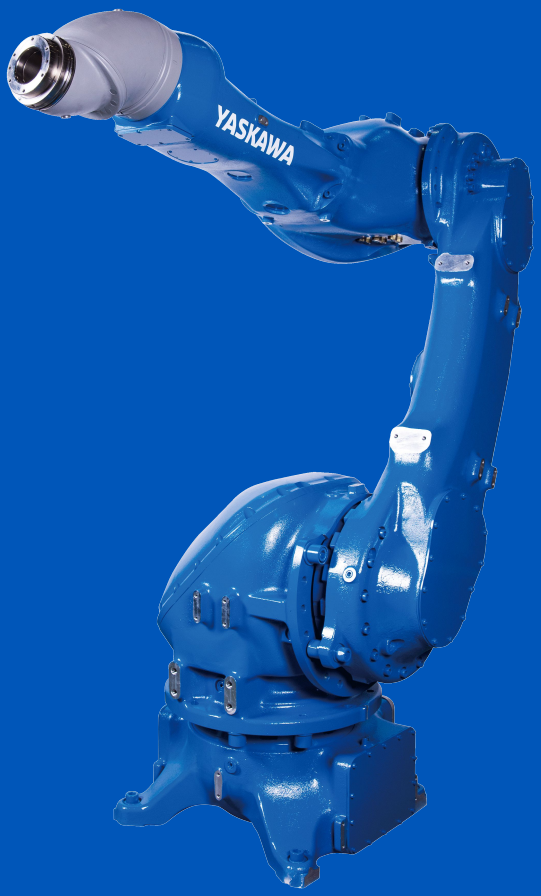
# MOTOMAN-MPX Series

Robots Optimized for Painting

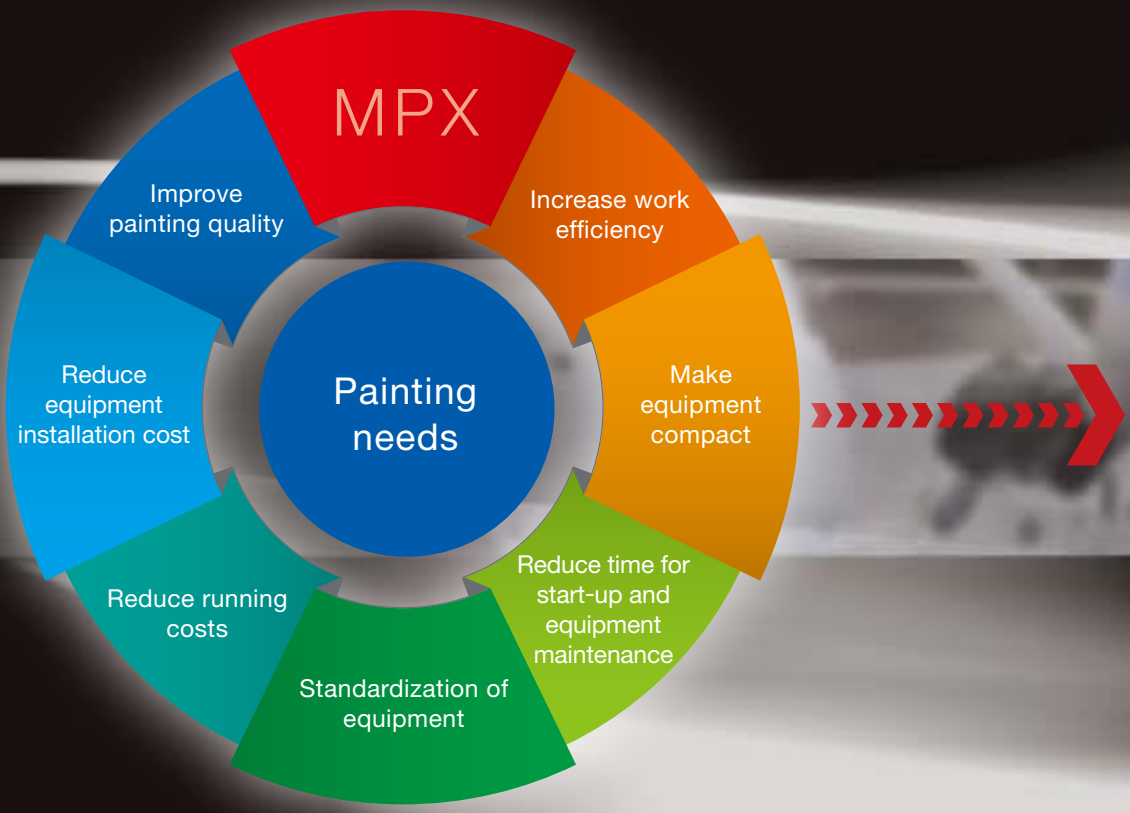
## Технические характеристики



*Robot System Solutions*

# MOTOMAN-MPX Series

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



# YASKAWA has the answer

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

YASKAWA's extensive know-how in robotics technologies can meet the requirements of a wide range of systems.

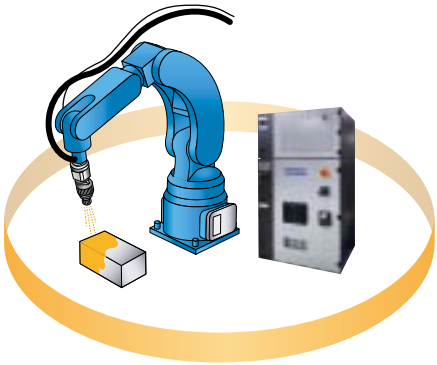
## Painting of small parts

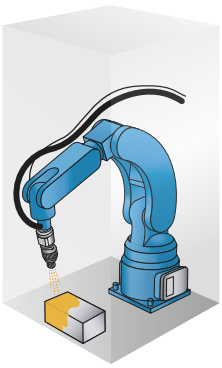
◀ MOTOMAN-MPX1150

Small parts can be painted in minimal installation space

Supports MPX1150*

Our MOTOMAN robots can perform high-quality painting of small parts in compact booths. By using painting robots with a 700-mm class reach, small parts can be painted in minimum installation space.





Paint small parts in a compact booth!

## Painting of workpieces that are moving on conveyors

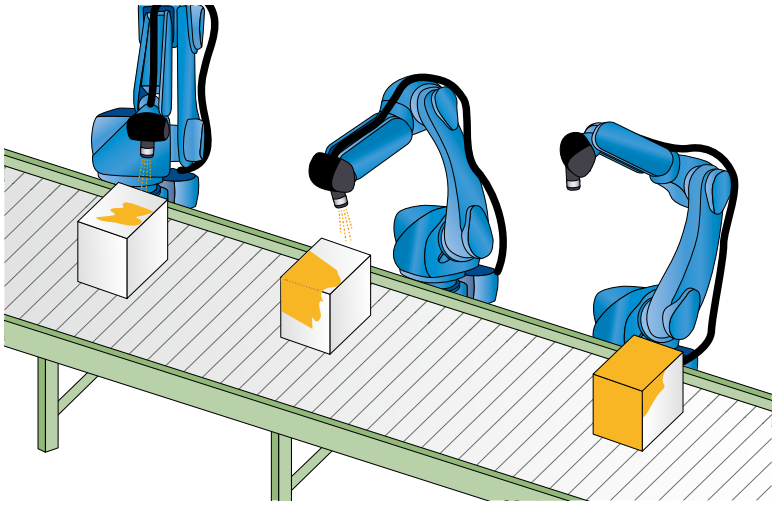
◀ MOTOMAN-MPX1950

Follows and paints moving workpieces on conveyors

Supports all models*

The robots can follow and paint workpieces that are moving on conveyors or hung from overhead conveyors.

Improves production efficiency by painting workpieces while they are continuously conveyed






## Painting workpieces of various shapes and conditions

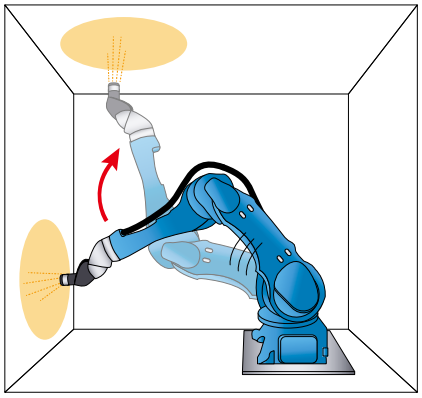
◀ MOTOMAN-MPX2600

### Efficient painting with flexible robot posture

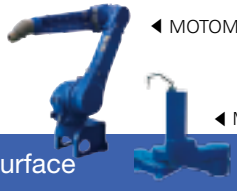
Supports MPX1950, MPX2600*

The improved axis configuration allows the robot to paint workpieces that are in the vicinity of the robot. The elbow can be bent in the opposite direction which expands the painting range of the robot.

Allows painting of workpieces that are large or complex



## Painting on automobile production lines



◀ MOTOMAN-MPX3500

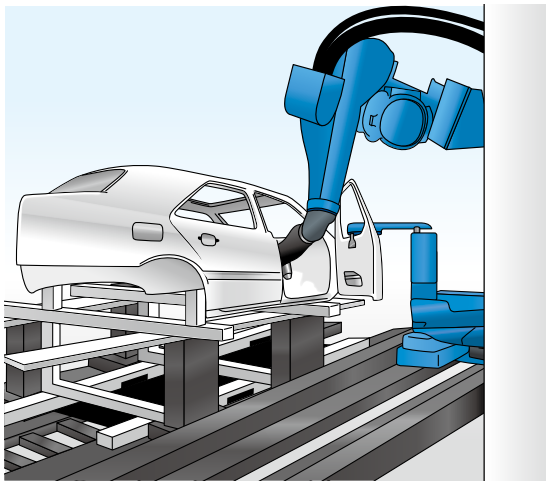
◀ MOTOMAN-MPO10

### Smooth painting of automobile interior surface

Supports MPX3500 + MPO10*

Using the MPO10 for opening doors and the MPX3500 for painting, it is possible to smoothly paint the interior surface of automobile bodies. These robots can be installed symmetrically on both sides and the JOB operations can be easily copied.

The MPO10 and MPX3500 can even follow and paint an object that is continuously conveyed on an automobile production line.



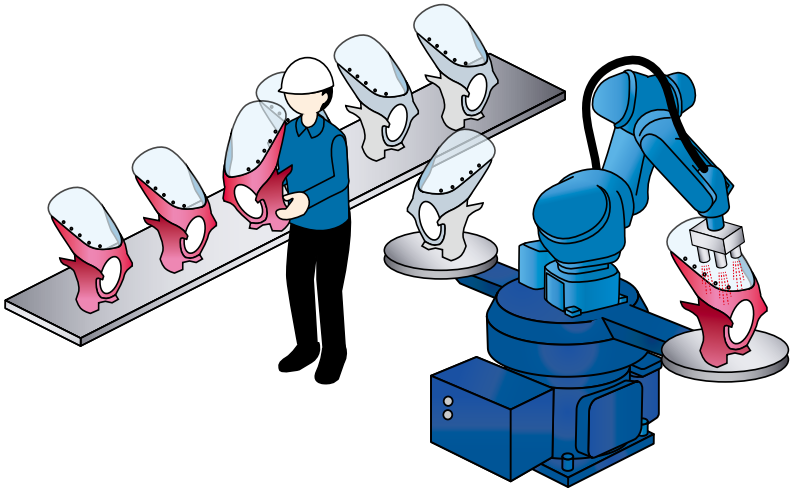
*: Contact your Yaskawa representative for details on supported models.

YASKAWA's extensive know-how in robotics technologies can meet the requirements of a wide range of systems.

## Easy setup of painting cell systems

**Reduces downtime and space** — Supports MOTOFEEDERⅡ + MPX1150, MPX1950*

Workers are able to set and shift workpieces while the robot is painting, which saves time and improves production efficiency. The range of motion is compact for easy replacement of manual tasks, leading to high-quality painting.

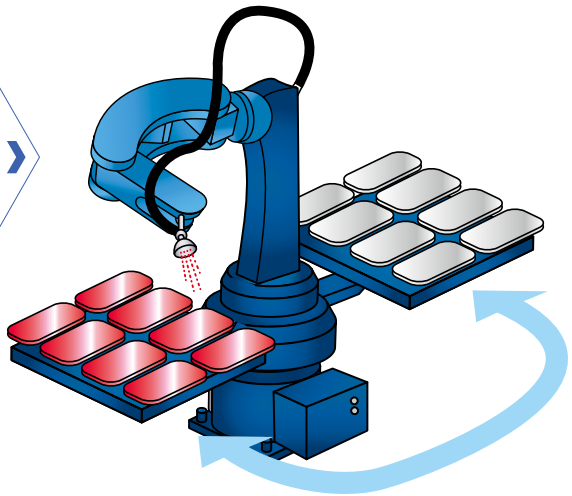


## Wide range of painting

**Full use of the robot's range of motion** — Supports MOTOFEEDERⅡ + MPX1150 (wall-mounted type)*

By mounting a small, lightweight, wall-mounted robot on MOTOFEEDER Ⅱ, Yaskawa's rotational workpiece feeder, a broad area can be painted utilizing the robot's wide range of motion.

A paint applicator can also be mounted on the mounting base for high-quality painting.



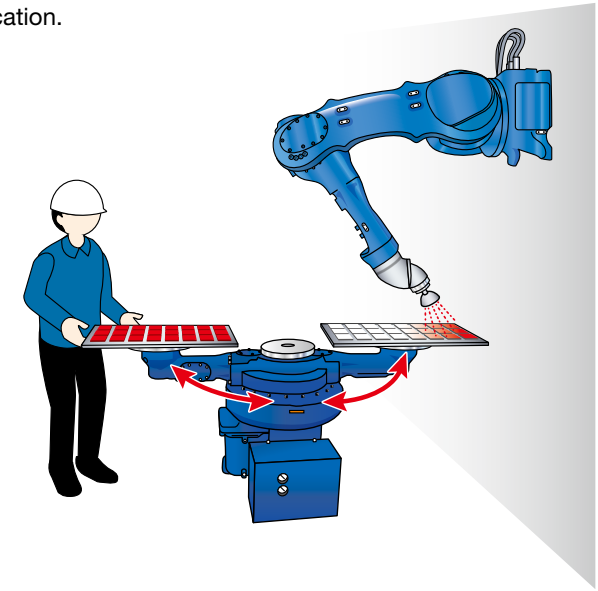



## Unlimited combinations

### Selectable according to target workpiece

Supports MOTOFEEDER Ⅱ+MPX2600 (wall installation in close vicinity)*

Supports various styles of painting by combining the MOTOFEEDER Ⅱ and your choice of painting robot.
The MOTOFEEDER Ⅱ has various arm lengths to choose from and the painting robots and installation method can be selected according to your application.

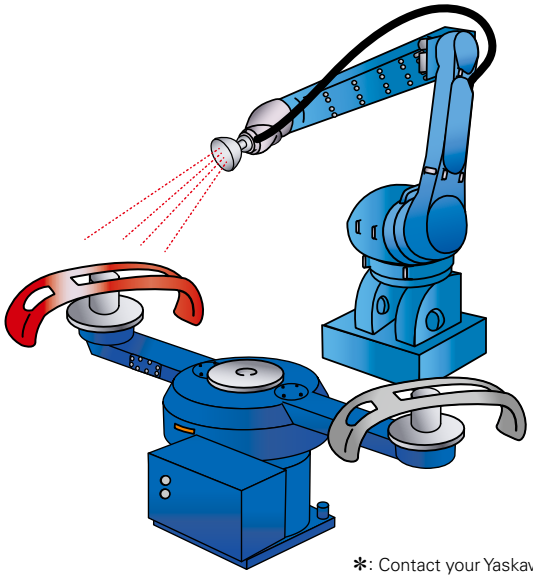


## Painting of large workpieces

### Easily paint large workpieces

Supports MOTOFEEDER Ⅱ+MPX3500 (floor-mounted)*

Painting of detailed workpieces can be carried out by combining the wide range of motion of a large painting robot and the rotation of the MOTOFEEDER Ⅱ turntable. Turntable movements can be coordinated with robot movements and the turntable can be stopped at any angle since the turntable is an external axis of the robot and controlled by a servo.



*: Contact your Yaskawa representative for details on supported models.

High-quality welding with an extensive lineup

# MPX Series

Customer needs **Make equipment compact**

## Three selectable installation methods

· Three installation methods are available depending on the facility to create a flexible layout.

Floor-mounted

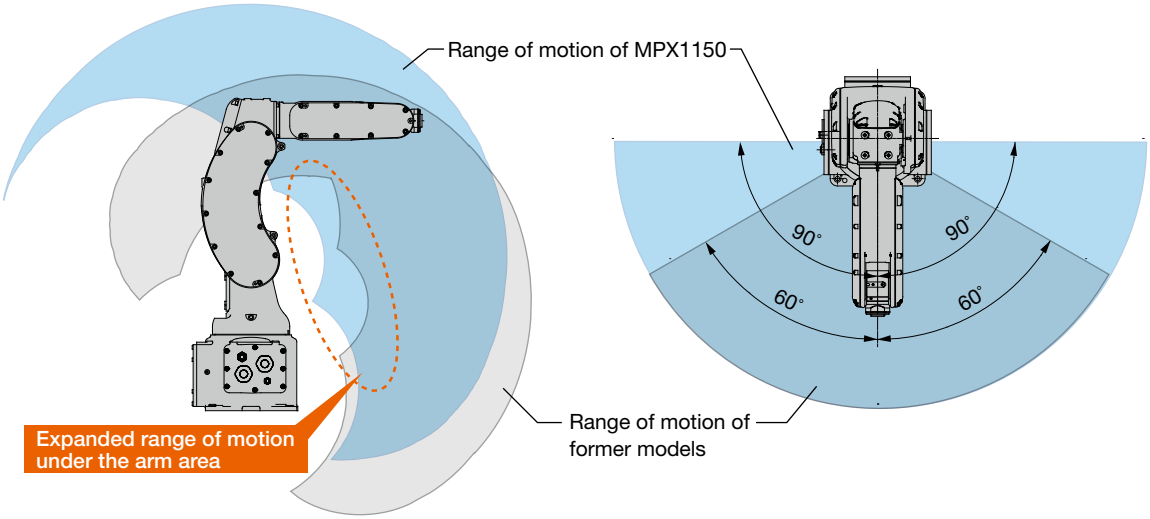
Wall-mounted *

Ceiling-mounted

* S-axis operations are limited when mounted on the wall

## Expanded range of motion

· Since the S/L axis is designed with no offset, workpieces can be placed closer to the robot to use the area under the robot arm more effectively.



Customer needs

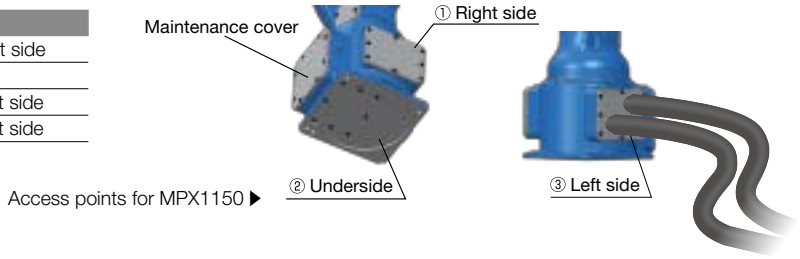
## Make equipment compact

### Selectable access points for power cables

· Access points for power cables can be selected depending on the facility to create flexible layouts.

▼Access points of each model

| Models MOTOMAN- | Access points |
|---|---|
| MPX1150 | Right side, underside, left side |
| MPX1950 | Back side, underside |
| MPX2600 | Right side, back side, left side |
| MPX3500 | Right side, back side, left side |

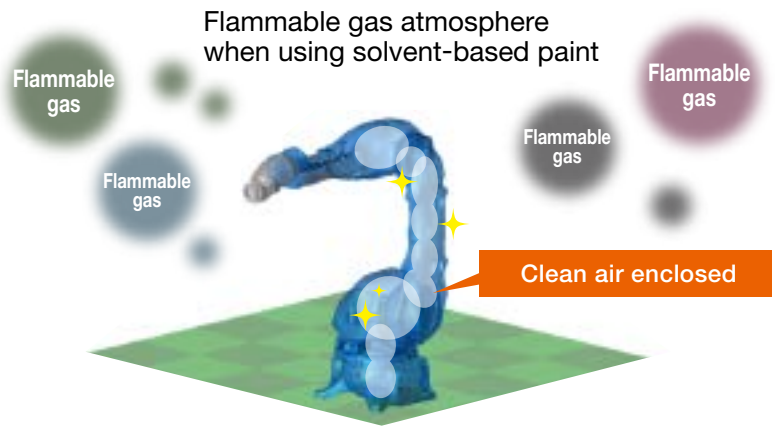



Customer needs

## Reduce running costs

### Pressurized enclosure for explosion protection with reduced air consumption

· The leakage compensation method is used to achieve positive pressure inside the enclosure. This method requires less air during operation than the continuous air flow method.



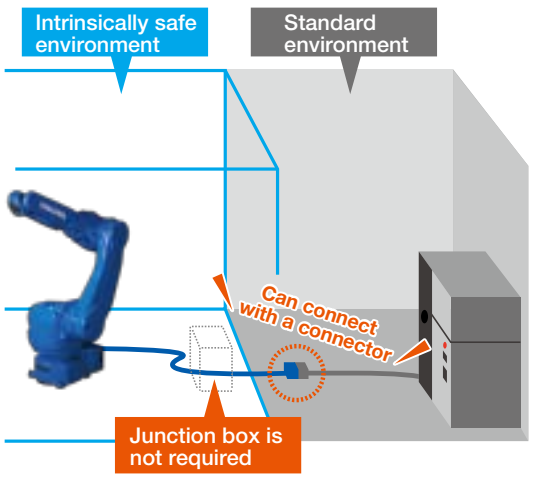

Customer needs

## Reduce time for start-up and equipment maintenance

### Cable can be connected in standard environment

· Power cable can be connected to the junction cable in a standard environment.

· Improve maintenance without the need of a junction box

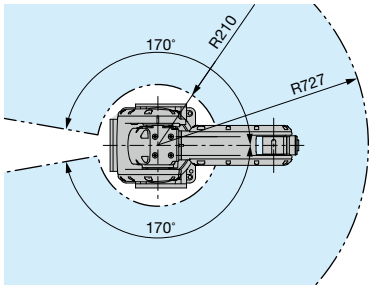


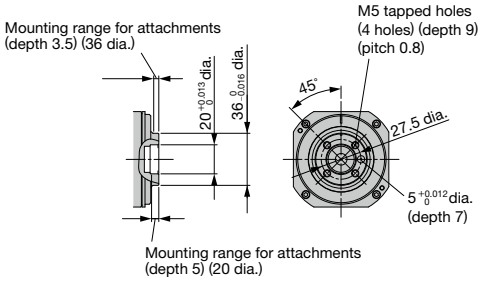
## Optimized for painting of small workpieces MPX1150

**Maximum reach: 727 mm Payload: Wrist (T-axis) 5 kg, Arm (L/U-axis) Total 1 kg**

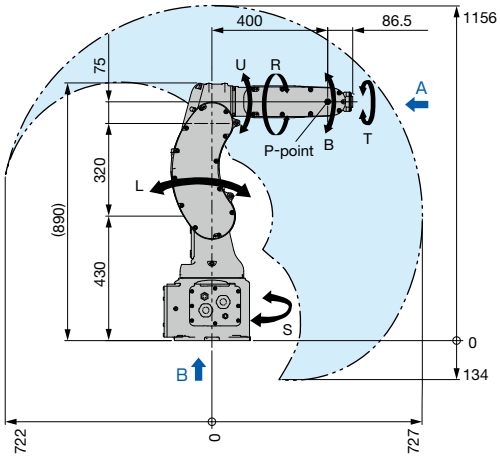
- One of the smallest, intrinsically safe robot in the world
- Wide range of motion with a compact installation
- Larger range of attachable painting guns compared to existing small painting robots

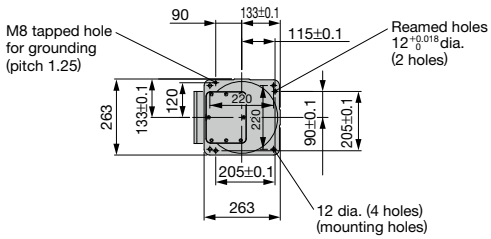
### Dimensions Units: mm ⬚: P-point Maximum Envelope




View A




View B

| Specifications | | MPX1150 |
|---|---|---|
| Type | | YR-MPX1150-✻00 |
| Controlled Axis | | 6 (vertically articulated) |
| Payload | | Wrist (T-axis): 5 kg<br>Arm (L/U-axis): Total 1 kg |
| Repeatability*1 | | ±0.02 mm |
| Range of Motion | S-axis (turning) | −170°−+170°<br>(wall mounted: −90°−+90°) |
| | L-axis (lower arm) | − 80°−+120° |
| | U-axis (upper arm, lower arm) | − 70°−+ 90° |
| | R-axis (wrist roll) | −190°−+190° |
| | B-axis (wrist pitch/yaw) | −135°−+135° |
| | T-axis (wrist twist) | −360°−+360° |
| Maximum Speed | | 1.5 m/s |
| Maximum Speed of Individual Axes | S-axis (turning) | 6.10 rad/s, 350°/s |
| | L-axis (lower arm) | 6.10 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) | 12.56 rad/s, 720°/s |
| Allowable Moment | R-axis (wrist roll) | 12 N·m (1.22 kgf·m) |
| | B-axis (wrist pitch/yaw) | 12 N·m (1.22 kgf·m) |
| | T-axis (wrist twist) | 7 N·m (0.71 kgf·m) |

| Specifications | | MPX1150 |
|---|---|---|
| Allowable Inertia ($GD^2/4$) | R-axis (wrist roll) | 0.3 kg·m² |
| | B-axis (wrist pitch/yaw) | 0.3 kg·m² |
| | T-axis (wrist twist) | 0.1 kg·m² |
| Approx. Mass | | 57 kg |
| Ambient Conditions | Temperature | 0 ℃ to +40 ℃ |
| | Humidity | 20% to 80%RH (non-condensing) |
| | Vibration acceleration | 4.9 m/s² (0.5 G) or less |
| | Altitude | 1000 m or less |
| | Others | Free from excessive electrical noise (plasma)<br>Free from strong magnetic fields |
| Explosion Protection Standard*2 | | TIIS (Japan), FM (North America), ATEX (Europe), KCs (Korea) |
| Power Requirements*3 | | 1.0 kVA |
| Mounting | | Floor, ceiling, wall |

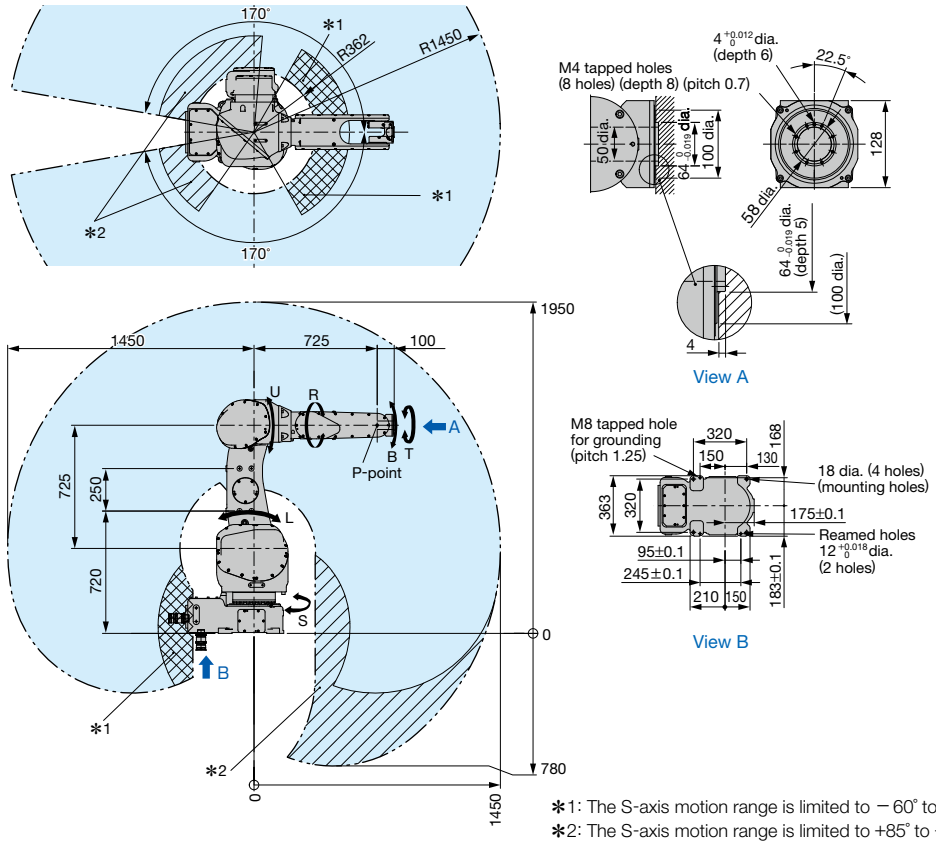
✻1: Conforms to ISO 9283.
✻2: Complies with the following international standards. Contact your Yaskawa representative regarding the approval status.
✻3: Varies in accordance with applications and motion patterns.
Note: SI units are used for the specifications.

# Optimized for painting of general industry workpieces MPX1950

**Maximum reach: 1450 mm Payload: Wrist (T-axis) 7 kg, Arm (L/U-axis) Total 3 kg**

- High-quality painting since small painting guns, such as non-electrostatic compact bells, can be mounted.
- With the hollow wrist structure, small-bell spray guns can be mounted with no offset.

## Dimensions Units: mm [ ]: P-point Maximum Envelope




∗1: The S-axis motion range is limited to −60° to +60°.
∗2: The S-axis motion range is limited to +85° to +170°, and −125° to −170°.

| Specifications | | MPX1950 |
|---|---|---|
| Type | | YR-MPX1950-∗00 |
| Controlled Axis | | 6 (vertically articulated) |
| Payload | | Wrist (T-axis): 7 kg<br>Arm (L/U-axis): Total 3 kg |
| Repeatability*1 | | ±0.15 mm |
| Range of Motion | S-axis (turning) | −170°−+170°<br>(wall mounted: −90°−+90°) |
| | L-axis (lower arm) | −100°−+140° |
| | U-axis (upper arm, lower arm) | − 62°−+235° |
| | R-axis (wrist roll) | −200°−+200° |
| | B-axis (wrist pitch/yaw) | −150°−+150° |
| | T-axis (wrist twist) | −400°−+400° |
| Maximum Speed | | 1.5 m/s |
| Maximum Speed of Individual Axes | S-axis (turning) | 3.14 rad/s, 180°/s |
| | L-axis (lower arm) | 3.14 rad/s, 180°/s |
| | U-axis (upper arm) | 3.14 rad/s, 180°/s |
| | R-axis (wrist roll) | 6.28 rad/s, 360°/s |
| | B-axis (wrist pitch/yaw) | 6.98 rad/s, 400°/s |
| | T-axis (wrist twist) | 8.72 rad/s, 500°/s |
| Allowable Moment | R-axis (wrist roll) | 19.6 N·m (2.0 kgf·m) |
| | B-axis (wrist pitch/yaw) | 19.6 N·m (2.0 kgf·m) |
| | T-axis (wrist twist) | 9.8 N·m (1.0 kgf·m) |

| Specifications | | MPX1950 |
|---|---|---|
| Allowable Inertia ($GD^2/4$) | R-axis (wrist roll) | 0.6 kg·m² |
| | B-axis (wrist pitch/yaw) | 0.6 kg·m² |
| | T-axis (wrist twist) | 0.16 kg·m² |
| Approx. Mass | | 265 kg |
| Ambient Conditions | Temperature | 0 ℃ to +40 ℃ |
| | Humidity | 20% to 80%RH (non-condensing) |
| | Vibration acceleration | 4.9 m/s² (0.5 G) or less |
| | Altitude | 1000 m or less |
| | Others | Free from excessive electrical noise (plasma)<br>Free from strong magnetic fields |
| Explosion Protection Standard*2 | | TIIS (Japan), FM (North America) |
| Power Requirements*3 | | 1.75 kVA or less |
| Mounting*4 | | Floor, ceiling, wall |

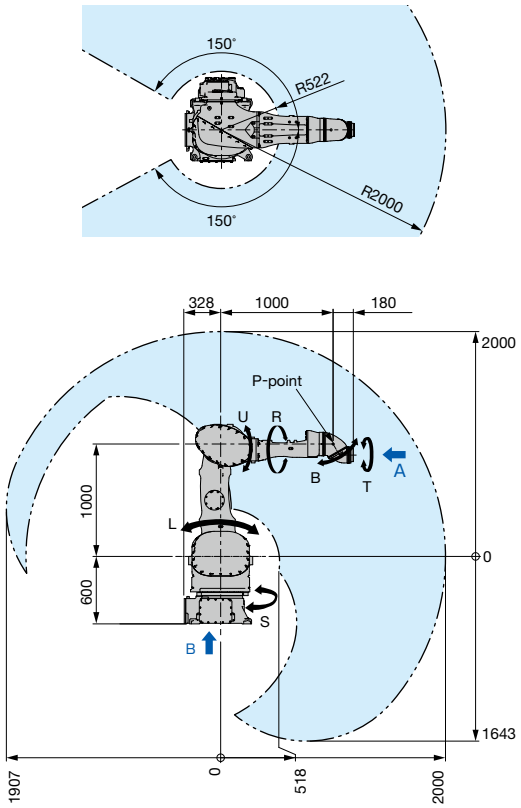
∗1: Conforms to ISO 9283.
∗2: Complies with the following international standards. Contact your Yaskawa representative regarding the approval status.
∗3: Varies in accordance with applications and motion patterns.
∗4: Ceiling and wall-mounting installation methods are optional.
Note: SI units are used for the specifications.

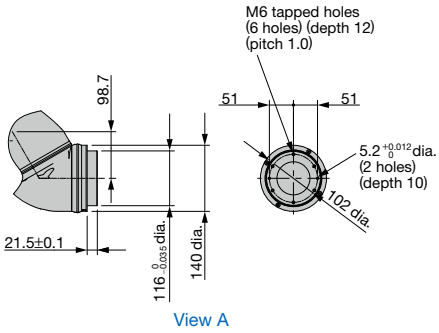
## Optimized for painting of medium-sized workpieces MPX2600

**Maximum reach: 2000 mm Payload: Wrist (T-axis) 15 kg, Arm (U-axis) 20 kg**

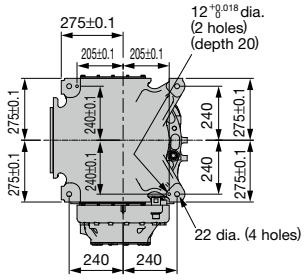
- Hollow arm with a large inner diameter can prevent interference between paint and air tubes.
- With the 15-kg wrist payload, multiple guns and large-bell spray guns can be mounted.
- A cartridge type, large-bell spray gun can be mounted because the MPX2600 uses the same wrist unit as the MPX3500.
- Painting devices, such as a color changing device, can be mounted on the U-arm.

### Dimensions Units: mm ⬚: P-point Maximum Envelope




View A




View B

| Specifications | | MPX2600 |
|---|---|---|
| Type | | YR-MPX2600-∗00 |
| Controlled Axis | | 6 (vertically articulated) |
| Payload | | Wrist (T-axis): 15 kg<br>Arm (U-axis): 20 kg |
| Repeatability*1 | | ±0.2 mm |
| Range of Motion | S-axis (turning) | −150°−+150°<br>(wall mounted: −90°−+90°) |
| | L-axis (lower arm) | − 65°−+130° |
| | U-axis (upper arm, lower arm) | − 65°−+150° |
| | R-axis (wrist roll) | −720°−+720° |
| | B-axis (wrist pitch/yaw) | −720°−+720° |
| | T-axis (wrist twist) | −720°−+720° |
| Maximum Speed | | 2.0 m/s |
| Maximum Speed of Individual Axes | S-axis (turning) | 2.09 rad/s, 120°/s |
| | L-axis (lower arm) | 2.09 rad/s, 120°/s |
| | U-axis (upper arm) | 2.18 rad/s, 125°/s |
| | R-axis (wrist roll) | 6.28 rad/s, 360°/s |
| | B-axis (wrist pitch/yaw) | 6.28 rad/s, 360°/s |
| | T-axis (wrist twist) | 6.28 rad/s, 360°/s |
| Allowable Moment | R-axis (wrist roll) | 93.2 N·m (9.5 kgf·m) |
| | B-axis (wrist pitch/yaw) | 58.8 N·m (6.0 kgf·m) |
| | T-axis (wrist twist) | 19.6 N·m (2.0 kgf·m) |

| Specifications | | MPX2600 |
|---|---|---|
| Allowable Inertia ($GD^2/4$) | R-axis (wrist roll) | 3.75 kg·m² |
| | B-axis (wrist pitch/yaw) | 2.225 kg·m² |
| | T-axis (wrist twist) | 0.2 kg·m² |
| Hollow Wrist Diameter | | 70 mm |
| Approx. Mass | | 485 kg |
| Ambient Conditions | Temperature | 0 °C to +40 °C |
| | Humidity | 20% to 80%RH (non-condensing) |
| | Vibration acceleration | 4.9 m/s² (0.5 G) or less |
| | Altitude | 1000 m or less |
| | Others | Free from excessive electrical noise (plasma)<br>Free from strong magnetic fields |
| Explosion Protection Standard*2 | | TIIS (Japan), FM (North America), ATEX (Europe), KCs (Korea) |
| Power Requirements*3 | | 3.0 kVA |
| Mounting*4 | | Floor, ceiling, wall |

∗1: Conforms to ISO 9283.
∗2: Complies with the following international standards. Contact your Yaskawa representative regarding the approval status.
∗3: Varies in accordance with applications and motion patterns.
∗4: Ceiling and wall-mounting installation methods are optional.
Note: SI units are used for the specifications.

# Optimized for painting of large workpieces MPX3500

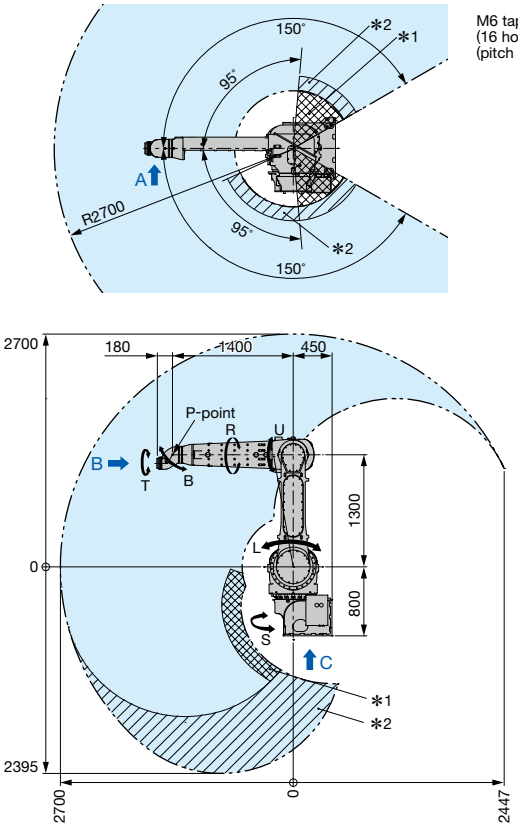
**Maximum reach: 2700 mm Payload: Wrist (T-axis) 15 kg, Arm (U-axis) 25 kg**

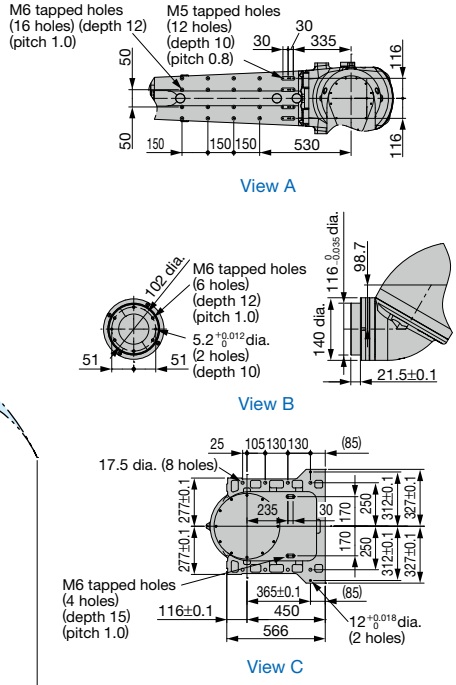
- Large painting robot with diverse installation methods to suit any automobile painting line
- External axes for pumps and control equipment for paint applicators can be built inside the arm.
- Symmetrical robots are available. Teaching data can be converted symmetrically for simple teaching.

## Dimensions

Units: mm [ ]: P-point Maximum Envelope

Note: The following figure shows the dimensions of YR-MPX3500-∗0∗ model. Refer to individual dimension diagrams for detailed dimensions and specifications for other models.



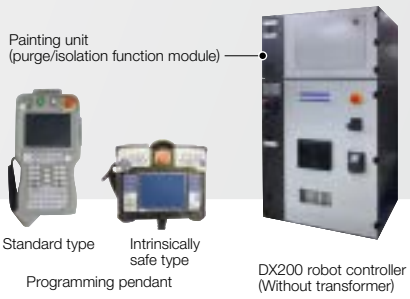

∗1: The S-axis motion range is limited to +95° to +150°, and −95° to −150°.
∗2: The S-axis motion range is limited to +25° to +150°, and −95° to −150°. The L-axis motion range is limited to −65° to +150°.

| Specifications | | MPX3500 |
|---|---|---|
| Type | | YR-MPX3500-∗0∗<br>YR-MPX3500-∗1∗ |
| Controlled Axis | | 6 (vertically articulated) |
| Payload | | Wrist (T-axis): 15 kg<br>Arm (U-axis): 25 kg*4 |
| Repeatability*1 | | ±0.15 mm |
| Range of Motion | S-axis (turning) | −150° −+150° |
| | L-axis (lower arm) | − 65° −+140° |
| | U-axis (upper arm, lower arm) | − 65° −+ 90° |
| | R-axis (wrist roll) | −720° −+720° |
| | B-axis (wrist pitch/yaw) | −720° −+720° |
| | T-axis (wrist twist) | −720° −+720° |
| Maximum Speed | | 2.0 m/s |
| Maximum Speed of Individual Axes | S-axis (turning) | 1.75 rad/s, 100°/s |
| | L-axis (lower arm) | 1.75 rad/s, 100°/s |
| | U-axis (upper arm) | 1.92 rad/s, 110°/s |
| | R-axis (wrist roll) | 5.24 rad/s, 300°/s |
| | B-axis (wrist pitch/yaw) | 6.28 rad/s, 360°/s |
| | T-axis (wrist twist) | 6.28 rad/s, 360°/s |
| Allowable Moment | R-axis (wrist roll) | 93.2 N·m (9.5 kgf·m) |
| | B-axis (wrist pitch/yaw) | 58.8 N·m (6.0 kgf·m) |
| | T-axis (wrist twist) | 19.6 N·m (2.0 kgf·m) |

| Specifications | | MPX3500 |
|---|---|---|
| Allowable Inertia ($GD^2/4$) | R-axis (wrist roll) | 3.75 kg·m² |
| | B-axis (wrist pitch/yaw) | 2.225 kg·m² |
| | T-axis (wrist twist) | 0.2 kg·m² |
| Hollow Wrist Diameter | | 70 mm |
| Approx. Mass | | 590 kg |
| Ambient Conditions | Temperature | 0 ℃ to +40 ℃ |
| | Humidity | 20% to 80%RH (non-condensing) |
| | Vibration acceleration | 4.9 m/s² (0.5 G) or less |
| | Altitude | 1000 m or less |
| | Others | Free from excessive electrical noise (plasma)<br>Free from strong magnetic fields |
| Certification of Explosion Protection | | TIIS (Japan), FM (North America), ATEX (Europe), KCs (Korea) |
| Power Requirements*2 | | 3.0 kVA |
| Mounting*3 | | Floor, ceiling, wall |

∗1: Conforms to ISO 9283.
∗2: Varies in accordance with applications and motion patterns.
∗3: Ceiling and wall-mounting installation methods are optional.
∗4: These payloads are correlated. They change depending on the weights of attachments on the arm and wrist.
Note: SI units are used for the specifications.

# DX200 Robot Controller



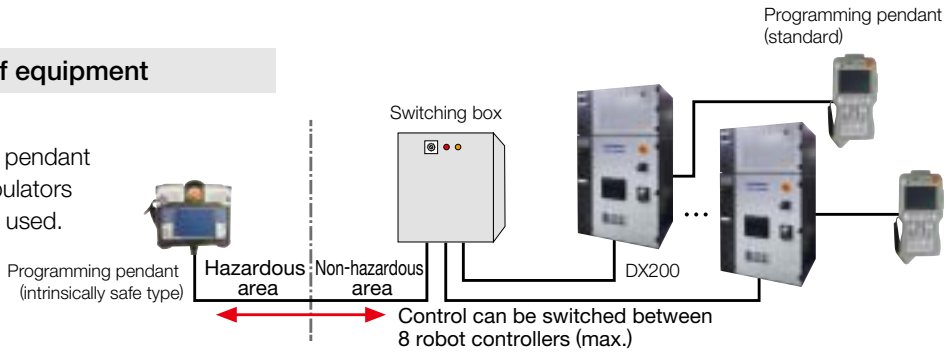

## Customer needs — Make equipment compact

### Smaller controller in unit configuration to create an optimal structure for painting applications

- The painting unit (purge/isolation function module) is mounted on the standard robot controller to create the ideal controller for painting applications.
- The height of the controller is reduced by 25% in comparison with former models.
- Two types of programming pendants are available: standard type and intrinsically safe type (can be placed in hazardous area).

## Customer needs — Standardization of equipment

One intrinsically safe programming pendant can control a maximum of 8 manipulators when the optional switching box is used.




■ DX200 Controller Specifications

| Items | Specifications |
|---|---|
| Configuration | Dust proof structure IP54 |
| Dimensions | 600 (W)×520 (D)×1060 (H) mm (without transformer) / 600 (W)×520 (D)×1340 (H) mm (with transformer) |
| Approx. Mass | 150 kg (without transformer) / 250 kg (with transformer) |
| Cooling System | Indirect cooling |
| Ambient Temperature | During operation: 0 ℃ to +45 ℃, During storage: −10 ℃ to +60 ℃ |
| Relative Humidity | 10% to 90%RH (non-condensing) |
| Vibration etc. | 4.9 m/s² (0.5 G) or less, must be installed in a non-hazardous area |
| Power Supply | Without transformer: Three-phase 200 VAC (+10% to −15%), 50/60 Hz (±2%)<br>Three-phase 220 VAC (+10% to −15%), 60 Hz (±2%)<br>With transformer: Asia Three-phase 380 VAC (+10% to −15%), 50/60 Hz (±2%)<br>North America Three-phase 480 VAC (+10% to −15%), 50/60 Hz (±2%)<br>Europe Three-phase 400 VAC (+10% to −15%), 50/60 Hz (±2%) |
| Grounding | Grounding resistance: 100 Ω or less* |
| Digital I/Os | Specialized signals: 28 inputs and 7 outputs<br>General signals: 40 inputs and 40 outputs (Specialized allocation: 24 inputs and 24 outputs, General allocation: 16 inputs and 16 outputs)<br>Max. I/O (optional): 4096 inputs and 4096 outputs |
| Positioning System | Serial communications (absolute encoder) |
| Programming Capacity | JOB: 200,000 steps, 10,000 instructions<br>CIO ladder: 20,000 steps max. |
| Expansion Slots | PCI: 2 slots |
| LAN (Connection to Host) | 1 (10BASE-T/100BASE-TX) |
| Interface | RS-232C: 1 ch |
| Control Method | Software servo control |
| Drive Units | SERVOPACK for AC servomotors (For robot + external axis (optional)) |

*: When using the Intrinsically safe programming pendant, ground to a resistance of 10 Ω or less via the specified terminal.

■ Programming Pendant Specifications

| Items | Standard | Intrinsically safe |
|---|---|---|
| Dimensions | 169 (W)×50 (D)×314.5 (H) mm | 235 (W)×78 (D)× 203 (H) mm |
| Approx. Mass | 0.990 kg | 1.30 kg (except the cable) |
| Material | Reinforced plastics | |
| Operation Device | Compact flash card interface device, USB port (1 port) | |
| Display | 5.7-inch color LCD, touch panel 640×480 pixels<br>(Alphanumeric characters, Chinese characters, Japanese letters, others) | 5.7-inch monochrome LCD, backlit white LED, touch panel 320× 240 pixels<br>(Alphanumeric characters, Chinese characters, Japanese letters, others) |
| Explosion Protection Standard | | TIIS (Japan). FM (North America). ATEX (Europe). KCs (Korea) |
| IEC Protection Class | IP65 | IP54 |
| Cable Length | Standard: 8 m,<br>Max.: 36 m (with optional extension cable) | Standard: 8 m (20 m cable is optional),<br>Max.: 50 m (with optional extension cable) |

# DX200's optimized functions for painting

Customer needs

## Standardization of equipment

### Customizing configuration items

The configuration item name, unit, and output form for painting conditions can be optionally set to suit various painting devices using the paint system configuration.

**Paint system configuration screen**

**Reflected to the following screen**

- Characteristics of painting device
- Paint condition
- Calibration configuration
- Time chart
- Paint output test

**Characteristics of painting device screen**

**Paint condition screen**

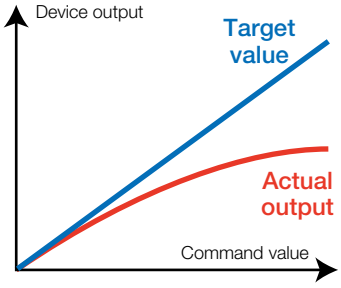
Customer needs

## Improve painting quality

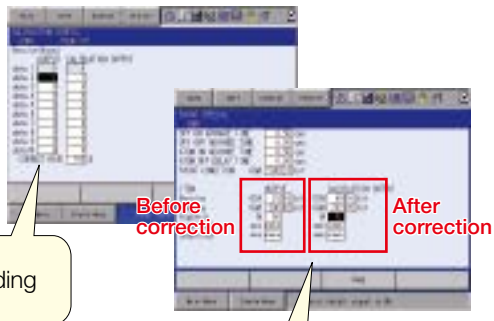
### Calibration Output

When actual values output by the paining device do not match with the command values, these command values can be corrected in the calibration configuration settings.

**When the device output is smaller than the command value**



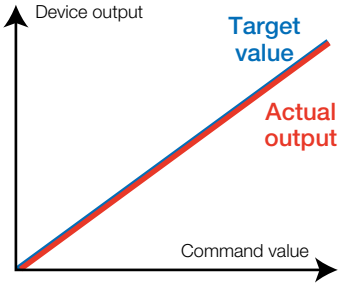

Corrected according to the characteristics of the painting device




Output will be corrected according to the settings

Output signals are specified by number

**Improve device output to an ideal value**




Achieve an ideal output by inputting a larger command value compared to the device output value

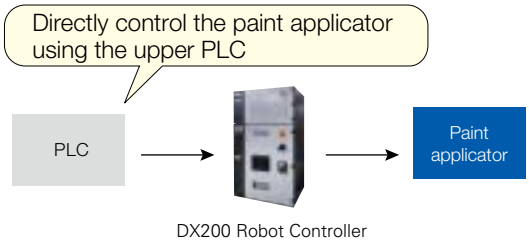
# DX200's optimized functions for painting

Customer needs

## Standardization of equipment

### I/O Paint condition output function

A command value for the input signal can control the paint condition output to the painting device without the need to execute the PAINTSET command.

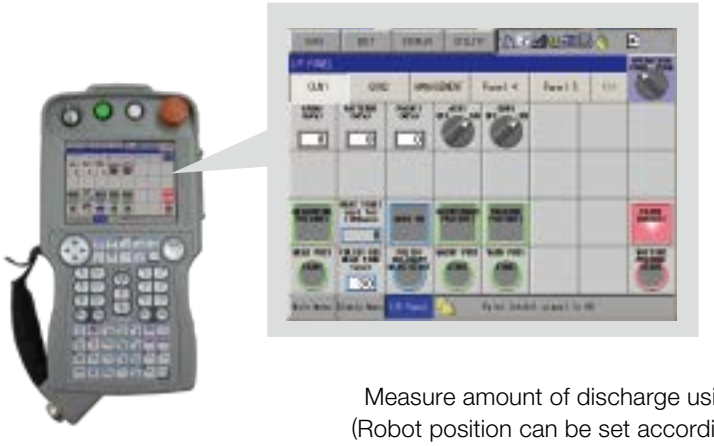



**I/O Paint condition output configuration screen**

### Interface panel function

The interface panel function allows intuitive operation to simplify complicated operations.

**Interface screen**



**When to use**

- Measurement of discharge amount
- Gun maintenance
- Gun cleaning

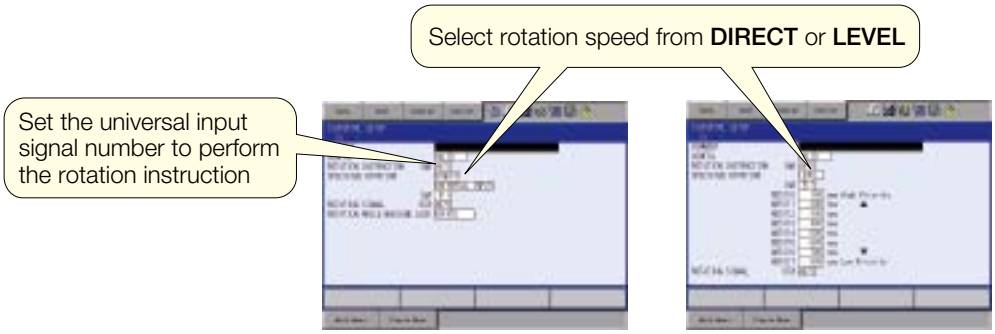
Measure amount of discharge using the panel ▶
(Robot position can be set according to facility)

Customer needs

## Improve painting quality

### I/O Speed control function

The speed control operation of the external axis can be operated by inputting an external signal without the need to execute the speed control command by a JOB. The speed control function can be used to control the pump axis used mainly in painting.

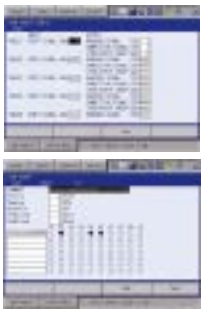


Customer needs

## Increase work efficiency

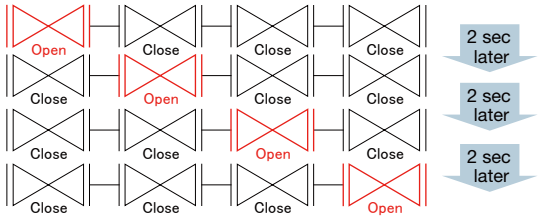
### Time chart function

When using the start signal input as a trigger, the signal output control is performed by varying the ON and OFF patterns specified in the time chart at every specified time. Start-up costs can be reduced as the color change sequence using the PLC is not required. The number of steps of the ladder program can be reduced.



Signals are output according to cleaning and filling patterns

Easy valve opening and closing patterns when cleaning the gun and filling paint




Customer needs

## Make equipment compact

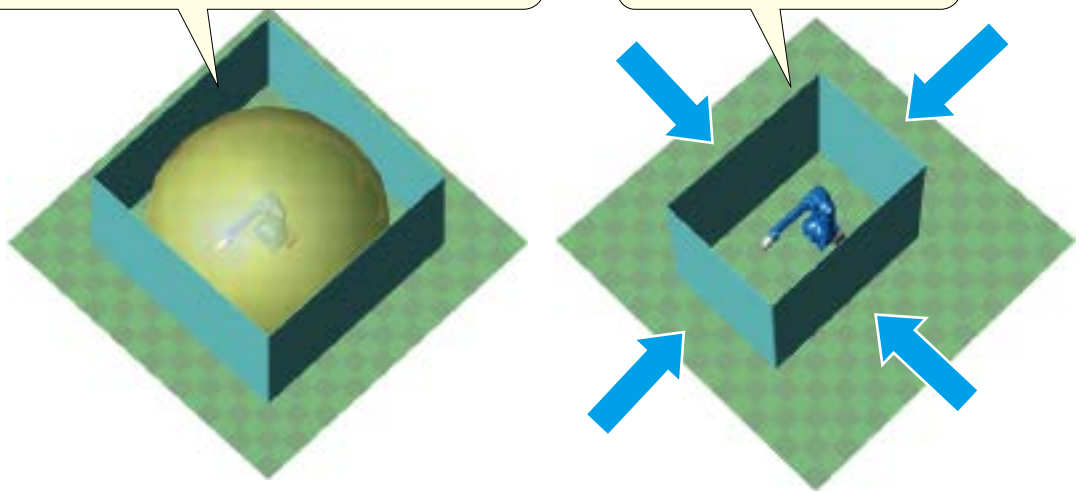
### Safety functions (optional)

Movements of the robot can be limited to a set area by monitoring the positions of the robot and tool. Safety is improved because positions are monitored with the functional safety module equipped with a double-CPU structure. With this function, the safety fence can be installed in a smaller area than the robot's motion range.

**When using the functional safety module**

A safety fence is required around the robot's motion range

Less space is necessary



# MPXAP air control panel for painting devices

## Reduce start-up time

Setup is simple after delivery of equipment since the MPXAP can be combined easily with the MPX series robots.

Customer needs

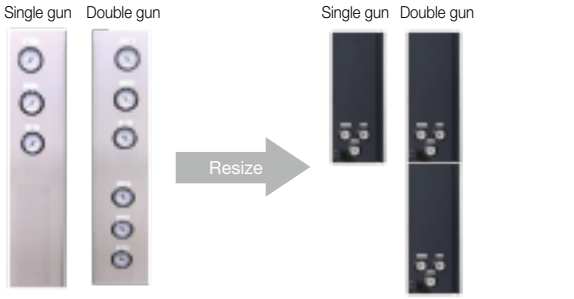
**Reduce time for start-up and equipment maintenance**

### Miniaturization

· The air panel for a single-gun specification is more compact, which saves installation space.

### Improved maintenance

· A handle is attached for easy opening and closing of the panel.



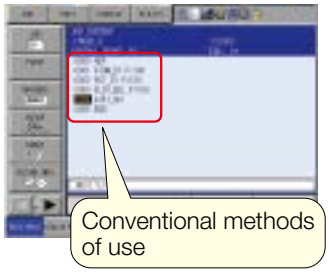

**Air panel for former model**
○Single-gun, double-gun specification
150 (W)×520 (D)×1350 (H) mm

**Air panel for DX200**
○Single-gun specification
200 (W)×520 (D)×500 (H) mm
○Double-gun specification
200 (W)×520 (D)×1000 (H) mm

## Enhancement of standard functions

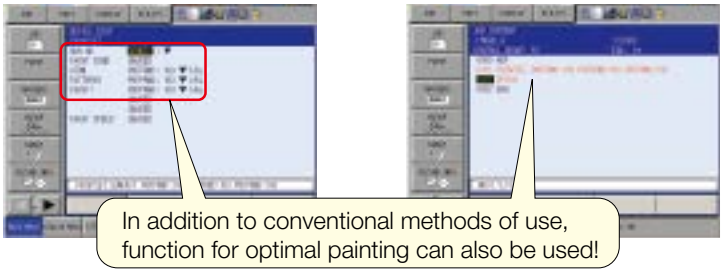
· Operation → Intuitive operation with exclusive JOB and interface panel function
· Automatic operation → Dedicated macro command allows the robot to execute an operation equivalent to conventional products
→ JOB creation is also possible using the PAINTSET command

**Dedicated macro command screen**



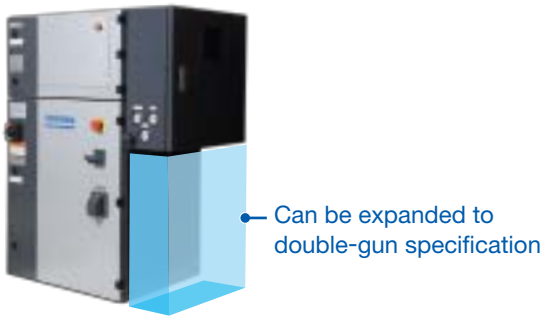

**PAINTSET command (paint applicator control function) setting screen**

**JOB creation screen**




## Free installation method

· Can be installed individually or attached on the side of DX200
· Can be installed in locations other than the controller
· Can easily support equipment change from single-gun to double-gun specification



## Multiple variations

- In addition to the analog communications specifications of conventional models, DeviceNet specifications are also available in line with the communications format with peripheral devices.
- The intrinsically-safe programming pendant can be used and operations can be enhanced by adding the optional touch panel. When the panel is added, the status of the robot and paint applicator can be monitored while maintaining the same operability of the interface panel function.

Selectable communications method

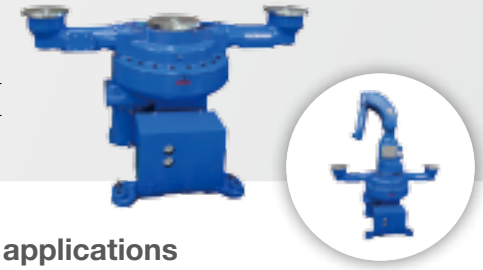
| Communications format | Guns specification | Pressure display | DX200 setting | Touch panel |
|---|---|---|---|---|
| DeviceNet | Single gun | Digital (interface panel) | Master | Compatible |
| | Double gun | | | |
| | Single gun added | | | |
| Analog | Single gun | Analog (side of the panel) | - | Compatible |
| | Double gun | | | |
| | Single gun added | | | |

◀ Touch panel screen (optional)

■ MPXAP air control panel specifications

| Item | | | DeviceNet Specification | Analog Specification |
|---|---|---|---|---|
| Type | | | MPXAP-D✻✻✻ | MPXAP-A✻✻✻ |
| Dimensions | | | 500 (W)×200 (D)×500 (H) mm | |
| Primary Air | Mist separator (optional) | Type | AFM40-04B-✻✻✻ (SMC) | |
| | | Specification | Degrease specification | |
| | | Rated flow rate | 1,100 L/min (at input pressure 0.7 MPa) | |
| | | Used pressure | 0.05-1.0 Mpa | |
| | Connection diameter | | 12 dia. (back of air panel)<br>When Installing optional mist separator: Mist separator IN side<br>Without optional mist separator: Primary air (back of air panel) | |
| Paint Applicator Control | Electro-pneumatic control | Type | ITV2050-DE2L-✻✻✻ (SMC) | ITV2050-312L-✻✻✻ (SMC) |
| | | Specification | · No-step specification<br>· Degrease specification<br>· Individual control of atomization, pattern and discharge amount | |
| | | Specified pressure range | 0.005-0.9 Mpa | |
| | | Quantity | 3 pcs | |
| | | Connection diameter | 10 dia. (back of air panel): Atomization and pattern<br>6 dia. (back of air panel): Discharge | |
| | | Pressure gauge | No (Displayable on Programming pendant) | Type: G46-10-01-C-✻✻✻ (SMC)<br>Range: 0-1.0 MPa (front of air panel)<br>Quantity: 3 pcs |
| | Air-operated valve | Type | VPA342-1-02A-F-✻✻✻ (SMC) | |
| | | Specification | Degrease specification | |
| | | Quantity | 2 pcs Set on the output side of electro-pneumatic control (atomization and pattern) | |
| | Direct operated precision regulator | Type | ARP30-03BG-3-✻✻✻ (SMC) | |
| | | Specification | · Degrease specification<br>· For solenoid valve base pressure adjustment | |
| | | Specified pressure range | 0.008-0.6 MPa | |
| | Solenoid valve | Type | SY5A00-5Z1-✻✻✻ (SMC) | VQZ215-5LO1-✻✻✻ (SMC) |
| | | Specification | · Double solenoid valve<br>· Degrease specification | · Single solenoid valve<br>· Degrease specification |
| | | Quantity | 2 pcs (4 signals)<br>Spray, reserve, atomization, and pattern | 4 pcs (4 signals)<br>Spray, reserve, atomization, and pattern |
| | | Connection diameter | 6 dia. (back of air panel) (spray and reserve) | |

# Rotational workpiece feeder MOTOFEEDER Ⅱ



View when mounted

## Rotational workpiece feeder that supports various painting applications

Wide variety of models to support compact and smooth painting for various applications.

Customer needs

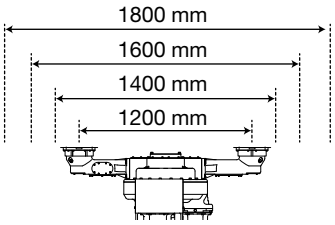
**Reduce equipment installation cost**

### Substantial reduction in equipment investment costs

· Can easily launch painting in lot production without adding large-scale equipment, such as conveyors, with a painting robot, MOTOFEEDER Ⅱ, and a paint applicator.

### Space-saving installation

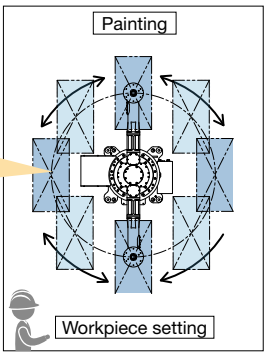
· A 1200-mm table pitch model has been added to existing 1400-mm, 1600-mm, and 1800-mm models, allowing for even greater space savings.




### Reduced interference during workpiece transfer

· Improved turntable movements prevent long workpieces from coming into contact with walls.

Feed a workpiece while maintaining the direction using forward direction rotary method.

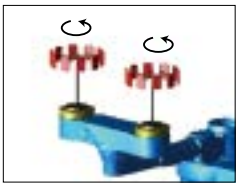



### Spindle painting application

· The MOTOFEEDER Ⅱ can be used for high-efficiency spindle painting. A single or double spindle can be selected as options to the standard turntable.

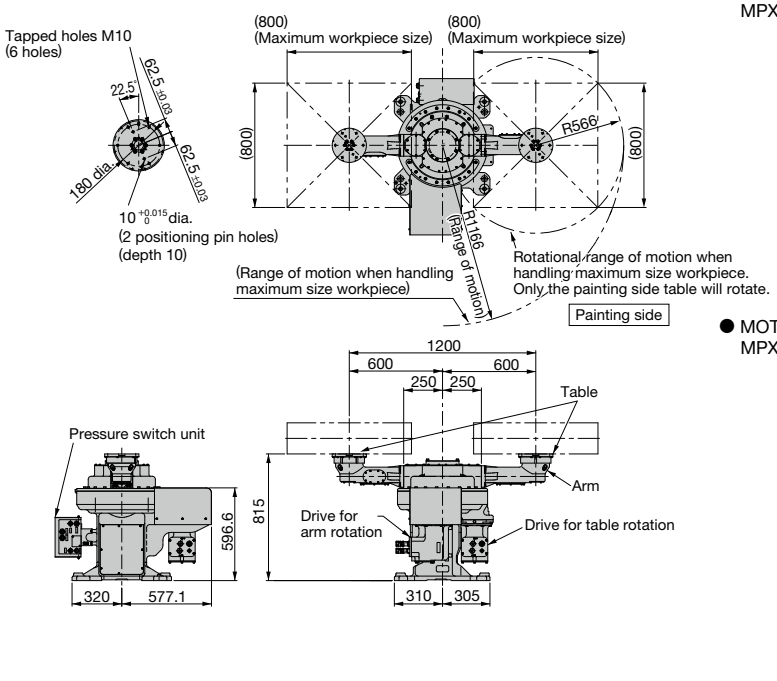
Turntable

Single spindle

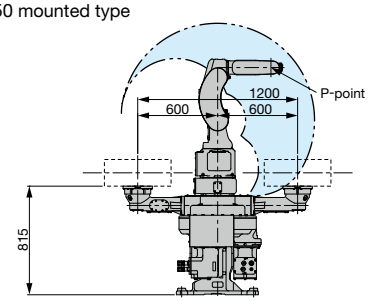


Double spindle

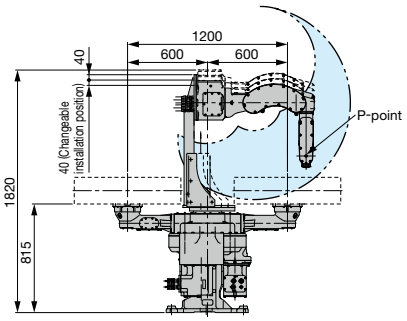
## Dimensions Units: mm ⬚: P-point Maximum Envelope




● MOTOFEEDER Ⅱ Pitch between tables 1200 mm
MPX1150 mounted type




● MOTOFEEDER Ⅱ Pitch between tables 1200 mm
MPX1150 mounted type (wall-mounted type)




Note: Equipment layout should be considered before mounting a robot on the MOTOFEEDER Ⅱ.

### ■ MOTOFEEDERⅡ Specifications

| Items | | Specifications | | | |
|---|---|---|---|---|---|
| Pitch between tables | | 1200 mm | 1400 mm | 1600 mm | 1800 mm |
| Number of Axes | | 2 (changing gears for tables) | | | |
| Control Method | | AC servo drive control (robot's external axes control) | | | |
| Table Rotation Method | | Indexed or spindle rotation (endless rotation) can be selected. | | | |
| Max. Load | Values per table | Heavy loads model: 40 kg | | | |
| | | High-speed rotation model: 20 kg | | | |
| Max. Speed (Rotation Speed) | | Arm: 2.27 rad/s, 130°/s | | | |
| | | Table (for 40 kg load): 4.71 rad/s, 270°/s | | | |
| | | Table (for 20 kg load): 15.7 rad/s, 900°/s | | | |

| Items | | Specifications | | | |
|---|---|---|---|---|---|
| Repeatability | | ±0.55 mm (at 300 mm from the center of table) | | | |
| Allowable Inertia (GD²/4) | | 2.8 kg·m² (for 40 kg load) | | | |
| | | 1.4 kg·m² (for 20 kg load) | | | |
| Approx. Mass | | 470 kg | 475 kg | 490 kg | 495 kg |
| Ambient Conditions | Temperature | 0°C to +40°C | | | |
| | Humidity | 20% to 80%RH (non-condensing) | | | |
| | Vibration | 4.9 m/s² (0.5 G) or less | | | |
| | Others | Free from excessive electrical noise (plasma) | | | |
| Explosion Protection Standard*1 | | TIIS (Japan), ATEX (Europe), FM (North America) | | | |

### ■ Optional Specifications

| Items | | Specifications |
|---|---|---|
| Double-spindle Unit (with two rotational shafts)*2 | Max. Load | 10 kg |
| | Max. Speed | 900°/s |
| | Allowable Inertia (GD²/4) | 0.6 kg·m² |
| | Pitch Between Tables | 600 mm (A workpiece must be no larger than 250 mm from the center of the table.) |
| | Repeatability | ±1.1 mm (at 200 mm from the center of table) |
| | Approx. Mass | 20 kg |
| Operation Box | | Emergency stop, start, and hold functions |

*1: Complies with the following international standards. Contact your Yaskawa representative regarding the approval status.
*2: Two rotational shafts perform the same operation.

## Maximum Movable Width

Refer to the below list for the booth width when handling a maximum-size workpiece.

| Pitch between tables (mm) | Maximum workpiece size (mm) | Maximum movable width (mm) |
|---|---|---|
| 1200 | 800×800 | 2000 |
| 1400 | 800×800 | 2200 |
| 1600 | 800×800 | 2400 |
| 1800 | 800×800 | 2600 |

# Door opener robot for automobile painting applications MPO10

## Compact door opener robot optimal for painting the interior surface of automobile bodies

By combining the MPO10 with MOTOMAN-MPX painting robots, it is possible to construct highly-productive production lines.

Customer needs

**Make equipment compact**

### Installation in a compact booth

- The low-height design of the MPO10 saves space and enables a high-density layout in combination with painting robots.
- Installation in a compact painting booth cuts running costs for the booth.

### Flexible layout

- Motion range of the S-axis can be selected from three patterns (Standard(S), L, and R type).
- Location of the stopper for and settings of MPO10 can be changed to meet new system requirements even after the system is set up.
- Location to connect power cables can be selected from three patterns (left, right, or back side).

Can be mounted on a traverse track

### Easy maintenance

- Cylindrical and smooth design of the lift section allows for easy routine maintenance.

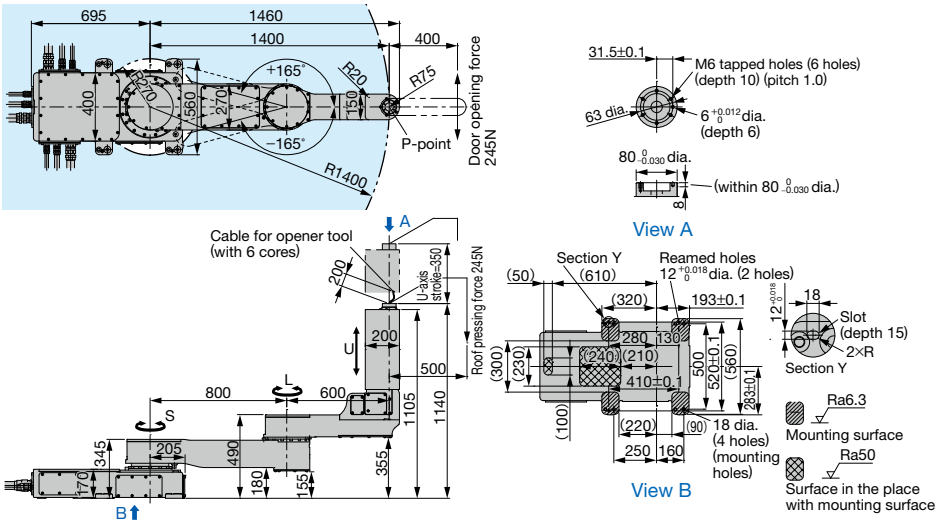
### Selectable controller

- Select from either a standalone controller or coordinated controller for use with a painting robot controller.

■ Dimensions

Units: mm

: P-point Maximum Envelope




■ MPO10 Specifications

| Items | | | Specifications |
|---|---|---|---|
| Type | | | YR-MPO0010-∗00 |
| Controlled Axis | | | 3 (horizontally articulated) |
| Payload | | | 10 kg |
| Door Opening Force*1 | | | 245 N |
| Roof Pressing Force*2 | | | 245 N |
| Repeatability*3 | | | ±0.15 mm |
| Range of Motion | S-axis (lower arm) | Standard | −150° − +150° |
| | | L-type | −200° − + 60° |
| | | R-type | − 60° − +200° |
| | L-axis (upper arm) | | −165° − +165° |
| | U-axis (up/down) | | 0 mm to 350 mm |
| Maximum Speed | S-axis (lower arm) | | 2.27 rad/s, 130°/s |
| | L-axis (upper arm) | | 2.27 rad/s, 130°/s |
| | U-axis (up/down) | | 500 mm/s |

∗1: The horizontal load point is 400 mm (max.) from the center of the flange.
∗2: The vertical load point is 500 mm (max.) from the center of the flange.
∗3: Conforms to ISO 9283.

| Items | | Specifications |
|---|---|---|
| Allowable Moment (Gravity Direction) | Opener tool (at flange) | 27 N·m |
| Allowable Inertia (CD²/4) | Opener tool (at flange) | 1.0 kg·m² |
| Approx. Mass | | 350 kg |
| Ambient Conditions | Temperature | 0 ℃ to +40 ℃ |
| | Humidity | 20% to 80%RH (non-condensing) |
| | Vibration | 4.9 m/s² (0.5 G) or less |
| | Others | Free from corrosive gas or liquid, or explosive gas or liquid<br>Free from exposure to water, oil, or dust<br>Free from excessive electrical noise (plasma) |
| Explosion Protection Standard*4 | | TIIS(Japan), FM(North America), ATEX(Europe), KCs(Korea) |
| Power Requirements*5 | | 1.25 kVA |

∗4: Complies with the following international standards. Contact your Yaskawa representative regarding the approval status.
∗5: Varies in accordance with applications and motion patterns.
Note: SI units are used for the specifications.

# Traverse track

## Expanded paintable range with a traverse track

Traverse tracks can follow and paint workpieces that are moving on conveyors for efficient painting.

## Select models according to installation environment

Select from either an intrinsically safe or standard model according to the production line.

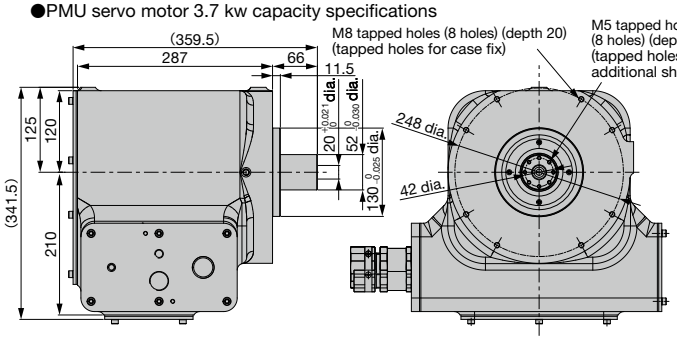
## Intrinsically safe: Spraying and dispensing of solvent-based paint

A motor unit with pressurized enclosure for explosion protection are available for peripheral equipment used in intrinsically safe environments. Peripheral equipment, such as traverse tracks, turntables, and shuttle-type workpiece feeders can be designed and created.

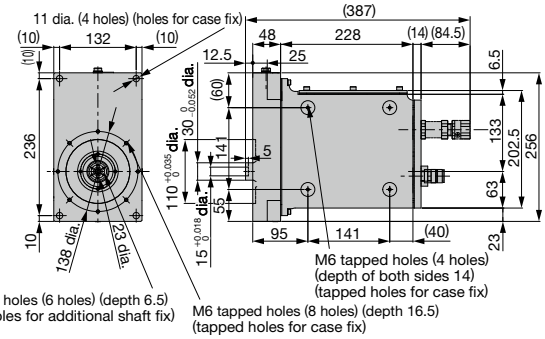
### Motor unit with pressurized enclosure for explosion protection PMU series (3.7 kw, 0.9 kw, 0.4 kw)

■ Dimensions Units: mm

●PMU servo motor 3.7 kw capacity specifications



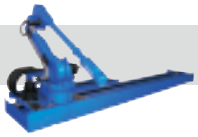

●PMU servo motor 0.4 kw capacity specifications




## Standard: Spraying and dispensing of water-based paint

Select from seven types of traverse tracks with different stroke lengths to suit various applications.

**Traverse track** **MOTOBASE-TC series** Compatible model MOTOMAN-GP25



### Easy to select

- Seven types of strokes are available by combining the frame and rail
- Symmetrical traverse tracks are available. Teaching data can be converted symmetrically for simple teaching.

| MOTOBASE model | Max. stroke | Total length |
|---|---|---|
| TC□017D | 1630 mm | 2940 mm |
| TC□022D | 2155 mm | 3465 mm |
| TC□027D | 2690 mm | 3990 mm |
| TC□031D | 3100 mm | 4410 mm |
| TC□037D | 3625 mm | 4935 mm |
| TC□042D | 4150 mm | 5460 mm |
| TC□047D | 4675 mm | 5985 mm |

### Improved maintainability

- Easy replacement and maintenance with the carrier's jack up structure

### Excellent environmental durability

- Environmentally-durable end cap of the linear block

### Improved scalability

- Stroke lengths can be extended by connecting frames on site

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