YASKAWA

Multi-Purpose Robot
MOTOMAN-MH, HP, and UP Series

Multi-purpose

Certified for ISO9001 and ISO14001

JAB QMS Accreditation R009

JQA-0813

JQA-EM0924

The Highest Potential in the World!
A complete lineup to help build optimum facilities.

Save Space Energy

The slimmer structure, new features, and high performance enable you to downsize production facilities and save energy.

Hardware

Manipulator

Best Performance in its class

The highest speed in the world has been achieved by using high-speed, low-inertia AC servomotors and state-of-the-art control technology. A slimmer robot form has also been developed, while wrist allowable inertia has been increased.

Applicable in Severe Environments

The waterproof and dustproof structure (IP67 class level)*1 at the wrist part enables the robot to operate in environments subject to water drops and dust.

*1 : Available as an option for MH5S, MH5LS, MH6, and MH6S.

DX100 Controller

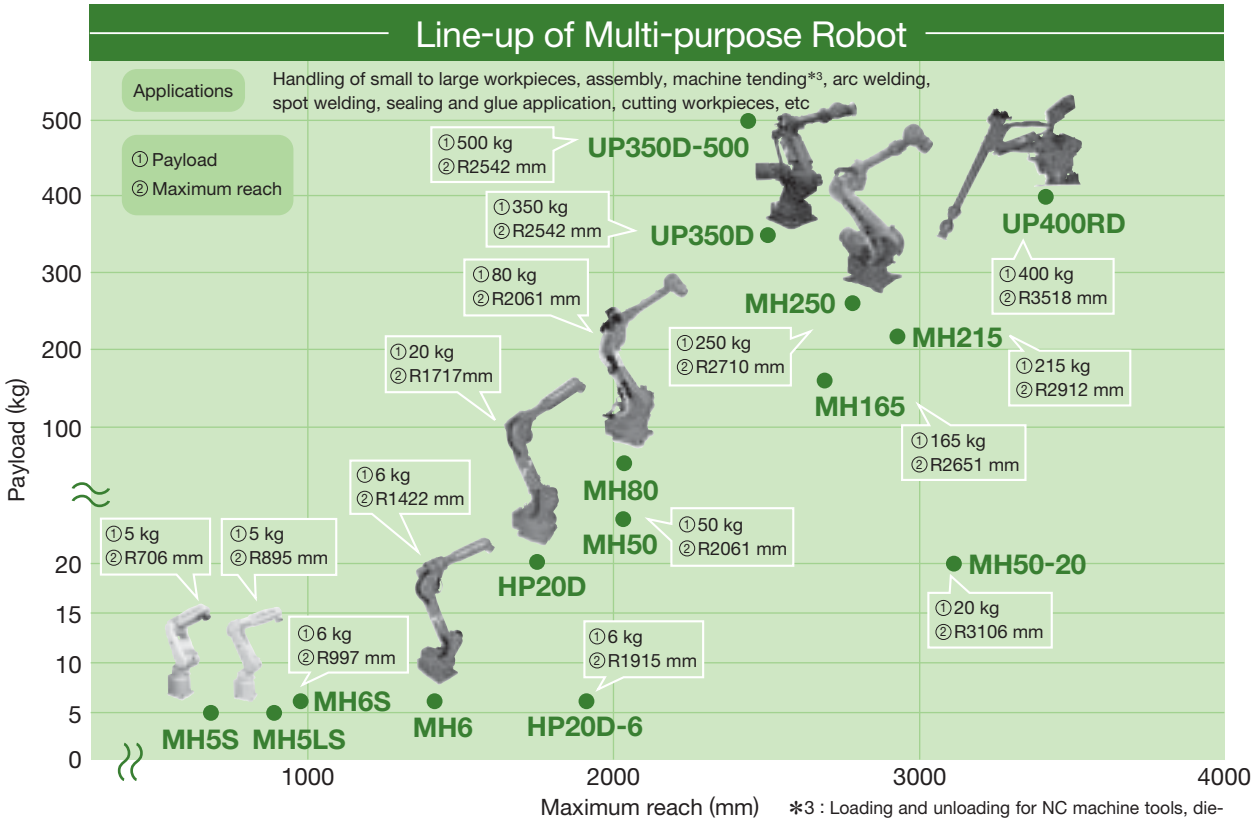
Installation space for the control panel is reduced by 42%.

Mass
100 kg max.

A slim design with a control panel width of only 425 mm reduces the installation space by up to 42%.*2 Up to 72 axes (8 robots) can be controlled by installing the additional BOX.

*2 : Compared to conventional large-sized controllers

Line-up of Multi-purpose Robot



*3 : Loading and unloading for NC machine tools, die-casting, bending, injection molding presses, etc.

Short processing

Increased freedom in operation or compact and slim design have made the new robots more optimized for specific applications. High-density installation has contributed customers production line to saving space. The facility which enables integrated process, rapid production and saving space is called "short processing".

New robot solutions → Short process → Customer advantages

- Slimmer design enables closer mounting.
- Smaller Controller saves space.
- Multiple Robot Controller prevents robots from collisions.
- Installation space reduced by safety function (restricting the range of Robot operation).

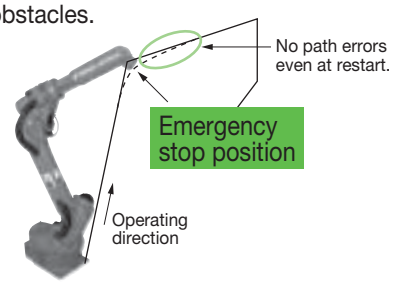
- Shorter production lines.
- Reduced number of processes.

- Highly efficient production.
- Better quality.
- Saving energy.

Software

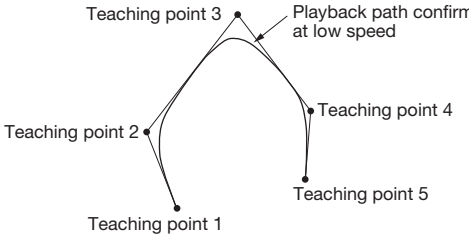
No Deviation from Track at Emergency Stop

The Robot stops on the taught path at emergency stop and will not deviate from the path when restarting, preventing interference of the Robot with nearby obstacles.



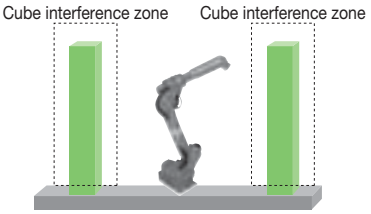
Playback path confirmation

The playback path mode during a test operation can be confirmed by a low speed test operation. This has mode the teaching operation with the optimum path in minimal time possible while verifying the existence of interference with workpieces or jigs.



Interference Checking Function*4 Optional

- Interference between the arms of densely installed Robots can be constantly monitored to automatically stop movement if a collision is likely to occur. (This prevents collisions between Robots caused by programming mistakes.) Constantly checks the interference between the robot arm and up to 16 defined cubes to prevent the robot to collide with workpieces or peripheral jigs. (See the figure at right for reference.)

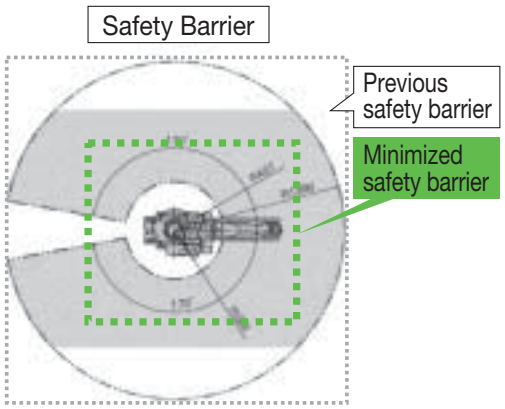


*4 : Contact the Yaskawa sales department about manipulator models that support this function.

Minimized Safety Barrier*5 Optional

The functional safety unit, which is configured with the redundant CPUs, minimizes the area within the safety barrier by restricting the robot's operating area.

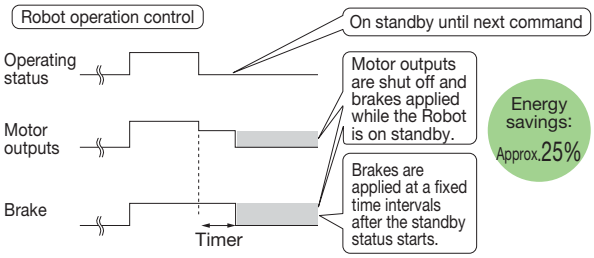
- Safety barrier can be limited to only a minimum area to downsize production facilities.
- Zone limit switches can be eliminated for Robots in setting process.



Saving Energy

- The servos are turned OFF automatically when the Robot is stopped for a long period of time. Reduced power consumption helps lower running costs.

〈Conditions〉
Twenty-four-hour operation in which the Robot is operating for 16 hours and on standby for 8 hours



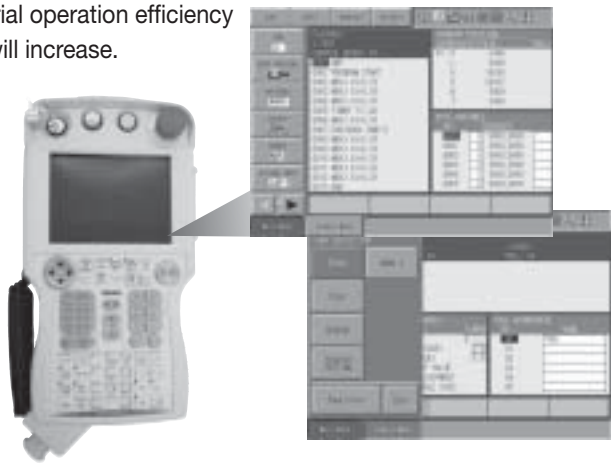
*5 : Contact the Yaskawa sales department about manipulator models that support this function.

Easy Operation Simulation

Operability of teaching and simulation have been improved to reduce time required for system startup.

Multi-window Display Function

Program operation can be checked while monitoring I/O or variables on the programming pendant so that teaching and trial operation efficiency will increase.



MotoSimEG-VRC Simulator Optional

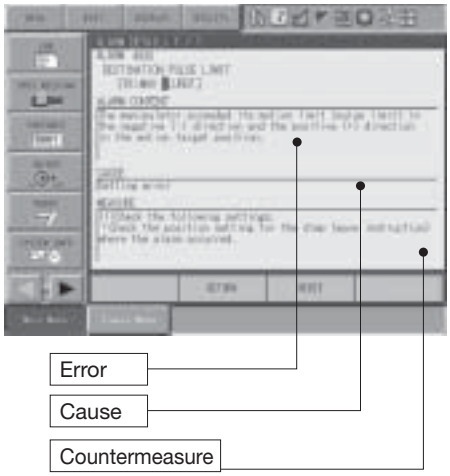
The Simulator has evolved from merely simulating Robot operation to a Virtual Controller that reproduces the functions, operations, and displays of the actual Robot. Easy simulation is possible by anyone with an understanding of Robot operation.

Quick Maintenance Troubleshooting

MOTOMAN continually strives to improve monitoring, troubleshooting, and structures to reduce maintenance and recovery time from failures.

Troubleshooting

When an alarm occurs, the detail, cause, and countermeasure of the error are displayed on the Programming Pendant to provide measures for troubleshooting.



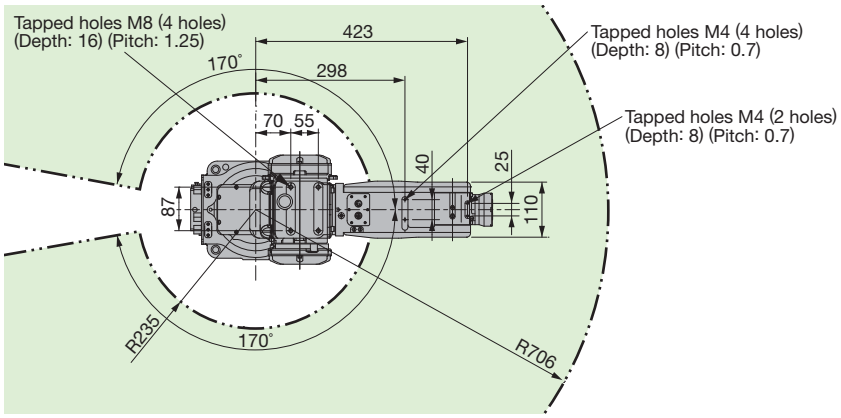
Reduced Replacement Time for Parts

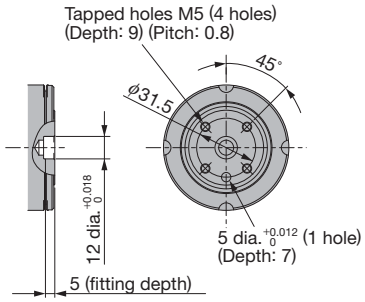
We have reduced the time required to replace Controller parts to shorten recovery time when troubles do occur. (Required time for replacement: from 10 to 8 minutes: reduced by 20%)
The encoder can be replaced with standard tools since it employs a unit style and thus the required time for replacement is reduced.
An optional zeroing function can be used to accurately and quickly reset the home position after replacing the motor or encoder.

MOTOMAN-MH5S

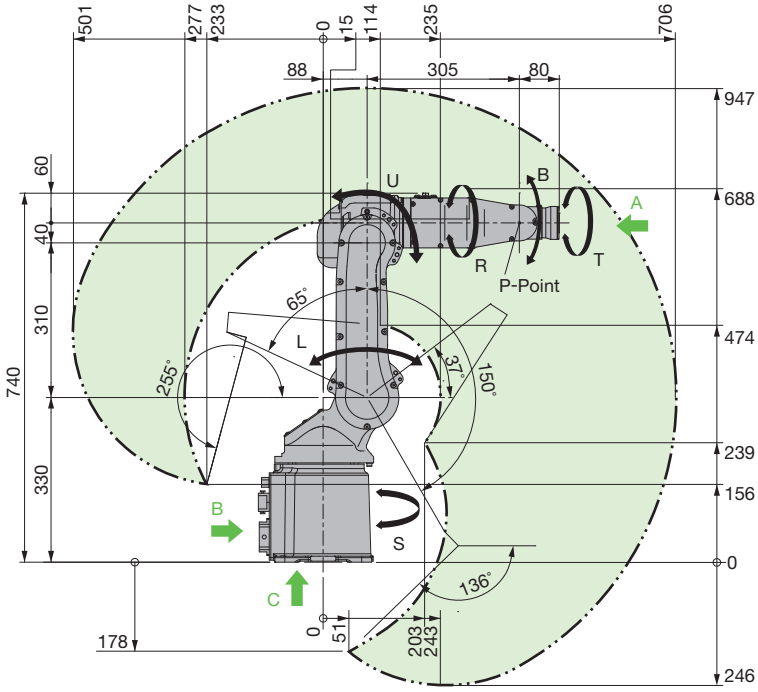
5 kg payload, R706 mm maximum reach DX100 FS100

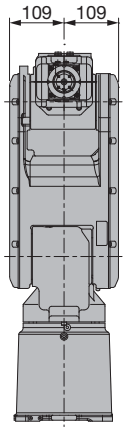
Dimensions Units : mm : P-point Maximum Envelope



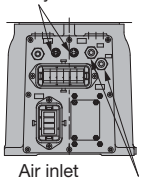


View A



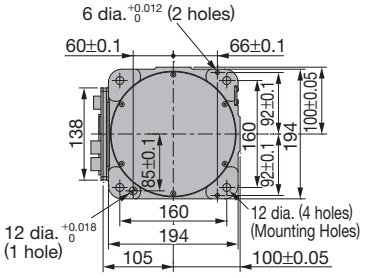


Connector for internal user I/O wiring harness:
HR10A-10R-10P (73)
Matching connector:
HR10A-10P-10S∗HIROSE∗
(provided by users)



Air inlet
Tapped holes PT1/4
(with pipe plug)

View B



View C

Manipulator Specifications

Model		MOTOMAN-MH5S*3
Type		YR-MH0005S-A00*4
Controlled Axis		6 (Vertically articulated)
Payload		5 kg
Repeatability*1		±0.02 mm
Range of Motion	S -axis (turning)	−170° – +170°
	L -axis (lower arm)	−65° – +150°
	U -axis (upper arm)	−136° – +255°
	R -axis (wrist roll)	−190° – +190°
	B -axis (wrist pitch/yaw)	−135° – +135°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	6.56 rad/s, 376°/s
	L -axis (lower arm)	6.11 rad/s, 350°/s
	U -axis (upper arm)	6.98 rad/s, 400°/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

Allowable Moment	R -axis (wrist roll)	12 N·m
	B -axis (wrist pitch/yaw)	12 N·m
	T -axis (wrist twist)	7 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	0.30 kg·m²
	B -axis (wrist pitch/yaw)	0.30 kg·m²
	T -axis (wrist twist)	0.1 kg·m²
Mass		27 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		1.0 kVA

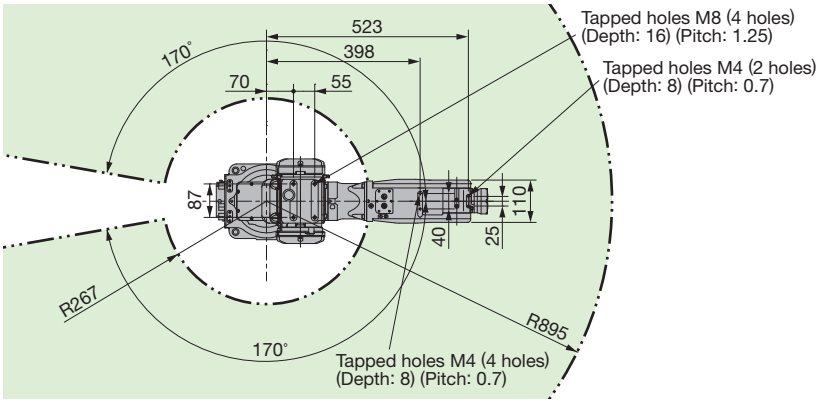
∗1 : Conforms to ISO 9283.
∗2 : Varies in accordance with applications and motion patterns.
∗3 : MOTOMAN-MH5F when using a FS100 controller.
∗4 : YR-MH0005F-A00 when using a FS100 controller.
Note : SI units are used for specifications.

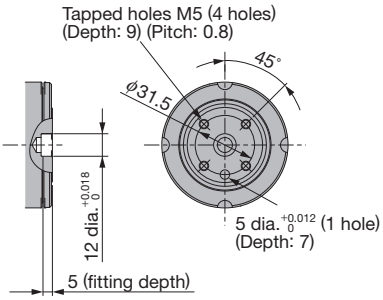
MOTOMAN-MH5LS

5 kg payload, R895 mm maximum reach

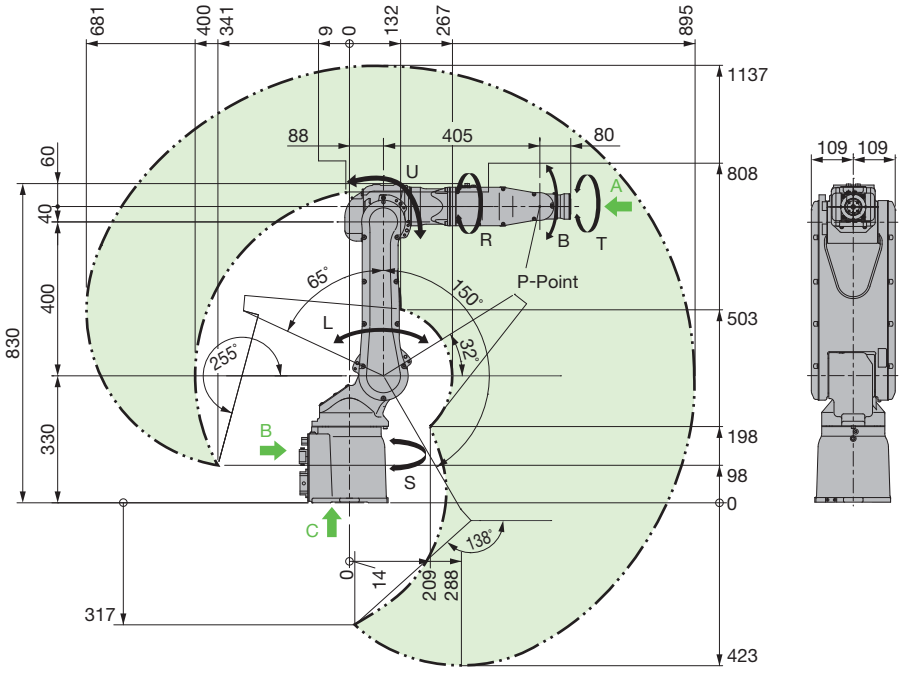
DX100 FS100

Dimensions Units : mm : P-point Maximum Envelope

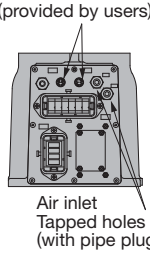




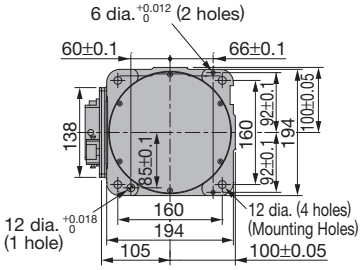
View A



Connector for internal user I/O wiring harness:
HR10A-10R-10P (73)
Matching connector:
HR10A-10P-10S∗HIROSE∗
(provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-MH5LS∗3
Type		YR-MH005LS-A00∗4
Controlled Axis		6 (Vertically articulated)
Payload		5 kg
Repeatability∗1		±0.03 mm
Range of Motion	S -axis (turning)	−170° – +170°
	L -axis (lower arm)	−65° – +150°
	U -axis (upper arm)	−138° – +255°
	R -axis (wrist roll)	−190° – +190°
	B -axis (wrist pitch/yaw)	−135° – +135°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	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

Allowable Moment	R -axis (wrist roll)	12 N·m
	B -axis (wrist pitch/yaw)	12 N·m
	T -axis (wrist twist)	7 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	0.30 kg·m²
	B -axis (wrist pitch/yaw)	0.30 kg·m²
	T -axis (wrist twist)	0.1 kg·m²
Mass		29 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements∗2		1.0 kVA

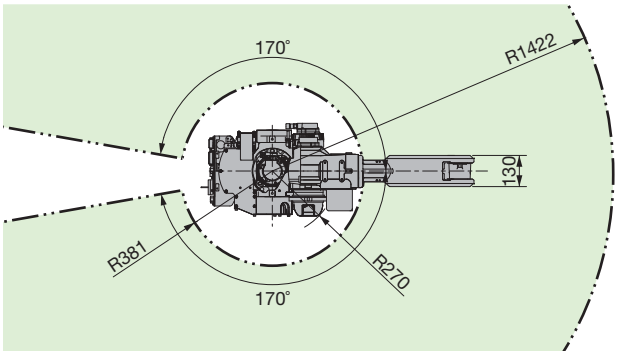
∗1 : Conforms to ISO 9283.
∗2 : Varies in accordance with applications and motion patterns.
∗3 : MOTOMAN-MH5LF when using a FS100 controller.
∗4 : YR-MH005LF-A00 when using a FS100 controller.
Note : SI units are used for specifications.

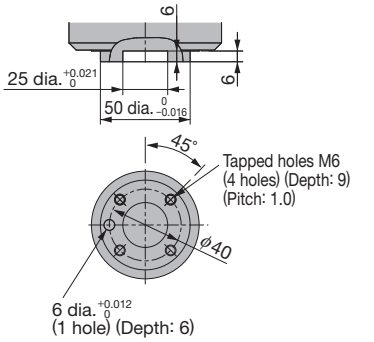
MOTOMAN-MH6

6 kg payload, R1422 mm maximum reach

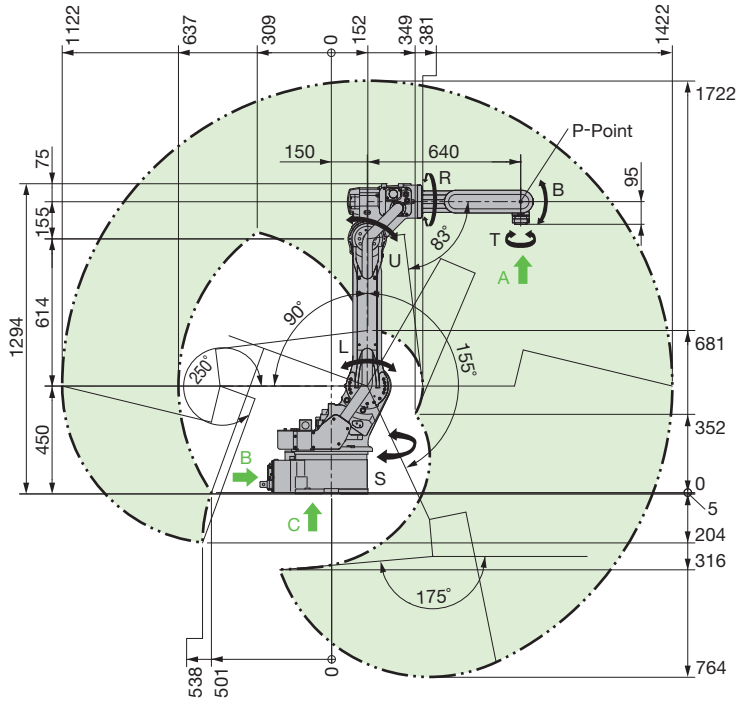
DX100 FS100

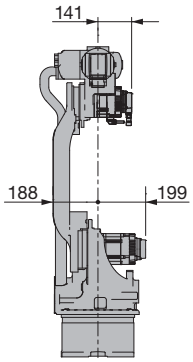
Dimensions Units : mm : P-point Maximum Envelope

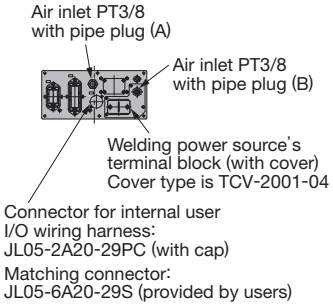




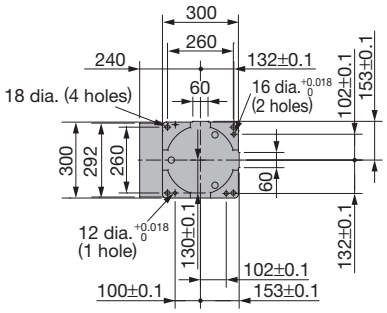
View A







View B



View C

Manipulator Specifications

Model		MOTOMAN-MH6*3
Type		YR-MH00006-A00*4
Controlled Axis		6 (Vertically articulated)
Payload		6 kg
Repeatability*1		±0.08 mm
Range of Motion	S -axis (turning)	−170° – +170°
	L -axis (lower arm)	−90° – +155°
	U -axis (upper arm)	−175° – +250°
	R -axis (wrist roll)	−180° – +180°
	B -axis (wrist pitch/yaw)	−45° – +225°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	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

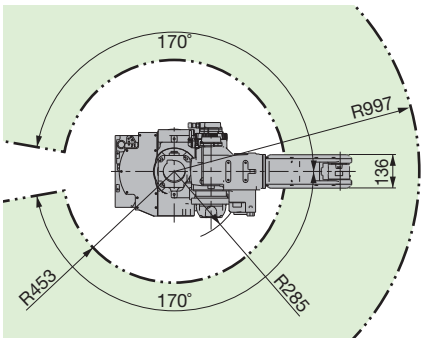
Allowable Moment	R -axis (wrist roll)	11.8 N·m
	B -axis (wrist pitch/yaw)	9.8 N·m
	T -axis (wrist twist)	5.9 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	0.27 kg·m²
	B -axis (wrist pitch/yaw)	0.27 kg·m²
	T -axis (wrist twist)	0.06 kg·m²
Mass		130 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		1.5 kVA

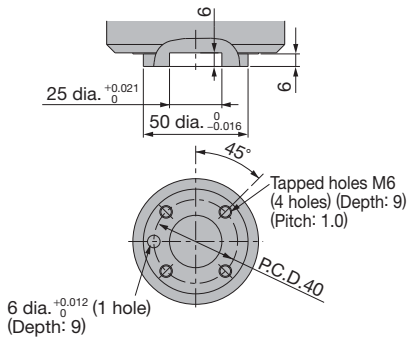
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
*3 : MOTOMAN-MH6F when using a FS100 controller.
*4 : YR-MH0006F-A00 when using a FS100 controller.
Note : SI units are used for specifications.

MOTOMAN-MH6S

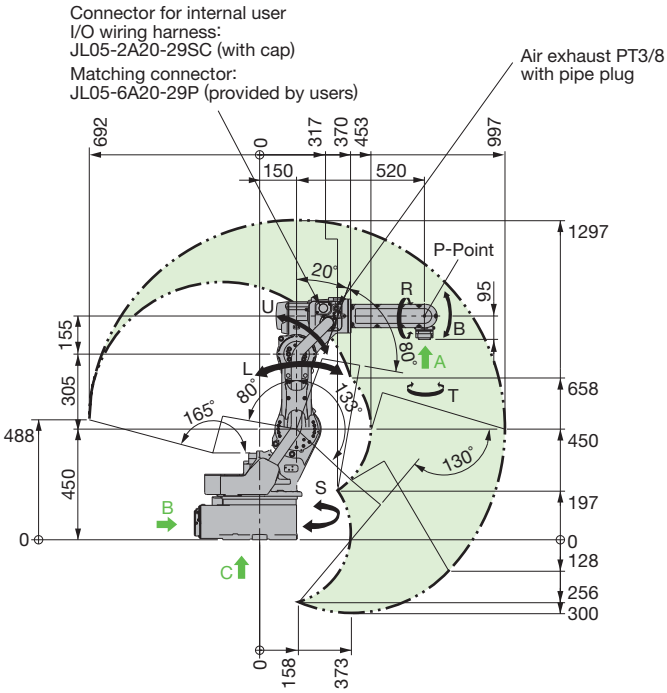
6 kg payload, R997 mm maximum reach DX100

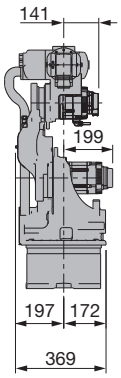
Dimensions Units : mm : P-point Maximum Envelope

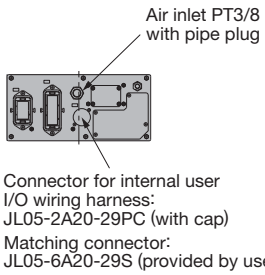




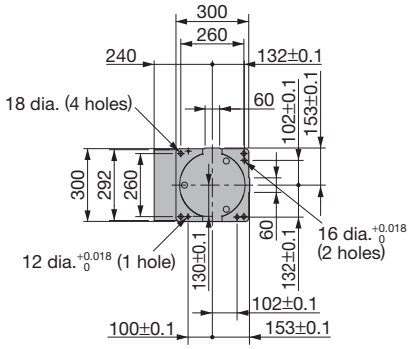
View A







View B



View C

Manipulator Specifications

Model		MOTOMAN-MH6S
Type		YR-MH0006S-A00
Controlled Axis		6 (Vertically articulated)
Payload		6 kg
Repeatability*1		±0.08 mm
Range of Motion	S -axis (turning)	−170° – +170°
	L -axis (lower arm)	−80° – +133°
	U -axis (upper arm)	−130° – +165°
	R -axis (wrist roll)	−180° – +180°
	B -axis (wrist pitch/yaw)	−45° – +225°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	3.84 rad/s, 220°/s
	L -axis (lower arm)	3.84 rad/s, 220°/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

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
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	0.27 kg·m²
	B -axis (wrist pitch/yaw)	0.27 kg·m²
	T -axis (wrist twist)	0.06 kg·m²
Mass		120 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		1.5 kVA

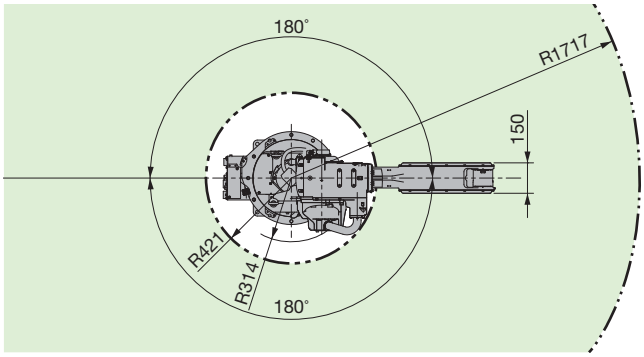
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

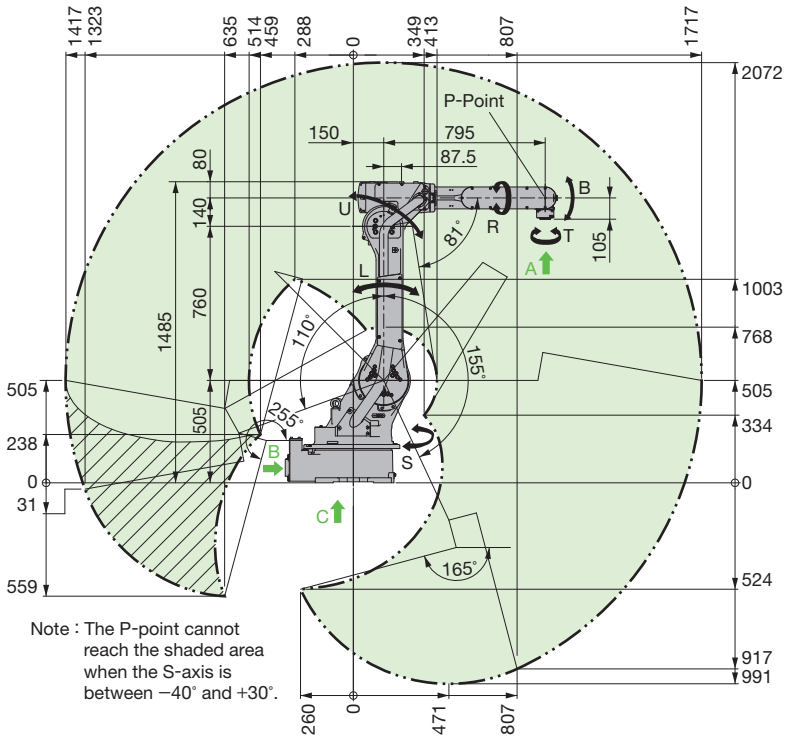
MOTOMAN-HP20D

20 kg payload, R1717 mm maximum reach

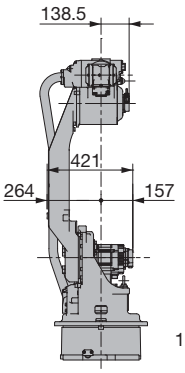
DX100 FS100

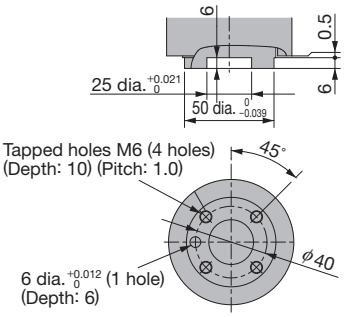
Dimensions Units : mm : P-point Maximum Envelope



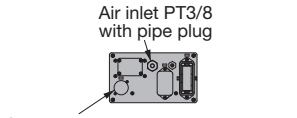


Note : The P-point cannot reach the shaded area when the S-axis is between −40° and +30°.

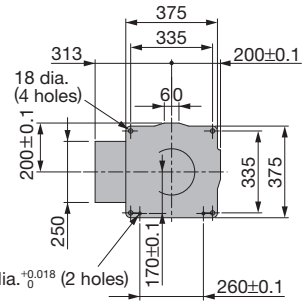




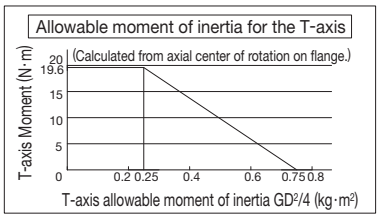
View A



View B



View C



Manipulator Specifications

Model		MOTOMAN-HP20D*3
Type		YR-HP0020D-A00*4
Controlled Axis		6 (Vertically articulated)
Payload		20 kg
Repeatability*1		±0.06 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−110° – +155°
	U -axis (upper arm)	−165° – +255°
	R -axis (wrist roll)	−200° – +200°
	B -axis (wrist pitch/yaw)	−50° – +230°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	3.44 rad/s, 197°/s
	L -axis (lower arm)	3.05 rad/s, 175°/s
	U -axis (upper arm)	3.58 rad/s, 205°/s
	R -axis (wrist roll)	6.98 rad/s, 400°/s
	B -axis (wrist pitch/yaw)	6.98 rad/s, 400°/s
	T -axis (wrist twist)	10.47 rad/s, 600°/s

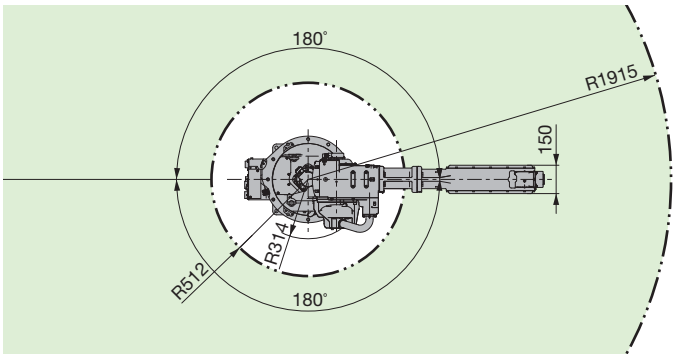
Allowable Moment	R -axis (wrist roll)	39.2 N·m
	B -axis (wrist pitch/yaw)	39.2 N·m
	T -axis (wrist twist)	19.6 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	1.05 kg·m²
	B -axis (wrist pitch/yaw)	1.05 kg·m²
	T -axis (wrist twist)	0.75 kg·m² (only for downward movements)*5
Mass		268 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		2.0 kVA*6

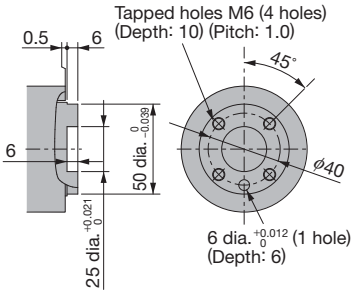
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
*3 : MOTOMAN-HP20F when using a FS100 controller.
*4 : YR-HP0020F-A00 when using a FS100 controller.
*5 : For more information, refer to the line graph showing the allowable moment of inertia on this page.
*6 : The power requirement is 1.5 kVA when using a FS100 controller.
Note : SI units are used for specifications.

MOTOMAN-HP20D-6

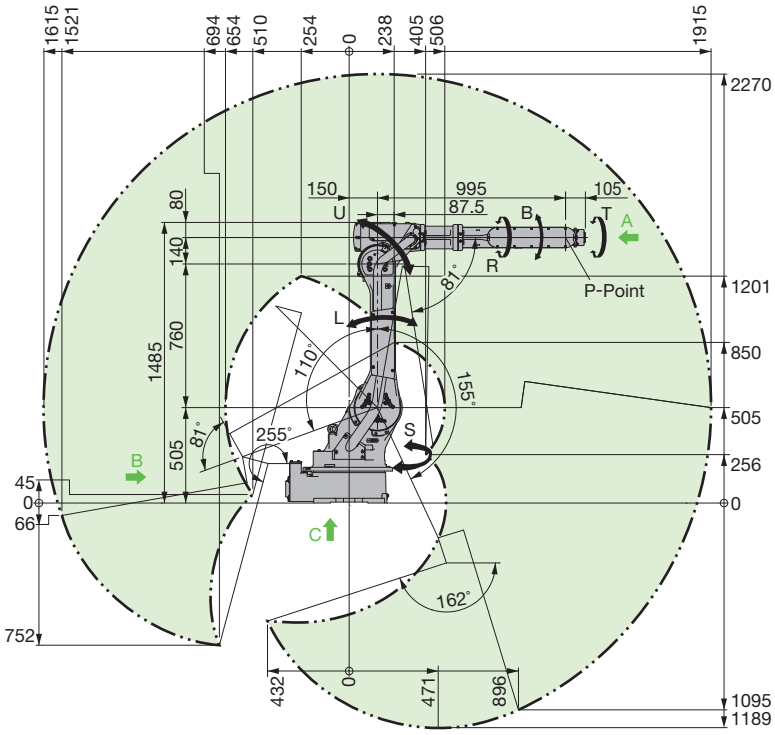
6 kg payload, R1915 mm maximum reach DX100

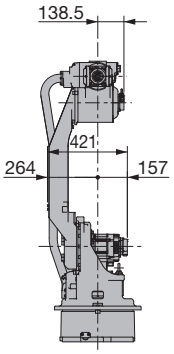
Dimensions Units : mm : P-point Maximum Envelope

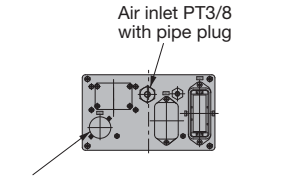




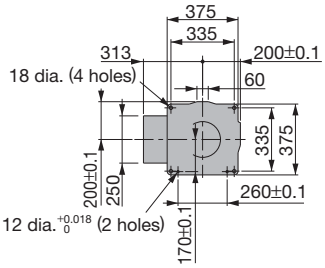
View A







View B



View C

Manipulator Specifications

Model		MOTOMAN-HP20D-6
Type		YR-HP0020D-A10
Controlled Axis		6 (Vertically articulated)
Payload		6 kg
Repeatability*1		±0.06 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−110° – +155°
	U -axis (upper arm)	−162° – +255°
	R -axis (wrist roll)	−200° – +200°
	B -axis (wrist pitch/yaw)	−50° – +230°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	3.44 rad/s, 197°/s
	L -axis (lower arm)	3.05 rad/s, 175°/s
	U -axis (upper arm)	3.26 rad/s, 187°/s
	R -axis (wrist roll)	6.98 rad/s, 400°/s
	B -axis (wrist pitch/yaw)	6.98 rad/s, 400°/s
	T -axis (wrist twist)	10.47 rad/s, 600°/s

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
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	0.24 kg·m²
	B -axis (wrist pitch/yaw)	0.17 kg·m²
	T -axis (wrist twist)	0.06 kg·m²
Mass		273 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		2.0 kVA

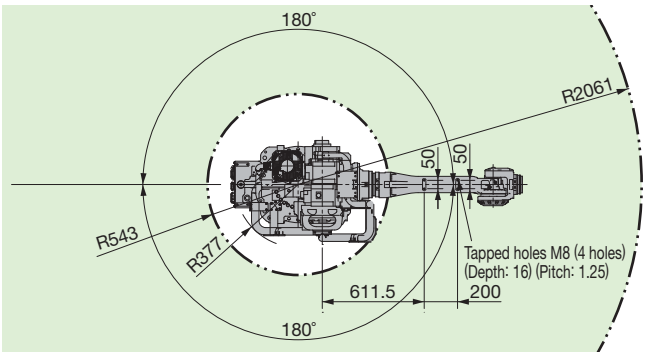
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : 1 SI units are used for specifications.
2 The B-axis is at the home position when it is moved downward into the position where it is perpendicular to the floor at the level 0 shown in the drawing on this page.

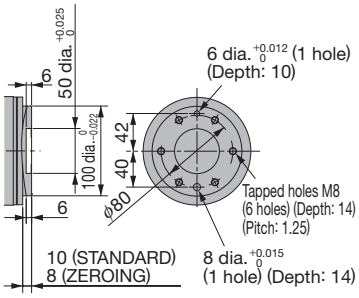
MOTOMAN-MH50

50 kg payload, R2061 mm maximum reach

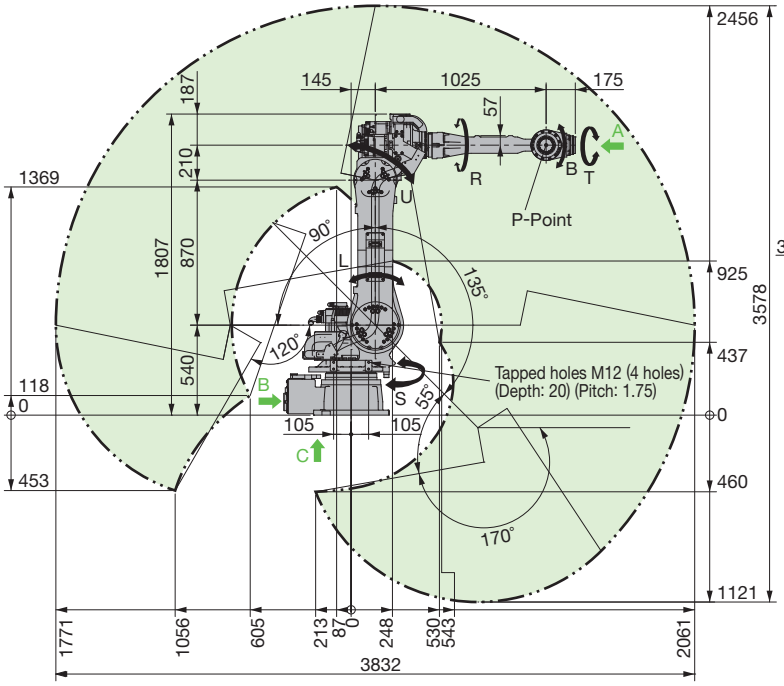
DX100

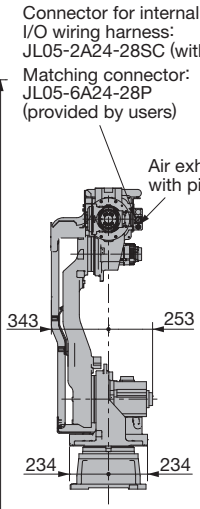
Dimensions Units : mm : P-point Maximum Envelope

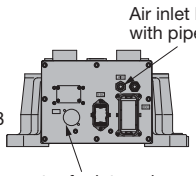




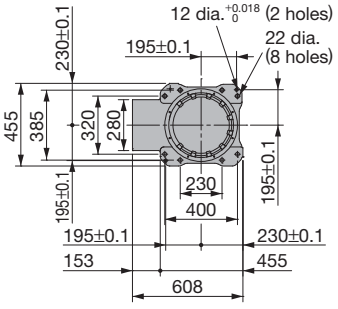
View A







View B



View C

Manipulator Specifications

Model		MOTOMAN-MH50
Type		YR-MH00050-A00
Controlled Axis		6 (Vertically articulated)
Payload		50 kg
Repeatability*1		±0.07 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−90° – +135°
	U -axis (upper arm)	−170° – +251°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	3.14 rad/s, 180°/s
	L -axis (lower arm)	3.11 rad/s, 178°/s
	U -axis (upper arm)	3.11 rad/s, 178°/s
	R -axis (wrist roll)	4.36 rad/s, 250°/s
	B -axis (wrist pitch/yaw)	4.36 rad/s, 250°/s
	T -axis (wrist twist)	6.28 rad/s, 360°/s

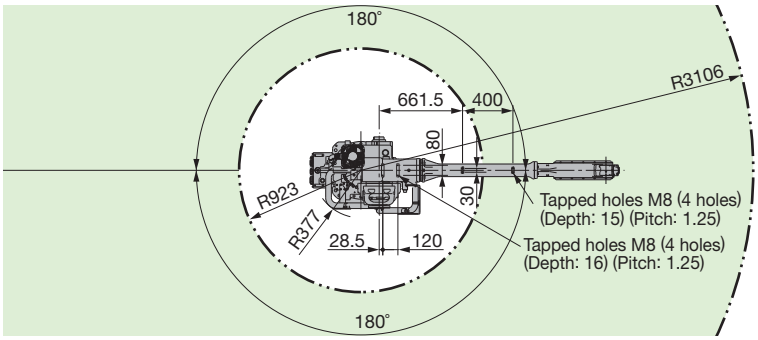
Allowable Moment	R -axis (wrist roll)	216 N·m
	B -axis (wrist pitch/yaw)	216 N·m
	T -axis (wrist twist)	147 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	28 kg·m²
	B -axis (wrist pitch/yaw)	28 kg·m²
	T -axis (wrist twist)	11 kg·m²
Mass		550 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		4.0 kVA

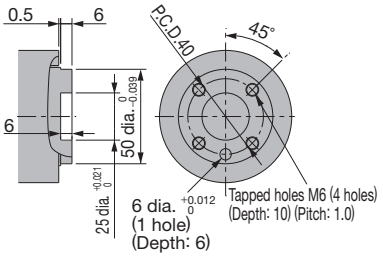
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

MOTOMAN-MH50-20

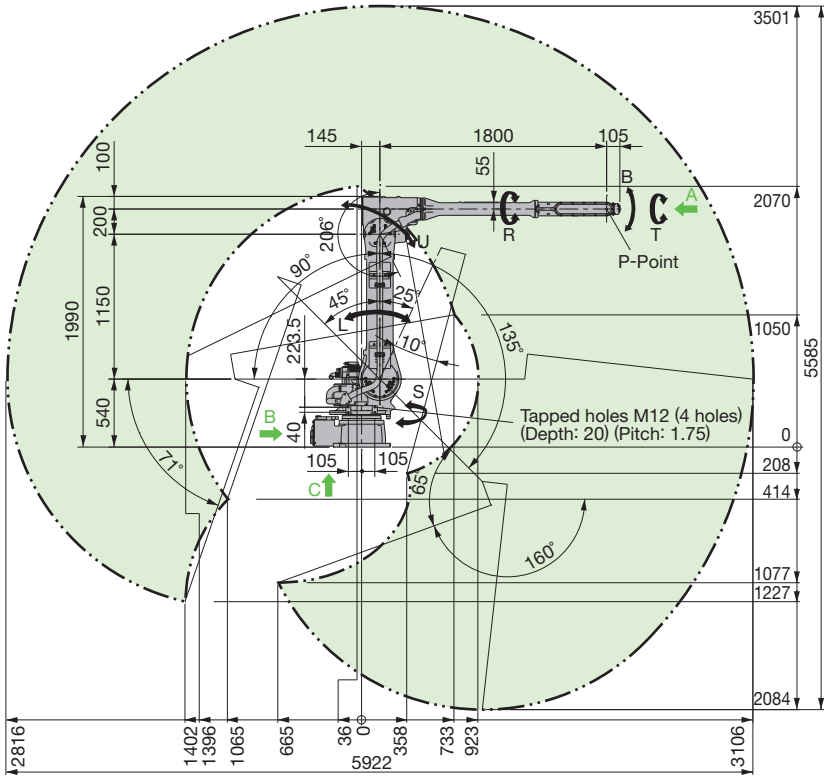
20 kg payload, R3106 mm maximum reach DX100

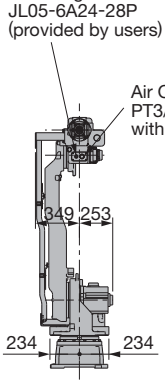
Dimensions Units : mm : P-point Maximum Envelope



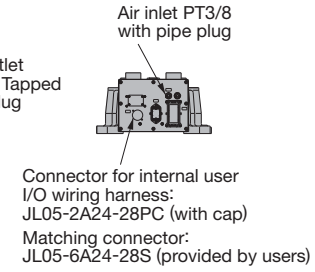


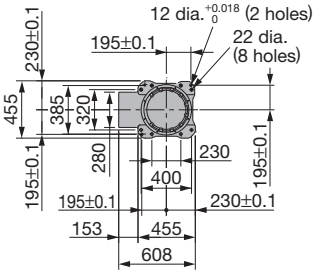
View A





View B





View C

Manipulator Specifications

Model		MOTOMAN-MH50-20
Type		YR-MH00050-A10
Controlled Axis		6 (Vertically articulated)
Payload		20 kg
Repeatability*1		±0.15 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−90° – +135°
	U -axis (upper arm)	−160° – +251°
	R -axis (wrist roll)	−190° – +190°
	B -axis (wrist pitch/yaw)	−50° – +230°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	3.14 rad/s, 180°/s
	L -axis (lower arm)	3.11 rad/s, 178°/s
	U -axis (upper arm)	3.11 rad/s, 178°/s
	R -axis (wrist roll)	6.98 rad/s, 400°/s
	B -axis (wrist pitch/yaw)	6.98 rad/s, 400°/s
	T -axis (wrist twist)	10.47 rad/s, 600°/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)	1.05 kg·m²
	B -axis (wrist pitch/yaw)	1.05 kg·m²
	T -axis (wrist twist)	0.75 kg·m²
Mass		495 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		3.5 kVA

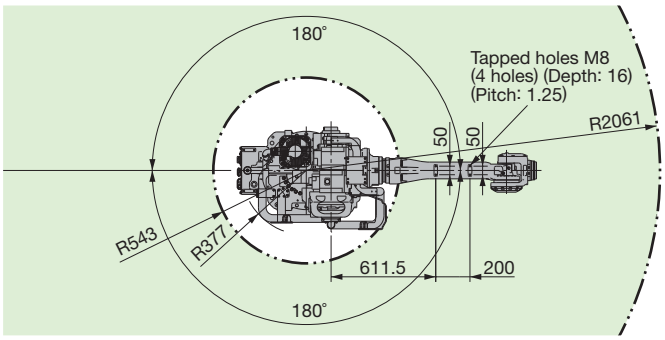
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

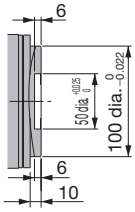
MOTOMAN-MH80

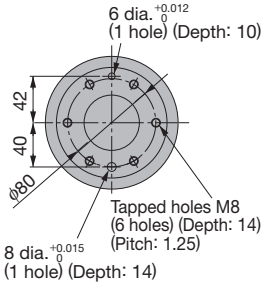
80 kg payload, R2061 mm maximum reach

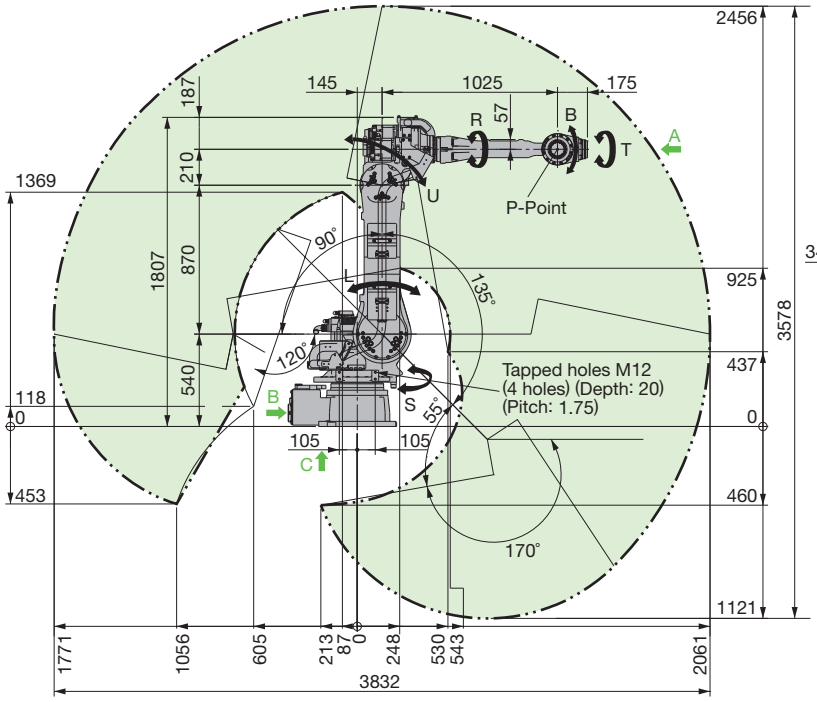
DX100

Dimensions Units : mm : P-point Maximum Envelope



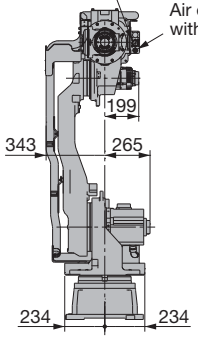


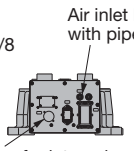




Connector for internal user
I/O wiring harness:
JL05-2A24-28SC (with cap)
Matching connector:
JL05-6A24-28P (provided by users)

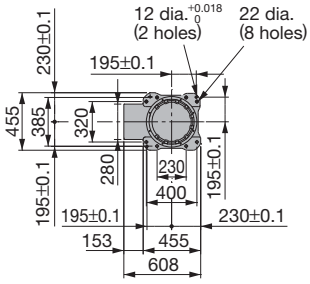
View A





Connector for internal user
I/O wiring harness:
JL05-2A24-28PC (with cap)
Matching connector:
JL05-6A24-28S (provided by users)

View B



View C

Manipulator Specifications

Model		MOTOMAN-MH80
Type		YR-MH00080-A00
Controlled Axis		6 (Vertically articulated)
Payload		80 kg
Repeatability*1		±0.07 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−90° – +135°
	U -axis (upper arm)	−170° – +251°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	2.97 rad/s, 170°/s
	L -axis (lower arm)	2.44 rad/s, 140°/s
	U -axis (upper arm)	2.79 rad/s, 160°/s
	R -axis (wrist roll)	4.01 rad/s, 230°/s
	B -axis (wrist pitch/yaw)	4.01 rad/s, 230°/s
	T -axis (wrist twist)	6.11 rad/s, 350°/s

Allowable Moment	R -axis (wrist roll)	392 N·m
	B -axis (wrist pitch/yaw)	392 N·m
	T -axis (wrist twist)	196 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	28 kg·m²
	B -axis (wrist pitch/yaw)	28 kg·m²
	T -axis (wrist twist)	11 kg·m²
Mass		555 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		4.5 kVA

*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

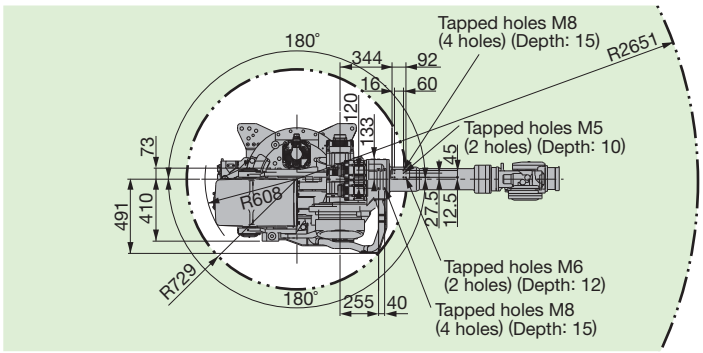
MOTOMAN-MH165

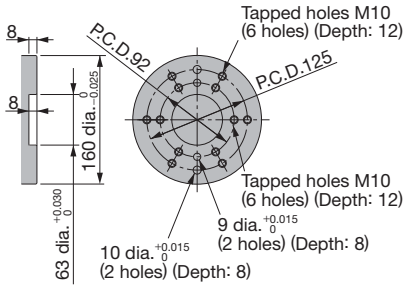
165 kg payload, R2651 mm maximum reach

DX100

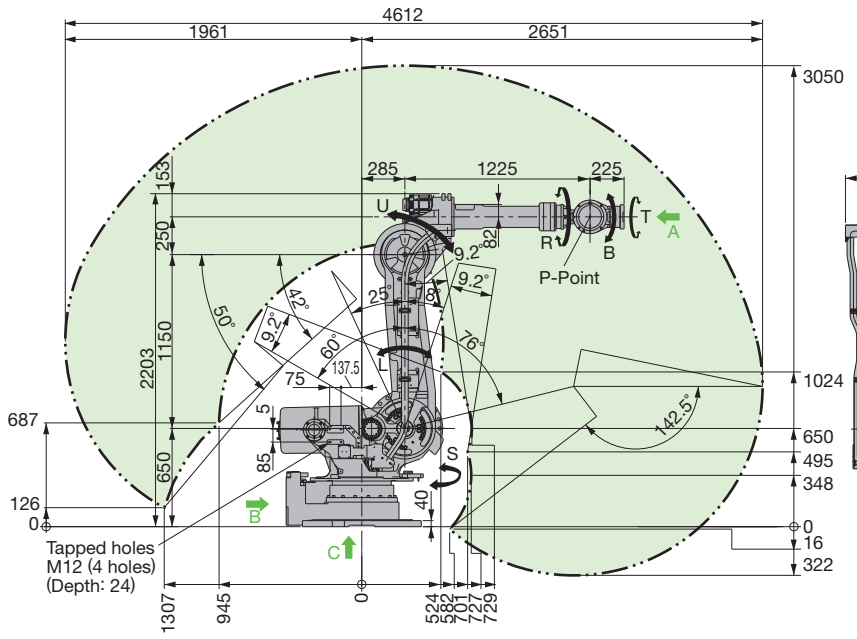
Dimensions Units : mm

: P-point Maximum Envelope



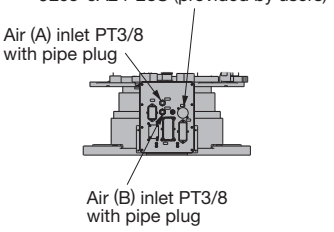


View A

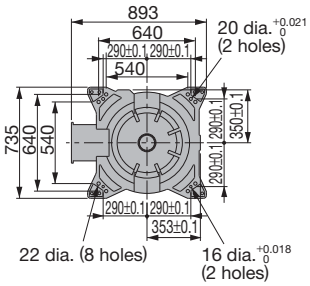


Connector for internal user I/O wiring harness: JL05-2A24-28PC (with cap)

Matching connector: JL05-6A24-28S (provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-MH165
Type		YR-MH00165-A00
Controlled Axis		6 (Vertically articulated)
Payload		165 kg
Repeatability*1		±0.2 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−60° – +76°
	U -axis (upper arm)	−142.5° – +230°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−130° – +130°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	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)	2.62 rad/s, 150°/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·m²
	B -axis (wrist pitch/yaw)	85 kg·m²
	T -axis (wrist twist)	45 kg·m²
Mass		1100 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		5.0 kVA

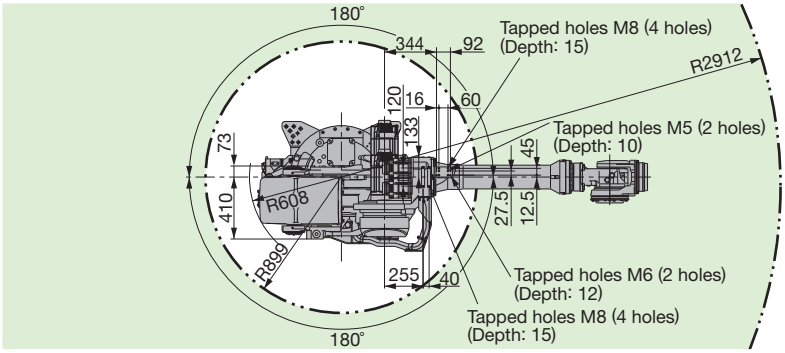
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

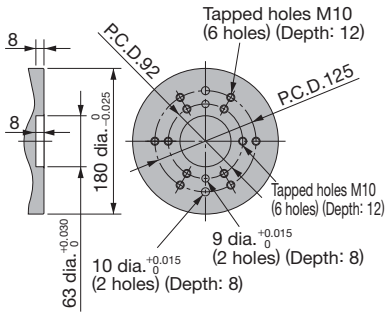
MOTOMAN-MH215

215 kg payload, R2912 mm maximum reach

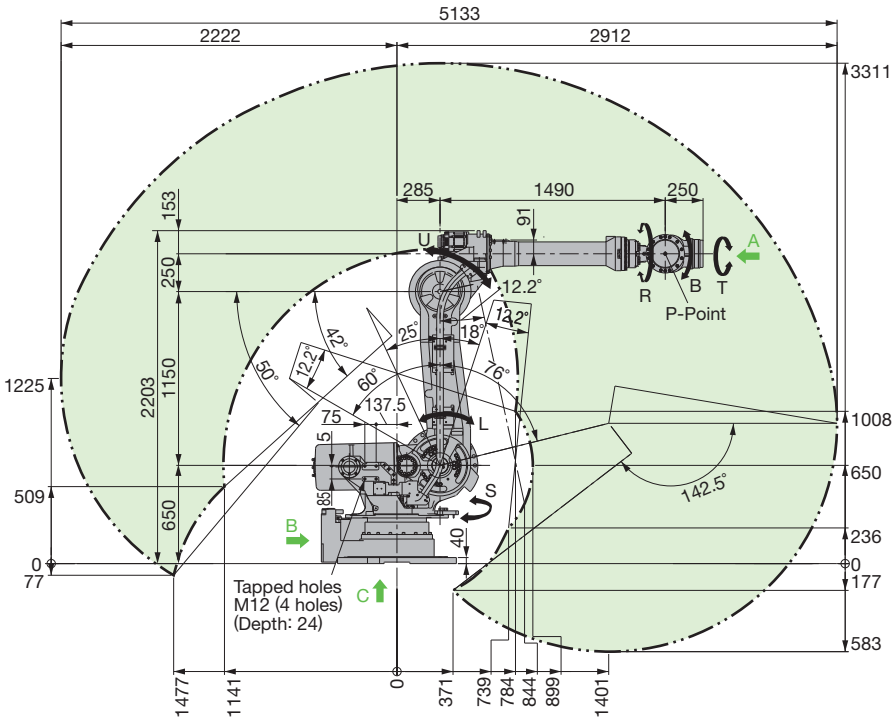
DX100

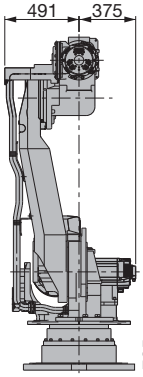
Dimensions Units : mm : P-point Maximum Envelope



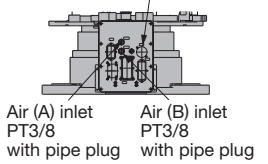


View A

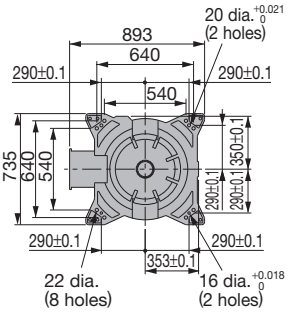




Connector for internal user I/O wiring harness (Base side):
JL05-2A24-28PC (with cap)
Matching connector:
JL05-6A24-28S (provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-MH215
Type		YR-MH00215-A00
Controlled Axis		6 (Vertically articulated)
Payload		215 kg
Repeatability*1		±0.2 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−60° – +76°
	U -axis (upper arm)	−142.5° – +230°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	1.75 rad/s, 100°/s
	L -axis (lower arm)	1.57 rad/s, 90°/s
	U -axis (upper arm)	1.69 rad/s, 97°/s
	R -axis (wrist roll)	2.09 rad/s, 120°/s
	B -axis (wrist pitch/yaw)	2.09 rad/s, 120°/s
	T -axis (wrist twist)	3.32 rad/s, 190°/s

Allowable Moment	R -axis (wrist roll)	1176 N·m
	B -axis (wrist pitch/yaw)	1176 N·m
	T -axis (wrist twist)	710 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	317 kg·m²
	B -axis (wrist pitch/yaw)	317 kg·m²
	T -axis (wrist twist)	200 kg·m²
Mass		1140 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		6.0 kVA

*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

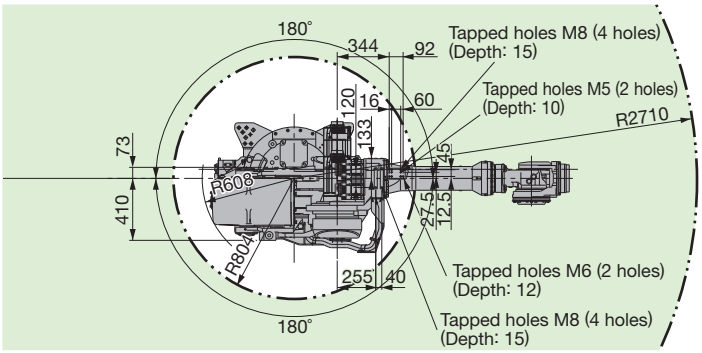
MOTOMAN-MH250

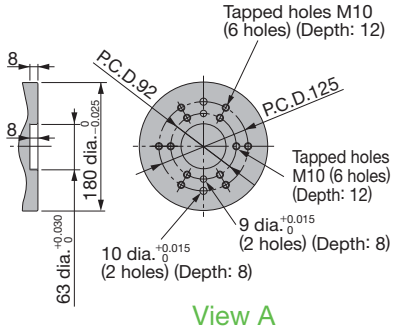
250 kg payload, R2710 mm maximum reach

DX100

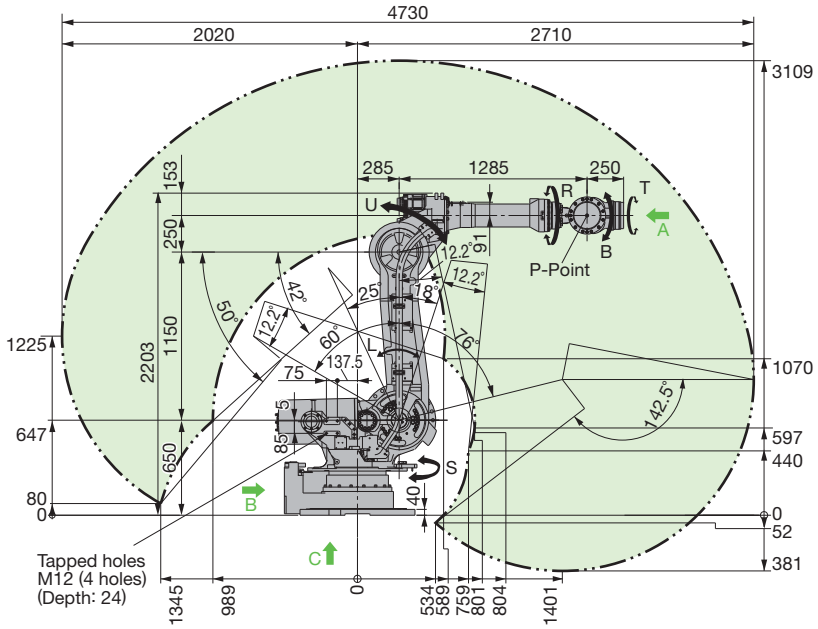
Dimensions Units : mm

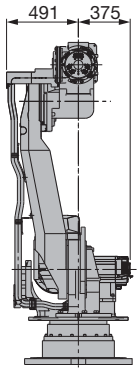
: P-point Maximum Envelope



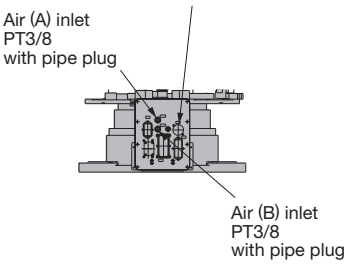


View A

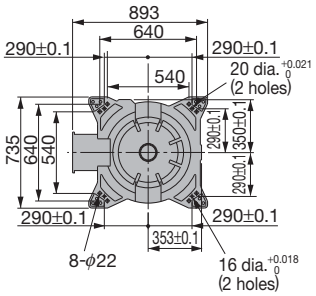




Connector for internal user
I/O wiring harness (Base side):
JL05-2A24-28PC (with cap)
Matching connector:
JL05-6A24-28S (provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-MH250
Type		YR-MH00250-A00
Controlled Axis		6 (Vertically articulated)
Payload		250 kg
Repeatability*1		±0.2 mm
Range of Motion	S -axis (turning)	−180° – +180°
	L -axis (lower arm)	−60° – +76°
	U -axis (upper arm)	−142.5° – +230°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	1.75 rad/s, 100°/s
	L -axis (lower arm)	1.57 rad/s, 90°/s
	U -axis (upper arm)	1.69 rad/s, 97°/s
	R -axis (wrist roll)	2.09 rad/s, 120°/s
	B -axis (wrist pitch/yaw)	2.09 rad/s, 120°/s
	T -axis (wrist twist)	3.32 rad/s, 190°/s

Allowable Moment	R -axis (wrist roll)	1385 N·m
	B -axis (wrist pitch/yaw)	1385 N·m
	T -axis (wrist twist)	735 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	317 kg·m²
	B -axis (wrist pitch/yaw)	317 kg·m²
	T -axis (wrist twist)	200 kg·m²
Mass		1130 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		6.0 kVA

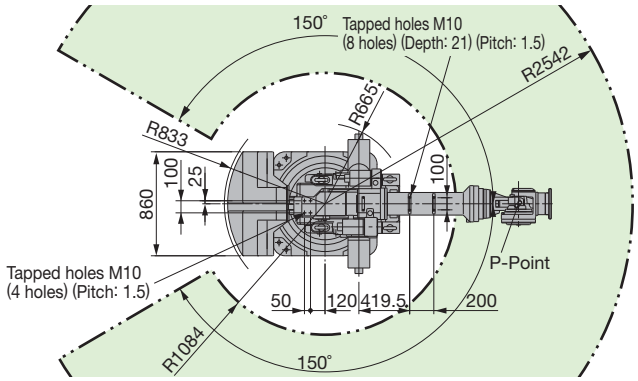
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

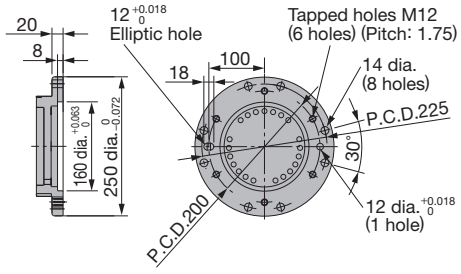
MOTOMAN-UP350D

350 kg payload, R2542 mm maximum reach

DX100

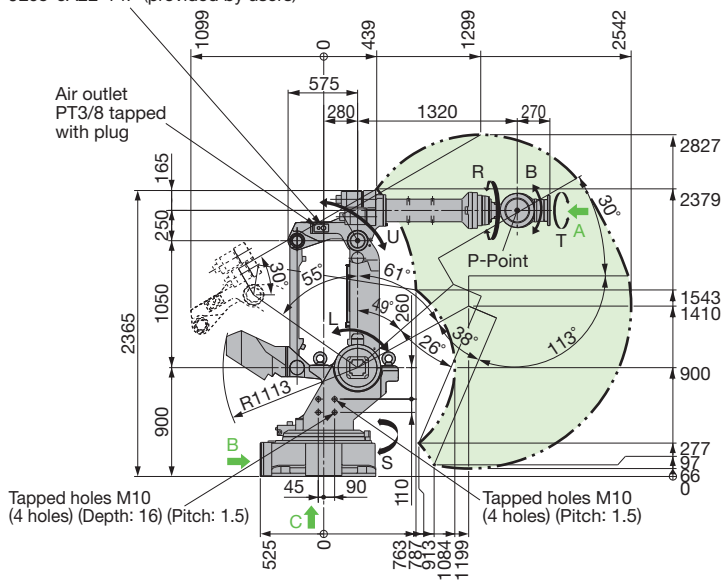
Dimensions Units : mm : P-point Maximum Envelope

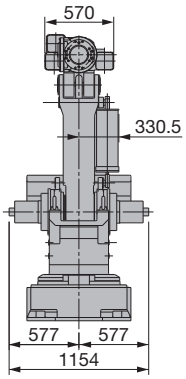




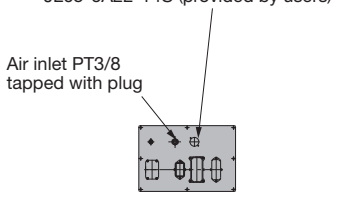
View A

Connector for internal user
I/O wiring harness:
JL05-2A22-14SC (with cap)
Matching connector:
JL05-6A22-14P (provided by users)

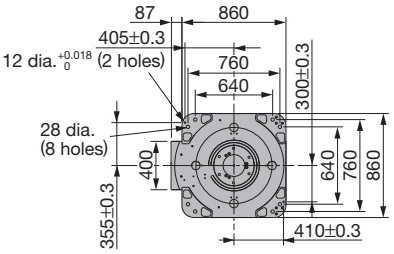




Connector for internal user
I/O wiring harness:
JL05-2A22-14PC (with cap)
Matching connector:
JL05-6A22-14S (provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-UP350D
Type		YR-UP0350D-A00
Controlled Axis		6 (Vertically articulated)
Payload		350 kg
Repeatability*1		±0.5 mm
Range of Motion	S -axis (turning)	−150° – +150°
	L -axis (lower arm)	−55° – +61°
	U -axis (upper arm)	−113° – +30°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	1.66 rad/s, 95°/s
	L -axis (lower arm)	1.66 rad/s, 95°/s
	U -axis (upper arm)	1.66 rad/s, 95°/s
	R -axis (wrist roll)	1.75 rad/s, 100°/s
	B -axis (wrist pitch/yaw)	1.75 rad/s, 100°/s
	T -axis (wrist twist)	2.79 rad/s, 160°/s

Allowable Moment	R -axis (wrist roll)	1960 N·m
	B -axis (wrist pitch/yaw)	1960 N·m
	T -axis (wrist twist)	823 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	150 kg·m²
	B -axis (wrist pitch/yaw)	150 kg·m²
	T -axis (wrist twist)	90 kg·m²
Mass		2200 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		5.5 kVA

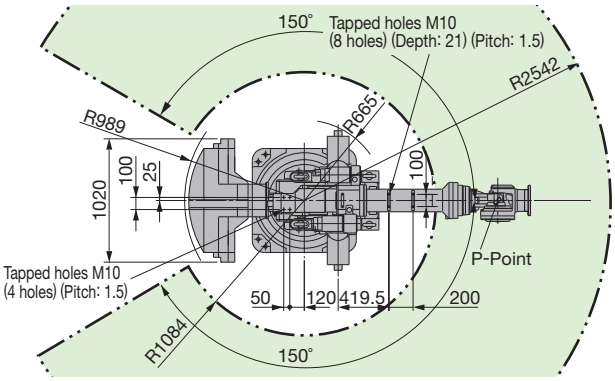
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

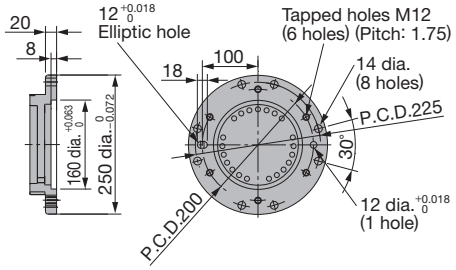
MOTOMAN-UP350D-500

500 kg payload, R2542 mm maximum reach

DX100

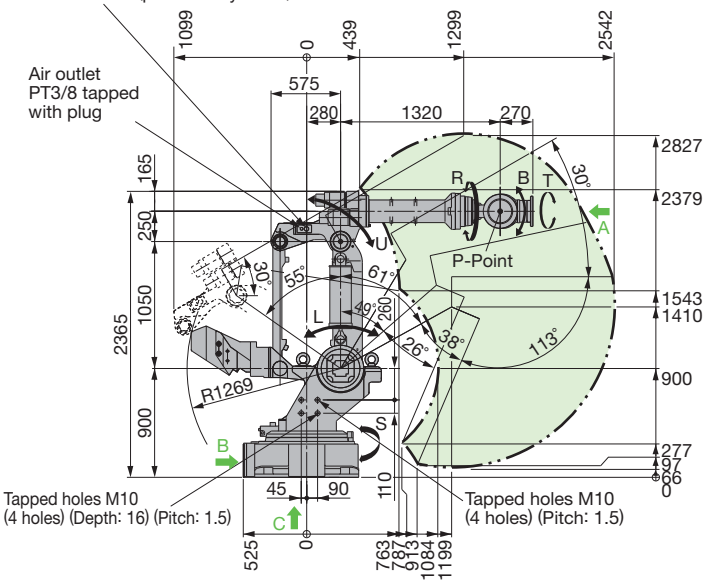
Dimensions Units : mm : P-point Maximum Envelope

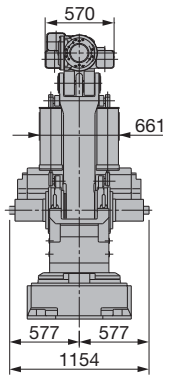




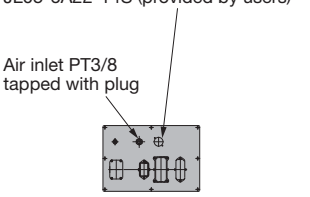
View A

Connector for internal user
I/O wiring harness:
JL05-2A22-14SC (with cap)
Matching connector:
JL05-6A22-14P (provided by users)

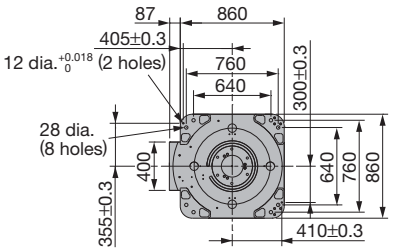




Connector for internal user
I/O wiring harness:
JL05-2A22-14PC (with cap)
Matching connector:
JL05-6A22-14S (provided by users)



View B



View C

Manipulator Specifications

Model		MOTOMAN-UP350D-500
Type		YR-UP0350D-A20
Controlled Axis		6 (Vertically articulated)
Payload		500 kg
Repeatability*1		±0.5 mm
Range of Motion	S -axis (turning)	−150° – +150°
	L -axis (lower arm)	−55° – +61°
	U -axis (upper arm)	−113° – +30°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−125° – +125°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	1.40 rad/s, 80°/s
	L -axis (lower arm)	1.40 rad/s, 80°/s
	U -axis (upper arm)	1.40 rad/s, 80°/s
	R -axis (wrist roll)	1.75 rad/s, 100°/s
	B -axis (wrist pitch/yaw)	1.75 rad/s, 100°/s
	T -axis (wrist twist)	2.79 rad/s, 160°/s

Allowable Moment	R -axis (wrist roll)	1960 N·m
	B -axis (wrist pitch/yaw)	1960 N·m
	T -axis (wrist twist)	823 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	150 kg·m²
	B -axis (wrist pitch/yaw)	150 kg·m²
	T -axis (wrist twist)	90 kg·m²
Mass		2350 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		5.5 kVA

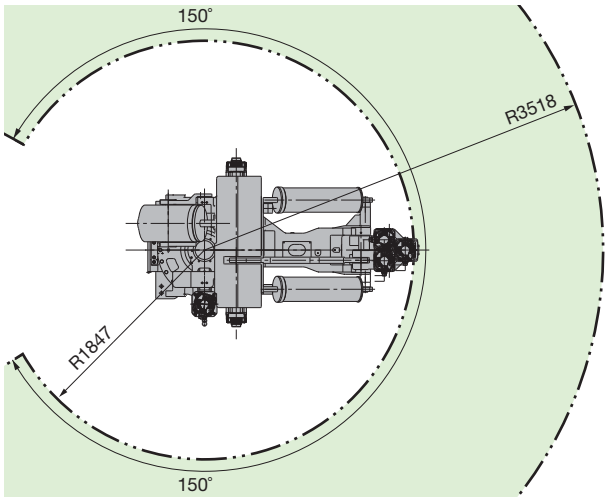
*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

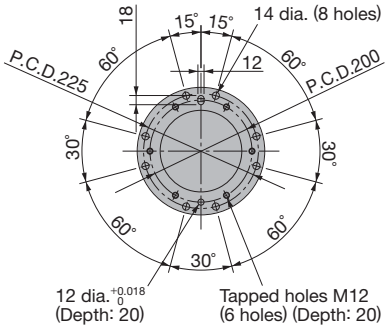
MOTOMAN-UP400RD

400 kg payload, R3518 mm maximum reach

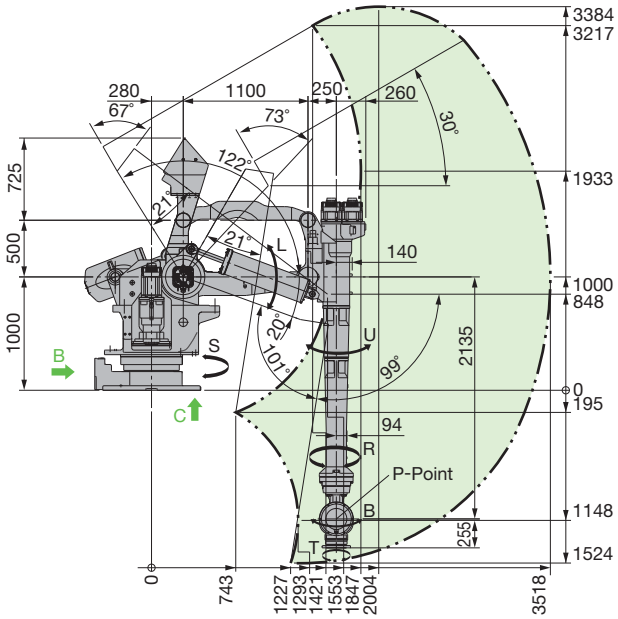
DX100

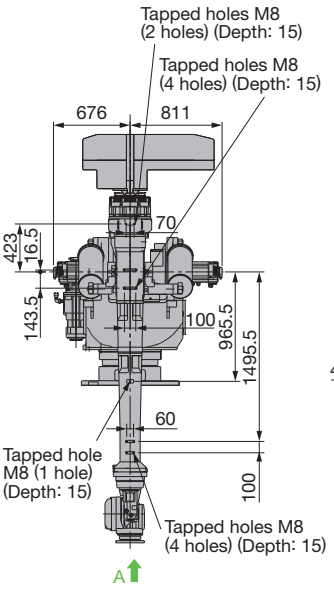
Dimensions Units : mm : P-point Maximum Envelope

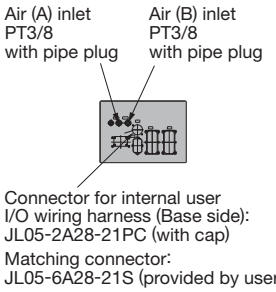




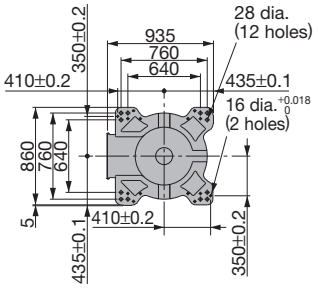
View A







View B



View C

Manipulator Specifications

Model		MOTOMAN-UP400RD
Type		YR-UP0400RD-A00
Controlled Axis		6 (Vertically articulated)
Payload		400 kg
Repeatability*1		±0.5 mm
Range of Motion	S -axis (turning)	−150° – +150°
	L -axis (lower arm)	−122° – +20°
	U -axis (upper arm)	−9° – +120°
	R -axis (wrist roll)	−360° – +360°
	B -axis (wrist pitch/yaw)	−120° – +120°
	T -axis (wrist twist)	−360° – +360°
Maximum Speed	S -axis (turning)	1.40 rad/s, 80°/s
	L -axis (lower arm)	1.40 rad/s, 80°/s
	U -axis (upper arm)	1.40 rad/s, 80°/s
	R -axis (wrist roll)	1.40 rad/s, 80°/s
	B -axis (wrist pitch/yaw)	1.40 rad/s, 80°/s
	T -axis (wrist twist)	2.79 rad/s, 160°/s

Allowable Moment	R -axis (wrist roll)	1960 N·m
	B -axis (wrist pitch/yaw)	1960 N·m
	T -axis (wrist twist)	833 N·m
Allowable Inertia ($GD^2/4$)	R -axis (wrist roll)	150 kg·m²
	B -axis (wrist pitch/yaw)	150 kg·m²
	T -axis (wrist twist)	50 kg·m²
Mass		3600 kg
Ambient conditions	Temperature	0°C to +45°C
	Humidity	20 to 80%RH (non-condensing)
	Vibration	4.9 m/s² 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)
Power Requirements*2		8.5 kVA

*1 : Conforms to ISO 9283.
*2 : Varies in accordance with applications and motion patterns.
Note : SI units are used for specifications.

MOTOMAN-MH, HP, and UP Series

Controller Specifications

Items	DX100 Controller	FS100 Controller
Configuration	Dust proof	Standard : IP20 (open structure), Option : IP54 (dustproof housing)
Dimensions, Mass	425 (W) × 450 (D) × 1200 (H) mm, 100 kg	470 (W) × 420 (D) × 200 (H) mm (Protrusions are not included.), 20 kg
Applicable MOTOMAN	All models described in this catalog [Small Robots*1 : Possible to control three external axes Large Robots*2 : Possible to control two external axes]	MOTOMAN-MH5F, MH5LF, MH6F, HP20F (Possible to control two external axes)
Cooling System	Indirect cooling	Direct cooling
Ambient Temperature	During operation : 0°C to +45°C During storage : −10°C to +60°C	During operation : 0°C to +40°C During storage : −10°C to +60°C
Relative Humidity	90% max. (non-condensing)	90% max. (non-condensing)
Power Supply	Three-phase 200/220 VAC (+10% to −15%), 60 Hz (±2%) (Japan) Three-phase 200 VAC (+10% to −15%), 50 Hz (±2%) (Japan)	Three-phase 200/220 VAC (+10%, −15%), 50/60 Hz Single-phase 200/230 VAC (+10%, −15%), 50/60 Hz
Grounding	Grounding resistance : 100 Ω or less	Grounding resistance : 100 Ω or less
Digital I/Os	Specialized signals : 23 inputs and 5 outputs General signals : 40 inputs and 40 outputs Max. I/O (optional) : 2,048 inputs and 2,048 outputs	Specialized signals : 10 inputs and 1 output General signals : 28 inputs and 28 outputs Max. I/O (optional) : 1,024 inputs and 1,024 outputs
Positioning System	By serial encoder	By serial encoder
Programming Capacity	JOB : 200,000 steps, 10,000 instructions CIO ladder : 20,000 steps	JOB : 10,000 steps, 1,000 instructions CIO ladder : 1,500 steps
Expansion Slots	PCI : 2 slots for main CPUs and 1 slot for servo CPU 1 additional slot for sensor board	MP2000 bus×5 slots
LAN (Connection to Host)	1 (10BASE-T/100BASE-TX)	1 (10BASE-T/100BASE-TX)
Interface	RS-232C : 1ch	RS-232C : 1ch
Control Method	Software servo control	Software servo control
Drive Units	Standard 6 axes and 2 additional single-axis amplifiers can be mounted (8 axes max.)	Standard 6 axes and 2 additional single-axis amplifiers can be mounted.
Painting Color	Munsell notation 5Y7/1 (reference value)	Munsell notation 5Y7/1 (reference value)
Items	Programming Pendant*3	
Dimensions, Mass	169 (W) × 314.5 (H) × 50 (D) mm, 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, Max. : 36 m (optional)	Standard : 8 m, optional : 20 m max.

*1 : Small Robots : Models of the MOTOMAN with a payload of 20 kg or less.
*2 : Large Robots : Models of the MOTOMAN with a payload of 50 kg or more.
For MOTOMAN-MH215 and MH250, the regenerative resistor box (120 mm in depth, 50 kg) is mounted on the surface of the backside of the controller.
*3 : The programming pendant for the FS100 controller is optional. The model number of the programming pendant differs from that of the programming pendant for the DX100 controller.

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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.

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