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.

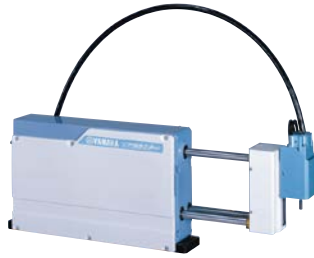# Full lineup of 6 models in all from 2 axes to 4 axes

YP220BX/YP320X　　　　**YP220BXR/YP320XR/YP330X**　　　　**YP340X**
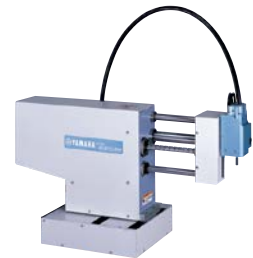
Model	Axis	Structure				Maximum payload (kg)	Cycle time (sec.)	Page
		X-axis	Y-axis	Z-axis	R-axis			
YP220BX	2 axes	Belt	-	Belt	-	3	0.45	P.429
YP320X		Ball screw	-	Belt	-	3	0.57	P.430
YP220BXR	3 axes	Belt	-	Belt	Rotation axis	1	0.62	P.431
YP320XR		Ball screw	-	Belt	Rotation axis	1	0.67	P.432
YP330X		Ball screw	Ball screw	Belt	-	3	0.57	P.433
YP340X	4 axes	Ball screw	Ball screw	Belt	Rotation axis	1	0.67	P.434

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.

Reciprocation 0.45 sec.

50 mm

150 mm
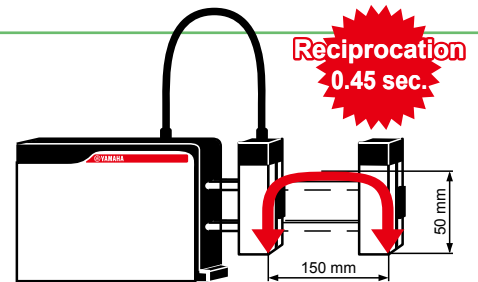
POINT 2

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.

■ Line using pick & place utilizing space saving

287.5　287.5　109 109

■ Line using YAMAHA's compact Cartesian robot PXYx
X-axis stroke: 250 mm
Y-axis stroke: 250 mm

504.5　504.5　504.5

■ Line using YAMAHA's compact SCARA robot YK250X

574
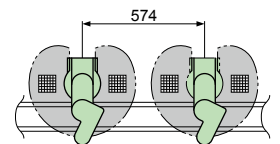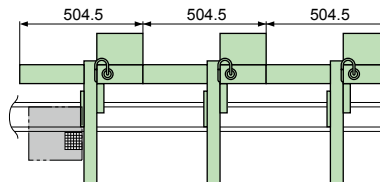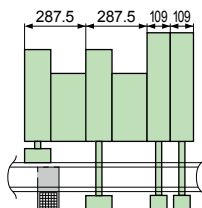
POINT 3

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

Articulated robots
YA

Linear conveyor modules
LCM100

Compact single-axis robots
TRANSERVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

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YP-X

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YA Articulated robots

LCM100 Linear conveyor modules

TRANSERVO Compact single-axis robots

FLIP-X Single-axis robots

PHASER Linear motor single-axis robots

XY-X Cartesian robots

YK-X SCARA robots

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YP-X SPECIFICATION SHEET

Type	Model	Maximum payload (kg)	Cycle time (sec) Note 1	Structure		Moving range	Detailed info page
2-axes	YP220BX	3	0.45	X-axis	Belt	200mm	P.429
				Z-axis	Belt	100mm	
	YP320X	3	0.57	X-axis	Ball screw	330mm	P.430
				Z-axis	Belt	100mm	
3-axes	YP220BXR	1	0.62	X-axis	Belt	200mm	P.431
				Z-axis	Belt	100mm	
				R-axis	Rotation axis	+/-180°	
	YP320XR	1	0.67	X-axis	Ball screw	330mm	P.432
				Z-axis	Belt	100mm	
				R-axis	Rotation axis	+/-180°	
	YP330X	3	0.57	X-axis	Ball screw	330mm	P.433
				Y-axis	Ball screw	150mm	
				Z-axis	Belt	100mm	
4-axes	YP340X	1	0.67	X-axis	Ball screw	330mm	P.434
				Y-axis	Ball screw	150mm	
				Z-axis	Belt	100mm	
				R-axis	Rotation axis	+/-180°	

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 ▶ RCX222**
- Usable for CE ▷ Not required
- Input/Output selection 1 ▷ NPN
- Input/Output selection 2 ▷ None

● **Ordering method**

YP220BX－3L－RCX222－N

Mechanical section　　　Controller section

－① Model	－② Cable length	RCX222	－④ Usable for CE	－⑤ Input/Output selection 1	⑥ Input/Output selection 2
YP220BX	3L 3.5m	③ Controller	No entry Standard	N NPN Note 1	No entry None
YP320X	5L 5m		E CE marking	P PNP	N1 OP.DIO 24/16 (NPN) Note 1
	10L 10m			CC CC-Link	P1 OP.DIO 24/17 (PNP)
				DN DeviceNet™	EN Ethernet Note 3
				PB PROFIBUS	
				EN Ethernet	
				YC YC-Link Note 2	

Note 1. With the CE marking, it is not possible to select NPN or Ethernet.
Note 2. Available only for the master.
Note 3. Only when CC-Link or DeviceNet™ or PROFIBUS was selected for I/O select 1 above. Ethenet can be selected in I/O select 2.

■ **3 / 4 axis specifications**

● **Mechanical ▶ YP340X**
- Robot cable length ▷ 5m

● **Controller ▶ RCX240S**

● **Ordering method**

YP340X－5L－RCX240S

Mechanical section　　　Controller section

－① Model	－② Cable length	－③ Controller
YP220BXR	3L 3.5m	RCX240S
YP320XR	5L 5m	RCX340
YP330X	10L 10m	
YP340X		

To find detailed controller information see the controller page.　　**RCX222 ▶ P.524, RCX240S ▶ P.532, RCX340 ▶ P.542**

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 the RCX222. **3 / 4 axis specifications:**　Select either the RCX240S or RCX340.

YP220BX `2 axes`

YA — Articulated robots
LCM100 — Linear conveyor modules
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FLIP-X — Single-axis robots
PHASER — Linear motor single-axis robots
XY-X — Cartesian robots
YK-X — SCARA robots
YP-X — Pick & place robots
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■ Ordering method

YP220BX ☐ – **RCX222** – ☐ – ☐ – ☐

Model	–	Cable length	Controller	Usable for CE	Inputs/Outputs selection 1	Inputs/Outputs selection 2
YP220BX		3L: 3.5m 5L: 5m 10L: 10m	RCX222	No entry: Standard E: CE marking	N: NPN Note 2 P: PNP CC: CC-Link DN: DeviceNet™ PB: PROFIBUS EN: Ethernet YC: YC-Link Note 1	No entry: None N1: OP.DIO24/16 (NPN) Note 2 P1: OP.DIO24/17 (PNP) EN: Ethernet Note 3

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.

■ Specifications

	X axis	Z axis
AC servo motor output (W)	200	200
Repeatability Note 1 (mm)	+/-0.05	+/-0.05
Drive system	Timing belt	Timing belt
Deceleration ratio (mm)	Equivalent to lead 24	Equivalent to lead 20
Maximum speed Note 2 (mm/sec)	1440	1200
Moving range (mm)	200	100
Cycle time (sec)	0.45 Note 3	
Maximum payload (kg)	3	
Robot cable length (m)	Standard: 3.5 Option: 5,10	
Weight (kg)	17	

Note 1. Positioning repeatability precision in a single swing when residual vibration is stabilized (variable depending on the load and stroke).
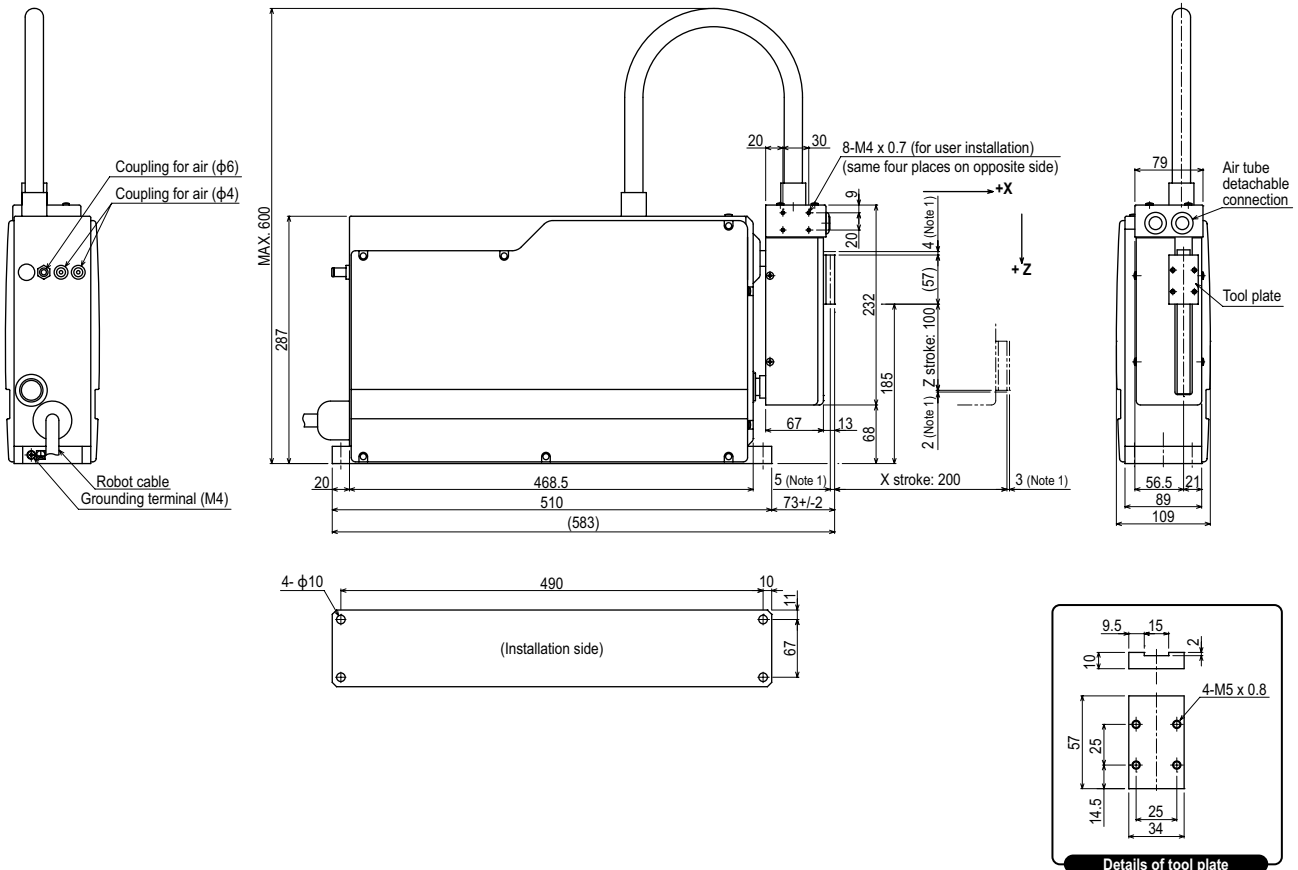Note 2. When the moving stroke is short, the maximum speed may not be reached.
Note 3. Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).

■ Controller

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

YP220BX

MAX. 600
287
Coupling for air (φ6)
Coupling for air (φ4)
Robot cable
Grounding terminal (M4)
20 30
8-M4 x 0.7 (for user installation)
(same four places on opposite side)
+X
+Z
9
20
4 (Note 1)
(57)
232
185
67 13
68
2 (Note 1) Z stroke: 100
20 468.5 510 (583)
5 (Note 1) X stroke: 200 3 (Note 1)
73+/-2
79
Air tube detachable connection
Tool plate
56.5 21
89
109

4- φ10
490 10
11
67
(Installation side)

Details of tool plate
9.5 15
2
10
4-M5 x 0.8
57 25
14.5
25
34

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.

YA — Articulated robots
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YP-X — Pick & place robots
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YP320X **2 axes**

■ Ordering method

YP320X — [ ] — RCX222 [ ] [ ] [ ] [ ]

Model	Cable length	Controller	Usable for CE	Inputs/Outputs selection 1	Inputs/Outputs selection 2
	3L: 3.5m	RCX222	No entry: Standard	N: NPN [Note 2]	No entry: None
	5L: 5m		E: CE marking	P: PNP	N1: OP.DIO24/16 (NPN) [Note 2]
	10L: 10m			CC: CC-Link	P1: OP.DIO24/17 (PNP)
				DN: DeviceNet™	EN: Ethernet [Note 3]
				PB: PROFIBUS	
				EN: Ethernet	
				YC: YC-Link [Note 1]	

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.

■ Specifications

	X axis	Z axis
AC servo motor output (W)	200	200
Repeatability [Note 1] (mm)	+/-0.02	+/-0.05
Drive system	Ball screw (C7 class)	Timing belt
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 25
Maximum speed [Note 2] (mm/sec)	1500	1500
Moving range (mm)	330	100
Cycle time (sec)	0.57 [Note 3], 0.78 [Note 4]	
Maximum payload (kg)	3	
Robot cable length (m)	Standard: 3.5 Option: 5,10	
Weight (kg)	21	

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

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

YP320X

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).

YP220BXR 3 axes

■ Ordering method

YP220BXR — □ **Cable length**
3L: 3.5m
5L: 5m
10L: 10m

RCX340-3 — □ □ □ □ □ □ □
Controller / Number of controllable axes | Safety standard | Option A (OP.A) | Option B (OP.B) | Option C (OP.C) | Option D (OP.D) | Option E (OP.E) | Absolute battery

Specify various controller setting items. RCX340 ▶ **P.542**

RCX240S — □ □ □ □ □ □
Controller | CE Marking | Expansion I/O | Network option | iVY System | Gripper | Battery

Specify various controller setting items. RCX240/RCX240S ▶ **P.532**

■ Specifications

	X axis	Z axis	R axis
AC servo motor output (W)	200	200	60
Repeatability Note1 (mm)	+/-0.05	+/-0.05	+/-0.1
Drive system	Timing belt	Timing belt	Ball Reducer
Deceleration ratio (mm)	Equivalent to lead 24	Equivalent to lead 20	1/18
Maximum speed Note 2 (XZ: mm/sec) (R: °/sec)	1440	1200	1000
Moving range (XZ: mm) (R: °)	200	100	+/-180
Cycle time (sec)	0.62 Note 3		
Maximum payload (kg)	1		
R-axis allowable moment inertia (kgm²[kgfcms²])	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).
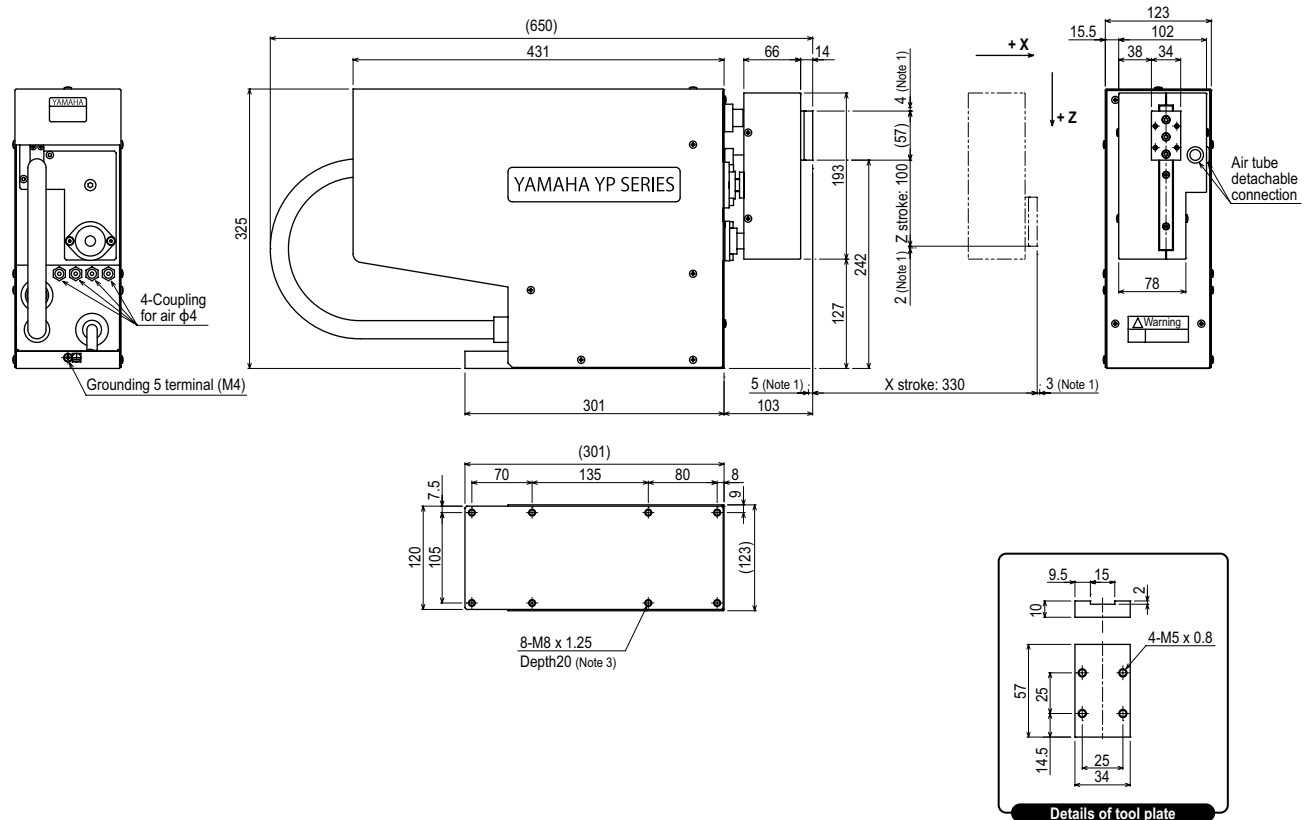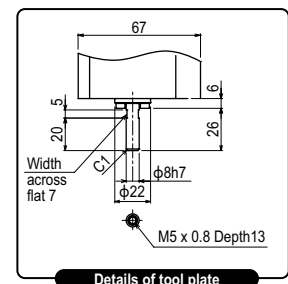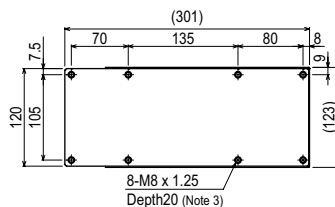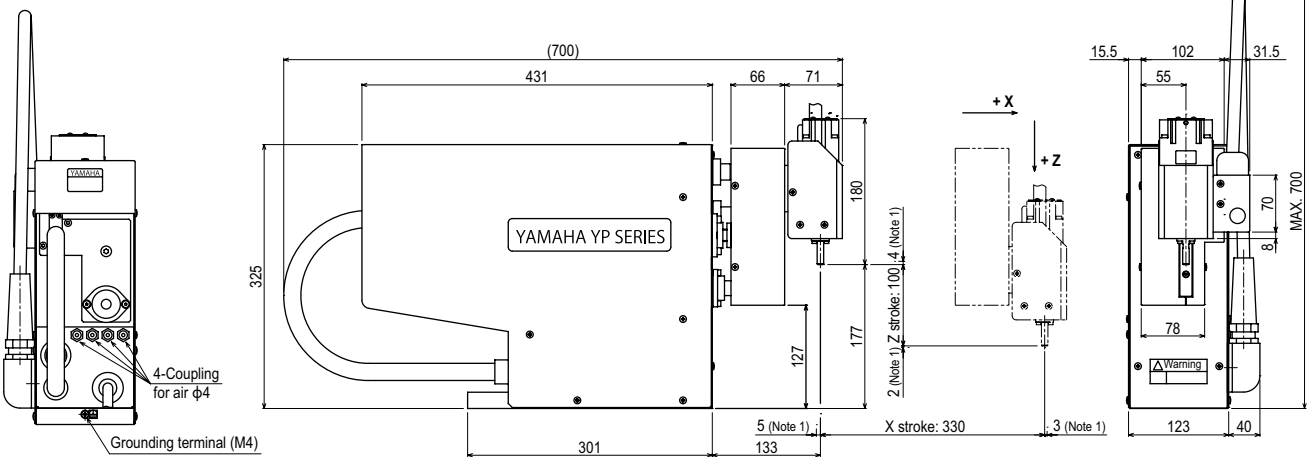Note 2. When the moving stroke is short, the maximum speed may not be reached.
Note 3. Reciprocating time in vertical direction (50mm) and longitudinal direction (150mm) with the arch amount of 50 (when executing rough-positioning arch motion with 1kg load).

■ Controller

Controller	Power consumption (VA)	Operating method
RCX340 RCX240S	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP220BXR

2-Coupling for air φ4
Grounding terminal (M4)
287
640
67 70
179
68
120
2 (Note 1) Z stroke: 100 4 (Note 1)
+ X
+ Z
20
468.5
510
5 (Note 1)
103+/-2
X stroke: 200
3 (Note 1)
MAX. 700
70
8
Air tube detachable connection
10 89 40 17.5

4- φ10
490
10
11
67
Bottom plate

Details of tool plate
67
5
20
6
26
C1
Width across flat 7
φ8h7
φ22
M5 x 0.8 Depth13

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.

Articulated robots YA

Linear conveyor modules LCM100

Compact single-axis robots TRANSERVO

Single-axis robots FLIP-X

Linear motor single-axis robots PHASER

Cartesian robots XY-X

SCARA robots YK-X

Pick & place robots YP-X

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YP320XR 3 axes

■ Ordering method

YP320XR – [Model] – [Cable length] — RCX340-3 – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

| Model | Cable length | Controller / Number of controllable axes | Safety standard | Option A (OP.A) | Option B (OP.B) | Option C (OP.C) | Option D (OP.D) | Option E (OP.E) | Absolute battery |

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

Specify various controller setting items. RCX340 ▶ **P.542**

RCX240S – [ ] – [ ] – [ ] – [ ] – [ ]

| Controller | CE Marking | Expansion I/O | Network option | iVY System | Gripper | Battery |

Specify various controller setting items. RCX240/RCX240S ▶ **P.532**
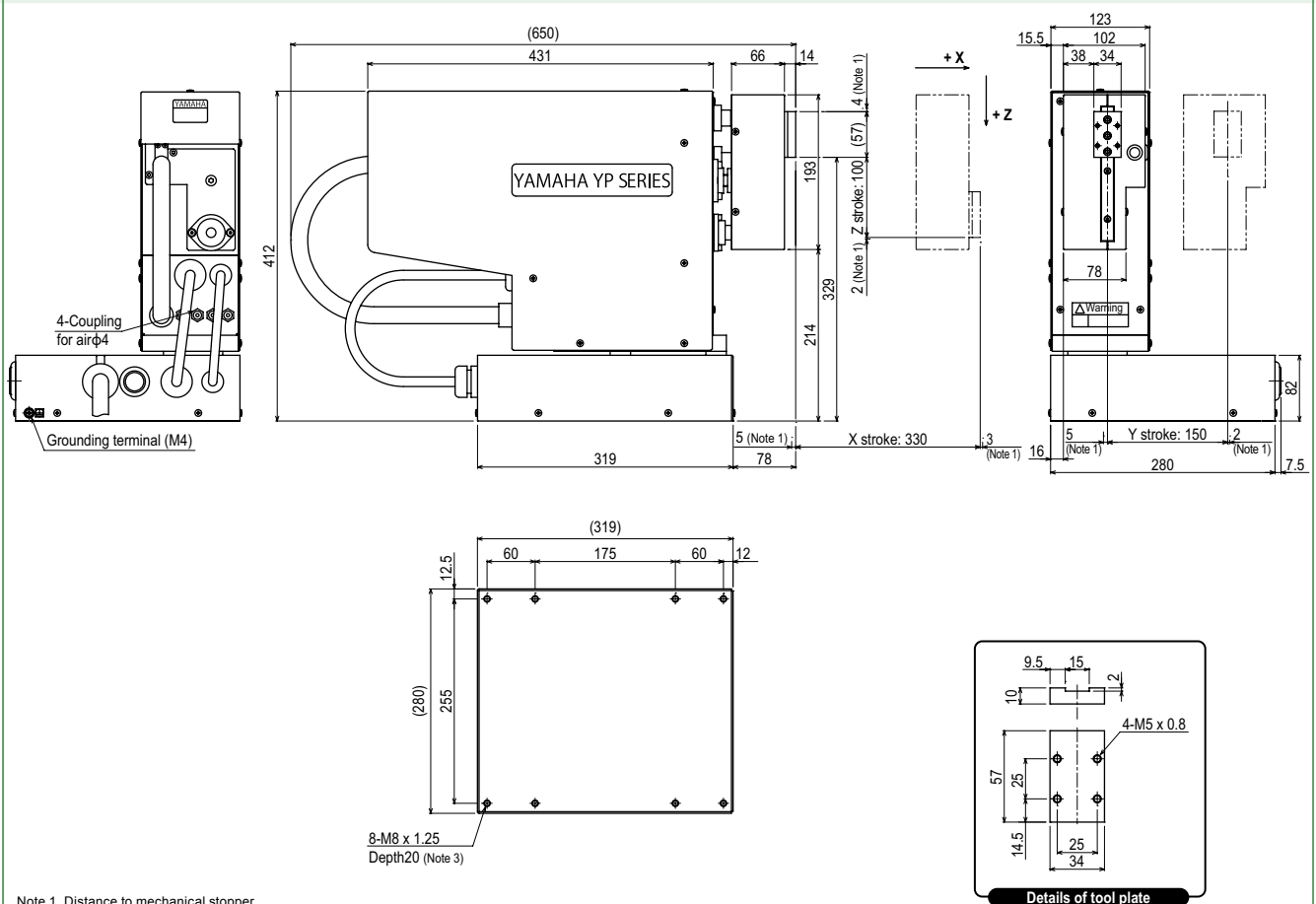
■ Specifications

	X axis	Z axis	R axis
AC servo motor output (W)	200	200	60
Repeatability Note 1 (XZ: mm) (R: °)	+/-0.02	+/-0.05	+/-0.1
Drive system	Ball screw (C7 class)	Timing belt	Ball Reducer
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 25	1/18
Maximum speed Note 2 (XZ: mm/sec) (R: °/sec)	1500	1500	1000
Moving range (XZ: mm) (R: °)	330	100	+/-180
Cycle time (sec)	0.67 Note 3, 0.87 Note 4		
Maximum payload (kg)	1		
R-axis allowable moment inertia (kgm²[kgfcms²])	0.00098 [0.01]		
Robot cable length (m)	Standard: 3.5 Option: 5,10		
Weight (kg)	23		

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

Controller	Power consumption (VA)	Operating method
RCX340 RCX240S	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP320XR

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).

YP330X `3 axes`

YA — Articulated robots
LCM100 — Linear conveyor modules
TRANSERVO — Compact single-axis robots
FLIP-X — Single-axis robots
PHASER — Linear motor single-axis robots
XY-X — Cartesian robots
YK-X — SCARA robots
YP-X — Pick & place robots
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■ Ordering method

YP330X □ — Model
- Cable length
  - 3L: 3.5m
  - 5L: 5m
  - 10L: 10m

RCX340-3 □ □ □ □ □ □ □
- Controller / Number of controllable axes
- Safety standard
- Option A (OP.A)
- Option B (OP.B)
- Option C (OP.C)
- Option D (OP.D)
- Option E (OP.E)
- Absolute battery

Specify various controller setting items. RCX340 ▶ P.542

RCX240S □ □ □ □ □ □
- Controller
- CE Marking
- Expansion I/O
- Network option
- iVY System
- Gripper
- Battery

Specify various controller setting items. RCX240/RCX240S ▶ P.532

■ Specifications

	X axis	Y axis	Z axis
AC servo motor output (W)	200	200	200
Repeatability Note 1 (mm)	+/-0.02	+/-0.02	+/-0.05
Drive system	Ball screw (C7 class)	Ball screw (C7 class)	Timing belt
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 20	Equivalent to lead 25
Maximum speed Note 2 (mm/sec)	1500	1000	1500
Moving range (mm)	330	150	100
Cycle time (sec)	0.57 Note 3, 0.78 Note 4		
Maximum payload (kg)	3		
Robot cable length (m)	Standard: 3.5 Option: 5,10		
Weight (kg)	32		

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

Controller	Power consumption (VA)	Operating method
RCX340 RCX240S	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP330X

Details of tool plate

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).

Articulated robots YA
Linear conveyor modules LCM100
Compact single-axis robots TRANSERVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
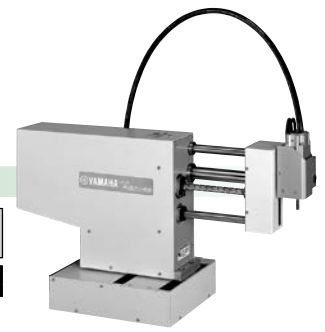SCARA robots YK-X
Pick & place robots YP-X
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YP340X `4 axes`

■ Ordering method

YP340X - [ ] - RCX340-4 [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

| Model | Cable length | Controller / Number of controllable axes | Safety standard | Option A (OP.A) | Option B (OP.B) | Option C (OP.C) | Option D (OP.D) | Option E (OP.E) | Absolute battery |

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

Specify various controller setting items. RCX340 ▶ **P.542**

RCX240S [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

| Controller | CE Marking | Expansion I/O | Network option | iVY System | Gripper | Battery |

Specify various controller setting items. RCX240/RCX240S ▶ **P.532**

■ Specifications

	X axis	Y axis	Z axis	R axis
AC servo motor output (W)	200	200	200	60
Repeatability Note 1 (XYZ: mm)(R: °)	+/-0.02	+/-0.02	+/-0.05	+/-0.1
Drive system	Ball screw (C7 class)	Ball screw (C7 class)	Timing belt	Ball Reducer
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 20	Equivalent to lead 25	1/18
Maximum spee Note 2 (XYZ: mm/sec) (R: °/sec)	1500	1000	1500	1000
Moving range (XYZ: mm) (R: °)	330	150	100	+/-180
Cycle time (sec)	0.67 Note 3, 0.87 Note 4			
Maximum payload (kg)	1			
R-axis allowable moment inertia (kgm²[kgfcms²])	0.00098 [0.01]			
Robot cable length (m)	Standard: 3.5 Option: 5,10			
Weight (kg)	34			

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

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

YP340X
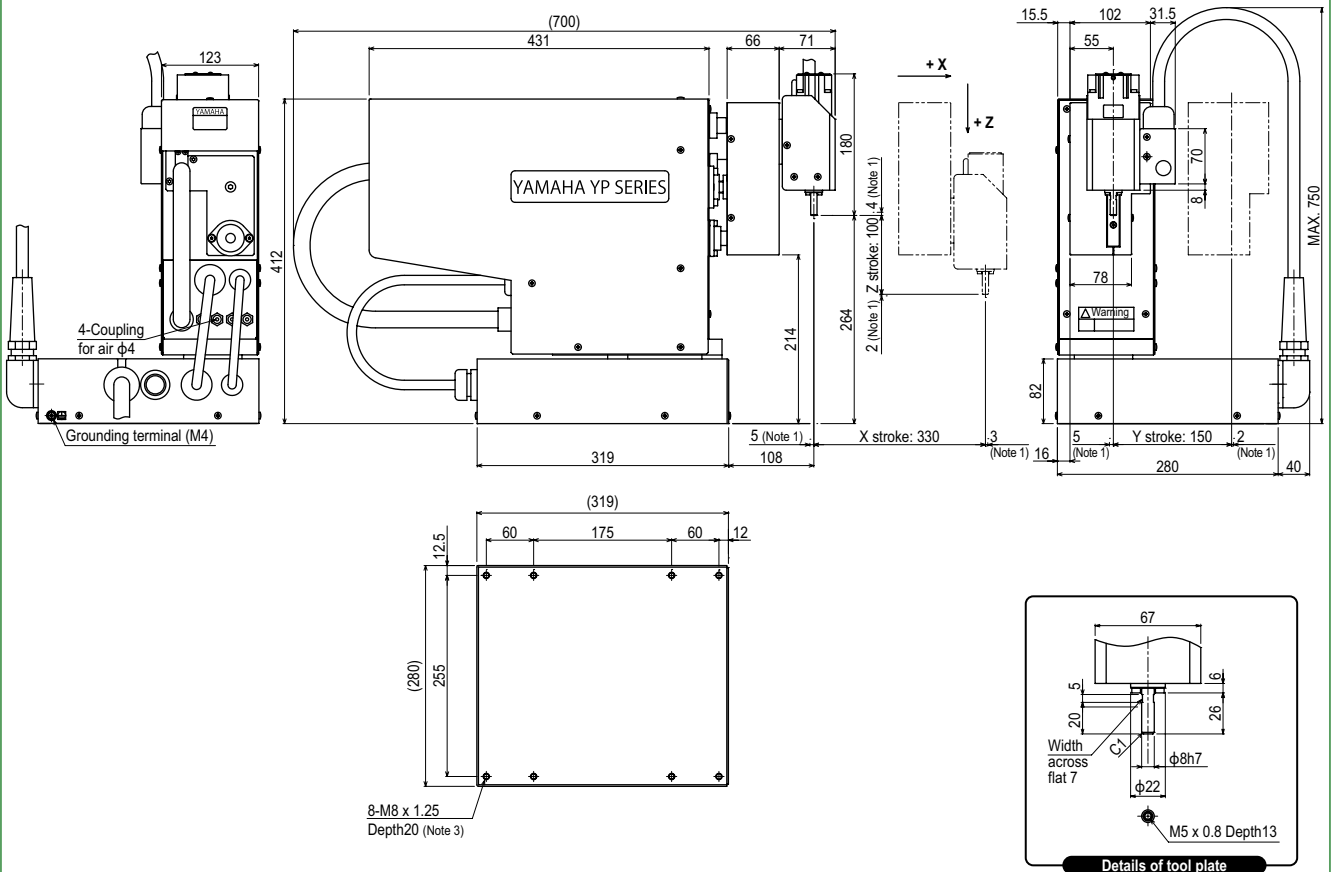
Note 1. Distance to mechanical stopper.
Note 2. Return-to-origin on the YP340X is by absolute reset. So the origin position must be set the first time (making initial settings) but after that is not required.
Note 3. Do not use bolts longer than 20mm (robot bottom plate thickness).