

YRC1000

YASKAWA



MOTOMAN-GP Series

Small Models (max. payload 25 kg)

Compatible with YRC1000/YRC1000micro Robot Controller

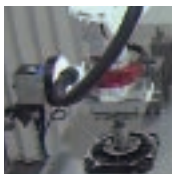


YASKAWA

Robot System Solutions

MOTOMAN-GP Series

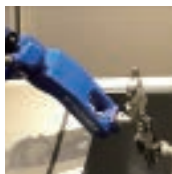
Find smart solutions for your production site with YASKAWA's cutting-edge robot systems.



Precision fitting



Picking, aligning



Transfer between/
within equipment



Polishing



Assembly

YASKAWA has the answer

We can meet our customers' diverse needs with a wide range of functions and components.

Application examples

Bin picking of parts, fitting, assembly, polishing, and machine work.
See application examples on page 4 and 5.



YASKAWA can meet the requirements of a wide range of applications with its cutting-edge robot systems.

Bin picking of parts

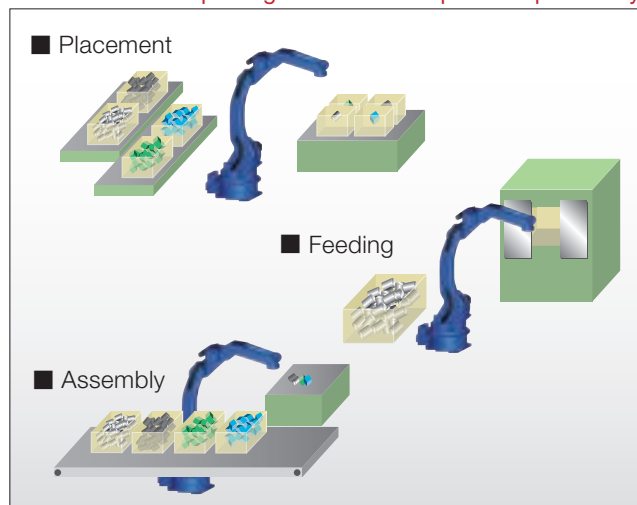


Full automation with 3D vision package "MotoSight3D"

Bin picking of parts can be automated as:

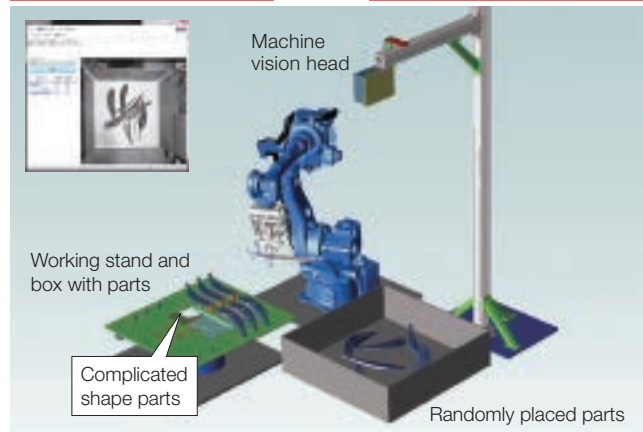
- Parts with complicated forms and greasy metal parts can be recognized and handled by MOTOMAN robots using MotoSight3D, YASKAWA's 3D vision package.
- Work required to register the different parts, which used to take days, can now be executed in approximately 4 hours.

Automation of bin picking which was not possible previously



Workpieces can easily be registered without programming.

Bin picking can now be completely automated.



Picking from pallet, conveyor

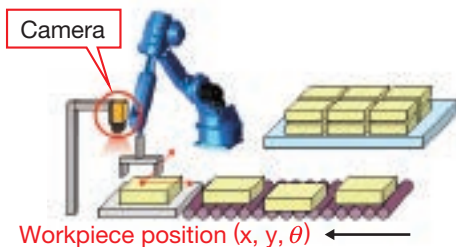
Correction of workpiece position



The 2D vision package "MotoSight2D" eliminates the need for positioning mechanism

■ Picking from conveyor

- Die-cast aluminum product, cardboard cases, etc.

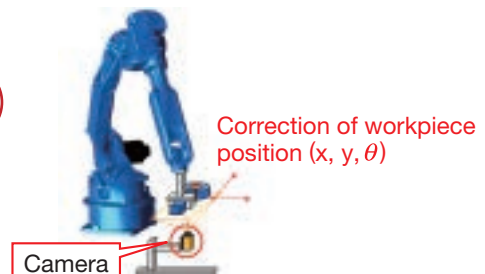


Removes necessity of complex positioning mechanism

System that operates correction by vision after conveyor stops without using conveyor synchronization.

■ Correction of workpiece position after picking

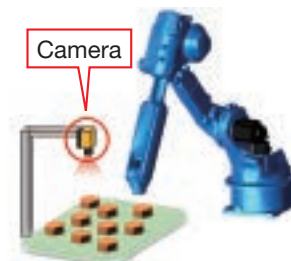
- Panel shape workpieces, connecting rods, etc.



■ Picking from pallet (multiple workpiece recognition)

- Applications requiring high-speed processing.

Detecting multiple workpieces with just a single image



Mirror-like polishing

»»»»»»»»»» Achieve polishing quality of skilled craftsmen without having to teach the manipulator

The YRC1000 robot controller is equipped (as a standard) with an application program for polishing workpieces. Moreover, the controller has improved motion path accuracy, enabling smooth and high-quality polishing, which is comparable to the technique of a highly skilled craftsman.



Polishing product (mirror-like polishing)



“Integration of robot technology with application technologies”

- Higher speed**
»»»»» Reduces time required for polishing.
- Increased payloads**
»»»»» Increases product value.
- More working space**
»»»»» Secures enough space for optimal robot postures.
- Environmental consideration**
»»»»» Provides countermeasures for dust and oil mists.

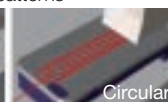


- No teaching required**
»»»»» Can be used by anyone.
- Variety of polishing patterns**
»»»»» Craftsmanship is included as a standard specification.

Automatic program generation



Different polishing patterns



Reciprocal

Circular

Precision fitting (control by force tracking)

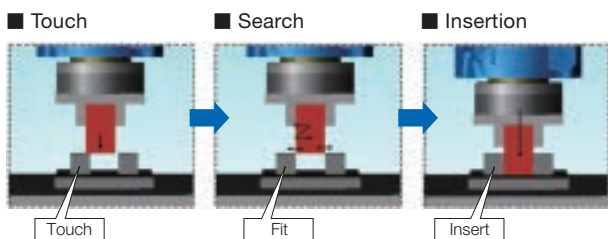
»»»»»»»»»» High-speed automation of precision fitting (which was difficult manually) with six-axis force sensing control function “MotoFit”

MotoFit, YASKAWA’s six-axis force sensing control function can be added to the wrist section of the MOTOMAN robot. MotoFit detects changes in force that the robot arm is subjected to and feeds back the information to robot motions. This allows the robot to perform precision fitting, which involves sophisticated human hand movement, to smoothly search for the right position and angle at high speed.

Precision fitting function (search and insertion)

- »»»»»»»»»» ○ Fitting time of 10 μm clearance gap and 20 mm depth is within 5 seconds (fastest in the industry).
- Parameter automatic tuning and monitoring functions reduced teaching time.
- Hole position search and biting prevention function improve reliability.

Three operation patterns have achieved high-speed fitting.

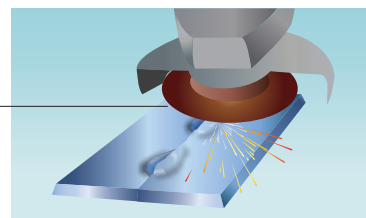


Force tracking and force change detection

- »»»»»»»»»» ○ Detects beads (convex) and applies force only to beads to grind them down.

Polishing work (Removing beads)

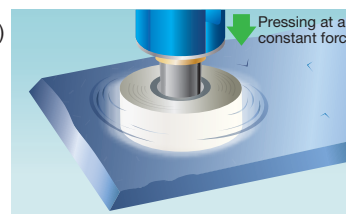
Repeats surface tracing motion by applying optimal pressure until it reaches the track specified by teaching.



- »»»»»»»»»» ○ Enables the repetition of surface tracing motion with the application of pressure at a force that is specified by teaching.

Polishing work (pressing a workpiece against a grinder)

Can press at constant force even if grinder wears off.



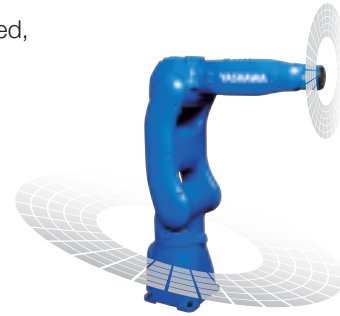
MOTOMAN-GP Series Robot : GP4, GP7, and GP8, Compact and High Speed



Increase productivity

Achieve high transfer capabilities with number 1 payloads, speeds, and wrist allowable moments in their classes

- A wide range of workpieces can be transferred and different grippers can be mounted, with 4 kg/7 kg/8 kg payloads (class number 1) and greater allowable moment (60% increase in GP4 and 38% increase in GP7 and GP8).
- Speeds of all axes have been increased.
- Acceleration/deceleration control has been improved to achieve maximum reduction of acceleration/deceleration times for all robot postures.



Make equipment compact

Slim and easy to use body and arm structure enabling efficient installation space

- Slim manipulator body requires minimum installation space (minimizes L and U axis offset).
- Power cable can be connected at the bottom section, which reduces interference with walls when compared with cable connections on the side of the manipulator.
- Increased maximum reach and horizontal reach enables manipulator to operate in wider work areas.
- Slim, straight, and symmetrical arm design minimize interference with peripheral devices, even in small spaces.
- Three-way solenoid valve can be installed inside the arm (optional; available only for GP7 and GP8), which provides a V-shape space and reduces motion limitations.

■ Reduced interference radius when S-axis is turning

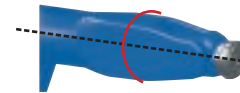


Former model:
MH5(L)SII 182 mm



New model:
GP4 109 mm
GP7 and GP8 140 mm

■ Reduced interference radius when the wrist is turning



Former model:
MH5(L)SII 73 mm

New model:
GP4, GP7, and GP8 67 mm



Built-in three-way solenoid valve (optional; available only for GP7 and GP8)



Power cable connection on the side and bottom (optional) of the manipulator



Improve equipment installation, operation, and maintenance

High environmental performance

- The IP67-rated body and wrist are standard on the GP7 and GP8 models, providing strong protection against dust and coolant.

Easy-to-clean design

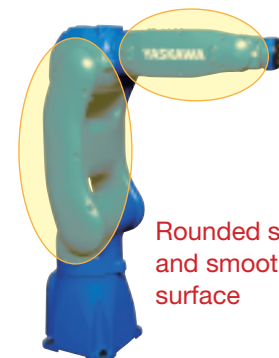
- Manipulator surface is designed to prevent adherence of dust.

Easy maintenance

- Zero position data can be saved without the need to connect to a battery when replacing wire harness.
- Number of cables and connectors have been reduced for better work efficiency.

Reduced wiring time

- Power cable is reduced to one cable, which reduces wiring time.

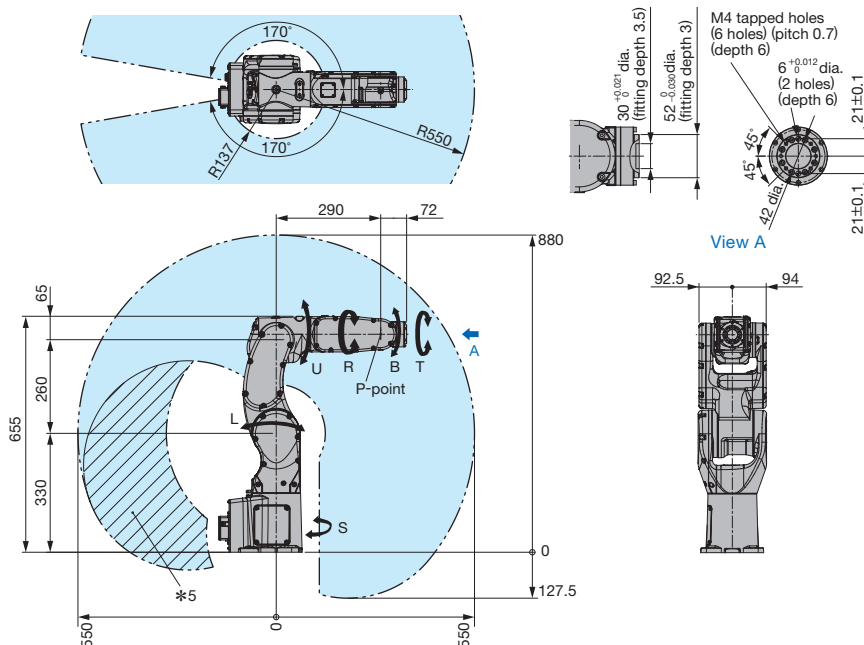


Rounded shape and smooth surface



■ Dimensions Units: mm  P-point Maximum Envelope

Note: Refer to individual dimension diagrams for detailed dimensions and specifications of the following models.



Model		MOTOMAN-GP4
Type		YR-1-06VX4-A00
Controlled Axis		6 (vertically articulated)
Payload	Wrist	4 kg
	U-arm*1	1 kg
Maximum Reach		550 mm
Repeatability*2		0.01 mm
Range of Motion	S-axis (turning)	-170° - +170°
	L-axis (lower arm)	-110° - +130°
	U-axis (upper arm)*3	-65° - +200°
	R-axis (wrist roll)	-200° - +200°
	B-axis (wrist pitch/yaw)	-123° - +123°
	T-axis (wrist twist)	-455° - +455°
Maximum Speed	S-axis (turning)	8.11 rad/s, 465°/s
	L-axis (lower arm)	8.11 rad/s, 465°/s
	U-axis (upper arm)	9.16 rad/s, 525°/s
	R-axis (wrist roll)	9.86 rad/s, 565°/s
	B-axis (wrist pitch/yaw)	9.86 rad/s, 565°/s
	T-axis (wrist twist)	17.45 rad/s, 1000°/s
Allowable Moment	R-axis (wrist roll)	8.86 N·m
	B-axis (wrist pitch/yaw)	8.86 N·m
	T-axis (wrist twist)	4.9 N·m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.2 kg·m ²
	B-axis (wrist pitch/yaw)	0.2 kg·m ²
	T-axis (wrist twist)	0.07 kg·m ²
Approx. Mass		28 kg
IEC Protection Class		IP67
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4		1.0 kVA
Mounting		Floor, ceiling, wall, tilt
Compatible Controller		YRC1000, YRC1000micro

*1: U arm payload capacity will vary according to payload carried by wrist.

*2: Conforms to ISO 9283.

*3: The range of motion of the U-axis itself. Not with respect to the ground.

*4: Varies in accordance with applications and motion patterns.

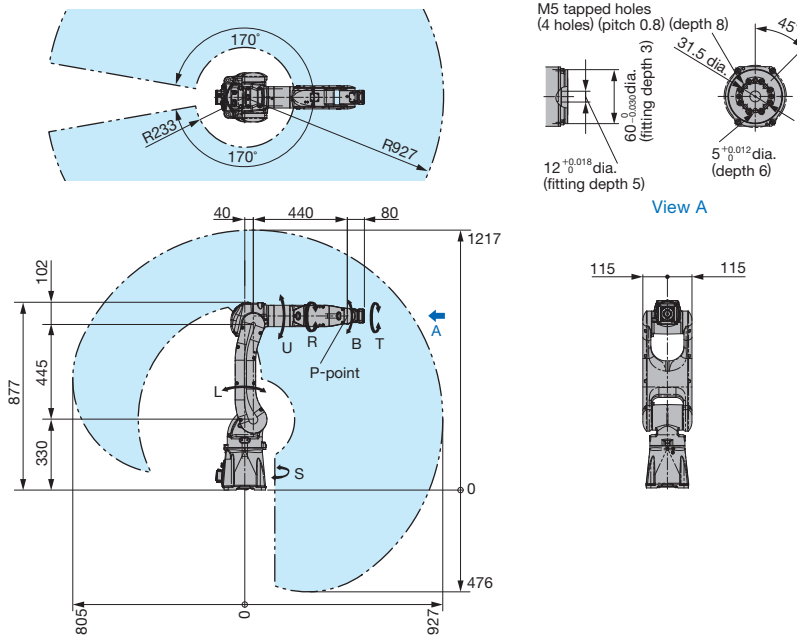
*5: When using air or a mating connector, the arm cannot be moved in the shaded area because it interferes with the connector.

Note: SI units are used for the specifications.



■ Dimensions Units: mm □ P-point Maximum Envelope

Note: Refer to individual dimension diagrams for detailed dimensions and specifications of the following models.

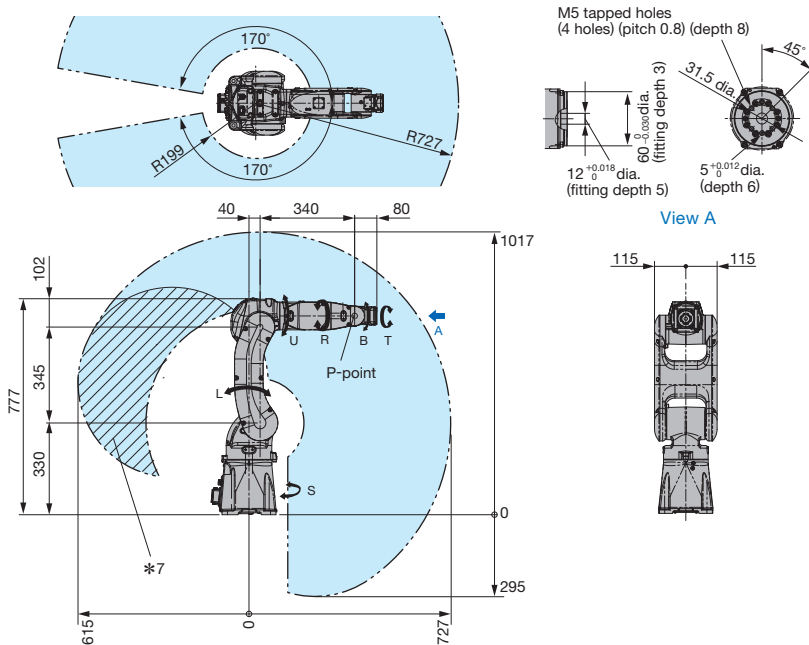


Model	MOTOMAN-GP7	
Type	YR-1-06VX7-A00	
Controlled Axis	6 (vertically articulated)	
Payload	Wrist	7 kg
	U-arm*1	1 kg
Maximum Reach	927 mm	
Repeatability*2	0.01 mm	
Range of Motion	S -axis (turning)	-170° - +170°
	L -axis (lower arm)	-65° - +145°
	U -axis (upper arm)*3	-70° - +190°
	R -axis (wrist roll)	-190° - +190°
	B -axis (wrist pitch/yaw)	-135° - +135°
	T -axis (wrist twist)	-360° - +360°
Maximum Speed	S -axis (turning)	6.54 rad/s, 375°/s
	L -axis (lower arm)	5.50 rad/s, 315°/s
	U -axis (upper arm)	7.15 rad/s, 410°/s
	R -axis (wrist roll)	9.59 rad/s, 550°/s
	B -axis (wrist pitch/yaw)	9.59 rad/s, 550°/s
	T -axis (wrist twist)	17.45 rad/s, 1000°/s
Allowable Moment	R -axis (wrist roll)	17 N·m
	B -axis (wrist pitch/yaw)	17 N·m
	T -axis (wrist twist)	10 N·m
Allowable Inertia (GD ² /4)	R -axis (wrist roll)	0.5 kg·m ²
	B -axis (wrist pitch/yaw)	0.5 kg·m ²
	T -axis (wrist twist)	0.2 kg·m ²
Approx. Mass	37 kg	
IEC Protection Class	IP67	
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4	1.0 kVA	
Mounting*5	Floor, ceiling, wall, tilt	
Compatible Controller	YRC1000, YRC1000micro	
Optional Specification*6	Food-grade grease	

*1: U arm payload capacity will vary according to payload carried by wrist.
 *2: Conforms to ISO 9283.
 *3: The range of motion of the U-axis itself. Not with respect to the ground.
 *4: Varies in accordance with applications and motion patterns.

*5: There are motion limitations on S-axis for wall, tilt mounting type.
 *6: Contact your Yaskawa representative about delivery dates.
 Note: SI units are used for the specifications.

GP8



Model	MOTOMAN-GP8	
Type	YR-1-06VX8-A00	
Controlled Axis	6 (vertically articulated)	
Payload	Wrist	8 kg
	U-arm*1	1 kg
Maximum Reach	727 mm	
Repeatability*2	0.01 mm	
Range of Motion	S-axis (turning)	-170° - +170°
	L-axis (lower arm)	-65° - +145°
	U-axis (upper arm)*3	-70° - +190°
	R-axis (wrist roll)	-190° - +190°
	B-axis (wrist pitch/yaw)	-135° - +135°
	T-axis (wrist twist)	-360° - +360°
Maximum Speed	S-axis (turning)	7.94 rad/s, 455°/s
	L-axis (lower arm)	6.72 rad/s, 385°/s
	U-axis (upper arm)	9.07 rad/s, 520°/s
	R-axis (wrist roll)	9.59 rad/s, 550°/s
	B-axis (wrist pitch/yaw)	9.59 rad/s, 550°/s
	T-axis (wrist twist)	17.45 rad/s, 1000°/s
Allowable Moment	R-axis (wrist roll)	17 N·m
	B-axis (wrist pitch/yaw)	17 N·m
	T-axis (wrist twist)	10 N·m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.5 kg·m ²
	B-axis (wrist pitch/yaw)	0.5 kg·m ²
	T-axis (wrist twist)	0.2 kg·m ²
Approx. Mass	35 kg	
IEC Protection Class	IP67	
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4	1.0 kVA	
Mounting*5	Floor, ceiling, wall, tilt	
Compatible Controller	YRC1000, YRC1000micro	
Optional Specification*6	Food-grade grease	

*1: U arm payload capacity will vary according to payload carried by wrist.
 *2: Conforms to ISO 9283.
 *3: The range of motion of the U-axis itself. Not with respect to the ground.
 *4: Varies in accordance with applications and motion patterns.
 *5: There are motion limitations on S-axis for wall, tilt mounting type.

*6: Contact your Yaskawa representative about delivery dates.
 *7: When using air, an optional solenoid valve, or a mating connector, the arm cannot be moved in the shaded area because it interferes with the connector.
 Note: SI units are used for the specifications.

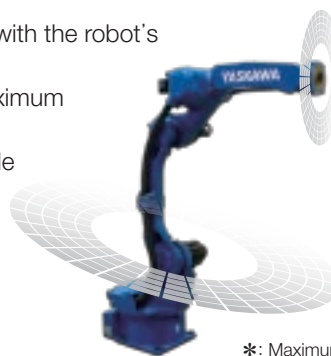
MOTOMAN-GP Series Robot: GP12, GP25, and GP25-12, World's Highest Speed in their Classes



Increase productivity

Achieve high transfer capability with number 1 payload, speed, and wrist allowable moment in its class

- Productivity of customers' equipment can be improved significantly with the robot's high speed (highest speed in 12 kg and 25 kg payload classes).
- Acceleration/deceleration control has been improved to achieve maximum reduction of acceleration/deceleration times for all robot postures.
- With its high payload, the robot can carry heavy objects and a double gripper can be attached to the arm.



The maximum speed of GP25 has been increased by 30% (max.) compared with the former model.

*: Maximum speeds of GP12 and GP25-12 have been increased by 15% (max.) compared with former models.



Make equipment compact

Slim hollow arm design reduces interference

- Hollow arm structure to store cables reduces operation restriction due to cable interference, simplifies teaching, and eliminates cable disconnection caused by interference.
- Slim wrist and curvy arm design minimizes interference with surrounding equipment.

■ Hollow arm

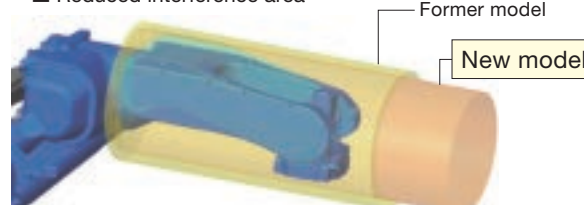


R-axis hollow arm: 50 mm dia.



T-axis hollow arm: 50 mm dia.

■ Reduced interference area



Minimized interference radius of the wrist

	Former model	New model
MH12	136 mm	GP12 120 mm
MH24	147 mm	GP25 138 mm
MH24-10	136 mm	GP25-12 120 mm



Improve equipment installation, operation, and maintenance

Easy set-up

- Only one cable is required, which reduces setup time.

Wrist structure with high environmental resistance

- The IP67-rated wrist is standard on the GP12 and GP25 model.

Easy maintenance

- Zero position data can be saved without the need to connect to a battery when replacing wire harness.
- Number of cables and connectors have been reduced for better work efficiency.

Reduced wiring time

- Power cable is reduced to one cable, which reduces wiring time.

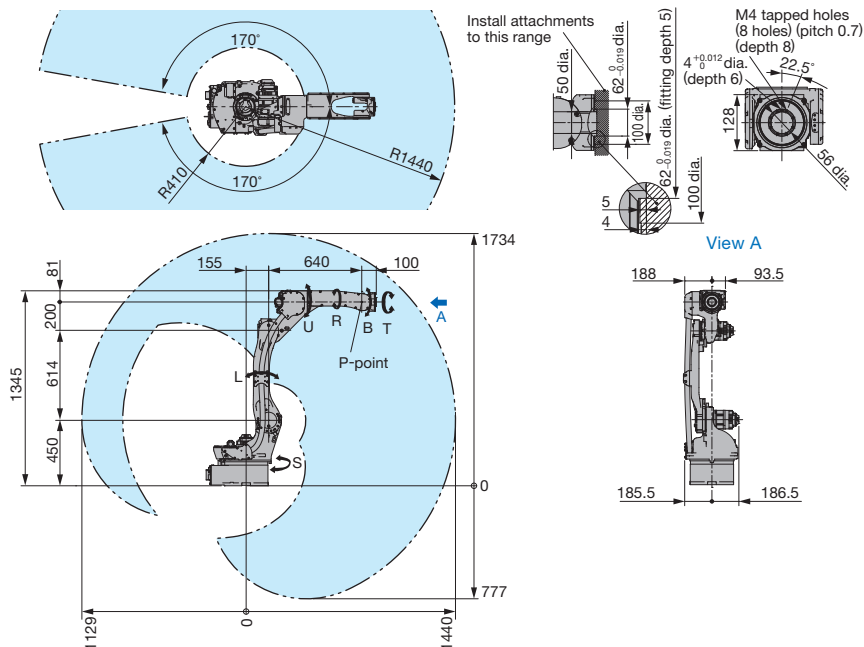


GP12



■ Dimensions Units: mm P-point Maximum Envelope

Note: Refer to individual dimension diagrams for detailed dimensions and specifications of the following models.



Model	MOTOMAN-GP12	
Type	YR-1-06VXH12-A00	
Controlled Axis	6 (vertically articulated)	
Payload	Wrist	12 kg
	U-arm*1	10 kg
Maximum Reach	1440 mm	
Repeatability*2	0.02 mm	
Range of Motion	S-axis (turning)	-170° - +170°
	L-axis (lower arm)	-90° - +155°
	U-axis (upper arm)*3	-85° - +150°
	R-axis (wrist roll)	-200° - +200°
	B-axis (wrist pitch/yaw)	-150° - +150°
	T-axis (wrist twist)	-455° - +455°
Maximum Speed	S-axis (turning)	4.53 rad/s, 260°/s
	L-axis (lower arm)	4.01 rad/s, 230°/s
	U-axis (upper arm)	4.53 rad/s, 260°/s
	R-axis (wrist roll)	8.20 rad/s, 470°/s
	B-axis (wrist pitch/yaw)	8.20 rad/s, 470°/s
	T-axis (wrist twist)	12.2 rad/s, 700°/s
Allowable Moment	R-axis (wrist roll)	22 N·m
	B-axis (wrist pitch/yaw)	22 N·m
	T-axis (wrist twist)	9.8 N·m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.65 kg·m ²
	B-axis (wrist pitch/yaw)	0.65 kg·m ²
	T-axis (wrist twist)	0.17 kg·m ²
Approx. Mass	150 kg	
IEC Protection Class	Body: IP54, Wrist: IP67	
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4	1.5 kVA	
Mounting*5	Floor, ceiling, wall, tilt	
Compatible Controller	YRC1000, YRC1000micro	
Optional Specification*6	Drip-proof (Body: IP65, Wrist: IP67)/ Food-grade grease	

*1: U arm payload capacity will vary according to payload carried by wrist.
 *2: Conforms to ISO 9283.
 *3: The range of motion of the U-axis itself. Not with respect to the ground.
 *4: Varies in accordance with applications and motion patterns.

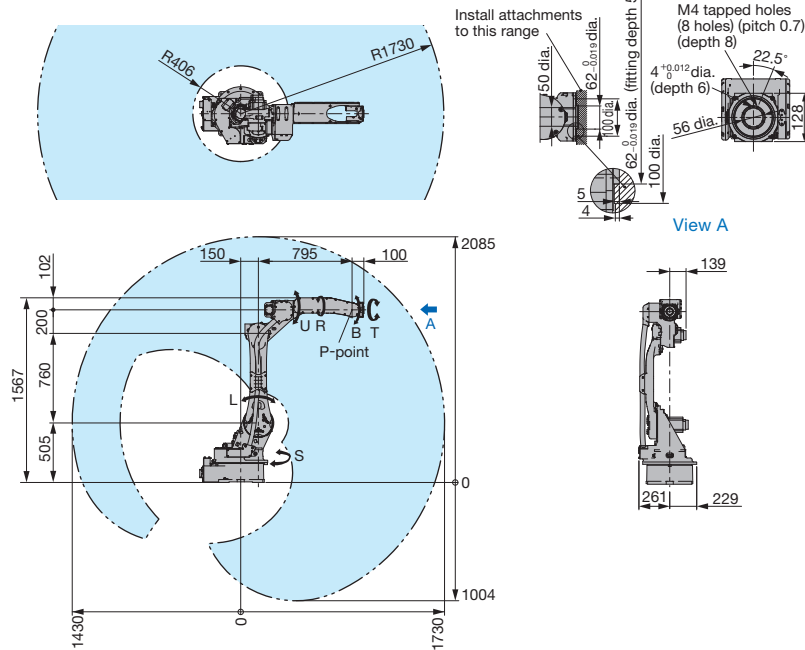
*5: There are motion limitations on S-axis for wall, tilt mounting type.
 *6: Contact your Yaskawa representative about delivery dates.
 Note: SI units are used for the specifications.

GP25



■ Dimensions Units: mm □: P-point Maximum Envelope

Note: Refer to individual dimension diagrams for detailed dimensions and specifications of the following models.

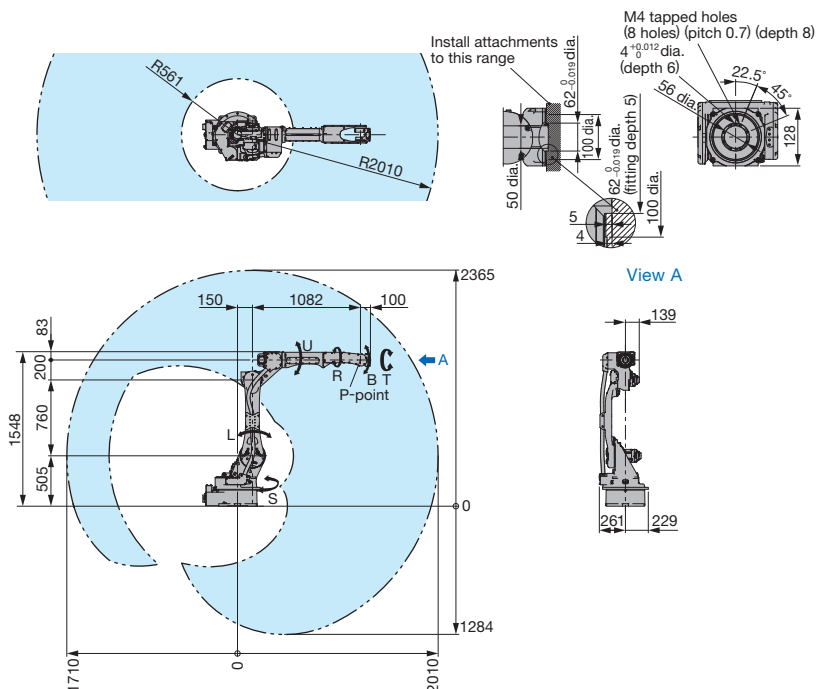


Model	MOTOMAN-GP25	
Type	YR-1-06VXH25-A00	
Controlled Axis	6 (vertically articulated)	
Payload	Wrist	25 kg
	U -arm*1	12 kg
Maximum Reach	1730 mm	
Repeatability*2	0.02 mm	
Range of Motion	S -axis (turning)	- 180° - +180°
	L -axis (lower arm)	- 105° - +155°
	U -axis (upper arm)*3	- 86° - +160°
	R -axis (wrist roll)	- 200° - +200°
	B -axis (wrist pitch/yaw)	- 150° - +150°
	T -axis (wrist twist)	- 455° - +455°
Maximum Speed	S -axis (turning)	3.67 rad/s, 210°/s
	L -axis (lower arm)	3.67 rad/s, 210°/s
	U -axis (upper arm)	4.63 rad/s, 265°/s
	R -axis (wrist roll)	7.33 rad/s, 420°/s
	B -axis (wrist pitch/yaw)	7.33 rad/s, 420°/s
	T -axis (wrist twist)	15.44 rad/s, 885°/s
Allowable Moment	R -axis (wrist roll)	52 N·m
	B -axis (wrist pitch/yaw)	52 N·m
	T -axis (wrist twist)	32 N·m
Allowable Inertia (GD ² /4)	R -axis (wrist roll)	2.3 kg·m ²
	B -axis (wrist pitch/yaw)	2.3 kg·m ²
	T -axis (wrist twist)	1.2 kg·m ²
Approx. Mass	250 kg	
IEC Protection Class	Body: IP54, Wrist: IP67	
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4	2.0 kVA	
Mounting*5	Floor, ceiling, wall, tilt	
Compatible Controller	YRC1000	
Optional Specification*6	Drip-proof (Body: IP65, Wrist: IP67)/Food-grade grease/ Form cutting	

*1: U arm payload capacity will vary according to payload carried by wrist.
 *2: Conforms to ISO 9283.
 *3: The range of motion of the U-axis itself. Not with respect to the ground.
 *4: Varies in accordance with applications and motion patterns.

*5: There are motion limitations on S-axis for wall, tilt mounting type.
 *6: Contact your Yaskawa representative about delivery dates.
 Note: SI units are used for the specifications.

GP25-12



Model		MOTOMAN-GP25-12
Type		YR-1-06VXH25-A10
Controlled Axis		6 (vertically articulated)
Payload	Wrist	12 kg
	U -arm*1	9 kg
Maximum Reach		2010 mm
Repeatability*2		0.03 mm
Range of Motion	S -axis (turning)	- 180° - +180°
	L -axis (lower arm)	- 105° - +155°
	U -axis (upper arm)*3	- 86° - +160°
	R -axis (wrist roll)	- 200° - +200°
	B -axis (wrist pitch/yaw)	- 150° - +150°
	T -axis (wrist twist)	- 455° - +455°
Maximum Speed	S -axis (turning)	3.67 rad/s, 210°/s
	L -axis (lower arm)	3.67 rad/s, 210°/s
	U -axis (upper arm)	3.84 rad/s, 220°/s
	R -axis (wrist roll)	7.59 rad/s, 435°/s
	B -axis (wrist pitch/yaw)	7.59 rad/s, 435°/s
	T -axis (wrist twist)	12.2 rad/s, 700°/s
Allowable Moment	R -axis (wrist roll)	22 N·m
	B -axis (wrist pitch/yaw)	22 N·m
	T -axis (wrist twist)	9.8 N·m
Allowable Inertia (GD ² /4)	R -axis (wrist roll)	0.65 kg·m ²
	B -axis (wrist pitch/yaw)	0.65 kg·m ²
	T -axis (wrist twist)	0.17 kg·m ²
Approx. Mass		260 kg
IEC Protection Class		Body: IP54, Wrist: IP67
Ambient Conditions	Temperature	0 °C to +45 °C
	Humidity	20% to 80%RH (non-condensing)
	Vibration	4.9 m/s ² (0.5 G) or less
	Altitude	1000 m or less
Power Requirements*4		2.0 kVA
Mounting*5		Floor, ceiling, wall, tilt
Compatible Controller		YRC1000
Optional Specification*6		Drip-proof (Body: IP65, Wrist: IP67)

*1: U arm payload capacity will vary according to payload carried by wrist.
 *2: Conforms to ISO 9283.
 *3: The range of motion of the U-axis itself. Not with respect to the ground.
 *4: Varies in accordance with applications and motion patterns.

*5: There are motion limitations on S-axis for wall, tilt mounting type.
 *6: Contact your Yaskawa representative about delivery dates.
 Note: SI units are used for the specifications.

YRC1000 Robot Controller



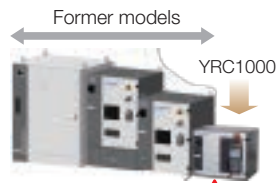
YRC1000 Robot Controller



Make equipment compact

Smallest size in the world reduces installation space

This 125 L compact size controller does not require a transformer and has built-in external axis amplifiers for three axes.



Realized this size by building in three external axes and eliminating the need for a transformer.



Standardization of equipment

Global standardization (Universal size)

- Common size for use in Japan and overseas.
- Overseas models do not require a transformer to adapt to the required power supply voltage.



Improve work efficiency

New motion control (high precision and high speed)

- Cycle time improved by max. 10% (compared with the former model) due to optimized acceleration/deceleration control (depends on conditions).
- Significantly reduces error in path accuracy caused by differences in motion speed (improved by 80% compared with the former model).

Lighter programming pendant with better operability

- Weighs only 730 g, the lightest programming pendant in its class, with improved cable installation.
- Can confirm robot positions and postures on the 3D robot model display.
- Touch screen allows intuitive operation to easily move the cursor and scroll.

■ YRC1000 Robot Controller Specifications **Supported models** MOTOMAN-GP4, -GP7, -GP8, -GP12, -GP25, -GP25-12

Items	Specifications
Configuration	Dust proof structure IP54 (area of backside duct fan: IP2X)
Dimensions	598 (W)×427 (D)×490 (H) mm. 125 L
Approx. Mass	70 kg max. (External axis amplifiers for up to three axes can be built in.)
Cooling System	Indirect cooling
Ambient Temperature	During operation: 0°C to +45°C, During storage: -10°C to +60°C
Relative Humidity	90% max. (non-condensing)
Altitude	2000 m (with temperature derating) Derating condition of over 1000 m: max. ambient temperature decreases 1% per 100 m.
Power Supply	Japan: three-phase 200 VAC to 240 VAC (+10% to -15%), 50/60 Hz (±2%) Asia and Europe: three-phase 380 VAC to 440 VAC (+10% to -15%), 50/60 Hz (±2%) (neutral grounding) North America: three-phase 380 VAC to 480 VAC (+10% to -15%), 50/60 Hz (±2%) (neutral grounding)
Grounding	Grounding resistance: 100 Ω or less for 200-V class, 10 Ω or less for 400-V class
Digital I/Os	Specialized signals: 19 inputs and 6 outputs General signals: 40 inputs and 40 outputs (32 transistor outputs, 8 relay outputs)
Positioning System	Serial communications (absolute encoder)
Programming Capacity	JOB: 200,000 steps, 10,000 instructions CIO ladder: 20,000 steps max.
Expansion Slots	PCI express: 2 slots
LAN (Connection to Host)	2 (10BASE-T/100BASE-TX)
Interface	RS-232C: 1ch
Control Method	Software servo control
Drive Units	SERVOPACK for AC servomotors

■ Programming Pendant Specifications

Items	Specifications
Dimensions	152 (W)×49.5 (D)×300 (H) mm
Approx. Mass	0.730 kg
Material	Reinforced plastics
Operation Device	Select keys, axis keys, numerical/application keys, mode selector switch with keys (mode: teach, play, and remote), emergency stop button, enable switch, compact flash card interface device (compact flash is optional.), USB port (USB 2.0, 1 port)
Display	5.7-inch TFT color LCD, touch panel VGA 640×480 pixels (alphanumeric characters, Chinese characters, Japanese letters, and others)
IEC Protection Class	IP54
Cable Length	Standard: 8 m, max.: 36 m (with optional extension cable)

Note: The controller features and specifications on this page are for the manipulators described in this catalog.

YRC1000micro Robot Controller



YRC1000micro Robot Controller



Make equipment compact

Compact and lightweight controller

- Compact size of 15 L*
- Weighs only 10.5 kg (9.5 kg less than the former model)*
- Can be installed inside a 19-inch rack, inside equipment or conveyors

*: For Japan, Asia, and North America model specifications



Standardization of equipment

Easy connections to peripheral devices

- Can be easily connected with Yaskawa's external devices, such as machine controllers (MP series), PLCs, sensors, and HMIs.



Improve work efficiency

New motion control (high precision and high speed)

- Cycle time improved by max. 10% (compared with the former model) due to optimized acceleration/deceleration control (depends on conditions).
- Significantly reduces error in path accuracy caused by differences in motion speed (improved by 80% compared with the former model).



Make equipment compact

Enhanced safety function (optional)

- Compatible with Functional Safety which monitors motion range and speed limitations.

■ YRC1000micro Robot Controller Specifications

Supported models

MOTOMAN-GP4, -GP7, -GP8, -GP12

Items	Japan, Asia, and North America Model Specifications	Europe Model Specifications
Configuration	Open structure IP20	
Dimensions	425 (W)×280 (D)×125 (H) mm, 15 L	425 (W)×280 (D)×180 (H) mm, 22 L
Approx. Mass	10.5 kg (External axis amplifiers for up to two axes can be built in.)	16.0 kg (External axis amplifiers for up to two axes can be built in.)
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)	
Altitude	2000 m (with temperature derating) Derating condition of over 1000 m: max. ambient temperature decreases 1% per 100 m.	
Power Supply	Single-phase 200/230 VAC (+10% to -15%), 50/60 Hz (±2%)* Three-phase 200/220 VAC (+10% to -15%), 50/60 Hz (±2%)	
Grounding	Grounding resistance : 100 Ω or less	
Digital I/Os	Specialized signals: 7 inputs and 1 output General signals: 8 inputs and 8 outputs (8 transistor outputs)	
Positioning System	Serial communications (absolute encoder)	
Programming Capacity	JOB: 200,000 steps, 10,000 instructions CIO ladder: 1,500 steps max.	
Expansion Slots	PCI express: 2 slots	
LAN (Connection to Host)	1 (10BASE-T/100BASE-TX)	
Interface	Not possible	
Control Method	Software servo control	
Drive Units	SERVOPACK for AC servomotors	

*: MOTOMAN-GP12 only supports three-phase power supply

■ Programming Pendant Specifications (optional)*

Items	Specifications
Dimensions	152 (W)×49.5 (D)×300 (H) mm
Approx. Mass	0.730 kg
Material	Reinforced plastics
Operation Device	Select keys, axis keys, numerical/application keys, mode selector switch with keys (mode: teach, play, and remote), emergency stop button, enable switch, compact flash card interface device (compact flash is optional.), USB port (USB 2.0, 1 port)
Display	5.7-inch TFT color LCD, touch panel VGA 640×480 pixels (alphanumeric characters, Chinese characters, Japanese letters, and others)
IEC Protection Class	IP54
Cable Length	Standard: 8 m, max.: 20 m (with optional extension cable)

*: A programming pendant or a dummy connector is required with this controller. (Sold separately.)

· Programming pendant

The programming pendant for this controller is required. Different types of programming pendants cannot be connected to this controller because of differences in their specifications.

· Dummy connector

The dummy connector must be inserted when the programming pendant is not connected or when a software pendant is used.

Note: The controller features and specifications on this page are for the manipulators described in this catalog.

Extensive Optional Software Lineup

3D Vision Package

MotoSight3D

Bin picking, which used to be impossible with robots, can be automated with the high-performance 3D vision package.

Range of detectable workpieces have increased

Works exceptionally well with metal workpieces

- »»» ○ Greasy parts with high reflection of light can be handled.
- Parts with curved surface or with complicated structure can be handled. ➔ Optimal for pressed parts for automobile.
- Target parts size (approx.)
10×10 mm (when using RV300) to 1,000×1,000 mm (when using RV1100)

Highly accurate detection capability

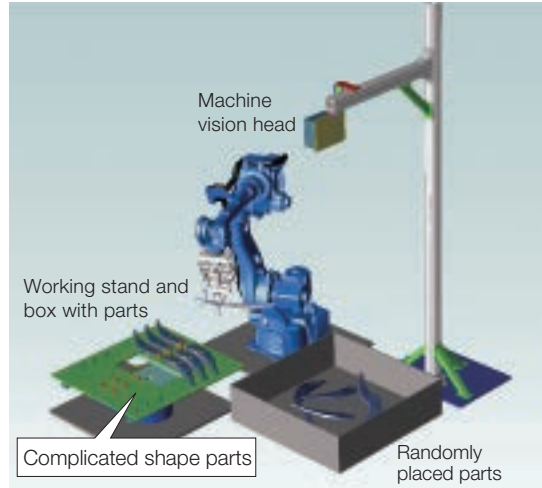
Reduces the number of processes

- »»» ○ 3D position posture (6 degree-of-freedom) can be detected with one measurement.
- Temporary placing table or other positioning sensors are not needed.

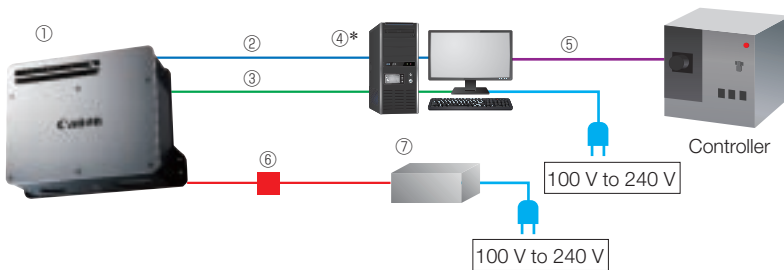
Very simple setting operation

Reduces setup time

- »»» ○ Workpiece can be registered by inputting the CAD data and imaging the piled parts.



System Configuration



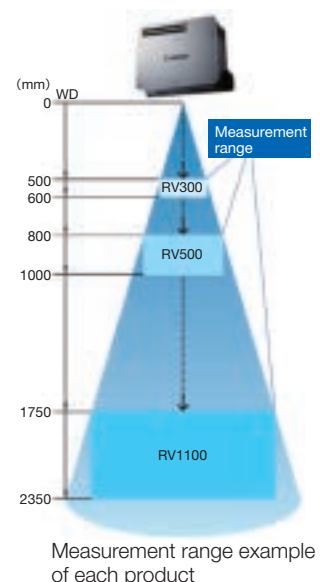
*: Contact your Yaskawa representative for information on how to select a PC when using a general PC or other PCs.

Device Composition Table

NO.	Name	Specification
①	Machine Vision Head	Select from RV1100/ RV500/RV300
②	Communications Cable (PC - sensor)	Cable length: 16 m (optional: 36 m)
③	Vision Cable (PC - sensor)	Cable length: 16 m (optional: 36 m)
④*	PC (optional)	Industrial PC
⑤	Communications Cable (PC - Controller)	Cable length: 10 m
⑥	Power Cable (thin)	Cable length: 5 m
	Power Cable (thick)	Cable length: 10 m
⑦	Power Source Box and Cable	—

Machine Vision Head Specifications

Items		RV1100	RV500	RV300
Measurement	Measurement distance	1750 mm to 2350 mm	800 mm to 1000 mm	500 mm to 600 mm
	Measurement range	1160 mm × 1160 mm × 600 (H) mm	540 mm × 540 mm × 200 (H) mm	340 mm × 340 mm × 100 (H) mm
	Target minimum workpiece size Note: Necessary projection area	45 mm × 45 mm	20 mm × 20 mm	10 mm × 10 mm
Time	Measurement + recognition time	2.5 s	1.8 s	1.8 s
	Measurement cycle	5.0 s	3.0 s	3.0 s
Recognition	Recognition method	3D CAD matching		
	Repeatability	±0.5 mm	±0.15 mm	±0.1 mm
	Number of types to be registered	200 types		
Function (standard)	Empty pallet judgment function	Function to judge whether the pallet is empty or not		
	Pallet measurement function	Function to measure the position of thrown-in pallet		
	Interference check function	Function to detect interference between the hand and the workpiece or between the hand and the pallet		
	Calibration function	Function to perform the calibration of the robot and the machine vision head		
	Exposure time automatic adjustment function	Function that eliminates gloss of industry components/parts, and halation due to oil adhesion		
Main Unit	Dimensions (Protrusions are not included)	252 (W) × 206 (D) × 124 (H) mm		
	Approx. Mass	6.4 kg		

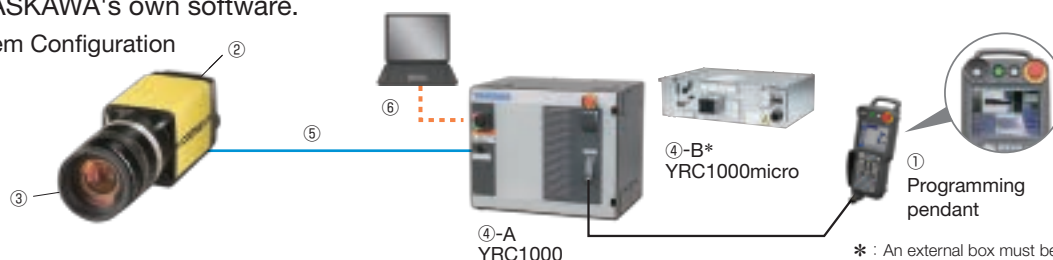


2D Vision Package

MotoSight2D

MotoSight2D is a vision package that enables the operation of vision systems using a programming pendant with YASKAWA's own software.

■ System Configuration



* : An external box must be installed for the controller.

■ Device Composition Table

NO.	Name	Specification
①	MotoSight2D (PP application + MotoPlus + macro job)	Settings installed prior to shipping
②	2D Vision Camera (built-in image processing device)	Select a standard, high-spec, or ultra-high-spec model.
③	Lens	Focal distance: 4 / 6 / 8 / 12 / 16 / 25 / 35 / 50 / 75 mm
④	A Customization of YRC1000 for MotoSight2D	With attached connector panel and built-in PoE hub, wiring of communications cable (Ethernet)
	B External Box for YRC1000micro for MotoSight2D	With built-in 24-V power supply and PoE hub, wiring of communications cable (Ethernet)
⑤	Camera Communications Cable	Connect the camera with the controller Cable length: 5 m (flexible/mobile cable) *Total cable length up to 35 m with an optional extension cable.
⑥	Cable for PC Connection	Connect the controller with the PC Cable length: 5 m *Use PC only during maintenance or detailed settings for camera jobs.

2D Vision camera line-up

Model	Application	Resolution	CPU Speed Ratio*	Image Processing Function
Standard Model MS8101	In-Sight 8101M-363-40 or equivalent Position correction (for automobile parts, electronic parts, etc.)	1280 × 1024 pixels	× 1.0	COGNEX Full tool set
High-spec Model MS8401	In-Sight 8401M-363-50 or equivalent High-speed processing, including conveyor synchronization (for high-speed picking of food, etc.)	1280 × 1024 pixels	× 4.0	COGNEX Full tool set
Ultra-high-spec Model MS8402	In-Sight 8402M-363-50 or equivalent High precision and wide field of view (for transfer of automobile glass parts, etc.)	1600 × 1200 pixels	× 4.0	COGNEX Full tool set

*: Refers to the ratio where the CPU speed of the standard model is "1.0".

6-axis Force Sensing Control Function

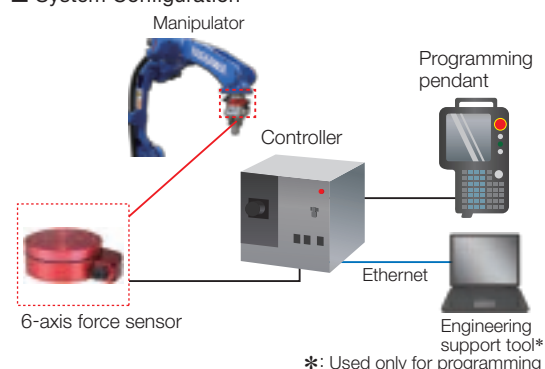
MotoFit

Changes in force that robot is subjected to are detected by 6-axis force sensor and fed back to robot movements.

■ Force Sensor Specifications

Force Sensor Type		200 N/20 N·m	1000 N/30 N·m
Rated Load	Fx, Fy, Fz	200 N	1000 N
	Mx, My, Mz	20 N·m	30 N·m
Maximum Static Load	Fx, Fy, Fz	800 N	5000 N
	Mx, My, Mz	80 N·m	50 N·m
Linearity		± 3%FS	
Hysteresis		± 3%FS	
Cross-axis Sensitivity		± 5%FS	
Protection Rating		IP65	
Ambient Conditions	Temperature	0 °C to +40 °C	
	Humidity	20% to 80%RH (non-condensing)	
Dimensions		90 dia. × 32.5 (H) mm	90 dia. × 40 (H) mm
Mass		560 g	580 g

■ System Configuration



*: Used only for programming

MOTOMAN-GP Series

Small Models (max. payload 25 kg)

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