

Feel the action.

YouTube Yamaha Robot Official Channel

Articulated Robots YA series **6-axis** **7-axis**

https://www.youtube.com/watch?v=wNY01XEI_nI

Pick and place using a SCARA robot while using an articulated robot to change pallets

A diverse variety of general-purpose robots provide the best solution for a wide range of tasks



New Generation Robots

YA
S E R I E S

YA-R5F

YA-R6F

YA-U20F



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● Specifications and appearance are subject to change without prior notice.

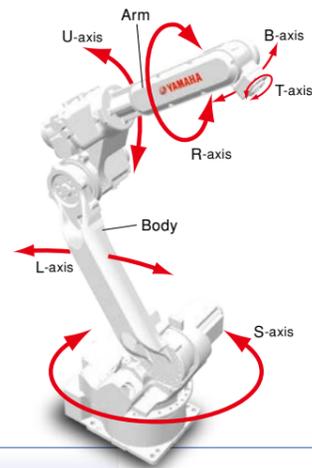
Yamaha articulated robots

YA series

6-axis 7-axis

Reduce personnel, increase productivity

The YA series provides a wide range of products.

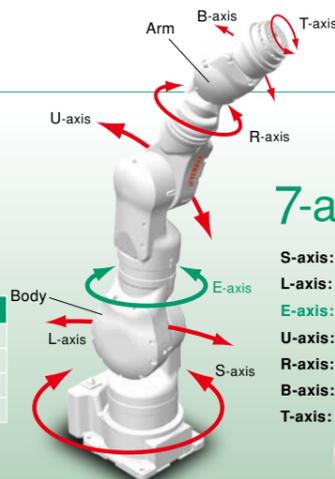


6-axis robots

- S-axis:** Rotate the body horizontally
- L-axis:** Move the body forward/backward
- U-axis:** Move the arm up/down
- R-axis:** Rotate the arm
- B-axis:** Move the tip of the arm up/down
- T-axis:** Rotate the tip of the arm

YA series 6-axis	YA-RJ	YA-R3F	YA-R5F	YA-R5LF	YA-R6F
Application	Handling (general)				
Number of axes	6	6	6	6	6
Payload	1 kg (max. 2 kg*)	3 kg	5 kg	5 kg	6 kg
Vertical reach	909 mm	804 mm	1193 mm	1560 mm	2486 mm
Horizontal reach	545 mm	532 mm	706 mm	895 mm	1422 mm

* When a load is more than 1 kg, the motion range will be smaller. Use the robot within the recommended motion range. For details see the dimensional diagram on p. 4.



7-axis robots

- S-axis:** Rotate the body horizontally
- L-axis:** Move the body forward/backward
- E-axis:** Twist the arm
- U-axis:** Move the arm up/down
- R-axis:** Rotate the arm
- B-axis:** Move the tip of the arm up/down
- T-axis:** Rotate the tip of the arm

YA series 7-axis	YA-U5F	YA-U10F	YA-U20F
Applications	Assembly / Placement		
Number of axes	7	7	7
Payload	5 kg	10 kg	20 kg
Vertical reach	1007 mm	1203 mm	1498 mm
Horizontal reach	559 mm	720 mm	910 mm

Inspection processing

Transport and assemble small parts

Construct compact cells

High-speed operation reduces cycle time

Thanks to high-speed, low-inertia AC servo motors, an arm designed for light weight, and the latest control technology, these robots achieve an operating speed that is best in their class. From supply, assembly, inspection, and packing to palletization, all applications can enjoy shorter cycle time and improved productivity.

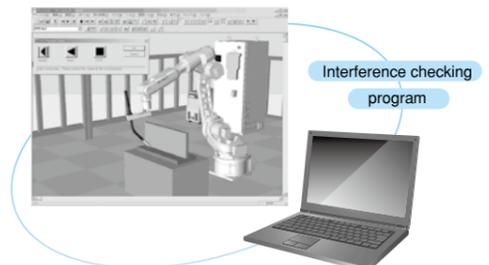
Workpieces with a high wrist load are also supported

With a wrist section that has the highest allowable moment of inertia in its class, these robots can support jobs involving a high wrist load, or simultaneous handling of multiple workpieces.

Robot simulator dramatically reduces startup time

We provide software that lets you use 3D CAD data to construct a production facility in virtual space in a personal computer, and easily perform engineering tasks such as creating programs and checking for robot interference. Teaching can be performed even before the actual production line is completed, dramatically reducing line startup time.

* Optional support



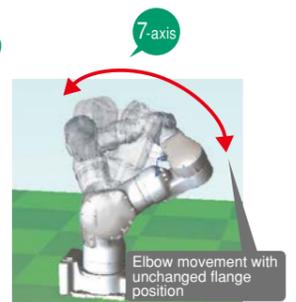
Free arm movement further boosts productivity.

Reduced space allows sophisticated system layouts

Since these robots can be installed close to workpieces or other equipment, you can reduce the space required for your production facility. By locating multiple robots close to each other, processing can be integrated and shortened.

"Elbow movement" unique to 7-axis models allows optimal posture to be maintained

The 7-axis U-type robots allow "elbow movement," changing only the elbow angle without affecting the position or posture of the tool. This permits operation to avoid nearby obstructions.



Access the workpiece from the opposite side or from below

Rotation of the seventh axis enables flexible movement with the same freedom of motion as a human arm, allowing the workpiece to be accessed from the opposite side or from below. This allows the robot to enter narrow locations that a person could not fit in, or to approach the workpiece in a way that avoids obstructions, giving you more freedom to design the layout for shorter cycle time and reduced space.

YA SERIES MANIPULATOR SPECIFICATIONS

Applications	6-axis					7-axis			
	Handling (general)					Assembly / Placement			
Model	YA-RJ	YA-R3F	YA-R5F	YA-R5LF	YA-R6F	YA-U5F	YA-U10F	YA-U20F	
Number of axes	6	6	6	6	6	7	7	7	
Payload	1 kg (max. 2 kg ^{Note 2})	3 kg	5 kg	5 kg	6 kg	5 kg	10 kg	20 kg	
Vertical reach	909 mm	804 mm	1193 mm	1560 mm	2486 mm	1007 mm	1203 mm	1498 mm	
Horizontal reach	545 mm	532 mm	706 mm	895 mm	1422 mm	559 mm	720 mm	910 mm	
Repeatability	±0.03 mm	±0.03 mm	±0.02 mm	±0.03 mm	±0.08 mm	±0.06 mm	±0.1 mm	±0.1 mm	
Range of Motion	S-axis (turning)	-160° to +160°	-160° to +160°	-170° to +170°	-170° to +170°	-170° to +170°	-180° to +180°	-180° to +180°	-180° to +180°
	L-axis (lower Arm)	-90° to +110°	-85° to +90°	-65° to +150°	-65° to +150°	-90° to +155°	-110° to +110°	-110° to +110°	-110° to +110°
	E-axis (elbow twist)	-	-	-	-	-	-170° to +170°	-170° to +170°	-170° to +170°
	U-axis (upper arm)	-290° to +105°	-105° to +260°	-136° to +255°	-138° to +255°	-175° to +250°	-90° to +115°	-135° to +135°	-130° to +130°
	R-axis (wrist roll)	-180° to +180°	-170° to +170°	-190° to +190°	-190° to +190°	-180° to +180°	-180° to +180°	-180° to +180°	-180° to +180°
	B-axis (wrist pitch/yaw)	-130° to +130°	-120° to +120°	-135° to +135°	-135° to +135°	-45° to +225°	-110° to +110°	-110° to +110°	-110° to +110°
	T-axis (wrist twist)	-360° to +360°	-360° to +360°	-360° to +360°	-360° to +360°	-360° to +360°	-180° to +180°	-180° to +180°	-180° to +180°
Maximum Speed	S-axis (turning)	160°/s	200°/s	376°/s	270°/s	220°/s	200°/s	170°/s	130°/s
	L-axis (lower Arm)	130°/s	150°/s	350°/s	280°/s	200°/s	200°/s	170°/s	130°/s
	E-axis (elbow twist)	-	-	-	-	-	200°/s	170°/s	170°/s
	U-axis (upper arm)	200°/s	190°/s	400°/s	300°/s	220°/s	200°/s	170°/s	170°/s
	R-axis (wrist roll)	300°/s	300°/s	450°/s	450°/s	410°/s	200°/s	200°/s	200°/s
	B-axis (wrist pitch/yaw)	400°/s	300°/s	450°/s	450°/s	410°/s	230°/s	200°/s	200°/s
	T-axis (wrist twist)	500°/s	420°/s	720°/s	720°/s	610°/s	350°/s	400°/s	400°/s
Allowable Moment	R-axis (wrist roll)	3.33 N·m	5.39 N·m	12 N·m	12 N·m	11.8 N·m	14.7 N·m	31.4 N·m	58.8 N·m
	B-axis (wrist pitch/yaw)	3.33 N·m	5.39 N·m	12 N·m	12 N·m	9.8 N·m	14.7 N·m	31.4 N·m	58.8 N·m
	T-axis (wrist twist)	0.98 N·m	2.94 N·m	7 N·m	7 N·m	5.9 N·m	7.35 N·m	19.6 N·m	29.4 N·m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.058 kg·m ²	0.1 kg·m ²	0.30 kg·m ²	0.30 kg·m ²	0.27 kg·m ²	0.45 kg·m ²	1.0 kg·m ²	4.0 kg·m ²
	B-axis (wrist pitch/yaw)	0.058 kg·m ²	0.1 kg·m ²	0.30 kg·m ²	0.30 kg·m ²	0.27 kg·m ²	0.45 kg·m ²	1.0 kg·m ²	4.0 kg·m ²
	T-axis (wrist twist)	0.005 kg·m ²	0.03 kg·m ²	0.1 kg·m ²	0.1 kg·m ²	0.06 kg·m ²	0.11 kg·m ²	0.4 kg·m ²	2.0 kg·m ²
Mass	15 kg	27 kg	27 kg	29 kg	130 kg	30 kg	60 kg	120 kg	
Power Requirements ^{Note 1}	0.5 kVA	0.5 kVA	1.0 kVA	1.0 kVA	1.0 kVA	1.0 kVA	1.0 kVA	1.5 kVA	
Detailed info page	P.5	P.6	P.7	P.8	P.9	P.10	P.11	P.12	

Note 1. Varies in accordance with applications and motion patterns.
 Note 2. When a load is more than 1 kg, the motion range will be smaller. Use the robot within the recommended motion range. For details, refer to the dimensional diagram on P.5.

Robot ordering method description

In the order format for the YAMAHA articulated robots YA series, the notation (letters/numbers) for the mechanical section is shown linked to the controller section notation.

[Example]

- Mechanical ▶ YA-RJ
 - Power cable length ▶ 4L
- Controller ▶ YAC100
 - Safety standard ▶ CE marking
 - Language setting ▶ Japanese/English
 - Option I/O ▶ Standard I/O
 - Network option ▶ CC-Link

● Ordering Method

YA-RJ-4L - YAC100-E-JE-N-CC

Mechanical section

Controller section

YA-RJ 6-axis

- Maximum payload 2 kg
- Longest Reach R545 mm

Ordering method

YA-RJ	4L	YAC100				
Model	Power cable length 4L: 4m	Controller	Safety standard N: Normal E: CE marking	Language setting JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	Option I/O N: P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	Network option No entry: None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFIBUS EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave

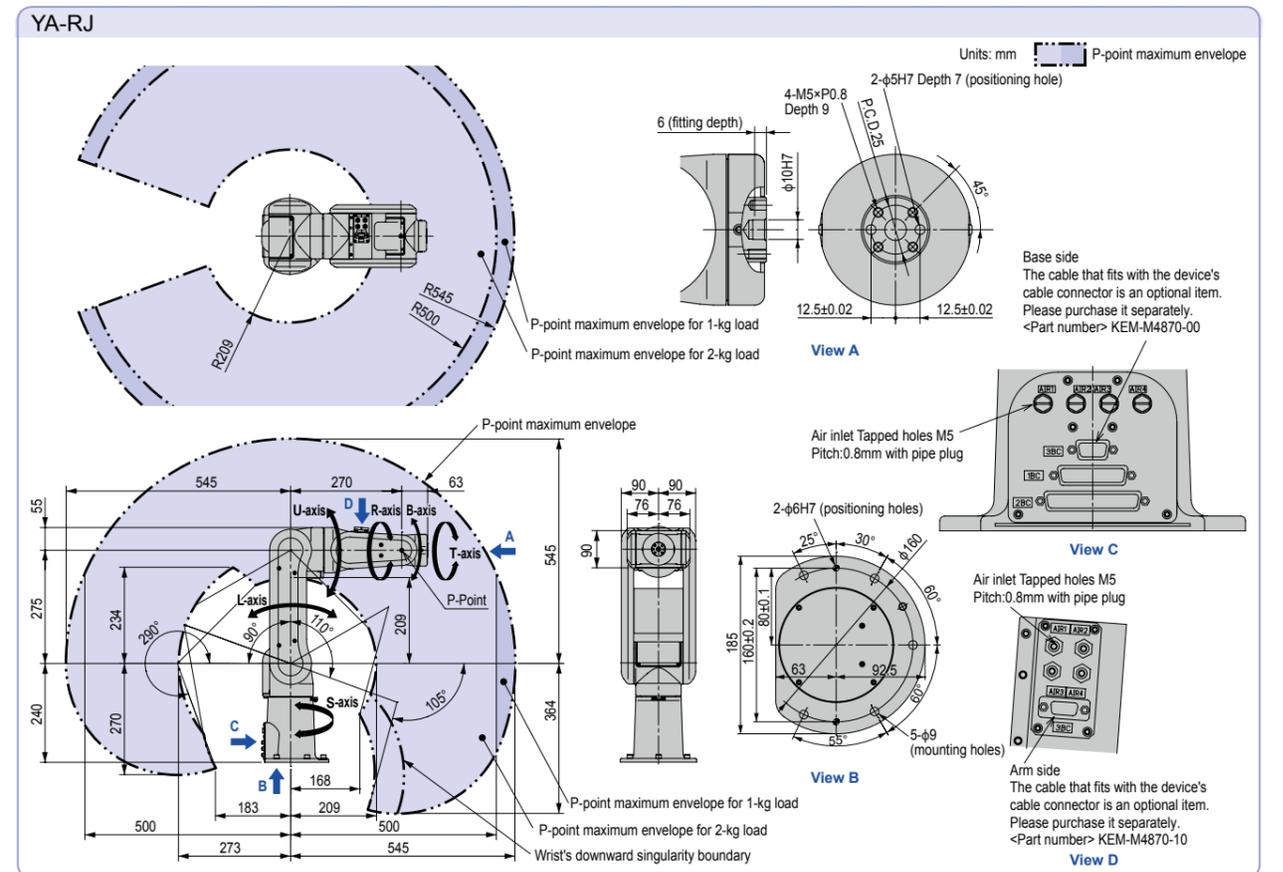


Note. This unit is ideal for small tabletop devices or for education.
 Note. The ultra-light, compact YA-RJ features portability and easy installation for simplified system integration.
 Note. Each axis uses a motor of 80 W or less.
 Note. This unit can also be used in combination with a travel axis or other external axis. Please contact us.

Specifications

Controlled Axis	6	Allowable Moment	R-axis (wrist roll)	3.33 N·m	
Payload	1 kg (max. 2 kg ^{Note 1})		B-axis (wrist pitch/yaw)	3.33 N·m	
Repeatability	±0.03 mm		T-axis (wrist twist)	0.98 N·m	
Range of Motion	S-axis (turning)	-160° to +160°	Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.058 kg·m ²
	L-axis (lower Arm)	-90° to +110°		B-axis (wrist pitch/yaw)	0.058 kg·m ²
	U-axis (upper arm)	-290° to +105°		T-axis (wrist twist)	0.005 kg·m ²
	R-axis (wrist roll)	-180° to +180°		Mass	15 kg
	B-axis (wrist pitch/yaw)	-130° to +130°		Ambient Conditions	Ambient Temperature
Axis with brake ^{Note 2}	L-axis, U-axis			Relative Humidity	90% max. (non-condensing)
Maximum Speed	S-axis (turning)	2.79 rad/s, 160°/s		Vibration Acceleration	4.9 m/s ² or less
	L-axis (lower Arm)	2.27 rad/s, 130°/s		Others	• Free from corrosive gasses or liquids, or explosive gasses • Free from exposure to water, oil, or dust • Free from excessive electrical noise (plasma)
	U-axis (upper arm)	3.49 rad/s, 200°/s		Power Requirements ^{Note 3}	0.5 kVA
	R-axis (wrist roll)	5.23 rad/s, 300°/s			
	B-axis (wrist pitch/yaw)	6.98 rad/s, 400°/s			
T-axis (wrist twist)	8.72 rad/s, 500°/s				

Note 1. When a load is more than 1 kg, the motion range will be smaller. Use the robot within the recommended motion range. (See diagrams below)
 Note 2. The S-, R-, B-, and T-axes do not have any brakes. Make sure that the operation does not require brakes.
 Note 3. Varies in accordance with applications and motion patterns.
 Note. SI units are used for specifications.



YA-R3F 6-axis

● Maximum payload 3 kg ● Longest Reach R532 mm

Ordering method

YA-R3F	4L	YAC100				
Model	Power cable length	Controller	Safety standard	Language setting	Option I/O	Network option
	4L: 4m		N: Normal E: CE marking	JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	N, P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	No entry: None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFIBUS EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave



Note. The YA-R3F, a compact manipulator with a motor of 80 W or less mounted on all axes, requires minimal space (baseplate: 240 mm × 170 mm). No fence is required for robot's working area. The robot can be used in applications such as automated guided vehicles (AGVs), testing equipment, and educational tools.

Note. Standard models include four air hoses (diameter: 4 mm), and an internal user I/O wiring harness (0.2 mm² × 10) running through the U-arm. This structure simplifies wiring and tubing for easier system construction.

Note. Floor-mounted, wall-mounted, and ceiling-mounted types are available. Please contact us separately regarding wall-mounted or ceiling-mounted installations.

Note. This unit can also be used in combination with a travel axis or other external axis. Please contact us.

Specifications

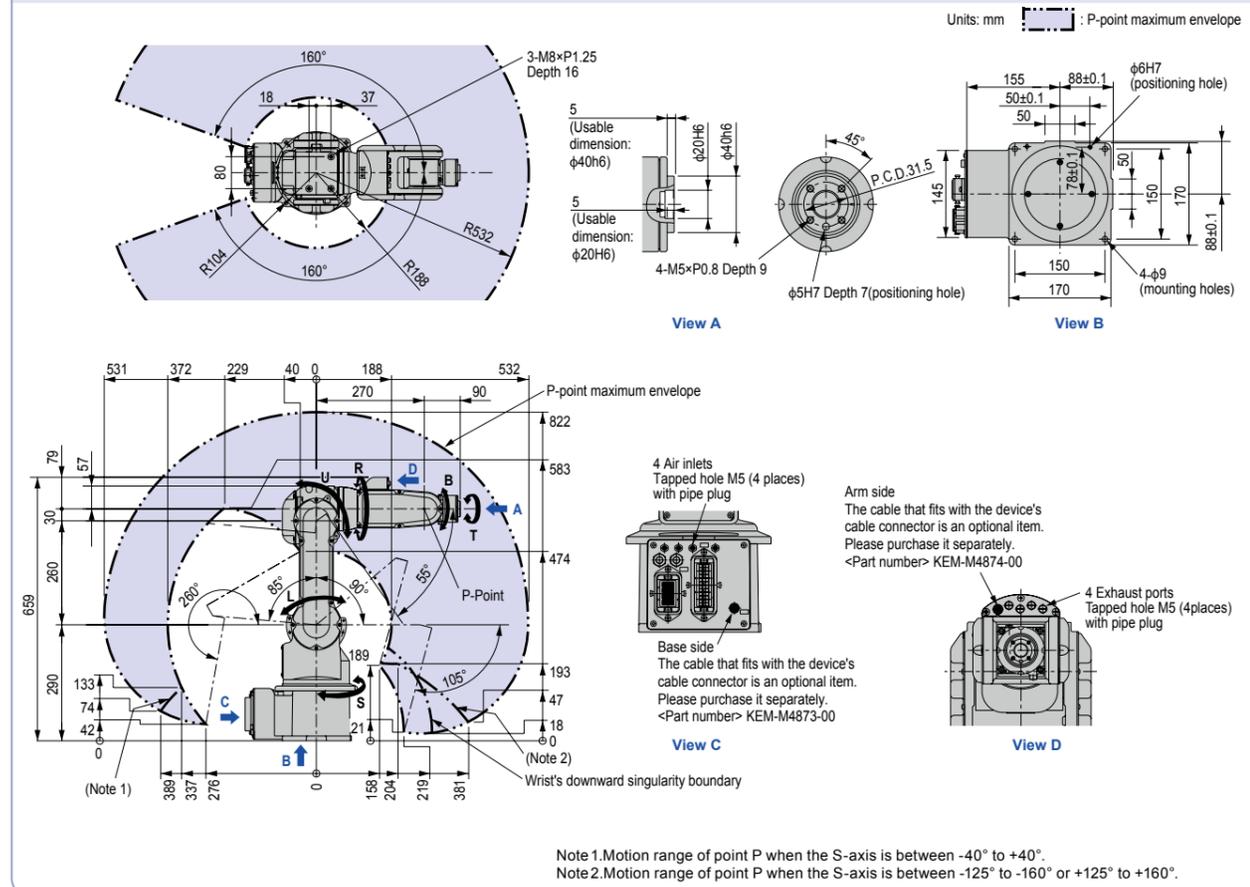
Controlled Axis	6	Allowable Moment	R-axis (wrist roll)	5.39 N·m
Payload	3 kg	B-axis (wrist pitch/yaw)	5.39 N·m	
Repeatability	±0.03 mm	T-axis (wrist twist)	2.94 N·m	
Range of Motion	S-axis (turning)	-160° to +160° ^{Note 1}	Allowable Inertia (GD²/4)	R-axis (wrist roll)
	L-axis (lower Arm)	-85° to +90°		0.1 kg·m ²
	U-axis (upper arm)	-105° to +260°		B-axis (wrist pitch/yaw)
	R-axis (wrist roll)	-170° to +170°		0.1 kg·m ²
	B-axis (wrist pitch/yaw)	-120° to +120°		T-axis (wrist twist)
	T-axis (wrist twist)	-360° to +360°		0.03 kg·m ²
Maximum Speed	S-axis (turning)	3.49 rad/s, 200°/s	Mass	27 kg
	L-axis (lower Arm)	2.62 rad/s, 150°/s	Temperature	0 to +40°C
	U-axis (upper arm)	3.32 rad/s, 190°/s	Humidity	20 to 80%RH (non-condensing)
	R-axis (wrist roll)	5.24 rad/s, 300°/s	Vibration	4.9 m/s ² or less
	B-axis (wrist pitch/yaw)	5.24 rad/s, 300°/s	Others	•Free from corrosive gasses or liquids, or explosive gasses •Free from exposure to water, oil, or dust •Free from excessive electrical noise (plasma)
	T-axis (wrist twist)	7.33 rad/s, 420°/s	Power Requirements ^{Note 2}	0.5 kVA

Note 1. For wall-mounted installation, the S-axis operating range is ±25°.

Note 2. Varies in accordance with applications and motion patterns.

Note. SI units are used for specifications.

YA-R3F



YA-R5F 6-axis

● Maximum payload 5 kg ● Longest Reach R706 mm

Ordering method

YA-R5F	4L	YAC100				
Model	Power cable length	Controller	Safety standard	Language setting	Option I/O	Network option
	4L: 4m		N: Normal E: CE marking	JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	N, P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	No entry: None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFIBUS EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave



Note. Thanks to the higher control rate of the YAC100 controller and vibration-damping control of the arm, we have reduced the residual vibration when the arm stops moving, while shortening the cycle time and achieving the fastest speed in this class.

Note. Longest reach in a respective class (706 mm)

Note. Floor-mounted, wall-mounted, and ceiling-mounted types are available. Please contact us separately regarding wall-mounted or ceiling-mounted installations.

Note. This unit can also be used in combination with a travel axis or other external axis. Please contact us.

Specifications

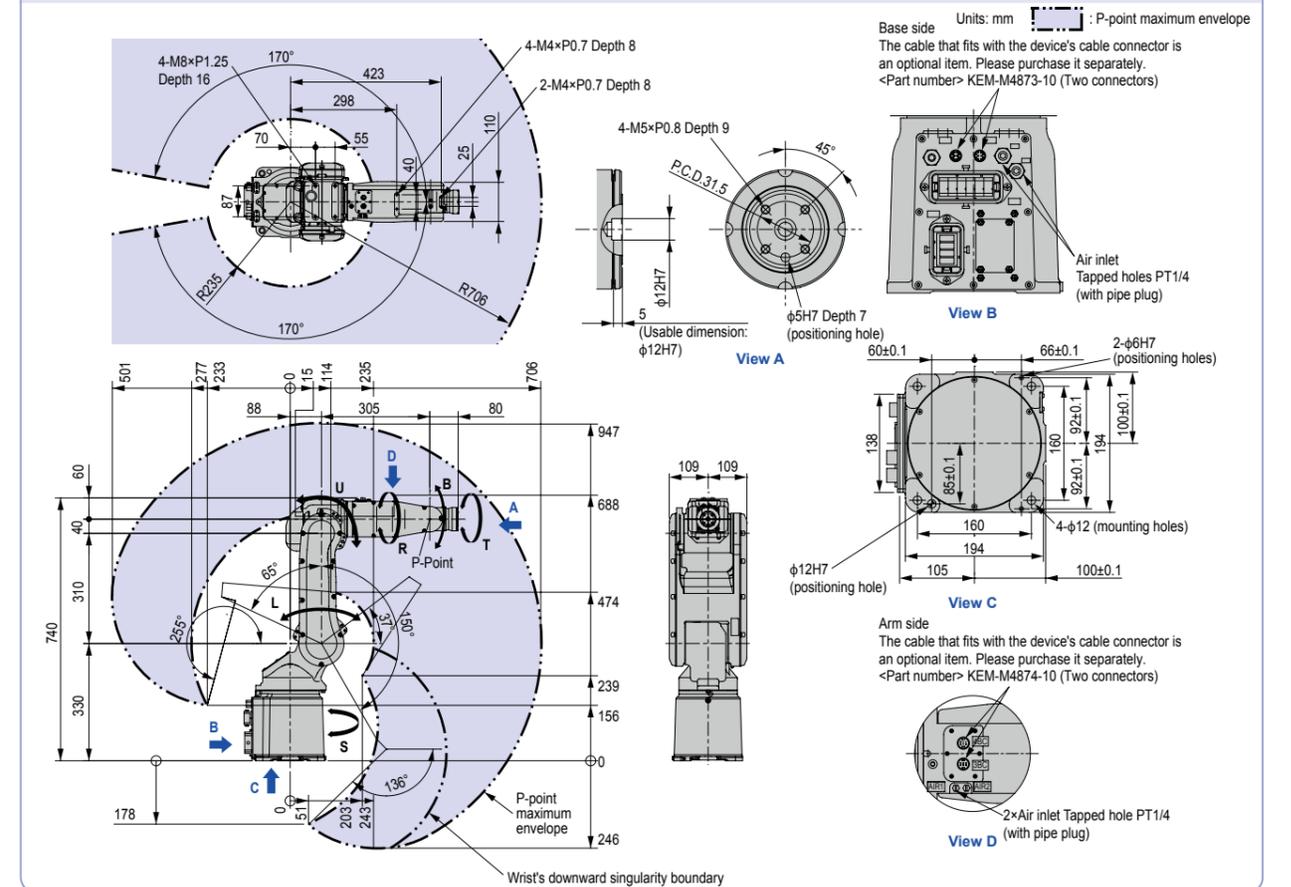
Controlled Axis	6	Allowable Moment	R-axis (wrist roll)	12 N·m
Payload	5 kg	B-axis (wrist pitch/yaw)	12 N·m	
Repeatability	±0.02 mm	T-axis (wrist twist)	7 N·m	
Range of Motion	S-axis (turning)	-170° to +170° ^{Note 1}	Allowable Inertia (GD²/4)	R-axis (wrist roll)
	L-axis (lower Arm)	-65° to +150°		0.3 kg·m ²
	U-axis (upper arm)	-136° to +255°		B-axis (wrist pitch/yaw)
	R-axis (wrist roll)	-190° to +190°		0.3 kg·m ²
	B-axis (wrist pitch/yaw)	-135° to +135°		T-axis (wrist twist)
	T-axis (wrist twist)	-360° to +360°		0.1 kg·m ²
Maximum Speed	S-axis (turning)	6.56 rad/s, 376°/s	Mass	27 kg
	L-axis (lower Arm)	6.11 rad/s, 350°/s	Temperature	0 to +45°C
	U-axis (upper arm)	6.98 rad/s, 400°/s	Humidity	20 to 80%RH (non-condensing)
	R-axis (wrist roll)	7.85 rad/s, 450°/s	Vibration	4.9 m/s ² or less
	B-axis (wrist pitch/yaw)	7.85 rad/s, 450°/s	Others	•Free from corrosive gasses or liquids, or explosive gasses •Free from exposure to water, oil, or dust •Free from excessive electrical noise (plasma)
	T-axis (wrist twist)	12.57 rad/s, 720°/s	Power Requirements ^{Note 2}	1.0 kVA

Note 1. For wall-mounted installation, the S-axis operating range is ±30°.

Note 2. Varies in accordance with applications and motion patterns.

Note. SI units are used for specifications.

YA-R5F



YA-R5LF 6-axis

● Maximum payload 5 kg ● Longest Reach R895 mm

Ordering method

YA-R5LF	4L	YAC100				
Model	Power cable length	Controller	Safety standard	Language setting	Option I/O	Network option
	4L: 4m		N: Normal E: CE marking	JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	N, P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	No entry : None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFINET EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave



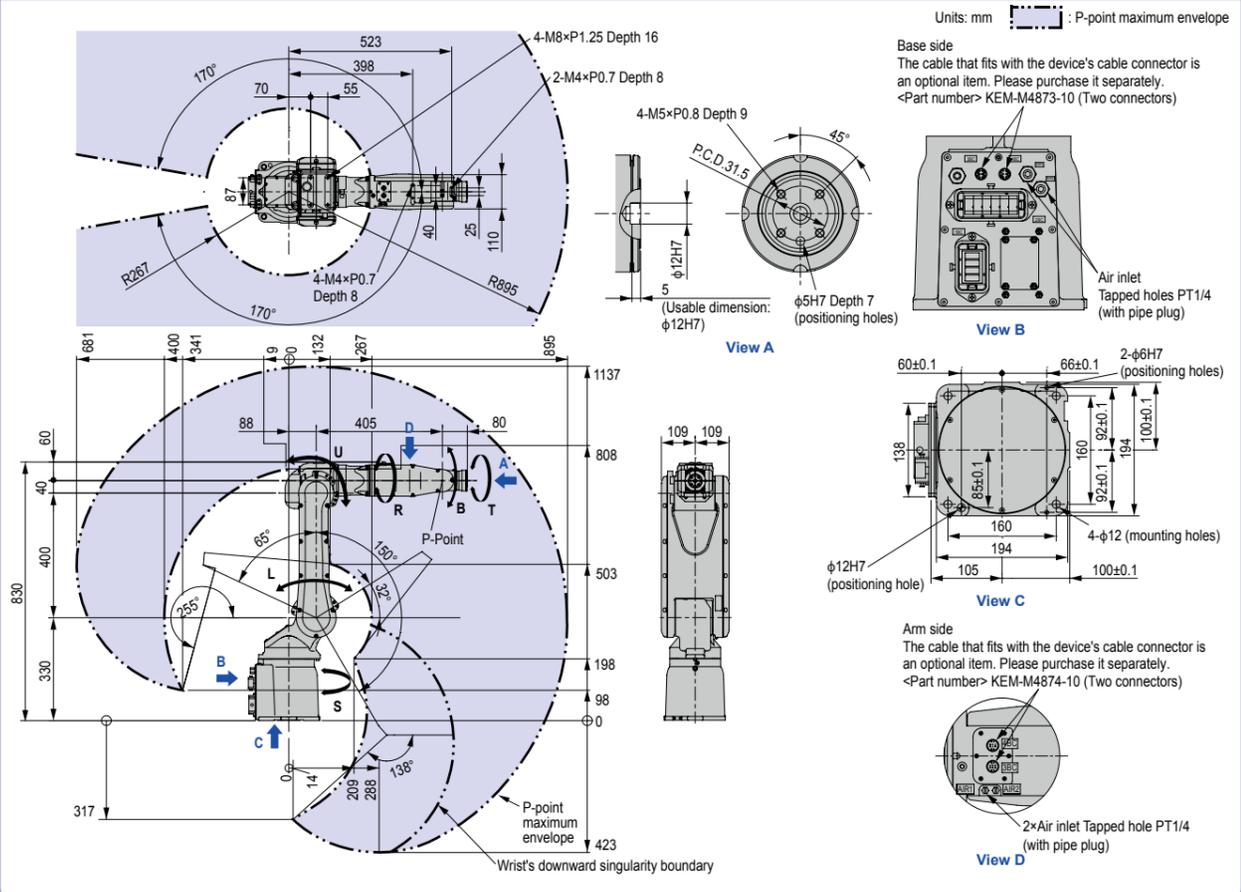
Note. Thanks to the higher control rate of the YAC100 controller and vibration-damping control of the arm, we have reduced the residual vibration when the arm stops moving, while shortening the cycle time and achieving the fastest speed in this class.
 Note. Longest reach in a respective class (895 mm)
 Note. Floor-mounted, wall-mounted, and ceiling-mounted types are available. Please contact us separately regarding wall-mounted or ceiling-mounted installations.
 Note. This unit can also be used in combination with a travel axis or other external axis. Please contact us.

Specifications

Controlled Axis	6	Allowable Moment	R-axis (wrist roll) 12 N·m B-axis (wrist pitch/yaw) 12 N·m T-axis (wrist twist) 7 N·m
Payload	5 kg	Allowable Inertia (GD²/4)	R-axis (wrist roll) 0.3 kg·m ² B-axis (wrist pitch/yaw) 0.3 kg·m ² T-axis (wrist twist) 0.1 kg·m ²
Repeatability	±0.03 mm	Mass	29 kg
Range of Motion	S-axis (turning)	-170° to +170° ^{Note 1}	Ambient Conditions Temperature 0 to +45°C Humidity 20 to 80%RH (non-condensing) Vibration 4.9 m/s ² or less Others •Free from corrosive gasses or liquids, or explosive gasses •Free from exposure to water, oil, or dust •Free from excessive electrical noise (plasma)
	L-axis (lower Arm)	-65° to +150°	
	U-axis (upper arm)	-138° to +255°	
	R-axis (wrist roll)	-190° to +190°	
	B-axis (wrist pitch/yaw)	-135° to +135°	
Maximum Speed	T-axis (wrist twist)	-360° to +360°	
	S-axis (turning)	4.71 rad/s, 270°/s	
	L-axis (lower Arm)	4.89 rad/s, 280°/s	
	U-axis (upper arm)	5.24 rad/s, 300°/s	
	R-axis (wrist roll)	7.85 rad/s, 450°/s	
B-axis (wrist pitch/yaw)	7.85 rad/s, 450°/s		
T-axis (wrist twist)	12.57 rad/s, 720°/s	Power Requirements^{Note 2}	1.0 kVA

Note1. For wall-mounted installation, the S-axis operating range is ±30°.
 Note2. Varies in accordance with applications and motion patterns.
 Note. SI units are used for specifications.

YA-R5LF



YA-R6F 6-axis

● Maximum payload 6 kg ● Longest Reach R1422 mm

Ordering method

YA-R6F	4L	YAC100				
Model	Power cable length	Controller	Safety standard	Language setting	Option I/O	Network option
	4L: 4m		N: Normal E: CE marking	JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	N, P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	No entry : None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFINET EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave



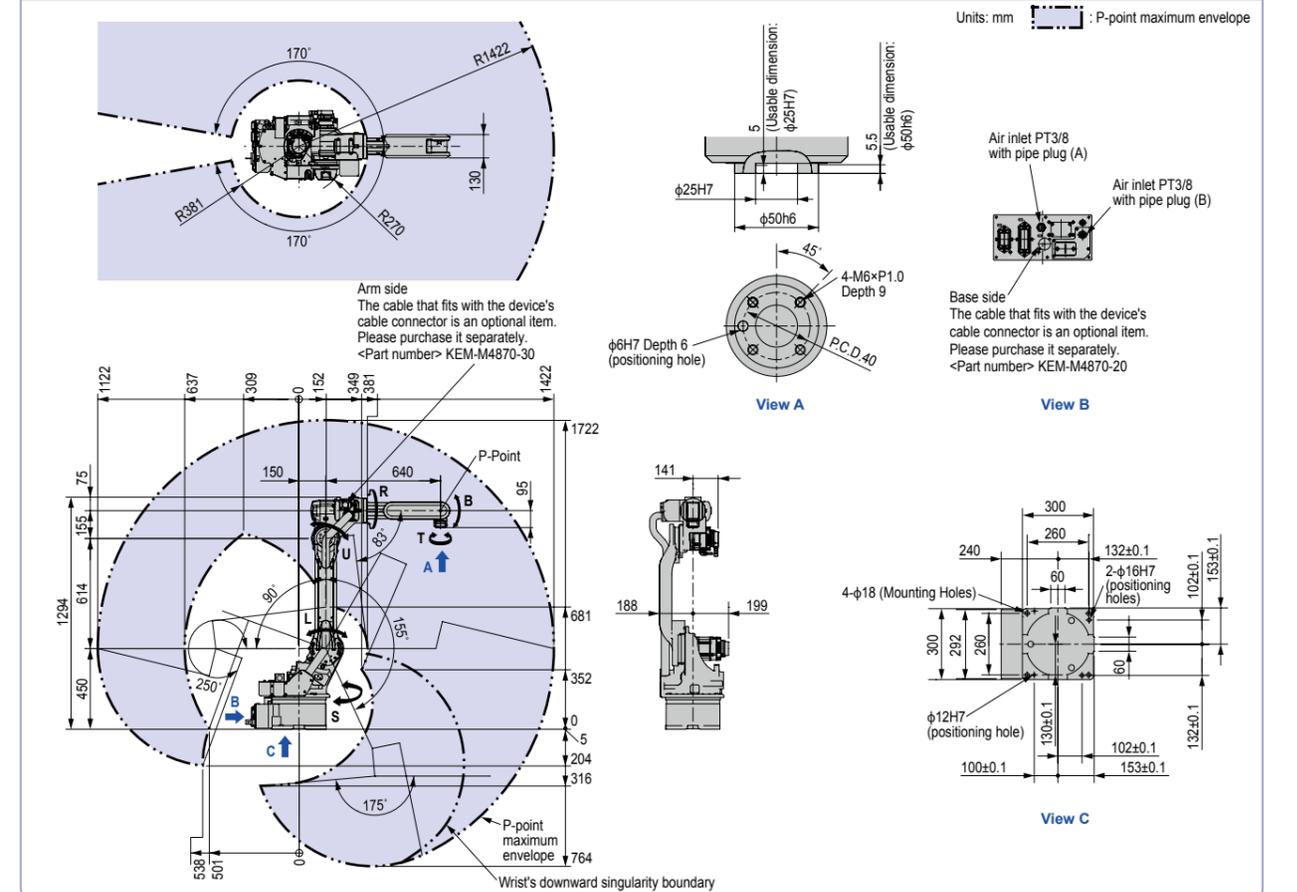
Note. Thanks to the higher control rate of the YAC100 controller and vibration-damping control of the arm, we have reduced the residual vibration when the arm stops moving, while shortening the cycle time and achieving the fastest speed in this class.
 Note. Longest reach in its class (1422 mm) and increased moment capacity of the wrist.
 Note. Floor-mounted, wall-mounted, and ceiling-mounted types are available. Please contact us separately regarding wall-mounted or ceiling-mounted installations.
 Note. This unit can also be used in combination with a travel axis or other external axis. Please contact us.

Specifications

Controlled Axis	6	Allowable Moment	R-axis (wrist roll) 11.8 N·m B-axis (wrist pitch/yaw) 9.8 N·m T-axis (wrist twist) 5.9 N·m
Payload	6 kg	Allowable Inertia (GD²/4)	R-axis (wrist roll) 0.27 kg·m ² B-axis (wrist pitch/yaw) 0.27 kg·m ² T-axis (wrist twist) 0.06 kg·m ²
Repeatability	±0.08 mm	Mass	130 kg
Range of Motion	S-axis (turning)	-170° to +170° ^{Note 1}	Ambient Conditions Temperature 0 to +45°C Humidity 20 to 80%RH (non-condensing) Vibration 4.9 m/s ² or less Others •Free from corrosive gasses or liquids, or explosive gasses •Free from exposure to water, oil, or dust •Free from excessive electrical noise (plasma)
	L-axis (lower Arm)	-90° to +155°	
	U-axis (upper arm)	-175° to +250°	
	R-axis (wrist roll)	-180° to +180°	
	B-axis (wrist pitch/yaw)	-45° to +225°	
Maximum Speed	T-axis (wrist twist)	-360° to +360°	
	S-axis (turning)	3.84 rad/s, 220°/s	
	L-axis (lower Arm)	3.49 rad/s, 200°/s	
	U-axis (upper arm)	3.84 rad/s, 220°/s	
	R-axis (wrist roll)	7.16 rad/s, 410°/s	
B-axis (wrist pitch/yaw)	7.16 rad/s, 410°/s		
T-axis (wrist twist)	10.65 rad/s, 610°/s	Power Requirements^{Note 2}	1.0 kVA

Note1. For wall-mounted installation, the S-axis operating range is ±30°.
 Note2. Varies in accordance with applications and motion patterns.
 Note. SI units are used for specifications.

YA-R6F



YA-U20F 7-axis

● Maximum payload 20 kg

Ordering method

YA-U20F	4L	YAC100				
Model	Power cable length 4L: 4m	Controller	Safety standard N: Normal E: CE marking	Language setting JE: Japanese/English JC: Japanese/Chinese EJ: English/Japanese EC: English/Chinese	Option I/O N, P: Standard I/O 28/28 N1, P1: 56/56 points N2, P2: 84/84 points N3, P3: 112/112 points N4, P4: 140/140 points	Network option No entry: None CC: CC-Link DM: DeviceNet master DS: DeviceNet slave PB: PROFIBUS EP: EtherNet/IP™ PM: Profinet master PT: Profinet slave ES: EtherCAT slave

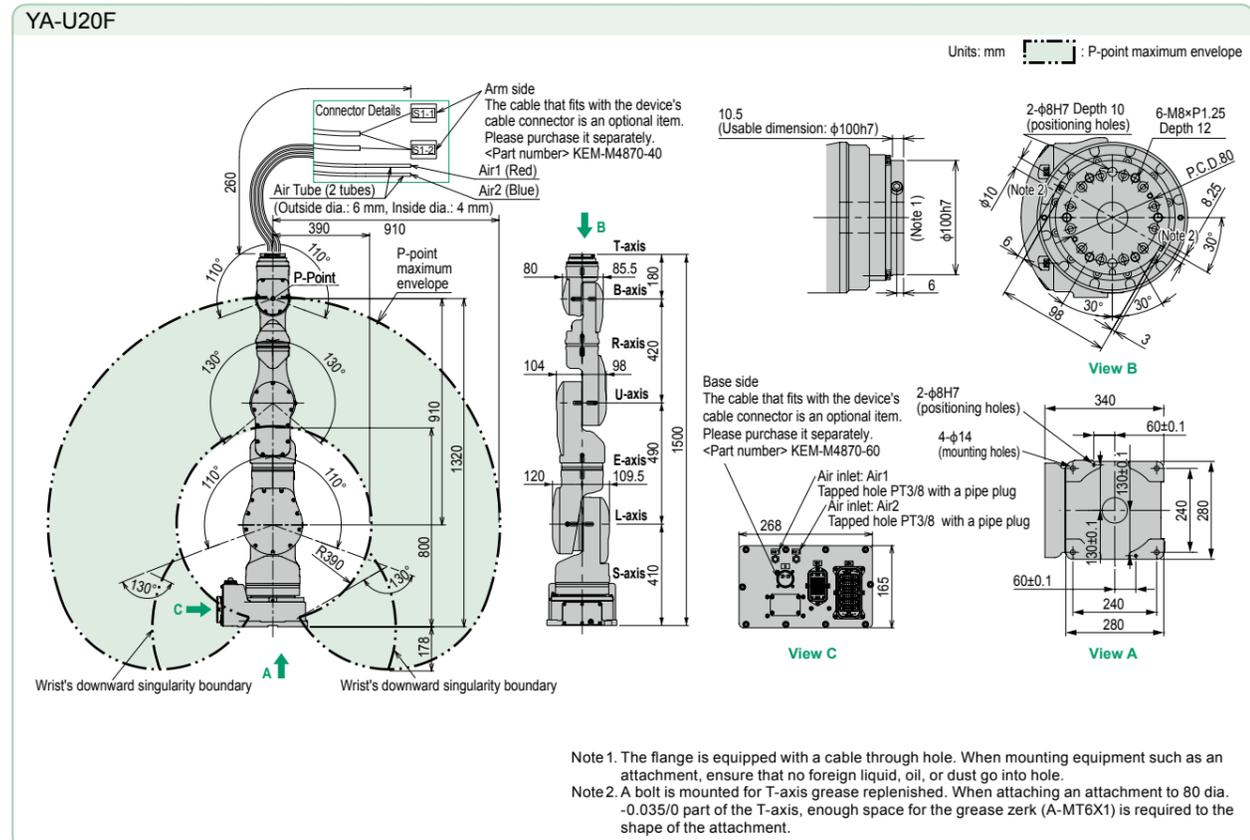


Note. High degree of motion like a human arm with its 7-axis arm.
 Note. The high flexibility of motion makes operation possible even in narrow spaces inaccessible to humans.
 Note. Folds to compact size when not in use.
 Note. Many installation options: on the floor, on the wall or on the ceiling. Please contact us separately regarding wall-mounted or ceiling-mounted installations.
 Note. Assembles and handles heavy objects up to 20 kg.
 Note. By utilizing internal user I/O wiring harness and air lines integrated in the arm, layout can be planned offline without worrying about peripheral interference.
 (Internal user I/O wiring harness and air lines specifications: two air hoses and sixteen-core cables)
 External axis specification for a hand can be accommodated. Contact YAMAHA regarding your requirements.

Specifications

Controlled Axis	7	Allowable Moment	R-axis (wrist roll)	58.8 N·m
Payload	20 kg	Allowable Inertia (GD²/4)	B-axis (wrist pitch/yaw)	58.8 N·m
Repeatability	±0.1 mm		T-axis (wrist twist)	29.4 N·m
Range of Motion	S-axis (turning)	-180° to +180°	R-axis (wrist roll)	4.0 kg·m ²
	L-axis (lower Arm)	-110° to +110°	B-axis (wrist pitch/yaw)	4.0 kg·m ²
	E-axis (elbow twist)	-170° to +170°	T-axis (wrist twist)	2.0 kg·m ²
	U-axis (upper arm)	-130° to +130°	Mass	120 kg
	R-axis (wrist roll)	-180° to +180°	Power Requirements ^{Note 1}	1.5 kVA
	B-axis (wrist pitch/yaw)	-110° to +110°	Temperature	0 to +40°C
	T-axis (wrist twist)	-180° to +180°	Humidity	20 to 80%RH (non-condensing)
Maximum Speed	S-axis (turning)	2.27 rad/s, 130°/s	Vibration	4.9 m/s ² or less
	L-axis (lower Arm)	2.27 rad/s, 130°/s	Others	• Free from corrosive gasses or liquids, or explosive gasses • Free from exposure to water, oil, or dust • Free from excessive electrical noise (plasma)
	E-axis (elbow twist)	2.97 rad/s, 170°/s		
	U-axis (upper arm)	2.97 rad/s, 170°/s		
	R-axis (wrist roll)	3.49 rad/s, 200°/s		
	B-axis (wrist pitch/yaw)	3.49 rad/s, 200°/s		
	T-axis (wrist twist)	6.98 rad/s, 400°/s		

Note 1. Varies in accordance with applications and motion patterns.
 Note. SI units are used for specifications.



Controller for use with the YA series YAC100 Specifications

YAC100 controller specifications

Configuration	Standard: IP20 (open structure)
Dimensions	470 mm (W) × 420 mm (D) × 200 mm (H) (Protrusions are not included.)
Mass	20 kg
Cooling System	Direct cooling
Ambient Temperature	During operation: 0°C to +40°C During storage: -10°C to +60°C
Relative Humidity	90% max. (non-condensing)
Power Supply ^{Note}	Single-phase 200/230 VAC (+10% to -15%), 50/60 Hz Three-phase 200/220 VAC (+10% to -15%), 50/60 Hz
Grounding	Grounding resistance: 100 Ω or less
Digital I/Os	Specialized signals: 8 inputs and 11 output General signals: 16 inputs and 16 outputs Max. I/O (optional): 1,024 inputs and 1,024 outputs
Positioning System	By serial encoder
Programming Capacity	JOB: 10,000 steps, 1,000 instructions C/O ladder: 1,500 steps
Expansion Slots	MP2000 bus × 5 slots
LAN (Connection to Host)	1 (10BASE-T/100BASE-TX)
Interface	RS-232C: 1ch
Control Method	Software servo control
Drive Units	Six axes for robots. Two more axes can be added as external axes. (Can be installed in the controller.)
Painting Color	Munsell notation 5Y7/1 (reference value)

Note. YA-R6F: Three-phase only.

YAP programming pendant specifications



Dimensions	169 mm (W) × 314.5 mm (H) × 50 mm (D)
Mass	0.990 kg
Material	Reinforced plastics
Operation Device	Select keys, axis keys (8 axes), numerical/application keys, Mode switch with key (mode: teach, play, and remote), emergency stop button, enable switch, compact flash card interface device (compact flash is optional.), USB port (1 port)
Display	640 × 480 pixels color LCD, touch panel (Alphanumeric characters, Chinese characters, Japanese letters, Others)
IEC Protection Class	IP65
Cable Length	Standard: 8 m, 4 m / 8 m / 12 m extension cable (maximum 20 m)

Optimum controller for handling and assembly

The YAC100 is a compact controller with improved performance and functions optimized for handling and assembly.

- Fits in a 19-inch rack and can be installed under conveyors.
- Commands specifically designed for workpiece handling with synchronized conveyors.



Hardware Options

- External axis (max.: 2 axes)
- I/O module (28 points, NPN or PNP)
- Major fieldbus interface boards: DeviceNet™ (master/slave), CC-Link (slave), PROFIBUS (slave), EtherNet/IP™ (slave, I/O communications), EtherCAT (slave), PROFINET (master/slave)

Optional Functions

- Conveyor synchronization
- Vision function
- External reference point control
- Software pendant

Regarding the concurrent I/O ladder program

The YAC100 controller is equipped with an NPN (or PNP) for standard I/O. Dedicated input/output is assigned to this standard I/O board. For this reason, if dedicated input/output is to be assigned to various types of field bus, concurrent I/O ladder program settings must be made.

Sample programs can be downloaded from our website.^{Note}
<https://global.yamaha-motor.com/business/robot/>

Note. The member site requires registration.

A robot simulator that implements the same functionality as the actual controller

MotoSim EG-VRC-CadPack for YAMAHA

Virtual programming before the actual line is completed allows major reduction in line startup time.

- Modeling layout**
Models of workers and workpieces can be easily laid out.
- Intuitive control of models**
Models can be moved intuitively, simply by using the mouse.
- Programming and debugging**
Automatic generation of robot operating programs, job editing, and job analysis can be performed easily.
- Intuitive robot operation**
The robot's posture can be operated intuitively, allowing more efficient teaching.
- Robot simulation**
The robot can be watched as it operates, allowing visual verification.

Accessories and part options

Standard accessories

YAP programming box (with 8m cable)

Name	Model	Language
YAP-J	KEN-M5110-0J	Japanese
YAP-E	KEN-M5110-0E	English
YAP-C	KEN-M5110-0C	Chinese

Parts for the YAC100 controller

Name	Model
Power supply connector	KEN-M4871-00
Power supply cable clamp	KEN-M4836-00
Dummy connector for shorting safety signal	KEN-M5370-00
Power supply protection fuse	KEN-M5853-00
Standard I/O connector (STD.IO)	KBH-M4420-00
	KEN-M4420-00

Power cable (robot cable)

Manipulator name	Model	Cable length	Cable diameter		Bending radius
			Signal wire	Power wire	
YA-RJ	KEM-M4710-40	4 m	Signal wire	φ8.5 mm	85.0 mm
			Power wire	φ13.5 mm	
YA-R3F	KEM-M4711-40	4 m	Signal wire	φ17.5 mm	180.0 mm
			Power wire	φ19.5 mm	
YA-R5F/R5LF/R6F	KEM-M4712-40	4 m	Signal wire	φ17.5 mm	180.0 mm
			Power wire	φ19.5 mm	
YA-U5F/U10F	KEM-M4713-40	4 m	Signal wire	φ17.5 mm	180.0 mm
			Power wire	φ16.1 mm	
YA-U20F	KEM-M4714-40	4 m	Signal wire	φ17.5 mm	180.0 mm
			Power wire	φ26.0 mm	

Options

Power cable (robot cable)

Manipulator name	Model			Cable diameter	Bending radius
	Cable length (10 m)	Cable length (15 m)	Cable length (20 m)		
YA-RJ	KEM-M4710-A0	KEM-M4710-F0	KEM-M4710-L0	Signal wire	φ8.5 mm
				Power wire	φ13.5 mm
YA-R3F	KEM-M4711-A0	KEM-M4711-F0	KEM-M4711-L0	Signal wire	φ17.5 mm
				Power wire	φ19.5 mm
YA-R5F/R5LF/R6F	KEM-M4712-A0	KEM-M4712-F0	KEM-M4712-L0	Signal wire	φ17.5 mm
				Power wire	φ19.5 mm
YA-U5F/U10F	KEM-M4713-A0	KEM-M4713-F0	KEM-M4713-L0	Signal wire	φ17.5 mm
				Power wire	φ16.1 mm
YA-U20F	KEM-M4714-A0	KEM-M4714-F0	KEM-M4714-L0	Signal wire	φ17.5 mm
				Power wire	φ26.0 mm

Device cable connector (connector for user wiring)

Manipulator name	Part position	Model	Remarks
YA-RJ	Base side	KEM-M4870-00	
	Arm side	KEM-M4870-10	
YA-R3F	Base side	KEM-M4873-00	
	Arm side	KEM-M4874-00	
YA-R5F/R5LF	Base side	KEM-M4873-10	Two connectors
	Arm side	KEM-M4874-10	Two connectors
YA-R6F	Base side	KEM-M4870-20	
	Arm side	KEM-M4870-30	
YA-U5F	Base side	KEM-M4873-30	
	Arm side	KEM-M4870-40	
YA-U10F	Base side	KEM-M4873-30	
	Arm side	KEM-M4870-50	
YA-U20F	Base side	KEM-M4870-60	
	Arm side	KEM-M4870-40 ^{Note}	

Note. Two connectors are required on the arm side of YA-U20F.

Extension cable for YAP (extension cable for programming box)

Name	Model	Cable length
Extension cable for YAP	KEN-M531F-10	4 m
	KEN-M531F-20	8 m
	KEN-M531F-30	12 m

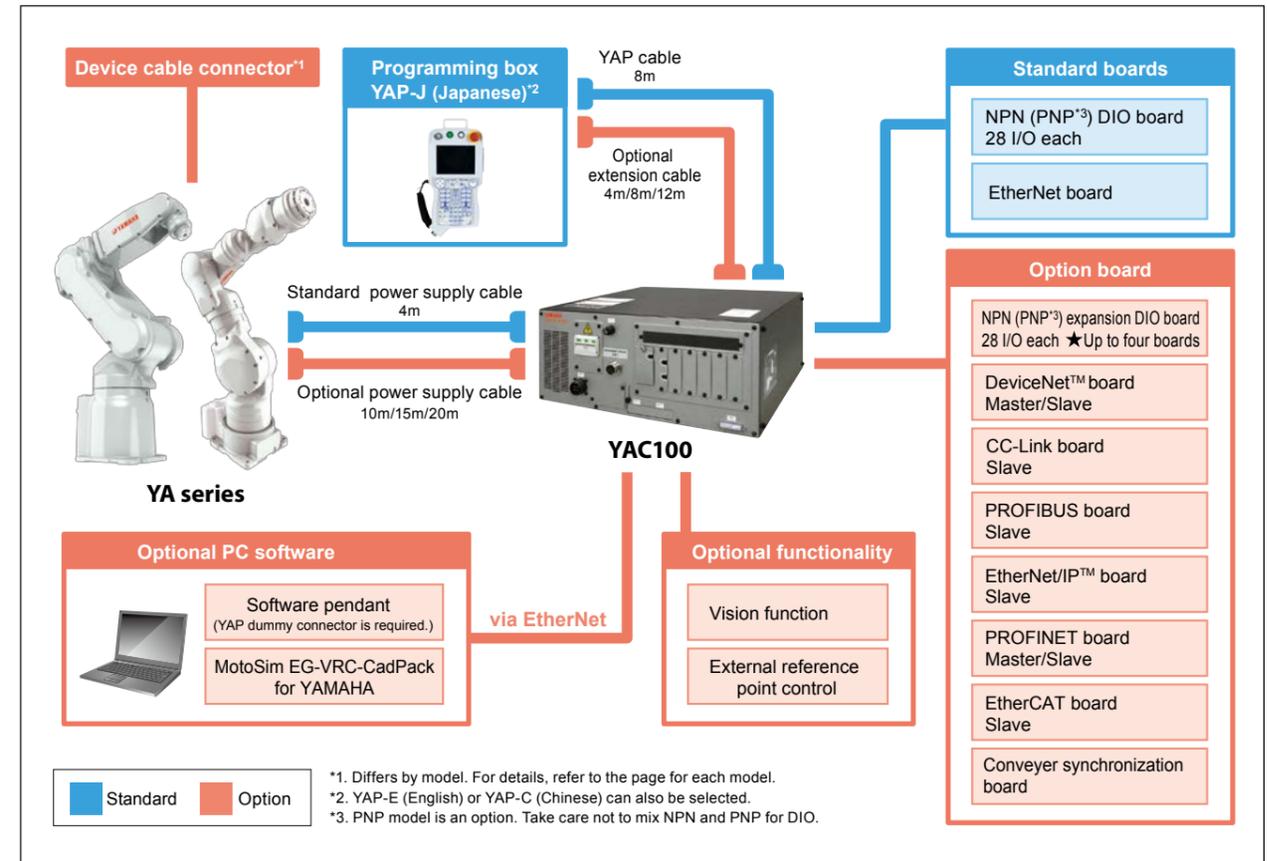
Dummy connector for YAP

Name	Model
YAP dummy connector	KEN-M5163-00

Maintenance parts

Name	Model
Battery unit for YA-RJ/R3F	KEM-M53G3-10
YA-R5F/R5LF/R6F	KEM-M53G3-00
Battery unit for YA-U5F/U10F/U20F	
Battery unit for YAC100 controller	KEN-M53G3-00
AC fan motor	KEN-M6175-00

Basic system contents



MEMO