



YASKAWA

YASKAWA INDUSTRIAL ROBOT MOTOMAN-HP SERIES

FOR MATERIAL HANDLING/ASSEMBLING/CUTTING

VERTICALLY ARTICULATED ROBOT



Slim
Manipulator
with High
Payload



High-performance
NX100
Controller



6.5-inch
Color
LCD

*The HP Series, the Evolution
of Technology*

Certified for
ISO9001 and
ISO14001



JAB
QMS Accreditation
R009



JQA-0813



JQA-EM0924

High Efficiency

MOTOMAN-HP series with a full lineup for improved system efficiency

You can choose the ideal robot from small to large in the MOTOMAN-HP series with improved levels of speed, accuracy, and reliability.

With a high-performance NX100 controller and a 6.5-inch color LCD on the programming pendant for improving operability, you can select the perfect fit for your robotic system with the MOTOMAN-HP series.

For Optimum Systems

MOTOMAN-HP Series

Manipulators seeking excellence

Highest motion performance in its class

The MOTOMAN-HP series has a faster axis speed than conventional models.

This achievement, combined with a lightweight body and the NX100 controller with the high-accuracy path control and the vibration-suppression control, reduces residual vibration when starting up and stopping, resulting in shortened cycle times for common handling patterns.

The improved allowable motion and inertia enables the HP165 to be used for spot welding and handling large workpieces in a wider variety of applications.

Greater range of motion

Manipulators in the HP series offer you greater flexibility in system design with the longest stroke and the maximum and the minimum reach in each class.

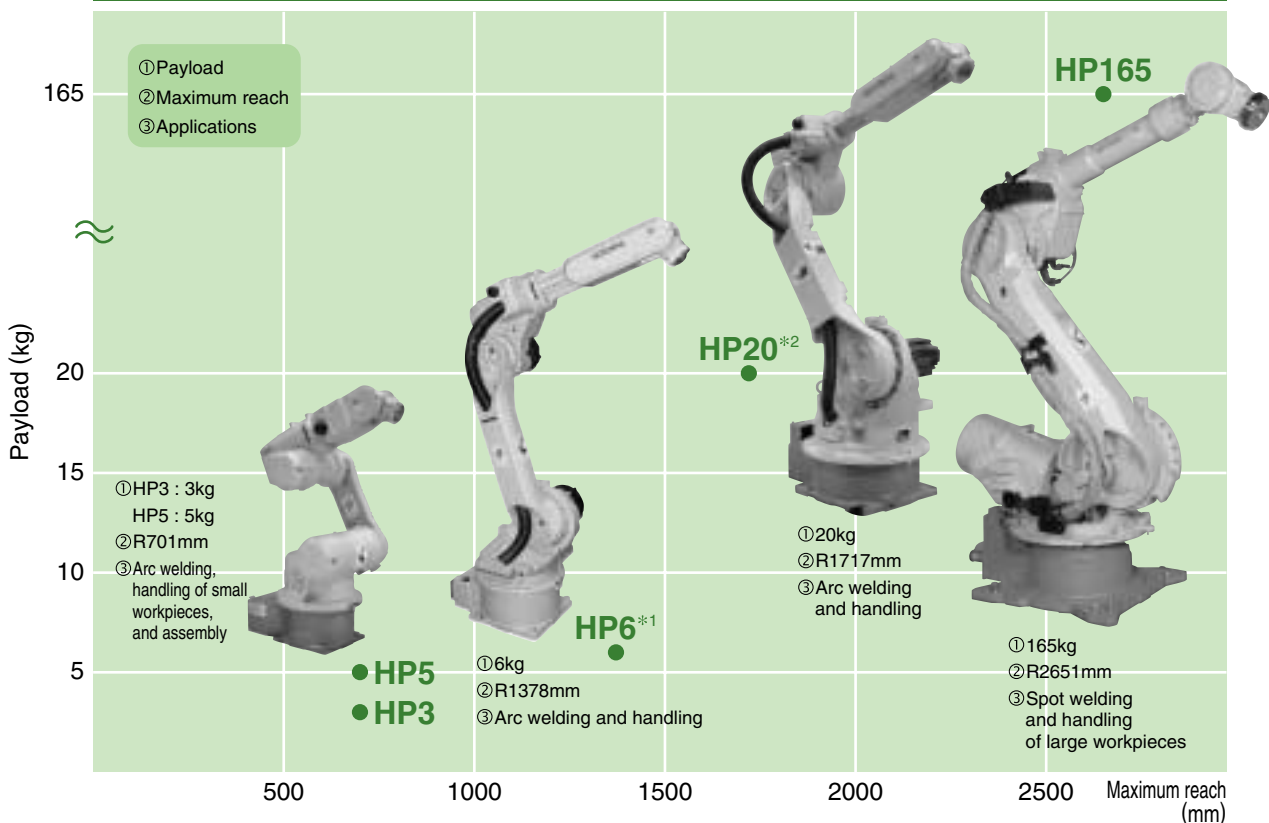
With an expanded range of motion in the rear side, HP3, HP5, HP6, and HP20 can handle a greater variety of applications and allow efficient installation of jigs such as wire cutters as well.

Enhanced water and dust resistance

The HP series has an IP67-rated waterproof and dustproof cover*1 for the wrist. This feature enables handling in adverse environments.

*1: The MOTOMAN-HP20 and -HP165 are standard.
The MOTOMAN-HP3 and -HP6 are available as an option.

Representative models in the MOTOMAN-HP series



*1: Short-arm and wall-mounted types are available.

*2: A 6-kg payload model with a R1915-mm maximum reach is also available.

For High-quality Systems

MOTOMAN-HP Series

Revolutionary controller NX100

Improved path accuracy and absolute-position accuracy

The lag time after a command is minimized with new algorithm for high-accuracy path control, which is one of the features of Yaskawa's unique Advanced Robot Motion (ARM) control. This results in an improvement of up to 50%*2 for the path accuracy of the robots.

The deflection compensation function (optional) increases the absolute-position accuracy by 2 to 5 times*2. This feature improves quality and reduces faulty operations related to the absolute positioning accuracy for all applications.

Coordinated control with 36 axes

The NX100 can control four manipulators (36 axes). This feature enables easy construction of a system for "Jigless Coordinated Motion (up to 4 manipulators)" and helps save space and reduce equipment cost.

The NX100 also helps reduce cycle time with a double processing speed*2.

*2: Compared to conventional models.

For User-friendly Systems

MOTOMAN-HP Series

Programming pendant filled with functions

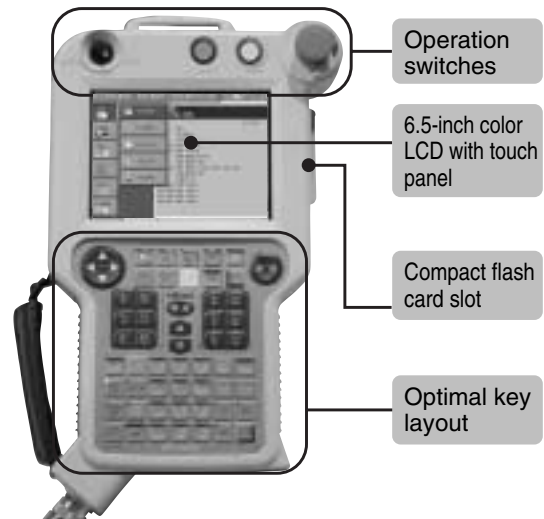
Color display & touch panel

The programming panel required for teaching and maintenance has a 6.5-inch color LCD with a touch panel function of 640×480 pixels. Using icons, drawings, and operations similar to Windows, the operations are even easier than ever before. The on-screen Guidance Function allows you to confirm the program to operate the programming pendant.

Note: Windows is a registered trademark of Microsoft Corporation, U.S.A.

Enhanced ladder editing and monitoring function (Optional)

The programming pendant enables a remarkably increased debugging efficiency of I/O signals in setting up the system on site, allowing you to edit a ladder diagram on the screen. With an increased memory capacity of 10,000 steps, no external PLC is required. For arc welding, you can check the voltage and current during welding with the arc monitoring function.

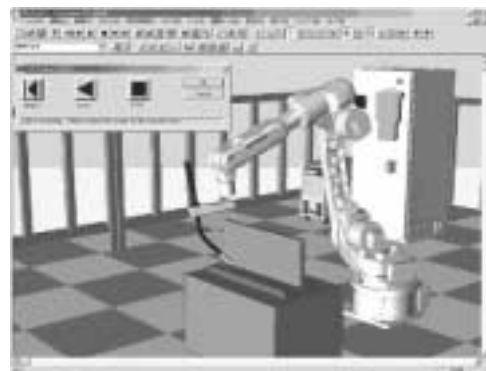


Easy pre-examination

For cell simulation, an easy pre-examination is available on your PC by optional high-speed 3D graphics MotoSim EG*3. It also supports ROBCAD and IGRIP for the line simulation.

*3: MOTOMAN Simulation Enhanced Graphics

Note: ROBCAD is a registered trademark of UGS Corp.
IGRIP is a registered trademark of DELMIA Corp.



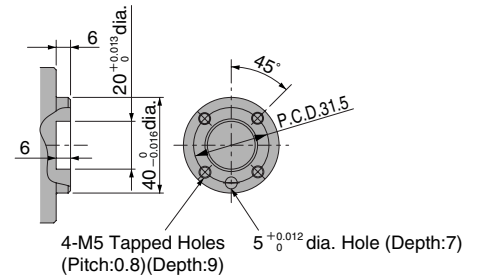
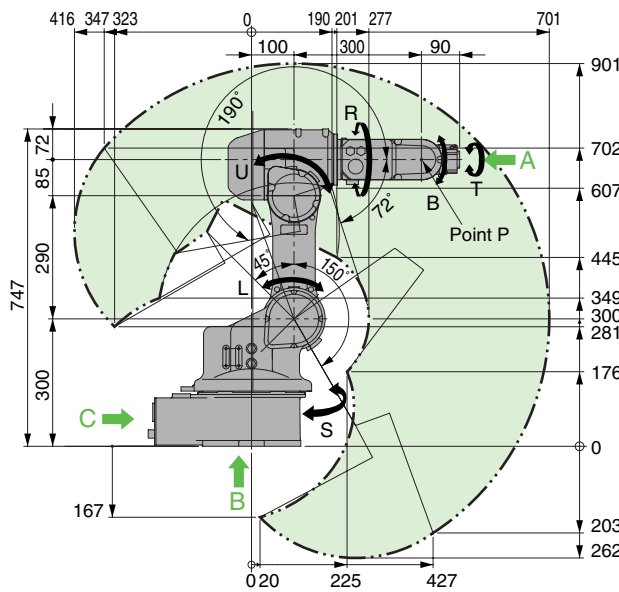
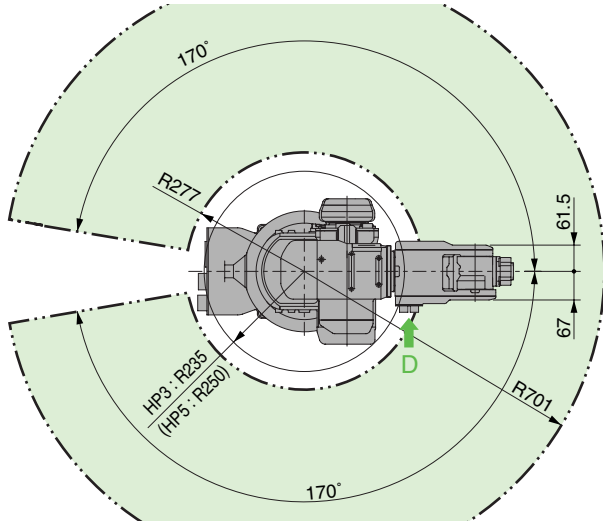
Operation Screen



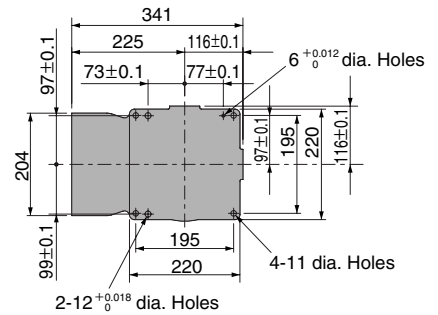
MOTOMAN-HP3/-HP5

3 kg / 5 kg payload, R701 mm maximum reach

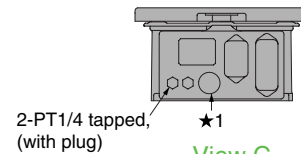
■ Dimensions Units : mm : P-point Maximum Envelope



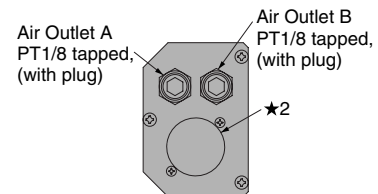
View A



View B



View C



View D

	Connector Type	Plug Type (Prepared by user)
★1	JL05-2A20-29PC	JL05-6A20-29S
★2	JL05-2A20-29SC	JL05-6A20-29P

■ Manipulator Specifications

Model	MOTOMAN-HP3	MOTOMAN-HP5
Type	YR-HP3-A00	YR-HP5-A00
Controlled Axis	6 (Vertically articulated)	
Payload	3 kg	5 kg
Repeatability*1	±0.03 mm	
Range of Motion	S-axis (turning)	±170°
	L-axis (lower arm)	+150° ~ -45°
	U-axis (upper arm)	+210° ~ -152°
	R-axis (wrist roll)	±190°
	B-axis (wrist pitch/yaw)	±125°
	T-axis (wrist twist)	±360°
Maximum Speed	S-axis (turning)	3.66 rad/s, 210°/s 4.36 rad/s, 250°/s
	L-axis (lower arm)	3.14 rad/s, 180°/s
	U-axis (upper arm)	3.93 rad/s, 225°/s
	R-axis (wrist roll)	6.54 rad/s, 375°/s
	B-axis (wrist pitch/yaw)	6.54 rad/s, 375°/s
	T-axis (wrist twist)	8.73 rad/s, 500°/s

Model	MOTOMAN-HP3	MOTOMAN-HP5
Allowable Moment	R-axis (wrist roll)	7.25 N · m
	B-axis (wrist pitch/yaw)	7.25 N · m
	T-axis (wrist twist)	5.21 N · m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.30 kg · m ²
	B-axis (wrist pitch/yaw)	0.30 kg · m ²
	T-axis (wrist twist)	0.1 kg · m ²
Mass	45 kg	47 kg
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	Less than 4.9m/s ²
	Others	<ul style="list-style-type: none"> Free from corrosive gasses or liquids, or explosive gasses Clean and dry Free from excessive electrical noise (plasma)
Power Requirements*2	1 kVA	

*1: Conforms to JIS B 8432.

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

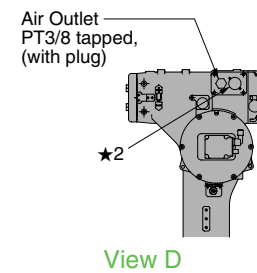
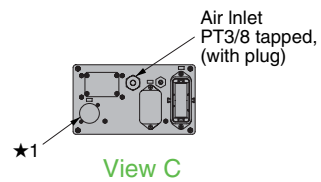
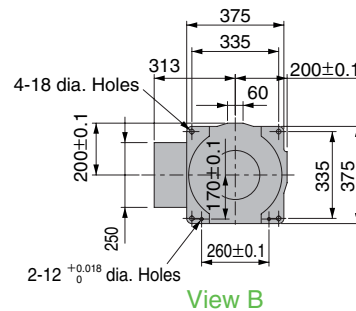
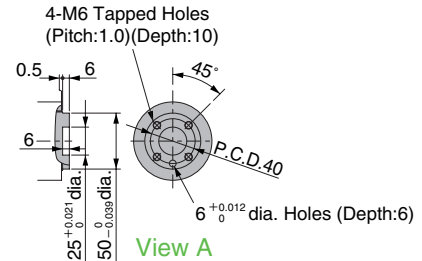
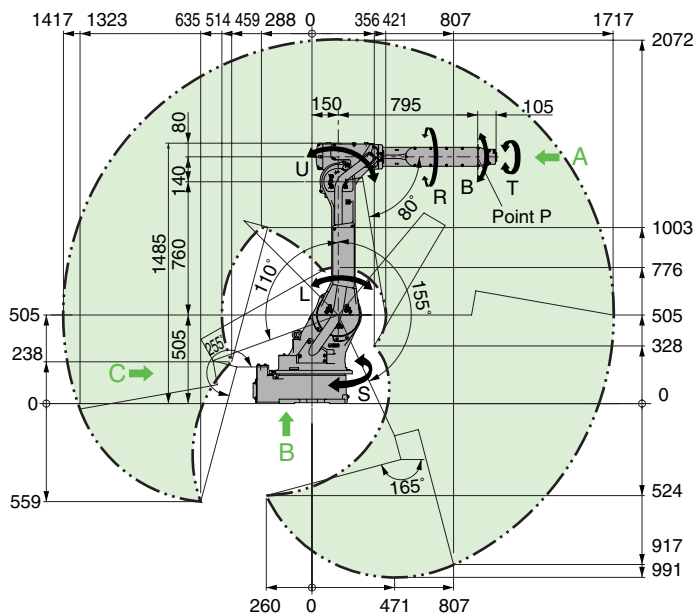
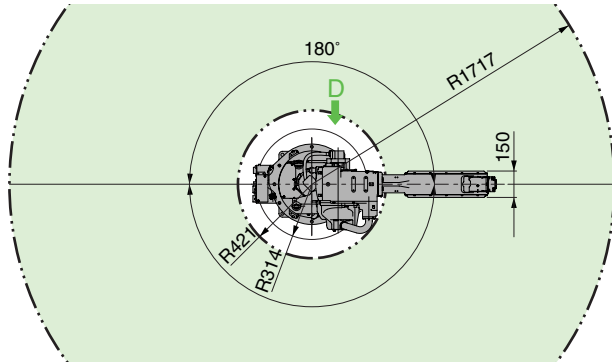
Note: SI units are used for specifications.

MOTOMAN-HP20

20 kg payload, R1717 mm maximum reach



Dimensions Units : mm : P-point Maximum Envelope



	Connector Type	Plug Type (Prepared by user)
★1	JL05-2A20-29PC	JL05-6A20-29S
★2	JL05-2A20-29SC	JL05-6A20-29P

Manipulator Specifications

Model		MOTOMAN-HP20
Type		YR-HP20-A00
Controlled Axis		6 (Vertically articulated)
Payload		20 kg
Repeatability*1		± 0.06 mm
Range of Motion	S-axis (turning)	±180°
	L-axis (lower arm)	+155° to -110°
	U-axis (upper arm)	+255° to -165°
	R-axis (wrist roll)	± 200°
	B-axis (wrist pitch/yaw)	+230° to -50°
Maximum Speed	T-axis (wrist twist)	± 360°
	S-axis (turning)	2.96 rad/s, 170°/s
	L-axis (lower arm)	2.96 rad/s, 170°/s
	U-axis (upper arm)	3.05 rad/s, 175°/s
	R-axis (wrist roll)	6.20 rad/s, 355°/s
	B-axis (wrist pitch/yaw)	6.02 rad/s, 345°/s
	T-axis (wrist twist)	9.16 rad/s, 525°/s

Allowable Moment	R-axis (wrist roll)	39.2 N · m
	B-axis (wrist pitch/yaw)	39.2 N · m
	T-axis (wrist twist)	19.6 N · m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	0.9 kg · m ²
	B-axis (wrist pitch/yaw)	0.9 kg · m ²
	T-axis (wrist twist)	0.25 kg · m ²
Mass		280 kg
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	Less than 4.9m/s ²
	Others	<ul style="list-style-type: none"> Free from corrosive gasses or liquids, or explosive gasses Clean and dry Free from excessive electrical noise (plasma)
Power Requirements*2		2.8 kVA

*1: Conforms to JIS B 8432.

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

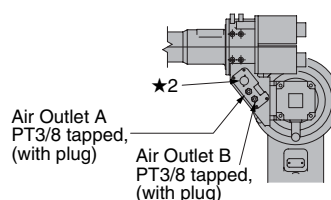
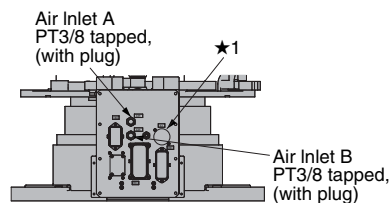
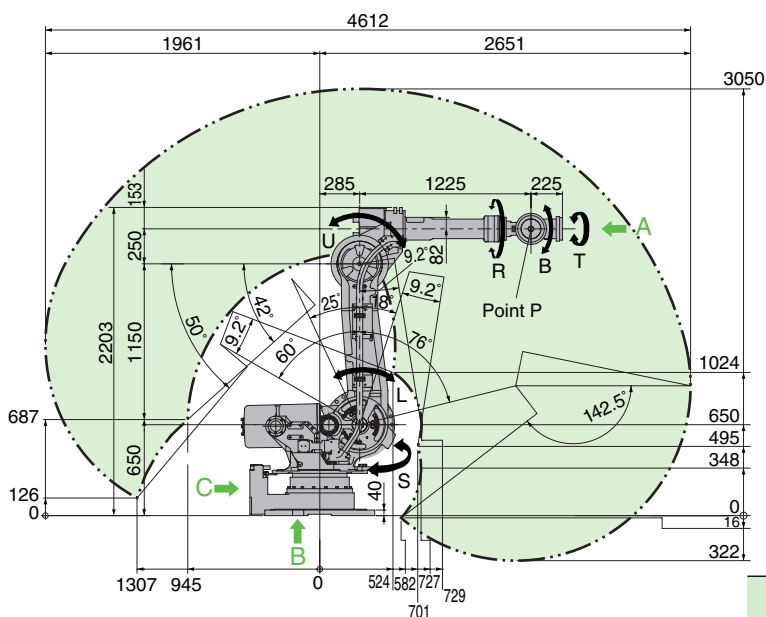
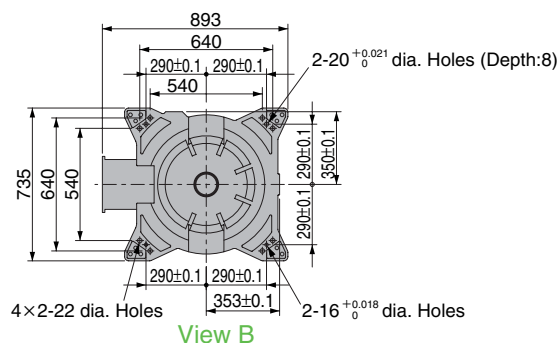
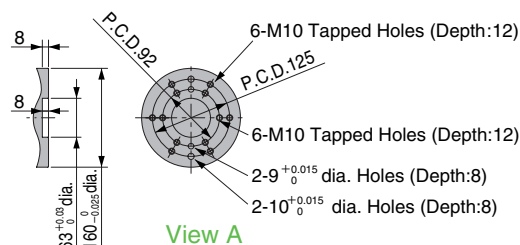
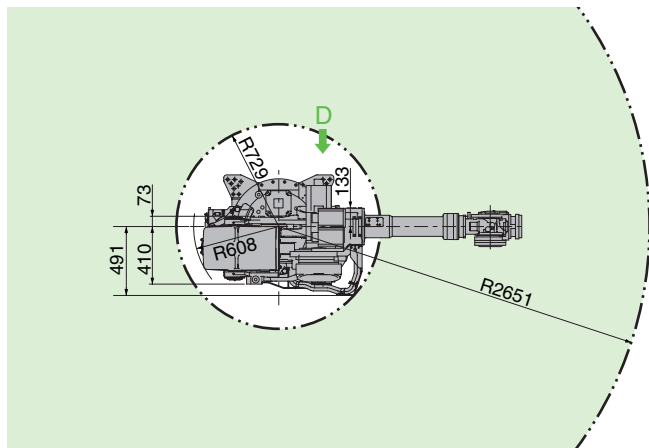
Note: SI units are used for specifications.



MOTOMAN-HP165

165 kg payload, R2651 mm maximum reach

■ Dimensions Units : mm : P-point Maximum Envelope



	Connector Type	Plug Type (Prepared by user)
★1	JL05-2A24-28PC	JL05-6A24-28S
★2	JL05-2A24-28SC	JL05-6A24-28P

■ Manipulator Specifications

Model	MOTOMAN-HP165	
Type	YR-HP165-A00	
Controlled Axis	6 (Vertically articulated)	
Payload	165 kg	
Repeatability*1	±0.2 mm	
Range of Motion	S-axis (turning)	±180°
	L-axis (lower arm)	+76° to -60°
	U-axis (upper arm)	+230° to -142.5°
	R-axis (wrist roll)	±360°
	B-axis (wrist pitch/yaw)	±130°
Maximum Speed	T-axis (wrist twist)	±360°
	S-axis (turning)	1.92 rad/s, 110°/s
	L-axis (lower arm)	1.92 rad/s, 110°/s
	U-axis (upper arm)	1.92 rad/s, 110°/s
	R-axis (wrist roll)	3.05 rad/s, 175°/s
	B-axis (wrist pitch/yaw)	2.53 rad/s, 145°/s
	T-axis (wrist twist)	4.19 rad/s, 240°/s

Allowable Moment	R-axis (wrist roll)	921 N · m
	B-axis (wrist pitch/yaw)	921 N · m
	T-axis (wrist twist)	490 N · m
Allowable Inertia (GD ² /4)	R-axis (wrist roll)	85 kg · m ²
	B-axis (wrist pitch/yaw)	85 kg · m ²
	T-axis (wrist twist)	45 kg · m ²
Mass	1100 kg	
Ambient Conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	Less than 4.9m/s ²
	Others	<ul style="list-style-type: none"> Free from corrosive gasses or liquids, or explosive gasses Clean and dry Free from excessive electrical noise (plasma)
Power Requirements*2	7.5 kVA	

*1 : Conforms to JIS B 8432.

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

Note: SI units are used for specifications.

MOTOMAN-HP SERIES

■ NX100 Specifications

Items	Specifications
Configuration	Dust proof
Dimensions	*1 500(W)×500(D)×1200(H) mm (Possible to control 2 external axes.)
	*2 600(W)×550(D)×1200(H) mm (Possible to control 2 external axes.)
Mass	*1 100 kg max. (Possible to control 2 external axes.)
	*2 150 kg max. (Possible to control 2 external axes.)
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)
Power Supply	Three-phase 200/220 VAC (+10% to -15%), 60 Hz (Japan) Three-phase 200 VAC (+10% to -115%), 50 Hz (Japan)
Grounding	Grounding resistance : 100Ω or less
Digital I/Os	Specialized signals : 17 inputs and 3 outputs General signals : 40 inputs and 40 outputs Max.I/O (optional) : 1024 inputs and 1024 outputs
Positioning System	By serial encoder
Programming Capacity	JOB : 60,000 steps
	10,000 instructions CIO ladder : 10,000 steps max.
Expansion Slots	PCI: 2 slots for main CPUs and 1 slot for servo CPU
LAN (Connection to Host)	1 (10BaseT/100BaseTX)
Interface	RS-232C:1ch
Control Method	Software servo control
Drive Units	For robot axes: One drive unit for AC servo with 6 axes Time required for replacement: 5 minutes (One unit includes amplifiers for 6 axes)
	For external axes: Combined converter and amplifier per axis.(optional)
Painting Color	Munsell notation 5Y 7/1 (reference value)

*1 : For small size manipulator.

The MOTOMAN-HP3, HP5, HP6, and-HP20 are small size manipulators.

*2 : For large size manipulator.

The MOTOMAN-HP165 is a large size manipulator.

■ Programming Pendant Specifications

Items	Specifications
Dimensions	199(W)×338(H)×60(D) mm
Mass	1.32 kg
Material	Reinforced plastics
Operation Device	Select keys, axes keys, numerical/application keys, mode keys (mode: teach, play, and remote) emergency stop button, enable switch, compact flash card interface device (compact flash is optional.)
Display	6.5 -inch color LCD, touch panel 640×480 pixels (Alphanumeric characters, Chinese characters, Japanese letters,Others)
IEC Protection Class	IP65
Cable Length	Standard: 8 m, Max.: 36 m (optional)

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YASKAWA

YASKAWA ELECTRIC CORPORATION

In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

Specifications are subject to change without notice
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