SINGLE-AXIS ROBOTS

General-purpose single-axis robots can be used for various applications, such as assembly and inspection work. 6 types and 28 models ranging from compact size to long-stroke robots are available.

Various custom specifications are also supported.
Various custom specifications, such as double-slider and wide slider are also supported. For details, please consult YAMAHA.
Six types with high reliability and durability

**T type Frame-less structure model**  P.198
- Double appeal of compact body and low price.
- Ideal in applications as an actuator directly installed on an installation base.

**R type Rotation axis model**  P.236
- Repeated positioning accuracy +/- 0.01 mm
- Maximum payload 80 kg
- Double-carrier available as a standard

**N type Nut rotation type model**  P.222
- Repeated positioning accuracy +/- 0.01 mm
- Maximum payload 80 kg
- Double-carrier available as a standard

**B type Timing belt drive model**  P.230
- Maximum stroke is 3050 mm. Long-distance transfer between the processes is possible.

**F type Model with high rigidity frame**  P.205
- Tolerable load moment is large and highly resistant to the offset load.
- Suitable for Cartesian robots needing rigid arm or moving arms that move the entire axis.

**GF type Long stroke model with high rigidity frame**  P.214
- Movable at 1200 mm/sec in the whole area without critical speed.
- Suitable for long distance transfer.
FLIP-X Series
Product Lineup

**POINTER 1**

4-row circular arc groove type 2-point contact guide that is resistant to large moment load is adopted.\(^1\)

4-row circular arc groove type 2-point contact guide with less differential slip is used for the linear guide. This guide has less ball differential slip due to its structure when compared to the 2-row Gothic arch type 4-point contact guide and maintains a satisfactory rolling movement even if a large moment load is applied or the installation surface precision is poor. The guide has characteristics that are difficult to malfunction, such as unusual wear and provides excellent reliability.

Note 1. Except for T4L/T4LH and T5L/T5LH

**F/N/B type**\(^2\)

For the F type, N type, and B type, two guide frames are laid out on the high rigidity aluminum extruded material frame. Two bearing units per rail, four bearing units in total, support a large load firmly. As a large moment load is mainly converted into vertical force, the moment applied to one bearing unit becomes small to ensure excellent durability.

Note 2. Except for F8 series/F10/B10.

**F8 series**

The F8 series uses a newly developed module guide to greatly reduce the cross-sectional area (70 % when compared to F10). The rail is laid out in the full width of the frame to ensure the high rigidity even with compact design. Of course, this series also uses the 4-row circular arc groove type 2-point contact guide.

**POINTER 2**

Resolver with excellent environment resistance is used for the position detector.

A resolver is used for the position detector. The resolver has a simple and rigid structure without using electronic components and optical elements. Detection problems due to electronic component breakdown, dew condensation on or oil sticking to the disk that may occur in optical encoders do not occur in the resolver. The resolver provides excellent durability. Additionally, as the absolute specifications and incremental specifications use the same mechanical specifications and common controller, desired specifications can be selected only by setting parameters. Furthermore, even when the absolute battery is consumed completely, the robot can still operate as the incremental specifications. So, even if a trouble occurs, the line stop is not needed to ensure the safe production line. Furthermore, the backup circuit has been completely renovated and now has a backup period of one year in the non-energizing state.
POINT 3

Long service life greatly reduces the maintenance cost.

As the acceleration is determined by the weight parameter, the service life can be assured when the weight and position of center of gravity are known.

As YAMAHA’s robot uses high rigidity ball screw or guide, it provides excellent durability. This greatly contributes to reduction of the customer’s maintenance cost.

![Allowable overhang](image)

<table>
<thead>
<tr>
<th>Horizontal installation (Unit: mm)</th>
<th>Vertical installation (Unit: mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>15kg</td>
<td>516</td>
</tr>
<tr>
<td>18kg</td>
<td>572</td>
</tr>
<tr>
<td>20kg</td>
<td>619</td>
</tr>
</tbody>
</table>

Note. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

As YAMAHA’s robot uses high rigidity ball screw or guide, it provides excellent durability. This greatly contributes to reduction of the customer’s maintenance cost.

POINT 4

Controllers suitable for applications are prepared.

In addition to the robot program operation and pulse train control, a positioner that is operated by specifying a point number was added to the product lineup. Additionally, multi specifications that control multiple robots using one controller are also supported. You can select an optimal controller suitable for your application.

![Program](image)

<table>
<thead>
<tr>
<th>Program</th>
<th>I/O point trace (Positioner)</th>
<th>Pulse-train control</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1-X</td>
<td>P540</td>
<td>P528</td>
</tr>
<tr>
<td>RCX320</td>
<td>P548</td>
<td></td>
</tr>
<tr>
<td>RCX222</td>
<td>P558</td>
<td></td>
</tr>
<tr>
<td>RCX340</td>
<td>P566</td>
<td></td>
</tr>
<tr>
<td>TS-X</td>
<td>P514</td>
<td></td>
</tr>
</tbody>
</table>

POINT 5

Various custom specifications are supported.

YAMAHA supports custom orders flexibility to meet the customers’ various needs.

<table>
<thead>
<tr>
<th>Addition of free slider</th>
<th>Free slider is added. Various applications, such as rigidity increase or use of two heads are supported.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide slider</td>
<td>To increase the slider rigidity, the standard slider is processed to the wide slider.</td>
</tr>
<tr>
<td>Specified stroke</td>
<td>A stroke smaller than the minimum stroke may be supported. For details, please consult YAMAHA.</td>
</tr>
<tr>
<td>Lead beyond catalog</td>
<td>The lead may be changed to that not stated in the catalog. For details, please consult YAMAHA.</td>
</tr>
<tr>
<td>Origin non-motor</td>
<td>Even when not stated in the catalog, the origin may be changed to the non-motor side. For details, please consult YAMAHA.</td>
</tr>
<tr>
<td>specifications</td>
<td></td>
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</tbody>
</table>

YAMAHA has a wide variety of custom order results other than those shown above. If you have any requirement or request, please feel free to contact YAMAHA.
### FLIP-X Series Product Lineup

<table>
<thead>
<tr>
<th>Type</th>
<th>Size (mm)</th>
<th>Model</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><strong>T type</strong></td>
<td>W45 × H53</td>
<td>T4L/T4LH</td>
<td>12</td>
<td>4.5</td>
<td>1.2</td>
<td>720</td>
<td>50 to 400</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>6</td>
<td>2.4</td>
<td>360</td>
<td>T4LH: P.199</td>
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<tr>
<td></td>
<td>W55 × H52</td>
<td>T5L/T5LH</td>
<td>20</td>
<td>3</td>
<td>-</td>
<td>1200</td>
<td>50 to 800</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>5</td>
<td>1.2</td>
<td>800</td>
<td>T5LH: P.201</td>
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<tr>
<td></td>
<td>W65 × H56</td>
<td>T6L</td>
<td>20</td>
<td>10</td>
<td>-</td>
<td>1333</td>
<td>50 to 800</td>
</tr>
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<td>12</td>
<td>12</td>
<td>4</td>
<td>800</td>
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<tr>
<td></td>
<td>W94 × H58</td>
<td>T9 (Standard)</td>
<td>30</td>
<td>15</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9H (High thrust)</td>
<td>30</td>
<td>25</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td>W80 × H65</td>
<td>F8</td>
<td>20</td>
<td>12</td>
<td>-</td>
<td>1200</td>
<td>150 to 800</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>20</td>
<td>4</td>
<td>720</td>
<td></td>
</tr>
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<td></td>
<td>W80 × H65</td>
<td>F8L</td>
<td>30</td>
<td>7</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>20</td>
<td>4</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>W80 × H65</td>
<td>F8LH</td>
<td>5</td>
<td>50</td>
<td>16</td>
<td>300</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td>W110 × H71</td>
<td>F10 (Standard)</td>
<td>30</td>
<td>15</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F10H (High thrust)</td>
<td>30</td>
<td>25</td>
<td>-</td>
<td>1800</td>
<td>150 to 1000</td>
</tr>
<tr>
<td></td>
<td>W136 × H63</td>
<td>F14 (Standard)</td>
<td>30</td>
<td>15</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F14H (High thrust)</td>
<td>30</td>
<td>25</td>
<td>-</td>
<td>1800</td>
<td>150 to 1050</td>
</tr>
<tr>
<td></td>
<td>W168 × H100</td>
<td>F17L</td>
<td>50</td>
<td>50</td>
<td>10</td>
<td>2200</td>
<td>1100 to 2050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F17</td>
<td>40</td>
<td>40</td>
<td>-</td>
<td>2400</td>
<td>200 to 1450</td>
</tr>
<tr>
<td></td>
<td>W202 × H115</td>
<td>F20</td>
<td>40</td>
<td>60</td>
<td>-</td>
<td>2400</td>
<td>200 to 1450</td>
</tr>
<tr>
<td></td>
<td>W202 × H120</td>
<td>F20N</td>
<td>20</td>
<td>80</td>
<td>-</td>
<td>1200</td>
<td>1150 to 2050</td>
</tr>
<tr>
<td><strong>F type</strong></td>
<td>W140 × H91.5</td>
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<td>20</td>
<td>45</td>
<td>-</td>
<td>1200</td>
<td>750 to 2000</td>
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<tr>
<td></td>
<td>W168 × H105.5</td>
<td>GF17XL</td>
<td>20</td>
<td>90</td>
<td>-</td>
<td>1200</td>
<td>850 to 2500</td>
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<tr>
<td><strong>N type</strong></td>
<td>W145 × H120</td>
<td>N15 (Single-carrier)</td>
<td>20</td>
<td>50</td>
<td>-</td>
<td>1200</td>
<td>500 to 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N15D (Double-carrier)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>2250</td>
<td>250 to 1750</td>
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<tr>
<td></td>
<td>W180 × H115</td>
<td>N18 (Single-carrier)</td>
<td></td>
<td>80</td>
<td>-</td>
<td>1200</td>
<td>500 to 2500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N18D (Double-carrier)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>2250</td>
<td>250 to 2250</td>
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<td><strong>B type</strong></td>
<td>W100 × H81</td>
<td>B10 Belt drive</td>
<td>10</td>
<td>10</td>
<td>-</td>
<td>1875</td>
<td>150 to 2550</td>
</tr>
<tr>
<td></td>
<td>W146 × H94</td>
<td>B14 (Standard)</td>
<td>20</td>
<td>20</td>
<td>-</td>
<td>1875</td>
<td>150 to 3050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B14H (High thrust)</td>
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<td>30</td>
<td>-</td>
<td>1875</td>
<td>B14H: P.234</td>
</tr>
<tr>
<td><strong>R type</strong></td>
<td>-</td>
<td>R5</td>
<td>60</td>
<td>-</td>
<td>0.12 kgm²</td>
<td>-</td>
<td>360 °/sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R10</td>
<td>60</td>
<td>-</td>
<td>0.36 kgm²</td>
<td>-</td>
<td>360 °</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R20</td>
<td>60</td>
<td>-</td>
<td>1.83 kgm²</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note 1: The size shows approximate maximum cross sectional size.
This robot has multi specifications that control multiple robots using one controller.

### Advantages of control with multi-axis controller
- Sequence control is easy. System upgrades are easy at less expensive price.
- Compact and space saving when compared to the operation with multiple single-axis controllers.
- More advanced control is possible.
- RCX320, RCX221 and RCX340 provide mixed control of the FLIP-X series and PHASER series (linear single-axis).

### Multi-robot ordering method
Up to 8 units can be controlled.

#### MLTX
- **1st unit**
  - **1st unit robot type**
  - **Multi-robot model prefix**
- **2nd unit**
  - **2nd unit robot type**
- **3rd unit**
  - **3rd unit robot type**

Note 1. When ordering a multi-robot, prefix “MLTX” to the top of the order model.
Note 2. Select either MULTI-FLIP or MULTI-PHASER shown below.
Note 3. For details about the controller and controller option models, please refer to relevant page of each controller.

### MULTI-FLIP

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Lead (mm)</th>
<th>Stroke (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T type</td>
<td>Frame-less structure model</td>
<td>T4L/T4LH</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T5L/T5LH</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T6L</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9 (Standard)</td>
<td>20</td>
</tr>
<tr>
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<td>T9H (High thrust)</td>
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<td></td>
<td></td>
<td>F8</td>
<td>12</td>
</tr>
<tr>
<td></td>
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<td>F8L</td>
<td>12</td>
</tr>
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<td></td>
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<td>F8LH</td>
<td>12</td>
</tr>
<tr>
<td></td>
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<td>F10 (Standard)</td>
<td>20</td>
</tr>
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<td></td>
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<td>F10H (High thrust)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F14 (Standard)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F14H (High thrust)</td>
<td>20</td>
</tr>
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<td></td>
<td></td>
<td>F17L</td>
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<td>F20N</td>
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<td>Nut rotation type model</td>
<td>GF14XL</td>
<td>20</td>
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<td>GF17XL</td>
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<td>Timing belt drive model</td>
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<td>Belt drive</td>
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<td></td>
<td>B14 (Standard)</td>
<td>Belt drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B14H (High thrust)</td>
<td>Belt drive</td>
</tr>
<tr>
<td>R type</td>
<td>Rotation axis model</td>
<td>R5</td>
<td>360°</td>
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<tr>
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<td>R20</td>
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### MULTI-PHASER

<table>
<thead>
<tr>
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<th>Model</th>
<th>Lead (mm)</th>
<th>Stroke (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF type</td>
<td>Flat type with core Linear motor specifications</td>
<td>C4L</td>
<td>12</td>
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<td>C4LH</td>
<td>6</td>
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<td></td>
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<td>C5L</td>
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<td>C6LH</td>
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<td>C8L</td>
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<td>C8LH</td>
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<td></td>
<td>C10</td>
<td>20</td>
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<tr>
<td></td>
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<td>C10H</td>
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<td>C17</td>
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<td>C20</td>
<td>20</td>
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<tr>
<td>N type</td>
<td>Nut rotation type model</td>
<td>N15 (Single-carrier)</td>
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<tr>
<td></td>
<td></td>
<td>N15D (Double-carrier)</td>
<td>20</td>
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<td></td>
<td></td>
<td>N18 (Single-carrier)</td>
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<td></td>
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<td>N18D (Double-carrier)</td>
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<tr>
<td>R type</td>
<td>Rotation axis model</td>
<td>R10</td>
<td>Belt drive</td>
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<td>R14H (High thrust)</td>
<td>Belt drive</td>
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</table>

### Table Note
- Note 1: Controller models: RCX320, RCX221, RCX340
- Note 2: Model prefixes: MLTX, MLTX1, MLTX2, MLTX3
- Note 3: For details about controller and controller option models, please refer to relevant page of each controller.
## Robot settings

### 2-robot settings

Use of 2-robot settings and multi-task program makes it possible to perform asynchronous independent operation. As the auxiliary axis setting is used together, more free axis assignment can be made.

### Double-carrier

In robot types that the motor runs separately, such as linear motor single-axis PHASER series or N type (nut rotation type) of FLIP-X series, two motors can be added to one axis.

### Main auxiliary axis setting

This auxiliary axis setting is used when it is inconvenient that two axes move simultaneously by the MOVE command. The axis set for the main auxiliary axis does not operate by the MOVE command and it operates only by the DRIVE command (movement command in axis units). This setting is recommended for the axis that needs to be operated asynchronously from the main robot.

### Dual setting

This setting is used when performing the dual drive (2-axis synchronous control). This setting is used when the gantry type Cartesian robot with a long Y-axis stroke stabilizes the high acceleration/deceleration or when a high load or high thrust is needed.

## Applicable controllers

<table>
<thead>
<tr>
<th>Name</th>
<th>1 to 2 axes controller</th>
<th>1 to 2 axes controller</th>
<th>1 to 4 axes controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>RCX320</td>
<td>RCX221</td>
<td>RCX222</td>
</tr>
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<td></td>
<td>P548</td>
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<td>P558</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P566</td>
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<tr>
<td>Position detection</td>
<td>Incremental/Absolute</td>
<td>Incremental</td>
<td>Absolute</td>
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<td></td>
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<td>Incremental/Absolute</td>
</tr>
<tr>
<td>Control model</td>
<td>FLIP-X and PHASER can</td>
<td>FLIP-X and PHASER can</td>
<td>FLIP-X</td>
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<tr>
<td></td>
<td>be mixed.</td>
<td>be mixed.</td>
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<td>100 programs</td>
<td>100 programs</td>
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<td></td>
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<tr>
<td>Number of input/output</td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td>points</td>
<td>Dedicated input 8 points/ dedicated output 9 points General-purpose input 16 points/ general-purpose output 8 points</td>
<td>Dedicated input 10 points/ dedicated output 12 points General-purpose input 16 points/ general-purpose output 8 points</td>
<td>Dedicated input 8 points/ dedicated output 9 points General-purpose input 16 points/ general-purpose output 8 points</td>
</tr>
<tr>
<td></td>
<td>Expansion</td>
<td>Expansion</td>
<td>Expansion</td>
</tr>
<tr>
<td></td>
<td>General-purpose input 24 points/ general-purpose output 16 points</td>
<td>General-purpose input 24 points/ general-purpose output 16 points</td>
<td>General-purpose input 24 points/ general-purpose output 16 points</td>
</tr>
<tr>
<td>Network option</td>
<td>CC-Link, DeviceNet™, Ethernet, PROFIBUS, PROFINET, EtherCAT</td>
<td>CC-Link, DeviceNet™, PROFIBUS</td>
<td>CC-Link, DeviceNet™, Ethernet, PROFIBUS, PROFINET, EtherCAT</td>
</tr>
</tbody>
</table>
Examples of multi-robot ordering methods

Separate single axes

<Example> F14H and F10 are installed separately.

\[
\begin{align*}
\text{MLTX - F14H - 20 - U - 500} & & \text{1st unit} \\
\text{- F10 - 20 - 300} & & \text{2nd unit} \\
\text{- 5K - RCX222 - N - N1} & & \text{Controller}
\end{align*}
\]

2 axes + 1 axis

<Example> T6 is installed on the base for the 1st axis, C6 is secured to the upper portion for the 2nd axis, and CH4 is secured to the upper portion for the 3rd axis to assemble the C6 and C4H to the XZ. (Either 2 axes + 1 axis or 3 axes simultaneous control can be made by the setting.)

\[
\begin{align*}
\text{MLTX - T6 - 6 - 300} & & \text{1st unit} \\
\text{- C6 - 6 - 300} & & \text{2nd unit} \\
\text{- C4H - 6 - BK - 100} & & \text{3rd unit} \\
\text{- 3K - RCX240S - N - BB} & & \text{Controller}
\end{align*}
\]

3 axes combination

<Example> C17L, C14H, and C14H are used for the X-axis, Y-axis, and Z-axis, respectively to form a 3-axis XYZ combination.

\[
\begin{align*}
\text{MLTX - C17L - 50 - Z - 1500} & & \text{1st unit} \\
\text{- C14H - 20 - 450} & & \text{2nd unit} \\
\text{- C14H - 10 - BK - 150} & & \text{3rd unit} \\
\text{- 3K - RCX240 - R - N - BB} & & \text{Controller}
\end{align*}
\]

Double-carrier

Example of 4-axis control

<Example> Two T6 are assembled to the double-carrier of the MF20A, and they are used as XZ type and controlled using one controller.

\[
\begin{align*}
\text{MLTX - MF20AD - W - M - 850} & & \text{1st unit} \\
\text{- T6 - 12 - BK - 100} & & \text{2nd unit} \\
\text{- T6 - 12 - BK - 100} & & \text{3rd unit} \\
\text{- 3K - RCX240S - N - BB} & & \text{Controller}
\end{align*}
\]

Double-carrier/dual drive (2-axis simultaneous control)

Example of 8-axis control

<Example> Two double-carriers of the MF30 are arranged in parallel and two MF20 installed on the top are moved by the dual-drive. T6 is attached to each tip of the MF20 and the robots are controlled using two controllers.

\[
\begin{align*}
\text{MLTX - MF30D - H - L - 950} & & \text{1st unit} \\
\text{- MF30D - H - L - 950} & & \text{2nd unit} \\
\text{- MF20 - H - 1350} & & \text{3rd unit} \\
\text{- T6 - 6 - BK - 100} & & \text{4th unit} \\
\text{- MF20 - H - 1350} & & \text{5th unit} \\
\text{- T6 - 6 - BK - 100} & & \text{6th unit} \\
\text{- 3K - RCX240 - R - N} & & \text{Controller}
\end{align*}
\]

CAUTION

Conditions needing regenerative unit on multi-robot

- The total motor capacity exceeds 450 W.
- The total motor capacity of the vertical axis exceeds 240 W.
- The B14H performs the operation at a maximum speed of more than 1250 mm/s.
- When the vertical axis is 240 W or less, the conditions shown below are satisfied.
  - There is a 200 W-vertical axis.
  - A 100 W-vertical axis has a stroke of 700 mm or more.
  - There are two 100 W-vertical axes with a 5 mm-lead.

Note. For this specification, when writing one controller model, two controller will be arranged automatically.
**FLIP-X terminology**

**High lead**
This term indicates models supporting ball screw leads that exceed the standard lead (12 mm or 20 mm). (The standard lead of the F17L and C17L is 50.)

**Origin on non-motor side**
This term indicates models that are applicable to the origin non-motor specifications as standard. The origin on the non-motor side in the standard state is not supported with a lead not stated in the catalog. If special specifications are needed, please consult YAMAHA.

**Maximum speed**
This term indicates the maximum transfer speed. YAMAHA’s single-axis robots can transfer a workpiece at this speed regardless of the transfer weight as long as it is within the maximum payload. However, as the workpiece is heavier, the acceleration/deceleration curve becomes gentle. If the movement distance is short, the speed does not reach the maximum speed stated in the catalog.

**CAUTION**
When the stroke of the ball screw drive type is long, noise or vibration is produced due to resonance of the ball screw if moved at the maximum speed. If this happens, lower the speed to that stated in the note column. (It is also possible to lower the transfer speed of the entire program using the SPEED setting or make the adjustment for each movement command.)

**Maximum payload**
This term indicates the maximum weight that can be loaded on the slider and transferred. Select an appropriate model so that the total weight of the customer’s tools (air cylinder or chuck) and workpiece is less than this data. When the center of gravity of the tool or workpiece is offset from the center of the slider, the allowable overhang needs to be taken into consideration. Additionally, when entering the total weight of the tool and workpiece for the payload parameter of the controller, optimal acceleration/deceleration and servo parameter are automatically set.

**Rated thrust**
This term indicates the force to be applied in the slider advancing direction in the slider stationary (hold) state. When using vertically, the weight of the loaded workpiece is subtracted from this value (when the force is applied downward from the top). The slider can move only at a low speed (approximately 10% of the maximum speed), but this value becomes lower than the specification value. Additionally, the type B of the timing belt drive cannot be used for applications, in which thrust is applied.

**Allowable overhang**
This term indicates an allowable overhang of an object to be transferred. In the specification data, this indicates the distance from the center of the top face of the slider to the center of gravity of an object to be transferred by the weight. This value is determined according to the service life of the linear guide. Under normal operation conditions, the 90% service life of the linear guide is 10,000 km or more if gravity centers of the workpiece and tool are kept within the allowable overhang. When using with an overhang amount exceeding the specification data, it is necessary to install a separate support guide or restrict operating conditions (speed, acceleration) so that a load is not applied to the linear guide of the single-axis robot. For detail, please consult YAMAHA.

![Note. Speed, acceleration 100% (It is preconditioned that the weight parameters are set correctly.) There shall be no impact load or excessive vibration during operation. Additionally, the alignment is correct.]

**Static tolerance moment**
This term indicates the load moment applied to the slider in the robot stationary state.

**Critical speed**
When the stroke of the ball screw drive type is long, noise or vibration is produced due to resonance of the ball screw if moved at the maximum speed. If this happens, lower the speed to that stated in the note column. (It is also possible to lower the transfer speed of the entire program using the SPEED setting or make the adjustment for each movement command.)
SINGLE-AXIS ROBOTS

FLIP-X SERIES

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<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Motor output (W)</th>
<th>Repeatability (mm)</th>
<th>Load (mm)</th>
<th>Payload (kg)</th>
<th>Stroke (mm) and maximum speed (mm/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vertical</td>
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<tr>
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<td>105</td>
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</tr>
</tbody>
</table>

#### Precautions for use

- **Handling**: Fully understand the contents stated in the "FLIP-X Series User's Manual" and strictly observe the handling precautions during operation.
- **Allowable installation ambient temperature**: 8 to 45°C
# Articulated Robots

- **YA**
- **Linear conveyor modules**
- **LCM100**
- **Compact single-axis robots**
- **TRANSERVO**
- **Motor-less single axis actuator**
- **Robonity**
- **Single-axis robots**
- **FLIP-X**
- **Linear motor single-axis robots**
- **PHASER**
- **Cartesian robots**
- **XY-X**
- **SCARA robots**
- **YK-X**
- **Pick & place robots**
- **YP-X**

## Specification Sheet

### Type Model

<table>
<thead>
<tr>
<th>Motor</th>
<th>Output (W)</th>
<th>Repeat ability (mm)</th>
<th>Lead (mm)</th>
<th>Payload (kg)</th>
<th>Stroke (mm) and Maximum Speed (mm/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Detailed info page

- **T type**
- **F type**
- **N type**
- **B/R type**
- **GF type**

### FLIP-X SPECIFICATION SHEET

*Detailed info page*
# Robot ordering method description

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

## [Example]

- **Mechanical > F8**
  - Lead  > 20mm
  - Brake  > Yes
  - Stroke  > 600mm
  - Origin position  > Non-motor side
  - Grease  > Standard
  - Cable length  > 3.5m

- **Controller > SR1-X**
  - Usable for CE  > Not required
  - Regenerative unit  > Not required
  - I/O selection  > NPN
  - Battery  > With battery

## Ordering method

### F8-20-BK-Z-500-3L-SR1-X05-N-B

### T type / F type (F8 / F8L / F8LH)

<table>
<thead>
<tr>
<th>Model</th>
<th>Last designation</th>
<th>Brake</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9L</td>
<td>F8</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>T9LH</td>
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<td>F8LH</td>
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<td></td>
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</tr>
<tr>
<td>T9B</td>
<td>F8LH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### F type (Except F8 / F8L / F8LH)

<table>
<thead>
<tr>
<th>Model</th>
<th>Last designation</th>
<th>Brake</th>
<th>Cable entry location</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>F10</td>
<td>F8</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>F10H</td>
<td>F8L</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>F14</td>
<td>F8LH</td>
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<td>F8L</td>
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<td>F17L</td>
<td>F8LH</td>
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</table>

### GF type

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Last designation</th>
<th>Cable entry location</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
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<tbody>
<tr>
<td>GF14XL</td>
<td>S</td>
<td>Straight model</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>GF17XL</td>
<td>H</td>
<td>Horizontal installation</td>
<td></td>
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</tbody>
</table>

### N type (Single carriage)

<table>
<thead>
<tr>
<th>Model</th>
<th>Last designation</th>
<th>Cable entry location</th>
<th>Cable specification</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>N15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### N type (Double carriage)

<table>
<thead>
<tr>
<th>Model</th>
<th>Last designation</th>
<th>Take out direction</th>
<th>Cable specification</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>N15D</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N18D</td>
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</tbody>
</table>

### B type

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor installation direction</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>B10</td>
<td>L, Motor leftward, horizontal position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B14</td>
<td>R, Motor rightward, horizontal position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B14H</td>
<td>L, Motor leftward, upper position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B15</td>
<td>R, Motor rightward, upper position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B16</td>
<td>L, Motor leftward, lower position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B16H</td>
<td>R, Motor rightward, lower position</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### R type

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable entry location</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Robot ordering method terminology

1. Model
   Enter the robot unit model.

2. Model
   Straight model only (GF type)

3. Lead designation
   Select the ball screw lead.

4. Brake
   Select Brake or No-brake.
   **Horizontal specs**: No-brake
   **Vertical specs**: with Brake

5. Take out direction
   Select what direction to install the robot (horizontal / wall mounted).

6. Cable entry location
   Select what direction to extract the robot cable connecting the robot and controller.

7. Cable carrier entry location
   Select what direction to install the robot (horizontal / wall mounted) and what direction to extract the robot cable carrier.

   - RH: Horizontal, right
   - RW: Wall, right
   - LH: Horizontal, left
   - LW: Wall, left

   **Note**: Be sure to install in the direction as specified (in cable carrier take-out direction drawing and various specification drawings) individually. Installation in any other way will cause a failure. For requirement of installation in any way other than the above standard installation, please consult YAMAHA as special arrangement will be available.

8. Cable carrier specification
   Select the cable carrier size for the customer wiring.

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard cable carrier</th>
<th>Optional cable carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>S type</td>
<td><img src="image1" alt="Cable Carrier Drawing" /></td>
<td><img src="image2" alt="Optional Cable Carrier Drawing" /></td>
</tr>
<tr>
<td>M type</td>
<td><img src="image3" alt="Cable Carrier Drawing" /></td>
<td><img src="image4" alt="Optional Cable Carrier Drawing" /></td>
</tr>
</tbody>
</table>

   **Note**: Cannot pass more than 3 urethane hoses (ϕ6 x 4).

9. Motor installation direction
   Select what direction to install the motor.

<table>
<thead>
<tr>
<th>Type</th>
<th>L type</th>
<th>R type</th>
<th>LU type</th>
<th>RU type</th>
<th>LD type</th>
<th>RD type</th>
</tr>
</thead>
<tbody>
<tr>
<td>L type</td>
<td>Leftward at horizontal position</td>
<td>Rightward at horizontal position</td>
<td>Leftward at upper position</td>
<td>Rightward at upper position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L type</td>
<td>Leftward at lower position</td>
<td>Rightward at lower position</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Option
    **Origin position change**: Origin point position can be changed.
    **Frame**: Hole to secure the frame can be selected. (Spot facing/tapping)
    **Grease type**: Clean grease can be selected.

11. Stroke
    Select the stroke for the robot movement range.

12. Cable length
    Select the robot cable length to use for connecting the robot to the controller.
    - 3L : 3.5m (Standard)
    - 5L : 5m
    - 10L : 10m
    - 1K : 1m  (You can select a 1m cable only when you use T4L/T5L. Flexible cable)
    - 3K : 3.5m (Flexible cable)
    - 5K : 5m (Flexible cable)
    - 10K : 10m (Flexible cable)
### Ordering method

**T4L**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead designation</th>
<th>Grade</th>
<th>Origin-position change</th>
<th>Grease type</th>
<th>Stroke</th>
<th>Cable length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4L</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **Controller**: 24V

---

### Specifications

- **AC servo motor output (W)**: 30
- **Repeatability (mm)**: ±0.02
- **Deceleration mechanism**: Ball screw 6/8
- **Ball screw lead (mm)**: 12, 6
- **Maximum speed (mm/sec)**: 720, 360, 120
- **Maximum payload (kg)**: 4.5, 6, 6
- **Rated thrust (N)**: 32, 64, 153
- **Linear guide type**: 2 rows of gothic arch grooves × 1 rail
- **Position detector**: Resolvers
- **Resolution (Pulse/rotation)**: 16384
- **Rated thrust (N)**: 32, 64, 153
- **payload (kg)**: 50 to 400 (50mm pitch)
- **Stroke (mm)**: 50 to 400 (50mm pitch)
- **Overall horizontal Stroke+198
- **Maximum dimensions of cross section of main unit (mm)**: W45 × H53
- **Cable length (m)**: 50 100 150 200 250 300 350 400

### Allowable overhang

- **Horizontal installation**: A 2kg 433 87 180 B 4.5kg 223 33 75 C 5kg 519 58 135
- **Wall installation**: A 2kg 149 54 376 B 4.5kg 50 1 148 C 5kg 107 24 380
- **Vertical installation**: A 2kg 125 125 125 125 B 4.5kg 125 125 125 125 C 5kg 125 125 125 125

### Static loading moment

- **MY**: 15, 19, 18
- **MP**: 56, 57
- **MR**: 72, 60

### Controller

- **Operation method**: Remote command / Programming / DO joint trace / Remote command / Operation using RS-232C communication

---

Note 1. The robot cable is flexible and resists bending. See P.614 for details on robot cable.

Note 2. Minimum bend radius of motor cable is 30mm.

Note 3. Weight of models with no brake. The weight of brake-attached models is 0.2 kg heavier than the models with no brake shown in the table.

Note 4. The under-head length of the hex socket-head bolt (M4×0.7) to be used for the installation work is 12mm or less.

Note 5. External view of T4LH is identical to T4L.
### Ordering method

**T4LH**

- **Model**
  - Lead A
  - Stroke 35
  - Grease type 260
  - Lead B
  - Stroke 35
  - Grease type 260

- **Driver**
  - Supply voltage: 200V
  - Power capacity: 100V / 200V

### Specifications

- **AC servo motor output (W)**: 30
- **Repeatability (mm)**: +/0.02
- **Deceleration mechanism**: Ball screw type
- **Rated thrust (N)**: 30
- **Overall length (mm)**: 1.2
- **Overall height (mm)**: 1.2
- **Max. dimensions of cross section of main unit (mm)**: W45 × H53
- **Linear guide type**: LM type
- **Position detector**: Resolvers
- **Resolution (Pulse/rotation)**: 10384

Note 1: Positioning accuracy: +/0.02
Note 2: Position detectors (resolvers) are common to incremental and absolute specifications.

### Allowable overhang

**Note**
- Distance from center of slider to center of gravity of object being carried at a guide service life of 10,000 km.
- Service life is calculated for 300mm stroke models.

### Static loading moment

**Note**
- The under-head length of the hex socket-head bolt (M4×0.7) to be used for the installation work is 12mm or less.

### Controller

**SR1-X**

- **Driver**
  - Power-supply voltage: 2AC200V
  - Power capacity: 100V / 200V

**RDV-X**

- **Driver**
  - Power-supply voltage: 2AC200V
  - Power capacity: 100V / 200V

**T4LH**

- **Effective stroke**
  - L: 248
  - A: 125.5
  - C: 125.5
  - D: 125.5

Note 1: Stop positions are determined by the mechanical stops at both ends.
Note 2: Minimum bend radius of motor cable is R30.
Note 3: Weight of models with no brake. The weight of brake-attached models is 0.2 kg heavier than the models with no brake shown in the table.
Note 4: The under-head length of the hex socket-head bolt (M4×0.7) to be used for the installation work is 12mm or less.
Note 5: External view of T4LH is identical to T4L.
### T5L
- **High lead**: Lead 20
- **Origin on the non-motor side is selectable**
- **Controller**: 24V

#### Ordering method

**T5L**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead designation</th>
<th>Rated load (kg)</th>
<th>Max. speed (mm/sec)</th>
<th>Cable length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCM100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Specifications

- **AC servo motor output (W)**: 30
- **Repeatability** (<0.02): 1.0mm
- **Deceleration mechanism**: Ball screw d12
- **Ball screw lead (mm)**: 20, 12, 6
- **Maximum speed (mm/sec)**: 800, 400
- **Cable length**: 2m

#### Allowable overhang

- **Note**: Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

#### Static loading moment

- **Controller**: ERCD

#### Controller

- **Operation method**: Pulse train control / Programmng / I/O point trace / Remote command / B: 232C communication

---

**Note 1**: With a lead of 20mm cannot select specifications with brake (vertical specifications).

**Note 2**: The robot cable is flexible and resists bending. See P.614 for details on robot cable.
### Ordering method

**T6L**

<table>
<thead>
<tr>
<th>Model</th>
<th>Brush type</th>
<th>Origin position change</th>
<th>Grease type</th>
<th>Stroke</th>
<th>Cable weight</th>
<th>Positioner</th>
<th>Power-supply voltage</th>
<th>LCD monitor</th>
<th>I/O selection</th>
<th>Battery</th>
<th>Motor type</th>
<th>I/O selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6L</td>
<td>202</td>
<td>No brake</td>
<td>0.02</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Standard</td>
<td>0.25</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>Standard</td>
<td>0.3</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>Standard</td>
<td>0.4</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>250</td>
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<td>0.5</td>
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<td>20kg</td>
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<td>AC servo (100V)</td>
<td>LCD-100</td>
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<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>Standard</td>
<td>0.6</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
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<td>350</td>
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<td>0.7</td>
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<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
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</tr>
<tr>
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<td>400</td>
<td>Standard</td>
<td>0.8</td>
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<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>450</td>
<td>Standard</td>
<td>0.9</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>500</td>
<td>Standard</td>
<td>1.0</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>550</td>
<td>Standard</td>
<td>1.1</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>600</td>
<td>Standard</td>
<td>1.2</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>650</td>
<td>Standard</td>
<td>1.3</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>700</td>
<td>Standard</td>
<td>1.4</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
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<td>750</td>
<td>Standard</td>
<td>1.5</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>Standard</td>
<td>1.6</td>
<td>10kg</td>
<td>20kg</td>
<td>PGX90</td>
<td>AC servo (100V)</td>
<td>LCD-100</td>
<td>0, 10</td>
<td>6V 12V</td>
<td>100W</td>
<td>5V 10V</td>
</tr>
</tbody>
</table>

**SR1-X**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1-X</td>
<td>Programming / I/O point brake / Remote control</td>
</tr>
<tr>
<td></td>
<td>(RS-232C using RS-232C communication)</td>
</tr>
<tr>
<td></td>
<td>RDC-X100</td>
</tr>
<tr>
<td></td>
<td>RDC-X200</td>
</tr>
</tbody>
</table>

**TS-X**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-X</td>
<td>Programming / I/O point brake / Remote control</td>
</tr>
<tr>
<td></td>
<td>(RS-232C using RS-232C communication)</td>
</tr>
<tr>
<td></td>
<td>RDC-X100</td>
</tr>
<tr>
<td></td>
<td>RDC-X200</td>
</tr>
</tbody>
</table>

**RDV-X**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDV-X</td>
<td>Programming / I/O point brake / Remote control</td>
</tr>
<tr>
<td></td>
<td>(RS-232C using RS-232C communication)</td>
</tr>
<tr>
<td></td>
<td>RDC-X100</td>
</tr>
<tr>
<td></td>
<td>RDC-X200</td>
</tr>
</tbody>
</table>

### Specifications

- **AC servo motor output (W):** 60
- **Repeatability (mm):** 0.02
- **Deceleration mechanism:** Ball screw 12
- **Ball screw lead (mm):** 20
- **Maximum speed (mm/sec):** 600
- **Maximum payload (kg):** 10
- **Maximum horizontal installation (mm):**
  - A: 240
  - B: 210
  - C: 180
- **Vertical installation (mm):**
  - A: 240
  - B: 210
  - C: 180
- **Horizontal installation (mm):**
  - A: 300
  - B: 270
  - C: 240
- **Wall installation (mm):**
  - A: 300
  - B: 270
  - C: 240
- **Cross-section B-B**

### Allowable overhang

- **Cable length (m):** Standard: 3.5 / Option: 5, 10
- **I/O selection:** 0, 10
- **Allowable overhang:** Note 1
- **Origin position change:** Note 2
- **Lead:** Note 3
- **Regenerative unit:** Note 4

### Static loading moment

- **Controller:** SR1-X -> 540
- **Controller:** TS-X -> 514
- **Controller:** RDV-X -> 528

### Note

- **Note 1:** The model with a lead of 20mm cannot select specifications with brake (vertical specifications).
- **Note 2:** The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable.
- **Note 3:** See P.522 for DIN rail mounting bracket.
- **Note 4:** Select this selection when using the gateway function. For details, see P.66.
### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Maximum stroke (mm)</th>
<th>Ball screw type</th>
<th>Accuracy (μm)</th>
<th>Stroke (mm)</th>
<th>Maximum thrust (N)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>30</td>
<td>1200</td>
<td>Ballscrews</td>
<td>±3</td>
<td>150</td>
<td>±0.1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>1050</td>
<td>Ballscrews</td>
<td>±3</td>
<td>125</td>
<td>±0.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>940</td>
<td>Ballscrews</td>
<td>±3</td>
<td>100</td>
<td>±0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

Note 1. The model with a lead of 30mm cannot select specifications with brake (vertical specifications).

Note 2. If selecting 5mm lead specifications then the origin point cannot be changed to the non-motor side.

Note 4. Select this selection when using the gateway function. For details, see P.66.

### Allowable overhang

**Horizontal installation (Unit: mm)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Effective stroke</th>
<th>Maximum thrust (N)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>30</td>
<td>150</td>
<td>±0.1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>125</td>
<td>±0.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>100</td>
<td>±0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

**Wall installation (Unit: mm)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Effective stroke</th>
<th>Maximum thrust (N)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>30</td>
<td>150</td>
<td>±0.1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>125</td>
<td>±0.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>100</td>
<td>±0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

**Vertical installation (Unit: mm)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Effective stroke</th>
<th>Maximum thrust (N)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>30</td>
<td>150</td>
<td>±0.1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>125</td>
<td>±0.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>100</td>
<td>±0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

**Note.** Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Static loading moment

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Effective stroke</th>
<th>Maximum thrust (N)</th>
<th>Payload (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T9</td>
<td>30</td>
<td>150</td>
<td>±0.1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>125</td>
<td>±0.1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>100</td>
<td>±0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

**Note.** Weight of models with no brake. The weight of brake-attached models is 0.5 kg heavier than the models with no brake.
### Ordering method

**T9H**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead (mm)</th>
<th>Stroke (mm)</th>
<th>Connector (mm)</th>
<th>Motor type</th>
<th>Motor capacity (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>100</td>
<td>150</td>
<td>AC</td>
<td>500</td>
</tr>
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<td></td>
<td>20</td>
<td>200</td>
<td>250</td>
<td>AC</td>
<td>800</td>
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</tr>
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<td>450</td>
<td>AC</td>
<td>1200</td>
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<td>950</td>
<td>AC</td>
<td>2200</td>
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<td>100</td>
<td>1000</td>
<td>1050</td>
<td>AC</td>
<td>2400</td>
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</tbody>
</table>

### Specifications

**AC servo motor output (W):** 200

**Repeatability (mm):** 0.007

**Ball screw lead (mm):** 150 to 1250 (600 mm (600))

**Maximum stroke (mm):** 1000 (1900)

**Maximum payload (kg):** 8 to 20

**Rated Thrust (N):** 30 20 10 5

**Ball screw lead (mm):** 30 20 10 5

**Positioning repeatability in one direction:** 0.007

**Position detector:** Resolver (φ)

**Resolution (pulse/revolution):** 1024

**Position detector (revolutions/rotation):** 1024

**H: 100V/200W**

**L: With LMT**

**PN: PNP**

**R: With RGT**

**E: CE marking**

**D: DeviceNet**

**T: Absolute**

**N: Incremental**

**Note:**

1. The model with a lead of 30mm cannot select specifications with vertical positioning (vertical specifications).
2. If selecting 10mm·5mm lead specifications then the origin point cannot be changed to the non-motor side.
3. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
4. Note 10mm·5mm lead specifications then the origin point cannot be changed from the non-motor side.
5. When the stroke is longer than 1050mm, 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 above.
6. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
7. The weight of brake-attached models is 0.5 kg heavier than the models with no brake shown in the table.

### Allowable overhang

**Note:**

1. The overhang is determined by the mechanical stoppers at both ends.
2. When installing the unit, washers, etc., cannot be used in the φ11 counter bore hole.
3. When installing the unit, washers, etc., cannot be used in the φ11 counter bore hole.
4. Note 10mm·5mm lead specifications then the origin point cannot be changed from the non-motor side.
5. When installing the unit, washers, etc., cannot be used in the φ11 counter bore hole.

### Static loading moment

**Controller**

**SR1-X > 540**

**TS-X > 514**

**RDV-X > 528**

**T9H**

**Approx. 250 (Motor cable length):**

**Effective stroke (N):**

**When origin is on motor side:**

<table>
<thead>
<tr>
<th>L</th>
<th>10kg</th>
<th>15kg</th>
<th>20kg</th>
<th>25kg</th>
<th>30kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>423</td>
<td>473</td>
<td>523</td>
<td>573</td>
<td>623</td>
<td>673</td>
</tr>
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<td>473</td>
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<td>723</td>
<td>773</td>
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<tr>
<td>573</td>
<td>623</td>
<td>673</td>
<td>723</td>
<td>773</td>
<td>823</td>
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<td>1573</td>
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</tr>
</tbody>
</table>

**Maximum load (kg):**

<table>
<thead>
<tr>
<th>Lead 30</th>
<th>4kg</th>
<th>5kg</th>
<th>6kg</th>
<th>7kg</th>
<th>8kg</th>
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<tbody>
<tr>
<td>140</td>
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<td>20</td>
<td>20</td>
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</tr>
</tbody>
</table>

**Speed setting (%):**

<table>
<thead>
<tr>
<th>Lead 30</th>
<th>80%</th>
<th>65%</th>
<th>50%</th>
<th>45%</th>
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</thead>
<tbody>
<tr>
<td>1440</td>
<td>1170</td>
<td>900</td>
<td>810</td>
<td>810</td>
</tr>
<tr>
<td>1170</td>
<td>900</td>
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<td>22</td>
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<td>22</td>
</tr>
</tbody>
</table>

**Note:**

1. When the stroke is longer than 700mm, 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 above.
2. Strokes longer than 1050mm are special order items. Please consult us for delivery time.
High lead: Lead 20
Origin on the non-motor side is selectable

Note 1. The model with a lead of 20mm cannot select specifications with brake (vertical specifications).
Note 2. The model can be standard cable (3L/SL/10L), but can be changed to flexible cable. See P.614 for details on robot cable. Note 3. See P.522 for DIN rail mounting bracket. Note 4. Select this selection when using the gateway function. For details, see P.66.

Specifications

AC servo motor output (W) 100
Repeatability (mm) 0.02
Deceleration mechanism Ball screw_12
Ball screw lead (mm) 20 12 6
Maximum speed (mm/sec) 1200 720 360
Maximum payload (kg) 12 20 40
Rated thrust (N) 84 141 283

Horizontal installation (Unit: mm) Vertical installation (Unit: mm)
A B C A B C A B C
5kg 107 54 538 106 53.8 53.8 106 53.8 53.8
10kg 103 59 503 100 50 50 100 50 50
15kg 100 64 468 97 46 46 97 46 46
20kg 97 69 432 94 43 43 94 43 43
30kg 93 74 368 90 37 37 90 37 37

Effective stroke 150 200 250 300 350 400 450 500 550 600 690 750 800
A 0 0 1 1 2 2 3 3 4 4 5 5 6 6
B 100 150 100 150 100 150 100 150 100 150 100 150 100 150
C 12 14 16 18 18 20 20 20 20 20 20 20 20 20
D 240 290 340 390 440 490 540 590 640 690 740 790 840 890

Weight (kg/m) 3.6 3.9 4.2 4.4 4.7 5.0 5.3 5.6 5.9 6.2 6.4 6.7 7.0 7.3

Maximum speed (mm/sec) 

Note 1. Speed positions are determined by the mechanical stoppers at both ends.
Note 2. When installing the robot, do not use washers inside the robot body.
Note 3. Minimum bend radius of motor cable is R50.
Note 4. When using this S10 knock-pin hole to position the robot body, the knockpin must not protrude more than 100mm inside the robot body.
Note 5. Weight of models with no brake. The weight of brake-attached models is 0.3 kg heavier than the models with no brake shown in the table.
Note 6. When the stroke is longer than 550mm, the maximum speeds shown in the table can be used.
Note 1. The model with a lead of 30mm cannot select specifications with brake (vertical specifications).
Note 2. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
Note 3. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
Note 4. Select this selection when using the gateway function. For details, see P.66.
Articulated robots

YA

Linear conveyor modules

LCM100

Compact single-axis robots

TRANSERVO

Motor-less single axis actuator

Robonity

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

Controller SR1-X 540 TS-X 514 RDV-X 528
### Specifications

<table>
<thead>
<tr>
<th>Controller</th>
<th>SDV-X</th>
<th>SDV-X205</th>
<th>RDV-X205-RBR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Power capacity (W)</td>
<td>AC200V 05: 100W or less</td>
<td>No entry: Standard</td>
<td>N: NPN</td>
</tr>
<tr>
<td>Power-supply voltage</td>
<td>205: 200V/100W or less</td>
<td>CC: CC-Link</td>
<td>N: None</td>
</tr>
<tr>
<td>Version</td>
<td>05</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>Origin on the non-motor side is selectable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### F8LH

#### Ordering method

- **SR1-X**: Motor-less single-axis robots
- **TS-X**: Linear motor robots
- **RDV-X**: Pick & place robots
- **YP-XCLEANCONTROLLERINFORMATION**: Clean controller

#### Ordered models

- **SR1-X**: Type F
- **TS-X**: Type N
- **RDV-X**: Type T
- **YP-X**: Type B/R
- **YP-XCLEANCONTROLLERINFORMATION**: Type GF

### Articulated robots

#### Transervo Motor-less single-axis robots

- **LCM100**: Linear conveyor modules
- **Compact single-axis robots**
- **PHASER**: Cartesian robots
- **XY-X**: SCARA robots
- **YK-X**: Pick & place robots
- **YP-XCLEANCONTROLLERINFORMATION**: Clean controller

#### Transervo Motor-less single-axis robots

- **T type**: Rated thrust (N)
- **F type**: Lead (mm)
- **N type**: Stroke
- **B/R type**: Maximum speed (mm/sec)
- **GF type**: Maximum speed (mm/sec)

#### Motor-less single-axis robots

- **Typ/ type**: Rated thrust (N)
- **Typ/F typ**: Lead (mm)
- **Typ/N typ**: Stroke
- **Typ/B/R typ**: Maximum speed (mm/sec)
- **Typ/GF typ**: Maximum speed (mm/sec)

#### Perfect straightness

- **Typ/ type**: Rated thrust (N)
- **Typ/F typ**: Lead (mm)
- **Typ/N typ**: Stroke
- **Typ/B/R typ**: Maximum speed (mm/sec)
- **Typ/GF typ**: Maximum speed (mm/sec)

#### Note

1. Positioning repeatability in one direction.
2. See P.522 for DIN rail mounting bracket.
3. Position detectors (resolvers) are common to incremental and absolute encoders.
4. When using this robot, use the AC servo motor output in the table above.
5. Origin on the non-motor side is selectable.
### Ordering method

**F10**

- **High lead: Lead 30**
- **Origin on the non-motor side is selectable: Lead 10-20-30**

Note: Strokes longer than 1050mm are special order items. Please consult us for delivery time.

### Specifications

**AC servo motor output (W)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>F10</td>
<td>100</td>
</tr>
</tbody>
</table>

**Repeatability**

- Y: 0.01

**Deceleration mechanism**

- Ball screw: U-shaped

**Maximum speed (mm/sec)**

- Linear: 2000
- Rotational: 1200

**Rated thrust (N)**

- Vertical: 100
- Horizontal: 150

**Stroke (mm)**

- Horizontal: 150 to 1250
- Vertical: 147 to 1100

**Ball screw lead (mm)**

- 4 rows of circular arc grooves × 1 rail

**Maximum speed (mm/sec)**

- Vertical: 147 to 1100
- Horizontal: 150 to 1250

**Deceleration mechanism**

- Motor: 3L/5L/10L

**Controller Driver Power-supply voltage**

- AC200V

**Driver Power-supply voltage**

- 100V or less

**Regenerative unit**

- RBR1

### Allowable overhang

**Note:**

- Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Static loading moment

**Controller Operation method**

- SR1-X
- TS-X
- RDV-X

**Controller**

- Programming / Remote command: Power capacity
- Operation using RS-232C communication
- Remote command: Pulse train control

**Note:**

- Regenerative unit is required when the models used vertically and with 700mm or larger stroke.

---

**Note:**

1. The model with a lead of 30mm cannot select specifications with brake (vertical specifications).
2. If selecting 5mm lead specifications then the origin point cannot be changed to the non-motor side.
3. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
4. See P.614 for details on robot cable.
5. Select this selection when using the gateway function. For details, see P.66.

---

**Note:**

1. Positioning repeatability in one direction.
2. When the stroke is longer than 700mm, 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.
3. Strokes longer than 1050mm are available only for high lead (Lead 30). (Special order items.)
4. Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

---

**Note:**

1. Stop positions are determined by the mechanical stoppers at both ends.
2. When the stroke is longer than 700mm, 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.
3. Strokes longer than 1050mm are special order items. Please consult us for delivery time.
4. When the stroke is longer than 700mm, 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.
5. When installing the unit, washers, etc., cannot be used in the φ5.5 counter bore hole.
6. Minimum bend radius of motor cable is 550. The bend radius must be the same as the radius of the robot body.
7. Note: Difference between φ5.5 and φ9.5 counter bore hole is 0.8 mm. The hole in the robot body, the knockout must not protrude more than 10mm inside the robot body
8. Weight of motor with brake: The weight of brake-attached models is 0.5 kg heavier than the models with no brake shown in the table.
9. When the stroke is longer than 700mm, 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.
10. Strokes longer than 1050mm are special order items. Please consult us for speed setting.
## Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>±0.01</td>
</tr>
<tr>
<td>Deceleration time (second)</td>
<td>0.001</td>
</tr>
<tr>
<td>Ball screw lead (mm)</td>
<td>30 20 10 5</td>
</tr>
<tr>
<td>Maximum speed (m/min)</td>
<td>1500 1200 600 200</td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>Vertical: 8 20 30 100</td>
</tr>
<tr>
<td>Rated thrust (kgf)</td>
<td>60 50 40 30 20 10 5</td>
</tr>
<tr>
<td>Linear guide type</td>
<td>Linear guide type</td>
</tr>
<tr>
<td>Position detector Resolution (Pulse/crtn)</td>
<td>Resolver or encoder</td>
</tr>
</tbody>
</table>

### Note
- Positioning repeatability in one direction.
- 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 by referring to the maximum speeds shown in the table below. When the movement distance is short, the speed may not reach the maximum speed according to the payload.
- Positional accuracies (incremental) are common to incremental and absolute specifications. If the controller has a backup function, it will be absolute specifications.

## Ordering method

### F10H

- Model: [Model Code] G 30mm
- Articulated or Compact single-axis robots
- Driver U2: 200W
- Encoder: Incremental or (D1) Absolute
- Motor ( achieve required )
- LCM100
- SR1-X
- RSV-X
- Clean controller
- Information

## Allowable overhang

### Note
- Horizontal installation
- Vertical installation
- Maximum speed (m/min)
- Lead 5, 10, 20, 30

## Static loading moment

### Note
- Distance from center of slider to center of gravity of object being carried at a guide service
- Service life is calculated for 600mm stroke models.

---

**F10H**

- Effective stroke
- Approx. 250 (Motor cable length)
- Stroke of 150 (with brake)
- Stroke of 150 (with brake), (Note 1)

---

**Controller**

- Operation method
- SIR-X110
- RCV-X100
- RCH-X200
- SR1-X100

---

**Operator**

- Driver Power-supply voltage
- Driver Power capacity
- Regenerative unit
F10H  High lead type: Lead 30

<table>
<thead>
<tr>
<th>Effective stroke (mm)</th>
<th>Weight (Kg)</th>
<th>Maximum speed (mm/sec)</th>
<th>Lead 30</th>
<th>Lead 20</th>
<th>Lead 10</th>
<th>Lead 5</th>
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</thead>
<tbody>
<tr>
<td>L 150</td>
<td>6.9</td>
<td>9.2</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
</tr>
<tr>
<td>L 200</td>
<td>7.3</td>
<td>9.6</td>
<td>160</td>
<td>200</td>
<td>250</td>
<td>300</td>
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<tr>
<td>L 250</td>
<td>7.7</td>
<td>10.6</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>L 300</td>
<td>8.4</td>
<td>10.9</td>
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<td>300</td>
<td>350</td>
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<td>L 350</td>
<td>8.8</td>
<td>11.3</td>
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<td>350</td>
<td>400</td>
<td>450</td>
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<tr>
<td>L 400</td>
<td>9.2</td>
<td>11.8</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>L 450</td>
<td>9.6</td>
<td>12.2</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
</tr>
<tr>
<td>L 500</td>
<td>10.3</td>
<td>12.6</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
</tr>
<tr>
<td>L 550</td>
<td>10.7</td>
<td>13.0</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>L 600</td>
<td>11.1</td>
<td>13.4</td>
<td>550</td>
<td>600</td>
<td>650</td>
<td>700</td>
</tr>
</tbody>
</table>

Note 1: Stop positions are determined by the mechanical stoppers at both ends.
Note 2: When installing the unit, washers, etc. cannot be used in the ϕ 9.5 counter bore hole.
Note 3: Minimum bend radius of motor cable is R50.
Note 4: When using the ϕ 10 knock-pin hole to position the robot body, the knockpin must not protrude more than 10mm inside the robot body.
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 above.
**F14**

**High lead: Lead 30**

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

Note. Strokes longer than 1050mm are special order items. Please consult us for delivery time.

### Ordering Method

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead description (mm)</th>
<th>Cable entry location</th>
<th>Origin position change (mm)</th>
<th>Motor-less type</th>
<th>Regenerative unit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F14</td>
<td>A</td>
<td>2</td>
<td>0</td>
<td>L: Clean</td>
<td>LS</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2</td>
<td>0</td>
<td>L: Clean</td>
<td>LS</td>
</tr>
</tbody>
</table>

### Specifications

- **AC servo motor output (W):** 100
- **Repeatability (mm):** ±0.007
- **Deceleration time (sec):** 0.5
- **Ball screw lead (mm):** 8
- **Max. feed speed (mm/sec):** 1200
- **Max. load (kg):** 160
- **Stroke (mm):** 1000
- **Resolution (Pulse/rotation):** 1
- **Cable length (m):** 20

### Allowable Overhang

- **Horizontal installation:**
  - A: 10
  - B: 15
  - C: 20
- **Wall installation:**
  - A: 10
  - B: 15
  - C: 20
- **Vertical installation:**
  - A: 10
  - B: 15
  - C: 20

### Static Loading Moment

- **Controller:**
  - SR1-X 540
  - TS-X 514
  - RVD-X 528

**Note:** Horizontal installation (Unit: mm)

- **MY:** 150 to 1250
- **MP:** 150 to 1250
- **MR:** 150 to 1250

**Note:** Wall installation (Unit: mm)

- **MY:** 150 to 1250
- **MP:** 150 to 1250
- **MR:** 150 to 1250

**Note:** Vertical installation (Unit: mm)

- **MY:** 150 to 1250
- **MP:** 150 to 1250
- **MR:** 150 to 1250

**Note:** Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Articulated Robots

- Linear conveyor modules

### Compact Single-Axis Robots

- TRANSERVO

### Motor-Less Single-Axis Robots

- PHASER

### Cartesian Robots

- XY-X

### SCARA Robots

- YK-X

### Pick & Place Robots

- YP-X

### Controller

- RBR1

**Note:**

1. The model with a lead of 30mm cannot select specifications with brake (vertical specifications).
2. The model with a lead of 30mm is standard cable (3L/SL/10L), but can be changed to flexible cable.
4. Select this selection when using the gateway function. For details, see P.66.
5. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.
### Ordering method

**Model**
- **Non-motor side**
- **Motor side**
- **Cable length**
- **Specifications**
- **Note**

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>0.01</td>
</tr>
<tr>
<td>Ball screw load (mm)</td>
<td>30</td>
</tr>
<tr>
<td>Maximum speed (mm/min)</td>
<td>1200 (50mm pitch)</td>
</tr>
<tr>
<td>Horizontal: Load (kg)</td>
<td>25</td>
</tr>
<tr>
<td>Vertical: Load (kg)</td>
<td>20</td>
</tr>
<tr>
<td>Rated thrust (N)</td>
<td>113</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>130</td>
</tr>
<tr>
<td>Resolution (Pulse/rotation)</td>
<td>15834</td>
</tr>
<tr>
<td>Position detector</td>
<td>Resolvers</td>
</tr>
</tbody>
</table>

### Allowable overhang

<table>
<thead>
<tr>
<th>Horizontal installation</th>
<th>Wall installation</th>
<th>Vertical installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Lead 5</td>
<td>B: Lead 20</td>
<td>C: Lead 30</td>
</tr>
<tr>
<td>A: 1150</td>
<td>B: 1200</td>
<td>C: 1350</td>
</tr>
</tbody>
</table>

### Static loading moment

### Controller

**Controller specification**
- **SR1-X**
- **TS-X**
- **RDV-X**

### Note

1. When selecting the gateway function, for details, see P.66.
Note 1. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
Note 2. See P.522 for DIN rail mounting bracket.
Note 3. Select this selection when using the gateaway function. For details, see P.66.

[Cautions after purchase]
- When changing the origin position, contact us since the adjustment is needed.
- When changing the cable entry location, contact us since necessary parts may vary depending on the cable entry location.
- Do not install the robot with the horizontal installation specifications in a direction other than the horizontal direction.

Note 1. Positioning repeatability in one direction.
Note 2. Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

Note. Service life is calculated for 1000mm stroke models.

When origin is on non-motor side
346+/-3: When origin is on non-motor side
132+/-1

When origin is on motor side
215+/-3:

Effective stroke
L: When origin is on motor side
551 552 485

Effective stroke
A: When origin is on non-motor side
128+/-1

Controlled operation
SR1-X100, RDV-X220, SCARA robot

Note. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.
Note. Service life is calculated for 1000mm stroke models.

Note 1. Stop positions are determined by the mechanical stops at both ends.
Note 2. When changing the return-to-origin direction, the adjustment is needed. (The standard is the origin on the motor side.)
Note 3. Secure the cable with a tie-band 100mm or less from unit’s end face to prevent the cable from being subjected to excessive loads.
Note 4. See P.614 for details on robot cable.
Note 5. The length under head of the hexagonal socket head bolts (M6 x 1.0) that are used to install the main body with the spot facing hole installation specifications is 20mm or more.

It is recommended that the length under head of the hexagonal socket head bolts (M6 x 1.0) that are used to install the main body with the spot facing hole installation specifications is 20mm or more.

When origin is on motor side
215+/-3:

Effective stroke
132+/-1

When origin is on non-motor side
128+/-1
Note. Upper robot cable (U) on models equipped with brekle is a special order item. Please consult our sales office for details on robot cable.

Note 2. See P.522 for DIN rail mounting bracket.

Note 5. The robot with the high lead specifications (lead 40) needs a regenerative unit.

Note 4. When installing the robot, do not use washers inside the robot body.

Note 3. Upper robot cable (U) on models equipped with brake is a special order item.

Controller

Note. Upper robot cable (U) on models equipped with brake is a special order item. Please consult our sales office for details on robot cable.

Note 2. See P.522 for DIN rail mounting bracket.

Note 5. The robot with the high lead specifications (lead 40) needs a regenerative unit.

Note 4. When installing the robot, do not use washers inside the robot body.

Note 3. Upper robot cable (U) on models equipped with brake is a special order item.

Note 4. Weight of models with no brake. The weight of brake-attached models is 1.2 kg heavier than the models with no brake shown in the table.

Note 5. To operate the unit at a speed exceeding 1,000mm/sec. (Max. speed), a regeneration unit RG1 is required.

Note 6. When the stroke exceeds 800mm, 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 above.

Note 7. To operate the unit at a speed exceeding 1,000mm/sec. (Max. speed), a regeneration unit RG1 is required.

Note 8. When origin is on motor side

Note 9. When origin is on non-motor side

Controller

Note. Upper robot cable (U) on models equipped with brake is a special order item. Please consult our sales office for details on robot cable.

Note 2. See P.522 for DIN rail mounting bracket.

Note 5. The robot with the high lead specifications (lead 40) needs a regenerative unit.

Note 4. When installing the robot, do not use washers inside the robot body.

Note 3. Upper robot cable (U) on models equipped with brake is a special order item.

Note 4. Weight of models with no brake. The weight of brake-attached models is 1.2 kg heavier than the models with no brake shown in the table.

Note 5. To operate the unit at a speed exceeding 1,000mm/sec. (Max. speed), a regeneration unit RG1 is required.

Note 6. When the stroke exceeds 800mm, 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 above.

Note 7. To operate the unit at a speed exceeding 1,000mm/sec. (Max. speed), a regeneration unit RG1 is required.

Note 8. When origin is on motor side

Note 9. When origin is on non-motor side
Articulated robots
YA
Linear conveyor 
modules
LCM100
Compact 
single-axis robots
TRANSERVO
Motor-less single ... robots
PHASER
Cartesian
robots 
XY-X
SCARA
robots
YK-X
Pick & place
robots 
YP-X

Controller:
SR1-X 540  TS-X 514  RDV-X 528

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. When installing the robot, do not use washers inside the robot body.
Note 3. Minimum bend radius of motor cable is R50.
Note 4. When the stroke is longer than 800mm, 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 above.
Articulated robots

Linear conveyor modules
LCM100
Compact single-axis robots
TRANSERVO
Motor-less single-axis robots
PHASER
Cartesian robots
XY-X
SCARA robots
YK-X
Pick & place robots
YP-X

Note 1. Upper robot cable (U) on models equipped with brake is a special-order item. See P.864 for details on robot cable.
Note 2. When the stroke is longer than 1200mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program using the maximum speed given in the above table as a guide.
Note 3. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>600</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>±0.02</td>
</tr>
<tr>
<td>Deceleration mechanism</td>
<td>Ball screw</td>
</tr>
<tr>
<td>Ball screw lead (mm)</td>
<td>50</td>
</tr>
<tr>
<td>Maximum stroke (mm)</td>
<td>1320</td>
</tr>
<tr>
<td>Maximum dimensions of cross section of main unit (mm)</td>
<td>600 × 1000</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Standard: 3.5 / Option: 6.10</td>
</tr>
<tr>
<td>Linear guide type</td>
<td>4 wheels of crossed-roller groove + 2 wheels</td>
</tr>
<tr>
<td>Position detector</td>
<td>Resolution (Pulse/Rotation) 16384</td>
</tr>
</tbody>
</table>

Note 1. Positioning repeatability in one direction.
Note 2. When the stroke is longer than 1200mm, resonance of the ball screw may occur depending on the operation conditions (critical speed). In this case, reduce the speed setting on the program referring to the maximum speeds shown in the table below.
Note 3. Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

Allowable overhang

<table>
<thead>
<tr>
<th>Overhang (mm)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>86%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>68%</td>
</tr>
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</table>

Static loading moment

<table>
<thead>
<tr>
<th>Load (kg)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>241.5</td>
</tr>
<tr>
<td>10</td>
<td>457.0</td>
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</table>

Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>SR1-X</th>
<th>TSX-X</th>
<th>RDV-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>200V</td>
<td>200V</td>
<td>200V</td>
</tr>
<tr>
<td>Power capacity</td>
<td>600W</td>
<td>500W</td>
<td>300W</td>
</tr>
</tbody>
</table>

Remote command communication using RS-232C

Controller Driver: SR1-X 20

Driver: Power supply: 200V

Usable for CE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead 50</td>
<td>50mm</td>
</tr>
<tr>
<td>Speed setting</td>
<td>4600</td>
</tr>
</tbody>
</table>

Note 1. Upper robot cable (U) on models equipped with brake is a special-order item. See P.864 for details on robot cable.
Note 2. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
Note 3. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective stroke (mm)</td>
<td>235+/-2 (With brake)</td>
</tr>
<tr>
<td>Vertical installation (mm)</td>
<td>217.5 (With brake)</td>
</tr>
</tbody>
</table>

Controller Driver: Power supply: 200V

Usable for CE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead 50</td>
<td>50mm</td>
</tr>
<tr>
<td>Speed setting</td>
<td>4600</td>
</tr>
</tbody>
</table>

Note 1. Upper robot cable (U) on models equipped with brake is a special-order item. See P.864 for details on robot cable.
Note 2. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
### Ordering method

**GF17XL-S H-20**

- **Model**
  - GF17XL
- **Type**
  - S
- **H-20**

#### Specifications

- **AC servo motor output (W)**: 400
- **Repeatability (mm)**: +/-0.01
- **Deceleration mechanism**: Ball screw 620
- **Ball screw lead (mm)**: 20
- **Maximum speed (mm/sec)**: 1200
- **Maximum payload (kg)**: 90
- **Rated thrust (N)**: 339
- **Stroke**: 850 to 2500 (50mm pitch)
- **Overall length (mm)**: 20480
- **Stroke (mm)**: 850 to 2500 (50mm pitch)
- **Linear guide type**: 4 rows of circular arc grooves × 2 rail
- **Position detector**: Resolver (Note 1)
- **Resolution (Pulse/rotation)**: 20480

#### Note

1. Positioning repeatability in one direction.
2. To operate the unit at a speed exceeding 750 mm/sec, a regenerative unit is required.
3. Position detectors are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

### Allowable overhang

- **Horizontal installation**
  - **A**: 30kg 4050 1900 1405
  - **B**: 50kg 2750 650 835
  - **C**: 20kg 1810 605 450

Note: Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Static loading moment

- **Controller**: SR1-X
- **Operation method**: Programming / I/O point trace / Remote command / Operation using RS-232c communication

Note: To operate the unit at a speed exceeding 750 mm/sec, a regenerative unit is required.

### Controller

- **Controller**
  - SR1-X
  - TS-X
  - RDV-X
- **Power capacity**: 20400 to 6000W
- **I/O selection**
  - SR1-X 20
  - TS-X 20
  - RDV-X 20

Note: Service life is calculated for 1000mm stroke models.
Note. Upper robot cable (U) on models equipped with brake is a special order item. See P.614 for details on robot cable.

Note. 4: To operate the unit at a speed exceeding 1,000 mm/sec. (Max. speed), a regeneration unit RG1 is required.

Note 5: Acceleration/deceleration is different depending on the Positioner or Driver.

Note 6: The robot with the high lead specifications (lead 40) needs a regenerative unit.

Note 7: To operate the unit at a speed exceeding 1,000 mm/sec. a regeneration unit RG1 is required.

Note 8: When origin is on motor side (horizontal installation).

Note 9: When origin is on non-motor side (vertical installation).

Note 10: Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

Note 11: The following arrangements require a regeneration unit. 

Note 12: (Incremental) DN: DeviceNet TM, TM: TN: TC: Torque command

Note 13: Use M8 x 1.25 hex socket bolt with length head bolt with length (under head) of 45 mm or more.

Note 14: The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.

Note 15: The model with a lead of 40 mm cannot select specifications with brake (vertical specifications).

Note 16: Cross-section C-C.

Note 17: The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
### F20 High lead type: Lead 40

#### Approx. 250 (Motor cable length) 277±5: When origin is on motor side  
Effective stroke 151±5: When origin is on non-motor side  
150: When origin is on motor side

#### Effective stroke

<table>
<thead>
<tr>
<th>Effective stroke</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>
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<th>700</th>
<th>750</th>
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<th>850</th>
<th>900</th>
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<th>1000</th>
<th>1050</th>
<th>1100</th>
<th>1150</th>
<th>1200</th>
<th>1250</th>
<th>1300</th>
<th>1350</th>
<th>1400</th>
<th>1450</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>627</td>
<td>677</td>
<td>727</td>
<td>777</td>
<td>827</td>
<td>877</td>
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<td>1677</td>
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<td>1777</td>
<td>1827</td>
<td>1877</td>
</tr>
<tr>
<td>A</td>
<td>50</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>
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<td>1320</td>
<td>1320</td>
<td>1320</td>
<td>1320</td>
<td>1320</td>
</tr>
</tbody>
</table>

#### Weight (kg)

| Effective stroke | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Maximum speed (mm/sec) | 21.2 | 23.1 | 24.0 | 25.5 | 28.6 | 29.7 | 28.1 | 28.5 | 30.5 | 31.4 | 32.3 | 33.2 | 34.2 | 35.1 | 36.0 | 36.9 | 37.8 | 38.7 | 39.7 | 40.6 | 41.5 | 42.4 | 43.3 | 44.2 |
| Lead 40 | 2400 | 1920 | 1680 | 1440 | 1200 | 960 | 840 | 720 |

#### Note 1.
Stop positions are determined by the mechanical stoppers at both ends.

#### Note 2.
When installing the robot, do not use washers inside the robot body.

#### Note 3.
Minimum bend radius of motor cable is R50.

#### Note 4.
When the stroke is longer than 800mm, 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 above.

#### Note 5.
Longer than 1250mm stroke can be handled by the high lead specification (Lead 40) only.
### Ordering method

**F20N - 20**

- **Model**: F20N
- **Lead Screw**: 20
- **Origin-position change**: Not applicable
- **Grease type**: Not applicable
- **Stroke (mm)**: Not applicable
- **Cable length**: Not applicable
- **Positioner**: SR-X
- **Power Supply Voltage**: 200V to 230V
- **Driver**: 200W or less
- **Battery**: 200W or less
- **Regenerative unit**: RBR1

**Note 1.** The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable.

**Note 2.** See P.522 for DIN rail mounting bracket.

**Note 3.** Select this selection when using the gateway function. For details, see P.66.

### Specifications

- **AC servo motor output (W)**: 400
- **Repeatability (mm)**: +/−0.04
- **Deceleration mechanism**: Ball screw 920
- **Ball screw lead (mm)**: 20
- **Maximum speed (mm/sec)**: 1000 (1200 max.)
- **Rated thrust (N)**: 339
- **Maximum dimensions of cross section of main unit (mm)**: W302 x H120
- **Cable length (m)**: Standard: 3.5 (Option: 5, 10)
- **Resolution (Pulse/rotation)**: Not applicable
- **Position detector**: Resolvers
- **Resolution (Pulse/rotation)**: 16384

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

**Note 2.** A regenerative unit is needed if using the SR-X, TS-X at maximum speeds exceeding 1000mm/sec. If using the RDV-X, then the regenerative unit RBR1 is required regardless of the installation conditions.

**Note 3.** Position detectors/resolvers are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

### Allowable overhang

**Note.** Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Static loading moment

**Note.** When the unit is operated at a speed exceeding the maximum speed or a position is changed, the regenerative unit is required.

### Controller

- **Controller**: SR1-X, TSX-220, RDV-X
- **Operation method**: Programming / I/O point trace / Remote command / Operation using RS-232 communications
- **Regenerative unit**: RBR1
- **Power-supply voltage**: 200V to 230V

**Note 1.** Stop positions are determined by the mechanical stoppers at both ends.

**Note 2.** The stepped position indicates the user cable extraction port.

**Note 3.** When installing the robot, do not use washers inside the robot body.

**Note 4.** The origin is set on the left (L) side at shipping.
### Ordering method

**N15-20**

- **Model**
- **Gear**
- **Cable carrier**
- **Gear position change**
- **Origin position change**
- **Mounting position**
- **Stroke**
- **Cable length**

### Specifications

- **AC servo motor output (W)**
- **Repeatability (mm)**
- **Deceleration mechanism**
- **Ball screw lead (mm)**
- **Maximum speed (mm/sec)**
- **Maximum payload (kg)**
- **Rated thrust (N)**
- **Maximum dimensions of cross section of main unit (mm)**
- **Linear guide type**
- **Position detector**
- **Resolution (Pulse/rotation)**

### Allowable overhang

#### Horizontal installation

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10kg</td>
<td>3048</td>
<td>3232</td>
<td>1259</td>
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<td>30kg</td>
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<td>1039</td>
</tr>
<tr>
<td>50kg</td>
<td>5048</td>
<td>4749</td>
<td>749</td>
</tr>
</tbody>
</table>

#### Wall installation

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>10kg</td>
<td>1258</td>
<td>1283</td>
<td>2449</td>
</tr>
<tr>
<td>30kg</td>
<td>2058</td>
<td>2054</td>
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</tr>
<tr>
<td>50kg</td>
<td>2958</td>
<td>2949</td>
<td>749</td>
</tr>
</tbody>
</table>

### Static loading moment

- **Controller**
<table>
<thead>
<tr>
<th>SR1-X</th>
<th>TS-X</th>
<th>RDU-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>540</td>
<td>514</td>
<td>528</td>
</tr>
</tbody>
</table>

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may be reached when the moving distance is short.
Note 3. Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be the absolute specifications.

### Cable carrier for users

- **S type**
  - Standard cable carrier
- **M type**
  - Optional cable carrier

### N15: Horizontal installation / Standard Cable carrier specification

- **Effective stroke**
- **Stroke**
- **Cable length**
- **Position detector**
- **Controller Driver**
- **Power capacity**
- **Communication**
- **I/O selection**

Note 1. Positioning repeatability in one direction.
Note 2. When shipped from the factory, the horizontal model has the origin on the right side and the wall model has the origin on the left side. (This diagram shows the machine whose cable is taken out from right.)
Note 3. If the model is a standard cable carrier specification, it is not possible to pass 3 or more φ4 x 4 mm hoses.
Note 4. Use M6x1.0 hex socket head with length (all thread) of 20mm or more.
Note 5. When using a φ10H7 hole, make sure that the pin does not go into deeper than as shown in the drawing.
Note 6. Cable carrier bending radius might be larger, making it higher than the dimensions shown in the drawing.
### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Load indication</th>
<th>Installation direction</th>
<th>Cable carrier specification</th>
<th>Option</th>
<th>Stroke</th>
<th>Cable length</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>N15D-20</td>
<td></td>
<td>Wall installation</td>
<td>Optional Cable carrier</td>
<td></td>
<td>200 to 1750 (100mm pitch)</td>
<td>L: 5 m</td>
<td>RCX320/RCX222HP-R</td>
</tr>
</tbody>
</table>

Note 1. To find controller selection options, see the ordering method on each controller page.
Note 2. 2 units are required when using SR1-X, TS-X or RDV-X.
Note 3. If a flexible cable is needed for the SR1-X, TS-X, or RDV-X, then select 3K/5K/10K. On the RCX320/RCX222HP, the standard cable is a flexible cable, so enter 3L/5L/10L when ordering.

### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>400</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>+/-0.01</td>
</tr>
<tr>
<td>Deceleration mechanism</td>
<td>Ball screw Ø15</td>
</tr>
<tr>
<td>Ball screw lead (mm)</td>
<td>20</td>
</tr>
<tr>
<td>Maximum speed (mm/sec)</td>
<td>1200</td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>50</td>
</tr>
<tr>
<td>Rated thrust (N)</td>
<td>339</td>
</tr>
<tr>
<td>Stroke (mm)</td>
<td>250 to 1750 (100mm pitch)</td>
</tr>
<tr>
<td>Overall length (mm)</td>
<td>Stroke+330</td>
</tr>
<tr>
<td>Maximum dimensions of cross-section of main unit (mm)</td>
<td>W145 x H120</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>20</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Option</td>
</tr>
<tr>
<td>Cable type</td>
<td>4 rows of circular arc grooves x 2 rail</td>
</tr>
<tr>
<td>Linear guide type</td>
<td>24/65</td>
</tr>
<tr>
<td>Position detector</td>
<td>Resolver</td>
</tr>
</tbody>
</table>

Note 1. Positioning repeatability in one direction.
Note 2. The maximum speed may not be reached when the moving distance is short.
Note 3. Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

### Allowable overhang

<table>
<thead>
<tr>
<th>Horizontal installation</th>
<th>Wall installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mm)</td>
<td>(mm)</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>100</td>
<td>3048</td>
</tr>
<tr>
<td>130</td>
<td>1489</td>
</tr>
<tr>
<td>160</td>
<td>1279</td>
</tr>
</tbody>
</table>

Note. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Cable carrier for users

#### S type

- Standard cable carrier
- Note. Cannot pass more than 3 urethane hoses (Ø4 x 4).
- Space for optional cable for users

#### M type

- Optional cable carrier
- Space for optional cable for users
- Note 3.  When using a Ø10H7 hole, make sure that the pin does not go into deeper than as shown in the drawing.
- Weight of brake-attached models is 1 kg heavier than the models with no brake shown in the table.
- Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.

### Static loading moment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Moment (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>691</td>
<td>692</td>
</tr>
<tr>
<td>608</td>
<td></td>
</tr>
</tbody>
</table>

### Controller

- RCX320-R
- RCX222HP-R
- Programming / I/O point trace / Remote command / Using RS-232C communication
- TS-X20-AB1
- Pulse train control
- Note. 2 units are required when using SR1-X, TS-X or RDV-X.

### Allowable overhang

- Horizontal installation
- Wall installation

### N15D: Horizontal installation / Standard Cable carrier specification

- Effective stroke: 250 mm to 1500 mm
- Cable length: 5 m
- Weight: 24 kg

Note 5. When using a Ø10H7 hole, make sure that the pin does not go into deeper than as shown in the drawing.
Note 6. Contact us for vertical installation.
Note 7. Weight of models with no brake. The weight of brake-attached models is 1 kg heavier than the models with no brake shown in the table.
Note 8. Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.
### Ordering method

**N18-20**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N18-20</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

- **AC servo motor output (W)**: 400
- **Repeatability (mm)**: +/- 0.01
- **Deceleration mechanism**: Ball screw Ø20
- **Maximum speed (mm/sec)**: 1200
- **Maximum payload (kg)**: 80
- **Rated thrust (N)**: 500 to 2500 (150mm pitch)
- **Overall length (mm)**: Stroke=382
- **Maximum dimensions of cross section of main unit (mm)**: W180 × H115
- **Cable lead length (m)**: Standard: 3.5 / Option: 5,10
- **Resolution (Pulse/rotation)**: 16384

**Note 1**: Repeatability for single oscillation.

**Note 2**: The maximum speed may not be reached when the moving distance is short.

**Note 3**: Position detectors (resolvers) are common to incremental and absolute specifications. If the controller has a backup function then it will be absolute specifications.

**Allowable overhang**

Horizontal installation (mm): A 30 B 20 C 20

Wall installation (mm): A 30 B 20 C 20

**Note**: See P.522 for DIN rail mounting bracket.

### Static loading moment

**Controller**

- **SR1-X**: 540
- **TS-X**: 514
- **RDV-X**: 528

### Controller

- **SR1-X-R**: 220
- **SR1-X**: 20
- **TS-X**: 220
- **RDV-X**: 20
- **RBR1**: 8

**Battery**

- **Battery**: LCD monitor

**Cable carrier for users**

- **S type**: Standard cable carrier
- **M type**: Optional cable carrier

**Note**: Cannot pass more than 3 urethane hoses (φ6 x 4).

**Note 4**: Select this selection when using the gateway function. For details, see P.66.

**N18: Horizontal installation / Standard Cable carrier specification**

**Cross-section E-E**

- **Effective stroke**
  - L: 181 + 3
  - M: 181 + 3

**Cross-section of cable carrier**

- **Weight (δg)**: 27-29

**Use M8 x 1.25 hex socket head bolt with length (under head) of 40mm or more.**

**Note 1**: Stop positions are determined by the mechanical stoppers at both ends.

**Note 2**: When using 60 holes for installation, do not use a washer, spring washer, etc. in the main unit.

**Note 3**: If the model is a standard cable carrier specification, it is not possible to pass more than 4 urethane hoses.

**Note 5**: When using a φ10H7 hole, make sure that the pin does not go into deeper than shown in the drawing.

**Note 6**: For the robot with more than 2.100 stroke, a roller is installed to prevent the cable carrier hanging.

**Note 7**: Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.
N18: Horizontal installation / Optional Cable carrier specification

N18: Wall installation / Standard Cable carrier specification

N18: Wall installation / Optional Cable carrier specification
### Specifications

| AC servo motor output (W) | 400 |
| Repeatability ±0.01 (mm) | 230 |
| Deceleration mechanism | Ball screw Ø20 |
| Maximum speed (mm/sec) | 1200 |
| Maximum payload (kg) | 80 |
| Rated thrust (N) | 330 |
| Stroke (mm) | 250 to 2250 (100 pitch) |
| Overall length (mm) | Stroke=362 |
| Maximum dimensions of cross section of main unit (mm) | W180 × H115 |
| Cable length (m) | Standard: 3.5 / Option: 5,10 |
| Linear guide type | 4 rows of circular arc grooves × 2 rail |
| Position detector | Resolver |
| Resolution (Pulse/rotation) | 16384 |

### Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX320-R</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX222-R</td>
<td>I/O point trace / Remote command</td>
</tr>
<tr>
<td>SR1-X20-AB1</td>
<td>Pulse train control</td>
</tr>
</tbody>
</table>

Note 1. To find controller selection options, see the ordering method on each controller page.

Note 2. 2 units are required when using SR1-X, TS-X, or RDV-X.

Note 3. If a flexible cable is needed for the SR1-X, TS-X, or RDV-X, then select 3K/5K/10K. On the RCX320/RCX222HP, the standard cable is a flexible cable, so enter 3L/5L/10L when ordering.

Note 7. For the robot with more than 2,050 stroke, a roller to prevent the cable carrier from hanging is provided.

Note 13. Space for optional cable for users |

Note 14. 2 units are required when using SR1-X, TS-X or RDV-X. |

### Static loading moment

<table>
<thead>
<tr>
<th>Controller</th>
<th>Static loading moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MY</td>
<td>1161</td>
</tr>
<tr>
<td>MP</td>
<td>1163</td>
</tr>
<tr>
<td>MR</td>
<td>1021</td>
</tr>
</tbody>
</table>

### N18D: Horizontal installation / Standard Cable Carrier specification

<table>
<thead>
<tr>
<th>Effective stroke</th>
<th>250</th>
<th>350</th>
<th>450</th>
<th>550</th>
<th>650</th>
<th>750</th>
<th>850</th>
<th>950</th>
<th>1050</th>
<th>1150</th>
<th>1250</th>
<th>1350</th>
<th>1450</th>
<th>1550</th>
<th>1650</th>
<th>1750</th>
<th>1850</th>
<th>1950</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>862</td>
<td>962</td>
<td>1062</td>
<td>1162</td>
<td>1262</td>
<td>1362</td>
<td>1462</td>
<td>1562</td>
<td>1662</td>
<td>1762</td>
<td>1862</td>
<td>1962</td>
<td>2062</td>
<td>2162</td>
<td>2262</td>
<td>2362</td>
<td>2462</td>
<td>2562</td>
</tr>
<tr>
<td>A</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
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<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<td>6</td>
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<td>10</td>
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<td>10</td>
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<td>10</td>
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<tr>
<td>D</td>
<td>650</td>
<td>750</td>
<td>850</td>
<td>950</td>
<td>1050</td>
<td>1150</td>
<td>1250</td>
<td>1350</td>
<td>1450</td>
<td>1550</td>
<td>1650</td>
<td>1750</td>
<td>1850</td>
<td>1950</td>
<td>2050</td>
<td>2150</td>
<td>2250</td>
<td>2350</td>
</tr>
</tbody>
</table>

Weight (kg) 55 37 39 47 43 40 47 48 50 52 54 56 58 60 62 64 66 68 70 72 74
N18D: Horizontal installation / Optional Cable carrier specification

N18D: Wall installation / Standard Cable carrier specification

N18D: Wall installation / Optional Cable carrier specification
### B10

#### Ordering method

- **Model**: [Please refer to the table below for details.]
- **Motor installation direction**: [Please refer to the table below for details.]

#### Specifications

- **AC servo motor output (W)**: 100
- **Repeatability*** (mm): +/-0.04
- **Maximum speed (mm/sec)**: 1875
- **Motor**: [Please refer to the table below for details.]
- **Cable length (m)**: Standard: 3.5 / Option: 5, 10
- **Allowable overhang (mm)**: 310
- **Weight (kg)**: 85.5

#### Motor installation

- **The line-up consisting of six models of different motor installation position as follows.**

#### Allowable overhang

- **Note**: Horizontal installation: [Please refer to the table below for details.]
- **Wall installation**: [Please refer to the table below for details.]

#### Static loading moment

- **Controller**: [Please refer to the table below for details.]

---

**Note 1.** The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable.

**Note 2.** See P.522 for DIN rail mounting bracket.

**Note 3.** Stop positions are determined by the mechanical stoppers at both ends. Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the forward direction.)
**Articulated robots**

- YA
- Linear conveyor modules
- LCM100
- Compact single-axis robots
- TRANSERVO
- Motor-less single-axis robots
- Phaser
- Cartesian robots
- XY-X
- SCARA robots
- YK-X
- Pick & place robots
- YP-X

**Controller**

- SR1-X 540
- TS-X 514
- RDV-X 528

---

**Ordering method**

### B14

#### Model
- Motor installation direction (optional)
  - L: Motor leftward, horizontal position
  - R: Motor rightward, horizontal position
- Motor rightward, horizontal position (optional)
- L: Motor leftward, upper position
- R: Motor rightward, upper position
- Motor leftward, lower position
- R: Motor rightward, lower position

**Specifications**

- AC servo motor output (W): 100
- Repeatability (mm): ±0.04
- Belt (mm): Equivalent to lead 25mm
- Maximum speed (mm/sec): 1875
- Maximum payload (kg): 10kg
- Maximum speed (mm/sec): 1875
- Stroke (mm): 150 to 3050 (100mm pitch)
- Maximum speed (mm/sec): 1875
- Maximum speed (mm/sec): 1875
- Belt (mm): Equivalent to lead 25mm

**Allowable overhang**

- Horizontal installation (unit: mm)
  - Tile: 80
  - Front: 100
  - Bar: 100
  - Rear: 100

- Wall installation (unit: mm)
  - Tile: 80
  - Front: 100
  - Bar: 100
  - Rear: 100

**Motor installation**

- The line-up consisting of six models of different motor installation position as follows.

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor installation position</th>
</tr>
</thead>
<tbody>
<tr>
<td>L type</td>
<td>Leftward at horizontal position</td>
</tr>
<tr>
<td>R type</td>
<td>Rightward at horizontal position</td>
</tr>
<tr>
<td>LU type</td>
<td>Leftward at upper position</td>
</tr>
<tr>
<td>RU type</td>
<td>Rightward at upper position</td>
</tr>
<tr>
<td>LD type</td>
<td>Leftward at lower position</td>
</tr>
<tr>
<td>RD type</td>
<td>Rightward at lower position</td>
</tr>
</tbody>
</table>

**Motor**

- **B14 R type (Motor rightward, horizontal position)**
  - Effective stroke:
    - (128) mm
  - Max. HOL Depth 10
  - Max. HOL Depth 10

**Controller**

- SR1-X 540
- TS-X 514
- RDV-X 528
- Operation method
  - Programming / I/O point trace / Remote command / Communication
  - TS-X 514
  - Remote command / Communication
  - RDV-X 528
  - Pulse train control

---

**Note**

1. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable attachment. Note 2. See P.522 for DIN rail mounting bracket. Note 3. Select this selection when using the gateway function. For details, see P.66.
**B14 RU type (Motor rightward, upper position)**

- Effective stroke: 128
- Stop positions are determined by the mechanical stoppers at both ends.
- Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the downward direction.)

**B14 RD type (Motor rightward, lower position)**

- Effective stroke: 128
- Stop positions are determined by the mechanical stoppers at both ends.
- Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the upward direction.)

**B14 LU type (Motor leftward, upper position)**

- Effective stroke: 128
- Stop positions are determined by the mechanical stoppers at both ends.
- Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the downward direction.)

---

**Note 1**: Stop positions are determined by the mechanical stoppers at both ends.

**Note 2**: Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the downward direction.)
Ordering method

**B14H**

- **Model**: Motor installation direction
- **Option**: Motor installation direction
- **Diagram type**: Standard
- **Stroke**:
  - Linear guide type: W146 × H84
- **Cable length** (m):
  - Standard: 5.3 / Option: 5.10
- **Resolution (Pulse/rotation)**: 16384

### Allowable overhang

**Note**
- Horizontal installation
- Wall installation

**Horizontal installation**

<table>
<thead>
<tr>
<th>Stroke (mm)</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective stroke (mm)</td>
<td>70.5</td>
<td>120</td>
<td>170</td>
<td>220</td>
<td>270</td>
<td>320</td>
<td>370</td>
<td>420</td>
<td>470</td>
</tr>
<tr>
<td>2-M6 x 1.0 Depth10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-M6 x 1.0 Depth15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Wall installation**

<table>
<thead>
<tr>
<th>Stroke (mm)</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective stroke (mm)</td>
<td>70.5</td>
<td>120</td>
<td>170</td>
<td>220</td>
<td>270</td>
<td>320</td>
<td>370</td>
<td>420</td>
<td>470</td>
</tr>
<tr>
<td>2-M6 x 1.0 Depth10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-M6 x 1.0 Depth15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Static loading moment

**Controller**

- **SR1-X**
  - Controller: 05
  - Driver: Power-capacity
- **TS-X**
  - Controller: 05
  - Driver: Power-capacity
- **RDV-X**
  - Controller: 05
  - Driver: Power-capacity

**Note**
- The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable.
- See P.614 for details on robot cable.
- Note 2. See P.522 for DIN rail mounting bracket.
- Note 3. Select this selection when using the gateway function. For details, see P.66.

### Specifications

- **AC servo motor output [W]**: 200
- **Repeatability** [mm]:
  - M6, 6H7: 1000
  - M6, 6H7: 1000
- **Maximum speed [mm/sec]**: 1250 (1875 **Note 3**)
- **Maximum payload (kg)**:
  - B14H: 28.4
- **Resolution (Pulse/rotation)**: 16384

### Motor installation

**The line-up consisting of six models of different motor installation position as follows.**

**B14H**

- **R type** (Motor rightward, horizontal position)

### Controller Operation method

- **SR1-X**
  - Controller: 05
  - Driver: Power-capacity
- **TS-X**
  - Controller: 05
  - Driver: Power-capacity
- **RDV-X**
  - Controller: 05
  - Driver: Power-capacity

**Note**
- A regenerative unit is needed if using the SR1-X, TS-X at maximum speeds exceeding 1250mm/sec.
B14H RU type (Motor rightward, upper position)

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the downward direction.)

B14H RD type (Motor rightward, lower position)

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the upward direction.)

B14H LU type (Motor leftward, upper position)

Note 1. Stop positions are determined by the mechanical stoppers at both ends.
Note 2. Cables can be extracted in upward, downward, forward or rearward directions. (This figure shows the downward direction.)
### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable entry location</th>
<th>Cable length (m)</th>
<th>Note 1</th>
<th>Note 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5</td>
<td>From the side</td>
<td>3.5</td>
<td>Standard (S) 3L: 3.5m</td>
<td>Flexible cable</td>
</tr>
</tbody>
</table>

Note 1: The robot cable is standard cable (3L, 5L, 10L), but can be changed to flexible cable.

Note 2: See P.614 for details on robot cable.

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>50</td>
</tr>
<tr>
<td>Repeatability (°)</td>
<td>+/−0.0083</td>
</tr>
<tr>
<td>Maximum speed (°/sec)</td>
<td>360</td>
</tr>
<tr>
<td>Maximum allowable moment inertia (kg·cm²)</td>
<td>0.12 (1.2)</td>
</tr>
<tr>
<td>Rated torque (Nm/kgf·cm)</td>
<td>5.29 (0.54)</td>
</tr>
<tr>
<td>Speed reduction ratio</td>
<td>150</td>
</tr>
<tr>
<td>Rotation range (°)</td>
<td>360</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Standard: 3.5 / Option: 5, 10</td>
</tr>
<tr>
<td>Speed reducer type</td>
<td>Harmonic drive</td>
</tr>
<tr>
<td>Position detector</td>
<td>Resolvers</td>
</tr>
<tr>
<td>Resolution (Pulse/rotation)</td>
<td>16384</td>
</tr>
</tbody>
</table>

### Maximum allowable moment inertia

<table>
<thead>
<tr>
<th>Payload parameters W (kg)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum allowable moment inertia J (kg·cm²)</td>
<td>0.12</td>
<td>0.24</td>
<td>0.36</td>
<td>0.48</td>
<td>0.60</td>
<td>0.72</td>
<td>0.84</td>
<td>0.96</td>
<td>1.08</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Note: When the weight of a tool or workpiece attached to the shaft R5 is W (kg), its moment of inertia (J) must be smaller than the values shown in the table above. (For example, enter 4kg if W is 3kg and J is 0.48kg·cm².) Enter the above mass parameter value for the controller, and optimum acceleration is automatically set based on this value.

### Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1-X05</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX320</td>
<td></td>
</tr>
<tr>
<td>RCX221/222</td>
<td></td>
</tr>
<tr>
<td>RCX340</td>
<td></td>
</tr>
<tr>
<td>TS-X105</td>
<td>I/O point trace / Remote command</td>
</tr>
<tr>
<td>TS-X205</td>
<td></td>
</tr>
<tr>
<td>RDV-X205-RBR1</td>
<td>Pulse train control</td>
</tr>
</tbody>
</table>

---

**Controller**

- **SR1-X**: 540
- **TS-X**: 514
- **RDV-X**: 528

**Ordering method**

- **Model**: R5
- **Cable entry location**: From the side
- **Cable length (m)**: 3.5
- **Notes**:
  - Standard (S): 3L: 3.5m
  - Flexible cable

**Specifications**

- **AC servo motor output (W)**: 50
- **Repeatability (°)**: +/−0.0083
- **Maximum speed (°/sec)**: 360
- **Maximum allowable moment inertia (kg·cm²)**: 0.12 (1.2)
- **Rated torque (Nm/kgf·cm)**: 5.29 (0.54)
- **Speed reduction ratio**: 150
- **Rotation range (°)**: 360
- **Cable length (m)**: Standard: 3.5 / Option: 5, 10
- **Speed reducer type**: Harmonic drive
- **Position detector**: Resolvers
- **Resolution (Pulse/rotation)**: 16384

**Maximum allowable moment inertia**

- **Payload parameters W (kg)**: 1 to 10
  - **Maximum allowable moment inertia J (kg·cm²)**: 0.12 to 1.20

**Note**: When the weight of a tool or workpiece attached to the shaft R5 is W (kg), its moment of inertia (J) must be smaller than the values shown in the table above. For example, enter 4kg if W is 3kg and J is 0.48kg·cm². Enter the above mass parameter value for the controller, and optimum acceleration is automatically set based on this value.

**Note**: For calculation (equation) of the inertia moment, please refer to P.643.
**R10**

### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>SR1-X</th>
<th>TSX</th>
<th>RDV-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable entry location</td>
<td>Cable entry location</td>
<td>Cable entry location</td>
<td>Cable entry location</td>
</tr>
<tr>
<td>S: From the side</td>
<td>S: From the side</td>
<td>S: From the side</td>
<td>S: From the side</td>
</tr>
<tr>
<td>+2.5m</td>
<td>+2.5m</td>
<td>+2.5m</td>
<td>+2.5m</td>
</tr>
<tr>
<td>(Flexible cable)</td>
<td>(Flexible cable)</td>
<td>(Flexible cable)</td>
<td>(Flexible cable)</td>
</tr>
</tbody>
</table>

**Note:**
1. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable.
2. See P.524 for DIN rail mounting bracket.
3. Select this selection when using the gateway function. For details, see P.66.

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>100</td>
</tr>
<tr>
<td>Repeatability (°)</td>
<td>+/-0.0083</td>
</tr>
<tr>
<td>Maximum speed (°/sec)</td>
<td>360</td>
</tr>
<tr>
<td>Maximum allowable moment inertia (kgm²/kgfcm²)</td>
<td>0.36 [3.71]</td>
</tr>
<tr>
<td>Rated torque (Nm/kgfcm)</td>
<td>10.78 [1.10]</td>
</tr>
<tr>
<td>Speed reduction ratio</td>
<td>1/50</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>Standard: 3.0 / Option: 5.10</td>
</tr>
<tr>
<td>Position detector</td>
<td>Harmonic drive</td>
</tr>
<tr>
<td>Resolution (Pulse/rotation)</td>
<td>16384</td>
</tr>
</tbody>
</table>

### Maximum allowable moment inertia

<table>
<thead>
<tr>
<th>Payload parameters (W)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum allowable moment inertia J (kgfcm²)</td>
<td>0.25</td>
<td>0.49</td>
<td>0.74</td>
<td>0.99</td>
<td>1.24</td>
<td>1.48</td>
<td>1.73</td>
<td>1.98</td>
<td>2.23</td>
<td>2.47</td>
</tr>
</tbody>
</table>

Note: when the weight of a tool or workpiece attached to the shaft (R10) is W (kg), its moment of inertia (J) must be smaller than the values shown in the table above. (For example, enter 4kg if W is 3kg and J is 0.99kgf cm sec².) Enter the above mass parameter value for the controller, and optimum acceleration is automatically set based on this value.

### Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Operation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1-X05</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>TS-X105</td>
<td>I/O point trace / Remote command</td>
</tr>
<tr>
<td>RDV-X205</td>
<td>Pulse train control</td>
</tr>
</tbody>
</table>

**Note:**
1. The cable extraction port can be changed.

---

**Controller Information**

<table>
<thead>
<tr>
<th>Controller</th>
<th>SR1-X</th>
<th>TS-X</th>
<th>RDV-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>540</td>
<td>514</td>
<td>528</td>
</tr>
</tbody>
</table>

---

**Notes:**
1. See P.643 for calculation (equation) of the inertia moment.
### Ordering method

#### R20

- **Model**: R20
- **Positioner**: BLX
- **Driver**: Power-supply voltage: 200V or less
- **Power capacity**: 360W
- **Maximum allowable moment inertia (J)**: 1.83 kgf·cm²
- **Rated torque**: 21.49 Nm
- **Speed reduction ratio**: 1/50
- **Rotation range (°)**: 360
- **Cable length (m)**: Standard: 3.5 / Option: 5, 10
- **Cable entry location**: No entry: Standard (S) 3L: 3.5m, B: From the side 5L: 5m, 10L: 10m
- **Position detector**: –
- **Resolution (Pulse/rotation)**: 16384
- **Cable take out direction**: B
- **Cable entry location**

#### TS-X

- **Driver**: Power-supply voltage: 200V or less
- **Controller**: D: 200V or less

#### SR1-X

- **Driver**: Power-supply voltage: 200V or less
- **Controller**: D: 200V or less

#### RDV-X

- **Driver**: Power-supply voltage: 200V or less
- **Controller**: D: 200V or less

#### BBR1

- **Driver**: Power-supply voltage: 200V or less
- **Regenerative unit**: –

### Specifications

- **AC servo motor output (W)**: 200
- **Repeatability (°)**: ±0.0083
- **Maximum speed (°/sec)**: 360
- **Maximum allowable moment inertia (kg·cm²)**: 1.83 (18.7)
- **Rated torque (Nm)**: 21.49
- **Speed reduction ratio**: 1/50
- **Rotation range (°)**: 360
- **Cable length (m)**: Standard: 3.5 / Option: 5, 10
- **Position detector**: –
- **Resolution (Pulse/rotation)**: 16384
- **Cable entry location**: No entry: Standard (S) 3L: 3.5m, B: From the side 5L: 5m, 10L: 10m
- **Position detector**: –
- **Resolution (Pulse/rotation)**: 16384

### Maximum allowable moment inertia

#### Payload parameters W (kg)

<table>
<thead>
<tr>
<th>W</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>0.93</td>
<td>1.8</td>
<td>2.8</td>
<td>3.7</td>
<td>4.6</td>
<td>5.6</td>
<td>6.5</td>
<td>7.4</td>
<td>8.4</td>
<td>9.3</td>
</tr>
</tbody>
</table>

#### Payload parameters W (kg)

<table>
<thead>
<tr>
<th>W</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>10.2</td>
<td>11.2</td>
<td>12.1</td>
<td>13.1</td>
<td>14.9</td>
<td>15.9</td>
<td>16.8</td>
<td>17.7</td>
<td>18.7</td>
<td></td>
</tr>
</tbody>
</table>

Note: When the weight of a tool or workpiece attached to the shaft R20 is W (kg), its moment of inertia (J) must be smaller than the values shown in the table above. (For example, enter 4kg if W is 3kg and J is 3.7kgf·cm²/sec. Enter the above mass parameter value for the controller, and optimum acceleration is automatically set based on this value.)

### Controller

- **Model**: SR1-X10
  - **Power-supply voltage**: 200W or less
  - **Operation method**: Programming / I/O point trace / Remote command / Operation using RS-232C communication

- **Model**: TS-X110
  - **Power-supply voltage**: 200V/200W or less
  - **Operation method**: I/O point trace / Remote command

- **Model**: RDV-X210
  - **Power-supply voltage**: 200W or less
  - **Operation method**: Pulse train control

### Note

- Note 1. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.514 for details on robot cable.
- Note 2. See P.522 for DIN rail mounting bracket.
- Note 3. Select this selection when using the gateway function. For details, see P.66.
- Note 4. For calculation (equation) of the inertia moment, please refer to P.643.