

YP-X
Series

PICK & PLACE ROBOTS

Ideal for high-speed pick & place tasks using small parts!
Positioning is by servo control so no complex mechanical adjustments are needed!

2 axes



YP220BX / YP320X

3 axes



YP220BRX / YP320XR / YP330X

4 axes

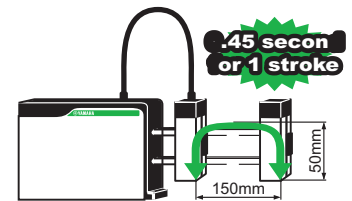


YP340X

This is why the YP-X is terrific!

1 High speed

Super high speed pick & place operation at 0.45sec cycle time as standard contributes largely to higher productivity (YP220BX under operation conditions of 50mm in vertical direction, 150mm in longitudinal direction, 50 in arch volume and 1kg load). As 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 reduced.



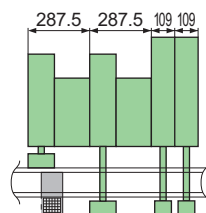
2 Compact size

Designed as compact as 109mm in width (YP220BX), it is possible to make the production line small and simple. The moving arm structure with less interference area in periphery contributes to saving space.

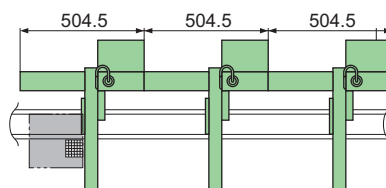
Reference example of comparison of robot layouts

Comparison of space occupied by the YP X series and by our small sized robots of Cartesian robot and SCARA robot allows you to confirm the compactness of the YP X series when they are installed to an assembly line.

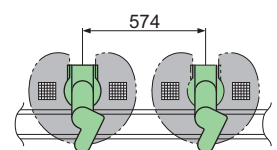
● An assembly line using the pick & place excellent in space saving property.



● An assembly line using the PXYx, Yamaha's compact size Cartesian robot.
Stroke of X axis: 250mm
Stroke of Y axis: 250mm



● An assembly line using the YK250X, Yamaha's compact size SCARA robot



3 High precision

Both outstanding high-speed performance and high precision of +/-0.02mm (YP320X, YP320XR, YP330X, YP340X) are assured.

4 General use

Owing to YAMAHA's unique servo system, settings for the stop point and operation pattern can be programmed freely. This provides outstanding applicability to production of multiple number of items in a small lot which is difficult with a cam type robot.




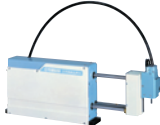


5 Complete absolute position system

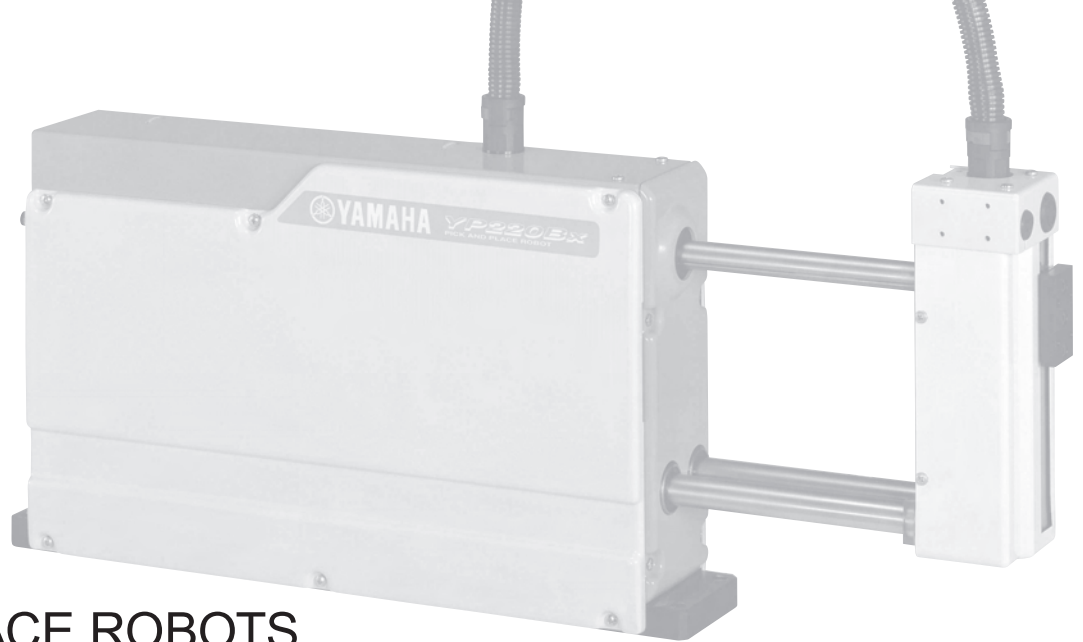
As complete absolute position system is adopted as standard specification, the origin return operation is not necessary.

6 Fully assorted line-up

Full line-up of 6 models in all from 2 axes type to 4 axes type selectable for each use purpose.

YP-X easy selection table

2 axes		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Belt				
		Z axis	Belt	3	0.45	YP220BX	P.304
		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Ball screw				
		Z axis	Belt	3	0.57	YP320X	P.305
3 axes		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Belt				
		Z axis	Belt				
		R axis	Rotation axis	1	0.62	YP220BXR	P.306
		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Ball screw				
		Z axis	Belt				
		R axis	Rotation axis	1	0.67	YP320XR	P.307
4 axes		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Ball screw				
		Y axis	Ball screw				
		Z axis	Belt	3	0.57	YP330X	P.308
		Structure		Maximum payload (kg)	Cycle time (sec)	Model	Detailed info page
		X axis	Ball screw				
		Y axis	Ball screw				
		Z axis	Belt				
		R axis	Rotation axis	1	0.67	YP340X	P.309



PICK & PLACE ROBOTS

YP-X SERIES

APPLICATION

TRANSSERVO
Compact
single-axis robots

FLIP-X
Single-axis robots

PHASER
Linear motor
single-axis robots

XY-X
Cartesian
robots

YK-XG
SCARA
robots

YP-X
Pick & place
robots

CLEAN

CONTROLLER

INFORMATION

2-axes

3-axes

4-axes

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- 4 AXES**
- YP340X 309

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 Z-axis: Belt	200mm 100mm	P.304
	YP320X	3	0.57	X-axis: Ball screw Z-axis: Belt	330mm 100mm	P.305
3-axes	YP220BXR	1	0.62	X-axis: Belt Z-axis: Belt	200mm 100mm	P.306
				R-axis: Rotation axis	+/-180°	
	YP320XR	1	0.67	X-axis: Ball screw Z-axis: Belt	330mm 100mm	P.307
				R-axis: Rotation axis	+/-180°	
YP330X	3	0.57	X-axis: Ball screw Y-axis: Ball screw Z-axis: Belt	330mm 150mm 100mm	P.308	
			X-axis: Ball screw	330mm		
			Y-axis: Ball screw	150mm		
4-axes	YP340X	1	0.67	X-axis: Ball screw Y-axis: Ball screw Z-axis: Belt R-axis: Rotation axis	330mm 150mm 100mm +/-180°	P.309
				X-axis: Ball screw	330mm	
				Y-axis: Ball screw	150mm	
				Z-axis: Belt	100mm	

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

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

Note 1. DRXC is also selectable.
 Note 2. With the CE marking, it is not possible to select NPN or Ethernet.
 Note 3. Available only for the master.
 Note 4. Only when CC-Link or DeviceNet or Profibus was selected for I/O select 1 above. Ethernet can be selected in I/O select 2.

■ 3 / 4 axis specifications

● Mechanical ▶ YP340X

- Robot cable length ▶ 5m

● Controller ▶ RCX240

- Usable for CE ▶ Not required
- Expansion I/O ▶ NPN Standard I/O 16/8
- Network option ▶ CC-Link
- Battery ▶ 4 pcs

● Ordering method

YP340X-5L-RCX240-N-CC-BB

Mechanical section

Controller section

		RCX240				BB
① Model	② Cable length	③ Controller	④ Usable for CE	⑦ Expansion I/O ^{Note 1}	⑧ Network option	⑨ Battery
YP220BXR YP320XR YP330X YP340X	3L 3.5m (Standard) 5L 5m 10L 10m		No entry E CE marking	N Standard I/O 16/8 (NPN) N1 40/24 (NPN) N2 64/40 (NPN) N3 88/55 (NPN) N4 112/72 (NPN) P Standard I/O 16/8 (PNP) P1 40/24 (PNP) P2 64/40 (PNP) P3 88/55 (PNP) P4 112/72 (PNP)	No entry None CC CC-Link DN DeviceNet PB Profibus EN Ethernet YC YC-Link ^{Note 1}	

Note 1. Available only for the master.

To find detailed controller information see the controller page. **DRXC ▶ P.387, RCX222 ▶ P.395, RCX240 ▶ P.402**

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 (Standard) 5L : 5m 10L : 10m
③ Controller	2-axis specifications: Select either RCX222 or DRCX. 3 / 4 axis specifications: RCX240.
④ Usable for CE	CE marking is selectable.
⑤ Input/Output selection 1	This is an RCX222 controller option. It allows selecting an expansion I/O board and network board adding to the standard I/O board.
⑥ Input/Output selection 2	
⑦ Expansion I/O	This is an RCX240 controller option. It allows selecting an expansion I/O board adding to the standard I/O board.
⑧ Network option	This is an RCX240 controller option. It allows selecting a network board adding to the standard I/O board.
⑨ Battery	Absolute data backup battery (not required if using incremental specifications).

APPLICATION

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Pick & place
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CONTROLLER

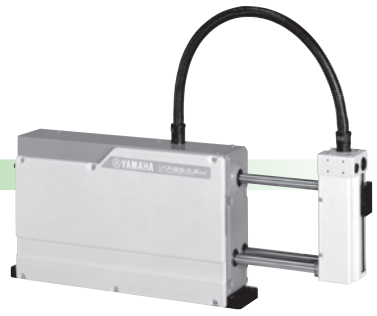
INFORMATION

2-axes

3-axes

4-axes

YP220BX 2 axes



Ordering method

YP220BX		RCX222			
Model	Cable length	Controller	Usable for CE	Inputs/Outputs selection 1	Inputs/Outputs selection 2
	3L: 3.5m (Standard) 5L: 5m 10L: 10m	RCX222 DRCX0505	No entry: Standard E: CE marking	N: NPN ^{Note 2} P: PNP CC: CC-Link DN: DeviceNet PB: Profibus ^{Note 2} EN: Ethernet ^{Note 2} YC: YC-Link ^{Note 1}	No entry: None N1: OPDIO24/16 (NPN) ^{Note 2} P1: OPDIO24/17 (PNP) EN: Ethernet ^{Note 2 No e 3}

Note 1. Available only for the master.
 Note 2. With the CE marking, it is not possible to select NPN or Ethernet.
 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

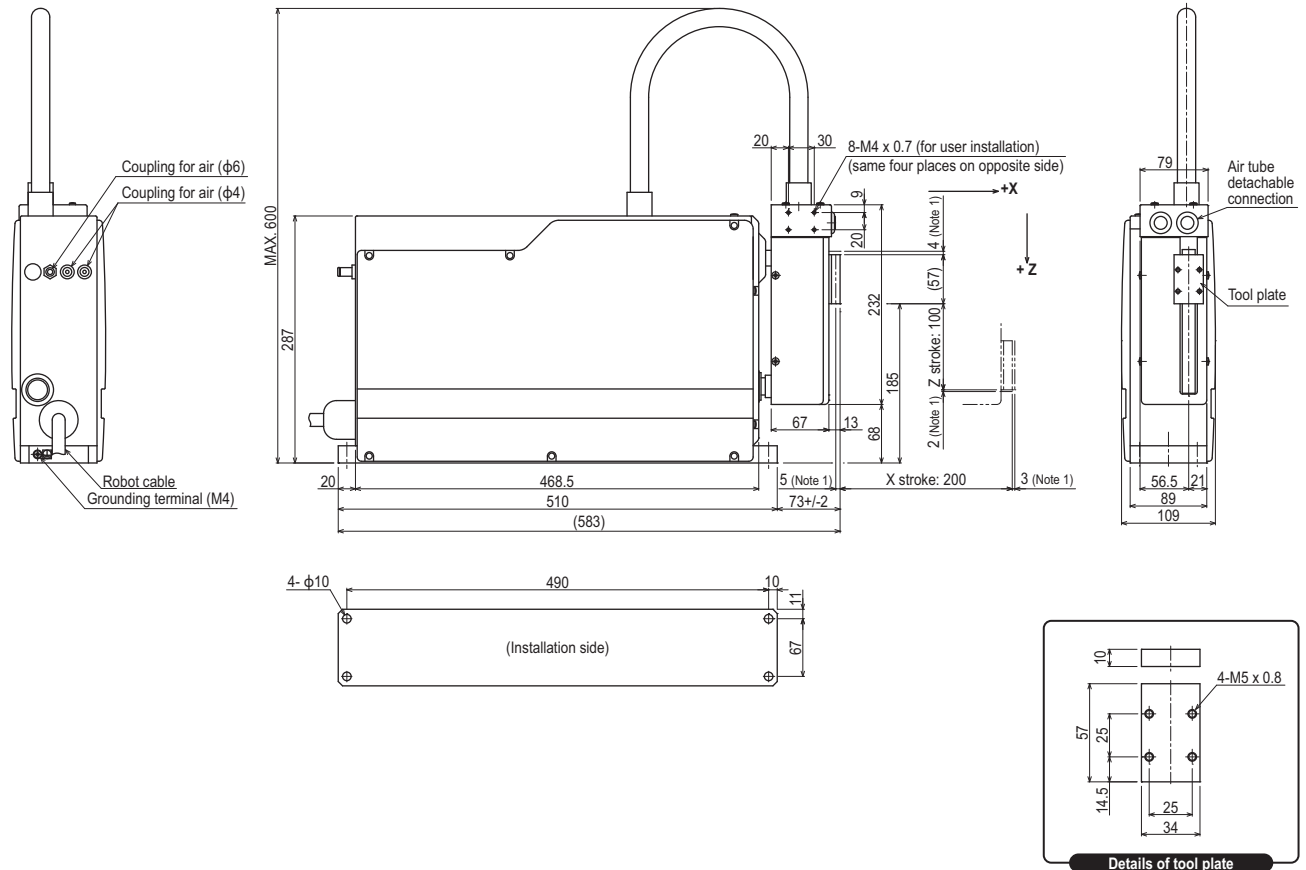
	X axis	Z axis
AC servo motor output (W)	200	200
Repeatability ^{Note 1} (mm)	+/-0.05	+/-0.05
Drive system	Timing belt	Timing belt
Deceleration ratio (mm)	Equivalent to lead 24	Equivalent to lead 20
Maximum speed ^{Note 2} (mm/sec)	1440	1200
Moving range (mm)	200	100
Cycle time (sec)	0.45 ^{Note 3}	
Maximum 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

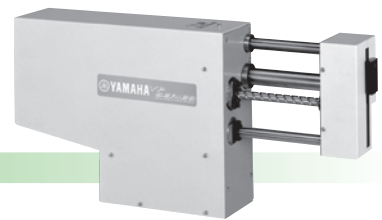
Controller	Power consumption (VA)	Operating method
RCX222	500	Programming / I/O point trace / Remote command / Operation using RS-232C communication
DRCX0505	500	

YP220BX



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

YP320X		RCX222			
Model	Cable length	Controller	Usable for CE	Inputs/Outputs selection 1	Inputs/Outputs selection 2
	3L: 3.5m (Standard) 5L: 5m 10L: 10m	RCX222 DRCX0505	No entry: Standard E: CE marking	N: NPN ^{Note 2} P: PNP CC: CC-Link DN: DeviceNet PB: Profibus ^{Note 2} EN: Ethernet ^{Note 2} Note 1. YC: YC-Link ^{Note 1}	No entry: None N1: OP.DIO24/16 (NPN) ^{Note 2} P1: OP.DIO24/17 (PNP) EN: Ethernet ^{Note 2} ^{Note 3}

Note 1. Available only for the master.

Note 2. With the CE marking, it is not possible to select NPN or Ethernet.

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 / /O point trace / Remote command / Operation using RS-232C communication
DRCX0505	500	

APPLICATION
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XY-X Cartesian robots
YK-XG SCARA robots

YP-X Pick & place robots

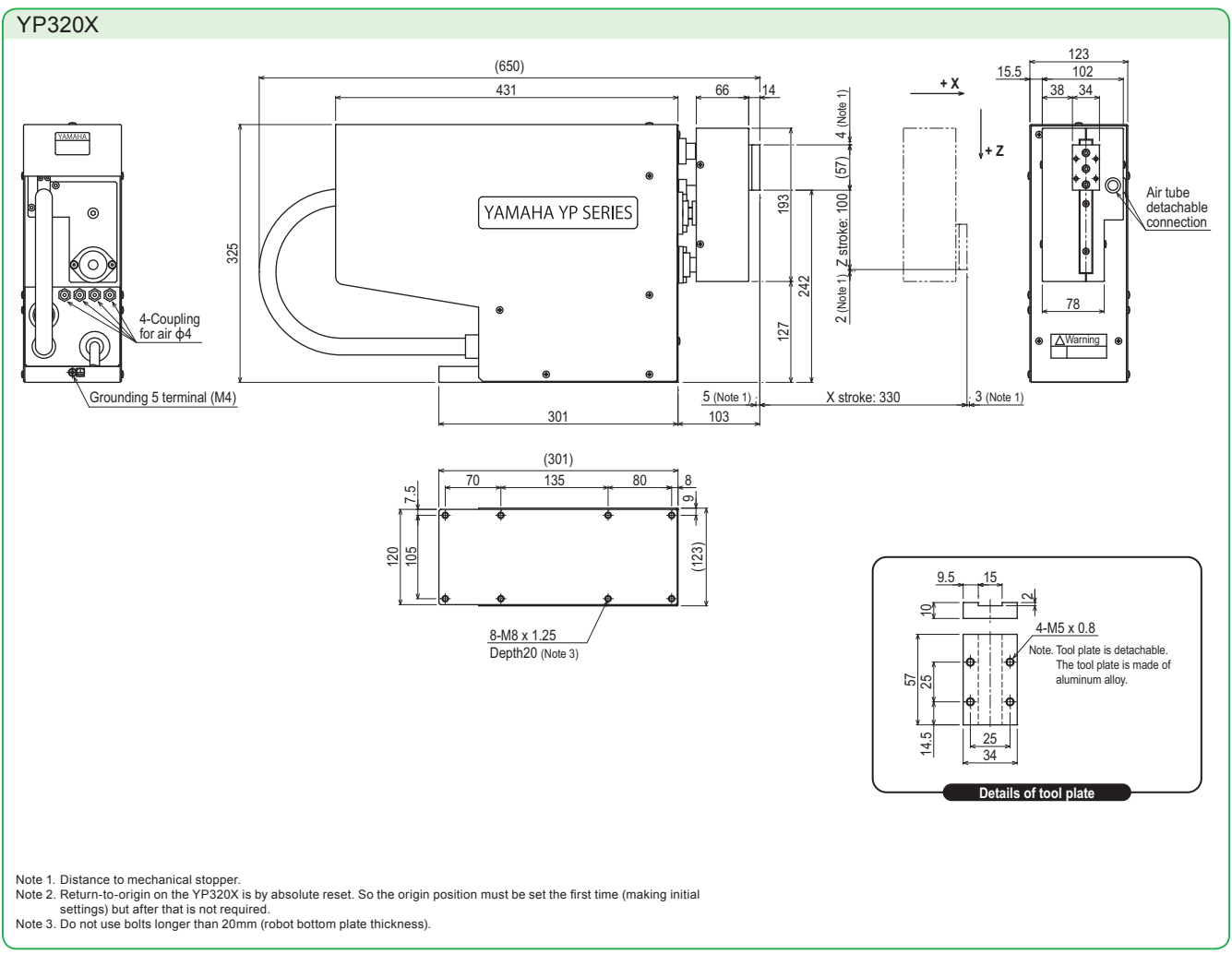
CLEAN

CONTROLLER INFORMATION

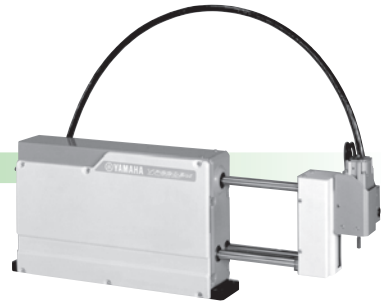
2-axes

3-axes

4-axes



YP220BXR 3 axes



Ordering method

YP220BXR		RCX240				BB
Model	Cable length	Controller	Usable for CE	Expansion I/O <small>Note 1</small>	Network option	Battery
	3L: 3.5m (Standard) 5L: 5m 10L: 10m		No entry: Standard E: CE marking	N, P: Standard I/O 16/8 N1, P1: 40/24 N2, P2: 64/40 N3, P3: 88/56 N4, P4: 112/72	No entry: None CC: CC-Link DN: DeviceNet PB: Profibus EN: Ethernet YC: YC-Link <small>Note 2</small>	BB: 4 pcs

Note 1. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.
Note 2. Available only for the master.

Specifications

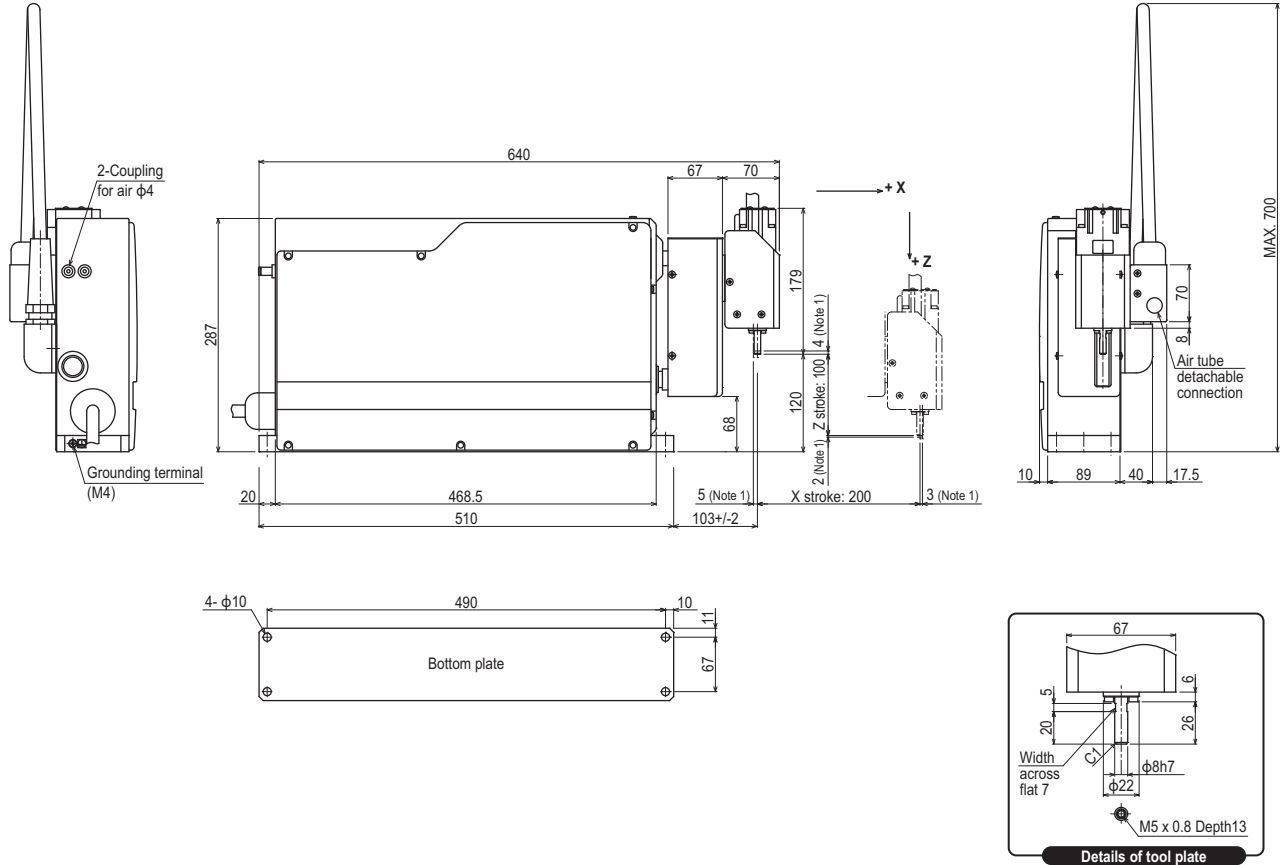
	X axis	Z axis	R axis
AC servo motor output (W)	200	200	60
Repeatability <small>Note 1</small> (mm)	+/-0.05	+/-0.05	+/-0.1
Drive system	Timing belt	Timing belt	Ball Reducer
Deceleration ratio (mm)	Equivalent to lead 24	Equivalent to lead 20	1/18
Maximum speed <small>Note 2</small> (XZ mm/sec) (R °/sec)	1440	1200	1000
Moving range (XZ mm) (R °)	200	100	+/-180
Cycle time (sec)	0.62 <small>Note 3</small>		
Maximum payload (kg)	1		
R-axis allowable moment inertia (kgm²[kgfcm²])	0.0098 [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

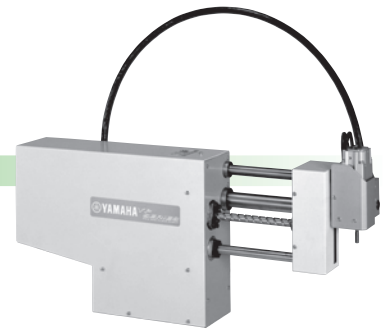
Controller	Power consumption (VA)	Operating method
RCX240	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP220BXR



Note1. Distance to mechanical stopper.
Note2. 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.

YP320XR 3 axes



Ordering method

YP320XR		RCX240				BB
Model	Cable length	Controller	Usable for CE	Expansion I/O ^{Note 1}	Network option	Battery
	3L: 3.5m (Standard) 5L: 5m 10L: 10m		No entry: Standard E: CE marking	N, P: Standard I/O 16/8 N1, P1: 40/24 N2, P2: 64/40 N3, P3: 88/56 N4, P4: 112/72	No entry: None CC: CC-Link DN: DeviceNet PB: Profibus EN: Ethernet YC: YC-Link ^{Note 2}	BB: 4 pcs

Note 1. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.
Note 2. Available only for the master.

Specifications

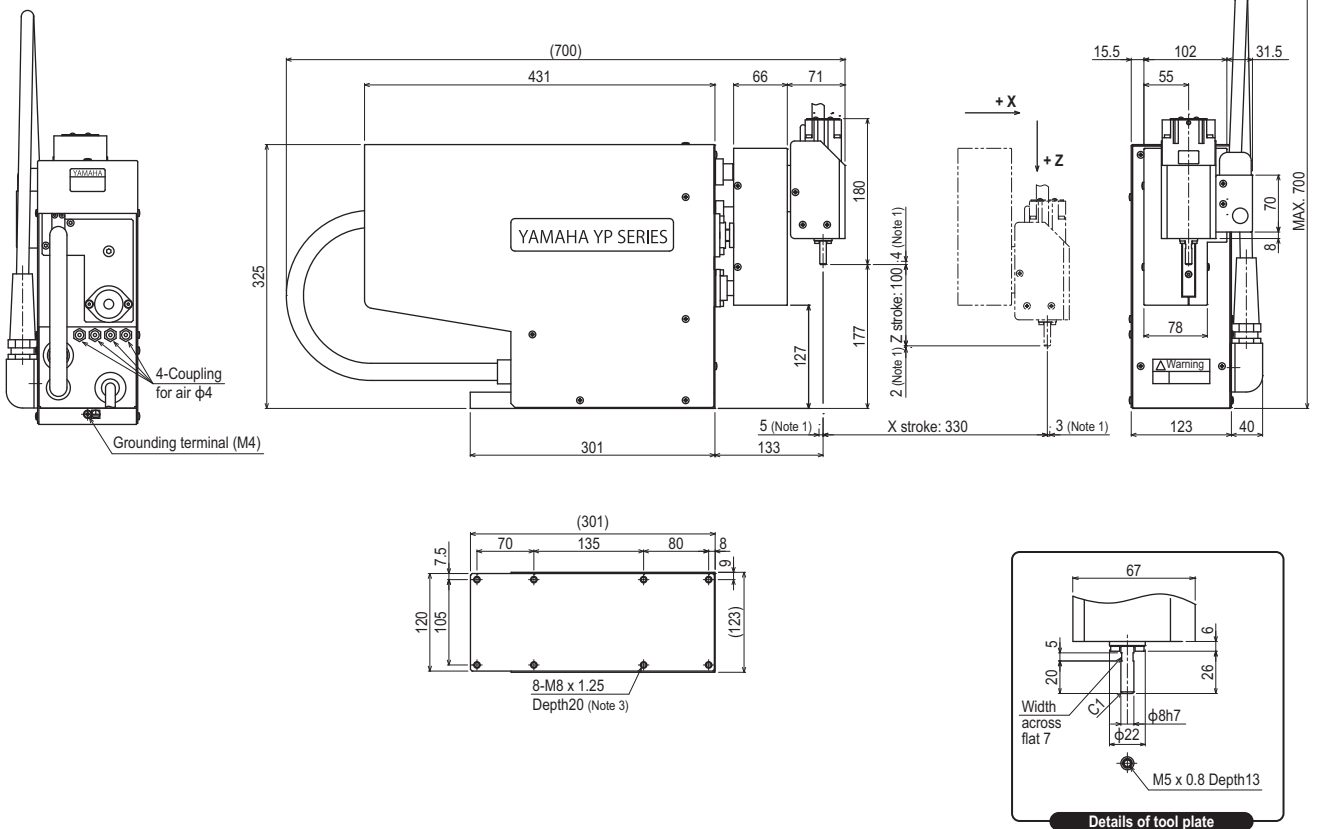
	X axis	Z axis	R axis
AC servo motor output (W)	200	200	60
Repeatability ^{Note 1} (XZ mm) (R °)	+/-0.02	+/-0.05	+/-0.1
Drive system	Ball screw (C7 class)	Timing belt	Ball Reducer
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 25	1/18
Maximum speed ^{Note 2} (XZ mm/sec) (R °/sec)	1500	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 (kgm ² [kgfcm ²])	0.0098 [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

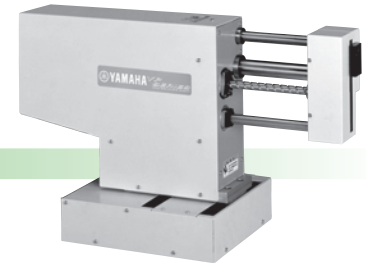
Controller	Power consumption (VA)	Operating method
RCX240	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP320XR



Note1. Distance to mechanical stopper.
Note2. 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.
Note3. Do not use bolts longer than 20mm (robot bottom plate thickness).

YP330X 3 axes



Ordering method

YP330X		RCX240				BB
Model	Cable length	Controller	Usable for CE	Expansion I/O <small>Note 1</small>	Network option	Battery
	3L: 3.5m (Standard) 5L: 5m 10L: 10m		No entry: Standard E: CE marking	N, P: Standard I/O 16/8 N1, P1: 40/24 N2, P2: 64/40 N3, P3: 88/56 N4, P4: 112/72	No entry: None CC: CC-Link DN: DeviceNet PB: Profibus EN: Ethernet YC: YC-Link <small>Note 2</small>	BB: 4 pcs

Note 1. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.
Note 2. Available only for the master.

Specifications

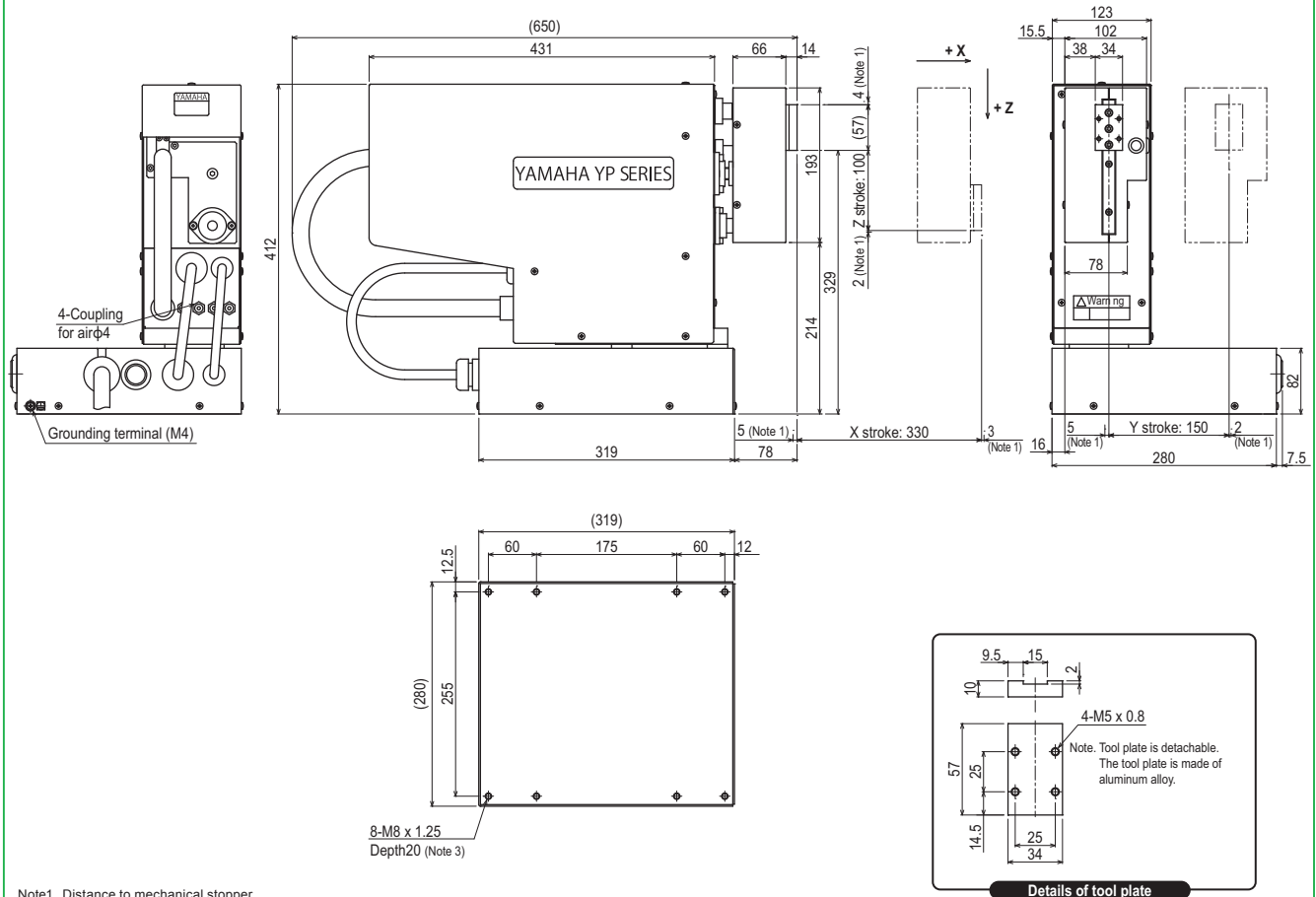
	X axis	Y axis	Z axis
AC servo motor output (W)	200	200	200
Repeatability <small>Note 1</small> (mm)	+/-0.02	+/-0.02	+/-0.05
Drive system	Ball screw (C7 class)	Ball screw (C7 class)	Timing belt
Deceleration ratio (mm)	Equivalent to lead 20	Equivalent to lead 20	Equivalent to lead 25
Maximum speed <small>Note 2</small> (mm/sec)	1500	1000	1500
Moving range (mm)	330	150	100
Cycle time (sec)	0.57 <small>Note 3</small> , 0.78 <small>Note 4</small>		
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
RCX240	700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

YP330X



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).

