CLOSED LOOP STEPPING MOTOR SINGLE-AXIS ROBOTS

Excellent characteristics of both stepping motor and servomotor were combined. Stepping motor single-axis robots "TRANSERVO" series breaking through existing conventions.

**Robot positioner TS-S2/TS-SH**

This robot positioner is specialized for the I/O point trace input. The positioning or pushing operation can be performed using simple operation, only by specifying a point number from the host control unit and inputting the START signal.

**Applicable models:**

- SS
- SG
- SR
- STH
- RF
- BD

Note. SG07 is only applicable to TS-SH.

**Robot driver TS-SD**

This robot driver omits the operation with robot languages and is dedicated to the pulse train input. This driver can be made applicable to the open collector method or line driver method using the parameter setting and signal wiring. So, you can match the robot driver to the host unit to be used.

**Applicable models:**

- SS
- SR
- STH
- RF
- BD

Note. Except for STH vertical specifications and RF sensor specifications.
Newly developed vector control method provides functions and performance similar to servomotors.

### SS type (Slider type)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>SS04-S</td>
<td>W49 × H59</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>600</td>
<td>50 to 400</td>
</tr>
<tr>
<td></td>
<td>SS04-R (L)</td>
<td>W49 × H59</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>300</td>
<td>50 to 400</td>
</tr>
<tr>
<td>Space-saving model</td>
<td>SS05-S</td>
<td>W55 × H56</td>
<td>20</td>
<td>4</td>
<td>-</td>
<td>1000</td>
<td>50 to 800</td>
</tr>
<tr>
<td></td>
<td>SS05-R (L)</td>
<td>W55 × H56</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>800</td>
<td>50 to 800</td>
</tr>
<tr>
<td></td>
<td>SS05H-S</td>
<td>W55 × H56</td>
<td>20</td>
<td>6</td>
<td>2</td>
<td>1000</td>
<td>50 to 800</td>
</tr>
<tr>
<td></td>
<td>SS05H-R (L)</td>
<td>W55 × H56</td>
<td>12</td>
<td>8</td>
<td>2</td>
<td>600 (Horizontal)</td>
<td>50 to 800</td>
</tr>
</tbody>
</table>

### SG type (Slider type)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>SG07</td>
<td>W65 × H64</td>
<td>20</td>
<td>4</td>
<td>1</td>
<td>1200</td>
<td>50 to 800</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>6</td>
<td>8</td>
<td>350</td>
<td></td>
</tr>
</tbody>
</table>

### SR type (Rod type standard)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>SR03-S</td>
<td>W48 × H56</td>
<td>12</td>
<td>10</td>
<td>4</td>
<td>500</td>
<td>50 to 200</td>
</tr>
<tr>
<td></td>
<td>SR03-R (L)</td>
<td>W48 × H56</td>
<td>6</td>
<td>20</td>
<td>8</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SR04-S</td>
<td>W48 × H58</td>
<td>12</td>
<td>25</td>
<td>5</td>
<td>500</td>
<td>50 to 300</td>
</tr>
<tr>
<td></td>
<td>SR04-R (L)</td>
<td>W48 × H58</td>
<td>6</td>
<td>40</td>
<td>12</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SR05-S</td>
<td>W56.4 × H71</td>
<td>12</td>
<td>45</td>
<td>25</td>
<td>80</td>
<td>50 to 300</td>
</tr>
<tr>
<td></td>
<td>SR05-R (L)</td>
<td>W56.4 × H71</td>
<td>6</td>
<td>60</td>
<td>20</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

### SR type (Rod type with support guide)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>SRD03-S</td>
<td>W105 × H56</td>
<td>12</td>
<td>10</td>
<td>3.5</td>
<td>500</td>
<td>50 to 200</td>
</tr>
<tr>
<td></td>
<td>SRD03-U</td>
<td>W105 × H56</td>
<td>6</td>
<td>20</td>
<td>7.5</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Space-saving model</td>
<td>SRD04-S</td>
<td>W135 × H58</td>
<td>12</td>
<td>25</td>
<td>4</td>
<td>500</td>
<td>50 to 200</td>
</tr>
<tr>
<td></td>
<td>SRD04-U</td>
<td>W135 × H58</td>
<td>6</td>
<td>40</td>
<td>11</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SRD05-S</td>
<td>W157 × H71</td>
<td>12</td>
<td>50</td>
<td>8.5</td>
<td>300</td>
<td>50 to 300</td>
</tr>
<tr>
<td></td>
<td>SRD05-U</td>
<td>W157 × H71</td>
<td>6</td>
<td>55</td>
<td>18.5</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>60</td>
<td>28.5</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1.** The size shows approximate maximum cross sectional size.
**Note 2.** The payload may vary depending on the operation speed. For details, refer to the detailed page of relevant model.
**Note 3.** The maximum speed may vary depending on the transfer weight or stroke length. For details, refer to the detailed page of relevant model.

- Allowable ambient temperature for robot installation SS/SR type: 0 to 40 °C
As the slide table type, rotary type, and belt type were added to the product lineup, the design flexibility was extended.

## STH type (Slide table type)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>STH04-S</td>
<td>W45 × H46</td>
<td>5</td>
<td>6</td>
<td>200</td>
<td>50 to 100</td>
<td>P.150</td>
</tr>
<tr>
<td></td>
<td>STH04-R (L)</td>
<td>W73 × H51</td>
<td>10</td>
<td>9</td>
<td>400</td>
<td>50 to 150</td>
<td>P.151</td>
</tr>
<tr>
<td></td>
<td>STH06</td>
<td>W61 × H65</td>
<td>8</td>
<td>9</td>
<td>150</td>
<td></td>
<td>P.152</td>
</tr>
<tr>
<td></td>
<td>STH06-R (L)</td>
<td>W106 × H70</td>
<td>16</td>
<td>6</td>
<td>400</td>
<td></td>
<td>P.153</td>
</tr>
<tr>
<td>Space-saving model</td>
<td>STH04-S</td>
<td>W45 × H46</td>
<td>5</td>
<td>6</td>
<td>200</td>
<td>50 to 100</td>
<td>P.150</td>
</tr>
<tr>
<td></td>
<td>STH04-R (L)</td>
<td>W73 × H51</td>
<td>10</td>
<td>9</td>
<td>400</td>
<td>50 to 150</td>
<td>P.151</td>
</tr>
<tr>
<td></td>
<td>STH06</td>
<td>W61 × H65</td>
<td>8</td>
<td>9</td>
<td>150</td>
<td></td>
<td>P.152</td>
</tr>
<tr>
<td></td>
<td>STH06-R (L)</td>
<td>W106 × H70</td>
<td>16</td>
<td>6</td>
<td>400</td>
<td></td>
<td>P.153</td>
</tr>
</tbody>
</table>

### Note
- Note 1: The size shows approximate maximum cross sectional size.
- Note 2: The payload may vary depending on the operation speed. For details, refer to the detailed page of relevant model.
- Note 3: The maximum speed may vary depending on the transfer weight or stroke length. For details, refer to the detailed page of relevant model.
- Note 4: STH04-R (L) with 50-stroke and brake is not supported.

### RF type (Rotary type)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Height (mm)</th>
<th>Torque type</th>
<th>Rotation torque (N • m)</th>
<th>Maximum pushing torque (N • m)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Rotation range (°)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard model</td>
<td>RF02-N</td>
<td>42 (Standard)</td>
<td>N: Standard</td>
<td>0.22</td>
<td>0.11</td>
<td>420</td>
<td>310 (RF02-N) 360 (RF02-S)</td>
<td>RF02-N: P.154 RF02-S: P.157</td>
</tr>
<tr>
<td></td>
<td>RF02-S</td>
<td>49 (High rigidity)</td>
<td>H: High torque</td>
<td>0.32</td>
<td>0.16</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High rigidity model</td>
<td>RF03-N</td>
<td>53 (Standard)</td>
<td>N: Standard</td>
<td>0.8</td>
<td>0.4</td>
<td>420</td>
<td>320 (RF03-N) 360 (RF03-S)</td>
<td>RF03-N: P.158 RF03-S: P.161</td>
</tr>
<tr>
<td></td>
<td>RF03-S</td>
<td>62 (High rigidity)</td>
<td>H: High torque</td>
<td>1.2</td>
<td>0.6</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RF04-N</td>
<td>68 (Standard)</td>
<td>N: Standard</td>
<td>6.6</td>
<td>3.3</td>
<td>420</td>
<td>320 (RF04-N) 360 (RF04-S)</td>
<td>RF04-N: P.162 RF04-S: P.165</td>
</tr>
<tr>
<td></td>
<td>RF04-S</td>
<td>78 (High rigidity)</td>
<td>H: High torque</td>
<td>10</td>
<td>5</td>
<td>280</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BD type (Belt type)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec.)</th>
<th>Stroke (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight model</td>
<td>BD04</td>
<td>W40 × H40</td>
<td>48</td>
<td>1</td>
<td>-</td>
<td>1100</td>
<td>P.166</td>
</tr>
<tr>
<td></td>
<td>BD05</td>
<td>W58 × H48</td>
<td>48</td>
<td>5</td>
<td>-</td>
<td>1400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BD07</td>
<td>W70 × H60</td>
<td>48</td>
<td>14</td>
<td>-</td>
<td>1500</td>
<td></td>
</tr>
</tbody>
</table>

Note: Allowable ambient temperature for robot installation

STH/RF/BD type: 5 to 40 °C
**POINT 1**

New control method combining the advantages of both the servomotor and stepping motor

The stepping motor provides features that its price is less expensive and hunting (minute vibration) does not occur during stopping. However, this motor has disadvantages that the positional deviation due to step-out occurs (in the open loop mode), the torque decreases greatly in the high speed area, and the power consumption is large during stopping. As YAMAHA’s TRANSERVO uses the closed loop control, this ensures complete “no step-out”. Furthermore, use of a newly developed vector control method ensures less torque decrease in the high speed area, energy saving, and low noise. The function and performance equivalent to the servomotor are achieved at a low cost even using the stepping motor.

<table>
<thead>
<tr>
<th>Servomotor</th>
<th>Stepping motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple &amp; low cost</td>
<td>Simple &amp; low cost</td>
</tr>
<tr>
<td>No vibration during stopping</td>
<td>No vibration during stopping</td>
</tr>
<tr>
<td>High-pitched operation noise</td>
<td>High-pitched operation noise</td>
</tr>
<tr>
<td>Great torque decrease in high speed area</td>
<td>Great torque decrease in high speed area</td>
</tr>
<tr>
<td>Large power consumption during stopping</td>
<td>Large power consumption during stopping</td>
</tr>
</tbody>
</table>

**TRANSERVO combines both merits.**

**Energy saving**

As the basic control is the same as the servomotor, waste power consumption is suppressed. This greatly contributes to the energy saving and CO₂ reduction.

**No hunting during stopping**

Stop mode without hunting can be set in the same manner as the general stepping motor. So, select this mode as required.

**POINT 2**

Closed loop control using excellent environment resistant resolver

A resolver with excellent reliability is used to detect the motor position in the same manner as YAMAHA’s upper model. The stable position detection can be made even in a poor environment where fine particle dusty or oil mists exist. Additionally, a high resolution of 20480 pulses per revolution is provided.

This resolver is a magnetic position detector. The resolver features a simple structure without using electronic components and optical elements, and less potential failure factors when compared to general optical encoders. The resolver has high environment resistance and low failure ratio, and is used in a wide variety of fields aiming at reliability such as automobile or aircraft industry.

**POINT 3**

High resolution (4096, 20480 pulse/rev)

Use of a high resolution makes it possible to maintain excellent controllability. Variations in speed are small and settling time during deceleration stop can be shortened.

**POINT 4**

Return-to-origin is not needed to shorten the start-up time.

New type robot positioner TS-SH applicable to the high power was newly developed. This robot positioner is applicable to the absolute position system and does not need any return-to-origin. The work can be started quickly to shorten the start-up time.
SS type (Slider type) Straight model/Space-saving model

**POINT**

4-row circular arc groove type 2-point contact guide applicable to even large moment load

A newly developed module guide is employed with a 4-row circular arc groove type 2-point contact guide built into a very compact body similar to the conventional model. This guide maintains a satisfactory rolling movement with less ball differential slip due to its structure even if a large moment load is applied or the installation surface precision is poor, and has characteristics that are difficult to malfunction, such as unusual wear.

**POINT**

Tact is shortened by high-speed movement.

As advantages of the vector control method are utilized at maximum level, the TRANSERVO maintains a constant payload even in a high-speed range. This greatly contributes to shortening of the tact time. Additionally, by combining this feature with high-lead ball screws, the TRANSERVO has achieved a maximum speed of 1 m/sec, which is faster than any single-axis servo motor.

Note. SS05-S/SS05H-S with 20 mm-lead specifications

<table>
<thead>
<tr>
<th>POINT</th>
<th>SS type (Slider type)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum payload is 46 kg. A maximum payload of 20 kg is supported even with the vertical specifications.</td>
</tr>
<tr>
<td></td>
<td>As rigid table slide and 56 motor are adopted, the payload is increased greatly. A maximum payload of 46 kg is achieved. Up to 20 kg can be transferred even with the vertical specifications.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POINT</th>
<th>Maximum speed is 1200 mm/sec.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The maximum speed is made 1.2 times faster than that of the current model SS05H. The tact-up of the equipment can be achieved.</td>
</tr>
</tbody>
</table>

**SR type (Rod type) Standard model/Model with support guide**

**POINT**

Long-term maintenance free is achieved.

A lubricator used in the ball screw and a contact scraper installed at the rod inlet and outlet provide maintenance-free operation.

Maintenance interval is greatly extended.

Normal grease lubrication on the ball screw loses a very small amount of oil as the ball screw moves. The SR type has a lubricator that supplies grease lost over long periods to greatly extend the maintenance interval and ensure near maintenance-free operation

Note. The maintenance-free period is within the running life of the robot.

**POINT**

Highly reliable resolver is used. A resolver with excellent environment resistance is used for the position detector. All models can select brake specifications.

Ball screw lubricator

A lubricator with high density fiber net impregnated with grease supplies an adequate amount of oil to appropriate locations.

Laminated type contact scraper

A dual-layer scraper removes fine foreign objects sticking to the rod to prevent them from entering the inside and troubles caused by foreign objects. Rod rattle is suppressed effectively.
**Environment-friendly lubrication system**

The lubrication system is environment-friendly as it uses a high density fiber net and supplies an adequate amount of oil to appropriate locations to eliminate waste lubrication.

**Prevention of foreign object entry**

The dual-layer scraper is in contact with the front of the rod to ensure excellent fine contaminant particle removal performance. The scraper removes fine contaminant particles sticking to the rod through multi steps to prevent them from entering the inside and troubles caused by foreign objects. Additionally, oleo-synthetic foam rubber with a self-lubricating function ensures low-friction resistance.

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**STH type (Slide table type) Straight model/Space-saving model**

**POINT**

Use of a circulation type linear guide achieves the high rigidity and high accuracy.

- Guide rail is integrated with the table.
- Table deflection amount is small.
- Use of a circulation type linear guide achieves the high rigidity and high accuracy.
- STH06 provides an allowable overhang exceeding that of FLIP-X series T9.
- Space-saving model with the motor built-into the body is also added to the product lineup.
- Suitable for precision assembly.

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**RF type (Rotary type) Standard model/High rigidity model**

**POINT**

Rotation axis model, first in TRANSERVO series

- Rotation axis model, first in TRANSERVO series
- Thin and compact
- Can be secured from the top or bottom surface.
- Hollow hole, through which the tool wiring is passed, is prepared.
- Workpiece can be attached easily.
- Motor is built-into the body to achieve the space-saving.
- Standard model or high rigidity model can be selected.

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**BD type (Belt type) Straight model**

**POINT**

Belt type applicable to long stroke

- Applicable to up to 2000 mm-stroke.
- High speed movement at a speed of up to 1500 mm/sec. can be made.
- Maximum payload 14 kg
- Main body can be installed without disassembling the robot.
- Shutter is provided as standard equipment. This prevents grease scattering or entry of foreign object.

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**Tip nozzle for grease application**

When applying the grease to the ball screw of the SR type space-saving model SR03-UB or SRD03-UB, use a grease gun with the tip bent.

<table>
<thead>
<tr>
<th>Model</th>
<th>KCU-M3861-00</th>
</tr>
</thead>
</table>

Note: YAMAHA’s recommended product. This tip nozzle can be attached to a generally available grease gun.

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**Environment-friendly lubrication system**

The lubrication system is environment-friendly as it uses a high density fiber net and supplies an adequate amount of oil to appropriate locations to eliminate waste lubrication.

**Prevention of foreign object entry**

The dual-layer scraper is in contact with the front of the rod to ensure excellent fine contaminant particle removal performance. The scraper removes fine contaminant particles sticking to the rod through multi steps to prevent them from entering the inside and troubles caused by foreign objects. Additionally, oleo-synthetic foam rubber with a self-lubricating function ensures low-friction resistance.
### TRANSERVO SPECIFICATION SHEET

#### Type: Articulated robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS04-S</td>
<td>W49 × H59</td>
<td>12</td>
<td>4</td>
<td>300</td>
</tr>
<tr>
<td>SS04-H-L</td>
<td>W55 × H56</td>
<td>12</td>
<td>8</td>
<td>600</td>
</tr>
<tr>
<td>SS09-S</td>
<td>W55 × H56</td>
<td>12</td>
<td>8</td>
<td>300</td>
</tr>
<tr>
<td>SS09-H-L</td>
<td>W55 × H56</td>
<td>12</td>
<td>8</td>
<td>1000</td>
</tr>
</tbody>
</table>

#### Type: Compact single-axis robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S07</td>
<td>W65 × H64</td>
<td>20</td>
<td>12</td>
<td>800</td>
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</tbody>
</table>

#### Type: Single-axis robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S03</td>
<td>W48 × H56.5</td>
<td>6</td>
<td>12</td>
<td>500</td>
</tr>
<tr>
<td>S04</td>
<td>W48 × H55</td>
<td>6</td>
<td>12</td>
<td>500</td>
</tr>
</tbody>
</table>

#### Type: Linear motor single-axis robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S05</td>
<td>W56.4 × H71</td>
<td>2</td>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>S06</td>
<td>W105 × H65</td>
<td>10</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Type: SCARA robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YK-X</td>
<td>Linear motor</td>
<td>14</td>
<td>2</td>
<td>250</td>
</tr>
</tbody>
</table>

#### Type: XY-X robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XY-X</td>
<td>Linear conveyor module</td>
<td>20</td>
<td>4</td>
<td>250</td>
</tr>
</tbody>
</table>

#### Type: Pick & place robots

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP-X</td>
<td>Linear conveyor module</td>
<td>20</td>
<td>4</td>
<td>300</td>
</tr>
</tbody>
</table>

#### Type: SG type (Slide type)

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG07</td>
<td>W65 × H64</td>
<td>20</td>
<td>12</td>
<td>800</td>
</tr>
</tbody>
</table>

#### Type: SR type (Rod type)

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR03-S</td>
<td>W48 × H56.5</td>
<td>6</td>
<td>12</td>
<td>500</td>
</tr>
<tr>
<td>SR04-S</td>
<td>W48 × H55</td>
<td>6</td>
<td>12</td>
<td>500</td>
</tr>
</tbody>
</table>

#### Type: SR type (Rod type with support guide)

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR05-S</td>
<td>W56.4 × H71</td>
<td>2</td>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>SR06-S</td>
<td>W105 × H65</td>
<td>10</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Type: STH type (Slide table type)

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (mm)</th>
<th>Lead (mm)</th>
<th>Maximum payload (kg)</th>
<th>Maximum speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STH04-R</td>
<td>W45 × H65</td>
<td>5</td>
<td>6</td>
<td>200</td>
</tr>
<tr>
<td>STH05-R</td>
<td>W73 × H51</td>
<td>10</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>STH06-R</td>
<td>W71 × H55</td>
<td>8</td>
<td>9</td>
<td>150</td>
</tr>
</tbody>
</table>

### SR/SRD/STH type Speed vs. payload table

#### SR03

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10 450 90</td>
<td>20 225 90</td>
<td>---</td>
</tr>
<tr>
<td>5 225 100</td>
<td>10 250 100</td>
<td>---</td>
</tr>
<tr>
<td>4 200 80</td>
<td>6 150 60</td>
<td>---</td>
</tr>
<tr>
<td>1 100</td>
<td>2 250 100</td>
<td>---</td>
</tr>
</tbody>
</table>

#### SR04

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 2</th>
<th>Load 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 320 84</td>
<td>40 200 80</td>
<td>45 30 100</td>
</tr>
<tr>
<td>20 257 87</td>
<td>30 180 80</td>
<td>40 200 80</td>
</tr>
<tr>
<td>15 200 80</td>
<td>25 250 100</td>
<td>40 200 80</td>
</tr>
<tr>
<td>10 150 60</td>
<td>20 200 60</td>
<td>30 180 80</td>
</tr>
<tr>
<td>5 100 40</td>
<td>10 150 60</td>
<td>20 200 60</td>
</tr>
</tbody>
</table>

#### SR05

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 2</th>
<th>Load 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 186 88</td>
<td>60 60 60</td>
<td>60 60 60</td>
</tr>
<tr>
<td>25 186 88</td>
<td>40 60 60</td>
<td>60 60 60</td>
</tr>
<tr>
<td>20 150 60</td>
<td>25 150 60</td>
<td>40 60 60</td>
</tr>
<tr>
<td>15 100 40</td>
<td>20 150 60</td>
<td>30 60 60</td>
</tr>
<tr>
<td>10 50 20</td>
<td>15 100 40</td>
<td>20 60 60</td>
</tr>
</tbody>
</table>

#### ST04

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>3 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>2 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>1 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>0.5 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
</tbody>
</table>

#### ST05

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>3 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>2 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>1 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>0.5 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
</tbody>
</table>

#### ST06

<table>
<thead>
<tr>
<th>Lead 12</th>
<th>Load 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>3 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>2 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>1 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
<tr>
<td>0.5 400</td>
<td>1 400 100</td>
<td>---</td>
</tr>
</tbody>
</table>

---

**Note:**

- Size shows approximate maximum cross sectional size.
- The maximum speed may vary depending on the operation speed. For details, refer to the page of relevant model.
- For details, refer to the detailed page of relevant model.
- For use in temperatures from 30°C to 50°C.

---

**Handling Precautions:**

- Fully understand the contents stated in the "TRANSERVO User’s Manual" and strictly observe the handling precautions during operation.

---

**Shake-out conditions:**

- SR/SRD type: 5°C to 40°C
- SRH/STH type: 0°C to 40°C

---

**Technical Details:**

- Detailed info page
- Detailed info page
- Detailed info page
- Detailed info page
- Detailed info page
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- Detailed info page
- Detailed info page
- Detailed info page
In the order format for the YAMAHA single-axis robots TRANSERVO series, the notation (letters/numbers) for the mechanical section is shown linked to the controller section notation.

[Example]

### Mechanical > SS05
- **Lead**: 6mm
- **Model**: Straight
- **Brake**: Yes
- **Origin position**: Standard
- **Grease**: Standard
- **Stroke**: 600mm
- **Cable length**: 1m

### Controller > TS-S2
- **Input /Output selection**: NPN

#### Ordering Method

**SS05-06SB-NN-600-1K-S2NP**

**Mechanical section**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Model</th>
<th>Brake</th>
<th>Origin position</th>
<th>Grease option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS05</td>
<td>600</td>
<td>SB</td>
<td>NN</td>
<td>R</td>
<td>3</td>
<td>1K</td>
<td>1K</td>
</tr>
<tr>
<td>SS04</td>
<td>500</td>
<td>SB</td>
<td>NN</td>
<td>R</td>
<td>3</td>
<td>1K</td>
<td>1K</td>
</tr>
<tr>
<td>SS03</td>
<td>400</td>
<td>SB</td>
<td>NN</td>
<td>R</td>
<td>3</td>
<td>1K</td>
<td>1K</td>
</tr>
<tr>
<td>SS02</td>
<td>300</td>
<td>SB</td>
<td>NN</td>
<td>R</td>
<td>3</td>
<td>1K</td>
<td>1K</td>
</tr>
<tr>
<td>SS01</td>
<td>200</td>
<td>SB</td>
<td>NN</td>
<td>R</td>
<td>3</td>
<td>1K</td>
<td>1K</td>
</tr>
</tbody>
</table>

**Controller section**

<table>
<thead>
<tr>
<th>Model</th>
<th>Return-to-origin method</th>
<th>Barring</th>
<th>Torque</th>
<th>Cable entry location</th>
<th>Rotation direction</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S2</td>
<td>CW (motor installed on left)</td>
<td>3</td>
<td>3</td>
<td>From the left</td>
<td>CW (motor installed on right)</td>
<td>3</td>
</tr>
<tr>
<td>TS-S1</td>
<td>CW (motor installed on right)</td>
<td>3</td>
<td>3</td>
<td>From the left</td>
<td>CW (motor installed on left)</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Rod type: Bracket plates

**SR03/SRD03 bracket plates**

- **Feet (horizontal mount)**: KCU-M223F-00
- **Flange (vertical mount)**: KCU-M224F-00

**SR04/SRD04 bracket plates**

- **Feet (horizontal mount)**: KCV-M223F-00
- **Flange (vertical mount)**: KCV-M224F-00

**SR05/SRD05 bracket plates**

- **Feet (horizontal mount)**: KCW-M223F-00
- **Flange (vertical mount)**: KCW-M224F-00

#### Rod type: Grease gun nozzle tube for space-saving models

When greasing the ball screw in the SR03-UB or SR03-UB (motor installed on top / with brake), use a grease gun with a bent nozzle tube as shown below.

**Grease gun nozzle tube (YAMAHA recommended nozzle tube)**

- **Model**: KCU-M3861-00

* Comes with 12 mounting nuts for feet.
* Comes with 8 mounting nuts for feet.

#### Rod type: Running life distance to life time conversion example

This is an example of life time converted from the running life distance listed on each model page for the SR type.

<table>
<thead>
<tr>
<th>Model</th>
<th>SR04-02SB</th>
<th>Vertical mount</th>
<th>25 kg payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life distance</td>
<td>1000 km</td>
<td>Life time : Approx. 3 years</td>
<td></td>
</tr>
<tr>
<td>Operating conditions</td>
<td>16 hours per day</td>
<td>Work days : 240 days per year</td>
<td></td>
</tr>
</tbody>
</table>

Note. Make sure that the rod is not subjected to a radical load.
**Ordering method**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead screw</th>
<th>Motor installed</th>
<th>Stroke</th>
<th>Grease option</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS04-S</td>
<td>Single-axis model</td>
<td>Left (motor side)</td>
<td>120+/-2</td>
<td>Standard grease</td>
<td>250 (mm)</td>
</tr>
<tr>
<td>SS04-R</td>
<td>Single-axis model</td>
<td>Right (motor side)</td>
<td>120+/-2</td>
<td>Standard grease</td>
<td>250 (mm)</td>
</tr>
</tbody>
</table>

**Basic specifications**

- **Motor**: Step motor
- **Resolution (Pulse/rotation)**: 20480
- **Repeatability (mm)**: 0.02
- **Deceleration mechanism**: Ball screw φ8 (Class C10)
- **Maximum motor torque (N.m)**: 2.7
- **Maximum speed (mm/sec)**: 600 / 300 / 100
- **Maximum lead (mm)**: 12 / 6 / 2
- **Overall length (mm)**: 216 / 161 / 149
- **Maximum outside dimension of body (mm)**: 549 x 89

**Allowable overhang**

- **Horizontal installation** (mm):
  - 1kg: 807 x 218 x 292
  - 2kg: 667 x 107 x 115
  - 3kg: 556 x 76 x 112
  - 4kg: 567 x 56 x 84
  - 5kg: 899 x 61 x 92
  - 6kg: 843 x 60

- **Vertical installation** (mm):
  - 1kg: 274 x 204 x 770
  - 2kg: 133 x 83 x 611
  - 3kg: 149 x 102 x 656
  - 4kg: 63 x 43 x 507
  - 5kg: 72 x 48 x 828
  - 6kg: 39 x 29

**Static loading moment**

- **Horizontal installation** (mm):
  - 1kg: 207.5 (with brake)
  - 2kg: 137.5
  - 3kg: 107
  - 4kg: 118
  - 5kg: 118
  - 6kg: 118

- **Vertical installation** (mm):
  - 1kg: 207.5 (with brake)
  - 2kg: 137.5
  - 3kg: 107
  - 4kg: 118
  - 5kg: 118
  - 6kg: 118

**Controller**

- **Operation method**:
  - TS-S2: I/O point trace / Remote command
  - TS-SH: Remote command
  - TS-SD: Pulse train control

**SS04 Straight model**

- **Effective stroke** (mm):
  - 161+/-2: When origin is on motor side
  - 206+/-2: When origin is on non-motor side

- **Effective stroke** (mm):
  - 207.5 (with brake)

**Note**

- Distance from center of slider upper surface to carrier center-of-gravity at a guide service life of 10,000 km (Service life is calculated for 400mm stroke models).

- Stop positions are determined by the mechanical stoppers at both ends.

**Configuration**

- **Controller**: TS-S2, TS-SH, TS-SD
- **Weight (kg)**:
  - L: 1.5
  - B: 1.6
  - C: 1.7
  - D: 1.8
  - E: 2.0
  - F: 2.1
  - G: 2.2
  - H: 2.3

**Note**

- Note 1: If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.
- Note 2: The robot cable is flexible and resists bending.
- Note 3: See P.498 for DIN rail mounting bracket.
- Note 4: Select this selection when using the gateway function. For details, see P.60.
SS04 Space-saving model

Effective stroke 50 100 150 200 250 300 350 400
L 187 237 287 337 387 437 487 537
A 2 3 4 5 6 7 8 9
B 3 4 5 6 7 8 9 10
C 100 150 200 250 300 350 400 450
Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Secure the cable with a tie-band 80mm or less from unit’s end face to prevent the cable from being subjected to excessive loads.
Note 3. The cable’s minimum bend radius is R30.
Note 4. These are the weights without a brake. The weights are 0.2kg heavier when equipped with a brake.
Note 5. The belt cover’s left and right sides are asymmetrical. Therefore, if the motor mounting orientation is changed, the cover cannot be attached.

Effective stroke (82: When origin is on motor side) (82: When origin is on non-motor side)

Effective stroke (55: When origin is on motor side) (55: When origin is on non-motor side)

Cable securing position Approx. 245 (Cable length)
### SS05 Slider type

- **High lead: Lead 20**
- **CE compliance**
- **Origin on the non-motor side is selectable**

#### Ordering method

<table>
<thead>
<tr>
<th>SS05-S</th>
<th>SS05-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Lead</td>
</tr>
<tr>
<td>S S2</td>
<td>Type[1]</td>
</tr>
<tr>
<td>Model</td>
<td>Type[2]</td>
</tr>
<tr>
<td>Weight</td>
<td>L+2</td>
</tr>
</tbody>
</table>

#### Basic specifications

- **Motor**
  - 42 * 2: Step motor
- **Resolution (Pulse/rotation)**: 20480
- **Deceleration mechanism**: Ball screw 8/7 (Class C10)
- **Maximum motor torque (kW)**: 0.27
- **Ball screw lead (mm)**: 20
- **Maximum speed (mm/sec)**: 140+/-1
- **Maximum payload (kg)**: 4kg
- **Grease option**: Vertical
- **Max. pressing force (N)**: 2kg
- **Stroke (mm)**: +/ -0.02

#### Allowable overhang

**Note:**
- The cable’s minimum bend radius is R30.
- The weights of each models are 0.2kg heavier when equipped with a brake.

### Static loading moment

**Note:**
- The cable's minimum bend radius is R30.

### Controller

- **Controller Operation method**
  - PT: PROFINET
  - EP: EtherNet/IP™
  - DN: DeviceNet™
  - PN: PNP

- **Robot positioner I/O**
  - NP: NPN
  - CC: CC-Link

- **Robot driver I/O cable**
  - SD1: 1m

### Motor installation (Space-saving model)

- **Notes:**
  - Positioning repeatability in one direction.
  - When the stroke is less than 600mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speeds shown in the table below.

### Motor installation (Space-saving model)

**Note:**
- Distance from center of slider upper surface to carrier center-of-gravity at a gauge service life of 10,000km (Service life is calculated for 600mm stroke models).

### Effective stroke

<table>
<thead>
<tr>
<th>Effective stroke</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
<th>700</th>
<th>750</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>280</td>
<td>330</td>
<td>380</td>
<td>430</td>
<td>480</td>
<td>530</td>
<td>580</td>
<td>630</td>
<td>680</td>
<td>730</td>
<td>780</td>
<td>830</td>
<td>880</td>
<td>930</td>
<td>980</td>
<td>1030</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
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<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2</td>
<td>3</td>
<td>2.5</td>
<td>2.8</td>
<td>3.0</td>
<td>3.2</td>
<td>3.4</td>
<td>3.6</td>
<td>3.8</td>
<td>4.0</td>
<td>4.2</td>
<td>4.4</td>
<td>4.6</td>
<td>4.8</td>
<td>5.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Maximum speed for each stroke (mm/sec)</td>
<td>1000</td>
<td>933</td>
<td>833</td>
<td>733</td>
<td>633</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
</tr>
<tr>
<td>Lead20</td>
<td>600</td>
<td>560</td>
<td>500</td>
<td>440</td>
<td>380</td>
<td>330</td>
<td>280</td>
<td>230</td>
<td>180</td>
<td>130</td>
<td>80</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Lead12</td>
<td>420</td>
<td>380</td>
<td>340</td>
<td>300</td>
<td>260</td>
<td>220</td>
<td>180</td>
<td>140</td>
<td>100</td>
<td>60</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### Handle

- **Robot positioner I/O**
  - NP: NPN
  - CC: CC-Link

- **Robot driver I/O**
  - SD: 1m

### Controller

- **Controller Operation method**
  - PT: PROFINET
  - EP: EtherNet/IP™
  - DN: DeviceNet™
  - PN: PNP

- **Robot positioner I/O**
  - NP: NPN
  - CC: CC-Link

- **Robot driver I/O cable**
  - SD: 1m
Note 1. Brake-equipped models can be selected only when the lead is 12mm or 6mm.
Note 2. If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.
Note 3. The robot cable is flexible and resists bending.
Note 4. See P.498 for DIN rail mounting bracket.
Note 5. Select this selection when using the gateway function. For details, see P.60.

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead screw (mm)</th>
<th>Stroke (mm)</th>
<th>Repeatability (mm)</th>
<th>Max. pressing force (N)</th>
<th>Motor installation (Space-saving model)</th>
<th>Deceleration mechanism</th>
<th>Basic specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS05H</td>
<td>6</td>
<td>145</td>
<td>43</td>
<td>3.8</td>
<td>Motor installed on left</td>
<td>Ball screw</td>
<td>Overall length (mm)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>190</td>
<td>85</td>
<td>5.5</td>
<td>Motor installed on right</td>
<td>Ball screw</td>
<td>Overall length (mm)</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>240</td>
<td>118</td>
<td>9.2</td>
<td>Motor installed on left</td>
<td>Ball screw</td>
<td>Overall length (mm)</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>290</td>
<td>151</td>
<td>11.1</td>
<td>Motor installed on right</td>
<td>Ball screw</td>
<td>Overall length (mm)</td>
</tr>
</tbody>
</table>

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Secure the cable with a tie-band 100mm or less from unit’s face to prevent the cable from being subjected to excessive loads.
Note 3. The cable’s minimum bend radius is R30.
Note 4. These are the weights without a brake. The weights are 0.2kg heavier when equipped with a brake.
Note 5. When the stroke is longer than 600mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speeds shown in the table at the left.
### SS05H Specifications

<table>
<thead>
<tr>
<th>Effective stroke</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
<th>700</th>
<th>750</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>12.85</td>
<td>25.7</td>
<td>38.5</td>
<td>51.3</td>
<td>64.1</td>
<td>76.9</td>
<td>89.7</td>
<td>102.5</td>
<td>115.3</td>
<td>128.1</td>
<td>140.8</td>
<td>153.6</td>
<td>166.4</td>
<td>179.2</td>
<td>192.0</td>
<td>204.8</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>650</td>
<td>700</td>
<td>750</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Maximum speed for each stroke (mm/sec)</td>
<td>1000</td>
<td>933</td>
<td>833</td>
<td>733</td>
<td>633</td>
<td>560</td>
<td>500</td>
<td>440</td>
<td>480</td>
<td>520</td>
<td>560</td>
<td>600</td>
<td>640</td>
<td>680</td>
<td>720</td>
<td></td>
</tr>
<tr>
<td>Speed setting</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>650</td>
<td>700</td>
<td>750</td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Stop positions are determined by the mechanical stoppers at both ends.
2. Ensure the cable with a low-band 80mm or less from the unit's end face to prevent the cable from being subjected to excessive loads.
3. The cable's minimum bend radius is 30mm. The weights are 0.2kg heavier when equipped with a brake.
4. When the stroke is longer than 600mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speed shown in the table at the left.
5. The belt cover's left and right sides are asymmetrical. Therefore, if the motor mounting orientation is changed, the cover cannot be attached.
### SG07 Slider type

- **High lead**: Lead 20
- **CE compliance**
- **Origin on the non-motor side is selectable.**

#### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead 20</th>
<th>Lead 12</th>
<th>Lead 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Straight model</td>
<td>Straight model</td>
<td>Straight model</td>
</tr>
<tr>
<td>Brake</td>
<td>MR</td>
<td>MY</td>
<td>BS</td>
</tr>
<tr>
<td>Origin position</td>
<td>Standard</td>
<td>2-Wire BNC</td>
<td>NPN</td>
</tr>
<tr>
<td>Grease option</td>
<td>Standard grease</td>
<td>Standard grease</td>
<td>Option: 3, 5, 10</td>
</tr>
<tr>
<td>Stroke</td>
<td>20mm (max)</td>
<td>12mm (max)</td>
<td>6mm (max)</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>W65×H64</td>
<td>Standard 1</td>
<td>Option: 3, 5, 10</td>
</tr>
<tr>
<td>Robot position</td>
<td>3-Phase</td>
<td>2-Phase</td>
<td>1-Phase</td>
</tr>
</tbody>
</table>

#### Basic specifications

- **Motor**: SE Step motor
- **Resolution (Pulse/rotation)**: 7/6/3/2
- **Deceleration mechanism**: Ball screw 0/2 (Series C10)
- **Maximum payload (kg)**: Vertical 4, 12, 20
- **Max. pressing force (N)**: 10kg
- **Overall length**: Stroke=218
- **Max. outside dimension of body cross-section (mm)**: W65×H64
- **Cable length (m)**: Standard 1, Option: 3, 5, 10

#### Allowable overhang

<table>
<thead>
<tr>
<th>Vertical installation (min)</th>
<th>Horizontal installation (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>10kg</td>
<td>19kg</td>
</tr>
<tr>
<td>25kg</td>
<td>19kg</td>
</tr>
<tr>
<td>35kg</td>
<td>17kg</td>
</tr>
<tr>
<td>50kg</td>
<td>13kg</td>
</tr>
</tbody>
</table>

#### Static loading moment

<table>
<thead>
<tr>
<th>MY</th>
<th>MP</th>
<th>MR</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>114</td>
<td>101</td>
</tr>
</tbody>
</table>

#### Controller

- **Controller Operation method**: Remote command

#### Speed vs. payload

<table>
<thead>
<tr>
<th>Payload (kg)</th>
<th>Speed (mm/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>600</td>
<td>200</td>
</tr>
<tr>
<td>800</td>
<td>100</td>
</tr>
<tr>
<td>1000</td>
<td>50</td>
</tr>
</tbody>
</table>

#### Quick reference

- **Ordering method**
  - TS-SH I/O point trace / Remote command

#### SG07 Straight model

- **Approx. 200 (Cable length)**
- **201**: When origin is on motor side
- **201/1**: When origin is on non-motor side
- **201/1 (Note 1)**
- **201/2**: When origin is on motor side
- **201/2 (Note 1)**
- **201/3**: When origin is on non-motor side
- **201/3 (Note 1)**

- **Effective stroke**: 201/1
- **Weight (kg)**
  - Maximum speed for each stroke (mm/sec)
  - 201/1 (with brake)
  - 201/1 (with brake) (Note 1)
  - 201/2 (with brake)
  - 201/3 (with brake)
  - 201/3 (with brake) (Note 1)

- **Note**: Stop positions are determined by the mechanical stoppers at both ends.
- **Note 2**: Secure the cable with a tie-band 10mm or less from unit’s end to prevent the cable from being subjected to excessive loads.
- **Note 3**: The cable’s minimum bend radius is R30.
- **Note 4**: These are the weights without a brake. The weights are 0.5kg heavier when equipped with a brake.
- **Note 5**: When the stroke is longer than 80mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program by referring to the maximum speeds shown in the table at the below.
### SR03 Rod type

**CE compliance**
- Origin on the non-motor side is selectable

#### Ordering method
```
<table>
<thead>
<tr>
<th>Model</th>
<th>Lead of wires</th>
<th>Motor</th>
<th>Resolution (Pulse/rotation)</th>
<th>Repeatability (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR03-S</td>
<td>3-0.25</td>
<td>42/1 Step motor</td>
<td>2000</td>
<td>+/-0.02</td>
</tr>
<tr>
<td>SR03-R</td>
<td>3-0.25</td>
<td>55/1 Step motor</td>
<td>2000</td>
<td>+/-0.02</td>
</tr>
</tbody>
</table>
```

#### Basic specifications
- **Motor**
  - Motor installed: 42/1 Step motor, 55/1 Step motor
- **Resolution** (Pulse/rotation): 2000
- **Repeatability (mm)**: +/-0.02
- **Deceleration mechanism**: Ball screw (Class C10)
- **Ball screw lead (mm)**: 6
- **Maximum speed (mm/sec)**: 500, 250
- **Maximum payload (kg)**: 15, 20
- **Stroke (mm)**: 50 to 200 (optional)
- **Lost motion**: 0.1mm or less
- **Max. maxing force (N)**: 75, 100
- **Cable length (m)**: Standard: 1, Option: 3, 5, 10

#### Speed vs. payload
```
<table>
<thead>
<tr>
<th>Lead 6</th>
<th>Lead 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed (mm/s)</td>
<td>Speed (mm/s)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>
```

#### Running life
- **5000 km on models other than shown below.**
  - Running life of only the model shown below becomes shorter than 5000 km depending on the payload, so check the running life curve.

#### Motor installation (Space-saving model)
- **Type A** Motor installed on right
- **Type L** Motor installed on left

#### Controller
```
<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S2</td>
<td>I/O point trace / Remote command</td>
<td>TS-S2</td>
<td>I/O point trace / Remote command</td>
</tr>
<tr>
<td>TS-SH</td>
<td>Remote command</td>
<td>TS-SH</td>
<td>Remote command</td>
</tr>
<tr>
<td>TS-SD</td>
<td>Pulse train control</td>
<td>TS-SD</td>
<td>Pulse train control</td>
</tr>
</tbody>
</table>
```

---

**Note 1.** See P.129 for grease gun nozzles.
**Note 2.** It is possible to apply only the axial load.
**Note 3.** Use the external guide together so that any radial load is not applied to the rod.
**Note 4.** The orientation of the width across flat part is undefined to the base surface.
**Note 5.** Use the support guide together to maintain the straightness.
**Note 6.** Use the support guide when the machine reference amount must be reset. For details, refer to the manual.
SRD03

**Basic specifications**

- **Motor**: 42 Step motor
- **Resolution (Pulse/Rotation)**: 20480
- **Repeatability (mm)**: +/-0.02
- **Deceleration mechanism**: Ball screw φ8 (Class C10)
- **Ball screw lead (mm)**: 12, 6
- **Maximum speed (mm/sec)**: 500, 250
- **Maximum payload (kg)**: 5, 2.5
- **Max. pressing force (N)**: 75, 100
- **Stroke (mm)**: 50 to 200 (50pitch)
- **Lost motion**: 0.1mm or less
- **Overall length (mm)**: Horizontal Stroke+236.5, Vertical Stroke+276.5
- **Maximum outside dimension of body cross-section (mm)**: W48 × H56.5

**Cable length (m)**: Standard: 1', Option: 3', 5', 10'

**Note**: 1. The maximum speed needs to be changed in accordance with the payload. See the "Speed vs. payload" graph shown on the right. For details, see P. 128.

**Speed vs. payload**

- **Horizontal**
  - **Lead 6**: 25, 20, 15, 10, 5, 0 (Speed (mm/sec))
  - **Payload (kg)**: 5, 2.5, 1.2, 0.7, 0.5, 0
- **Vertical**
  - **Lead 6**: 25, 20, 15, 10, 5, 0 (Speed (mm/sec))
  - **Payload (kg)**: 5, 2.5, 1.2, 0.7, 0.5, 0

**Running life**

- **5000 km** on models other than shown below. Running life of only the model shown below becomes shorter than 5000 km depending on the payload, so check the running life curve.

**Controller**

- **Controller**: TS-S2, TS-SH
- **Operation method**: (I/O point trace / Remote command)
- **Controller**: TS-SD
- **Operation method**: Pulse train control

**SRD03 Straight model**

See Note 3. The robot cable is flexible and resists bending. Note 4. See P.498 for DIN rail mounting bracket. Note 5. Select this selection when using the gateway function. For details, see P.60.

**Option**: Horizontal installation plate (foot)

- Contents of option: Plate, 2 pcs.

See Note 3. It is possible to apply only the axial load. Use the external guide together so that any radial load is not applied to the rod.

- Note 3. When running the cables, secure cables so that any load is not applied to them.
- Note 3. Remove the SA hex. socket head cap bolt and use them to secure the cables.
- Effective screw thread depth 5

**Note 4**: The cable’s minimum bend radius is 30cm.

**Note 5**: Models with a brake will be 0.2kg heavier.

**Controller information**

- **Controller**: TS-S2, TS-SH
- **Ordering method**: Remote command / I/O point trace

---

**Notations**

- **Note 1**: The maximum speed needs to be changed in accordance with the payload.
- **Note 2**: If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.
- **Note 3**: The robot cable is flexible and resists bending.
- **Note 4**: See P.498 for DIN rail mounting bracket.
- **Note 5**: Select this selection when using the gateway function. For details, see P.60.
SR04 Rod type

Ordering method

Table:

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Deceleration mechanism</th>
<th>Maximum speed (mm/min)</th>
<th>Maximum payload (kg)</th>
<th>Max. pressing force (N)</th>
<th>Stroke (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42</td>
<td>Ball screw g.1 (Class C10)</td>
<td>600</td>
<td>12</td>
<td>150</td>
<td>50 to 300</td>
</tr>
</tbody>
</table>

Motor:

- Resolution (Pulse/rotation): 22400
- Repeatability (mm): +/-0.005

Deceleration mechanism:

- Ball screw g.1 (Class C10)
- Ball screw g.2 (Class C12)

Maximum speed (mm/min):

- Horizontal: 600
- Vertical: 45

Maximum payload (kg):

- Horizontal: 12
- Vertical: 4

Max. pressing force (N):

- Horizontal: 150
- Vertical: 45

Stroke (mm):

- Horizontal: 50 to 300 (diploch)
- Vertical: Vertical (58 mm)

Motor installation:

- Motor installed on right
- Motor installed on left

Motor installation (Space-saving model)

- Robot positioner I/O connector
- Remote command
- I/O point trace / Remote command

Controller:

- Operation method: Pulse train control

Motor installation (Space-saving model)

- Option: Horizontal installation plate (foot)
- Option: Vertical installation plate (flange)

Dimensions of attached square nut for T-slot (6 pcs.):

- M4 x 0.7 Depth 5 (For securing cable)

Dimensions of attached nut:

- M5 x 0.8

Running life

- 5000 km on models other than shown below:

Payload (kg):

- 0 to 5
- 5 to 10
- 10 to 20
- 20 to 25
- 25 to 50

Payload (kg) vs. Payload (m/s):

- Vertical:
  - Payload (kg): 0 to 5
  - Payload (kg): 5 to 10
  - Payload (kg): 10 to 20
  - Payload (kg): 20 to 25
  - Payload (kg): 25 to 50

- Horizontal:
  - Payload (kg): 0 to 5
  - Payload (kg): 5 to 10
  - Payload (kg): 10 to 20
  - Payload (kg): 20 to 25
  - Payload (kg): 25 to 50

Motor:

- Motor installed on left
- Motor installed on right

Controller:

- Operation method: Pulse train control

Motor:

- Maximum speed (mm/sec):
  - Lead 2: 6.6
  - Lead 6: 3.3
  - Lead 12: 2.4

Payload (kg) vs. Payload (m/s):

- Vertical:
  - Horizontal:
  - Vertical:

Note 1: It is possible to apply only the axial load.

Note 2: Use the external guide together so that any radial load is not applied to the rod.

Note 3: Use the support guide together to maintain the straightness.

Note 4: For lead 2mm specifications, the origin on the non-motor side cannot be set.

Note 5: When running the cables, secure cables so that any load is not applied to them.

Note 6: Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)

Note 7: The cable's minimum bend radius is R30.

Note 8: Models with a brake will be 0.2kg heavier.

Note 9: Distance to mechanical stopper.
SR04 Space-saving model (motor installed on right)

Option: Horizontal installation plate (floor)
* Contents of option: Plate, 2 pcs., Nut, 12 pcs. See our robot manuals for additional settings.

Option: Vertical installation plate (flange)

Installed within the T-slot range of the main unit. (Hex. socket head cap bolt (M4×0.7), Length under head 14)
* See bolts are required for one plate.

Dimensions of attached square nut for T-slot (6 pcs.).

Effective stroke

<table>
<thead>
<tr>
<th>Stroke</th>
<th>L (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>162.5</td>
<td>212.5</td>
</tr>
<tr>
<td>100</td>
<td>209.5</td>
<td>259.5</td>
</tr>
<tr>
<td>150</td>
<td>256.5</td>
<td>306.5</td>
</tr>
<tr>
<td>200</td>
<td>313.5</td>
<td>363.5</td>
</tr>
<tr>
<td>250</td>
<td>370.5</td>
<td>423.5</td>
</tr>
<tr>
<td>300</td>
<td>427.5</td>
<td>476.5</td>
</tr>
</tbody>
</table>

Note:
1. It is possible to apply only the axial load.
2. Use the external guide together so that any radial load is not applied to the rod.
3. Use the support guide together to maintain the straightness.
4. When running the cables, secure cables so that any load is not applied to them.
5. Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)
6. The cable’s minimum bend radius is R30.
7. Models with a brake will be 0.2kg heavier.
8. Distance to mechanical stopper.
9. For lead 2mm specifications, the origin on the non-motor side cannot be set.
10. This unit can be installed with the motor facing up (turned 90 degrees from the position in this drawing).

SR04 Space-saving model (motor installed on left)

Option: Horizontal installation plate (floor)
* Contents of option: Plate, 2 pcs., Nut, 12 pcs. See our robot manuals for additional settings.

Option: Vertical installation plate (flange)

Installed within the T-slot range of the main unit. (Hex. socket head cap bolt (M4×0.7), Length under head 14)
* See bolts are required for one plate.

Dimensions of attached square nut for T-slot (6 pcs.).

Effective stroke

<table>
<thead>
<tr>
<th>Stroke</th>
<th>L (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>162.5</td>
<td>212.5</td>
</tr>
<tr>
<td>100</td>
<td>209.5</td>
<td>259.5</td>
</tr>
<tr>
<td>150</td>
<td>256.5</td>
<td>306.5</td>
</tr>
<tr>
<td>200</td>
<td>313.5</td>
<td>363.5</td>
</tr>
<tr>
<td>250</td>
<td>370.5</td>
<td>423.5</td>
</tr>
<tr>
<td>300</td>
<td>427.5</td>
<td>476.5</td>
</tr>
</tbody>
</table>

Note:
1. It is possible to apply only the axial load.
2. Use the external guide together so that any radial load is not applied to the rod.
3. Use the support guide together to maintain the straightness.
4. When running the cables, secure cables so that any load is not applied to them.
5. Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)
6. The cable’s minimum bend radius is R30.
7. Models with a brake will be 0.2kg heavier.
8. Distance to mechanical stopper.
9. For lead 2mm specifications, the origin on the non-motor side cannot be set.
10. This unit can be installed with the motor facing up (turned 90 degrees from the position in this drawing).
## Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Model</th>
<th>Lead (mm)</th>
<th>Brake</th>
<th>Stroke</th>
<th>Cables length (mm)</th>
<th>Stroke+100.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCARA</td>
<td>300</td>
<td>YP-X</td>
<td>250</td>
<td>2mm</td>
<td>30mm</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>YP-X</td>
<td>300</td>
<td>2mm</td>
<td>45mm</td>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>

Note 1. See P.129 for grease gun nozzles.
Note 2. When "2mm lead" is selected, the origin position cannot be changed (to non-motor side).
Note 3. If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.

## Basic specifications

<table>
<thead>
<tr>
<th>Motor</th>
<th>421 Step motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution/Pulse(rotation)</td>
<td>2240</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>+/-0.02</td>
</tr>
<tr>
<td>Deceleration mechanism</td>
<td>Ball screw +1/8 (Class C10)</td>
</tr>
<tr>
<td>Ball screw lead (mm)</td>
<td>12</td>
</tr>
<tr>
<td>Maximum speed (mm/sec)</td>
<td>200</td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>Vertical</td>
</tr>
<tr>
<td>stroke</td>
<td>Vertical</td>
</tr>
<tr>
<td>Max. pressing force (N)</td>
<td>1500</td>
</tr>
<tr>
<td>Lost motion</td>
<td>+/-0.05</td>
</tr>
<tr>
<td>Rotating backlash (*):</td>
<td>Ball screw+3/8</td>
</tr>
<tr>
<td>Overall length (Horizontal)</td>
<td>Stroke+100</td>
</tr>
<tr>
<td>Maximum outside diameter of body cross-section (mm)</td>
<td>W4H8</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Standard: 1 Option: 3, 5, 10</td>
</tr>
</tbody>
</table>

Note 1. The maximum speed needs to be changed in accordance with the payload.
See the "Speed vs. payload" graph shown on the right. For details, see P. 128.
Additionally, when the stroke is long, the maximum speed is decreased due to the critical speed of the ball screw.
See the maximum speed table shown at the lower portion of the drawing.

## Speed vs. payload

<table>
<thead>
<tr>
<th>Speed (mm/sec)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

## Running life

5000 km on models other than shown below. Running life of only the model shown below becomes shorter than 5000 km depending on the payload, so check the running life curve.

<table>
<thead>
<tr>
<th>Running life (km)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>10</td>
</tr>
<tr>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td>3000</td>
<td>30</td>
</tr>
<tr>
<td>4000</td>
<td>40</td>
</tr>
<tr>
<td>5000</td>
<td>50</td>
</tr>
</tbody>
</table>

Note 2. When "2mm lead" is selected, the origin position cannot be changed (to non-motor side).
Note 3. If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.

## Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-S2</td>
<td>Remote command</td>
</tr>
<tr>
<td>TS-SH</td>
<td>Remote command</td>
</tr>
</tbody>
</table>

Note 4. The robot cable is flexible and resists bending.
Note 5. See P.498 for DIN rail mounting bracket.

Note 2. When "2mm lead" is selected, the origin position cannot be changed (to non-motor side).
Note 3. If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.

## Details of T-slot

<table>
<thead>
<tr>
<th>T-slot range</th>
<th>Dimensions of attached square nut for T-slot (6pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>100</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>150</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>200</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>250</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
</tbody>
</table>

Note 1. The maximum speed needs to be changed in accordance with the payload.
See the "Speed vs. payload" graph shown on the right. For details, see P. 128.
Additionally, when the stroke is long, the maximum speed is decreased due to the critical speed of the ball screw.
See the maximum speed table shown at the lower portion of the drawing.

## Dimensions of T-slot

<table>
<thead>
<tr>
<th>T-slot range</th>
<th>Dimensions of attached square nut for T-slot (6pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>100</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>150</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>200</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>250</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
</tbody>
</table>

Note 1. The maximum speed needs to be changed in accordance with the payload.
See the "Speed vs. payload" graph shown on the right. For details, see P. 128.
Additionally, when the stroke is long, the maximum speed is decreased due to the critical speed of the ball screw.
See the maximum speed table shown at the lower portion of the drawing.

## Dimensions of T-slot

<table>
<thead>
<tr>
<th>T-slot range</th>
<th>Dimensions of attached square nut for T-slot (6pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>100</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>150</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>200</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
<tr>
<td>250</td>
<td>M0.5 x 0.7 Depth 5 (For securing cable)</td>
</tr>
</tbody>
</table>
**SRD04**  Space-saving model (motor installed on top)  

* Contents of option: Plate, 2 pcs., Nut, 12 pcs.  
  See our robot manuals for additional settings.

- **Installed within the T-slot range of the main unit (Hex. socket head cap bolt (M3×0.5), length under head 10)*** Six bolts are required for one plate.
- **24/6 drill-through**

---

<table>
<thead>
<tr>
<th>Effective stroke</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L</strong></td>
<td>102.5</td>
<td>122.5</td>
<td>142.5</td>
<td>162.5</td>
<td>182.5</td>
<td>202.5</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
<td>2.8</td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>Maximum speed for each stroke (mm/sec)</strong></td>
<td>900</td>
<td>800</td>
<td>720</td>
<td>650</td>
<td>580</td>
<td>510</td>
</tr>
<tr>
<td><strong>Lead 1</strong></td>
<td>500</td>
<td>440</td>
<td>320</td>
<td>250</td>
<td>180</td>
<td>110</td>
</tr>
<tr>
<td><strong>Lead 6</strong></td>
<td>250</td>
<td>220</td>
<td>160</td>
<td>130</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td><strong>Lead 2</strong></td>
<td>80</td>
<td>72</td>
<td>53</td>
<td>45</td>
<td>38</td>
<td>31</td>
</tr>
</tbody>
</table>

---

*Note 1. It is possible to apply only the axial load.
Use the external guide together so that any radial load is not applied to the rod.
*Note 2. The orientation of the width across flat part is undefined to the base surface.
*Note 3. Use the support guide together to maintain the straightness.
*Note 4. When running the cables, secure cables so that any load is not applied to them.
*Note 5. Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)
*Note 6. The cable’s minimum bend radius is R30.
*Note 7. Models with a brake will be 0.2kg heavier.
*Note 8. Distance to mechanical stopper.
*Note 9. For lead 2mm specifications, the origin on the non-motor side cannot be set.
SR05 Rod type

- CE compliance
- Origin on the non-motor side is selectable: Lead 6, 12

### Ordering method

**SR05**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Motor</th>
<th>Type</th>
<th>Motor installation</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Step motor</td>
<td>50</td>
<td>Motor installed on right</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repeatability (mm)</td>
<td>0.005</td>
<td></td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deceleration mechanism</td>
<td>Ball screw 50</td>
<td></td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ball screw lead (mm)</td>
<td>15</td>
<td></td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum speed (mm/min)</td>
<td>2000</td>
<td></td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum payload (kg)</td>
<td>50</td>
<td></td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. pressing force (N)</td>
<td>1000</td>
<td></td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lost motion</td>
<td>0.01</td>
<td></td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall length (Horizontal)</td>
<td>1376</td>
<td></td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over glass width (Vertical)</td>
<td>1386</td>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum outside diameter of body cross-section (mm)</td>
<td>164</td>
<td></td>
<td>7.6</td>
</tr>
</tbody>
</table>

**Speed vs. payload**

- **Horizontal**
  - Lead 2: Speed 50 to 250 (mm/s)
  - Lead 6, 12: Speed 100 to 150 (mm/s)

- **Vertical**
  - Lead 2: Speed 50 to 250 (mm/s)
  - Lead 6, 12: Speed 100 to 150 (mm/s)

**Motor installation (Space-saving model)**

- **R type** Motor installed on right
- **L type** Motor installed on left

**SR05 Straight model S**

- Ball screw greasing port (M4.5)
- M4-0.7 Depth 5 (For securing cable)
- M4-0.7 Depth 5 (For securing cable)
- L1 (T-slot range)
- Hex. socket head cap bolt (M5x0.8)
- Length under head 14

**Controller**

- **Controller**
  - Operation method
    - TS-S2: I/O point trace / Remote command
    - TS-SH: Remote command

Note 1. See P.129 for grease gun nozzles.
Note 2. When "2mm feed" is selected, the origin position cannot be changed (to non-motor side).
Note 3. If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.

- **Running life**
  - 5000 km on models other than shown below.
  - Running life of only the model shown below becomes shorter than 5000 km depending on the payload, so check the running life curve.

**Motor installation (Space-saving model)**

- Installed within the T-slot range of the main unit.
- Hex. socket head cap bolt (M4-0.7)
- Length under head 14

**Dimensions of attached square nut for T-slot (8 pcs.)**

- Effective stroke: 50, 100, 200, 250, 300
- L: 163, 233, 283, 333, 383, 433, 483, 530
- Weight (kg): 2.2, 2.6, 3.0, 3.3, 3.7, 4.1

Note 1. It is possible to apply only the axial load.
Note 2. Use the external guide together so that any radial load is not applied to the rod.
Note 3. The orientation of the width across flat part is undefined to the base surface.
Note 4. For lead 2 specifications, the origin on the non-motor side cannot be set.
Note 5. When the lead is 2mm, this dimension is 0.7mm.
Note 6. When running the cables, secure cables so that any load is not applied to them.
Note 7. Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)
Note 8. The cable's minimum bend radius is R30.
Note 9. Take great care as the outer case of the motor projects from the bottom of the main unit.
Note 10. Models with a brake will be 0.2kg heavier.
Note 11. Distance to mechanical stopper.

---

**SR05-S**

See our robot manuals for additional settings.

**TS-S2 > 490**

* Contents of option: Plate, 2 pcs., Nut, 8 pcs.
  * See our robot manuals for additional settings.

---

**SR05-R**

* Battery
  * With battery (5VDC, 800mA)
  * Without battery
  * DC: 24V, 50W
  * DC: 48V, 100W
  * CE: TUV
  * Proprietor
  * CE: TUV
  * Proprietor
  * CE: TUV
  * Proprietor
  * CE: TUV
  * Proprietor

---

**PHASER**

See our robot manuals for additional settings.
SRD05 Straight model S

**Ordering method**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead</th>
<th>Brake</th>
<th>Controller Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRD05</td>
<td>56 [Step motor]</td>
<td>-</td>
<td>TS-S2 (50) 490</td>
</tr>
</tbody>
</table>

**Basic specifications**

- **Motor:** 56 [Step motor]
- **Resolution (Pulse/rotation):** 20480
- **Repeatability (mm):** +/- 0.02
- **Deceleration mechanism:** Ball screw φ12 (Class C10)
- **Ball screw lead (mm):** 12 / 6 / 2
- **Maximum speed (mm/sec):** 300 / 150 / 50
- **Maximum payload (kg):** 50 / 55 / 60
- **Max. pressing force (N):** 250 / 550 / 900
- **Stroke (mm):** 50 to 300 (50pitches)
- **Lost motion:** 0.1mm or less
- **Rotating backlash (°):** +/- 0.05
- **Overall length (mm):** Horizontal Stroke=276 / Vertical Stroke=316
- **Maximum outside dimension of body cross-section (mm):** W56.4 × H71

**Cable length (m):** Standard: 1 / Option: 3, 5, 10

**Running life**

- 5000 km on models other than shown below. Running life of only the model shown below becomes shorter than 5000 km depending on the payload, so check the running life curve.

**Controller**

- **Controller:** TS-S2 / TS-SH / TS-SD
- **Operation method:** TS-S2: Remote command / TS-SH: I/O point trace / TS-SD: Pulse train control

**SRD05 Rod type (With support guide)**

- **CE compliance**
- **Origin on the non-motor side is selectable: Lead 6, 12**

---

**Note 1.** See P.129 for grease gun nozzles.

**Note 2.** When “2mm lead” is selected, the origin position cannot be changed to (non-motor side).

**Note 3.** If changing from the origin position at the time of purchase, the machine reference amount must be reset. For details, refer to the manual.

**Note 4.** The robot cable is flexible and resists bending.

**Note 5.** See P.498 for DIN rail mounting bracket.

**Note 1.** It is possible to apply only the axial load.

**Note 2.** For Lead 2mm specifications, the origin on the non-motor side cannot be set.

**Note 3.** When the lead is 2mm, this dimension is 27mm.

**Note 4.** When running the cables, secure cables so that any load is not applied to them.

**Note 5.** Remove the M4 hex. socket head cap set bolts and use them to secure the cables.

**Note 6.** The cable’s minimum bend radius is R30.

**Note 7.** Take great care as the outer case of the motor projects from the bottom of the main unit.

**Note 8.** Models with a brake will be 0.2kg heavier.

**Note 9.** Distance to mechanical stopper.
SRD05 Space-saving model (motor installed on top) U

- **View A**
- **Details of section B**
- **Dimensions of attached square nuts for T-slot (6 pcs.)**

**Effective stroke**

<table>
<thead>
<tr>
<th>L1</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>183</td>
<td>233</td>
<td>283</td>
<td>333</td>
<td>383</td>
<td>433</td>
<td></td>
</tr>
</tbody>
</table>

**Weight (kg)**

| 3.3 | 3.8 | 4.3 | 4.7 | 5.2 | 5.7 |

**Notes:**

1. It is possible to apply only the axial load.
2. Use the external guide together so that any radial load is not applied to the rod.
3. Use the support guide together to maintain the straightness.
4. When running the cables, secure them without any load applied to them.
5. Remove the M4 hex. socket head cap set bolts and use them to secure the cables. (Effective screw thread depth 5)
6. The cable’s minimum bend radius is R30.
7. Models with a brake will be 0.2 kg heavier.
8. Use the support guide together to maintain the straightness.
9. For lead 2mm specifications, the origin on the non-motor side cannot be set.
10. Take great care as the outer case of the cover projects from the bottom of the main unit.
11. When the lead is 2 mm, this dimension is 27 mm.
Articulated robots

Compact

single-axis robots

TRANSERVO

Single-axis robots

FLIP-X

Linear motor

single-axis robots

XY-X

SCARA robots

YK-X

Pick & place robots

YP-X

CLEAN CONTROLLER INFORMATION

Linear conveyor modules

LCM100

Battery Bracket plate Note 3

Stroke Static loading moment [1+/- 0.5]

Cable length Note 4

A 0.3 Vertical Option: Installation plate

Cross-sectional drawing (A-A)

Effective stroke S 50 100 150

Weight [kg] 12 19 27

Controller TS-S2 490 TS-SH 490 TS-SD 500
### Ordering method

**STH06**

- **Model**
  - Lead 8: Standard model
  - Lead 16: Space-saving model

- **Motor**
  - 42: Brake motor

- **Resolution (Pulse/rotation)**
  - 20480

- **Repeatability (mm)**
  - +/-0.05

- **Drive method**
  - Straight: Slide screw
  - Space-saving: Slide screw + belt

- **Ball screw lead (mm)**
  - 8
  - 16

- **Maximum speed (mm/sec)**
  - 150
  - 400

- **Maximum payload (kg)**
  - 9
  - 6

- **Max. pressing force (N)**
  - 180
  - 100

- **Stroke (mm)**
  - 50/100/150

- **Ball screw lead (mm)**
  - 8
  - 16

- **Space-saving**
  - W61 × H65
  - W108 × H70

- **Cable length (m)**
  - 30
  - 60

- **Max. pressing force (N)**
  - 180

- **Max. pressing force (N)**
  - 180

- **Type**
  - Model installed on right: C
  - Model installed on left: L

### Basic specifications

- **Motor**
  - 42: Brake motor

- **Resolution (Pulse/rotation)**
  - 20480

- **Repeatability (mm)**
  - +/-0.05

- **Drive method**
  - Straight: Slide screw
  - Space-saving: Slide screw + belt

- **Ball screw lead (mm)**
  - 8
  - 16

- **Maximum speed (mm/sec)**
  - 150
  - 400

- **Maximum payload (kg)**
  - 9
  - 6

- **Max. pressing force (N)**
  - 180

- **Stroke (mm)**
  - 50/100/150

- **Ball screw lead (mm)**
  - 8
  - 16

- **Space-saving**
  - W61 × H65
  - W108 × H70

- **Cable length (m)**
  - 30
  - 60

- **Max. pressing force (N)**
  - 180

- **Max. pressing force (N)**
  - 180

- **Type**
  - Model installed on right: C
  - Model installed on left: L

### Allowable overhang

**Note**
- Overhang at travelling service life of 3000km. (Service life is calculated for 100mm stroke models.)

### Speed vs. payload

**STH06**

- **Type**
  - Straight model: S

- **Effective stroke**
  - 50
  - 100
  - 150

- **Effective stroke**
  - 50
  - 100
  - 150

- **Weight (kg)**
  - 2.52
  - 3.27
  - 3.9

- **Note 1**
  - Return-to-origin position.

- **Note 2**
  - Table movable range during return-to-origin operation. The values in [ ] show those when the return-to-origin direction is changed.

- **Note 3**
  - The minimum bending radius of the motor cable is R30.

- **Note 4**
  - When installing the mechanical main unit using the back facing holes, use the hex socket head cap M6 bolts.

- **Note 5**
  - The installation hole positions of the main unit with the specifications with the brake are common to those shown above.

- **Note 6**
  - Models with a brake will be 0.34kg heavier.
Articulated robots
YA
Compact 
single-axis robots
TRANSERVO
Single-axis robots
FLIP-X
Linear motor
single-axis robots
PHASER
Cartesian 
robots
XY-X
SCARA
robots
YK-X
Pick & place
robots
YP-X
CLEAN
CONTROLLER
INFORMATION
Linear conveyor 
modules
LCM100

Controller
TS-S2 >> 490
TS-SH >> 490
TS-SD >> 500

STH06 Space-saving model (motor installed on right)

Effective stroke

<table>
<thead>
<tr>
<th></th>
<th>50</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>75</td>
<td>48</td>
<td>65</td>
</tr>
<tr>
<td>D</td>
<td>80</td>
<td>44</td>
<td>66</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>80</td>
<td>88</td>
<td>132</td>
</tr>
<tr>
<td>G</td>
<td>143</td>
<td>207</td>
<td>285</td>
</tr>
<tr>
<td>L</td>
<td>132</td>
<td>196</td>
<td>274</td>
</tr>
</tbody>
</table>

Weight (kg)

|   | 2.5 | 3.3 | 4.26 |

Note 1. Return-to-origin position.
Note 2. Table movable range during return-to-origin operation. The values in [ ] show those when the return-to-origin direction is changed.
Note 3. The minimum bending radius of the motor cable is R30.
Note 4. When installing the mechanical main unit using the back facing holes, push the slider toward the origin position on the motor side and insert the hex socket head cap (M6) bolt.
Note 5. The dimensions of the specifications with the brake are common to those shown above.
Note 6. Models with a brake will be 0.34kg heavier.

STH06 Space-saving model (motor installed on left)

Effective stroke

<table>
<thead>
<tr>
<th></th>
<th>50</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>75</td>
<td>48</td>
<td>65</td>
</tr>
<tr>
<td>D</td>
<td>80</td>
<td>44</td>
<td>66</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>80</td>
<td>88</td>
<td>132</td>
</tr>
<tr>
<td>G</td>
<td>143</td>
<td>207</td>
<td>285</td>
</tr>
<tr>
<td>L</td>
<td>132</td>
<td>196</td>
<td>274</td>
</tr>
</tbody>
</table>

Weight (kg)

|   | 2.5 | 3.3 | 4.26 |

Note 1. Return-to-origin position.
Note 2. Table movable range during return-to-origin operation. The values in [ ] show those when the return-to-origin direction is changed.
Note 3. The minimum bending radius of the motor cable is R30.
Note 4. When installing the mechanical main unit using the back facing holes, push the slider toward the origin position on the motor side and insert the hex socket head cap (M6) bolt.
Note 5. The dimensions of the specifications with the brake are common to those shown above.
Note 6. Models with a brake will be 0.34kg heavier.
RF02-N  Rotary type / Limit rotation specification

Ordering method

RF02 N

Model: RF02  Return-to-origin method: L (Lower end limit rotation)

Basic specifications

Motor: 20°  Step motor
Resolution (Pulse/rotation): 4096
Repeatability (°): +/-0.05
Drive method: Special warm gear + belt
Torque type: Standard/High torque
Maximum speed (°/sec): 420
Rotating torque (Nm): 0.22
Max. pushing torque (Nm): 0.11
Backlash (°): +/-0.5
Max. moment of inertia (kgm²): 0.0018
Note 1: Positioning repeatability in one direction.
Note 2: The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” graph and the “Effective torque vs. Speed” graph.
Note 3: For moment of inertia and effective torque details, see P.604.

Moment of inertia Acceleration/deceleration

Effective torque vs. speed

Allowable load

Controller

Operator method

Note: When purchasing the product, set the controller acceleration while carefully checking the “Moment of inertia vs. Acceleration/Deceleration” and “Effective torque vs. Speed” graphs.

For details, please refer to the TRANSERVO Series User’s Manual.
RF02-N

Limit rotation specification – High rigidity model

Table movable range by return-to-origin operation.
Be careful not to interfere with the workpiece or equipment around the table.

Return-to-origin position
Values and characters in [ ] show those when the return-to-origin direction is changed.

Note 1: This drawing is output under the conditions below.
Bearing: High rigidity
Torque: Standard/High torque

Note 2: The minimum bending radius of the motor cable is R30.

Note 3: The motor cable exit direction is only the left side.
**RF02-S**  
**Rotary type / Sensor specification**

### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>RF02</th>
<th>S</th>
<th>L</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return-to-origin method</td>
<td>Return-to-origin method (Without)</td>
<td>Return-to-origin method (Limitless rotation)</td>
<td>Bearing</td>
<td>Bearing</td>
</tr>
<tr>
<td>Torque type</td>
<td>Standard</td>
<td>High torque</td>
<td>Torque type</td>
<td>Torque type</td>
</tr>
<tr>
<td>Cable entry location</td>
<td>2 proximity switches</td>
<td>2 proximity switches</td>
<td>Cable entry location</td>
<td>2 proximity switches</td>
</tr>
<tr>
<td>Rotation direction</td>
<td>CW</td>
<td>CCW</td>
<td>Rotation direction</td>
<td>CW</td>
</tr>
<tr>
<td>Screw type</td>
<td>M4</td>
<td>M4</td>
<td>Screw type</td>
<td>M4</td>
</tr>
<tr>
<td>Motor</td>
<td>20</td>
<td>Step motor</td>
<td>Motor</td>
<td>20</td>
</tr>
</tbody>
</table>

### Basic specifications

- **Motor**: 20 Step motor
- **Resolution (Pulse/rotation)**: 4096
- **Repeatability** (+/-0.05)
- **Drive method**: Special warm gear + belt
- **Maximum speed** (°/sec): 420, 281
- **Rotating torque (Nm)**: 0.22, 0.32
- **Max. pushing torque (Nm)**: 0.11, 0.16
- **Backlash (°)**: +/-0.5
- **Max. moment of inertia** (kgm²): 0.0015, 0.004
- **Cable length (m)**: Standard: 1, Option: 3, 5, 10
- **Rotation range (°)**: 360

**Note**: Positioning repeatability in one direction. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” and the “Effective torque vs. speed” graph. For moment of inertia and effective torque details, see P.604.

### Moment of inertia Acceleration/deceleration

- **Graphs**: 100 - 10000
- **Effective torque vs. speed**: 0.000 - 0.004

### Effective torque vs. speed

- **Graphs**: 0 - 0.39
- **Speed**: 0 - 300

### Allowable load

- **Allowable radial load (N)**
- **Allowable thrust load (N)**
- **Allowable moment (Nm)**

### Controller

- **Controller**: TS-S2, TS-SHS
- **Operation method**: I/O point trace / Remote command

### Controller Operation method

- **Controller**: TS-S2, TS-SHS
- **Operation method**: I/O point trace / Remote command

### RF02-SN Sensor specification – Standard model

- **Weight (kg)**: 0.51
- **Cross-sectional drawing A-A**

**Note**:  
1. This drawing is output under the conditions below.  
2. Be careful not to interfere with the workspace or equipment around the robot.  
3. The minimum bending radii of the motor cable and sensor cable are R30.  
4. The motor cable exit direction is only the left side.
RF02-S  Sensor specification – High rigidity model

1. Table movable range by return-to-origin operation. Be careful not to interfere with the workspace or equipment around the table.
2. The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User’s Manual and change the origin coordinates.

Note 1. This drawing is output under the conditions below.
- Bearing: High rigidity
- Torque: Standard/High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

Note 3. The motor cable exit direction is only the left side.

Controller  TS-S2 ➤ 490 TS-SH ➤ 490
### RF03-N  
**Rotary type / Limit rotation specification**

#### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Return-to-origin method</th>
<th>Bearing</th>
<th>Torque</th>
<th>Cable entry location</th>
<th>Rotation direction</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF03-N</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Basic specifications

- **Motor**: 28 [Step motor]
- **Resolution (Pulse/rotation)**: 4096
- **Repeatability [°]**: +0.05
- **Drive method**: Special warm gear + belt
- **Torque type**: Standard / High torque
- **Maximum speed [°/sec]**: 420 / 280
- **Rotating torque (Nm)**: 0.8 / 1.2
- **Max. pushing torque (Nm)**: 0.4 / 0.6
- **Backlash [°]**: +0.5
- **Max. moment of inertia (kg·m²)**: 0.012 / 0.027
- **Cable length (m)**: 320

#### Moment of inertia Acceleration/deceleration

<table>
<thead>
<tr>
<th>Controller Operation method</th>
<th>TS-S2</th>
<th>TS-SH</th>
<th>TS-SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controller</strong></td>
<td>Remote command</td>
<td>Pulse train control</td>
<td></td>
</tr>
</tbody>
</table>

#### Effective torque vs. speed

**Note**: The maximum speed may vary depending on the conditions.

**Note 1**: Positioning repeatability in one direction.

**Note 2**: The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the "Moment of Inertia vs. Acceleration/deceleration" graph and the "Effective torque vs. speed" graph (reference).

**Note 3**: For moment of inertia and effective torque details, see P.604.

---

### RF03-NN  
**Limit rotation specification – Standard model**

1. Table movable range by return-to-origin operation. Be careful not to interfere with the workpiece or equipment around the table.
2. Return-to-origin position
3. Values and characters in [ ] show those when the return-to-origin direction is changed.

---

**Note**: The robot cable is flexible and resists bending. Refer to the "Moment of Inertia vs. Acceleration/deceleration" and "Effective torque vs. speed" graphs. For details, please refer to the TRANSERVO Series User’s Manual.
RF03-NH Limit rotation specification – High rigidity model

1. Table movable range by return-to-origin operation.
   - Be careful not to interfere with the workpiece or equipment around the table.
2. Return-to-origin position
3. Values and characters in [ ] show those when the return-to-origin direction is changed.

Cross-sectional drawing A-A

Note 1. This drawing is output under the conditions below.
   - Bearing: High rigidity
   - Torque: Standard/High torque

Note 2. The minimum bending radius of the motor cable is R30.
**RF03-S** Rotary type / Sensor specification

- **CE compliance**
- **Limitless rotation**

### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>RF03-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Return-to-origin method</td>
</tr>
<tr>
<td></td>
<td>Reference line (Limitless rotation)</td>
</tr>
</tbody>
</table>

### Basic specifications

<table>
<thead>
<tr>
<th>Motor</th>
<th>28 [a] Step motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution (Pulse/rotation)</td>
<td>4096</td>
</tr>
<tr>
<td>Repeatability (°)</td>
<td>±0.005</td>
</tr>
<tr>
<td>Drive method</td>
<td>Special warm gear + belt</td>
</tr>
<tr>
<td>Torque type</td>
<td>High torque</td>
</tr>
<tr>
<td>Maximum speed (°/sec)</td>
<td>420</td>
</tr>
<tr>
<td>Rotating torque (N•m)</td>
<td>0.8</td>
</tr>
<tr>
<td>Max. pushing torque (N•m)</td>
<td>0.4</td>
</tr>
<tr>
<td>Backlash (°)</td>
<td>±0.5</td>
</tr>
<tr>
<td>Max. moment of inertia (kg•m²)</td>
<td>0.012</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Standard 1 / Option 3, 5, 10</td>
</tr>
<tr>
<td>Rotation range (°)</td>
<td>360</td>
</tr>
</tbody>
</table>

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” graph and the “Effective torque vs. speed” graph (reference).
Note 3. For moment of inertia and effective torque details, see P.604.

### Moment of inertia

- **Acceleration/deceleration**
  - Standard: High torque
  - High: 10000

- **Effective torque vs. speed**
  - Graph (reference).

### Allowable load

- **Allowable radial load (N)**
  - Standard: High: 5000
  - Standard: High: 5000

- **Allowable moment (N•m)**
  - Standard: High: 5000
  - Standard: High: 5000

Note. When purchasing the product, set the controller acceleration while carefully checking the “Moment of inertia vs. Acceleration/Deceleration” and “Effective torque vs. Speed” graphs.

### Controller

- **Controller**
  - Operation method
    - TS-S2
    - TS-SH
    - Remote command

### RF03-SN Sensor specification – Standard model

- **Cross-sectional drawing A-A**
- **Manual operation screw** (both sides)

**Note:**
- This drawing is output under the conditions below:
  - Bearing: Standard
  - Torque: High torque

**Note 2.** The minimum bending radii of the motor cable and sensor cable are R30.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-sectional drawing A-A</td>
<td>Width: 1.25 Depth 8</td>
</tr>
</tbody>
</table>

For details, please refer to the TRANSERVO Series User’s Manual.
RF03-S  Sensor specification – High rigidity model

1 Table movable range by return-to-origin operation. Be careful not to interfere with the workplace or equipment around the table.
2 The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User’s Manual and change the origin coordinates.

Manual operation screw (both sides)

Cross-sectional drawing A-A

Weight (kg) 1.3

Note 1. This drawing is output under the conditions below.
Bearing: High rigidity
Torque: Standard/High torque
Note 2. The minimum bending radii of the motor cable and sensor cable are R30.
RF04-N  Rotary type / Limit rotation specification

Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Return-to-origin method</th>
<th>Torque</th>
<th>Cable entry location</th>
<th>Rotation direction</th>
<th>Cable length</th>
<th>Set width</th>
<th>Shaft diameter</th>
<th>Output screw</th>
<th>Manual operation screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF04</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Basic specifications

- Motor: 42 [Step motor]
- Resolution (Pulse/rotation): 20480
- Repeatability [%]: +0.05
- Drive method: Special warm gear + belt
- Torque type: Standard / High torque
- Maximum speed: 420 / 280 [°/sec]
- Rotating torque: 6.6 / 10 [N•m]
- Max. pushing torque: 3.3 / 5 [N•m]
- Max. moment of inertia: 0.04 / 0.1 [kg•m²]
- Cable length: Standard / Option 3, 5, 10
- Rotation range: 320°

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the "Moment of Inertia vs. Acceleration/Deceleration" graph and the "Effective torque vs. Speed" graph (reference).
Note 3. For moment of inertia and effective torque details, see P.604.

Moment of inertia Acceleration/deceleration

Effective torque vs. speed

Allowable load

- Allowable load (N): Standard model / High rigidity model
- Allowable Moment (N•m): Standard model / High rigidity model

Controller

- Controller: TS-S2 / TS-SH / TS-SD
- Operation method: I/O point trace / Remote command / Pulse train control

Note 1. This drawing is output under the conditions below.
- Bearing: Standard
- Torque: Standard / High torque
- Note 2. The minimum bending radius of the motor cable is R30.

RF04-NN  Limit rotation specification – Standard model

- Stroke and Origin position in CCW rotation direction
- Origin position in CCW rotation direction
- Origin mark
- Manual operation screw (both sides)
- Cross-sectional drawing A-A

Weight (kg): 2.2

Note 1. This drawing is output under the conditions below.
- Bearing: Standard
- Torque: Standard

Note 2. The minimum bending radius of the motor cable is R30.

Controller: TS-S2 > 490 | TS-SH > 490 | TS-SD > 500
RF04-NH  Limit rotation specification – High rigidity model

1. Table movable range by return-to-origin operation.
   Be careful not to interfere with the workpiece or equipment around the table.

2. Return-to-origin position
   *3 Values and characters in [ ] show those when the return-to-origin direction is changed.

Note 1. This drawing is output under the conditions below.
   Bearing: High rigidity
   Torque: Standard/High torque

Note 2. The minimum bending radius of the motor cable is R30.
### RF04-S  Rotary type / Sensor specification

#### Ordering method

**RF04**

- **Model**
- **Return-to-origin method**
  - Standard (Limitless rotation)
- **Drive method**
  - Step motor
- **Resolution (Pulse/rotation)**
  - 4200
- **Repeatability**
  - 1/0.05
- **Torque type**
  - Standard
  - High torque
- **Maximum speed**
  - 420°/sec
- **Rotating torque**
  - 6.6 Nm
- **Max. pushing torque**
  - 3.3 Nm
- **Backlash**
  - +/- 0.5°
- **Max. moment of inertia**
  - 0.04 kg m²
- **Cable length**
  - Standard: 1/Option: 3, 5, 10
- **Rotation range**
  - 360°

#### Basic specifications

<table>
<thead>
<tr>
<th>Motor</th>
<th>Resolution (Pulse/rotation)</th>
<th>Repeatability</th>
<th>Drive method</th>
<th>Torque type</th>
<th>Maximum speed</th>
<th>Rotating torque</th>
<th>Max. pushing torque</th>
<th>Backlash</th>
<th>Max. moment of inertia</th>
<th>Cable length</th>
<th>Rotation range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4200</td>
<td>1/0.05</td>
<td>Step motor</td>
<td>Standard</td>
<td>420°/sec</td>
<td>6.6 Nm</td>
<td>3.3 Nm</td>
<td>+/- 0.5°</td>
<td>0.04 kg m²</td>
<td>Standard: 1</td>
<td>360°</td>
</tr>
</tbody>
</table>

#### Moment of inertia / Acceleration/deceleration

<table>
<thead>
<tr>
<th>I (kg m²)</th>
<th>Acceleration (°/s²)</th>
<th>Deceleration (°/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>314</td>
<td>700</td>
<td>1200</td>
</tr>
<tr>
<td>378</td>
<td>1000</td>
<td>2000</td>
</tr>
</tbody>
</table>

#### Effective torque vs. speed

![Effective torque vs. speed graph](image)

#### Allowable load

<table>
<thead>
<tr>
<th>Allowable radial load (N)</th>
<th>Allowable thrust load (N)</th>
<th>Allowable moment (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard model</td>
<td>High rigidity model</td>
<td>Standard model</td>
</tr>
<tr>
<td>314</td>
<td>1000</td>
<td>1200</td>
</tr>
<tr>
<td>378</td>
<td>1000</td>
<td>2000</td>
</tr>
</tbody>
</table>

#### Controller

- **Controller Operation method**
  - TS-S2S
  - TS-SHS
  - I/O point trace
  - Remote command

### RF04-SN  Sensor specification – Standard model

**Note:**
- For moment of inertia and effective torque details, refer to the TRANSERVO Series User’s Manual.
- For moment of inertia vs. Acceleration/Deceleration and Effective torque vs. Speed graphs, see P.604.

**Note:**
- 1. The robot cable is flexible and resists bending.
- 2. The maximum speed may vary depending on the load.
- 3. Positioning repeatability in one direction.
- 4. The maximum speed may vary depending on the moment of inertia. Check the maximum speed while referring to the “Moment of inertia vs. Acceleration/Deceleration” and the “Effective torque vs. Speed” graph (reference).

**Note:**
- 1. This drawing is output under the conditions below.
  - Torque: Standard/High torque
  - Controller acceleration:
  - Operation method: TS-S2S
  - I/O point trace
  - Remote command

**Controller**

- **Controller**
  - TS-S2S
  - TS-SHS
  - I/O point trace
  - Remote command

**Weight (kg):**

- 2.3 kg

**Note:**
- 1. This drawing is output under the conditions below.
  - Torque: Standard/High torque
  - Controller acceleration:
  - Operation method: TS-S2S
  - I/O point trace
  - Remote command

**Note:**
- 2. The minimum bending radii of the motor cable and sensor cable are R30.
RF04-S  Sensor specification – High rigidity model

1. Table movable range by return-to-origin operation. Be careful not to interfere with the workplace or equipment around the table.
2. The return-to-origin position may differ from that shown in this drawing. To align with the position shown in this drawing, refer to the TS Series User’s Manual and change the origin coordinates.

Note 1. This drawing is output under the conditions below.
- Bearing: High rigidity
- Torque: Standard/High torque

Note 2. The minimum bending radii of the motor cable and sensor cable are R30.

Weight (kg) 2.5

Controller TS-S2 ▶ 490 TS-SH ▶ 490
Articulated robots
YA
Compact
single-axis robots
TRANSERVO
Single-axis robots
FLIP-X
Linear motor
single-axis robots
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SCARA
robots
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robots
YP-X
CLEAN
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Linear conveyor
modules
LCM100
[166]
Controller
TS-S2
TS-SH
TS-SD
BD04
Belt type

CE compliance

Ordering method

BD04 48 N N

Model

Lead (mm)

Brake

Origin position

Stroke

Unit

100mm

300/500/600/700/800/900/1000

Motor

28 Step motor

Resolution (Pulse/rotation)

4096

Repeatability (mm)

+/-0.1

Drive method

Belt

Equivalent lead (mm)

1100

Maximum speed (mm/sec)

48

Maximum payload (kg)

1

Stroke (mm)

300/500/600/700/800/900/1000

Overall length (mm)

Stroke + 195.5

Maximum outside dimension of body cross-section (mm)

W40 × H101.9

Note 1. Positioning repeatability in one direction. Note 2. The maximum speed needs to be changed in accordance with the payload. See the “Speed vs. payload” graph shown on the right.

Allowable overhang Note

Horizontal installation (Unit: mm)

Wall installation (Unit: mm)

Payload (kg)

Speed (mm/sec)

0

0.2

0.4

0.6

0.8

1

0

200

400

600

800

1200

0

1

2

3

4

5

6

7

Horizontal (m)

Vertical (m)

Controller Operation method

TS-S2

TS-SH

TS-SD

Remote command

Pulse train control

Note 1. The robot cable is flexible and resists bending. Note 2. See P.498 for DIN rail mounting bracket. Note 3. Select this selection when using the gateway function. For details, see P.60.

Basic specifications

Motor

28 Step motor

Resolution (Pulse/rotation)

4096

Repeatability (mm)

+/-0.1

Drive method

Belt

Equivalent lead (mm)

1100

Maximum speed (mm/sec)

48

Maximum payload (kg)

1

Stroke (mm)

300/500/600/700/800/900/1000

Overall length (mm)

Stroke + 195.5

Maximum outside dimension of body cross-section (mm)

W40 × H101.9

Note 1. Positioning repeatability in one direction. Note 2. The maximum speed needs to be changed in accordance with the payload. See the “Speed vs. payload” graph shown on the right.

Allowable overhang Note

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Horizontal (m)

Vertical (m)

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TS-S2

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Note 1. The robot cable is flexible and resists bending. Note 2. See P.498 for DIN rail mounting bracket. Note 3. Select this selection when using the gateway function. For details, see P.60.
Articulated robots

Compact single-axis robots

TRANSERVO Single-axis robots

FLIP-X Linear motor single-axis robots

PHASER Cartesian robots

XY-X SCARA robots

YK-X Pick & place robots

YP-X Pick & place robots

CLEANCONTROLLERINFORMATION

Linear conveyor modules

LCM100

Controller

TS-S2

TS-SH

TS-SD

Motor

42 Step motor

Resolution (Pulse/rotation)

20480

Repeatability hmax (mm)

+/-0.1

Drive method

Belt

Equivalent lead (mm)

48

Maximum payload (kg)

5

Stroke (mm)

300/500/600/700/800/900/1000/1200/1500/1800/2000

Overall length (mm)

Stroke + 241.8

Maximum outside dimension of body cross-section (mm)

W58 × H123

Cable length (m)

Standard: 1 / Option: 3, 5, 10

Controller Operation method

TS-S2 I/O point trace / Remote command

TS-SH Pulse train control

TS-SD

Motor

42

Step motor

Resolution (Pulse/rotation)

20480

Repeatability hmax (mm)

+/-0.1

Drive method

Belt

Equivalent lead (mm)

48

Maximum payload (kg)

5

Stroke (mm)

300/500/600/700/800/900/1000/1200/1500/1800/2000

Overall length (mm)

Stroke + 241.8

Maximum outside dimension of body cross-section (mm)

W58 × H123

Cable length (m)

Standard: 1 / Option: 3, 5, 10

Controller Operation method

TS-S2 I/O point trace / Remote command

TS-SH Pulse train control

TS-SD

Controller

TS-S2

TS-SH

TS-SD

Note 1. Positioning repeatability in one direction.

Note 2. The maximum speed needs to be changed in accordance with the payload.

See the “Speed vs. payload” graph shown on the right.

Controller

TS-S2

TS-SH

TS-SD

Belt type

BD05

CE compliance

Ordering method

BD05  48  N  N

Model  Lead  Brake  Origin position  Stroke  Cable length

48: 48mm  N: No brake  N: Standard

48: 48mm  N: No brake  N: Standard

Controller

TS-S2

TS-SH

TS-SD

Controller

Operation method

TS-S2

I/O point trace / Remote command

TS-SH

Pulse train control

TS-SD

Controller

TS-S2

TS-SH

TS-SD

Controller

TS-S2

TS-SH

TS-SD

Basic specifications

Motor

42

Step motor

Resolution (Pulse/rotation)

20480

Repeatability hmax (mm)

+/-0.1

Drive method

Belt

Equivalent lead (mm)

48

Maximum payload (kg)

5

Stroke (mm)

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Overall length (mm)

Stroke + 241.8

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W58 × H123

Cable length (m)

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Controller Operation method

TS-S2 I/O point trace / Remote command

TS-SH Pulse train control

TS-SD

Note 1. The robot cable is flexible and resists bending.

Note 2. See P.498 for DIN rail mounting bracket.

Note 3. Select this selection when using the gateway function. For details, see P.60.

Note 1. Positioning repeatability in one direction.

Note 2. The maximum speed needs to be changed in accordance with the payload.

See the “Speed vs. payload” graph shown on the right.

Note 1. Position from both ends to the mechanical stopper. (Movable range during return-to-origin)

Note 2. When installing using the main unit installation reference surface, make the mating or positioning height 2mm or more higher than the reference surface since the R-chamfering is provided on the main unit. (Recommended height, 5mm)

Note 3. The minimum bending radius of the motor cable is R30.
**Ordering method**

**Basic specifications**

- **Motor**
  - Stepper motor
- **Resolution (Pulse/rotation)**
  - 20480
- **Repeatability**
  - +/-0.1
- **Drive method**
  - Belt
- **Equivalent lead (mm)**
  - 48
- **Maximum speed (mm/sec)**
  - 1500
- **Maximum payload (kg)**
  - 3kg: 5767, 353 1247
  - 8kg: 1839, 458
  - 14kg: 629, 254
- **Overall length (mm)**
  - 300/500/600/700/800/900/1000/1200/1500/1800/2000
- **Cable length (m)**
  - Standard: 1 / Option: 3, 5, 10
- **Static loading moment**
  - 48 N
- **Effective stroke**
  - 87.6 (Note 1)
- **Effective stroke**
  - 135 (Note 1)
- **Static loading moment**
  - 4kg: 5767, 353 1247
  - 8kg: 1839, 458
- **Motor type**
  - TS-S2

**Allowable overhang**

- **Horizontal installation**
  - Stroke + 285.6
- **Wall installation**
  - Stroke + 285.6

**Speed vs. payload**

- **Payload**
  - 14: 50 kg/sec
  - 9: 25 kg/sec
  - 4: 1000 kg/sec
  - 0.5: 1500 kg/sec

**Controller**

- **Controller Operation method**
  - TS-S2: I/O point trace / Remote command
  - TS-SH: Remote command
  - TS-SD: Pulse train control
  - Controller: Operation method
  - TS-S2: I/O point trace / Remote command
  - TS-SH: TS-SH
  - TS-SD: TS-SD
  - Robot driver I/O cable
  - Controller I/O cable
  - Robot positioner I/O
  - Robot positioner I/O

**Quick reference**

- **PayLoad**
  - 14: 50 kg/sec
  - 9: 25 kg/sec
  - 4: 1000 kg/sec
  - 0.5: 1500 kg/sec

**CE compliance**

- **Articulated robots**
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- **YP-X CLEAN CONTROLLER INFORMATION**
- **Linear conveyor modules**
- **LCM100**

**Note 1.** The robot cable is flexible and resists bending.
**Note 2.** Position from both ends to the mechanical stopper. (Movable range during return-to-origin)
**Note 3.** Select this selection when using the gateway function. For details, see P.60.