5,000km running life, single-direction load, 0.3G horizontal, 0.2G vertical, 150mm stroke.

**Speed & Load Capacity Comparison:**

**Dimensions:**

* Stroke to the mechanical stopper when the reverse motor side is in home position.

### Specifications:

**Control Device Type**

- **Motor:** ≤42

**Ball Screw Lead (mm):**

- 6
- 12

**Max. Load Weight:**

- **Accleration:** 0.3G
- **Deceleration:** 0.2G
- **Horizontal Mount:** 10
- **Vertical Mount:** 5
- **Lost Motion (mm):** 6

**Running Life (km):** 5000

**Positioning Repeatability (mm):** ≤0.020

**Lost Motion (mm):** 0.1

**Static Permissible Moment (N-m):** Ma: 10.5, Mc: 22, M: 22.1

1. Service life is based on below conditions: Horizontal or vertical, under the maximum load capacity, overhang length A=6mm, B and C=0mm, 0.3G for horizontal, 0.2G for vertical, Stroke 50mm.

2. Maximum permissible moment when unit is stationary. Applied point of moment load for MA and MC are the top face of the table, and that for MB is the center of the table.

**Permissible Overhang Length:**

- **Horizontal Use**
- **Wall Use**
- **Vertical Use**

**Ball Screw Lead (mm):**

- 6
- 12

**Load Capacity (kg):**

- 400
- 70
- 160
- 100
- 50

**Load in (mm):**

- 90
- 270
- 40
- 260
- 70

**Load out (mm):**

- 200
- 160
- 90
- 400
- 200

**Speed & Load Capacity Comparison:**

- **Horizontal Use**
- **Vertical Use**

**Dimensions:**

- **Stroke (mm):**
  - 12mm ball screw leads: 50 (±5), 140 (±5), 250 (±5), 380 (±5), 500 (±5)
  - 6mm ball screw leads: 50 (±5), 140 (±5), 250 (±5), 380 (±5), 500 (±5)

**Max. Speed (rpm):**

- **Ball Screw Lead 12mm:** 300
- **Ball Screw Lead 6mm:** 500

**Dimensions (mm):**

- **AL:**
  - 170.5
  - 220.5
  - 270.5
  - 320.5
  - 370.5
  - 420.5
  - 470.5
  - 520.5
  - 570.5
  - 620.5

- **L:**
  - 90
  - 140
  - 190
  - 240
  - 290
  - 340
  - 390
  - 440
  - 490
  - 540

- **L1:**
  - 100
  - 150
  - 200
  - 250
  - 300
  - 350
  - 400
  - 450
  - 500
  - 550

- **C:**
  - 0
  - 100
  - 200
  - 300
  - 400
  - 500

**Mounting Hole:**

- **N:**
  - 2
  - 3
  - 4
  - 5
  - 6

**Weight (kg):**

- **AL:** 2.1 (2.6)
- **L:** 2.6 (3.6)
- **L1:** 3.2 (3.7)
- **C:** 3.3 (3.8)

1. Load capacity and maximum speed vary dependent on usage conditions. For details, see “Speed & Load Capacity”.

2. Dependent on permissible rotational speed of ball screw.

3. Values when a brake is installed are shown in parentheses.
### Basic Specifications:

- **CONTROL DEVICE TYPE**: TSC
- **MOTOR**: AC2
- **BALL SCREW LEAD (mm)**: 6, 12
- **MAX. LOAD WEIGHT**
  - **ACCELERATION/DECELERATION RATE**: 0.3G for horizontal, 0.2G for vertical, MOUNT: 6, 2
- **RUNNING LIFE** (km): 5000
- **POSITIONING REPEATABILITY (mm)**: ±0.020
- **LOST MOTION (mm)**: 0.1
- **STATIC PERMISSIBLE MOMENT** (N-m)
  - **M1**: 10.5, M2: 22, M3: 22.1

### Speed & Load Capacity Comparison:

- **Load capacity [kg]**: 0 - 1200
- **Speed [mm/s]**: 0 - 600

### Dimensions:

- **STROKE (mm)**: 200 - 600
- **BALL SCREW LEAD**: 6mm, 12mm
- **MOUNTING HOLE**: 2, 3
- **WEIGHT** (kg):
  - **Load 6**: 2.4 (2.8), 2.6 (3.0)
  - **Load 12**: 2.7 (3.2), 2.8 (3.3)

*1 Distance from the center of the top face of the table to the load center of gravity position under the following conditions: 5.00m running life, single-direction load, 0.3G horizontal, 0.2G vertical, 150mm stroke.

*2 Dependent on permissible rotational speed of ball screw.

*3 Stroke in Blue: Stock Available for 6mm ball screw lead

*4 Stroke in Red: Stock Available for 12mm ball screw lead

---

**Note:**
- Load capacity and maximum speed vary dependent on usage conditions. For details, see “Speed & Load Capacity”.
- Values when a brake is installed are shown in parentheses.
**Basic Specifications:**

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<tbody>
<tr>
<td>MOTOR</td>
<td>≤35</td>
</tr>
<tr>
<td>BALL SCREW LEAD (mm)</td>
<td>6, 12</td>
</tr>
<tr>
<td>MAXIMUM LOAD WEIGHT (^*) (kg)</td>
<td>5, 10</td>
</tr>
<tr>
<td>ACCELERATION RATE</td>
<td>HORIZONTAL</td>
</tr>
<tr>
<td>VERTICAL</td>
<td>0.2G</td>
</tr>
<tr>
<td>RUNNING LIFE (^*) (km)</td>
<td>5000</td>
</tr>
<tr>
<td>POSITIONING REPEATABILITY (mm)</td>
<td>≤0.020</td>
</tr>
<tr>
<td>LOST MOTION (mm)</td>
<td>0.1</td>
</tr>
<tr>
<td>ROD NON-ROTATIONAL ACCURACY (°)</td>
<td>≤±1.5</td>
</tr>
</tbody>
</table>

\(^*\) Only axial loads permissible. Only an axial load may be applied to rod via LM Guide. LM Guide sliding resistance must be considered when making selection.

\(^*\) The following conditions apply to running life.

Conditions: Under the maximum load capacity (with LM guide), maximum speed, 0.3G for horizontal, 0.2G for vertical.

**Speed & Load Capacity Comparison:**

- **Horizontal**
  - Load 6: [Graph]
  - Speed: [Graph]

- **Vertical**
  - Load 6: [Graph]
  - Speed: [Graph]

**Dimensions:**

- **Stroke** (mm) (STROKE BETWEEN MECHANICAL STOPPERS)
  - 50 (0) 100 (10) 150 (150) 200 (200)

**MAXIMUM SPEED \(^*\) \(^*\) (mm/s) BALL SCREW LEAD: 6mm 187

**DIMENSIONS (mm)**

- AL \(^*\) \(^*\)
- L\(_1\) 135 185 235 285
- C 50 100 150 200
- MOUNTING HOLE COUNT n 3 4 5 6

**WEIGHT \(^*\) (kg)**

- 1.4 (1.6) 1.8 (2.0) 1.8 (2.2) 2 (2.4)

\(^*\) Load capacity and maximum speed vary dependent on usage conditions. For details, see "Speed & Load Capacity".

\(^*\) Dependent on permissible rotational speed of ball screw.

\(^*\) Values when a brake is installed are shown in parentheses.
**Basic Specifications:**

<table>
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<tbody>
<tr>
<td>MOTOR</td>
<td>i&lt;42</td>
</tr>
<tr>
<td>BALL SCREW LEAD (mm)</td>
<td>6 12</td>
</tr>
<tr>
<td>MAXIMUM LOAD WEIGHT (kg)</td>
<td>3.9</td>
</tr>
<tr>
<td>ACCELERATION &amp; DECELERATION RATE</td>
<td>0.3G 40 25</td>
</tr>
<tr>
<td>RUNNING LIFE (km)</td>
<td>1000</td>
</tr>
<tr>
<td>POSITIONING REPEATABILITY (mm)</td>
<td>0.02</td>
</tr>
<tr>
<td>LOST MOTION (mm)</td>
<td>0.1</td>
</tr>
<tr>
<td>ROD NON-ROTATIONAL ACCURACY (°)</td>
<td>±1.5</td>
</tr>
</tbody>
</table>

* Only an axial load is permissible.

Only an axial load may be applied to rod via LM Guide. LM Guide sliding resistance must be considered when making selection.

* The following conditions apply to running life.

Conditions: Under the maximum load capacity (with LM guide), maximum speed, 0.3G for horizontal, 0.2G for vertical.

**Speed & Load Capacity Comparison:**

<table>
<thead>
<tr>
<th>Speed &amp; Load Capacity Comparison</th>
<th>Lead 6</th>
<th>Lead 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load capacity (kg)</td>
<td>Load capacity (kg)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>200</td>
<td>400</td>
</tr>
</tbody>
</table>

**Dimensions:**

- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole
- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole

**STROKE (mm)**

- Stroke to the mechanical stopper when the motor side is in home position.
- Stroke to the mechanical stopper when the reverse motor side is in home position.

**MAXIMUM LOAD WEIGHT (kg)**

- ø22 Ball screw grease hole: 4.5
- ø8 Ball screw grease hole: 2.5
- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole
- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole

**WEIGHT (kg)**

- ø22 Ball screw grease hole: 4.5
- ø8 Ball screw grease hole: 2.5
- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole
- Width across flat: 10
- Orientation not determined by base surface.
- M10 x 1.25 Rod diameter: ø22
- ø8 Ball screw grease hole

*1 Load capacity and maximum speed vary dependent on usage conditions. For details, see “Speed & Load Capacity”.

*2 Dependent on permissible rotational speed of ball screw.

*3 Values when a brake is installed are shown in parentheses.

*4 The dimension of the T slot corresponds to L₁.
# Quick Ship Linear Actuators

## Basic Specifications:

### CONTROL
- **Input Power Supply:** 24V DC ±10% (Up to 2.5A)
- **Control Axis:** Single shaft
- **Motor Type:** Stepper Motor (-28mm, -35mm, -42mm)
- **Control Method:** Feedback control (Semi-closed loop)
- **Position Detection Method:** Incremental
- **Acceleration/Deceleration Method:** Trapezoid acceleration

### PROGRAM
- **Function Mode:**
  - 64-position
  - 256-position
  - 512-position
  - 7 points
  - 3 points
- **Step Data Count:** 64 points, 64 points, 256 points, 512 points, 7 points, 3 points
- **Data Input/Output Method:**
  - PC setup tool D-STEP or Digital operator TDO
  - Dedicated input/output

### INPUT/OUTPUT
- **Input Point:**
  - 16 points (Start, Return to home position, Pause, Reset, Servo ON, Specify step number, etc.)
- **Output Point:**
  - 16 points (Return to home position completed, In position, Servo ready, Alarm, Battery Alarm, etc.)
- **Input/Output Power Supply:** 24V DC ±10% (This should be prepared by yourself.)

### COMMUNICATION
- **Serial Communication Connected Device Method:**
  - PC setup tool D-STEP or Digital operator TDO
- **Communication Method:** RS-485
- **Port Count:** Mini DIN x 1

### USAGE CONDITIONS
- **Usage Conditions:**
  - 0 to 40°C (No freezing) / -20 to 85°C (No freezing)
- **Operating Humidity/Storage Humidity:** 90% RH or below (No condensation)

### AMBIENT CONDITION
- **Indoor (Free from direct sunlight, corrosive gas, flammable gas, oil mist, dust, water, oil and chemicals)**

### PROTECTIVE FUNCTION
- **Overload, overvoltage, excessive position deviation, software limit over error, etc.**

### ACCESSORIES
- Power supply connector x 1; I/O connector x 1

### OPTIONS (SOLD SEPARATELY)
- Digital operator TDO (Cable length 5m; I/O cable 3m, 5m, 7m and 10m; PC Communication cable (Mini DIN - USB))

### OUTER DIMENSIONS
- 32 mm (W) x 192.2mm (H) x 77.6mm (D)

### WEIGHT
- 300g or less

---

### System Configuration:

**TSC needs either TDO or D-STEP for setting**

**TDO**
- Digital Operator
  - Available in Japanese or English
  - The PC Setup tool can be freely downloaded after logging into the technical support website.

**D-STEP**
- PC Setup Tool
  - Available in Japanese, English and Simplified Chinese

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### Dimensional Drawing of Controller:

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### Determine TSC Part Number

**Model**
- TSC

**Current**
- 015

**Design Symbol**
- B

**Type**
- MOD

**Combine Actuator**
- ES6

**Combined Actuator Ball Screw Lead**
- 06

**Home Position**
- D00

**Sample Part Number**
- TSC-015B-MOD-ES6-06-D00

---

### Note 1)
- Power supply to be provided by customer. A power supply connector is provided with TSC.

### Note 2)
- To use a 10m actuator cable, please insert noise filter.
**Features:**
Supports multi-functional TSC/TLC/THC with user-friendly interface.

**Simple Operation:**
Operations and settings of TSC, TLC and THC are possible using a PC.
Equipped with functions useful for maintenance, such as backing up data or logging operating states.

**Functions:**
Checking, editing, backing up or offline-editing of step data.
Checking, editing, backing up or offline-editing of parameters.
Operations of actuator (Return to home position, Jog operation, Inching operation, Program execution, Servo ON/OFF).
Monitor (I/O, Current position, Position command, Current command) - Logging (Speed and current waveform display).
Alarm (History display, Clear history, Alarm reset) - Display language (Japanese/English/Simplified Chinese).
D-STEP can be freely downloaded from the THK technical support website (http://www.thk.com/us/dstep).
TLC/THC/TNU is supported with Version 1.10 or later.

**Cable:**
I/O cable: CBL-CON-IO-03 (optional)
Cables are shipped with the discrete wire side terminals unprocessed.
Cables are used for TSC/TLC/THC.
For longer cables, contact THK.

**PC SETUP TOOL**
- Supports multi-functional TSC/TLC/THC with user-friendly interface.

**More Options:**
Contact THK or refer to Actuator Catalog No. 660E for details

Motor Wrap
Servo Motor
Sensors: ES Option
Linear Bushings: EC Option
Cylinder Base: EC Option
Flange: EC Option
Other THK Actuators:

**GL-N:** Ball Screw & Belt Drive Selectable

**TY:** Optimal for Long Stroke

**ET:** Compact Rotary Table

**US/USW:** Universal Series

**PC/PCT:** Press Series

**GLM:** Linear Motor Series