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>Axis</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.431</td>
</tr>
<tr>
<td>YP320X</td>
<td>Ball screw - Belt - Belt</td>
<td>3</td>
<td>0.57</td>
<td>P.432</td>
<td></td>
</tr>
<tr>
<td>YP220BXR</td>
<td>3 axes</td>
<td>Belt - Belt - Rotation axis</td>
<td>1</td>
<td>0.62</td>
<td>P.433</td>
</tr>
<tr>
<td>YP320XR</td>
<td>Ball screw - Belt - Belt</td>
<td>1</td>
<td>0.67</td>
<td>P.434</td>
<td></td>
</tr>
<tr>
<td>YP330X</td>
<td>Ball screw - Ball screw</td>
<td>3</td>
<td>0.57</td>
<td>P.435</td>
<td></td>
</tr>
<tr>
<td>YP340X</td>
<td>Ball screw - Ball screw</td>
<td>Rotation axis</td>
<td>1</td>
<td>0.67</td>
<td>P.436</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 width 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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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 Belt</td>
<td>200mm</td>
<td>P431</td>
</tr>
<tr>
<td></td>
<td>YP320X</td>
<td>3</td>
<td>0.57</td>
<td>X-axis Belt</td>
<td>330mm</td>
<td>P432</td>
</tr>
<tr>
<td></td>
<td>YP220BXR</td>
<td>1</td>
<td>0.62</td>
<td>X-axis Belt</td>
<td>200mm</td>
<td>P433</td>
</tr>
<tr>
<td></td>
<td>YP320XR</td>
<td>1</td>
<td>0.67</td>
<td>X-axis Ball screw</td>
<td>330mm</td>
<td>P434</td>
</tr>
<tr>
<td></td>
<td>YP330X</td>
<td>3</td>
<td>0.57</td>
<td>X-axis Ball screw</td>
<td>330mm</td>
<td>P435</td>
</tr>
<tr>
<td></td>
<td>YP340X</td>
<td>1</td>
<td>0.67</td>
<td>X-axis Ball screw</td>
<td>330mm</td>
<td>P436</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-axes specifications
  - Mechanical > YP220BX
    - Robot cable length > 3.5m
  - Controller > RCX222
    - Usable for CE > Not required
    - Input/Output selection 1 > NPN
    - Input/Output selection 2 > None

- 3 / 4 axes specifications
  - Mechanical > YP340X
    - Robot cable length > 5m
  - Controller > RCX240S
    - Not required
    - NPN or Ethernet can be selected in I/O select 2.

To find detailed controller information see the controller page.

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: Select either the RCX222 or RCX240S.
### Ordering method

**YP220BX**

**Controller**

- **Model**: RCX222
- **Controller**: RCX222
- **Motor**: NPN, PNP, CE-Link, CC-Link, DeviceNet, PROFIBUS, Ethernet
- **Inputs/Outputs selection**: OP.DIO24/16 (NPN), OP.DIO24/17 (PNP), 24/16/17/18/19/20
- **Usable for CE**: Yes/No
- **Cable length**: Standard: 3.5m, Option: 5m, 10m

### Specifications

- **AC servo motor output (W)**: 200, 200
- **Repeatability (mm)**: ±0.05, ±0.05
- **Drive system**: Timing belt, Timing belt
- **Deceleration ratio (mm)**: Equivalent to lead 24, Equivalent to lead 20
- **Maximum speed (mm/sec)**: 1440, 1200
- **Moving range (mm)**: 200, 100
- **Cycle time (sec)**: 0.45
- **Maximum payload (kg)**: 3
- **Robot cable length (m)**: Standard: 3.5m, Option: 5m, 10m
- **Weight (kg)**: 17

Note 1. Available only for the master.
Note 2. NPN cannot be selected if using CE marking.
Note 3. Only when you have selected CC, DN or PB for Input/Output selection 1, you can select EN for Input/Output selection 2.

### Controller

- **Controller**: RCX222
- **Power consumption (VA)**: 500
- **Operating method**: Programming / I/O point trace / Remote command / Operation using RS-232C communication

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 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.

---

YP220BX

**Coupling for air (ϕ6)**
**Coupling for air (ϕ4)**

**Robot cable**
**Grounding terminal (M4)**

**Air tube detachable connection**

**Tool plate**

**Details of tool plate**

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.
### Ordering method

**YP320X**

<table>
<thead>
<tr>
<th>Model</th>
<th>RCX222</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>2 axes</td>
</tr>
<tr>
<td>Controller</td>
<td>2 axes</td>
</tr>
</tbody>
</table>

**YP320X**

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

### Specifications

#### X axis
- AC servo motor output (W): 200
- Repeatability (mm): +/-0.02
- Deceleration ratio (mm/sec): Equivalent to lead 20
- Maximum speed (mm/sec): 1500
- Cycle time (sec): 0.57
- Robot cable length (m): Standard: 3.5, Option: 5,10
- Weight (kg): 21

#### Z axis
- AC servo motor output (W): 200
- Repeatability (mm): +/-0.05
- Deceleration ratio (mm/sec): Equivalent to lead 25
- Maximum speed (mm/sec): 1500
- Cycle time (sec): 0.78
- Robot cable length (m): Standard: 3.5, Option: 5,10
- Weight (kg): 21

### Details of tool plate

- Distance to mechanical stopper: Note 1
- 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 2
- Do not use bolts longer than 20mm (robot bottom plate thickness). Note 3

### Notes
1. Available only for the master.
2. NPN cannot be selected if using CE marking.
3. Only when you have selected CC, DN or PB for Input/Output selection 1, you can select EN for Input/Output selection 2.
4. When the moving stroke is short, the maximum speed may not be reached.
5. 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).

### Diagram

- Grounding: 5 terminal (M4)
- Air tube: detachable connection
- 8-M8 x 1.25 Dph20 (Note 3)

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).
### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable length</th>
<th>Controller</th>
<th>Number of controllable axes</th>
<th>Safety standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP220BXR</td>
<td>3L: 3.5m</td>
<td>RCX340-3</td>
<td>2-axes</td>
<td>OP.A</td>
</tr>
<tr>
<td></td>
<td>5L: 5m</td>
<td>RCX240S</td>
<td>3-axes</td>
<td>OP.B</td>
</tr>
<tr>
<td></td>
<td>10L: 10m</td>
<td>RCX240S</td>
<td>4-axes</td>
<td>OP.C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OP.D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OP.E</td>
</tr>
</tbody>
</table>

Specify various controller setting items. RCX340 ➔ P.544

### Specifications

<table>
<thead>
<tr>
<th>Specifications</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 (mm)</td>
<td>+/- 0.05</td>
<td>+/- 0.05</td>
<td>+/- 0.1</td>
</tr>
<tr>
<td>Drive system</td>
<td>Timing belt</td>
<td>Timing belt</td>
<td>Ball Reducer</td>
</tr>
<tr>
<td>Deceleration ratio (mm)</td>
<td>Equivalent to lead 24</td>
<td>Equivalent to lead 20</td>
<td>1/18</td>
</tr>
<tr>
<td>Maximum speed (XZ: mm/sec) (R: °/sec)</td>
<td>1440</td>
<td>1200</td>
<td>1000</td>
</tr>
<tr>
<td>Moving range (XZ: mm) (R: °)</td>
<td>200</td>
<td>100</td>
<td>+/-180</td>
</tr>
<tr>
<td>Cycle time (sec)</td>
<td>0.62</td>
<td></td>
<td></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>
<tr>
<td>Robot cable length (m)</td>
<td>Standard: 3.5 Option: 5, 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>19</td>
<td></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>RCX340</td>
<td>700</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX240S</td>
<td>700</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).

---

YP220BXR

### Details of tool plate

<table>
<thead>
<tr>
<th>Details</th>
<th>Width across flg 7</th>
<th>Width across flg 8</th>
<th>Width across flg 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>X stroke: 200</td>
<td>3 (Note 1)</td>
<td>2 (Note 1)</td>
<td>4 (Note 1)</td>
</tr>
</tbody>
</table>

Note 1. Distance to mechanical stopper.

Note 2. Return-to-origin on the YP220BXR is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
### Ordering method

**YP320XR**

- **RCX340-3**

Controller / Number of controllable axes
- Safety standard
- Option A (OPA)
- Option B (OPB)
- Option C (OPC)
- Option D (OPD)
- Option E (OPF)
- Absolute battery

Specify various controller setting items. RCX340 [P.544]

### Specifications

<table>
<thead>
<tr>
<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>
</tr>
<tr>
<td>Repeatability [mm] (XZ: mm) (R: °)</td>
<td>+/-0.02</td>
<td>+/-0.05</td>
</tr>
<tr>
<td>Drive system</td>
<td>Ball screw (C7 class)</td>
<td>Timing belt</td>
</tr>
<tr>
<td>Deceleration ratio (mm)</td>
<td>Equivalent to lead 20</td>
<td>Equivalent to lead 25</td>
</tr>
<tr>
<td>Maximum speed [mm/sec] (XZ: mm/sec) (R: °/sec)</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Moving range (XZ: mm) (R: °)</td>
<td>330</td>
<td>100</td>
</tr>
<tr>
<td>Cycle time (sec)</td>
<td>0.67 [Note 1], 0.87 [Note 2]</td>
<td></td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>R-axis allowable moment inertia (kgm^2)</td>
<td>0.00098 [0.01]</td>
<td></td>
</tr>
</tbody>
</table>

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

Weight (kg)
- 23

### Controller

- **RCX340**
- **RCX240S**

<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>
<tr>
<td>RCX240S</td>
<td>544</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).

---

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 thickness).
### Ordering method

<table>
<thead>
<tr>
<th>Model</th>
<th>RCX340-3</th>
<th>RCX240S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller / Number of controllable axes</td>
<td>Safety standard</td>
<td>Option A (OP. A)</td>
</tr>
<tr>
<td>Specify various controller setting items.</td>
<td>RCX340</td>
<td>P.544</td>
</tr>
</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th></th>
<th>X axis</th>
<th>Y axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC servo motor output (W)</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>+/-0.02</td>
<td>+/-0.02</td>
<td>+/-0.05</td>
</tr>
<tr>
<td>Drive system</td>
<td>Ball screw (C7 class)</td>
<td>Ball screw (C7 class)</td>
<td>Timing belt</td>
</tr>
<tr>
<td>Deceleration ratio (mm/sec)</td>
<td>Equivalent to lead 20</td>
<td>Equivalent to lead 20</td>
<td>Equivalent to lead 25</td>
</tr>
<tr>
<td>Maximum speed (mm/sec)</td>
<td>1500</td>
<td>1000</td>
<td>1500</td>
</tr>
<tr>
<td>Moving range (mm)</td>
<td>330</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Cycle time (sec)</td>
<td>0.57</td>
<td>0.78</td>
<td>1.00</td>
</tr>
<tr>
<td>Maximum payload (kg)</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Robot cable length (m)</td>
<td>Standard: 3.5</td>
<td>Option: 5.10</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>32</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>
<tr>
<td>RCX240S</td>
<td>534</td>
<td></td>
</tr>
</tbody>
</table>

### Controller Specifications

- Model: YP330X
- X stroke: 330
- Z stroke: 100
- Y stroke: 150
- YP330X
- 4-Coupling for air
- Depth 20 (Note 3)
- 8-M8 x 10 (Note 3)

Note 1. Distance to mechanical stopper.
Note 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.
Note 3. Do not use bolts longer than 20mm (robot bottom plate thickness).
YP340X 4 axes

[Diagram of YP340X]

### Ordering method

YP340X | RCX340-4
---|---
Model | Controller / Number of controllable axes
Cable length | 3.5m (3L: 3.5m) 5L: 5m 10L: 10m

Specify various controller setting items. RCX340 | 544

### Specifications

<table>
<thead>
<tr>
<th>Controller</th>
<th>Power consumption (VA)</th>
<th>Operating method</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCX340</td>
<td>800</td>
<td>Programming / I/O point trace / Remote command / Operation using RS-232C communication</td>
</tr>
<tr>
<td>RCX240S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Controller

- Controller: RCX340, RCX240S
- Power consumption: 800 VA
- Operating method: Programming, I/O point trace, Remote command, Operation using RS-232C communication

### Specifications

- **AC servo motor output (W)**:
  - X axis: 200
  - Y axis: 200
  - Z axis: 200
  - R axis: 60

- **Repeatability (XYZ: mm/R: °)**:
  - X: ±0.02
  - Y: ±0.02
  - Z: ±0.02
  - R: ±0.05

- **Drive system**:
  - Ball screw (C7 class)
  - Timing belt
  - Ball Reducer

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

- **Maximum speed (XYZ: mm/sec) (R: °/sec)**:
  - X: 1500
  - Y: 1000
  - Z: 1500
  - R: 1000

- **Moving range (XYZ: mm) (R: °)**:
  - X: 330
  - Y: 150
  - Z: 100
  - R: +180

- **Cycle time (sec)**: 0.67, 0.87

- **Maximum payload (kg)**: 1

- **R-axis allowable moment inertia**:
  - (kgm²): 0.00098 [0.01]

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

- **Weight (kg)**: 34

### Notes

1. Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).
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.
3. Do not use bolts longer than 20mm (robot bottom plate thickness).

YP340X

[Diagram of YP340X]

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 thickness).