



YAMAHA SCARA ROBOTS LOW COST HIGH PERFORMANCE MODEL

New product information

YAMAHA

Robotics Operations FA Section

127 Toyooka, Kita-ku, Hamamatsu, Shizuoka 433-8103, Japan Tel. +81-53-525-8350 Fax. +81-53-525-8378

URL https://global.yamaha-motor.com/business/robot/ E-MAIL robotn@yamaha-motor.co.jp

YK-XE series

Efficiency In Production

Low cost high performance models that achieve both the high operation performance and affordable price

510mm arm length model YK510XE-10 has been newly added. Now, the YK-XE series provide four models with an arm length ranging from 400 mm to 710 mm.

Easy to use arm length and maximum payload contribute to optimization of the customer's production equipment and cost reduction of the equipment investment.

 Optimal for transfer and assembly of automotive parts

Maximum payload $10 \, \mathrm{kg}^{-1}$

* YK510XE-10, YK610XE-10, YK710XE-10



Providing Efficiency and Quality in production with Affordable price.

Improvement of productivity by high-speed operation

By reviewing the arm structure, the vibration is reduced and the motion is optimized to shorten the standard cycle time.

High-speed, less-vibration, and agile operation contributes to improvement of the productivity.

Standard cycle time 0.39 sec

* For YK610XE-10



Reduced

by approx.

Model	Arm length	Maximum payload	Standard cycle time	R-axis tolerable moment of inertia
YK400XE-4	400mm	4kg	0.41sec	0.05kgm²
NEW YK510XE-10	510mm	10kg	0.38sec	0.3kgm²
YK610XE-10	610mm	10kg	0.39sec	0.3kgm²
YK710XE-10	710mm	10kg	0.42sec	0.3kgm²

02

YK-XE series



Inspection

➤ For a wide variety of applications Maximum payload 4kg to 10kg

Packaging Palletizing

Sorting

Labelling

The models support a wide variety of fields such as assembly work that requires a high precision or food sorting work that requires a high-speed operation. As the maximum payload is 10 kg, heavy workpieces such as automotive parts can also be supported.

▶ Application Examples









▶ Affordable Price and Improved Performance

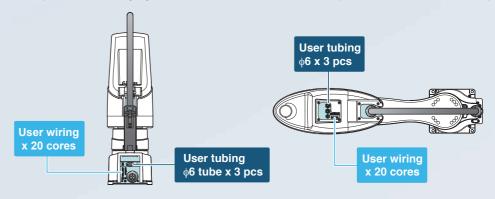
Both the high operation performance and affordable price are achieved. Production equipment with high cost performance can be constructed.



Improved User Interface

Enhanced size and numbers of air tubes and user I/O for end effectors.

Tubes and wires are positioned for easy layout and reduced risk of disconnection. (YK610XE-10 and YK710XE-10)



* YK400XE-4 provides the user wiring x 10 cores and the User tubing $\phi 4$ x 3 pcs.

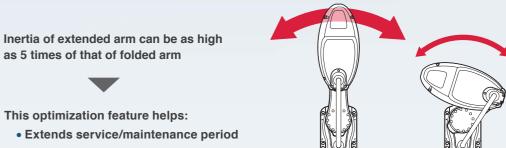
➤ In Yamaha YK-XE series Acceleration/Deceleration is optimized automatically

The optimal acceleration and deceleration are automatically selected from the arm posture at the time of operation start and the arm posture at the time of operation end.

The motor peak torque or the tolerable peak torque of the speed reducer is not exceeded by inputting only three parameters*.

The full power of the motor is always output to maintain the high acceleration/deceleration.

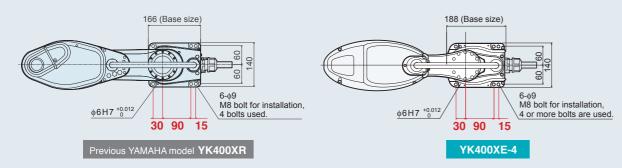
* Payload, R-axis moment of inertia, and offset amount of R-axis moment of inertia



- Minimizes vibration during operation
- Controllability in motion
- Keeps peak torque within a tolerance to prevent premature failure

Drop-In upgrade by common platform design

The installation position of the YK400XE-4 is fully compatible with that of the conventional model YK400XR. This ensures easy replacement work.



Easier operation in combination with the RCX340 controller

RCX340 comprehensive controller brings out maximum potential of YK400XE robot system. Optional integrated vision system "RCXiVY2+" provides simplified image processing. Choice of PC Programming Software or Teaching Pendant available.







[RCXiVY2+]



[RCX-Studio 2020]

Simple and Easy integration of Vision System



Compatible with various field networks

The robot is compatible with full field networks such as CC-Link, EtherNet/IP™, DeviceNet™, PROFIBUS, PROFINET, and EtherCAT.

CC-Link EtherNet/IP DeviceNet







➤ Reliability backed by 44-year experience of SCARA robot development

Originally developed in-house to provide durable and accurate motion control in harsh environment of motorcycle manufacturing, Yamaha SCARA robot has been "road tested" and proven over 44 years in various fields.





YK400XE-4

Ordering method

YK400XE- 4

150-

Standard type: Small type

RCX340-4

LOW COST HIGH PERFORMANCE MODEL

Note. For details about controller, refer to the RCX340 catalog or view YAMAHA's website

Specifi	cations								
			X-axis	Y-axis	Z-axis	R-axis			
Axis	Arm length		225 mm	175 mm	150 mm	-			
specifications	Rotation angl	e	+/-132 °	+/-150 °	-	+/-360 °			
AC servo mot	or output		200 W	100 W	100 W	100 W			
Deceleration	Transmission	Motor to speed reducer	Direct-	coupled	Timin	ig belt			
mechanism	method	Speed reducer to output		Direct-coupled					
Repeatability	Note 1		+/-0.0)1 mm	+/-0.01 mm	+/-0.01 °			
Maximum spe	ed		6 m	2600 °/sec					
Maximum pay	load		4 kg (Standard specification), 3 kg (Option specifications Note 4)						
Standard cycle	e time: with 2k	g payload ^{Note 2}	0.41 sec						
R-axis tolerab	le moment of	inertia Note 3		0.05 kgm² ((0.5 kgfcms ²)				
User wiring				0.2 sq ×	10 wires				
User tubing (C	Outer diameter	1)		ф 4	× 3				
Travel limit			1.Soft limit 2.Mechanical stopper (X,Y,Z axis)						
Robot cable le	ength		Standard: 3.5 m Option: 5 m, 10 m						
Weight			17 kg						

Note 1. This is the value at a constant ambient temperature. (X.Y axes)

Note 2. When reciprocating 300mm in horizontal and 25mm in vertical directions and performing the coarse positioning arch operation.

Note 3. The acceleration coefficient is set automatically in accordance with the tip weight and offset amount for R-axis moment of inertials Note 4. Maximum payload of option specifications (with user wiring/tubing through spline type) is 3kg.

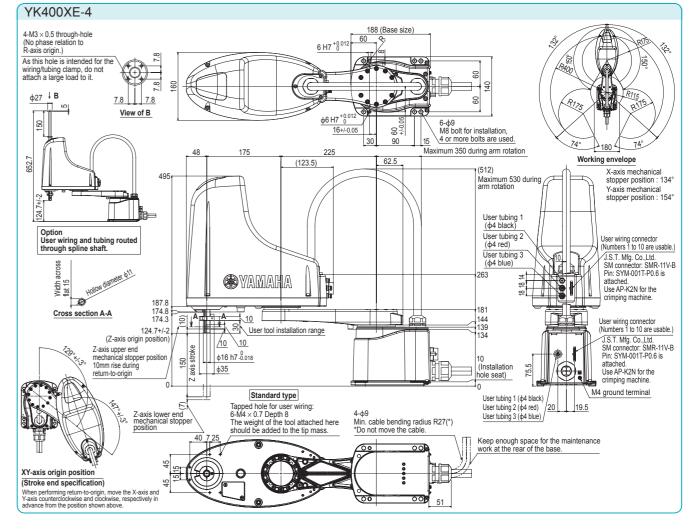
Controller Controller Power capacity (VA) Operation method emote command Operation using RS-232C communication

Note. The movement range can be restricted by adding the X- and Y-axis mechanical stoppers. (The maximum movement rawas set at shipment.)

See our robot manuals (installation manuals) for detailed

information. Note. To set the standard coordinates with high accuracy, use a standard coordinate setting jig (option). Refer to the user's manual (installation manual) for more details.

> Our robot manuals (installation manuals) can be downloaded from our website at the address below https://global.yamaha-motor.com/business/robot/



YK510XE-10

Standard type: Medium type **OLOW COST HIGH PERFORMANCE MODEL**

Arm length 510mm
Maximum payload 10kg



Programming / emote command / Operation using RS-232C

communication

■ Ordering method

YK510XE- 10 -200-RCX340-4

Note. The return-to-origin method is provided only in the sensor specifications, but not in the stroke end specifications.

Specification	ications								
			X-axis	Y-axis	Z-axis	R-axis			
Axis	Arm length		235 mm	275 mm	200 mm	-			
specifications	Rotation angl	le	+/-134 °	+/-152 °	-	+/-360 °			
AC servo mot	or output	400 W 200 W 200 W 200							
Deceleration	Transmission	Motor to speed reducer	Direct-o	coupled	Timin	g belt			
mechanism	method	Speed reducer to output		Direct-coupled					
Repeatability	Note 1		+/-0.0	1 mm	+/-0.01 mm	+/-0.01 °			
Maximum spe	ed		7.8 m	2 m/sec	2600 °/sec				
Maximum pay	load		10 kg (Standard specification), 9 kg (Option specifications Note 4)						
Standard cycl	e time: with 2k	g payload Note 2	0.38 sec						
R-axis tolerab	le moment of	inertia Note 3		0.3 l	(gm²				
User wiring				0.2 sq ×	20 wires				
User tubing (0	Outer diameter	r)		ф 6	× 3				
Travel limit			1.Soft limit 2.Mechanical stopper (X,Y,Z axis)						
Robot cable le	ength		Standard: 3.5 m Option: 5 m, 10 m						
Weight			25 kg						

Note 1. This is the value at a constant ambient temperature. (X,Y axes)

Note 2. When reciprocating 300mm in horizontal and 25mm in vertical directions and performing the coarse positioning arch operation.

Note 3. The acceleration coefficient is set automatically in accordance with the tip weight and offset amount for R-axis moment of inertia settings.

Note 4. Maximum payload of option specifications (with user wiring/tubing through spline type) is 9kg.

■ Conti	roller	
Controller	Power capacity (VA)	Operation method

1700

RCX340

Note. The movement range can be restricted by adding the X- and Y-axis mechanical stoppers. (The maximum movement range was set at shipment.) See our robot manuals (installation manuals) for detailed

standard coordinate setting jig (option). Refer to the user's manual (installation manual) for more details.

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YK510XE-10
User wiring connector (Numbers 1 to 12 are usable.) J.S.T. Mig. Co., Lid. SM connector: SMR-12V-B Pin: SYM-001T-P.0 6 is attached. Use AP-K2N for the crimping machine. User wiring connector (Numbers 1 to 12 are usable.) J.S.T. Mig. Co., Lid. SM connector: SMR-12V-B Pin: SYM-001T-P.0 6 is attached. Use AP-K2N for the crimping machine. User tubing 3 (\$\delta\$ blue) User tubing 2 (\$\delta\$ feel of red) User tubing 1 (\$\delta\$ black) User tubing 2 (\$\delta\$ feel of red) User tubing 1 (\$\delta\$ black) User tubing 2 (\$\delta\$ feel of red) User tubing 1 (\$\delta\$ black) User tubing 2 (\$\delta\$ feel of red) User tubing 3 (\$\delta\$ feel of red) User tubing 4 (\$\delta\$ feel of red) User tubing 4 (\$\delta\$ feel of red) User tubing 4 (\$\delta\$ feel of red) User tubin
49 275 235 arm rotation X-axis mechanical stopper position: 142° Y-axis mechanical stopper position: 154° Base installation Surface Option User wiring and tubing routed through spline shaft. Cross section A-A Cross section A-A 220.8
200.8 153+2 2-axis origin position 7.5mm rise during return-to-origin 4-65.5 through-hole (No phase relation to R-axis origin.) Position 133 Use AP-KZN for the crimping machine. 131 User tool 132 133 Use AP-KZN for the crimping machine. 133 130 121.5 134 125 125 12
Ser 10.00 g 3 (\$\phi\$ blue) Set 10.00 g 3 (\$

YK610XE-10

Arm length 610mm
Maximum payload 10kg

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■ Ordering method			
YK610XE - 10 -200)-	RCX340-4 -	
Model Maximum Zaxis payload stroke	No entry: None F: With tool flange No entry: None S: With hollow shaft S: With hollow shaft S: 10L: 10m	Controller / Safety Option A Number of controllable axes standard (OP.A)	Option B Option C Option D Option E Absolute (OP.B) (OP.C) (OP.D) (OP.E) battery

Standard type: Medium type

LOW COST HIGH PERFORMANCE MODEL

Note. The return-to-origin method is provided only in the sensor specifications, but not in the stroke end specifications.

			X-axis	Y-axis	Z-axis	R-axis			
Axis	Arm length		335 mm	275 mm	200 mm	-			
specifications	Rotation angl	le	+/-134 °	+/-152 °	-	+/-360 °			
AC servo mot	or output		400 W	200 W	200 W	200 W			
Deceleration	Transmission	Motor to speed reducer	Direct-	coupled	Timin	g belt			
mechanism	method	Speed reducer to output		Direct-coupled		Timing belt			
Repeatability	Note 1		+/-0.0)1 mm	+/-0.01 mm	+/-0.01 °			
Maximum spe	ed		8.6 n	2 m/sec	2600 °/sec				
Maximum pay	load		10 kg (Standard specification), 9 kg (Option specifications Note 4)						
Standard cycl	e time: with 2k	g payload Note 2	0.39 sec						
R-axis tolerab	ole moment of	inertia Note 3	0.3 kgm²						
User wiring			0.2 sq × 20 wires						
User tubing (0	Outer diameter	r)		ф 6	5 × 3				
Travel limit			1.Soft limit 2.Mechanical stopper (X,Y,Z axis)						
Robot cable le	ength		Standard: 3.5 m Option: 5 m, 10 m						
Weight			25 kg						

Note 1. This is the value at a constant ambient temperature. (X,Y axes)

Note 2. When reciprocating 300mm in horizontal and 25mm in vertical directions and performing the coarse positioning arch operation.

Note 3. The acceleration coefficient is set automatically in accordance with the tip weight and offset amount for R-axis moment of inertia settings.

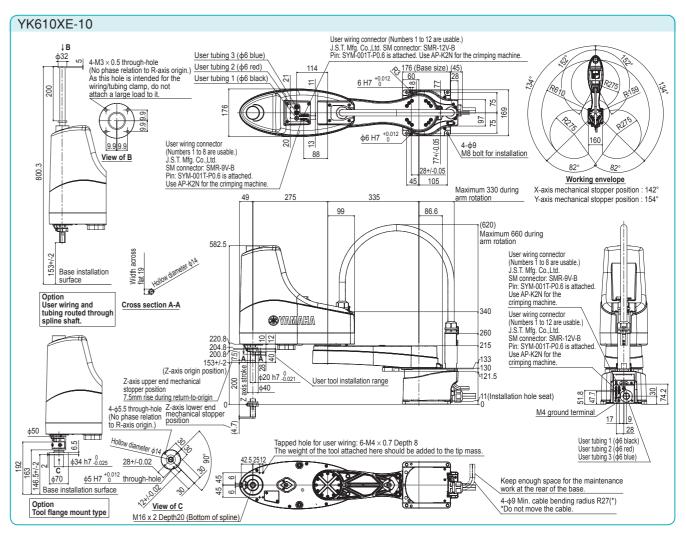
Note 4. Maximum payload of option specifications (with user wiring/tubing through spline type) is 9kg.

■ Cont	■ Controller											
Controller	Power capacity (VA)	Operation method										
RCX340	1700	Programming / Remote command / Operation using RS-232C communication										

Note. The movement range can be restricted by adding the X- and Y-axis mechanical stoppers. (The maximum mover was set at shipment.) See our robot manuals (installation manuals) for detailed

standard coordinate setting jig (option). Refer to the user's manual (installation manual) for more details.

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80 09

YK710XE-10

Standard type: Large type **■ LOW COST HIGH PERFORMANCE MODEL**

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Ordering method

YK710XE- 10 -200-

RCX340-4

Note. The return-to-origin method is provided only in the sensor specifications, but not in the stroke end specifications.

Axis specifications Rotation angle 435 mm 275 mm 200 mm 400 W 200 W 200 W Deceleration mechanism Transmission method Speed reducer to output Direct-coupled Timing be repeatability Note 1							
specifications Rotation angle +/-134 ° +/-152 ° - AC servo motor output 400 W 200 W 200 W Deceleration mechanism Transmission method Speed reducer to output Direct-coupled Timing be repeatability Note 1 +/-0.02 mm +/-0.01 mm	R-axis						
AC servo motor output AC servo motor output Deceleration method method speed reducer to output Repeatability Note 1 Motor to speed reducer Direct-coupled Timing be preclaimed by the following preclaim to the following prec	-						
Deceleration mechanism Transmission method Motor to speed reducer Speed reducer to output Direct-coupled Timing be Repeatability Note 1 +/-0.02 mm +/-0.01 mm	+/-360°						
mechanism method Speed reducer to output Direct-coupled Ti Repeatability Note 1 +/-0.02 mm +/-0.01 mm	200 W						
Repeatability Note 1 +/-0.02 mm +/-0.01 mm	ng belt						
	ming belt						
	+/-0.01 °						
Maximum speed 9.5 m/sec 2 m/sec 2 m/sec	600 °/sec						
Maximum payload 10 kg (Standard specification), 9 kg (Option specification)	10 kg (Standard specification), 9 kg (Option specifications Note 4)						
Standard cycle time: with 2kg payload Note 2 0.42 sec	0.42 sec						
R-axis tolerable moment of inertia Note 3 0.3 kgm ²							
User wiring 0.2 sq × 20 wires							
User tubing (Outer diameter) φ 6 × 3							
Travel limit 1.Soft limit 2.Mechanical stopper (X,Y,Z ax	1.Soft limit 2.Mechanical stopper (X,Y,Z axis)						
Robot cable length Standard: 3.5 m Option: 5 m, 10 m	Standard: 3.5 m Option: 5 m, 10 m						
Weight 26 kg	26 kg						

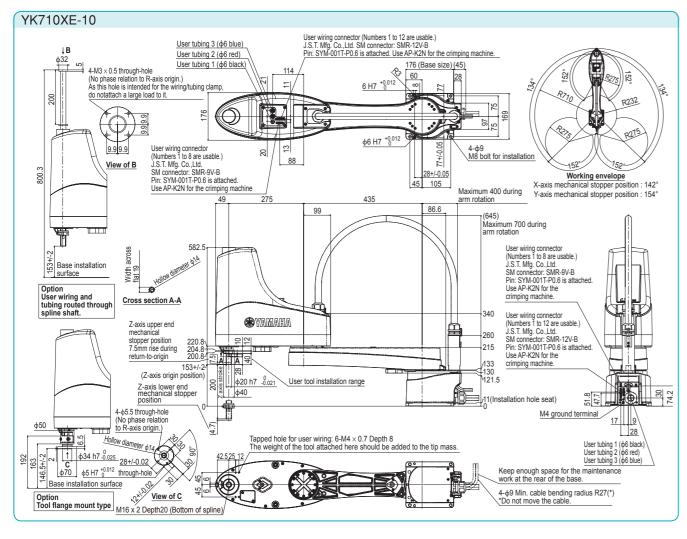
Note 1. This is the value at a constant ambient temperature. (X,Y axes)
Note 2. When reciprocating 300mm in horizontal and 25mm in vertical directions and performing the coarse positioning arch operation.
Note 3. The acceleration coefficient is set automatically in accordance with the tip weight and offset amount for R-axis moment of inertia settings.
Note 4. Maximum payload of option specifications (with user wiring/tubing through spline type) is 9kg.

■ Contr	oller	
Controller	Power capacity (VA)	Operation method
RCX340	1700	Programming / I/O point trace / Remote command / Operation using RS-232C communication

Note. The movement range can be limited by changing the positions of X and Y axis mechanical stoppers. (The movement range is set to the maximum at the time of shipment.) See our robot manuals (installation manuals) for detailed

Note. To set the standard coordinates with high accuracy, use a standard coordinate setting jig (option). Refer to the user's manual (installation manual) for more details.

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YAMAHA SCARA ROBOTS LINEUP

Wide variation of models with an arm length ranging from 120 mm to 1200 mm. Wall hanging, dust/drip proof, and clean room specifications are also supported.

■ Standard type / Wall mount • inverse type / Dust-proof & drip-proof type

Ту	pe	Model	Arm length (mm) and XY axis resultant maximum speed (m/s)								Standard cycle time	Maximum payload	R-axis tolerable moment of inertia	Completely beltless							
			120	150	180	220	250	300	350	400	500	600	700	800	900	1000	1200	cycle time (sec) Note 1	(kg)	(kgm²)	structure Note 2
=	Φ	YK350TW				5.6												0.32	5.0	0.005 (Rated) 0.05 (Maximum)	
9	type	YK500TW					6.8											0.29	5.0	0.005 (Maximum) 0.005 (Rated) 0.05 (Maximum)	
	l e	YK120XG	3.3															0.33	1.0	0.03 (Maximum)	•
	l type	YK150XG	3.	.4														0.33	1.0	0.01	•
	small	YK180XG		3.3														0.33	1.0	0.01	•
	ras	YK180X		3.3														0.39	1.0	0.01	•
	Extra	YK220X		3	.4													0.42	1.0	0.01	•
	\Box	YK250XG			4.5													0.43	5.0	0.05	•
	Small type	YK350XG				5.6												0.44	5.0	0.05	•
	lal	YK400XE-4				6.	.0											0.41	4.0	0.05	
	S	YK400XG				6												0.45	5.0	0.05	•
	П	YK500XGL					5.1											0.48	5.0	0.05	•
힏		YK500XG					7.6											0.42	10.0	0.30	•
Standard	Medium type	YK510XE-10					7.8											0.38	10.0	0.30	
Stal	튁	YK600XGL					4.	.9										0.54	5.0	0.05	•
	edit	YK600XG		8.4													0.43	10.0	0.30	•	
	2	YK610XE-10														0.39	10.0	0.30	-		
		YK600XGH 7.7														0.47	20.0	1.0	•		
	П	YK700XGL		9.2													0.50	10.0	0.30	•	
		YK710XE-10 9.5											0.42	10.0	0.30						
	be	YK700XG		8.4														0.42	20.0	1.0	•
	Large type	YK800XG		9.2											0.48	20.0	1.0	•			
	Larg	YK900XG							9.9									0.49	20.0	1.0	•
	-	YK1000XG							10	0.6								0.49	20.0	1.0	•
		YK1200X								7.4								0.91	50.0	2.45	
,	o l	YK300XGS			4	.4												0.49	5.0	0.05	•
į,	type	YK400XGS				6.	.1											0.49	5.0	0.05	•
	Lse	YK500XGS					7.6											0.45	10.0	0.3	•
	l Ne	YK600XGS					8	.4										0.46	10.0	0.3	•
1	5	YK700XGS						8.4										0.42	20.0	1.0	•
	mount / inverse	YK800XGS						9	.2									0.48	20.0	1.0	•
=	wall	YK900XGS							9.9									0.49	20.0	1.0	•
3	Š	YK1000XGS							10	0.6								0.49	20.0	1.0	•
		YK250XGP			4.5													0.50	4.0	0.05	•
	Ī	YK350XGP				5.6												0.52	4.0	0.05	•
- 1	e E	YK400XGP				6.	1											0.50	4.0	0.05	•
3	<u> </u>	YK500XGLP					5.1											0.66	4.0	0.05	•
3	arip-proor type	YK500XGP					7.6											0.55	10.0	0.3	•
1	₽	YK600XGLP					4.	.9										0.71	4.0	0.05	•
0	ō ŏ	YK600XGP					8	4										0.56	10.0	0.3	•
1	00	YK600XGHP					7.											0.57	18.0	1.0	•
1	Dust-proof	YK700XGP						8.4										0.52	20.0	1.0	•
3	snc	YK800XGP							.2									0.58	20.0	1.0	•
		YK900XGP							9.9									0.59	20.0	1.0	•
		YK1000XGP								0.6								0.59	20.0	1.0	•

Note 1. The standard cycle time is measured under the following conditions.

During back and forth movement 25mm vertically and 100mm horizontally (extra small type)

• During back and forth movement 25mm vertically and 300mm horizontally (small type / medium type / large type) Note 2. Maintains high accuracy over long periods because the beltless structure drastically cuts down on wasted motion

Operation is also nearly maintenance-free for long periods with no worries about belt breakage, stretching or deterioration over time

■ CLEAN type

	, , po																		
Туре	Model		Arm length (mm) and XY axis combined maximum speed (m/s)														Standard cycle time	Maximum payload	R axis tolerable moment of inertia
		120	150	180	220	250	300	350	400	500	600	700	800	900	1000	1200	(sec)	(kg)	(kgm²)
Extra small	YK180XC	3.3m/s															0.42	1.0	0.01
type	YK220XC		3.4	m/s													0.45	1.0	0.01
	YK250XGC			4.5m/s	,												0.50	4.0	0.05
Small type	YK350XGC		5.6m/s										0.52	4.0	0.05				
1,7,2	YK400XGC				6.1	m/s											0.50	4.0	0.05
	YK500XGLC					5.1m/s	3										0.66	4.0	0.05
Medium	YK500XC					4.9m/s	3										0.53	10.0	0.12
type	YK600XGLC					4.9	m/s										0.71	4.0	0.05
	YK600XC					5.6	m/s										0.56	10.0	0.12
	YK700XC						6.7m/s	,									0.57	20.0	0.32
Large type	YK800XC	7.3m/s															0.57	20.0	0.32
.,,,,,	YK1000XC							8.0	m/s								0.60	20.0	0.32