YASKAWA

# MOTOMAN GP-series

## Handling & General Application


Controlled by YRC1000

MOTOMAN GP8

reddot award 2018
winner

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# Masters of Robotics, Motion and Control

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YASKAWA

# MOTOMAN YRC1000

## Industrial Robot Controller

# High Performance Controller YRC1000 for MOTOMAN Robots

The MOTOMAN YRC1000 is a compact, fast and flexible controller for MOTOMAN robots that combines high performance robot control in a small footprint cabinet with volume of 125 litres and a maximum weight of 70 kg.

Besides the typical YASKAWA controller functionality, the YRC1000 includes additional functional improvements. Speed of the controller has been increased by lowering a ladder scanning time.

Path accuracy improvement assures increased precision in trajectory performance independently on the motion speed.

User interface supports smartphone like touch operations and allows the user to 3D simulate robots motion on PP screen before and during execution of the real robot arm. Service staff can directly connect to the PP user interface for remote service purposes. Total programming pendant's weight was reduced to 730 grams which offers more convenient use by the operator. The new controller simplifies maintenance by offering preventive maintenance information and powerful software tools for analysis and notification.

### KEY BENEFITS

- Compact, fast and flexible
- Global standardization (no transformer required)
- High path accuracy
- High efficiency

## Optimal Industrial Design

- Volume: 125 liters


## Programming Pendant (PHG) – ergonomical, light and easy


- Easy and fast programming
- Several user levels – from operator to safety mode
- Help function


| Specifications controller YRC1000 | |
|---|---|
| Dimensions | 598 (W) x 490 (H) x 427 (D) mm<br>(125 l without protrusion parts) |
| Mass | 70 kg max.<br>(possible to control three external axes) |
| Cooling system | Indirect cooling |
| Ambient temperature | During operation: 0°C to +45°C /<br>During storage: –10°C to +60°C |
| Relative humidity | 90 % max. (non-condensing) |
| Power supply | Three-phase 380–440 VAC (+10 %, –15 %),<br>50/60 Hz (±2 %) |
| Digital I/Os | Specialized signals: 19 inputs and 6 outputs /<br>General signals: 40 inputs and 40 outputs |
| Programming capacity | JOB: 200,000 steps, 10,000 instructions /<br>CIO ladder: 20,000 steps |
| Expansion slots | 2 x PCIe or 2 x PCI or 1 x PCI/1 x PCIe |
| LAN<br>(Connection to host) | 2 (10BASE-T/100BASE-TX) |
| Interface | RS-232C/RS422: 1 ch (used by switching) |

## Common Size for use in Japan, Asia, Europe, and the U.S.


## Improved Programming Pendant

| Specifications programming pendant | |
|---|---|
| Dimensions | 152 (W) x 299 (H) x 53 (D) mm |
| Mass | 0.730 kg |
| Material | Reinforced plastics |
| Operation device | Select keys, axis keys, numerical/application keys, mode selector switch with keys (mode: teach, play, and remote), emergency stop button, enable switch, SD card interface device, USB port (1 port) |
| Display | 5.7-inch color LCD,<br>touch panel 640 x 480 pixels |
| IEC protection class | IP54 |


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# MOTOMAN YRC1000micro

## Industrial Robot Controller for small MOTOMAN Robots

The MOTOMAN YRC1000micro controller is a controller for small MOTOMAN robots. It provides high performance robot control in a small footprint cabinet. Its performance and functions are optimized for Pick & Place and assembly applications.

Besides the typical YASKAWA functionality, the MOTOMAN YRC1000micro controller includes easy connections to peripheral devices and new high speed and high precision motion control.

It is compatible with the optional “Functional Safety”, which monitors motion range and speed limitations.


### KEY BENEFITS

- Compact and lightweight
- High performance
- New motion control
- Minimum installation space
- Easy connections to peripheral devices
- Compatible with “Functional Safety”

# Industrial Robot Controller
# YRC1000micro
## for small MOTOMAN Robots

| Specifications Controller YRC1000micro | |
|---|---|
| **Configuration** | Open structure |
| **Dimensions** | 425 (W) x 125 (H) x 280 (D) mm – excluding protrusions |
| **Mass** | 10.5 kg (without top mount box) |
| **Cooling system** | Direct cooling |
| **Ambient temperature** | During operation: 0°C to +40°C<br>During storage: –10°C to +60°C |
| **Relative humidity** | 90 % max. (non-condensing) |
| **Power supply** | Single-phase 200/230 VAC (+10 to –15%), 50/60 Hz (±2 %)[1];<br>three-phase 220/220 VAC (+10 to –15 %), 50/60 Hz (± 2%) |
| **Digital I/Os** | External IO (hardware, standard max):<br>8 inputs / 8 outputs (transistor 100 mA; number of points cannot be expanded)[2]<br>Standard signal allocation:<br>Gerneral Purpose IO: 1 input / 1 output<br>Specific IO: 7 inputs / 7 outputs |
| **Programming capacity** | JOB: 200,000 steps, 10,000 instructions;<br>CIO ladder: 1,500 steps |
| **Expansion slots** | PCI express, 2 slots |
| **LAN (Connections to host)** | 1 (10BASE-T/100BASE-TX) |
| **Safety category** | 3, PLd |

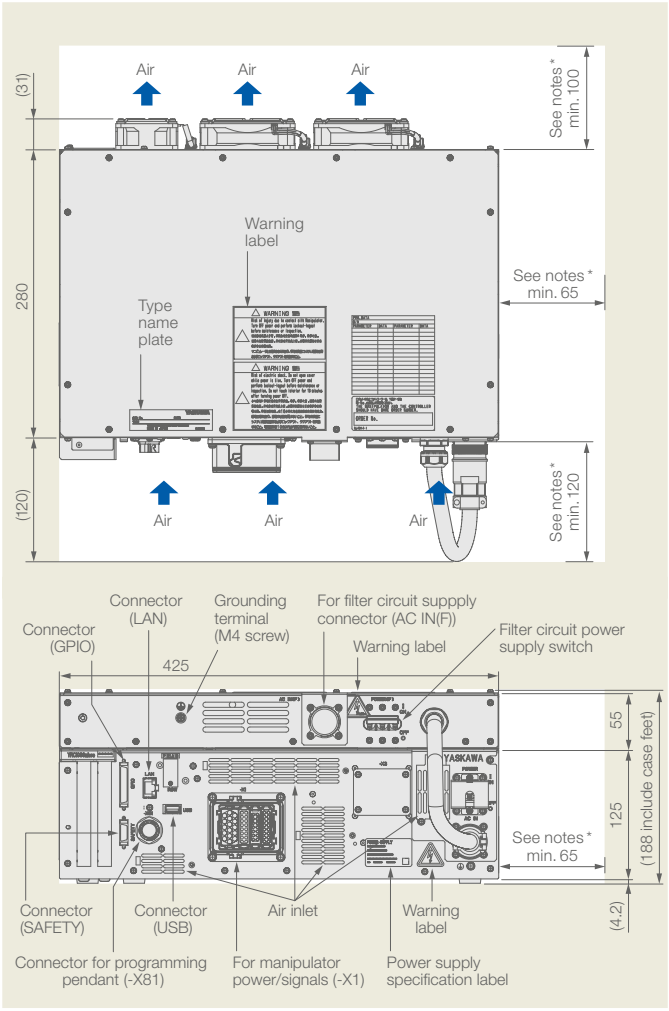
[1] Manipulators operated by single-phase power supply: MOTOMAN GP7, GP8, MotoMINI.
[2] If it is necessary to expand the number of points, a filed bus board is required

| Specifications programming pendant | |
|---|---|
| **Dimensions** | 152 (W) x 299 (H) x 53 (D) mm |
| **Mass** | 0.730 kg |
| **Material** | Reinforced plastics |
| **Operation device** | Select keys, axis keys, numerical/application keys, mode selector switch with keys (mode: teach, play, and remote), emergency stop button, enable switch, SD card interface device, USB port (1 port) |
| **Display** | 5.7-inch color LCD, touch panel 640 x 480 pixels |
| **IECpProtection class** | IP54 |

## Programming Pendant (PHG) – ergonomical, light and easy

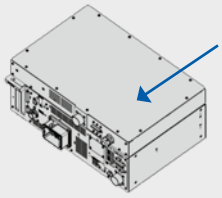
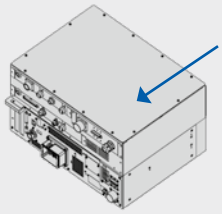

- Easy and fast programming
- Several user levels – from operator to safety mode
- Help function

## Horizontally mounted ***

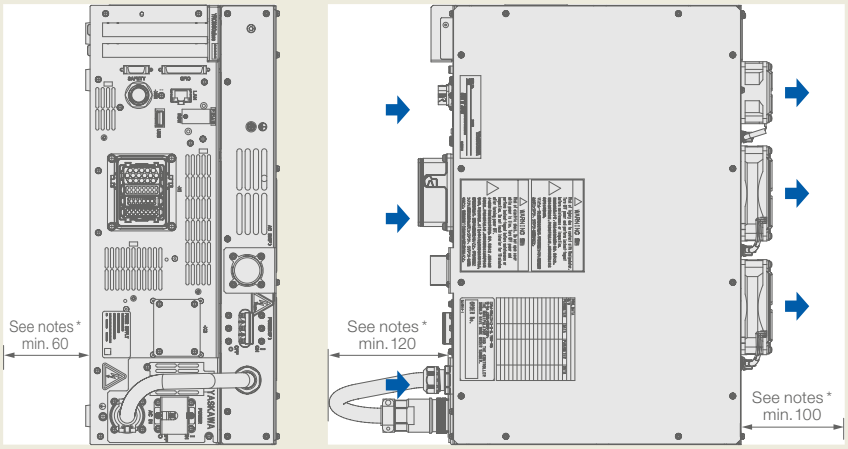


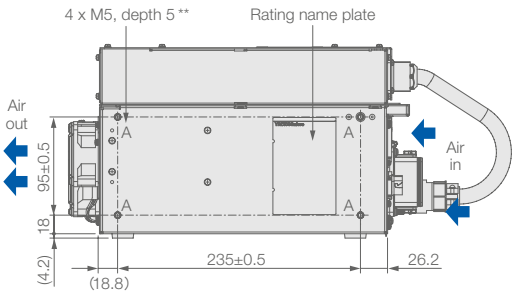

# Optimal Industrial Design

- Volume: 21,5 l (GP7/8/12, MotoMini), 30 l (HC10DT)


| Manipulator type | | Region: Europa and Korea (EMC directive required) |
|---|---|---|
| Standard size: 425 (W) x 125 (H) x 280 (D) mm<br><br>without additional boxes<br><br>without EMV | **GP7**<br>**GP8**<br>**GP12**<br><br>**MotoMINI** |  Top mount box for CE noise filter: 55 (H) x 280 (D) mm<br><br>Total litres: 21.5 l |
| | **HC10** |  Top mount box for CE noise filter PFL-Card: 125 (H) x 280 (D) mm<br><br>Total litres: 30 l |

## Vertically mounted ***




* Secure the dimensions stated in the placement space chart for cooling and maintenance.
** Use eight holes marked with the symbol "A" to fix the controller on the floor with fixing jigs and anchor bolts. When fixing the rack, use A hole (8 places).
*** Values refer to version for GP7, GP8, GP12 und MotoMini).

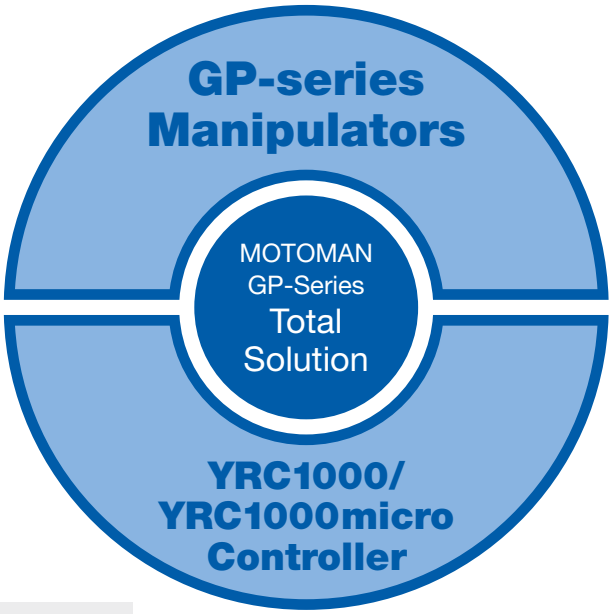
# MOTOMAN GP-series

## Robot System Solutions
## **MOTOMAN GP-series**

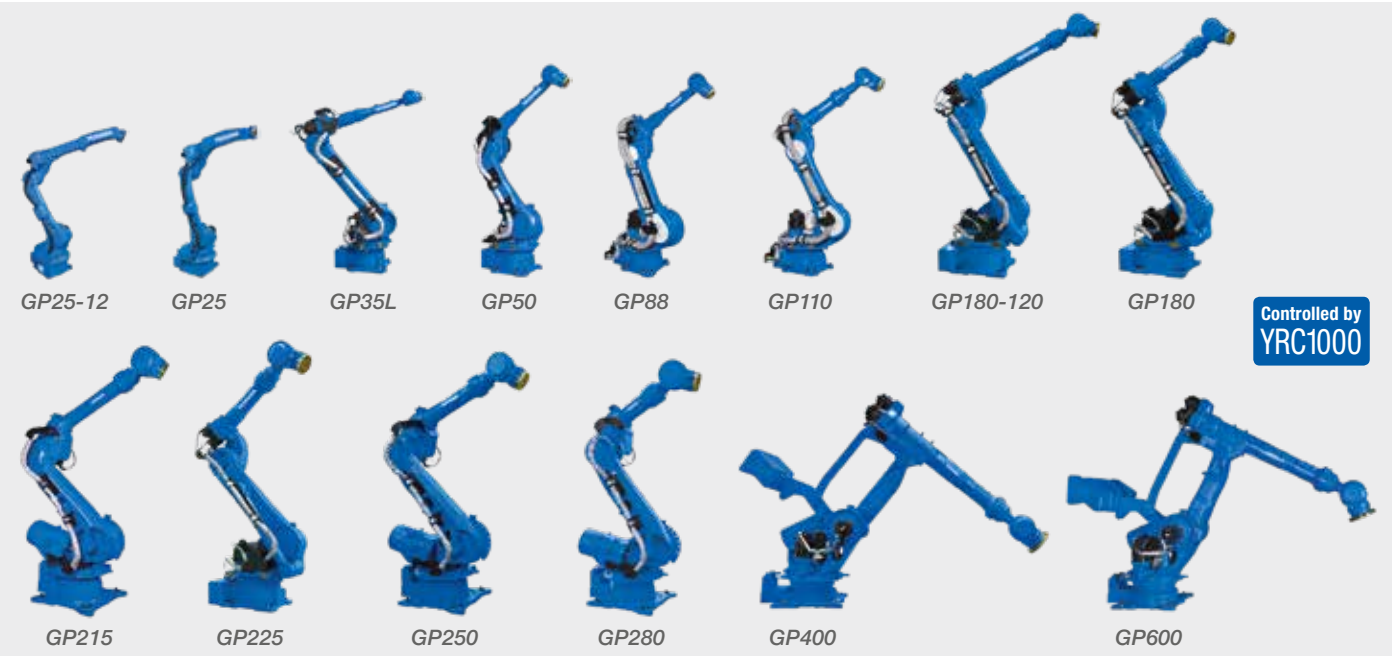
Find smart solutions for production site issues with YASKAWA's cutting-edge robot systems.


## **YASKAWA**
## has the Answer!

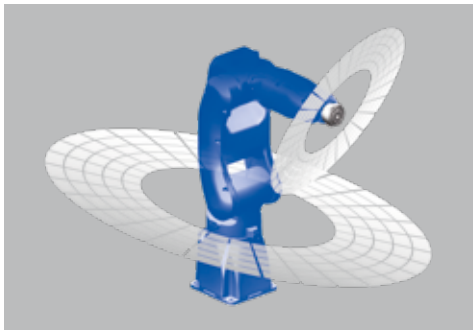
We can meet customer's diversified needs with a variety of functions and components.







# GP7 and GP8 – Compact and High Speed



## Increase Productivity

**Highest payloads, speeds and wrist allowable moment in its class**

- A variety of workpieces can be transferred and different grippers can be mounted with 7-kg and 8-kg payloads and 38 % greater allowable moment
- Speeds of all axes have been increased by 39 % (max)
- Acceleration/deceleration control has been improved to achieve maximum reduction of acceleration/deceleration times for all robot postures

*Reduced interference radius when S-axis is turning*

*Former model MH5(L)S II*
*Interference radius: 182 mm*

*New model GP7 and GP8*
*Interference radius: 140 mm*

*Reduced interference radius when the wrist is turning*

*Former model (MH5S II): 73 mm*
*New model (GP7 and GP8): 67 mm*

## Make Equipment compact

**Slim and easy-to-use structure**

- Slim robot body requires minimum installation space (minimizes L-U axis offset)
- The manipulator cable can be connected at the bottom section, which reduces interference with walls and requires far less installation space when compared with cable connections on the side of the robot
- Increased maximum reach and horizontal reach enables robots to operate in wider work areas
- The slim, straight, and symmetrical arm design minimize interference with peripheral devices even in small spaces

*Manipulator cable connection on the side and bottom (optional) of the robot*

## Improve efficiency in Installation, Operation and Maintenance of Equipment

**Easy set-up**

- Only one cable is required, which reduces setup time

**High environmental performance**

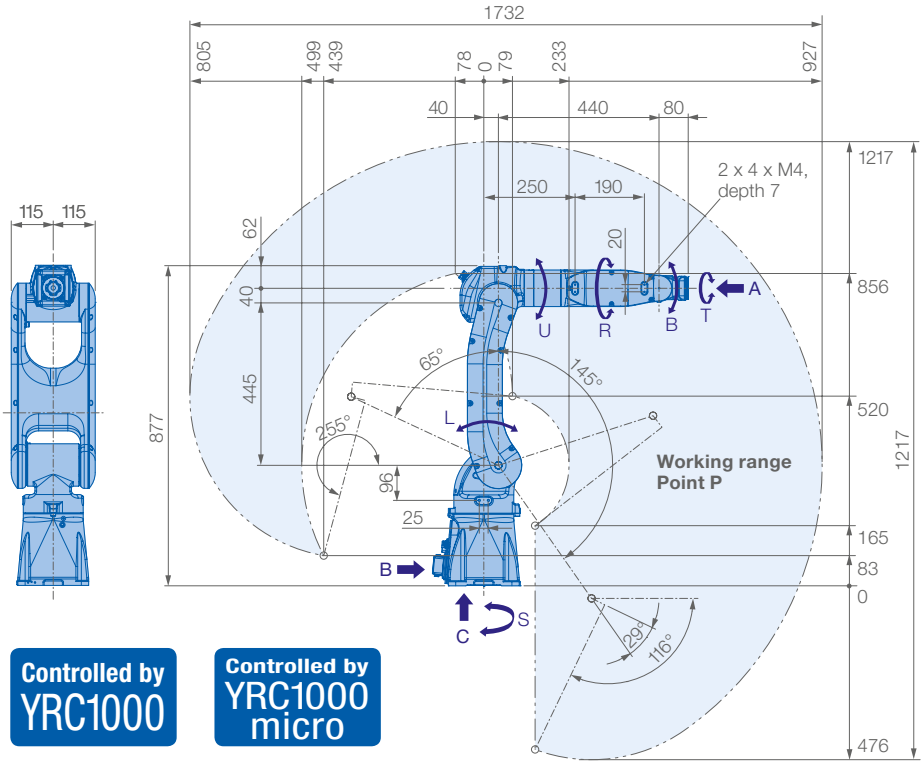
- Its structure can resist dust and coolants due to its IP67 standard protection class

**Easy-to-clean design**

- Robot surface is designed to prevent adherence of dust

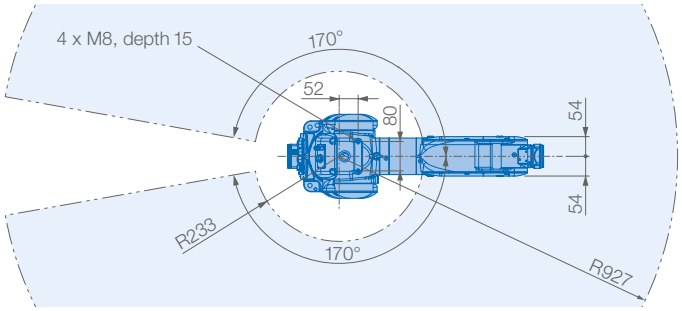
**Easy maintenance**

- Data saving feature enables to replace the wire harness in the robot without having to connect to a battery
- Productivity improvement due to reduction in number of cables & connectors

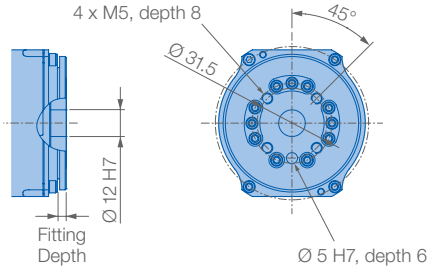



**Controlled by YRC1000**

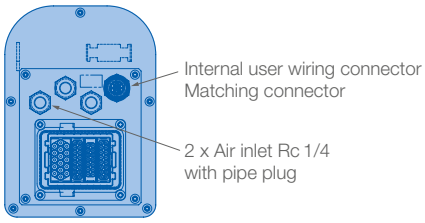
**Controlled by YRC1000 micro**



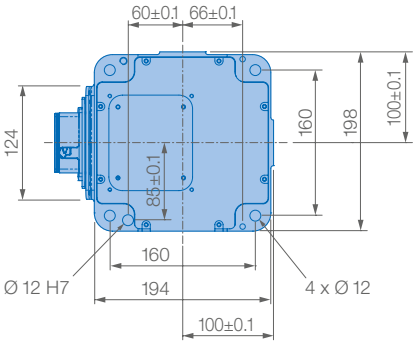

## View A




## View B




## View C



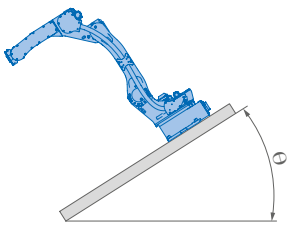

Mounting options: Floor, ceiling, wall, tilt*

Protection class: IP67

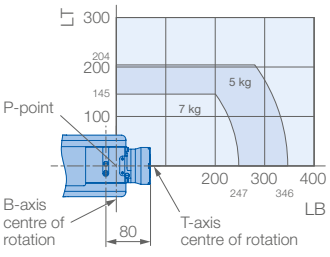
* tilt with condition of angle – see table below

**Prevent interaction of the robot with:**

- Corrosive gases, liquids or explosive gases
- Exposure to water, oil or dust
- Excessive electrical noise (plasma)




## Allowable wrist load



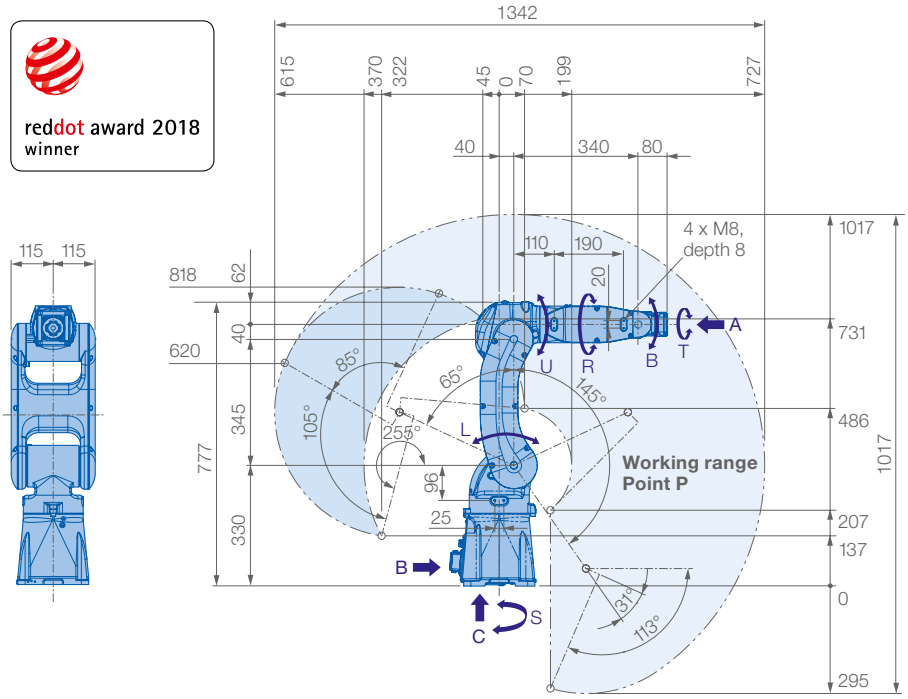

| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±170 degrees or less (no limit) |
| 30 < Θ ≤ 35 | ±60 degrees or less |
| 35 < Θ ≤ 45 | ±45 degrees or less |
| 45 < Θ | ±30 degrees or less |

| Specifications GP7 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 7 |
| **S** | ±170 | 375 | – | – | **Repeatability [mm]** | ±0.03* |
| **L** | +145/–65 | 315 | – | – | **Max. working range R [mm]** | 927 |
| **U** | +255/–116 | 410 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±190 | 550 | 17 | 0.5 | **Humidity [%]** | 20 – 80 |
| **B** | ±135 | 550 | 17 | 0.5 | **Weight [kg]** | 34 |
| **T** | ±360 | 1000 | 10 | 0.2 | **Power supply, average [KVA]** | 1** |

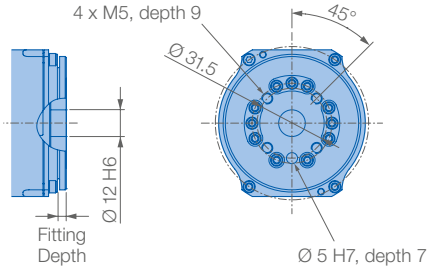
* Conforms to ISO 9283 ** Varies in accordance with applications and motion patterns **Note:** SI units are used for specifi cations.

All dimensions in mm

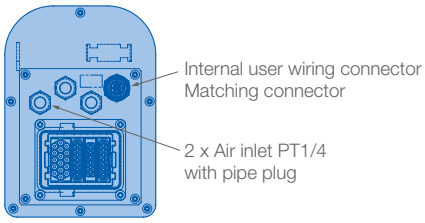
reddot award 2018 winner



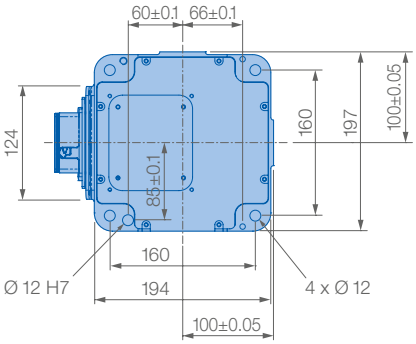

## View A




## View B




## View C



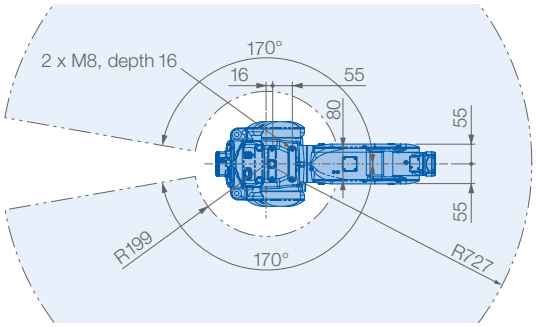

Mounting options: Floor, ceiling, wall, tilt*

Protection class: IP67

* tilt with condition of angle – see table below

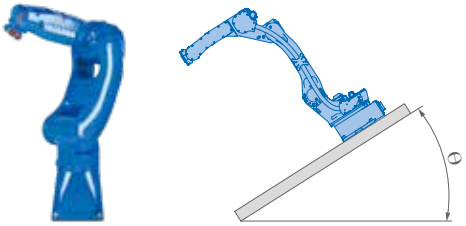
**Controlled by YRC1000**

**Controlled by YRC1000 micro**

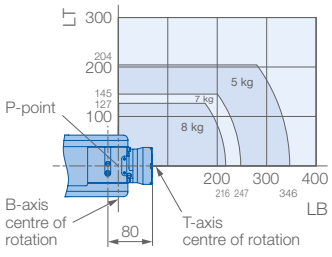



**Prevent interaction of the robot with:**

- Corrosive gases, liquids or explosive gases
- Exposure to water, oil or dust
- Excessive electrical noise (plasma)




## Allowable wrist load




| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±170 degrees or less (no limit) |
| 30 < Θ ≤ 35 | ±60 degrees or less |
| 35 < Θ ≤ 45 | ±45 degrees or less |
| 45 < Θ | ±30 degrees or less |

| Specifications GP8 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 8 |
| **S** | ±170 | 455 | – | – | **Repeatability [mm]** | ±0.02* |
| **L** | +145/–65 | 385 | – | – | **Max. working range R [mm]** | 727 |
| **U** | +255/–113 | 520 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±190 | 550 | 17 | 0.5 | **Humidity [%]** | 20 – 80 |
| **B** | ±135 | 550 | 17 | 0.5 | **Weight [kg]** | 32 |
| **T** | ±360 | 1000 | 10 | 0.2 | **Power supply, average [KVA]** | 1** |

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

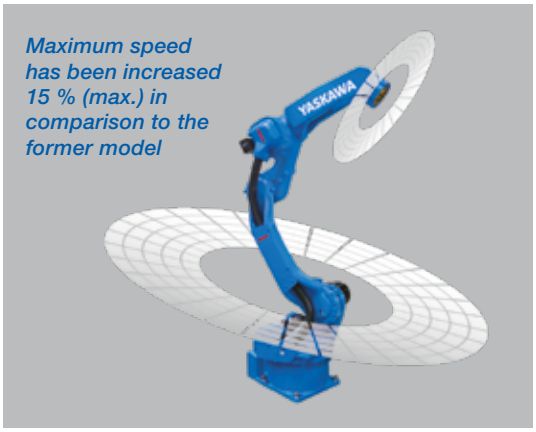
All dimensions in mm

# GP12, GP25 and GP25-12

## Increase Productivity

**Highest payloads, speeds and wrist allowable moment in its class**

- The productivity of the customer's equipment can be improved with the highest speed in the 12 and 25 kg payload class
- Acceleration/deceleration control has been improved to achieve maximum reduction of acceleration/deceleration times for all robot postures

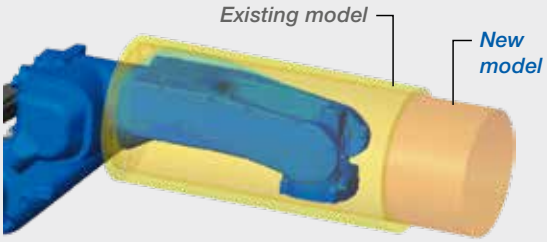



*Maximum speed has been increased 15 % (max.) in comparison to the former model*

*Hollow arm*

*50 mm dia.*

*50 mm dia.*




*Minimized interference radius of the wrist*
*MH12/MH24 (earlier models): 136/147 mm*
*GP12/GP25 (new models): 120/138 mm*

## Make Equipment compact

**Easy-to-use structure**

- The hollow arm structure to store cables reduces operation restriction due to cable interference, simplifies teaching and eliminates cable disconnection caused by interference

**Best accessibility in its class**

- The slim arm design minimizes interference with peripheral devices even in small spaces

## Improve Efficiency in Installation, Operation and Maintenance of Equipment

**Easy set-up**

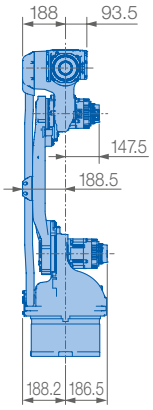
- Only one cable is required, which reduces setup time

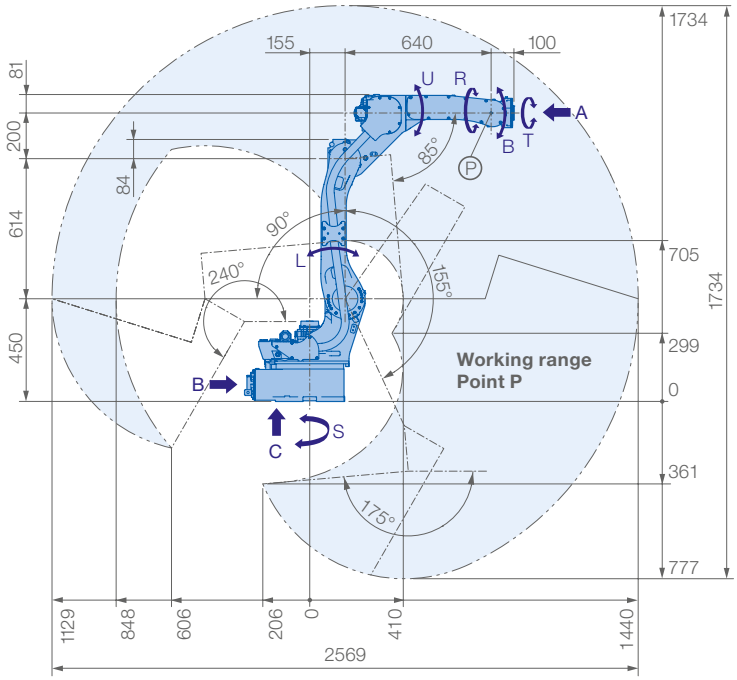
**Wrist structure with great environment resistance**

- Wrist structure of R, B and T axes are IP67-compliant as a standard specification
- Wrist structure of S, L and U axes are IP54-compliant (option IP65)

**Easy maintenance**

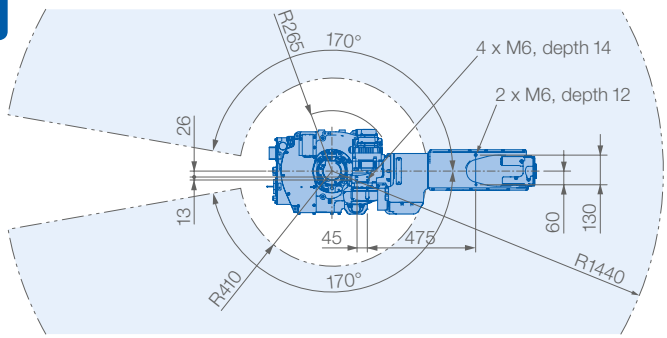
- Data saving feature enables to replace the wire harness in the robot without having to connect to a battery
- Productivity improvement due to reduction in number of cables & connectors



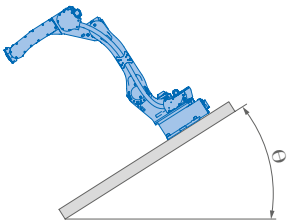

**Controlled by YRC1000**

**Controlled by YRC1000 micro**

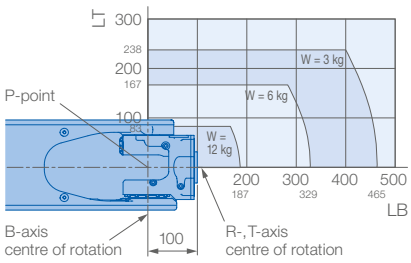



**Prevent interaction of the robot with:**

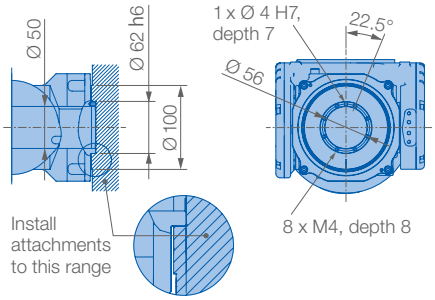
- Corrosive gases, liquids or explosive gases
- Exposure to water, oil or dust
- Excessive electrical noise (plasma)

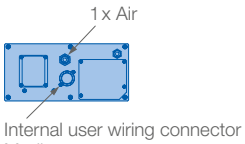

## Allowable wrist load



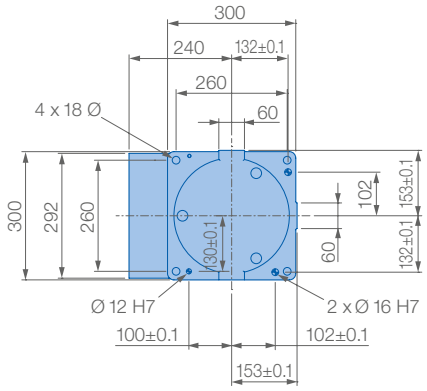

## View A




## View B




## View C




Mounting options: Floor, ceiling, wall, tilt*

Protection class: Main axes (S, L, U) IP54 (option 65), wrist IP67

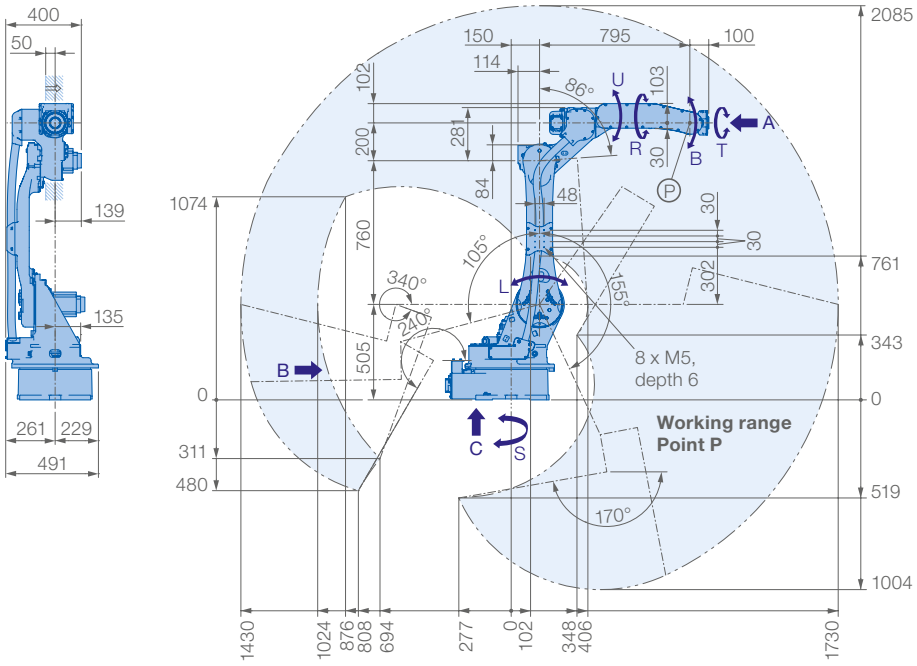
* tilt with condition of angle – see table below

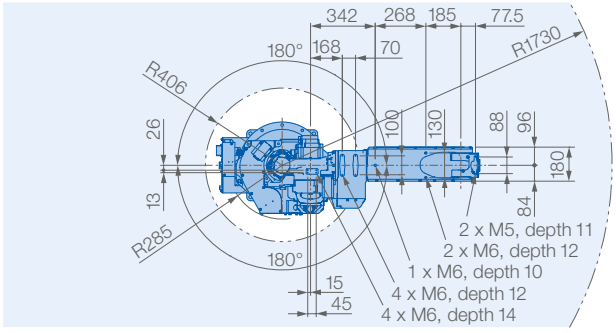
| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±170 degrees or less (no limit) |
| 30 < Θ ≤ 35 | ±60 degrees or less |
| 35 < Θ ≤ 45 | ±45 degrees or less |
| 45 < Θ | ±30 degrees or less |

| Specifications GP12 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 12 |
| **S** | ±170 | 260 | – | – | **Repeatability [mm]** | ±0.08* |
| **L** | +155/–90 | 230 | – | – | **Max. working range R [mm]** | 1440 |
| **U** | +155/–85 | 260 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±200 | 470 | 22 | 0.65 | **Humidity [%]** | 20 – 80 |
| **B** | ±150 | 470 | 22 | 0.65 | **Weight [kg]** | 150 |
| **T** | ±455 | 700 | 9.8 | 0.17 | **Power supply, average [KVA]** | 1.5** |

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

All dimensions in mm

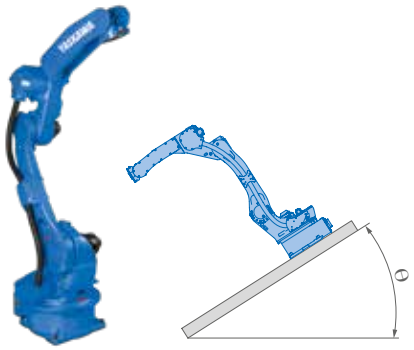


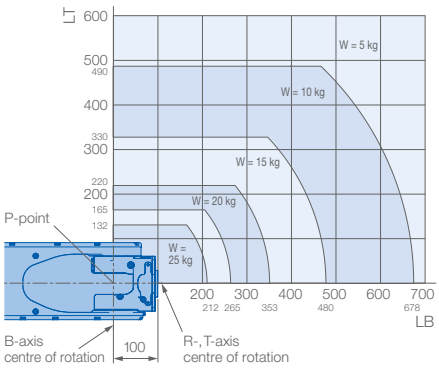

**Controlled by YRC1000**

**Prevent interaction of the robot with:**

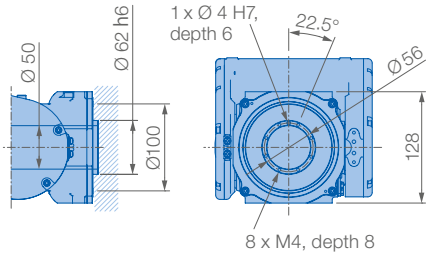
- Corrosive gases, liquids or explosive gases
- Exposure to water, oil or dust
- Excessive electrical noise (plasma)



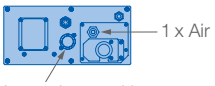

## Allowable wrist load




## View A

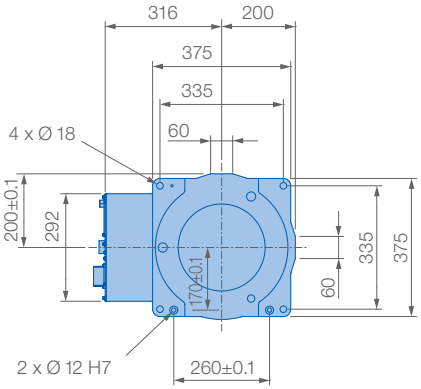



## View B




Internal user wiring connector
Media connector

## View C




Mounting options: Floor, ceiling, wall, tilt*

Protection class version YR-1-25VXH25-A00 standard: Main axes (S, L, U) IP54, wrist IP 67

Protection class version YR-1-25VXH25-C00: Main axes (S, L, U) IP65, wrist IP67

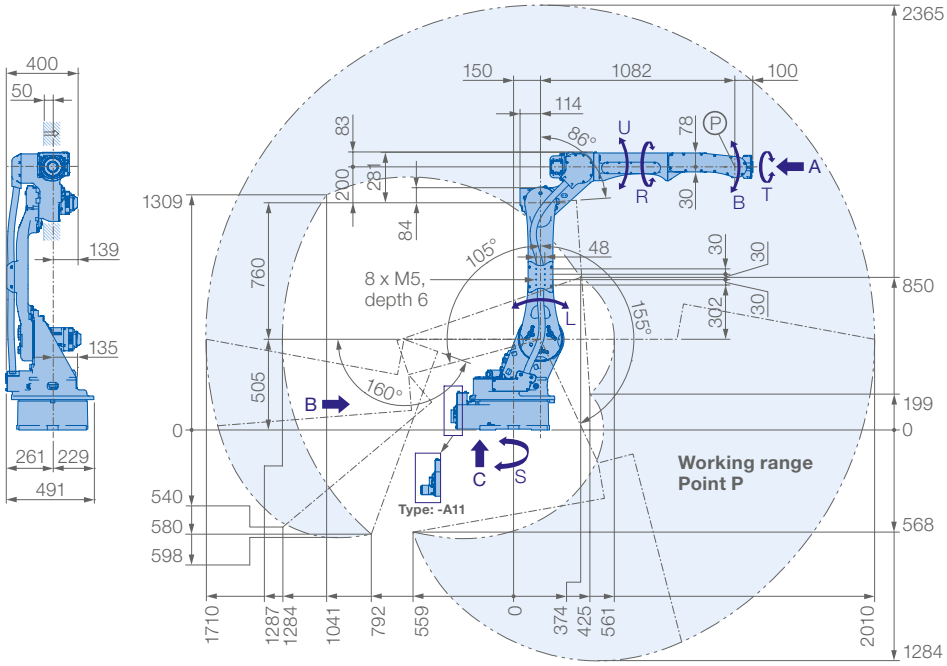
* tilt with condition of angle – see table below

| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±180 degrees or less (no limit) |
| 30 < Θ ≤ 35 | ±60 degrees or less |
| 35 < Θ | ±30 degrees or less |

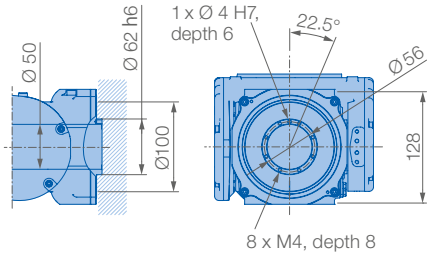
| Specifications GP25 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 25 |
| **S** | ±180 | 210 | – | – | **Repeatability [mm]** | ±0.06* |
| **L** | +155/–105 | 210 | – | – | **Max. working range R [mm]** | 1730 |
| **U** | +160/–86 | 265 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±200 | 420 | 52 | 2.3 | **Humidity [%]** | 20 – 80 |
| **B** | ±150 | 420 | 52 | 2.3 | **Weight [kg]** | 250 |
| **T** | ±455 | 885 | 32 | 1.2 | **Power supply, average [KVA]** | 2,0** |

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

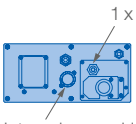
All dimensions in mm




## View A

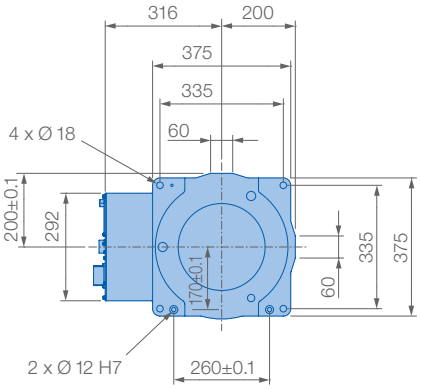



## View B

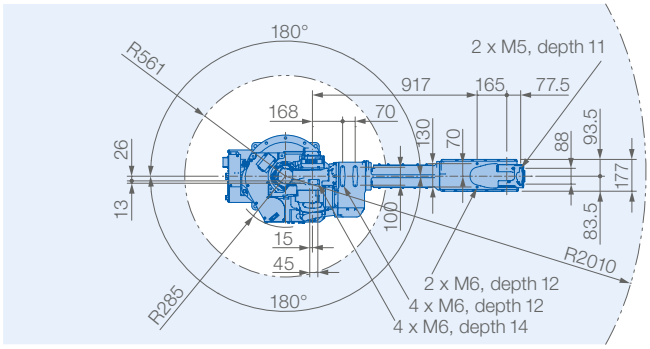



Internal user wiring connector
Media connector

## View C




**Controlled by YRC1000**



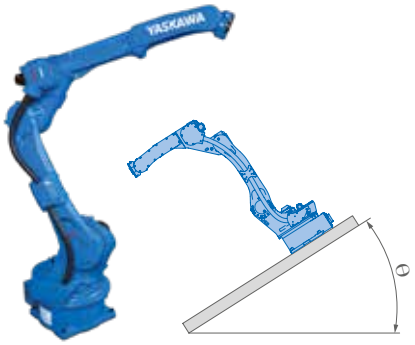

**Prevent interaction of the robot with:**

- Corrosive gases, liquids or explosive gases
- Exposure to water, oil or dust
- Excessive electrical noise (plasma)

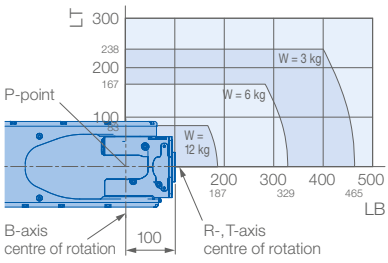
Mounting options: Floor, ceiling, wall, tilt*

Protection class: Main axes (S, L, U) IP54 (option 65), wrist IP67

* tilt with condition of angle – see table below




## Allowable wrist load




| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±180 degrees or less (no limit) |
| 30 < Θ ≤ 35 | ±60 degrees or less |
| 35 < Θ | ±30 degrees or less |

| Specifications GP25-12 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload (on U-axis) [kg]** | 12 (9) |
| **S** | ±180 | 210 | – | – | **Repeatability [mm]** | ±0.08* |
| **L** | +155/–105 | 210 | – | – | **Max. working range R [mm]** | 2010 |
| **U** | +160/–86 | 220 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±200 | 435 | 22 | 0.65 | **Humidity [%]** | 20 – 80 |
| **B** | ±150 | 435 | 22 | 0.65 | **Weight [kg]** | 260 |
| **T** | ±455 | 700 | 9.8 | 0.17 | **Power supply, average [KVA]** | 2.0** |

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

All dimensions in mm


YASKAWA

# MOTOMAN GP35L

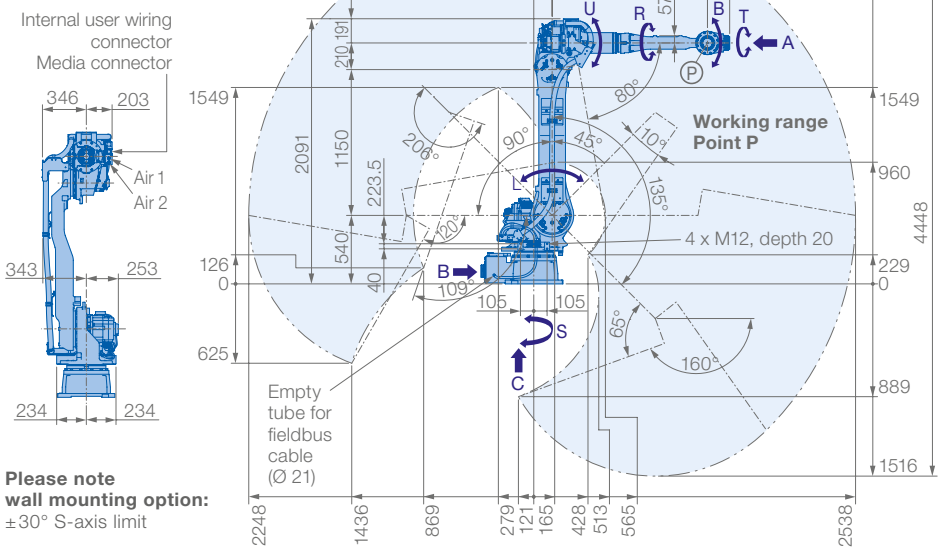
## Handling & General Applications with the GP-series

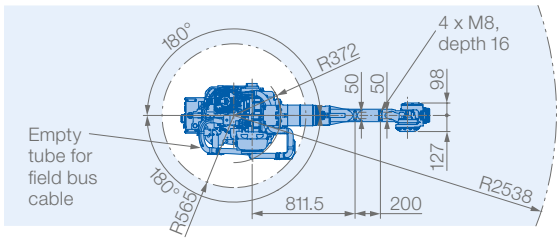

The MOTOMAN GP35L is a dynamic, high-speed robot featuring an extended reach for large parts. It offers superior performance in laser welding, coating, dispensing, gluing, material cutting and material handling applications.

### KEY BENEFITS

- High repeatability: ±0.07 mm
- Ideal for a variety of applications, multi-purpose robot
- Wide motion range
- Small interference radius reduces floorspace requirements
- Specifically designed for processing large parts
- Protection class IP54/67 as standard

Controlled by YRC1000

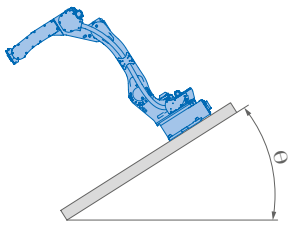



**Please note wall mounting option:**
±30° S-axis limit

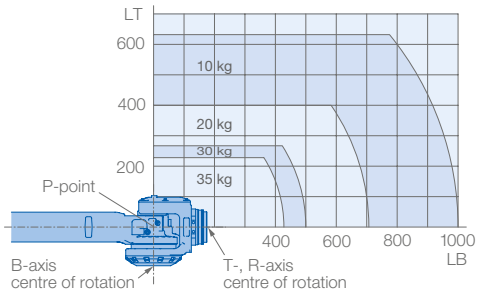
**Please note ceiling mounting option:**
Please notice working range of B-axis

**Please note tilted robot:**
0°–90° limitation of S-axis, details on request

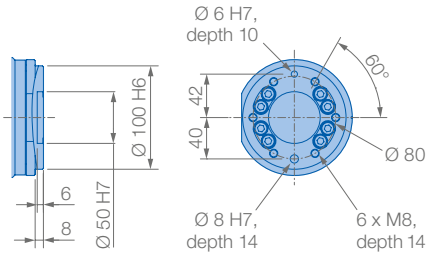



| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±180 (Standard) |
| 30 < Θ ≤ 35 | ±60 |
| 35 < Θ ≤ 45 | ±45 |
| 45 < Θ | ±45 |

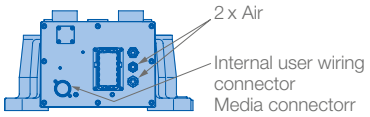
## Allowable wrist load



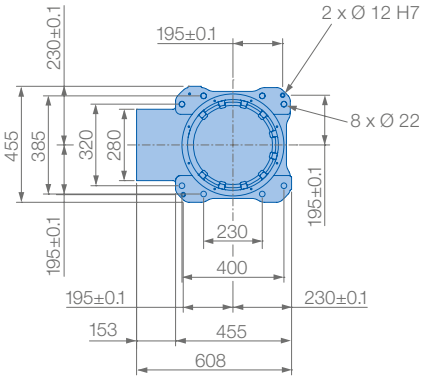

## View A




## View B




## View C




Mounting options: Floor, ceiling, wall, tilt*

Protection class: IP54/67

* tilt with condition of angle – see table left side

| | |
|---|---|
| **Wrist + U-arm in front** | Up to 35 kg for attaching load mass including wrist load |
| **U-arm behind** | Up to 10 kg. 49 N · m (5 kgf · m) max. for increased moment amount of upper arm (floor-, ceiling-mounted type only) |
| **S-axis below** | Up to 30 kg (floor-, ceiling-mounted type only) |

| Specifications GP35L | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 35 |
| **S** | ±180 | 180 | – | – | **Repeatability [mm]** | ±0.07 |
| **L** | +135/–90 | 140 | – | – | **Max. working range R [mm]** | 2538 |
| **U** | +206/–80 | 178 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 250 | 147 | 10 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 250 | 147 | 10 | **Weight [kg]** | 600 |
| **T** | ±360 | 360 | 78 | 4 | **Power supply, average [KVA]** | 4.0 |

# MOTOMAN GP50

## Handling & General Applications with the GP-series

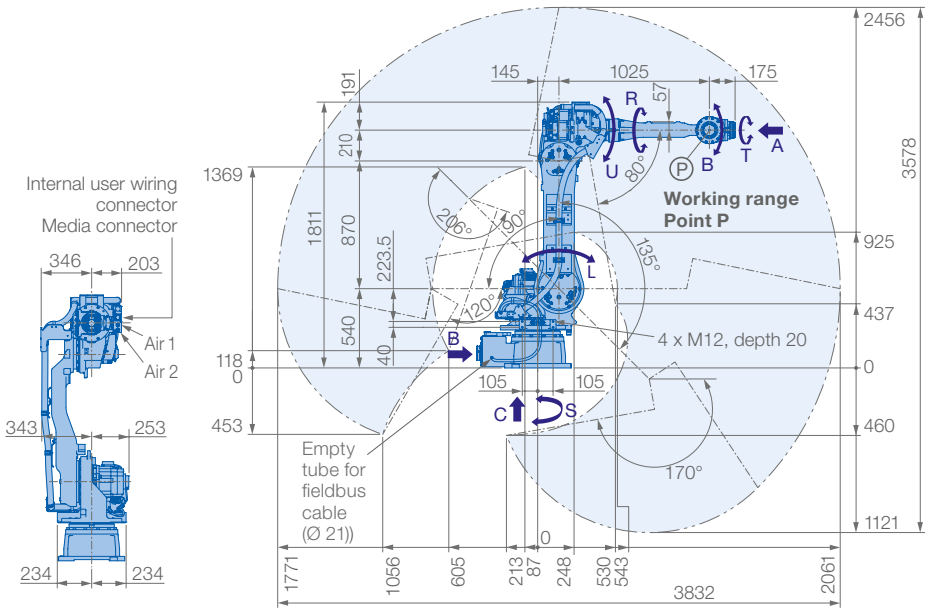

The MOTOMAN GP50 is a versatile, high speed 6-axis robot offering superior performance in material handling, machine tending, processing and dispensing applications.

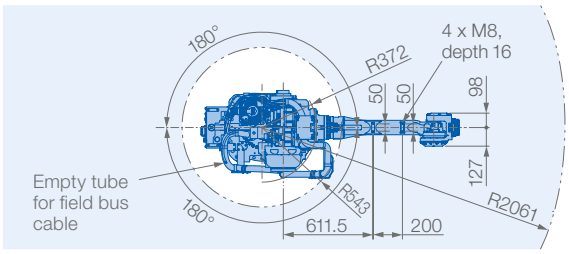
Due to its compact design, the GP50 can be placed close to machines for loading and unloading of parts.

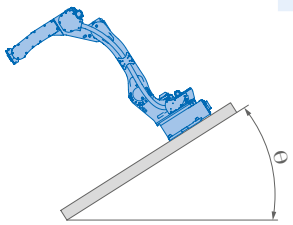
### KEY BENEFITS

- Fast, flexible and reliable
- Ideal for a variety of applications, multi-purpose robot
- Robot with sleek design that requires minimal installation space
- 50 kg payload

Controlled by YRC1000

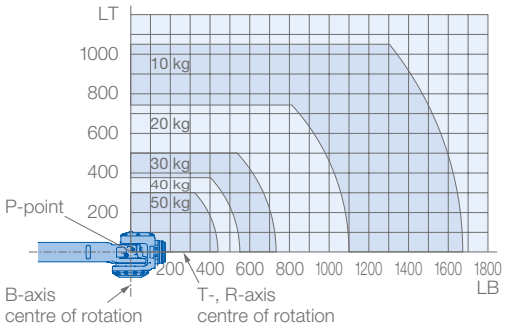


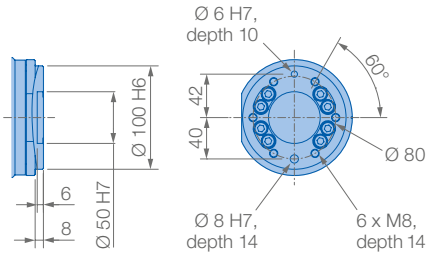




| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±180 (Standard) |
| 30 < Θ ≤ 35 | ±60 |
| 35 < Θ ≤ 45 | ±45 |
| 45 < Θ | ±30 |

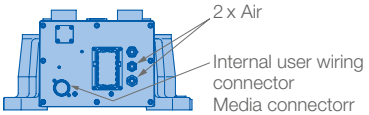
## Allowable wrist load



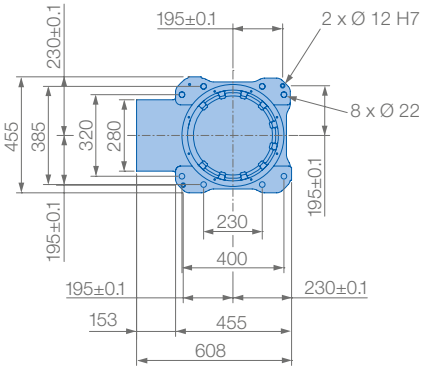

## View A




## View B




## View C




Mounting options: Floor, ceiling, wall, tilt*

**Please notice wall mounting option:**
±30° S-axis limit

**Please notice ceiling mounting option:**
Please notice working range of B-axis

**Please notice tilted robot:**
0°–90° limitation of S-axis, details on request

Protection class: IP54/67
**Please notice:** Just valid for body/wrist, connector base not protected

*tilt with condition of angle – see table left side

| Specifications GP50 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 50 |
| **S** | ±180 | 180 | – | – | **Repeatability [mm]** | ±0.07 |
| **L** | +135/–90 | 178 | – | – | **Max. working range R [mm]** | 2061 |
| **U** | +206/–80 | 178 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 250 | 216 | 28 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 250 | 216 | 28 | **Weight [kg]** | 570 |
| **T** | ±360 | 360 | 147 | 11 | **Power supply, average [KVA]** | 4.0 |

# MOTOMAN GP88

## Handling & General Applications with the GP-series

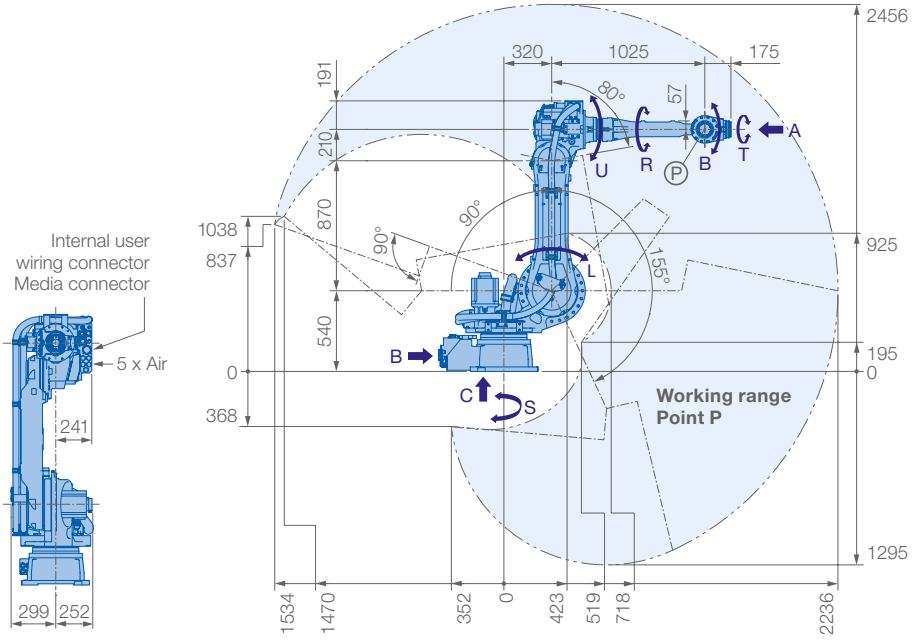

The MOTOMAN GP88 is a versatile high speed 6-axis robot, providing a high payload of up to 88 kg. It offers superior performance in material handling, machine tending, processing and dispending applications.

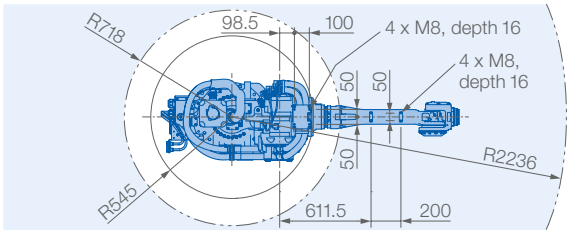
Despite its slim body, the MOTOMAN GP88 features a wide work envelope with a small interference radius. Thereby it can be placed close to machines for loading and unloading of parts, which reduces the required floor space to a minimum.

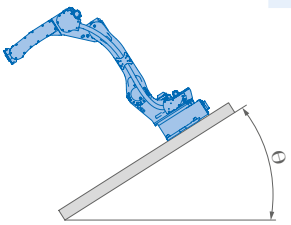
### KEY BENEFITS

- Flexible and powerful (payload of 88 kg)
- High axis speeds
- Improved wrist ratings provide higher handling capacity
- Small interference radius reduces floor space requirements

Controlled by YRC1000

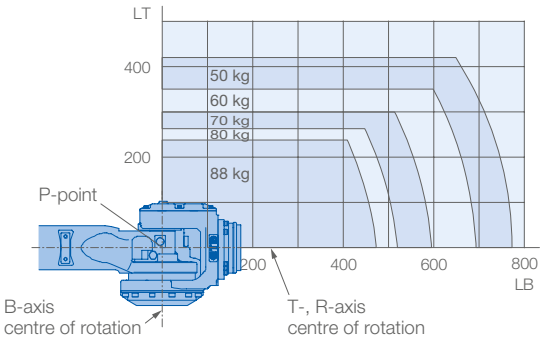


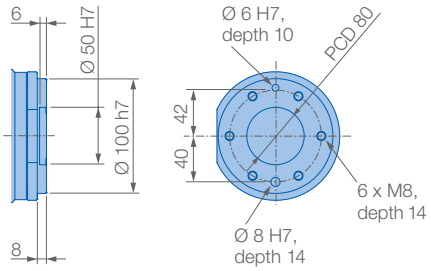




| Robot installation angle Θ [deg.] | S-axis operating range [deg.] |
|---|---|
| 0 ≤ Θ ≤ 30 | ±180 (Standard) |
| 30 < Θ ≤ 35 | ±60 |
| 35 < Θ ≤ 45 | ±45 |
| 45 < Θ | ±30 |

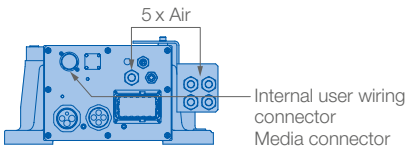
## Allowable wrist load



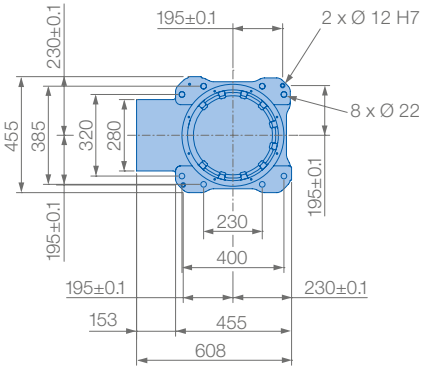

## View A




## View B




## View C




Mounting options: Floor, ceiling, wall, tilt*

Protection class: IP54/67
**Please notice:** Just valid for body/wrist, connector base not protected

* tilt with condition of angle – see table left side

| Specifications GP88 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 88 |
| **S** | ±180 | 170 | – | – | **Repeatability [mm]** | ±0.07 |
| **L** | +155/–90 | 140 | – | – | **Max. working range R [mm]** | 2236 |
| **U** | +90/–80 | 160 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 230 | 408 | 30 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 230 | 408 | 30 | **Weight [kg]** | 630 |
| **T** | ±360 | 350 | 206 | 11 | **Power supply, average [KVA]** | 4.0 |

# MOTOMAN GP110

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN GP110 is a versatile, high speed robot offering superior performance for a variety of applications, for example material handling, machine and press tending.

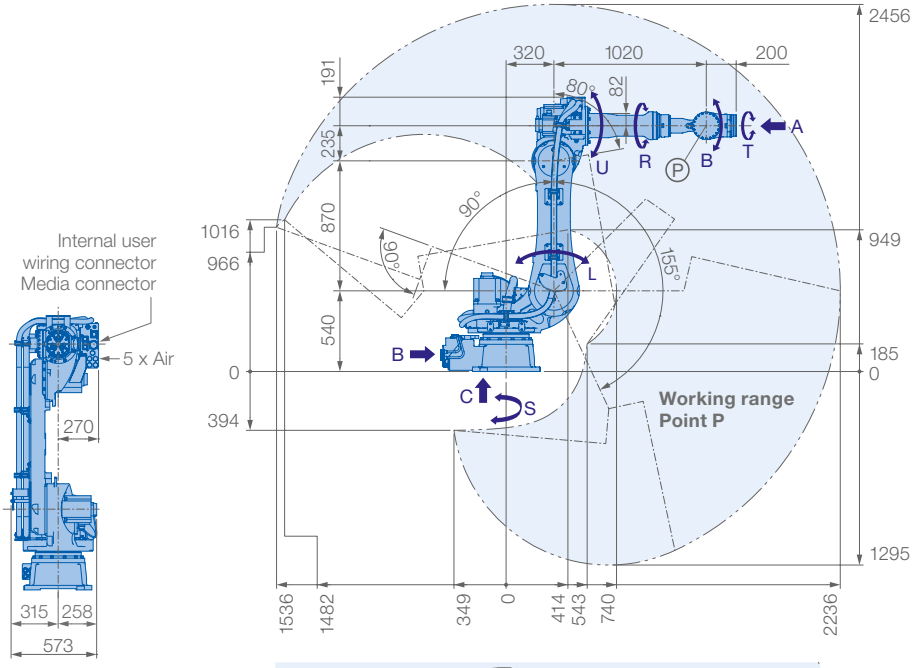
Despite of providing a wide motion range and high payload of 110 kg, the MOTOMAN GP110 has a streamlined design, which allows extremely close positioning of several robots. Also the slim cable inlet reduces the robots width, therefore valuable floor space can be saved.

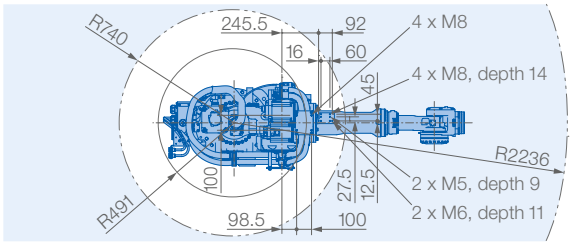
The MOTOMAN GP110 is available with the PLd Category 3 Functional Safety Unit (FSU).

### KEY BENEFITS

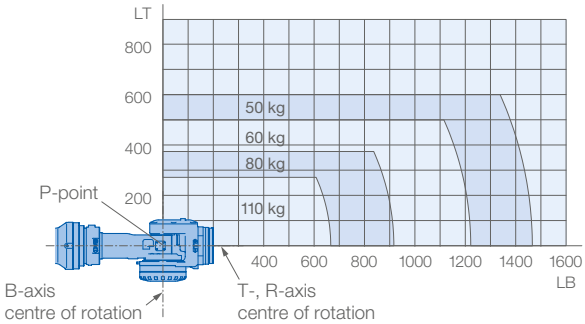
- Fast and flexible
- Wide motion range: 2236 mm
- High payload: 110 kg
- Compact design
- Slim cable inlet
- Enhanced safety functions

Controlled by YRC1000

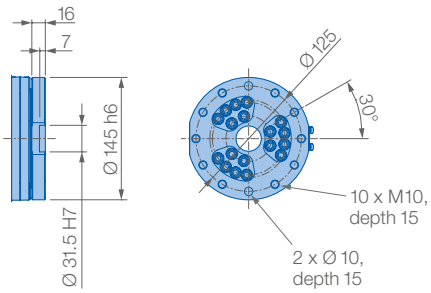


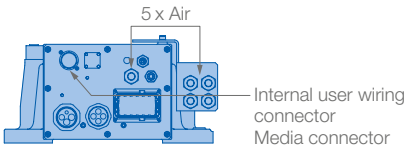

## Allowable wrist load



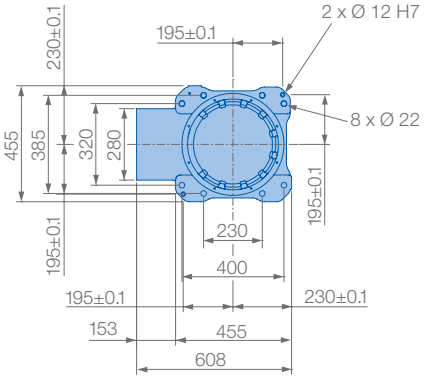

## View A




## View B




## View C




Mounting options: Floor

Protection class: IP54/67

| Specifications GP110 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 110 |
| **S** | ±180 | 140 | – | – | **Repeatability [mm]** | ±0.07 |
| **L** | +155/–90 | 110 | – | – | **Max. working range R [mm]** | 2236 |
| **U** | +90/–80 | 130 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 175 | 721 | 60 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 175 | 721 | 60 | **Weight [kg]** | 660 |
| **T** | ±360 | 255 | 294 | 33.7 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP180-120

## Handling & General Applications with the GP-series


This powerful six-axis handling robot features high speed motion which reduce cycle times.

High payload and increased moment and inertia ratings allows the MOTOMAN GP180-120 the handling of large and heavy payloads. Its streamlined upper arm design features a slim wrist profile and reduces robot width. This enables easier reach into confined spaces, improving application flexibility. Therefore the MOTOMAN GP180-120 can be mounted closer to machines and fixtures, making best use of valuable floor space.

Its cables and airlines are routed through the robot base to upper arm to increase cable life, enhance safety and reduce teaching time.

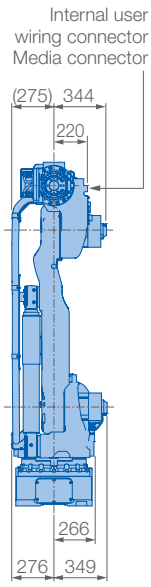
The cable installation tube in the base of the robot facilitates fieldbus routing to the robot upper arm and/or gripper. It is also pre-wired for servo gripper which allows a wider range of product handling.

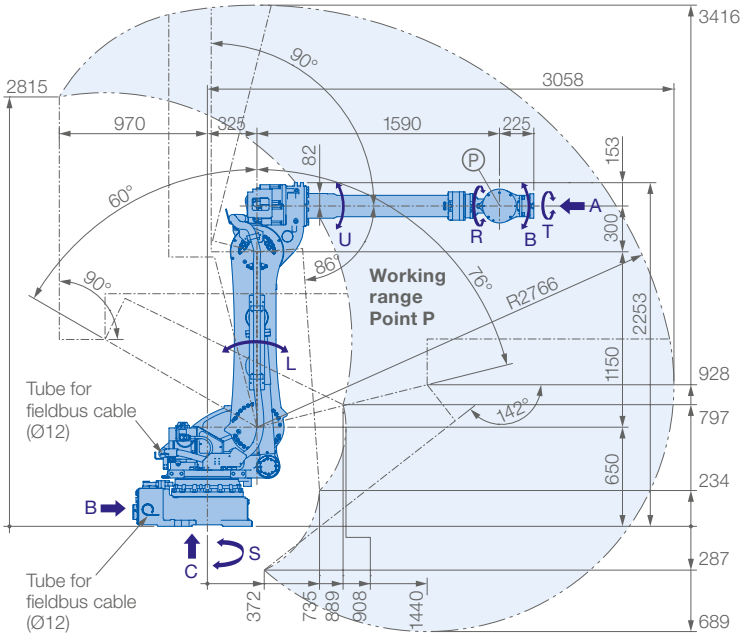
The MOTOMAN GP180-120 has an IP67-rated wrist and an IP54 body standard.

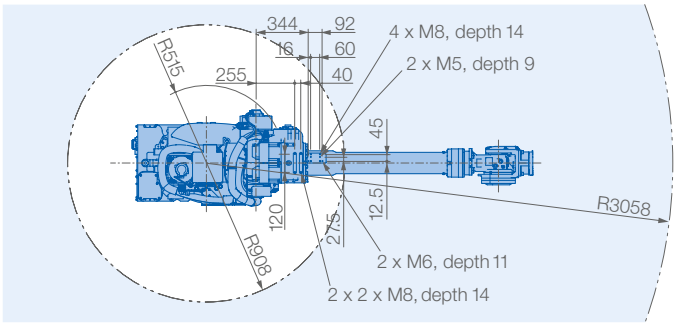
### KEY BENEFITS

- Small footprint and minimal interferences
- High inertia rating enables handling of huge work pieces
- Reduced cycle times by optimal design and high axes speed
- Versatile use in various applications
- High density spacing and reaching into confined spaces

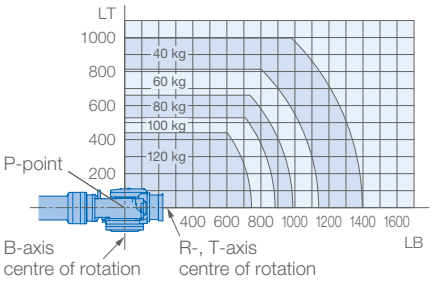
**Controlled by YRC1000**



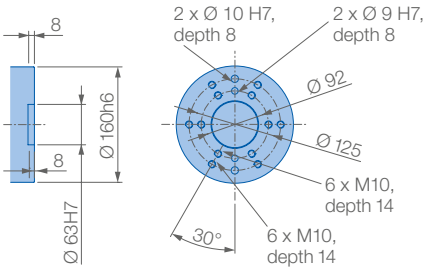



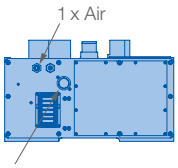

## Allowable wrist load



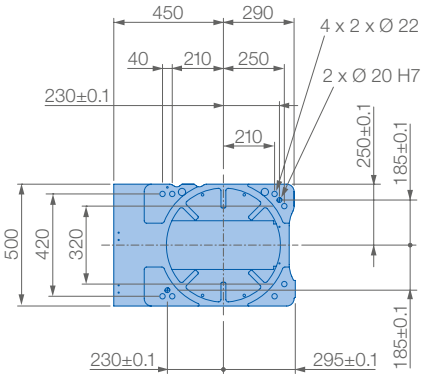

## View A




## View B




## View C




Mounting option: Floor

Protection class: IP54/67

| Specifications GP180-120 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 120 |
| **S** | ±180 | 125 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 115 | – | – | **Max. working range R [mm]** | 3058 |
| **U** | +90/–86 | 125 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 182 | 883 | 79 | **Humidity [%]** | 20 – 80 |
| **B** | ±130 | 175 | 883 | 79 | **Weight [kg]** | 1090 |
| **T** | ±360 | 265 | 520 | 40 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP180

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN GP180 is a versatile, high speed robot offering superior performance for a variety of applications, like material handling, machine and press tending.

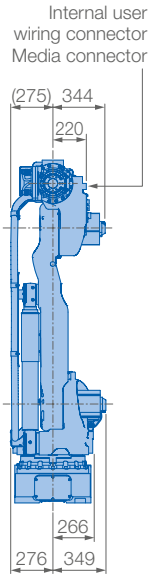
Despite of providing a high payload of 180 kg and the wide motion range of 2702 mm, the MOTOMAN GP180 was designed with a width of 625 mm, therefore valuable floor space can be saved.

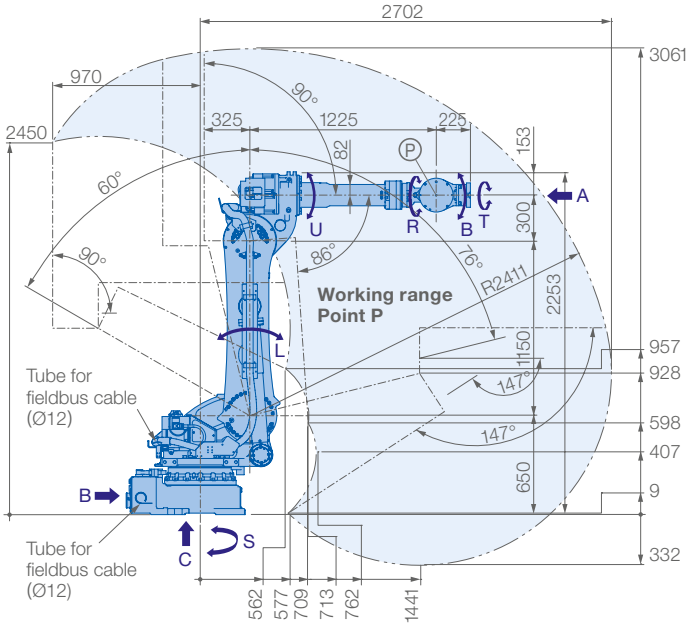
With the higher axis operation speed and speed reducer rigidity, a special vibration control system was developed. By reducing cycle times, this system realises high increases in productivity.

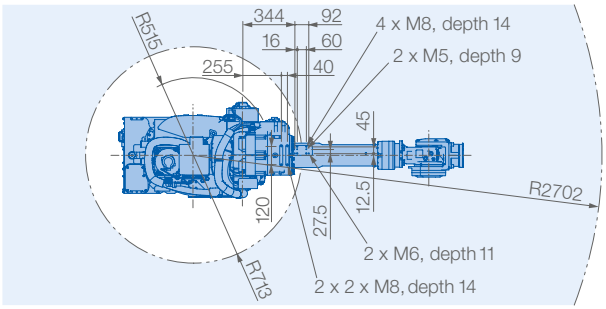
### KEY BENEFITS

- Fast, flexible and powerful
- High payload: 180 kg
- Wide motion range: 2702 mm
- Maximum performance using minimal floor space

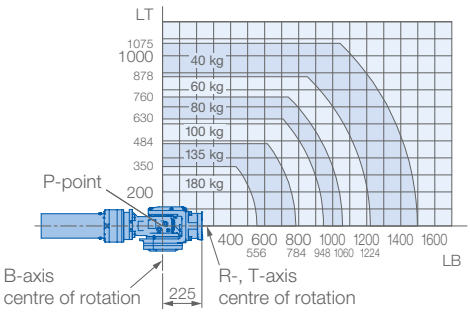
Controlled by YRC1000



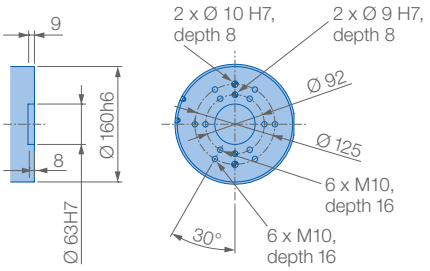



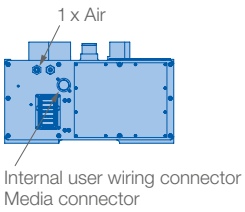

## Allowable wrist load



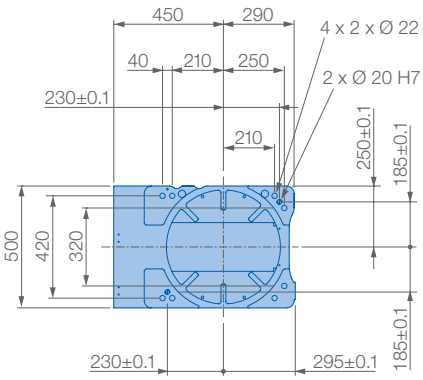

## View A




## View B




## View C




Mounting option: Floor

Protection class: IP54/67

| Specifications GP180 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 180 |
| **S** | ±180 | 125 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 115 | – | – | **Max. working range R [mm]** | 2702 |
| **U** | +90/–86 | 125 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 182 | 1000 | 90 | **Humidity [%]** | 20 – 80 |
| **B** | ±130 | 175 | 1000 | 90 | **Weight [kg]** | 1020 |
| **T** | ±360 | 265 | 618 | 46.3 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP215

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN GP215 is a versatile, high speed robot offering superior performance for a variety of applications, like material handling, machine and press tending.

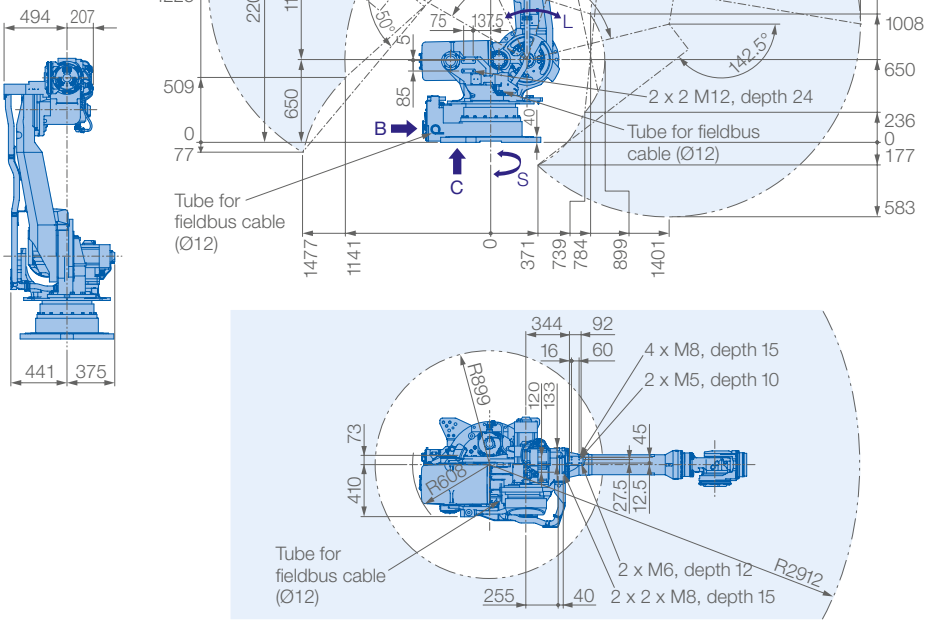
Despite of providing a high payload of 215 kg and the wide motion range of 2912 mm, the MOTOMAN GP215 was designed with a width of 816 mm, therefore valuable floor space can be saved.

The vibration control system uses higher axis operation speed and speed reducer rigidity to allow fast acceleration of short movements. By reducing cycle times, this system realises high increases in productivity.

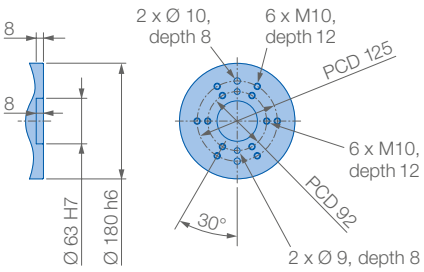
### KEY BENEFITS

- Fast, flexible and powerful
- High payload: 215 kg
- Wide motion range: 2912 mm
- Maximum performance using minimal floor space

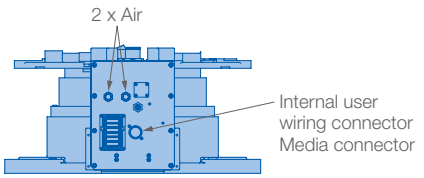
Controlled by YRC1000



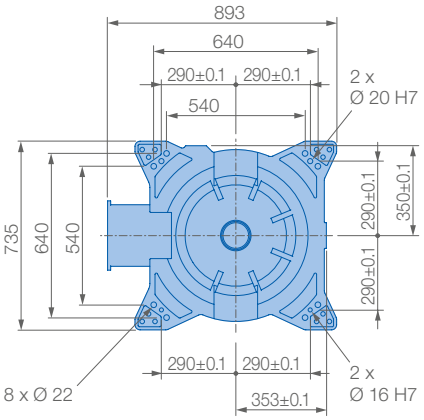

## View A



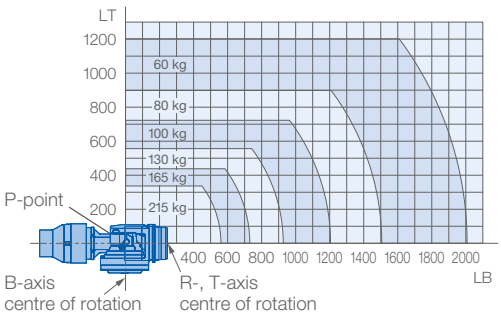

## View B




## View C




## Allowable wrist load




Mounting option: Floor

Protection class: IP54/67

| Specifications GP215 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 215 |
| **S** | ±180 | 100 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 90 | – | – | **Max. working range R [mm]** | 2912 |
| **U** | +197/–77.8 | 97 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 120 | 1176 | 317 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 120 | 1176 | 317 | **Weight [kg]** | 1340 |
| **T** | ±360 | 190 | 710 | 200 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP225

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN MH225 is a versatile, high speed robot offering superior performance for a variety of applications, like material handling, machine and press tending.

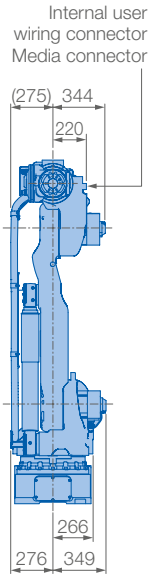
Despite of providing a high payload of 225 kg and the wide motion range of 2702 mm, the MOTOMAN GP225 was designed with a width of 625 mm, therefore valuable floor space can be saved.

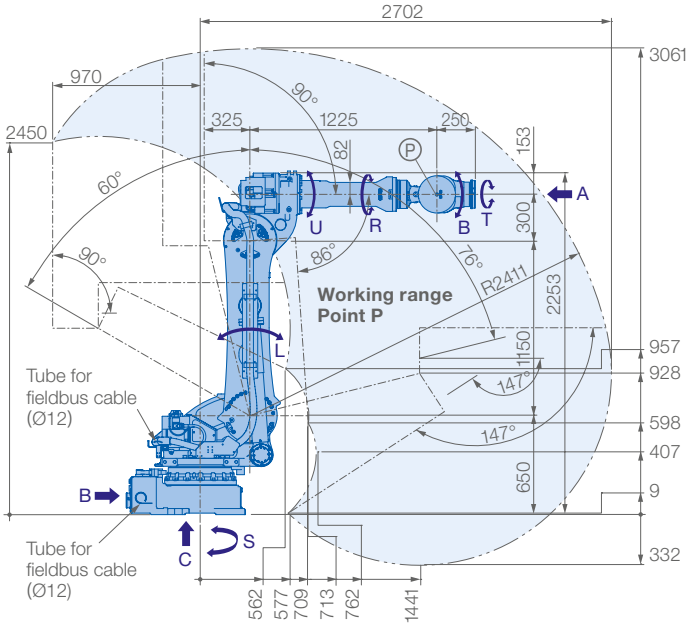
With the higher axis operation speed and speed reducer rigidity, a special vibration control system was developed. By reducing cycle times, this system realises high increases in productivity.

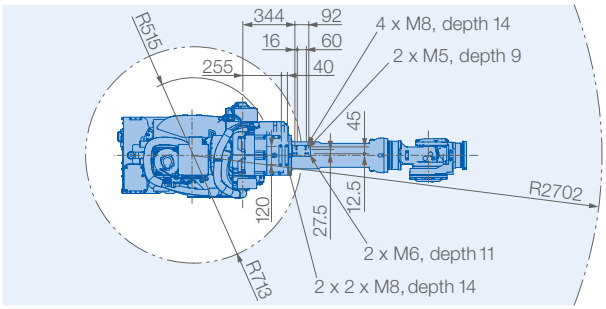
### KEY BENEFITS

- Fast, flexible and powerful
- High payload: 225 kg
- Wide motion range: 2702 mm
- Maximum performance using minimal floor space

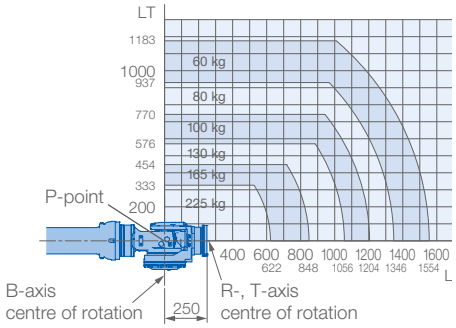
Controlled by YRC1000



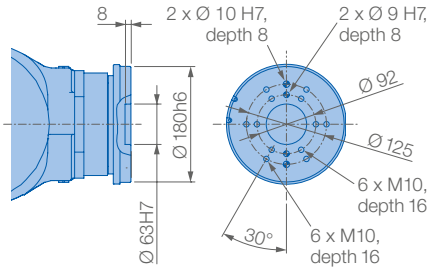



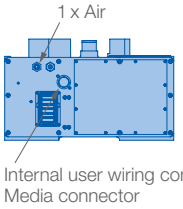

## Allowable wrist load



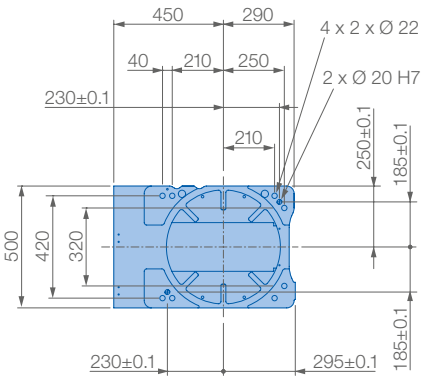

## View A




## View B




## View C




Mounting option: Floor

Protection class: IP54/67

| Specifications GP225 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 225 |
| **S** | ±180 | 120 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 97 | – | – | **Max. working range R [mm]** | 2702 |
| **U** | +90/–86 | 115 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 145 | 1372 | 145 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 145 | 1372 | 145 | **Weight [kg]** | 1080 |
| **T** | ±360 | 220 | 735 | 84 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP250

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN GP250 is a versatile, high speed robot offering superior performance for a variety of applications, like material handling, machine and press tending.

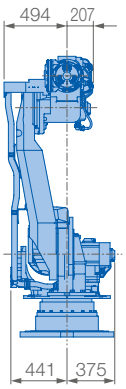
Despite of providing a high payload of 250 kg and the wide motion range of 2710 mm, the MOTOMAN GP250 was designed with a width of 816 mm, therefore valuable floor space can be saved.

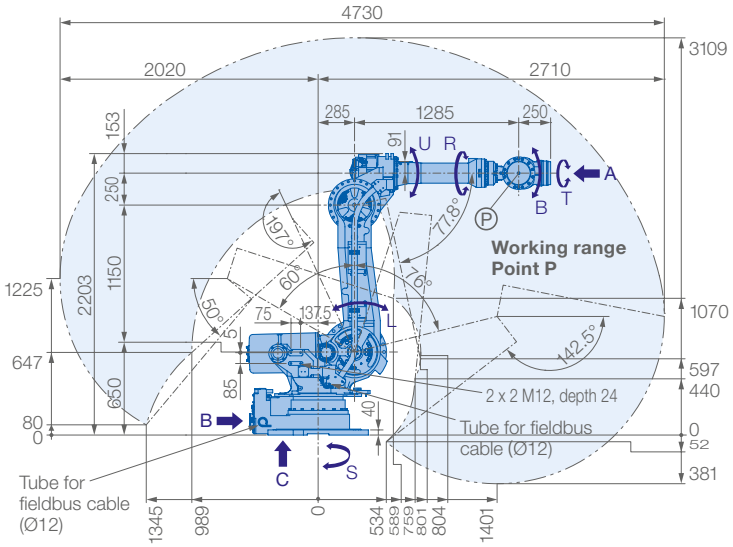
The vibration control system uses higher axis operation speed and speed reducer rigidity to allow fast acceleration of short movements. By reducing cycle times, this system realises high increases in productivity.

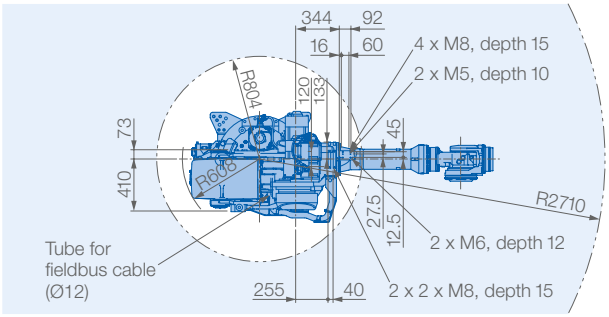
### KEY BENEFITS

- Fast, flexible and powerful
- High payload: 250 kg
- Wide motion range: 2710 mm
- Maximum performance using minimal floor space

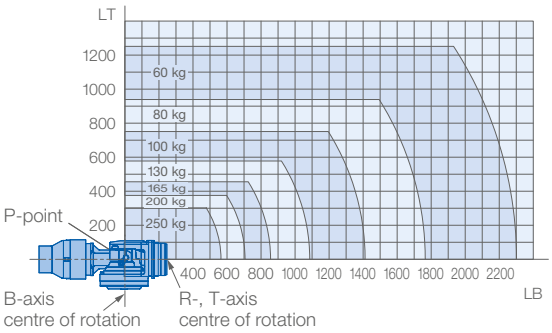
Controlled by YRC1000



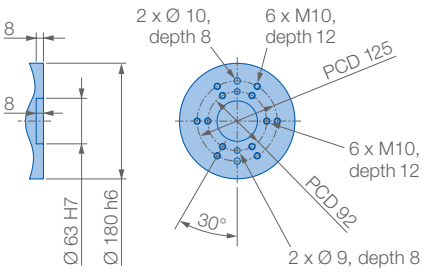



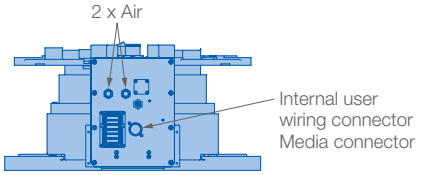

## Allowable wrist load



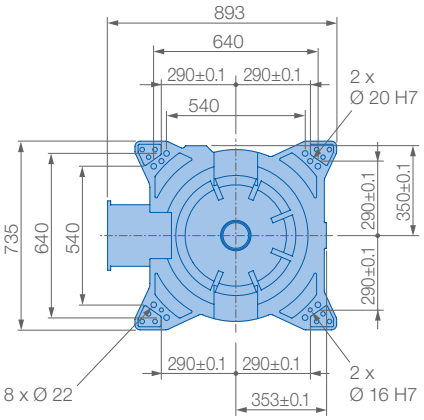

## View A




## View B




## View C




Mounting option: Floor

Protection class: IP54/67

| Specifications GP250 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 250 |
| **S** | ±180 | 100 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 90 | – | – | **Max. working range R [mm]** | 2710 |
| **U** | +197/–77.8 | 97 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 120 | 1385 | 317 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 120 | 1385 | 317 | **Weight [kg]** | 1345 |
| **T** | ±360 | 190 | 735 | 200 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP280

## Handling & General Applications with the GP-series


The 6-axis MOTOMAN GP280 is a versatile, high speed robot offering superior performance for a variety of applications, like material handling, machine and press tending.

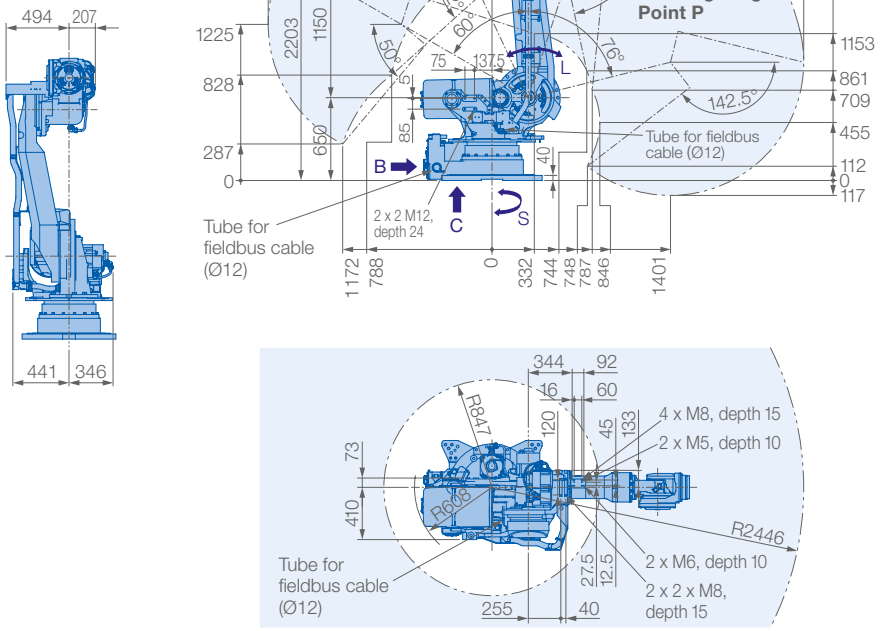
The GP280 offers a large work envelope of 2446 mm and a high moment of inertia ratings. Fast axial speeds and acceleration reduce cycle times and increase production output. The compact, slim design allows the robot to reach into confined spaces, improving system productivity.

The MOTOMAN GP280 is is available with the PLd Category 3 Functional Safety Unit (FSU).

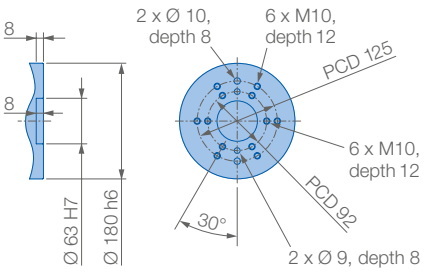
### KEY BENEFITS

- Fast, flexible and powerful
- Compact design allows maximum performance using minimal floor space
- Max. payload of 280 kg
- Max. working range of 2446 mm
- Enhanced safety funtions

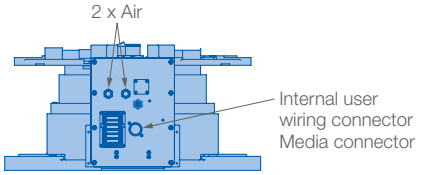
Controlled by YRC1000



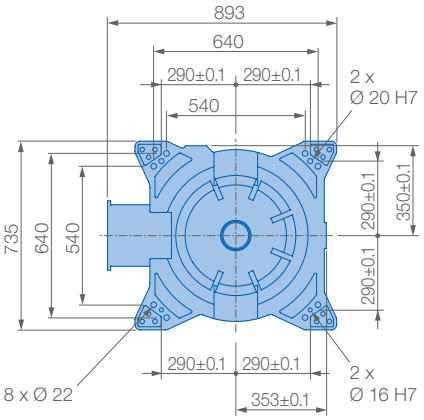

## View A




## View B



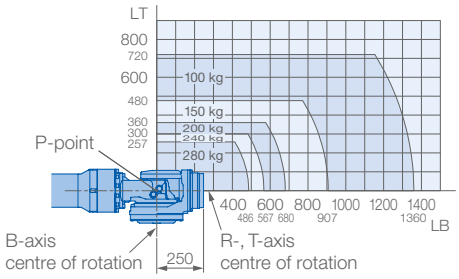

## View C




Mounting option: Floor

Protection class: IP54/67

## Allowable wrist load




| Specifications GP280 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 280 |
| **S** | ±180 | 90 | – | – | **Repeatability [mm]** | ±0.2 |
| **L** | +76/–60 | 80 | – | – | **Max. working range R [mm]** | 2446 |
| **U** | +197/–77.8 | 90 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 115 | 1333 | 142 | **Humidity [%]** | 20 – 80 |
| **B** | ±125 | 110 | 1333 | 142 | **Weight [kg]** | 1300 |
| **T** | ±360 | 190 | 706 | 79 | **Power supply, average [KVA]** | 5.0 |

# MOTOMAN GP400

## Handling & General Applications with the GP-series

The 6-axis MOTOMAN GP400 is a versatile, powerful robot offering superior performance for a variety of applications. It provides a high payload of 400 kg and a wide motion range, which especially enables the handling of large work pieces.

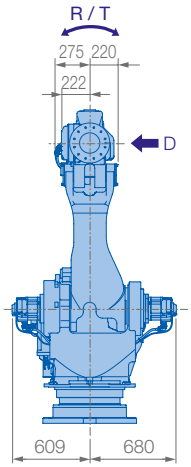
The robot features a parallel-link construction for strength, rigidity and stabilization of high moment and inertia loads. The GP400 also has heavy-duty bearings which provide a smooth arm rotation.

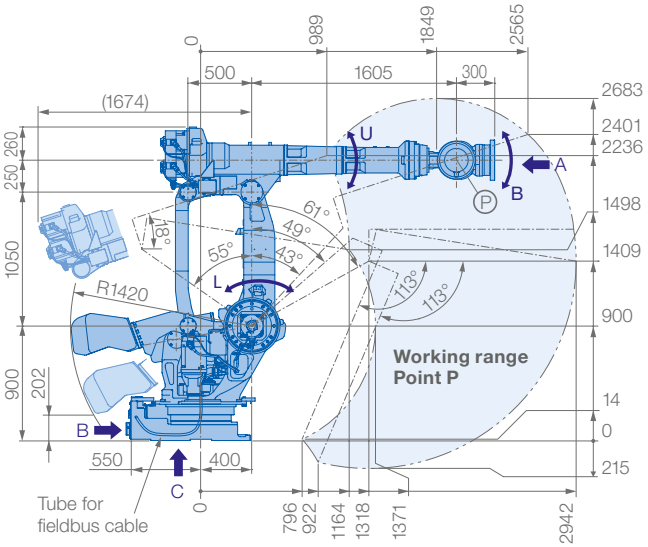
The MOTOMAN GP400 is available with the PLd Category 3 Functional Safety Unit (FSU).

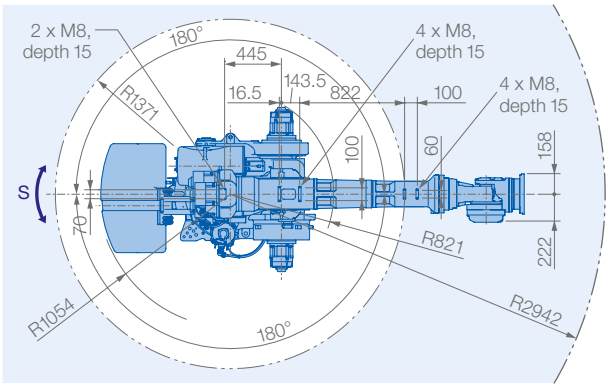

### KEY BENEFITS

- Fast, flexible and powerful
- High payload: 400 kg
- Wide motion range: 2942 mm
- Parallel-link construction
- Heavy-duty bearings for smooth arm rotation
- Enhanced safety functions

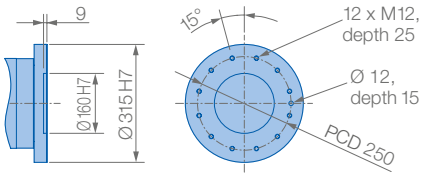
Controlled by YRC1000



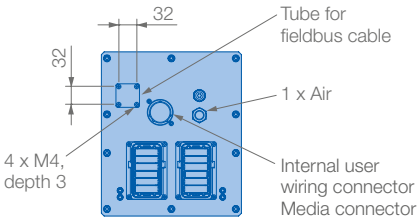



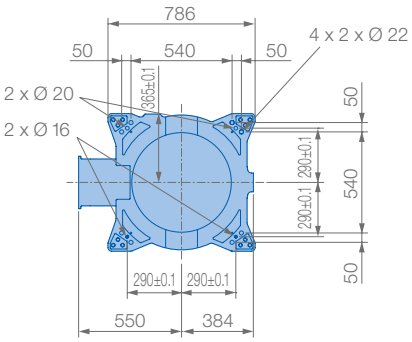

## View A




## View B



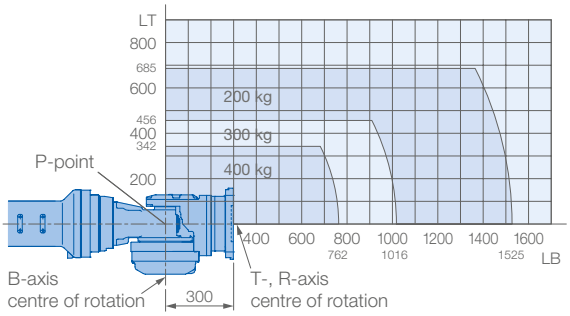

## View C



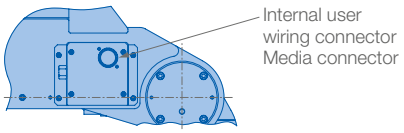

Mounting option: Floor

Protection class: IP30/67

## Allowable wrist load




## View D




| Specifications GP400 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 400 |
| **S** | ±180 | 102 | – | – | **Repeatability [mm]** | ±0.3 |
| **L** | +61/–55 | 97 | – | – | **Max. working range R [mm]** | 2942 |
| **U** | +18/–113 | 97 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 80 | 2989 | 500 | **Humidity [%]** | 20 – 80 |
| **B** | ±115 | 80 | 2989 | 500 | **Weight [kg]** | 2840 |
| **T** | ±360 | 172 | 1343 | 315 | **Power supply, average [KVA]** | 7.0 |

# MOTOMAN GP600

## Handling & General Applications with the GP-series

The 6-axis MOTOMAN GP600 is a versatile, powerful robot offering superior performance for a variety of applications. It provides a high payload of 600 kg and a wide motion range, which especially enables the handling of large and heavy work pieces.

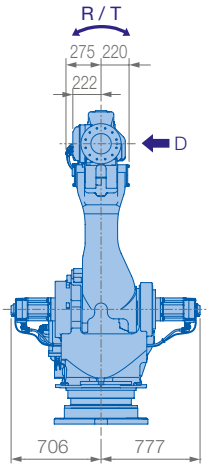
The robot features a parallel-link construction for strength, rigidity and stabilization of high moment and inertia loads. The GP600 also has heavy-duty bearings which provide a smooth arm rotation.

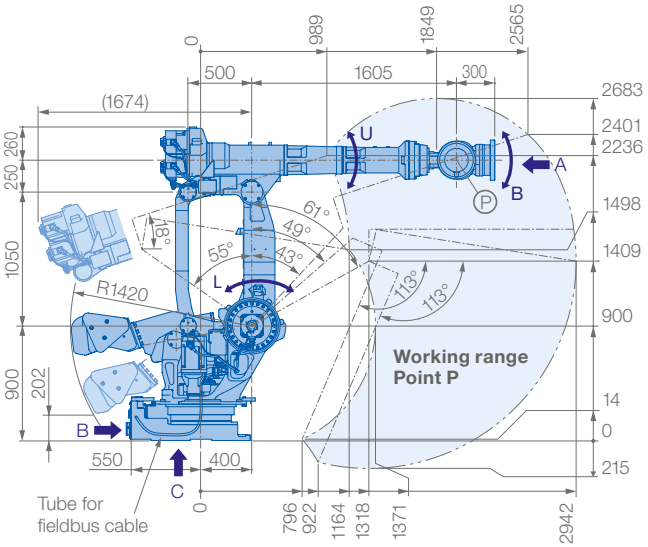
The MOTOMAN GP600 is available with the PLd Category 3 Functional Safety Unit (FSU).

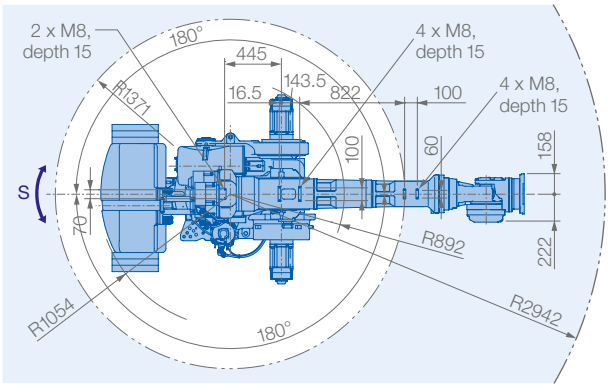
### KEY BENEFITS

- Ideal for handling of large work pieces
- High payload: 600 kg
- Wide motion range: 2942 mm
- Fast, flexible and powerful
- Parallel-link construction
- Heavy-duty bearings for smooth arm rotation
- Enhanced safety functions

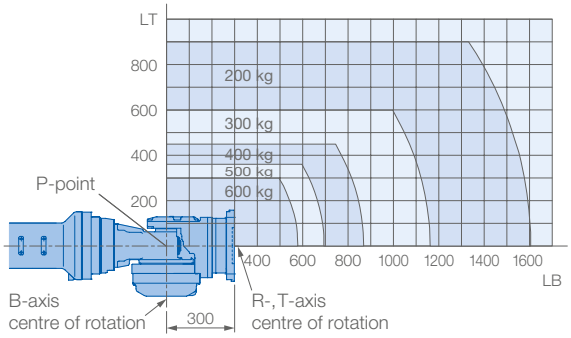
Controlled by YRC1000



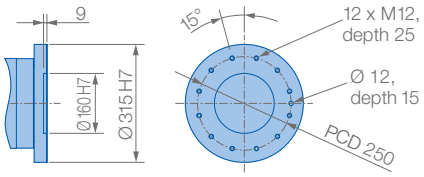



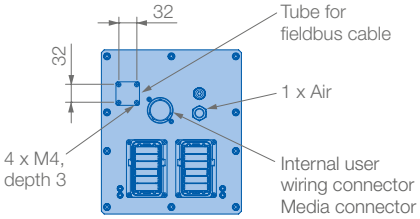

## Allowable wrist load



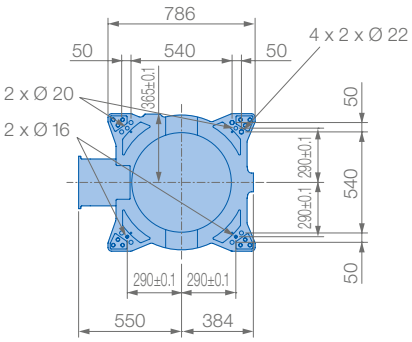

## View A




## View B



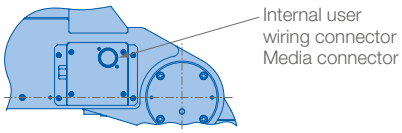

## View C



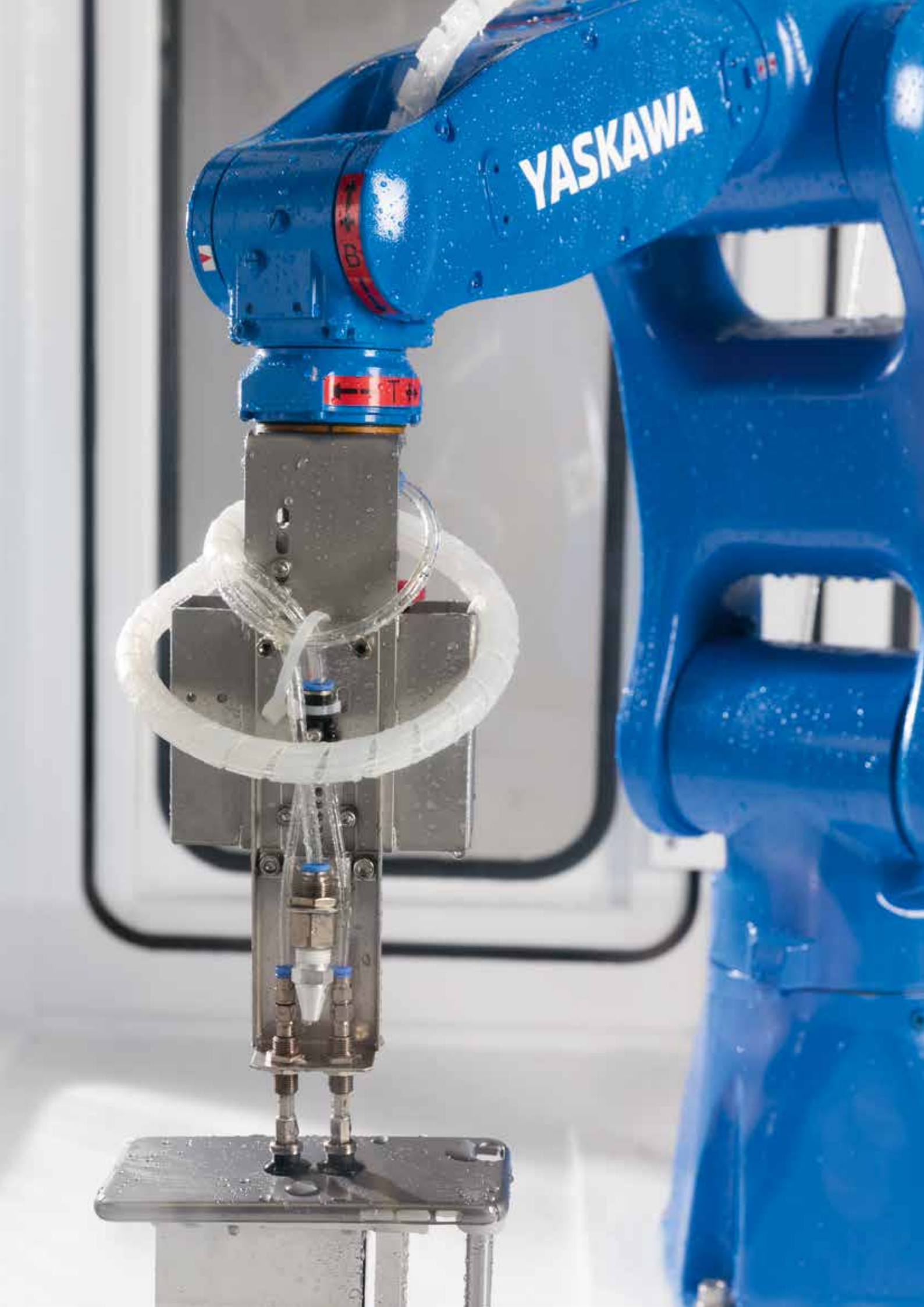

Mounting option: Floor

Protection class: IP30/67

## View D



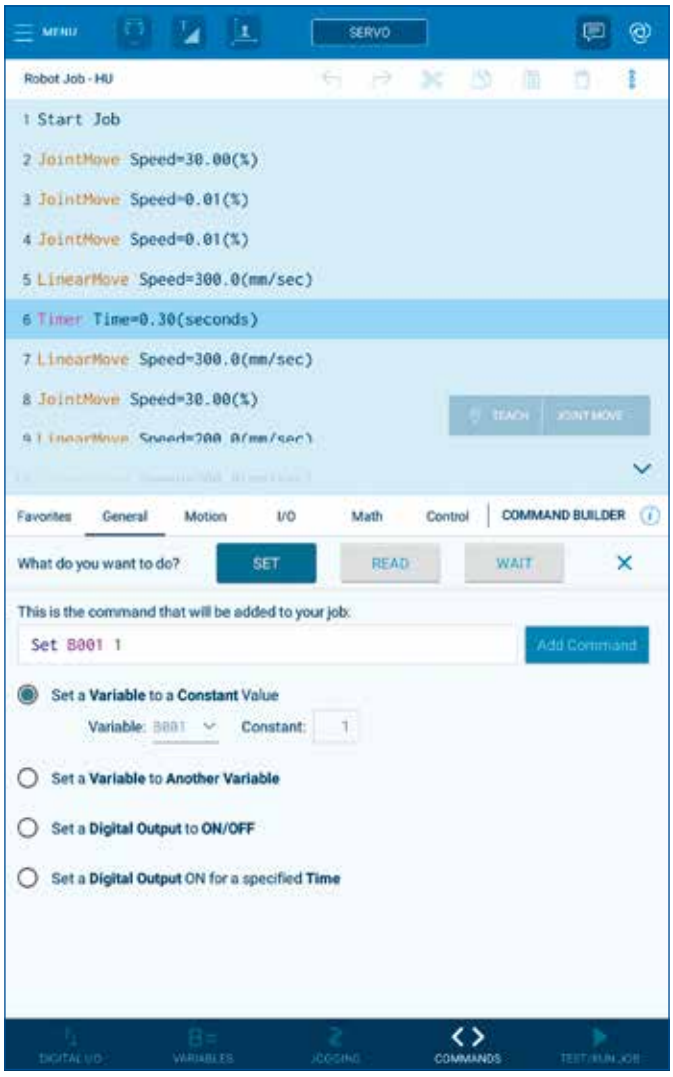

| Specifications GP600 | | | | | | |
|---|---|---|---|---|---|---|
| **Axes** | **Maximum motion range [°]** | **Maximum speed [°/sec.]** | **Allowable moment [Nm]** | **Allowable moment of inertia [kg · m²]** | **Controlled axes** | 6 |
| | | | | | **Max. payload [kg]** | 600 |
| **S** | ±180 | 82 | – | – | **Repeatability [mm]** | ±0.3 |
| **L** | +61/–55 | 82 | – | – | **Max. working range R [mm]** | 2942 |
| **U** | +18/–113 | 82 | – | – | **Temperature [°C]** | 0 to +45 |
| **R** | ±360 | 80 | 3430 | 520 | **Humidity [%]** | 20 – 80 |
| **B** | ±115 | 80 | 3430 | 520 | **Weight [kg]** | 3035 |
| **T** | ±360 | 162 | 1764 | 350 | **Power supply, average [KVA]** | 7.0 |


YASKAWA

# Smart Pendant


- **Smart Pendant reduces what the user needs to remember in order to enter instructions and values, and the procedures for doing so.**
- The main menu makes switching between screens more user-friendly, as all menus are listed in a sequence that requires minimal memorization.
- Easy access to all functions:
  The user can remember the location of each item in the navigation menu and safely return to the home menu in case of confusion.

- **Smart Pendant allows a user to quickly:**
  - **– Trigger an action**
  - **– Select an option**
  - **– Adapt parameter options**
  - **– Obtain assistance**
- Smart Pendant introduces a new type of coordinate frame: SMART FRAME
- Traditional teach pendant programming requires the operator to select the appropriate coordinate frame (joint, world, tool or user), which defines the direction in which the robot will move when a button is pressed. If the frame is not set correctly, moving the robot in the wrong direction or with the wrong trajectory can lead to problems and require time-consuming corrections.
- **Hand Guiding is a collaborative feature that allows an operator to hand-guide the robot to a desired position.**
- **This task can be achieved by utilizing additional external hardware mounted directly on the robot or by a robot specifically designed to support this feature, e.g. HC10.**
- Smart Pendant is YASKAWA's next generation programming pendant that makes no compromise between ease of use and capability.




- **Its key features are:**
  - – Easy-to-understand operation and user interface designed with customer participation
  - – Simplified INFORM programming without loss of functionality
  - – Command Builder for automatic INFORM generation

    SMART FRAME jogging eliminates coordinate frames
  - – Direct teaching with hand guiding for HC10
  - – Built in Help function and "How-To" guides

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YASKAWA