PICK & PLACE ROBOTS

Ideal for small components high-speed pick & place work. Positioning is made by servo control, so no complex mechanical adjustments are needed.
Full lineup of 6 models in all from 2 axes to 4 axes

<table>
<thead>
<tr>
<th>Model</th>
<th>Axes</th>
<th>Structure</th>
<th>Maximum payload (kg)</th>
<th>Cycle time (sec.)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP220BX</td>
<td>2 axes</td>
<td>Belt - Belt - Belt</td>
<td>3</td>
<td>0.45</td>
<td>P.453</td>
</tr>
<tr>
<td>YP320X</td>
<td>3 axes</td>
<td>Ball screw - Belt - Belt</td>
<td>3</td>
<td>0.57</td>
<td>P.454</td>
</tr>
<tr>
<td>YP320BX</td>
<td>3 axes</td>
<td>Belt - Belt - Rotation axis</td>
<td>1</td>
<td>0.62</td>
<td>P.455</td>
</tr>
<tr>
<td>YP320XR</td>
<td>3 axes</td>
<td>Ball screw - Belt - Rotation axis</td>
<td>1</td>
<td>0.67</td>
<td>P.456</td>
</tr>
<tr>
<td>YP330X</td>
<td>4 axes</td>
<td>Ball screw - Ball screw - Belt</td>
<td>3</td>
<td>0.57</td>
<td>P.457</td>
</tr>
<tr>
<td>YP340X</td>
<td>4 axes</td>
<td>Ball screw - Ball screw - Belt</td>
<td>1</td>
<td>0.67</td>
<td>P.458</td>
</tr>
</tbody>
</table>

**POINT 1**

**High speed**

Super high-speed pick & place operation with a standard cycle time of 0.45 sec. (YP220BX with up/down 50 mm, back/forth 150 mm, arch amount 50, load 1 kg) greatly contributes to improvement of the productivity. Since it is possible to output a signal to turn on/off any external equipment from any position while the axis is moving, the actual production cycle time is further improved.

**POINT 2**

**Compact**

Use of a compact size with an overall with of 109 mm (YP220BX) makes it possible to make the production line compact and simple. The moving arm structure with less interference with surroundings contributes to space saving.

**Reference examples of robot layout comparisons**

The compactness can be checked by comparing the occupied spaces when the YP-X series and YAMAHA’s Cartesian/SCARA robots are laid out.

**POINT 3**

**High accuracy**

Both extremely high-speed performance and high repeated positioning accuracy of +/- 0.02 mm (YP320X, YP320XR, YP330X, YP340X) are assured.

**POINT 4**

**Complete absolute position system**

As the complete absolute position system is used, no return-to-origin operation is needed.

**POINT 5**

**Versatility**

Use of YAMAHA’s unique servo system makes it possible to freely program the stop point and operation pattern settings. This robot is applicable to production of many models in small quantities that cannot be supported by the cam type robot.
PICK & PLACE ROBOTS

YP-X SERIES

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3 AXES
YP220BXR · 455
YP320XR · 456
YP330X · 457

4 AXES
YP340X · 458
### YP-X SPECIFICATION SHEET

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Maximum payload (kg)</th>
<th>Cycle time (sec)</th>
<th>Structure</th>
<th>Moving range</th>
<th>Detailed info page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-axes</td>
<td>YP220BX</td>
<td>3</td>
<td>0.45</td>
<td>X-axis</td>
<td>Belt 200mm</td>
<td>P453</td>
</tr>
<tr>
<td></td>
<td>YP320X</td>
<td>3</td>
<td>0.57</td>
<td>X-axis</td>
<td>Ball screw 330mm</td>
<td>P454</td>
</tr>
<tr>
<td></td>
<td>YP220BXR</td>
<td>1</td>
<td>0.62</td>
<td>X-axis</td>
<td>Belt 200mm</td>
<td>P455</td>
</tr>
<tr>
<td></td>
<td>YP320XR</td>
<td>1</td>
<td>0.67</td>
<td>X-axis</td>
<td>Ball screw 330mm</td>
<td>P456</td>
</tr>
<tr>
<td></td>
<td>YP330X</td>
<td>3</td>
<td>0.57</td>
<td>X-axis</td>
<td>Ball screw 330mm</td>
<td>P457</td>
</tr>
<tr>
<td></td>
<td>YP340X</td>
<td>1</td>
<td>0.67</td>
<td>X-axis</td>
<td>Ball screw 330mm</td>
<td>P458</td>
</tr>
</tbody>
</table>

Note 1. Cycle time is the time required for moving back and forth 150mm (arch 50) and vertically 50mm (during rough-positioning motion with 1kg load).

### Robot ordering method description

In the order format for the YAMAHA pick & place robots YP-X series, the notation (letters/numbers) for the mechanical section is shown linked to the controller section notation.

**[Example]**

**2-axis specifications**

- **Mechanical** > YP220BX
  - Robot cable length > 3.5m
  - Controller > RCX320

**3/4 axis specifications**

- **Mechanical** > YP340X
  - Robot cable length > 5m
  - Controller > RCX340

**Ordering method**

**YP220BX - 3L - RCX320 - 2 - N - NS - 2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable length</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP220BX</td>
<td>3L: 3.5m</td>
<td>RCX320</td>
</tr>
<tr>
<td>YP320X</td>
<td>5L: 5m</td>
<td>RCX320</td>
</tr>
<tr>
<td></td>
<td>10L: 10m</td>
<td>RCX320</td>
</tr>
</tbody>
</table>

To find detailed controller information see the controller page. RCX320 > P548, RCX222 > P558

**YP340X - 5L - RCX340**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable length</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP220BX</td>
<td>3L: 3.5m</td>
<td>RCX340</td>
</tr>
<tr>
<td>YP320X</td>
<td>5L: 5m</td>
<td>RCX340</td>
</tr>
<tr>
<td>YP330X</td>
<td>10L: 10m</td>
<td>RCX340</td>
</tr>
</tbody>
</table>

To find detailed controller information see the controller page. RCX340 > P558

### Robot ordering method terminology

1. **Model**
   - Enter the robot unit model.

2. **Cable length**
   - Select the length of the robot cable connecting the robot and controller.
     - 3L: 3.5m
     - 5L: 5m
     - 10L: 10m

3. **Controller**
   - 2-axis specifications: Select either the RCX320 or RCX222.
   - 3/4 axis specifications: Select the RCX340.
### Ordering method

YP220BX

<table>
<thead>
<tr>
<th>Model</th>
<th>Specification</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
<th>Option</th>
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</thead>
<tbody>
<tr>
<td>YP220BX</td>
<td>RCX320-2</td>
<td>Safety standard</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
</tr>
<tr>
<td>YP220BX</td>
<td>RCX222</td>
<td>Safety standard</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
<td>Option A</td>
</tr>
</tbody>
</table>

Specify various controller setting items. RCX320 ➔ 548

Specify various controller setting items. RCX222 ➔ 558

### Specifications

<table>
<thead>
<tr>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>+/-0.05</td>
</tr>
<tr>
<td>Drive system</td>
<td>Timing belt</td>
</tr>
<tr>
<td>Deceleration ratio (mm)</td>
<td>Equivalent to 24 lead</td>
</tr>
<tr>
<td>Maximum speed (mm/sec)</td>
<td>1440</td>
</tr>
<tr>
<td>Moving range (mm)</td>
<td>200</td>
</tr>
</tbody>
</table>
| Cycle time (sec) | 0.45

Note 1. Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).

Note 2. When the moving stroke is short, the maximum speed may not be reached.

Note 3. Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).

### Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX320</td>
<td>500</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX222</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

Note 1. Distance to mechanical stopper.

Note 2. Return-to-origin on the YP220BX is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
YP320X
2 axes

### Ordering method

**Model**
- YP320X
- RCX320
- RCX222

**Cable length**
- 3L: 3.5m
- 5L: 5m
- 10L: 10m

**Controller**
- RCX320
- RCX222

**Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>+/-0.02</td>
<td>+/-0.05</td>
</tr>
<tr>
<td>Drive system</td>
<td>Ball screw D15</td>
<td>Timing belt</td>
</tr>
<tr>
<td>Deceleration ratio (mm/sec)</td>
<td>Equivalent to lead 20</td>
<td>Equivalent to lead 25</td>
</tr>
<tr>
<td>Moving range (mm)</td>
<td>330</td>
<td>100</td>
</tr>
<tr>
<td>Cycle time (sec)</td>
<td>0.57&lt;sup&gt;Note 1&lt;/sup&gt;, 0.78&lt;sup&gt;Note 2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Robot cable length (m)</td>
<td>Standard: 3.5</td>
<td>Option: 5, 10</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

**Controller**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX320</td>
<td>500</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX222</td>
<td>558</td>
<td></td>
</tr>
</tbody>
</table>

**Note**
- Note 1: Distance to mechanical stopper.
- Note 2: Return-to-origin on the YP320X is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
- Note 3: Do not use bolts longer than 20mm (robot bottom plate thickness).
- Note 4: Reciprocating time in vertical direction (25mm) and longitudinal direction (300mm) with the arch amount of 25 (when executing rough-positioning arch motion with 1kg load).
### Ordering method

**Model**
- YP220BXR
  - Controller: RCX340-3

**Specifications**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX340</td>
<td>700</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
</tbody>
</table>

### Controller

**Controller**
- RCX340

**Power consumption (VA)**
- 700

**Operating method**
- Programming
- I/O point trace
- Remote command
- Operation using RS-232C communication

**Specifications**

- AC servo motor output (W): X axis 200, Z axis 200, R axis 60
- Repeatability: X axis ±0.05, Z axis ±0.05, R axis ±0.1
- Deceleration ratio (mm/sec^2): Equivalent to lead 24, Equivalent to lead 20, 1/18
- Maximum speed (XZ) (mm/sec): 1440, 1200, 1000
- Moving range (XZ) (R): 200, 100, +/-180
- Cycle time (sec): 0.62
- Maximum payload (kg): 1
- R-axis allowable moment inertia (kgm^2): 0.00098 [0.01]
- Robot cable length (m): Standard 3.5, Option 5.10
- Weight (kg): 19

**Note 1.** Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).

**Note 2.** When the moving stroke is short, the maximum speed may not be reached.

**Note 3.** Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).
### Specifications

<table>
<thead>
<tr>
<th></th>
<th>X axis</th>
<th>Z axis</th>
<th>R axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
<td>200</td>
<td>60</td>
</tr>
<tr>
<td>Repeatability (XZ: mm) (R: °)</td>
<td>±0.02</td>
<td>±0.06</td>
<td>±0.1</td>
</tr>
<tr>
<td>Drive system</td>
<td>Ball screw φ15</td>
<td>Timing belt</td>
<td>Ball Reducer</td>
</tr>
<tr>
<td>Maximum speed (XZ: mm/sec) (R: °/sec)</td>
<td>1500</td>
<td>1500</td>
<td>1000</td>
</tr>
<tr>
<td>Moving range (XZ: mm) (R: °)</td>
<td>330</td>
<td>100</td>
<td>±180</td>
</tr>
<tr>
<td>Cycle time (sec)</td>
<td>0.67</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-axis allowable moment inertia (kgm²[kgfcms²])</td>
<td>0.00098 [0.01]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1.** Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).

**Note 2.** When the moving stroke is short, the maximum speed may not be reached.

**Note 3.** Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).

**Note 4.** Reciprocating time in vertical direction (25mm) and longitudinal direction (300mm) with the arch amount of 25 (when executing rough-positioning arch motion with 1kg load).

### Controller

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX340</td>
<td>700</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
</tbody>
</table>

### Additional Notes

- **Note 1.** Distance to mechanical stopper.
- **Note 2.** Return-to-origin on the YP320XR is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
- **Note 3.** Do not use bolts longer than 20mm (robot bottom plate thicknesses).
### YP330X

**3 axes**

#### Ordering method

**YP330X**

- **Model**: YP330X
- **Cable length**: L: 3.5m, R: 3.5m
- **Controller / Number of controllable axes**: RCX340-3
- **Safety standard**: (OP A), (OP B), (OP C), (OP D), (OP E)
- **Absolute battery**:

Specify various controller setting items. RCX340 ➤ P.566

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#### Specifications

<table>
<thead>
<tr>
<th>AC servo motor output (W)</th>
<th>X axis</th>
<th>Y axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

- **Repeatability**
  - Note 1: +/-0.02
  - Note 2: +/-0.02
  - Note 3: +/-0.05

- **Drive system**
  - Ball screw \( \phi 15 \)
  - Ball screw \( \phi 15 \)
  - Timing belt

- **Deceleration ratio (mm)**
  - Equivalent to lead 20
  - Equivalent to lead 20
  - Equivalent to lead 25

- **Maximum speed**
  - \( \text{mm/sec} \)
  - Equivalent to lead 20
  - Equivalent to lead 20
  - Equivalent to lead 25

- **Moving range (mm)**
  - 330
  - 150
  - 100

- **Cycle time (sec)**
  - 0.57
  - 0.78

- **Maximum payload (kg)**
  - 3

- **Robot cable length (m)**
  - Standard: 3.5
  - Option: 5, 10

- **Weight (kg)**
  - 32

Notes:
1. Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).
2. When the moving stroke is short, the maximum speed may not be reached.
3. Repeatability time in vertical direction (50mm) and longitudinal direction (100mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).
4. Repeatability time in vertical direction (25mm) and longitudinal direction (300mm) with the arch amount of 25 (when executing rough-positioning arch motion with 1kg load).

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#### Controller

**Controller**: RCX340
- **Power consumption (VA)**: 700
- **Operating method**: Programming / I/O point trace / Remote command / Operation using RS-232C communication

**Specifications**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX340</td>
<td>700</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
</tbody>
</table>

**Equipment**

- **YP330X**
  - X stroke: 330
  - Z stroke: 100

**Details of tool plate**

**Notes**:
1. Distance to mechanical stopper.
2. Return-to-origin on the YP330X is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
3. Do not use bolts longer than 20mm (robot bottom plate thickness).
### Ordering method

**YP340X**

<table>
<thead>
<tr>
<th>Controller</th>
<th>RCX340-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety standard</td>
<td>OPC( )</td>
</tr>
<tr>
<td>OPC( )</td>
<td>OPC( )</td>
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<tr>
<td>OPC( )</td>
<td>OPC( )</td>
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<tr>
<td>OPC( )</td>
<td>OPC( )</td>
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</table>

Specify various controller setting items. RCX340 ▶ P.566

### Specifications

**YP340X**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable length</th>
<th>Number of controllable axes</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP340X</td>
<td>3.5m</td>
<td>4</td>
</tr>
</tbody>
</table>

**Controller**

- **RCX340**: 800
- **Power consumption (VA)**: 800
- **Operating method**: Programming / I/O point trace / Remote command / Operation using RS-232C communication

#### Controller

- **RCX340**: 800
- **Power consumption (VA)**: 800
- **Operating method**: Programming / I/O point trace / Remote command / Operation using RS-232C communication

#### Specifications

- **AC servo motor output (W)**: X axis Y axis Z axis R axis
- **Repeatability**
- **Drive system**
- **Deceleration ratio (mm)**
- **Maximum speed**
- **Moving range**
- **Cycle time (sec)**
- **R-axis allowable moment inertia (kgm²)**
- **Drive system**
- **Robot cable length (m)**
- **Weight (kg)**

#### Note 1
- Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).

#### Note 2
- When the moving stroke is short, the maximum speed may not be reached.

#### Note 3
- Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).

#### Note 4
- Reciprocating time in vertical direction (25mm) and longitudinal direction (300mm) with the arch amount of 25 (when executing rough-positioning arch motion with 1kg load).

---

**YP340X**

**Dimensional diagram**

- **X axis**: 330
- **Y axis**: 150
- **Z axis**: 100
- **R axis**: +/-180

---

**YP340X**

**Details of tool plate**

- **M5 x 0.8 Depth 13**
- **Width across flat 7**

---

Note 1. Distance to mechanical stopper.

Note 2. Return-to-origin on the YP340X is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.

Note 3. Do not use bolts longer than 20mm (robot bottom plate thicknesses).