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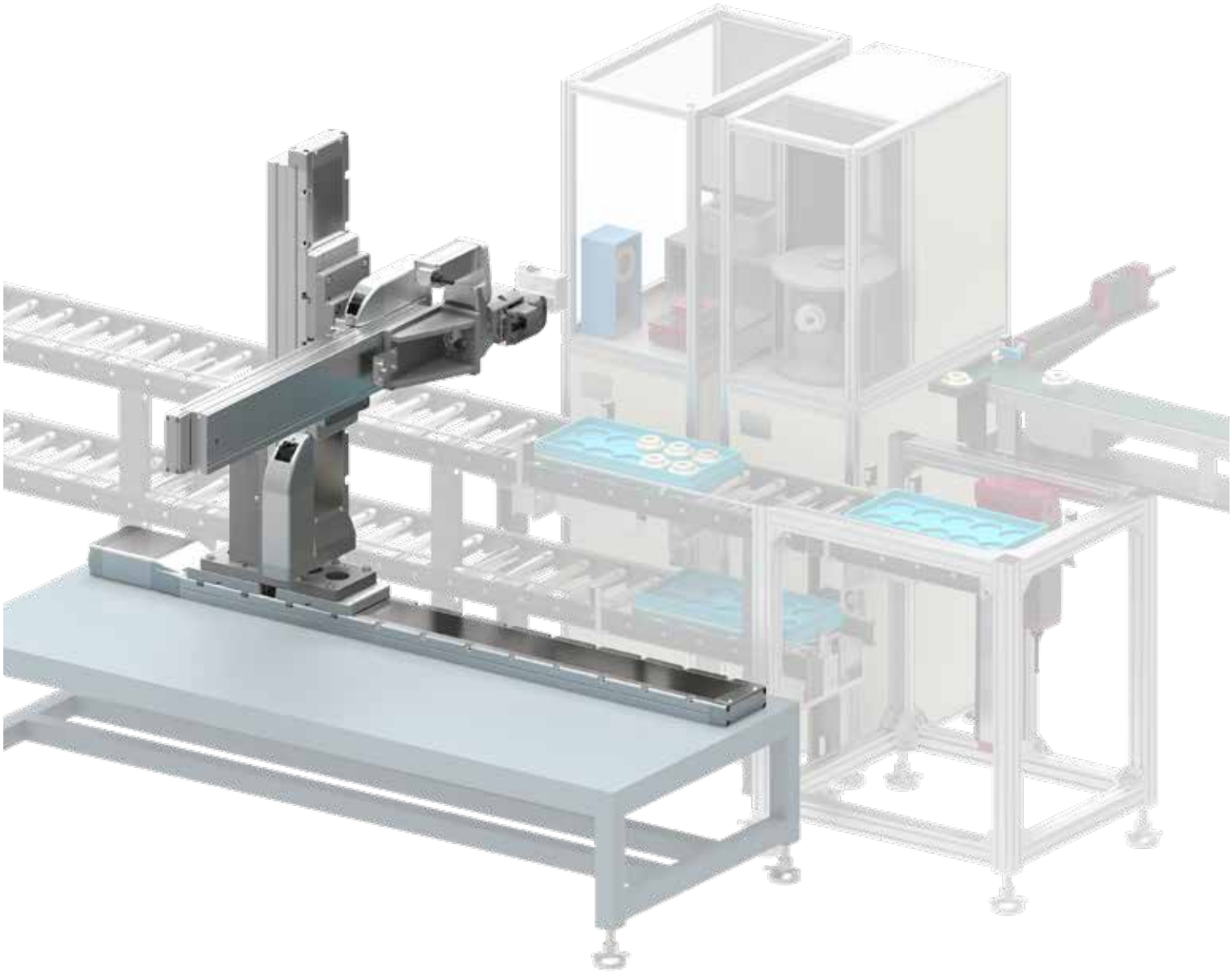
# Cartesian Type 6-Axis Robot CRS



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New Cartesian Type 6-Axis Robot CRS

# Robot with 6 degrees of freedom combining 3 cartesian and 3 rotational axes.

## Operations with a high degree of freedom are possible including rotation and turning.

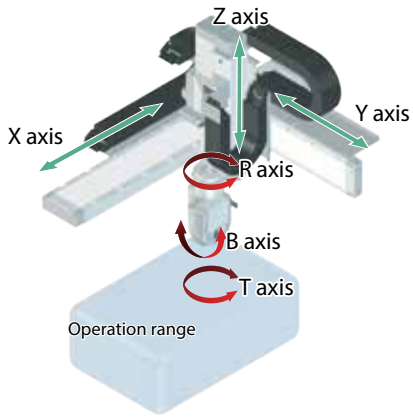
### 1 Many variations and combinations are available.

Ten different combinations are available.
An optimal combination can be selected according to payload, traveling stroke and installation space.

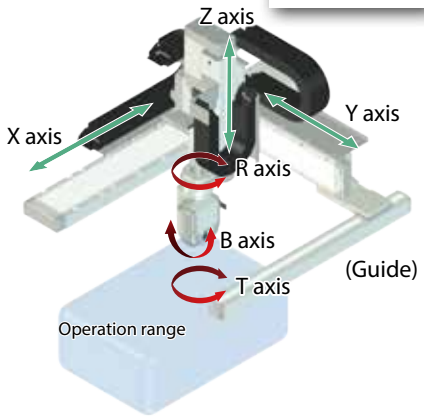
| **ROBO Cylinder** cartesian combination (X, Y, Z axes) | + | **Hollow rotary** RCP6-RTFML (R axis) | + | **Wrist unit** WU-S/M (B and T axes) |
|---|---|---|---|---|

**Sway and rotational movements to the horizontal surface (XY plane) is possible.**

Details on P5.



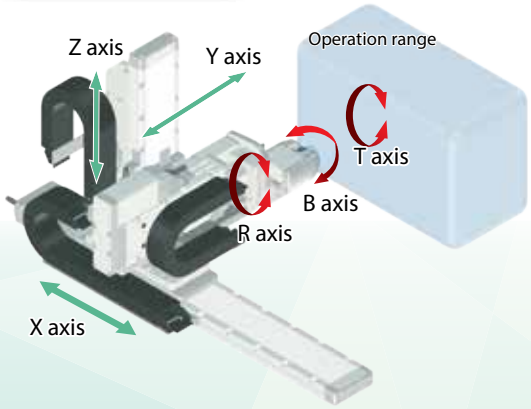

Gantry type



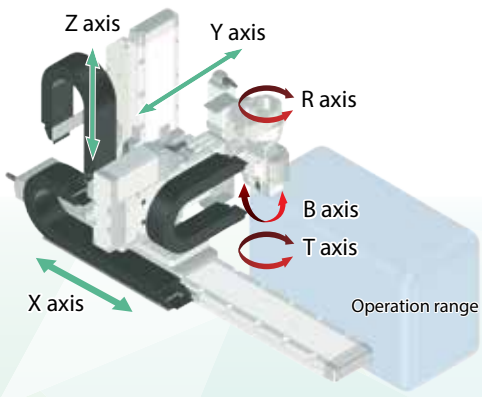

**Sway and rotational movements to the wall surface (YZ plane) is possible.**

Details on P6.

Sideway approach




Downwards approach



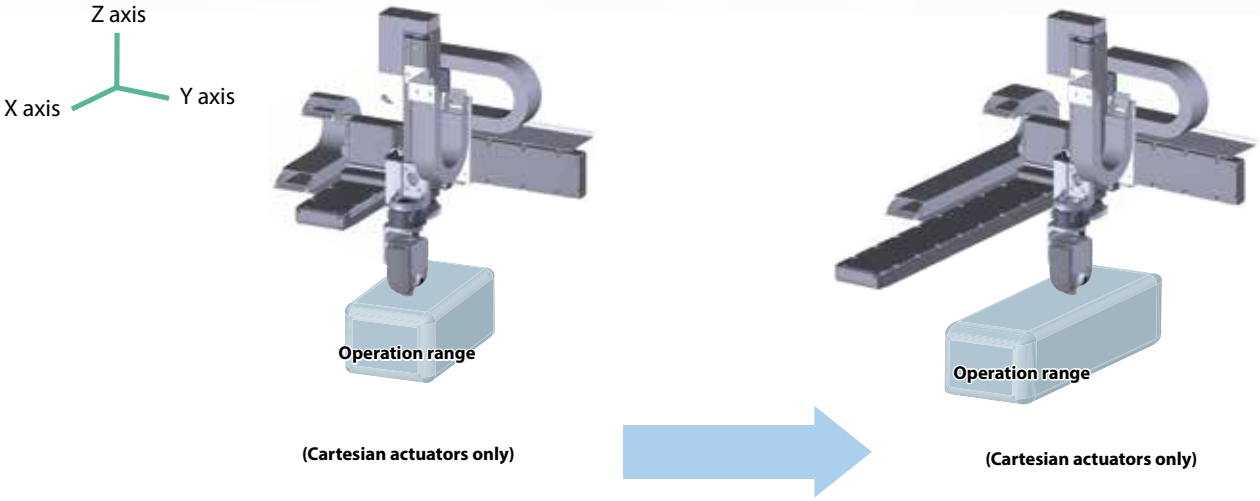
## 2 Strokes can be selected for each of X, Y and Z axes

An optimal size can be selected by setting the strokes of each axis.
Minimal cost increase by stroke length.

(Ex.) Changing the stroke of the X-axis of CRS-XBA from 200mm to 800mm.

| Strokes | XYZ : | **200**mm | ×300mm×190mm |
|---|---|---|---|

| Strokes | XYZ : | **800**mm | ×300mm×190mm |
|---|---|---|---|

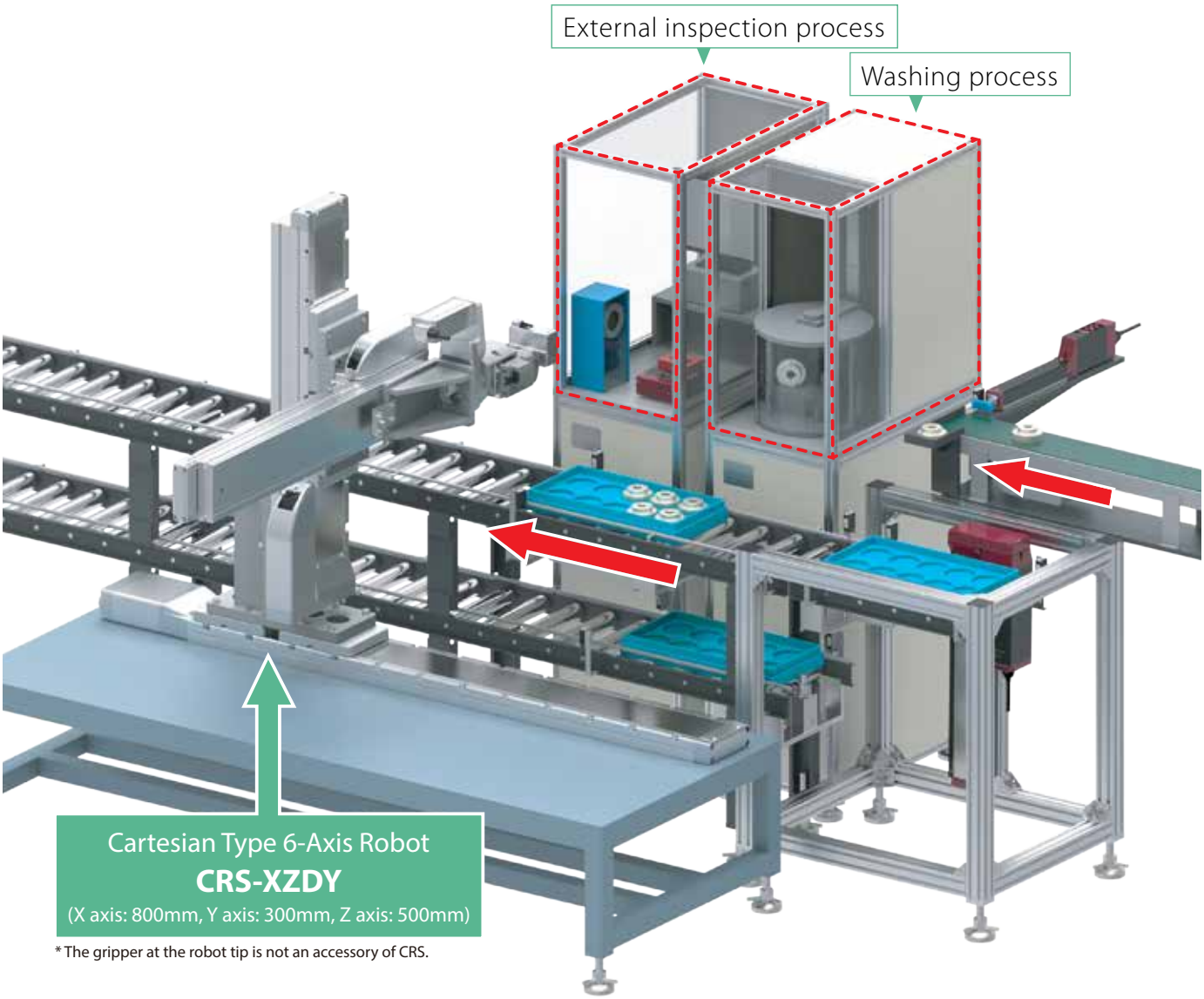



## 3 Battery-less absolute encoders are equipped standard.

# Application

## Loading and unloading gears for cleaning and external inspection.

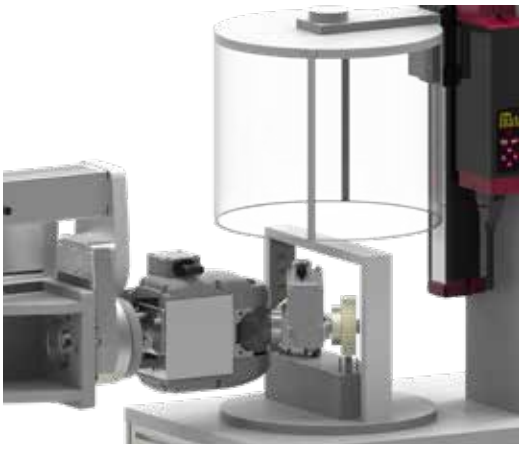
Equipment to wash machined gears and perform an external inspection.
A Cartesian Type 6-Axis Robot (CRS-XZDY) performs machine tending for washing equipment and inspection for external appearance from three directions.




* The gripper at the robot tip is not an accessory of CRS.

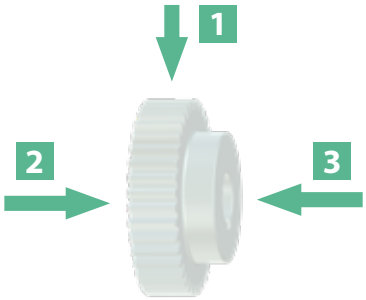
## Loading and unloading gears from the washing station.

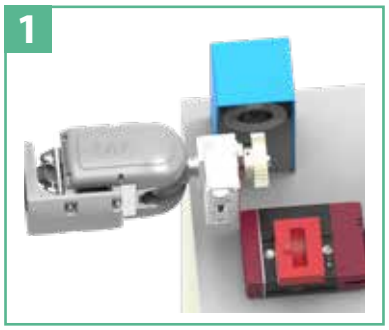
Picks up the gear from the previous process and places it in the washing equipment.
After washing, the gear is taken out and transferred to the external appearance inspection process.

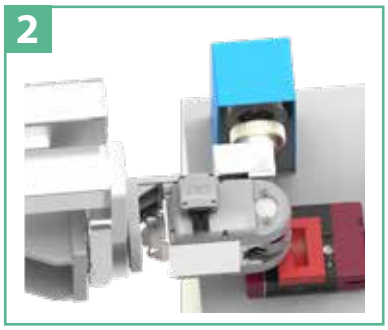


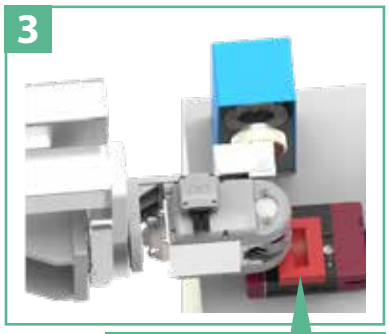
## External inspection

As shown in the illustration, the gear is inspected from 3 angles, by changing its direction in front of an inspection camera.




The gear is turned over by rotary type (EC-TRC).

## Filling the pallet

After inspection, good gears are placed in the pallet.

# Full Line Up

Three-dimensional movements are possible within a work envelope.

Recommended for pick & place, assembling and inspection.

- XYB (Y-axis base mounted) + Z-axis base mounted type
- XYG (gantry Y-axis horizontal) + Z-axis base mounted type

**Y-axis long stroke**

Gantry combination

**Long stroke X-axis, high speed, high payload**

## Model: CRS-XBA

| Max. operation range | X-axis 800mm | Y-axis 300mm | Z-axis 190mm |
|---|---|---|---|
| Maximum payload | 1 kg | | |
| Standard cycle time | 2.07 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

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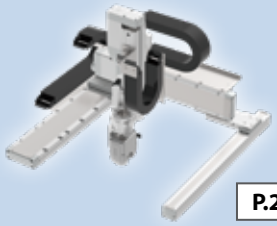
## Model: CRS-XGA

| Max. operation range | X-axis 800mm | Y-axis 600mm | Z-axis 190mm |
|---|---|---|---|
| Maximum payload | 1 kg | | |
| Standard cycle time | 2.11 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |



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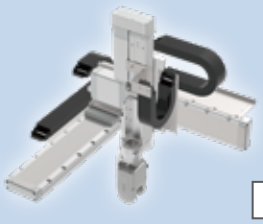
## Model: CRS-XBB

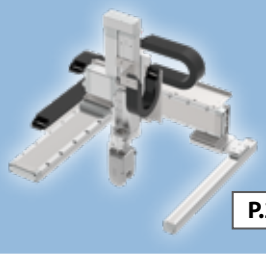
| Max. operation range | X-axis 1100mm | Y-axis 300mm | Z-axis 200mm |
|---|---|---|---|
| Maximum payload | 2 kg | | |
| Standard cycle time | 1.66 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |



P.19

## Model: CRS-XGB

| Max. operation range | X-axis 1100mm | Y-axis 600mm | Z-axis 200mm |
|---|---|---|---|
| Maximum payload | 2 kg | | |
| Standard cycle time | 1.66 seconds | | |
| Positioning repeatability | ± 0.04 mm | | |



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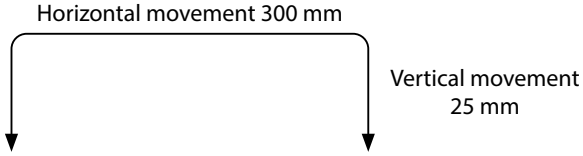
* Standard cycle time

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.
The cycle time can be higher than the specified value depending on stroke and operating conditions.



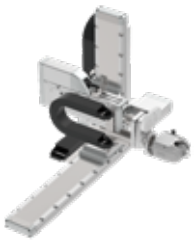

* Maximum payload

The maximum payload may decrease depending on the workpiece and its center of gravity.

Accessing difficult to reach locations is possible.

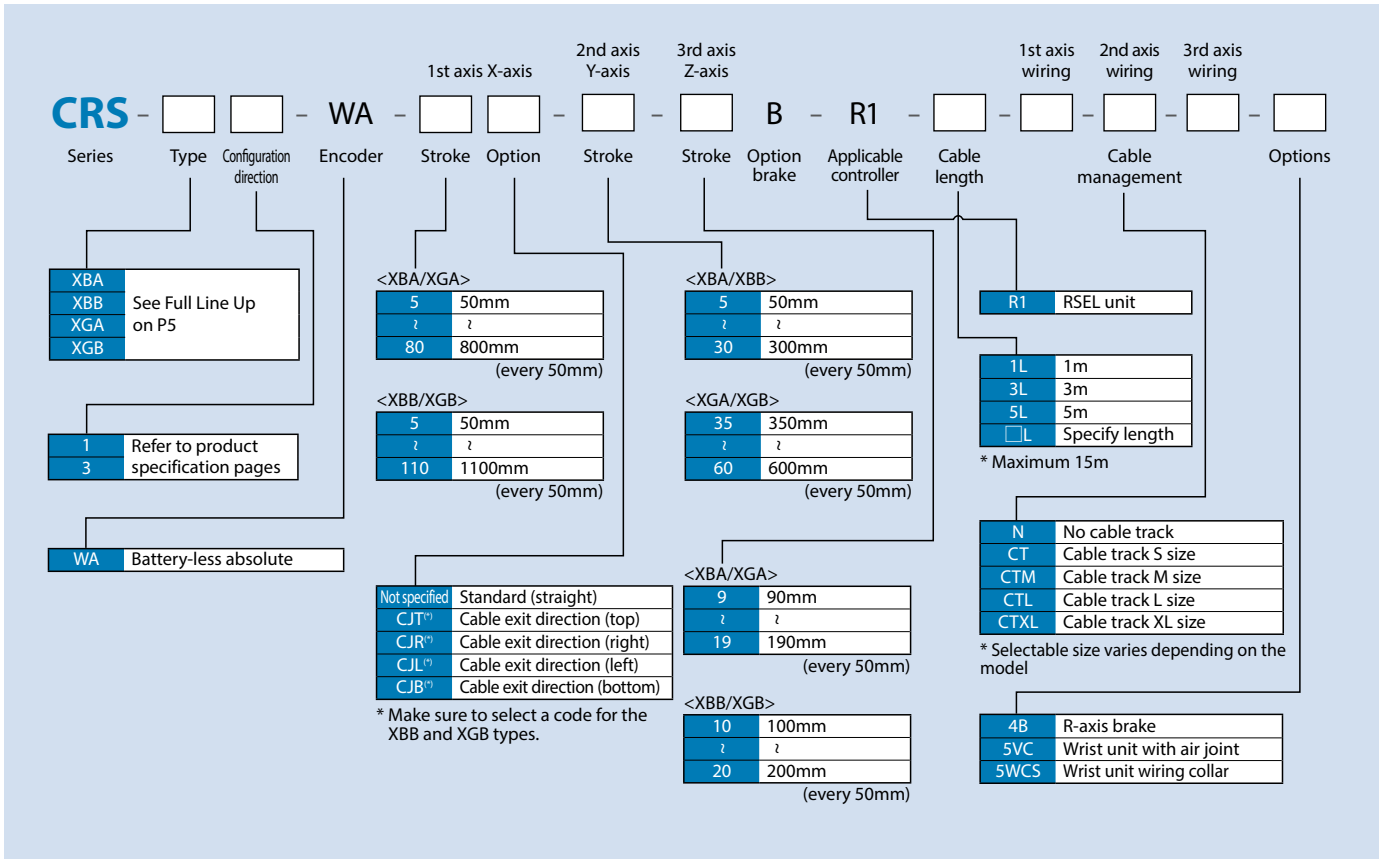
Recommended for loading and unloading machines

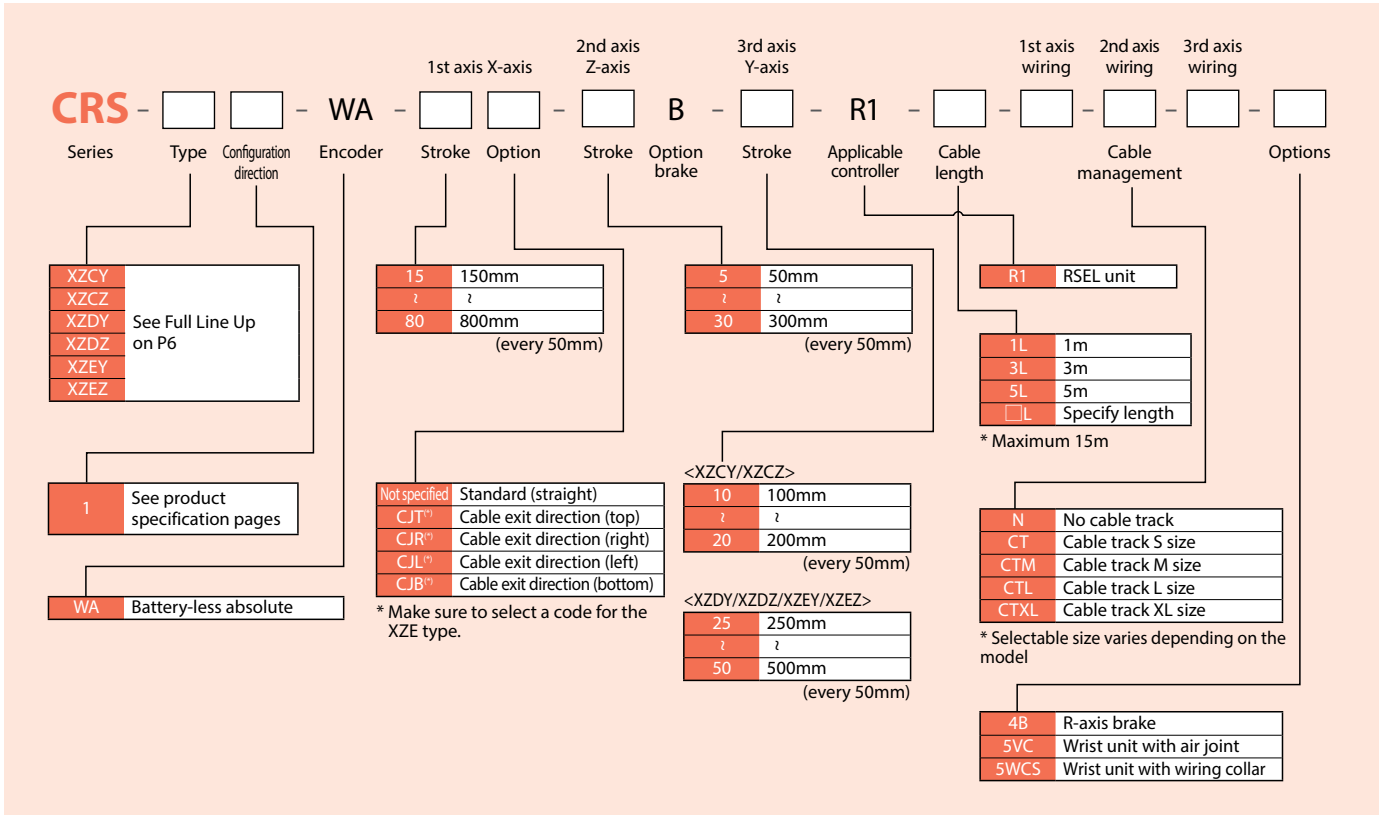
- XZ (Z-axis vertical) + Y-axis radial cylinder type
- XZ (Z-axis vertical) + Y-axis slider type

| | Side approach | Downward approach |
|---|---|---|
| **Long stroke Y-axis** | **Model: CRS-XZCY**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 200mm<br>Maximum payload: 1 kg<br>Standard cycle time: 2.55 seconds<br>Positioning repeatability: ± 0.06 mm<br>  <br>P.31 | **Model: CRS-XZCZ**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 200mm<br>Maximum payload: 1 kg<br>Standard cycle time: 2.55 seconds<br>Positioning repeatability: ± 0.06 mm<br>  <br>P.35 |
| | **Model: CRS-XZDY**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 500mm<br>Maximum payload: 1 kg<br>Standard cycle time: 2.28 seconds<br>Positioning repeatability: ± 0.03mm<br>  <br>P.39 | **Model: CRS-XZDZ**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 500mm<br>Maximum payload: 1 kg<br>Standard cycle time: 2.28 seconds<br>Positioning repeatability: ± 0.03mm<br>  <br>P.43 |
| **High speed** | **Model: CRS-XZEY**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 500mm<br>Maximum payload: 1 kg<br>Standard cycle time: 1.69 seconds<br>Positioning repeatability: ± 0.03mm<br>  <br>P.47 | **Model: CRS-XZEZ**<br>Max. operation range: X-axis 800mm, Z-axis 300mm, Y-axis 500mm<br>Maximum payload: 1 kg<br>Standard cycle time: 1.69 seconds<br>Positioning repeatability: ± 0.03mm<br>  <br>P.51 |

# Model Specification Items

For combination types, refer to the Full Line Up on P5 - P6.
Confirm the cable track size on each product pages.



# Options

## X-axis cable exit direction change

Model **CJT / CJR / CJL / CJB**

Description The mounting direction of the motor encoder cables on the actuator are changeable: top and bottom or left and right.
Confirm the directions in the dimensional drawing on the individual axis specs sheets.

## R-axis brake

Model **4B**

Description It prevents the rotary axis from moving at the time of power failure or servo OFF.
When using the rotary axis horizontally, it prevents the workpiece from dropping off due to the rotation of the axis.
(Brakes are standard equipment on the Z-axis and the BT axes for the wrist unit.)

## Wrist unit with air joint

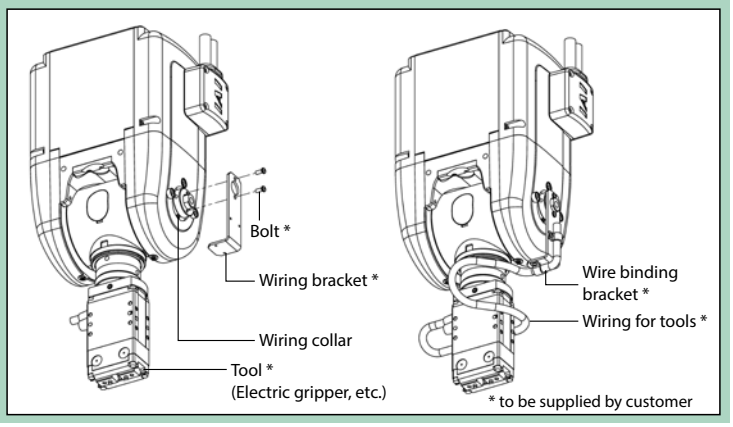
Model **5VC**

Description This is an option to attach an air joint (Φ6mm) on the side of the actuator when mounting a pneumatic device, such as a vacuum pad, to the wrist unit.
It is mounted on the same surface as the wrist unit's pigtail cable.

## Wrist unit with wiring collar

Model **5WCS**

Description The wrist unit wiring collar makes wiring easier when using an electric gripper.
The wiring collar is used as the base to which a wiring bracket (supplied by the customer) is mounted.



## Technical reference

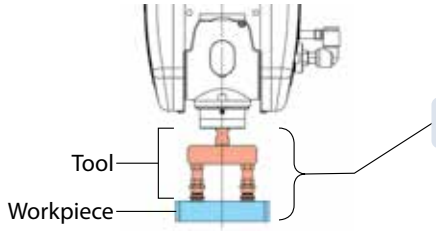
# Model selection procedure

Follow steps 1-4 for selection.

## Step 1

Confirm the mass of workpiece.

Calculate the mass of workpiece to be attached on the wrist unit and make sure that it is less than the maximum payload.




Mass of workpiece to be transferred ≦ Maximum payload

| Type | Wrist Unit | Maximum payload |
|---|---|---|
| CRS-XBA | WU-S | 1kg |
| CRS-XBB | WU-M | 2kg |
| CRS-XGA | WU-S | 1kg |
| CRS-XGB | WU-M | 2kg |

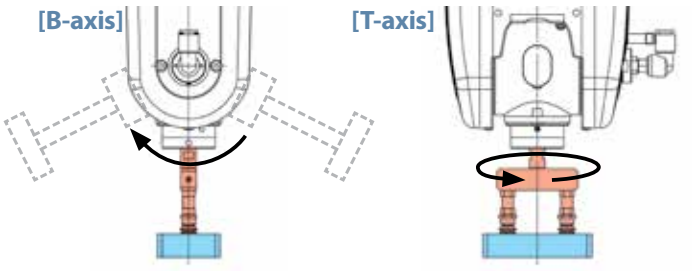
| Type | Wrist Unit | Maximum payload |
|---|---|---|
| CRS-XZCY | WU-S | 1kg |
| CRS-XZCZ | | |
| CRS-XZDY | | |
| CRS-XZDZ | | |
| CRS-XZEY | | |
| CRS-XZEZ | | |

## Step 2

Confirm the moment of inertia

When load torque is applied on the B or T axis, the allowable moment of inertia will be deceased accordingly.
Calculate load torque first, then determine compensated allowable moment of inertia.

[B-axis] [T-axis]



Page 12 shows the "how to calculate the moment of inertia of standard object shapes."

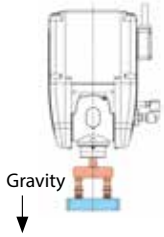
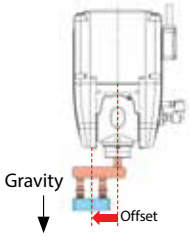
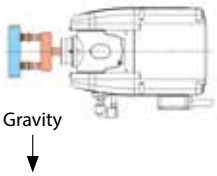
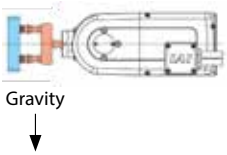
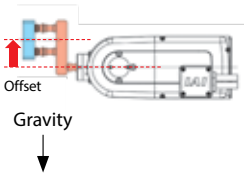
Confirm the existence of "load torque" on B-axis and T-axis.

If there is load torque:
Moment of inertia applied on B-axis and T-axis. ≦ Compensated allowable moment of inertia for both the small and medium wrist types.*

If there is no load torque:
Moment of inertia applied on B-axis and T-axis. ≦ Allowable moment of inertia for both the small and medium wrist types.*

* varies depending on speed and acceleration/deceleration.

### ■ Condition of load torque

| | Existence of load torque | | | | |
|---|---|---|---|---|---|
| | ① | ② | ③ | ④ | ⑤ |
| Mounting orientation |   |   |   |   |   |
| B-axis | Yes | Yes | No | Yes | Yes |
| T-axis | No | Yes | No | No | Yes |

## If there is load torque:

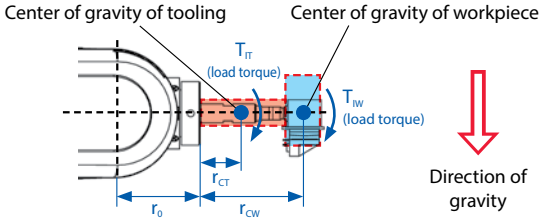
Moment of inertia applied on B-axis and T-axis. < Compensated allowable moment of inertia for both the small and medium wrist types.*

* varies depending on speed and acceleration/deceleration.

### (1) Calculation of load torque $T_I$

**B-axis**

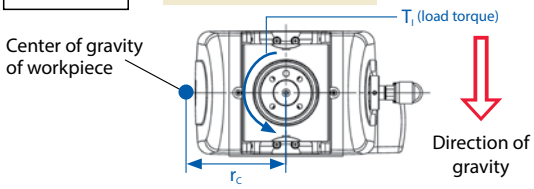
$$T_I = T_{IT} + T_{IW} = m_T \cdot g(r_0 + r_{CT}) \times 10^{-3} + m_W \cdot g(r_0 + r_{CW}) \times 10^{-3}$$




$T_{IT}$: Load torque caused by tooling [N・m]
$T_{IW}$: Load torque caused by the workpiece [N・m]
$m_T$: Tooling mass [kg]
$m_W$: Workpiece mass [kg]
g: Gravitational acceleration [m/s$^2$]
$r_0$: Distance of mounting surface [mm]
$r_{CT}$: Distance to tooling's center of gravity [mm]
$r_{CW}$: Distance to workpiece's center of gravity [mm]

**T-axis**

$$T_I = m \cdot g \cdot r_C \times 10^{-3}$$




$T_I$: Load torque caused by the workpiece [N・m]
m: Workpiece mass (be consistent with above) [kg]
g: Gravitational acceleration [m/s$^2$]
$r_C$: Distance to workpiece's center of gravity [mm]

### (2) Calculating the compensation coefficient ($C_j$) for the allowable moment of inertia

$$C_j = \frac{T_{max} - T_I}{T_{max}}$$

$T_{max}$: Output torque (from table) [Nm]
$T_I$: Calculated result of load torque (1)

**■ Output torque by speed [Nm]**

WU-S: Small type

| Speed Degree/s | B-axis | T-axis |
|---|---|---|
| 0 | 0.65 | 0.65 |
| 150 | 0.65 | 0.65 |
| 300 | 0.62 | 0.62 |
| 450 | 0.6 | 0.6 |
| 600 | 0.58 | 0.58 |
| 750 | 0.52 | 0.52 |
| 900 | 0.45 | 0.45 |
| 1050 | 0.45 | 0.45 |
| 1200 | 0.45 | 0.45 |

WU-M: Medium type

| Speed Degree/s | B-axis | T-axis |
|---|---|---|
| 0 | 1.65 | 1.65 |
| 150 | 1.65 | 1.65 |
| 300 | 1.65 | 1.65 |
| 450 | 1.65 | 1.65 |
| 600 | 1.58 | 1.58 |
| 750 | 1.36 | 1.36 |
| 900 | 1.14 | 1.14 |
| 1050 | 0.96 | 0.96 |
| 1200 | 0.79 | 0.79 |

### (3) Calculating the compensated allowable moment of inertia ( $J_{tl}$)

$$J_{tl} = J_{max} C_j \ (kgm^2)$$

$J_{max}$: Allowable moment of inertia (from table) [kgm$^2$]
$C_j$: Compensation coefficient for allowable moment of inertia, as calculated in (2).

**■ Allowable moment of inertia by speed and acceleration [kgm$^2$]**

WU-S: Small type

| Speed | B-axis | T-axis |
|---|---|---|
| | Acceleration/deceleration | |
| Degree/s | 0.3G | 0.3G |
| 0 | 0.008 | 0.0035 |
| 150 | 0.008 | 0.0035 |
| 300 | 0.008 | 0.0035 |
| 450 | 0.008 | 0.0035 |
| 600 | 0.008 | 0.0035 |
| 750 | | 0.0035 |
| 900 | | 0.0035 |
| 1050 | | 0.0035 |
| 1200 | | 0.0025 |

WU-M: Medium type

| Speed | B-axis | T-axis |
|---|---|---|
| | Acceleration/deceleration | |
| Degree/s | 0.3G | 0.3G |
| 0 | 0.0150 | 0.0126 |
| 150 | 0.0150 | 0.0126 |
| 300 | 0.0118 | 0.0072 |
| 450 | 0.0055 | 0.0054 |
| 600 | 0.0055 | 0.0054 |
| 750 | | 0.0054 |
| 900 | | 0.0036 |
| 1050 | | 0.0036 |
| 1200 | | 0.0036 |

### (4) Confirmation of moment of inertia of workpiece

Using the calculations for the moment of inertia of standard object shapes (P12), calculate the moment of inertia of the tool and workpiece. Then confirm that it is less than or equal to the compensated allowable moment of inertia calculated in (3): i.e., (4) ≤ (3).

**Key point**

Calculations can be done with ease by simplifying the tool and workpiece shapes.

## If there is no load torque:

Moment of inertia applied on B-axis and T-axis. < Allowable moment of inertia for both the small and medium wrist types.*

* varies depending on speed and acceleration/deceleration.

### ■ Allowable moment of inertia by speed and acceleration [kgm²]

WU-S: Small type

| Speed | B-axis | | T-axis | |
|---|---|---|---|---|
| | Acceleration/deceleration | | | |
| Degree/s | 0.3G | 0.7G | 0.3G | 0.7G |
| 0 | 0.0085 | 0.0065 | 0.0075 | 0.0035 |
| 150 | 0.0085 | 0.0065 | 0.0075 | 0.0035 |
| 300 | 0.0085 | 0.005 | 0.0065 | 0.0035 |
| 450 | 0.0085 | 0.005 | 0.0065 | 0.0025 |
| 600 | 0.0085 | 0.005 | 0.0065 | 0.0025 |
| 750 | | 0.005 | 0.0065 | 0.0025 |
| 900 | | | 0.0065 | 0.0025 |
| 1050 | | | 0.0065 | 0.0025 |
| 1200 | | | 0.0065 | 0.0025 |

(Unit is kg・m²)

WU-M: Medium type

| Speed | B-axis | | T-axis | |
|---|---|---|---|---|
| | Acceleration/deceleration | | | |
| Degree/s | 0.3G | 0.7G | 0.3G | 0.7G |
| 0 | 0.015 | 0.0145 | 0.0165 | 0.0126 |
| 150 | 0.015 | 0.0145 | 0.0165 | 0.0126 |
| 300 | 0.015 | 0.0127 | 0.0165 | 0.009 |
| 450 | 0.0099 | 0.0045 | 0.0126 | 0.0063 |
| 600 | 0.009 | 0.0036 | 0.0108 | 0.0054 |
| 750 | | 0.0036 | 0.0099 | 0.0054 |
| 900 | | 0.0036 | 0.0099 | 0.0045 |
| 1050 | | | 0.0081 | 0.0045 |
| 1200 | | | 0.0081 | 0.0045 |

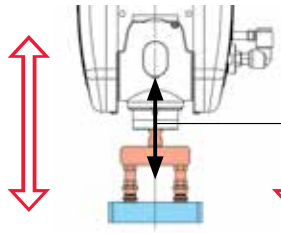
(Unit is kg・m²)

When there is no load torque, calculate the moment of inertia of the tool and workpiece by using the calculations for the moment of inertia of standard object shapes (P12). Then confirm that it is less than or equal to the allowable moment of inertia.

## Step 3

### Confirmation of dynamic thrust load

Confirm that the thrust load (load applied perpendicular to the mounting surface) is less than or equal to the dynamic allowable thrust load.




Dynamic thrust load: F ≦ Allowable dynamic thrust load

$F=(m_T+m_W)\cdot(a+g)\cdot 9.8[N]$

$m_T$: Tooling mass [kg]
$m_W$: Workpiece mass [kg]
g: Gravitational acceleration 1.0 [G]
a: Acceleration of movement [G]

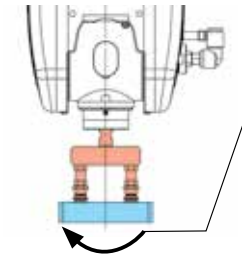
### ■ Allowable dynamic thrust load

| | Maximum thrust load |
|---|---|
| WU-S: Small type | 330N |
| WU-M: Medium type | 450N |

## Step 4

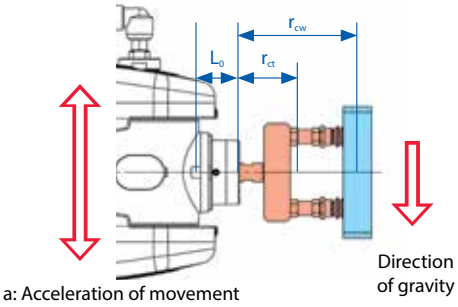
### Confirmation of load moment

Confirm that the load moment is less than or equal to the allowable dynamic load.



Dynamic load moment: M ≦ Allowable dynamic load moment

$$M=m_T \cdot a \cdot 9.8(L_0+r_{CT})\times10^{-3}+m_W \cdot a \cdot 9.8(L_0+r_{CW})\times10^{-3}\ [Nm]$$




$m_T$: Tooling mass [kg]
$m_W$: Workpiece mass [kg]
a: Acceleration of movement [G]
$L_0$: Load moment reference position
WU-S (small type) 17.5 [mm]
WU-M (medium type) 21.5 [mm]
$r_{CT}$: Distance to tooling's center of gravity [mm]
$r_{CW}$: Distance to workpiece's center of gravity [mm]

**■ Allowable dynamic load moment**

| | Maximum allowable load moment |
|---|---|
| WU-S: Small type | 1.4Nm |
| WU-M: Medium type | 4.2Nm |

Confirmation of conditions is complete with steps 1 to 4.

# Calculating the moment of inertia of standard object shapes.

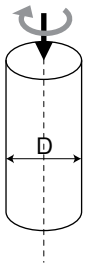
## 1. Rotational axis is located in the center of the object

### (1) Moment of inertia for a cylindrical object 1

* The same formula applies regardless of the height of the cylinder (including discs).

**<Formula> $J=M\times(D\times10^{-3})^2/8$**

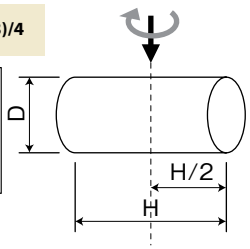
Moment of inertia of cylinder: J (kg・$m^2$)
Mass of cylinder: M (unit kg)
Diameter of cylinder: D (mm)




### (2) Moment of inertia for a cylindrical object 2

**<Formula> $J=M\times(D\times10^{-3})^2/4\ (H\times10^{-3})^2/3)/4$**

Moment of inertia of cylinder: J (kg・$m^2$)
Mass of cylinder: M (kg)
Diameter of cylinder: D (mm)
Height of cylinder: H (mm)

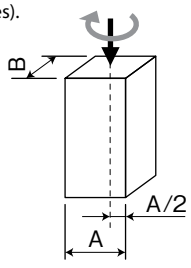



### (3) Moment of inertia for a rectangular prism 1

* The same formula applies regardless of the height of the prism (including rectangular plates).

**<Formula> $J=M\times(A\times10^{-3})^2+(B\times10^{-3})^2)/12$**

Moment of inertia of prism: J (kg・$m^2$)
Side of prism: A (mm)
Side of prism: B (mm)



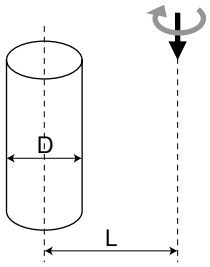

## 2. Center of the object is offset from the rotational axis

### (4) Moment of inertia for a cylindrical object 3

* The same formula applies regardless of the height of the cylinder (including discs).

**<Formula> $J=M\times(D\times10^{-3})^2/8+M\times(L\times10^{-3})^2$**

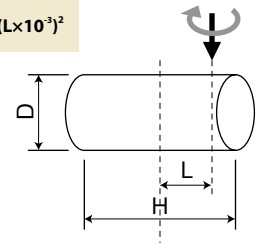
Moment of inertia of cylinder: J (kg・$m^2$)
Mass of cylinder: M (kg)
Diameter of cylinder: D (mm)
Distance between the rotation axis and the center of gravity: L (mm)




### (5) Moment of inertia for a cylindrical object 4

**<Formula> $J=M\times(D\times10^{-3})^2/4\ (H\times10^{-3})^2/3)/4+M\times(L\times10^{-3})^2$**

Moment of inertia of cylinder: J (kg・$m^2$)
Mass of cylinder: M (kg)
Diameter of cylinder: D (mm)
Height of cylinder: H (mm)
Distance between the rotation axis and the center of gravity: L (mm)

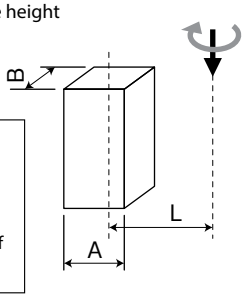



### (6) Moment of inertia for a rectangular prism 2

* The same formula applies regardless of the height of the prism (including rectangular plates).

**<Formula> $J=M\times(A\times10^{-3})^2+(B\times10^{-3})^2)/12+M\times(L\times10^{-3})^2$**

Moment of inertia of prism: J (kg・$m^2$)
Mass of prism: M (kg)
Side of prism: A (mm)
Side of prism: B (mm)
Distance between the rotation axis and the center of gravity: L (mm)



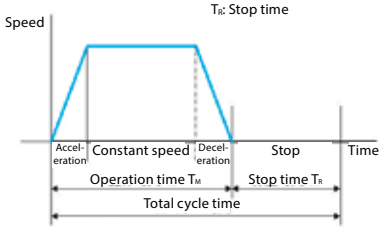
# Duty

**Duty ratio refers to the operating rate of the actuator (the time during which the actuator is operated in one cycle).**
**Note that calculating the allowable duty ratio is different for stepper motors and AC servo motors.**

[Duty Ratio]
The duty ratio is the operating rate in % of the time the actuator is operating in one cycle.

$$D = \frac{T_M}{T_M + T_R} \times 100\ (\%)$$

D: Duty
$T_M$: Operating time (including push force operation)
$T_R$: Stop time




**<Stepper Motor>**
**For the axes using a stepper motor, the actuators can be operated at a duty ration of 100%.**

| Type | Stepper motor axes |
|---|---|
| CRS-XBA | All axes |
| CRS-XBB | R-axis and BT axes |
| CRS-XGA | All axes |
| CRS-XGB | R-axis and BT- axes |

| Type | Stepper motor axes |
|---|---|
| CRS-XZCY | All axes |
| CRS-XZCZ | |
| CRS-XZDY | |
| CRS-XZDZ | |
| CRS-XZEY | R-axis and BT- axes |
| CRS-XZEZ | |

**<AC servo motor>**

**The allowable duty ratio for AC servo motors varies depending on the operating conditions (acceleration/deceleration, etc.).**

**Use the Load Factor (LF) determined from the table (step 1) and the Acceleration/Deceleration time ratio (tod) calculated with the formula (step 2), to obtain the allowable duty ration from the graph (step 3).**

| Type | AC servo motor axes |
|---|---|
| CRS-XBB | X-axis, Y-axis, Z-axis |
| CRS-XGB | |

| Type | AC servo motor axes |
|---|---|
| CRS-XZEY | X-axis, Y-axis, Z-axis |
| CRS-XZEZ | |

## 1 Determine the Load Factor by using the table "Load Factor (LF) by acceleration/deceleration" below.

*** The LF assumes the maximum stroke and maximum payload for each axis.**

**Load Factor (LF) by acceleration/deceleration**

[%]

| Model | Maximum payload kg | Axis configuration | Acceleration/deceleration of each axis (G) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 |
| XBB | 2 | X-axis | 21 | 42 | 62 | 83 | — |
| | | Y-axis | 15 | 30 | 45 | 60 | 75 |
| | | Z-axis | 10 | 20 | 30 | 40 | 50 |
| XGB | 2 | X-axis | 22 | 44 | 67 | 89 | — |
| | | Y-axis | 15 | 30 | 45 | 60 | 75 |
| | | Z-axis | 10 | 20 | 30 | 40 | 50 |
| XZEY XZEZ | 1 | X-axis | 18 | 37 | 55 | 74 | 92 |
| | | Y-axis | 29 | 57 | — | — | — |
| | | Z-axis | 13 | 26 | 40 | 53 | 66 |

## 2 Calculate the Acceleration/deceleration ratio, (tod) using the following formula.

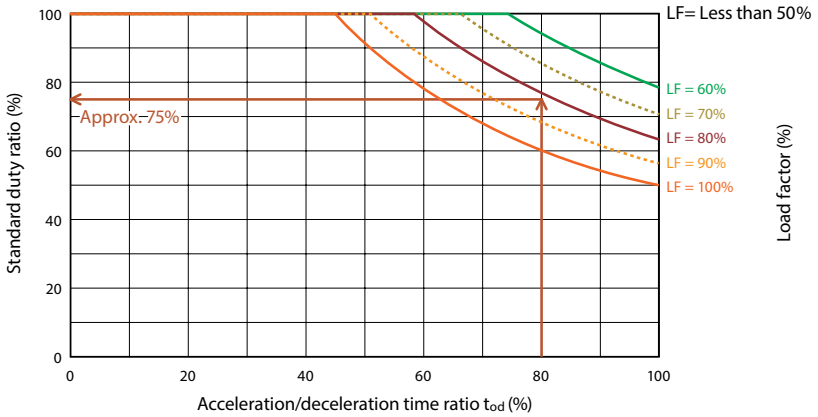
$$\text{Acceleration/deceleration ratio : } t_{od} = \frac{\text{Acceleration time + deceleration time}}{\text{Operation time}} \times 100\ (\%)$$

$$\text{Acceleration time} = \frac{\text{Speed (mm/s)}}{\text{Acceleration (mm/s}^2\text{)}}\ \text{(second)} \qquad \text{Deceleration time} = \frac{\text{Speed (mm/s)}}{\text{Deceleration (mm/s}^2\text{)}}\ \text{(second)}$$

$$\text{Acceleration (mm/s}^2\text{)} = \text{Acceleration (G)} \times 9{,}800\text{mm/s}^2 \qquad \text{Deceleration (mm/s}^2\text{)} = \text{Deceleration (G)} \times 9{,}800\ \text{mm/s}^2$$

## 3 Obtain the standard duty ratio from the graph below, based on (1) LF and (2) Acceleration/deceleration time ratio.

**(Ex.) When LF is 80% and acceleration/deceleration time ratio is 80%, the standard duty ratio is approx. 75%.**



# CRS-XBA

Battery-less absolute | 24V stepper motor

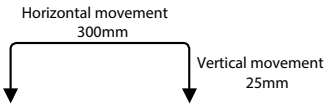
## Model specification items

CRS – XBA [ ] – WA [ ][ ] [ ] [ ] B – R1 [ ] [ ] [ ] [ ] [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) | | 2nd axis (Y-axis) | 3rd axis (Z-axis) | | Controller | Cable length | Cable management | | | Options | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 / 3: See configuration direction | WA: Battery-less absolute | Stroke: 5 ~ 80: 50mm ~ 800mm (every 50mm) | Options: CJT / CJR / CJL / CJB: See options table below | Stroke: 5 ~ 30: 50mm ~ 300mm (every 50mm) | Stroke: 9 ~ 19: 90mm ~ 190mm (every 50mm) | Option: B: Brake | R1: RSEL | 1L: 1m / 3L: 3m / 5L: 5m / □L: □m | 1st wiring / 2nd wiring / 3rd wiring: See cable management table below | | | 4B / 5VC / 5WCS: See options table below | |

| Maximum work envelope | X-axis 800 mm | Y-axis 300 mm | Z-axis 190 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.07 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

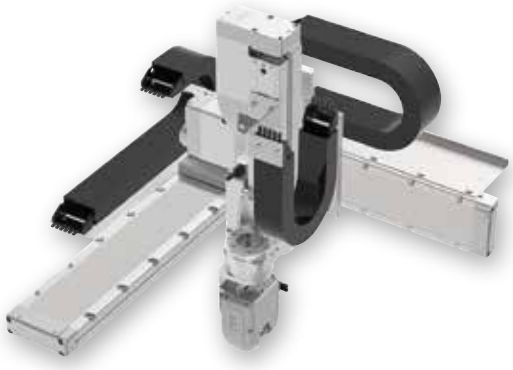
The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.




**POINT Selection Notes**

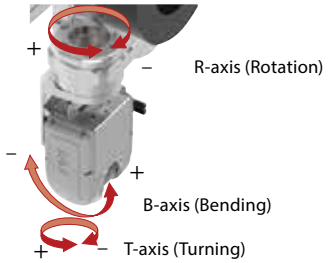
(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS



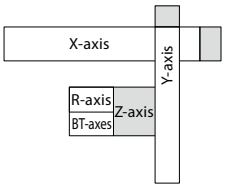
(Note) The above picture shows combination direction [1] and all axes with cable tracks.

## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)

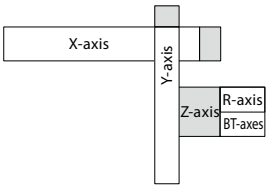



## Configuration direction

Direction 1




Direction 3




## Stroke

| Y-axis stroke (mm) \ X-axis stroke (mm) | 50~300 | 350~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Cable track List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Y-axis) | 3rd wiring (Z-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) (Note 2) | **CTL** | ○ | ○ | N/A |
| Cable track XL size (inside width 100mm) (Note 3) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st and 2nd wiring can be selected.
(Note 3) Only 1st wiring can be selected.

## Options

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Adaptable tube outer diameter: $\phi$6mm air joint.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | |
|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14C-WA-56P-16 | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | 0.2 | | 0.3 |
| | Stroke (mm) | 50~750 | 800 | 50~750 | 800 | 50~800 |
| | Max. speed (mm/s) | 480 | 440 | 460 | 440 | 380 |
| Stroke | Minimum stroke (mm) | 50 | | | | |
| | Maximum stroke (mm) | 800 | | | | |
| | Stroke pitch (mm) | 50 | | | | |
| Motor type | | Stepper motor 56□size | | | | |

### ■ Y-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-WSA12C-WA-42P-12 | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 400 | 400 | 400 |
| Stroke | Minimum stroke (mm) | 50 | | |
| | Maximum stroke (mm) | 300 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 42□size | | |

### ■ Z-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-TA7R-WA-56P-4-□-B-DB | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 175 | 140 | 140 |
| Stroke | Minimum stroke (mm) | 90 | | |
| | Maximum stroke (mm) | 190 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 56□size | | |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

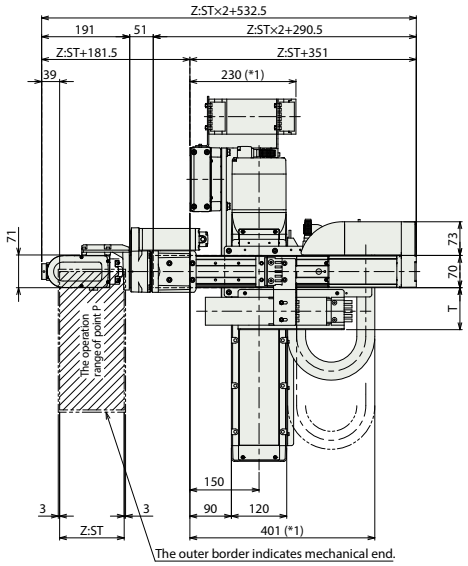
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous op. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

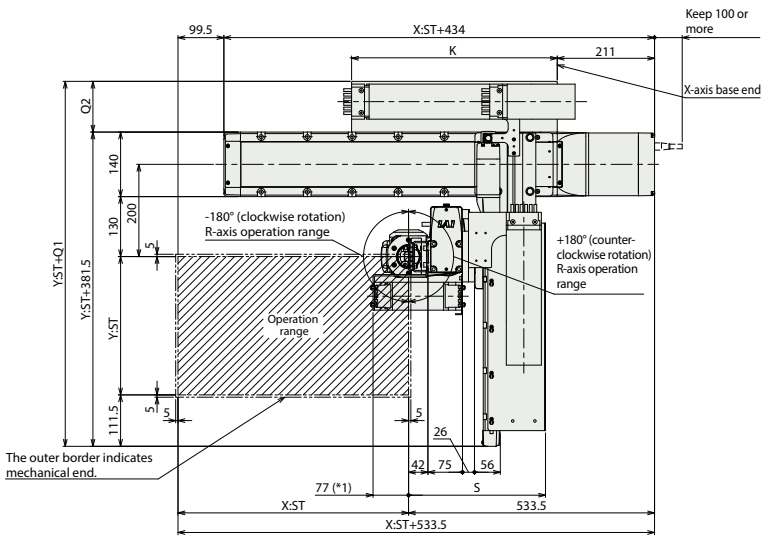
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

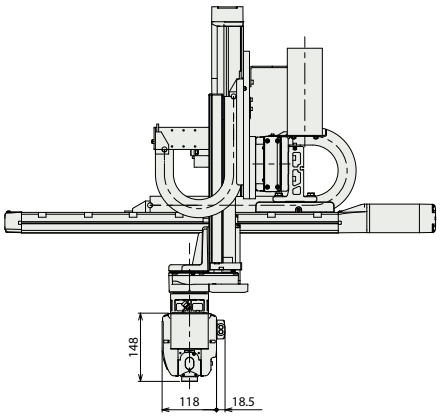
## Dimensions

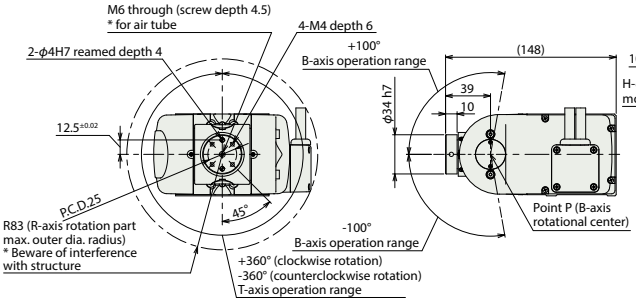
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com

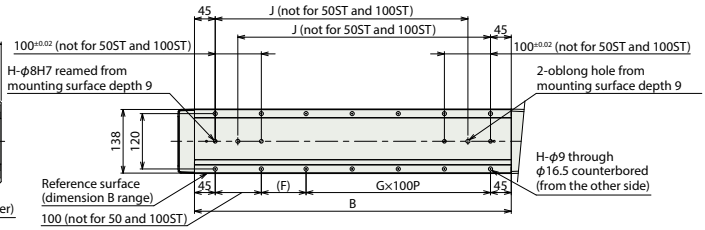


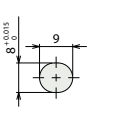



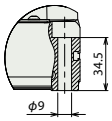

WU-S detail dimensions



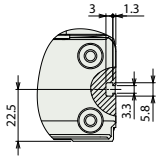

X-axis base mounting dimensions



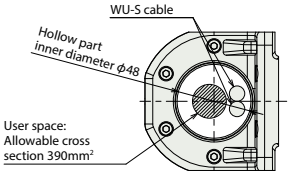

Detail of X-axis base oblong hole



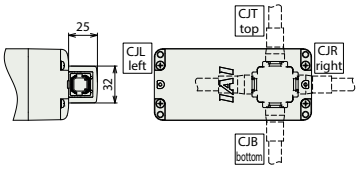

Detail of X-axis base mounting hole



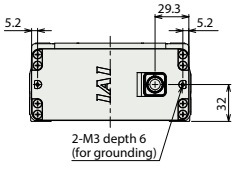

Detail of X-axis side T slot



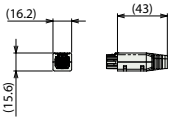

Detail of R-axis hollow part




X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis cable connection part

## ■ Dimensions by stroke

| X-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 237 | 287 | 337 | 387 | 437 | 487 | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 |
| F | 147 | 197 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 |
| H | 4 | 4 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| J | — | — | 198 | 248 | 298 | 348 | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 |
| K | 221 | 246 | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |
| M | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q1 | — | 491.5 | 508.5 | 528.5 |
| Q2 | — | 110 | 127 | 147 |
| S | 286 | 297 | 314 | — |
| T | 91 | 102 | — | — |

(Note) Dimensions of Q1, Q2, S and T vary depending on the cable track size.

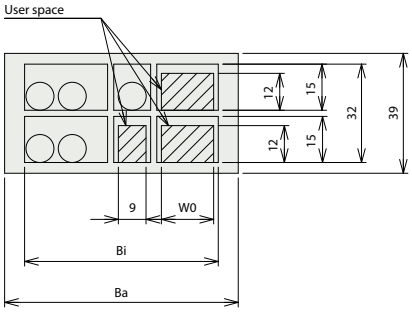
## ■ Cartesian system mass by stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 32~37 | 36~40 | 39~43 |
| 200~300 | 34~38 | 37~42 | 41~44 |

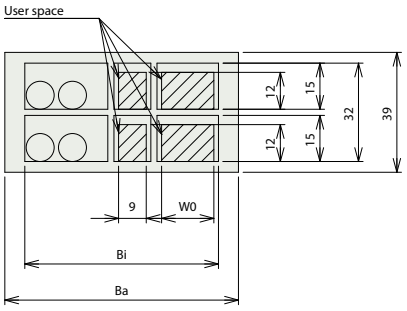
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

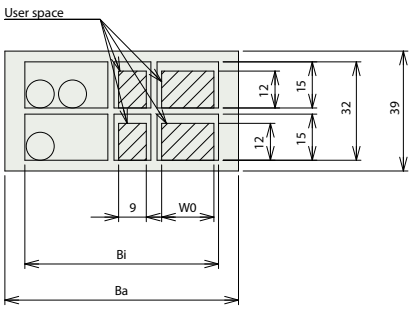
## Cable track cross section




X-Y cable track cross section




Y-Z cable track cross section




Z-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXBA (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XBB

Battery-less absolute | 24V stepper motor | 200V AC servo motor

## Model specification items

CRS – XBB □ – WA – □□ – □ – □ B – R1 – □ – □ – □ – □ – □

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) | 2nd axis (Y-axis) | 3rd axis (Z-axis) | Controller | Cable length | Cable management | Options |
|---|---|---|---|---|---|---|---|---|---|---|
| | XBB | 1: See configuration direction<br>3: See configuration direction | WA: Battery-less absolute | Stroke: 5 to 110 (50mm to 1100mm, every 50mm)<br>Options: CJT, CJR, CJL, CJB: See options table below | Stroke: 5 to 30 (50mm to 300mm, every 50mm) | Stroke: 10 to 20 (100mm to 200mm, every 50mm)<br>Option: B: Brake | R1: RSEL | 1L: 1m<br>3L: 3m<br>5L: 5m<br>□L: □m | 1st wiring / 2nd wiring / 3rd wiring: See cable management table below | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 1100 mm | Y-axis 300 mm | Z-axis 200 mm |
|---|---|---|---|
| Max. payload | 2 kg | | |
| Standard cycle time | 1.66 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.

Horizontal movement 300mm
Vertical movement 25mm

**POINT Selection Notes**

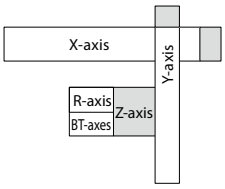
(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) The allowable duty ratio varies depending on operating conditions (payload, acceleration/deceleration, etc.). See P13 for details.
(3) For the R-axis and the BT axes, use RSEL driver modules with the high output setting enabled.
(4) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

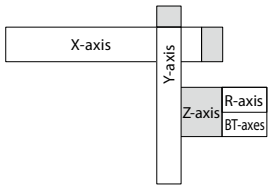
(Note) The above picture shows combination direction [1] and all axes with cable tracks.

## Direction of combination

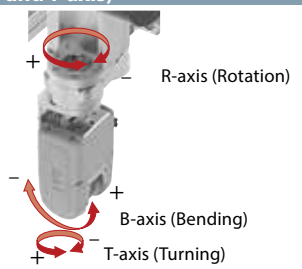
Direction 1




Direction 3




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~300 | 350~600 | 650~800 | 850~1100 |
|---|---|---|---|---|
| **50~150** | ○ | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (top) (Note 3) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) (Note 3) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) (Note 3) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) (Note 3) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes at the option column of the model number.
(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Y-axis) | 3rd wiring (Z-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 4) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 5) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 2kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 16384pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCS4-WSA16C-WA-400-20 | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.4 | | | | | | | | | | | |
| | Stroke (mm) | 50~550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| | Max. speed (mm/s) | 1200 | 1120 | 990 | 880 | 780 | 715 | 645 | 590 | 535 | 490 | 450 | 415 |
| Stroke | Minimum stroke (mm) | 50 | | | | | | | | | | | |
| | Maximum stroke (mm) | 1100 | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | |
| Motor type | | AC servo motor 400W | | | | | | | | | | | |

### ■ Y-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCS4-WSA14C-WA-200-16 |
| Speed/accel/decel | Accel/decel (G) | 0.5 |
| | Max. speed (mm/s) | 960 |
| Stroke | Minimum stroke (mm) | 50 |
| | Maximum stroke (mm) | 300 |
| | Stroke pitch (mm) | 50 |
| Motor type | | AC servo motor 200W |

### ■ Z-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCS4-SA8R-WA-400-10-□-B-W (double slider spec.) |
| Speed/accel/decel | Accel/decel (G) | 0.5 |
| | Max. speed (mm/s) | 600 |
| Stroke | Minimum stroke (mm) | 100 |
| | Maximum stroke (mm) | 200 |
| | Stroke pitch (mm) | 50 |
| Motor type | | AC servo motor 400W |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

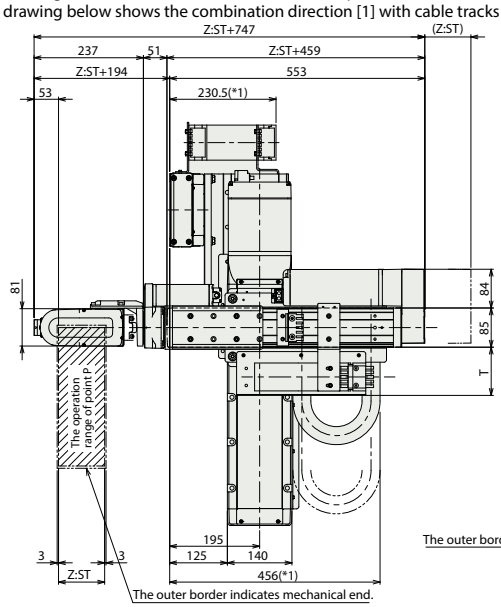
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-M-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 900 | 1200 |
| | | B&T axes simultaneous op. | 600 | 600 |
| Operation range (degree) | | | ±105 | ±360 |
| Motor type | | | Stepper motor 35□size | |
| Maximum torque (N・m) (Note 9) | | | 1.65 | 1.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.015 | 0.0165 |

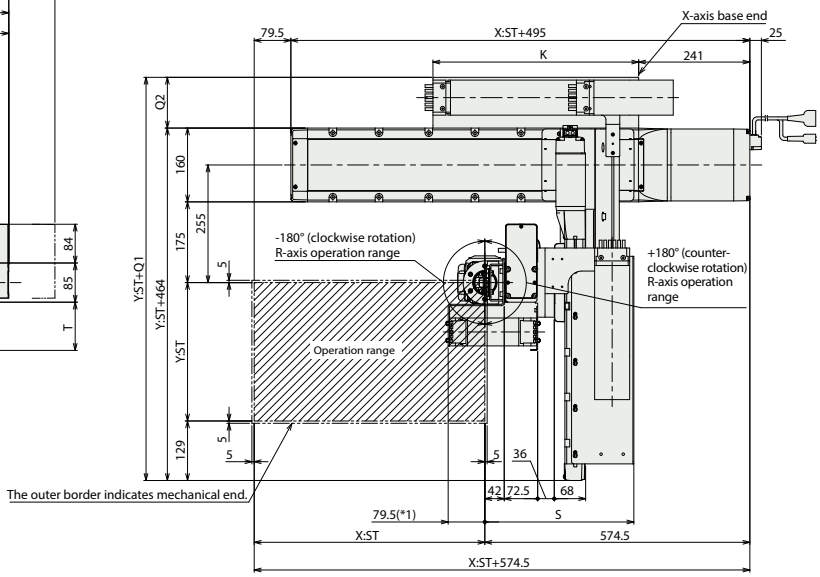
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

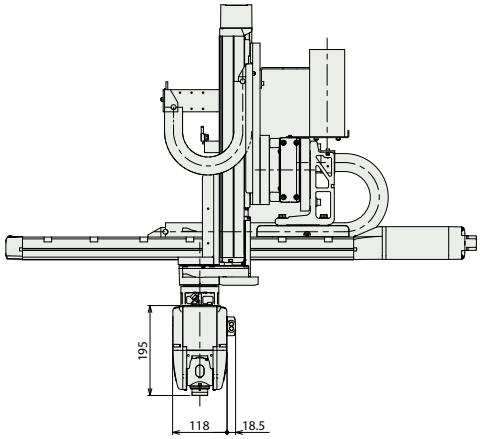
## Dimensions

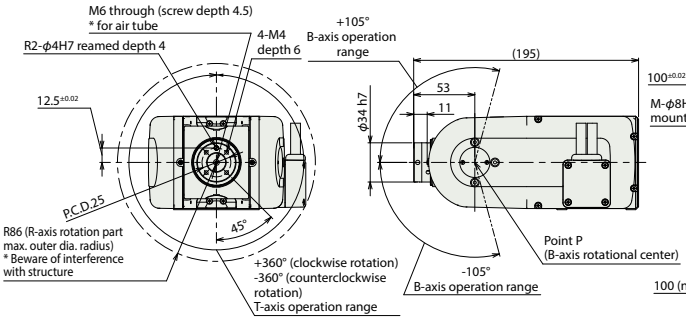
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

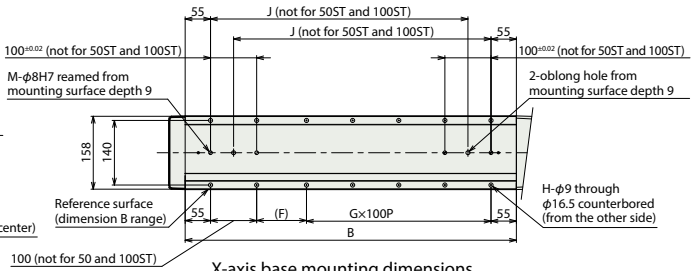


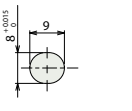



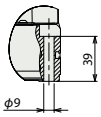

WU-M detail dimensions



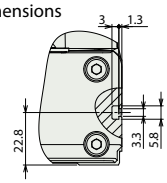

X-axis base mounting dimensions



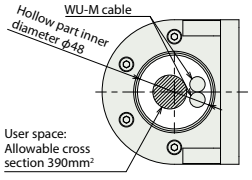

Detail of X-axis base oblong hole



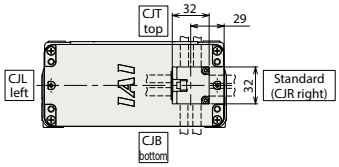

Detail of X-axis base mounting hole



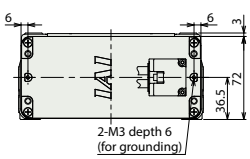

Detail of X-axis side T slot



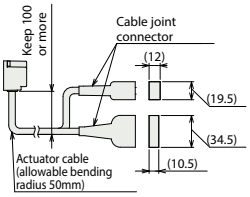

Detail of R-axis hollow part




Cable exit direction (option)
* Standard cable exit direction is right (CJR).




Detail of X-axis rear surface




X-axis pigtail cable connection

## Dimensions by stroke

| X-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 268 | 318 | 368 | 418 | 468 | 518 | 568 | 618 | 668 | 718 | 768 | 818 | 868 | 918 | 968 | 1018 | 1068 | 1118 | 1168 | 1218 | 1268 | 1318 |
| F | 158 | 208 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 |
| G | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 |
| H | 4 | 4 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 | 26 | 26 |
| J | — | — | 208 | 258 | 308 | 358 | 408 | 458 | 508 | 558 | 608 | 658 | 708 | 758 | 808 | 858 | 908 | 958 | 1008 | 1058 | 1108 | 1158 |
| K | 221 | 246 | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 | 621 | 646 | 671 | 696 | 721 | 746 |
| M | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q1 | — | 574 | 591 | 611 |
| Q2 | — | 110 | 127 | 147 |
| S | 312 | 323 | 340 | — |
| T | 104.5 | 115.5 | 132.5 | — |

(Note) Dimensions of Q1, Q2, S and T vary depending on the cable track size.

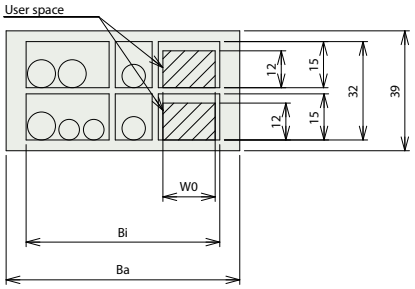
## Cartesian system mass by stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~400 | 450~800 | 850~1100 |
|---|---|---|---|
| 50~150 | 46~53 | 52~59 | 58~64 |
| 200~300 | 48~55 | 54~61 | 60~66 |

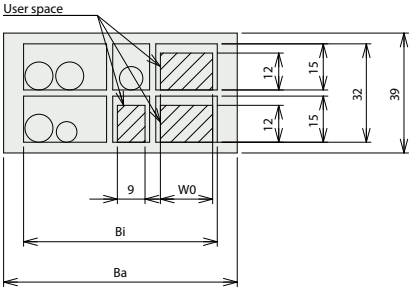
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

## Cable track cross section




X-Y cable track cross section




Y-Z cable track cross section
Z-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | |
| RSEL-SXBB (for CRS) |  | 8 | DC24V single-phase 200VAC three-phase 200VAC | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XGA

Battery-less absolute | 24V stepper motor

## Model specification items

CRS – XGA [ ] – WA [ ] [ ] – [ ] – [ ] B – R1 [ ] [ ] – [ ] – [ ] – [ ] [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) | | 2nd axis (Y-axis) | 3rd axis (Z-axis) | | Controller | Cable length | Cable management | | | Options | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 / 3: See configuration direction | WA: Battery-less absolute | Stroke | Options | Stroke | Stroke | Option | R1: RSEL | 1L: 1m<br>3L: 3m<br>5L: 5m<br>□L: □m | 1st wiring / 2nd wiring / 3rd wiring | | | 4B<br>5VC<br>5WCS | See options table below |
| | | | | 5 ~ 80: 50mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 35 ~ 60: 350mm ~ 600mm (every 50mm) | 9 ~ 19: 90mm ~ 190mm (every 50mm) | B: Brake | | | See cable management table below | | | | |

| Maximum work envelope | X-axis 800 mm | Y-axis 600 mm | Z-axis 190 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.11 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

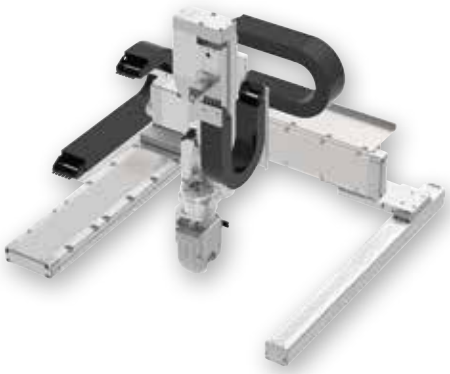
The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.

Horizontal movement 300mm
Vertical movement 25mm

**POINT Selection Notes**

(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

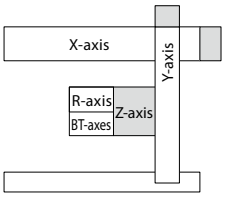
RoHS



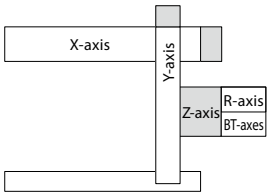
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

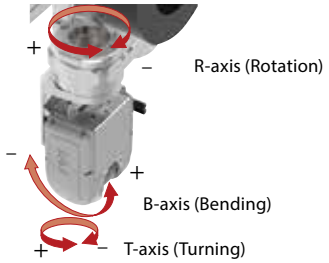
Direction 1




Direction 3




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~300 | 350~600 | 650~800 |
|---|---|---|---|
| **350~450** | ○ | ○ | ○ |
| **500~600** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| Name | | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Y-axis) | 3rd wiring (Z-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) (Note 2) | **CTL** | ○ | ○ | N/A |
| Cable track XL size (inside width 100mm) (Note 3) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st and 2nd wiring can be selected.
(Note 3) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | |
|---|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14LC-WA-56P-16 (long slider spec.) | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | | 0.2 | | 0.3 |
| | Stroke (mm) | 50~700 | 750 | 800 | 50~750 | 800 | 50~800 |
| | Max. speed (mm/s) | 460 | 440 | 395 | 420 | 395 | 340 |
| Stroke | Minimum stroke (mm) | 50 | | | | | |
| | Maximum stroke (mm) | 800 | | | | | |
| | Stroke pitch (mm) | 50 | | | | | |
| Motor type | | Stepper motor 56□size | | | | | |

### ■ Y-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-WSA12C-WA-42P-12 | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 400 | 400 | 400 |
| Stroke | Minimum stroke (mm) | 350 | | |
| | Maximum stroke (mm) | 600 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 42□size | | |

### ■ Z-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-TA7R-WA-56P-4-□-B-DB | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 175 | 140 | 140 |
| Stroke | Minimum stroke (mm) | 90 | | |
| | Maximum stroke (mm) | 190 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 56□size | | |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

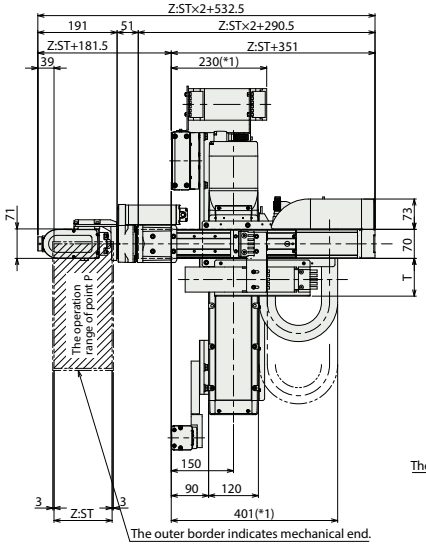
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

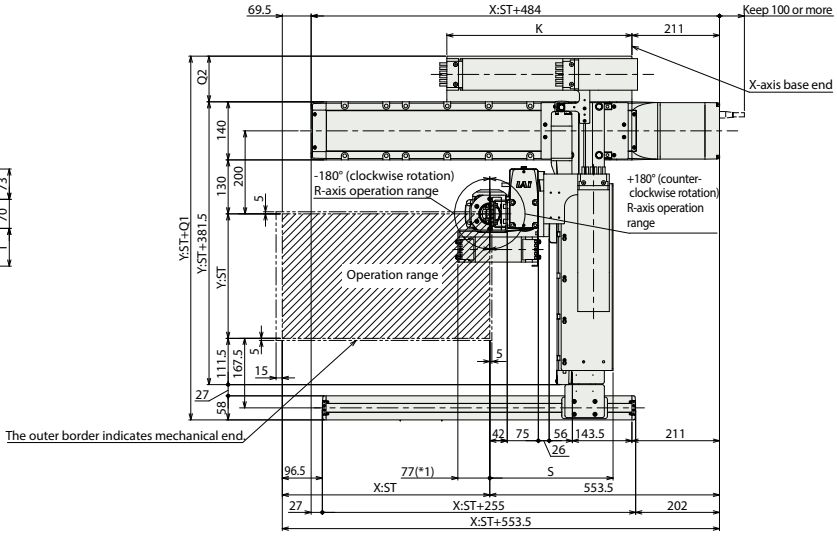
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

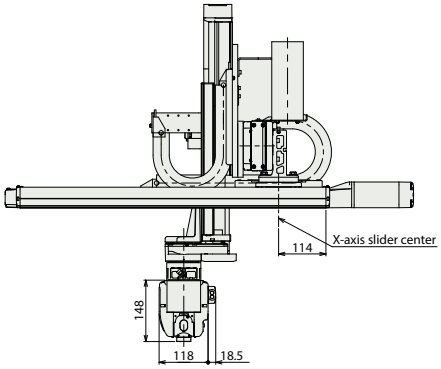
## Dimensions

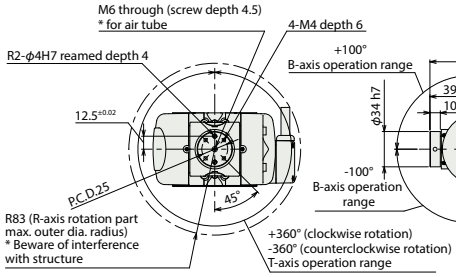
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The assembled drawing is the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.
(Note) The screw hole on the bottom surface of the driven axis is for the purpose of packing. Do not use it for installation.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

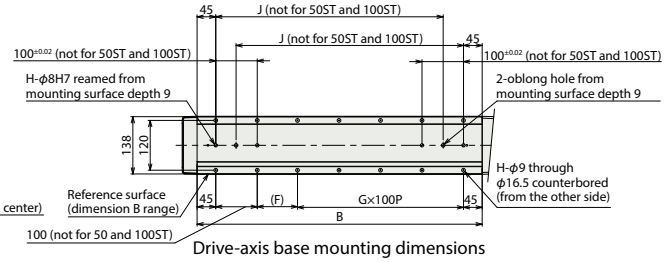


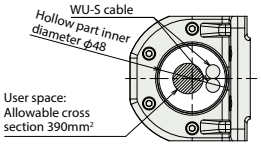



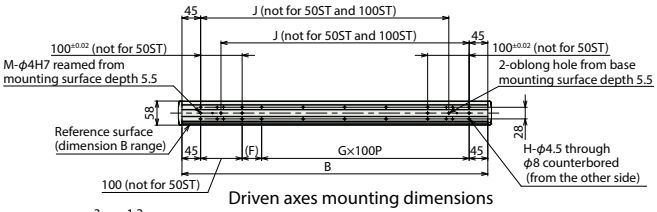

WU-S detail dimensions



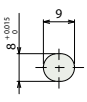

Drive-axis base mounting dimensions



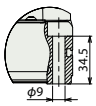

Detail of R-axis hollow part



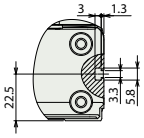

Driven axes mounting dimensions



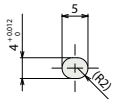

Detail of drive-axis base oblong hole



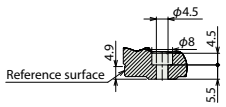

Detail of drive-axis base mounting hole



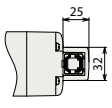

Detail of X-axis side T slot

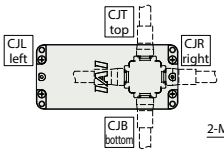



Detail of driven-axis base oblong hole

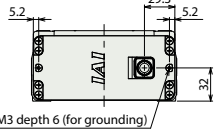



Detail of driven-axis base mounting hole

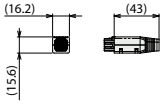



X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis cable connection part

## ■ Dimensions by stroke

| X-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 287 | 337 | 387 | 437 | 487 | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 |
| F | 197 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 |
| G | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 |
| H | 4 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 |
| J | — | 198 | 248 | 298 | 348 | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 |
| K | 221 | 246 | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |
| M | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q1 | — | 576.5 | 593.5 | 613.5 |
| Q2 | — | 110 | 127 | 147 |
| S | 286 | 297 | 314 | — |
| T | 91 | 102 | — | — |

(Note) Dimensions of Q1, Q2, S and T vary depending on the cable track size.

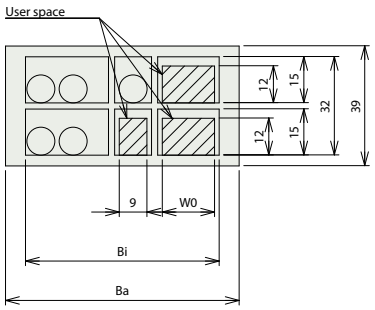
## ■ Cartesian system mass by stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~300 | 350~600 | 650~800 |
|---|---|---|---|
| 350~600 | 40~47 | 44~51 | 50~54 |

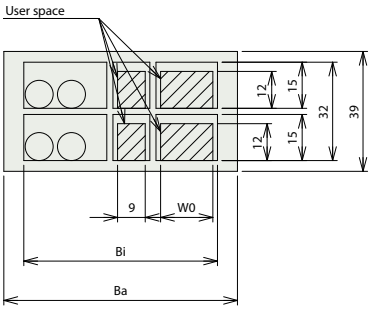
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

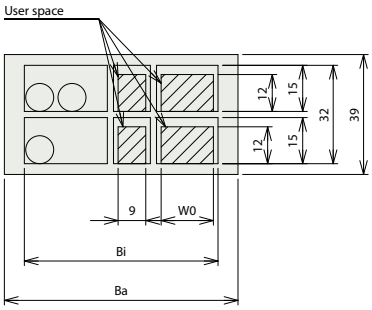
## Cable track cross section




X-Y cable track cross section




Y-Z cable track cross section




Z-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXGA (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XGB

Battery-less absolute | 24V stepper motor | 200V AC servo motor

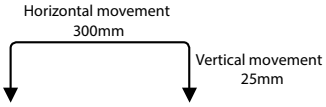
## Model specification items

CRS – XGB – [ ] – WA – [ ] [ ] – [ ] – [ ] – B – R1 – [ ] – [ ] [ ] [ ] [ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Y-axis) Stroke | 3rd axis (Z-axis) Stroke | 3rd axis (Z-axis) Option | Controller | Cable length | Cable management 1st wiring | Cable management 2nd wiring | Cable management 3rd wiring | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1: See configuration direction<br>3: See configuration direction | WA: Battery-less absolute | 5 ~ 110: 50mm ~ 1100mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 35 ~ 60: 350mm ~ 600mm (every 50mm) | 10 ~ 20: 100mm ~ 200mm (every 50mm) | B: Brake | R1: RSEL | 1L: 1m<br>3L: 3m<br>5L: 5m<br>□L: □m | See cable management table below | | | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 1100 mm | Y-axis 600 mm | Z-axis 200 mm |
|---|---|---|---|
| Max. payload | 2 kg | | |
| Standard cycle time | 1.66 seconds | | |
| Positioning repeatability | ± 0.04 mm | | |

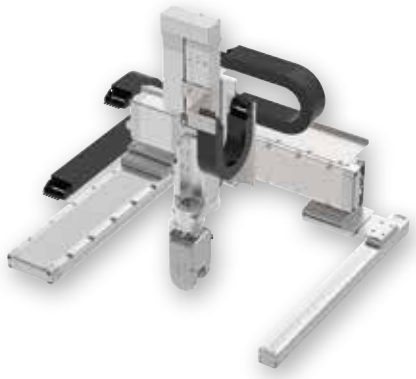
The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.




**POINT Selection Notes**

(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) The duty guide number varies depending on operating conditions (payload, acceleration/deceleration, etc.). See P13 for details.
(3) Use RSEL drive unit of the R-axis and BT axes with the high output setting "Enable."
(4) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

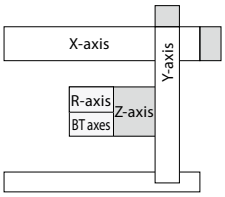
RoHS



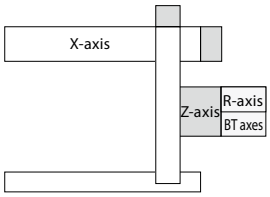
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

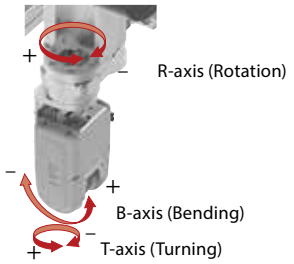
Direction 1




Direction 3




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~300 | 350~600 | 650~800 | 850~1100 |
|---|---|---|---|---|
| **350~450** | ○ | ○ | ○ | ○ |
| **500~600** | ○ | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (top) (Note 3) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) (Note 3) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) (Note 3) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) (Note 3) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes at the option column of the model specification item.
(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Y-axis) | 3rd wiring (Z-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 2) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 2kg |
| Positioning repeatability | ±0.04mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 16384pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### X-axis

| Item | | Description | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCS4-WSA16C-WA-400-20 | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.4 | | | | | | | | | | | |
| | Stroke (mm) | 50~550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| | Max. speed (mm/s) | 1200 | 1120 | 990 | 880 | 780 | 715 | 645 | 590 | 535 | 490 | 450 | 415 |
| Stroke | Minimum stroke (mm) | 50 | | | | | | | | | | | |
| | Maximum stroke (mm) | 1100 | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | |
| Motor type | | AC servo motor 400W | | | | | | | | | | | |

### Y-axis

| Item | | Description | | | |
|---|---|---|---|---|---|
| Axis model number | | RCS4-WSA14C-WA-200-16 | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.5 | | | |
| | Stroke (mm) | 350~450 | 500 | 550 | 600 |
| | Max. speed (mm/s) | 960 | 920 | 790 | 690 |
| Stroke | Minimum stroke (mm) | 350 | | | |
| | Maximum stroke (mm) | 600 | | | |
| | Stroke pitch (mm) | 50 | | | |
| Motor type | | AC servo motor 200W | | | |

### Z-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCS4-SA8R-WA-400-10-□-B-W (double slider spec.) |
| Speed/accel/decel | Accel/decel (G) | 0.5 |
| | Max. speed (mm/s) | 600 |
| Stroke | Minimum stroke (mm) | 100 |
| | Maximum stroke (mm) | 200 |
| | Stroke pitch (mm) | 50 |
| Motor type | | AC servo motor 400W |

### R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### BT-axis

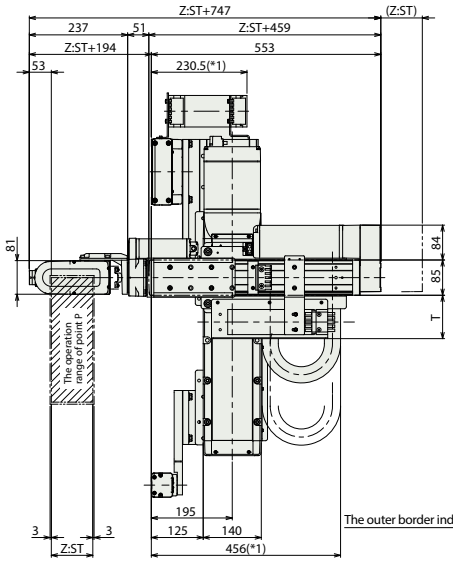
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-M-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 900 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±105 | ±360 |
| Motor type | | | Stepper motor 35□size | |
| Maximum torque (N・m) (Note 9) | | | 1.65 | 1.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.015 | 0.0165 |

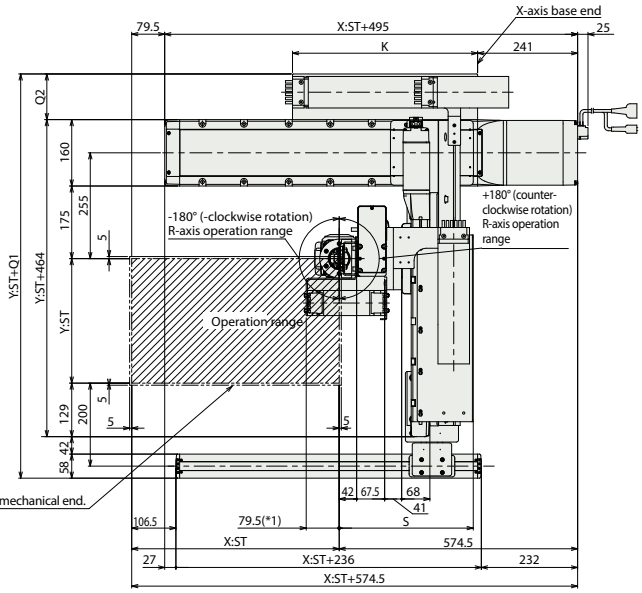
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

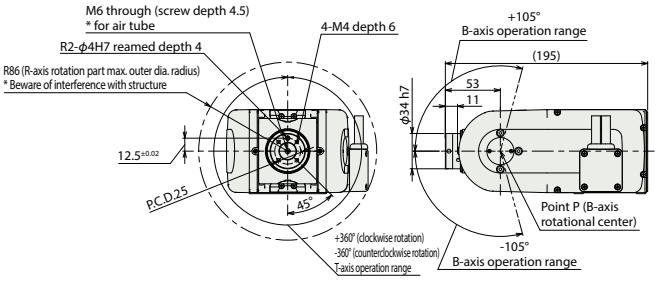
## Dimensions

*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.
(Note) The screw hole on the bottom surface of the driven axis is for the purpose of packing. Do not use it for installation.

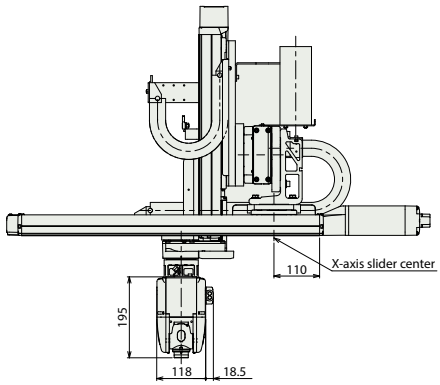
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

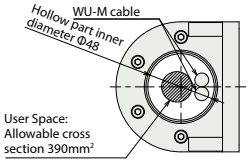


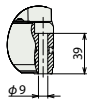

WU-M detail dimensions



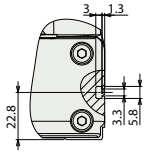




Detail of R-axis hollow part

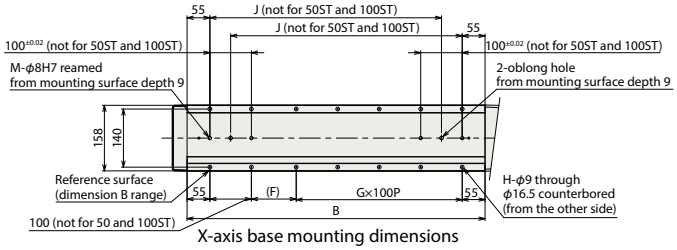

Detail of Drive-axis base oblong hole



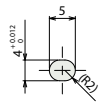

Detail of Drive-axis base mounting hole



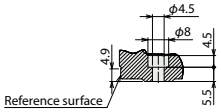

Detail of X-axis side surface T slot



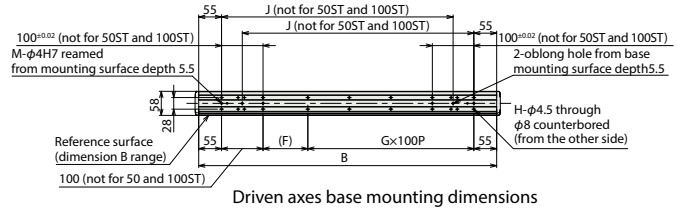

X-axis base mounting dimensions



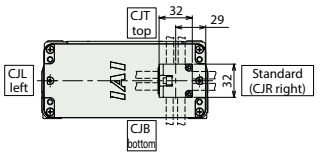

Detail of driven-axis base oblong hole



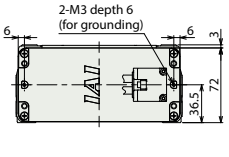

Detail of driven-axis base mounting hole



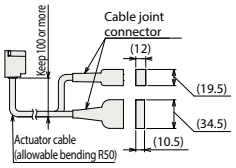

Driven axes base mounting dimensions




Cable exit direction (option)
* Standard cable exit direction is right (CJR).




Detail of X-axis rear surface




X-axis cable connection part

## Dimensions by stroke

| X-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 268 | 318 | 368 | 418 | 468 | 518 | 568 | 618 | 668 | 718 | 768 | 818 | 868 | 918 | 968 | 1018 | 1068 | 1118 | 1168 | 1218 | 1268 | 1318 |
| F | 158 | 208 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 | 58 | 108 |
| G | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 |
| H | 4 | 4 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 | 26 | 26 |
| J | — | — | 208 | 258 | 308 | 358 | 408 | 458 | 508 | 558 | 608 | 658 | 708 | 758 | 808 | 858 | 908 | 958 | 1008 | 1058 | 1108 | 1158 |
| K | 221 | 246 | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 | 621 | 646 | 671 | 696 | 721 | 746 |
| M | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q1 | — | 674 | 691 | 711 |
| Q2 | — | 110 | 127 | 147 |
| S | 312 | 323 | 340 | — |
| T | 104.5 | 115.5 | 132.5 | — |

(Note) Dimensions of Q1, Q2, S and T vary depending on the cable track size.

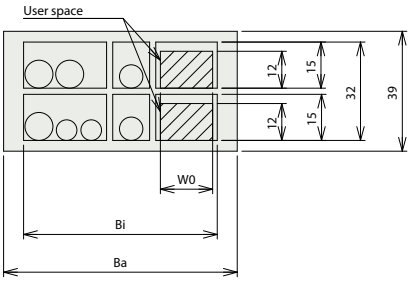
## Cartesian system mass by stroke

| X-axis stroke (mm) / Y-axis stroke (mm) | 50~400 | 450~800 | 850~1100 |
|---|---|---|---|
| 350~600 | 56~66 | 63~73 | 71~79 |

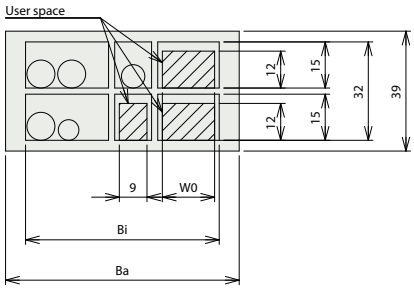
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

## Cable track cross section




X-Y cable track cross section




Y-Z cable track cross section
Z-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track Model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | |
| RSEL-SXGB (for CRS) |  | 8 | DC24V single-phase 200VAC three-phase 200VAC | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZCY

Battery-less absolute | 24V stepper motor

## Model specification items

CRS – XZCY1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ][ ][ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Z-axis) Stroke | 2nd axis (Z-axis) Option | 3rd axis (Y-axis) Stroke | Controller | Cable length | Cable management 1st wiring | Cable management 2nd wiring | Cable management 3rd wiring | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRS | XZCY1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 10 ~ 20: 100mm ~ 200mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | See cable management table below | | | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 200 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.55 seconds | | |
| Positioning repeatability | ± 0.06 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.

Horizontal movement 300mm
Vertical movement 25mm

**POINT Selection Notes**

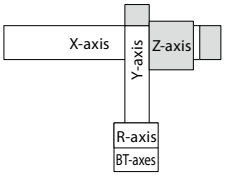
(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

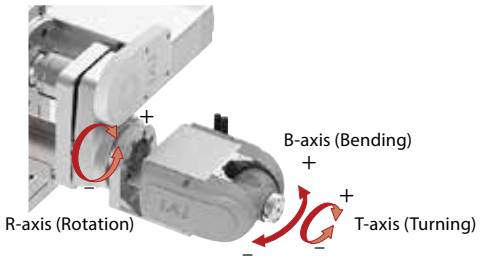
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

Direction 1




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| Name | | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) (Note 2) | **CTL** | ○ | ○ | N/A |
| Cable track XL size (inside width 100mm) (Note 3) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st and 2nd wiring can be selected.
(Note 3) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.06mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | |
|---|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14C-WA-56P-16-□-W (double slider spec.) | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | | | | 0.2 |
| | Stroke (mm) | 150~600 | 650 | 700 | 750 | 800 | 150~800 |
| | Max. speed (mm/s) | 420 | 395 | 360 | 325 | 300 | 280 |
| Stroke | Minimum stroke (mm) | 150 | | | | | |
| | Maximum stroke (mm) | 800 | | | | | |
| | Stroke pitch (mm) | 50 | | | | | |
| Motor type | | Stepper motor 56□size | | | | | |

### ■ Z-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-WSA14R-WA-56P-4-□-B | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 85 | 80 | |
| Stroke | Minimum stroke (mm) | 50 | | |
| | Maximum stroke (mm) | 300 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 56□size | | |

### ■ Y-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-WRA14R-WA-56P-16 |
| Speed/accel/decel | Accel/decel (G) | 0.3 |
| | Max. speed (mm/s) | 560 |
| Stroke | Minimum stroke (mm) | 100 |
| | Maximum stroke (mm) | 200 |
| | Stroke pitch (mm) | 50 |
| Motor type | | Stepper motor 56□size |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

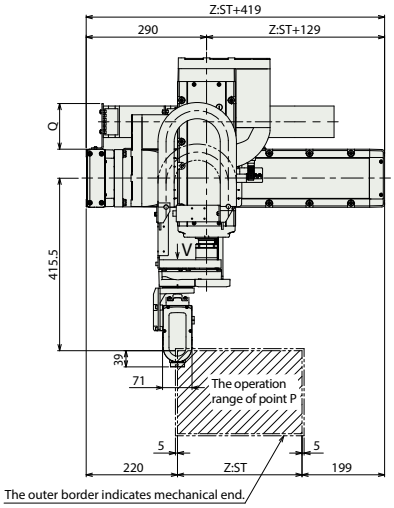
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

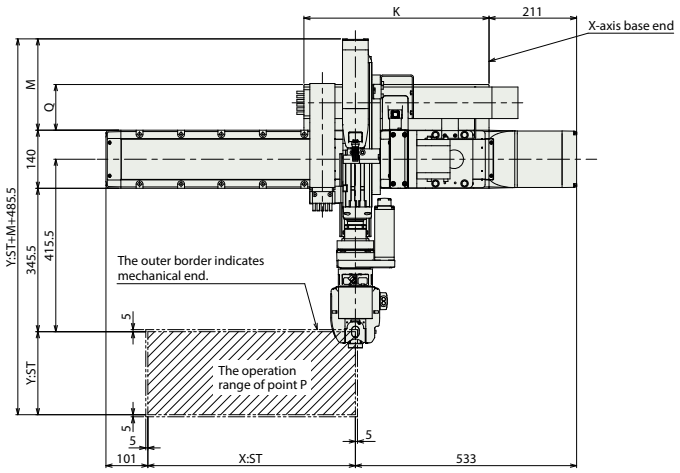
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

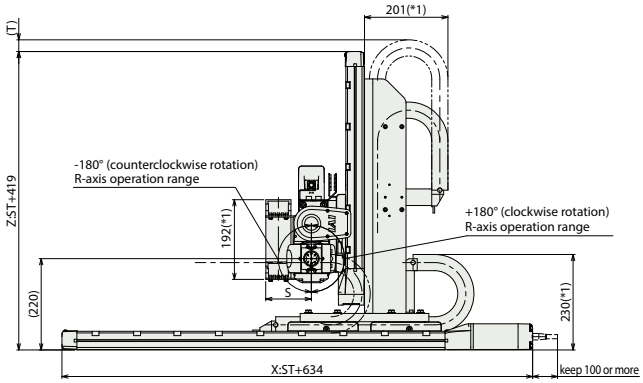
## Dimensions

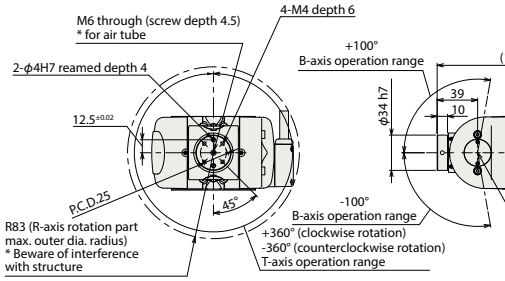
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

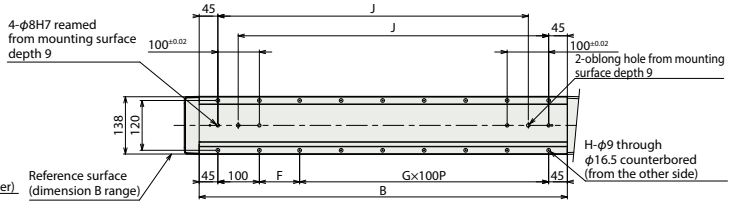


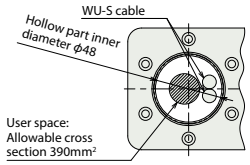



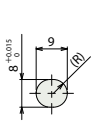

WU-S detail dimensions



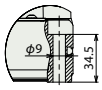

X-axis base mounting dimensions



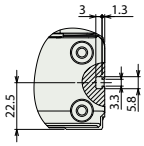

Arrow V
(Detail of R-axis hollow part)



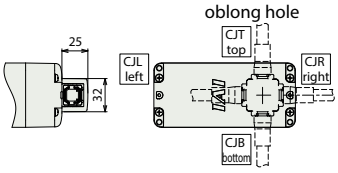

Detail of X-axis base oblong hole



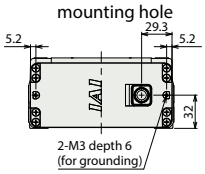

Detail of X-axis base mounting hole



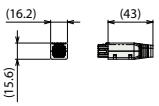

Detail of X-axis side surface T slot




X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis cable connection part

## Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Z-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|
| T | 155 | 132 | 111 | 88 | 35 | 29 |

| Y-axis stroke | 100 | 150 | 200 |
|---|---|---|---|
| M | 120 | 170 | 220 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | - | 110 | 127 | 147 |
| S | 110 | 121 | - | - |

(Note) Dimensions of Q and S vary depending on the cable track size.

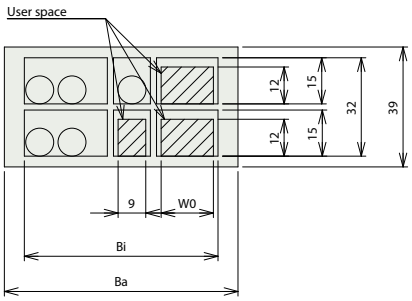
## Cartesian system mass by stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 43~49 | 45~53 | 49~55 |
| 200~300 | 46~52 | 49~56 | 53~59 |

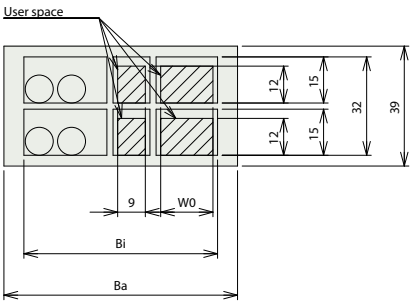
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

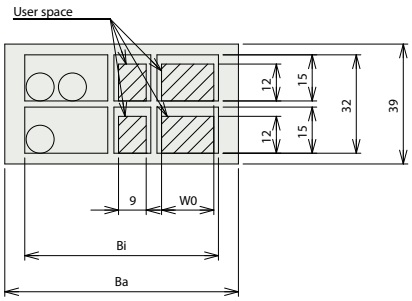
## Cable track cross section




X-Z cable track cross section




Z-Y-cable track cross section




Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXZCY (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZCZ

Battery-less absolute | 24V stepper motor

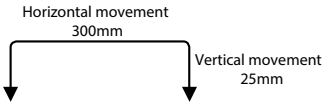
## Model specification items

CRS – XZCZ1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ] [ ] [ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Z-axis) Stroke | 2nd axis (Z-axis) Option | 3rd axis (Y-axis) Stroke | Controller | Cable length | Cable management | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRS | XZCZ1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 10 ~ 20: 100mm ~ 200mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | 1st wiring / 2nd wiring / 3rd wiring: See cable management table below | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 200 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.55 seconds | | |
| Positioning repeatability | ± 0.06 mm | | |

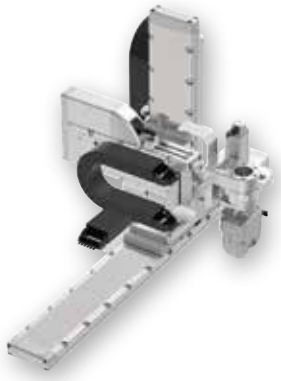
The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.




**POINT Selection Notes**

(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

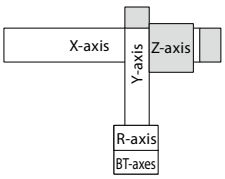
RoHS



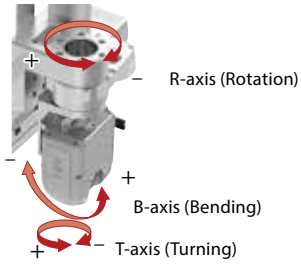
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

Direction 1




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit.
A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| Name | | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) (Note 2) | **CTL** | ○ | ○ | N/A |
| Cable track XL size (inside width 100mm) (Note 3) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st and 2nd wiring can be selected.
(Note 3) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.06mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | |
|---|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14C-WA-56P-16-□-W (double slider spec.) | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | | | | 0.2 |
| | Stroke (mm) | 150~600 | 650 | 700 | 750 | 800 | 150~800 |
| | Max. speed (mm/s) | 420 | 395 | 360 | 325 | 300 | 280 |
| Stroke | Minimum stroke (mm) | 150 | | | | | |
| | Maximum stroke (mm) | 800 | | | | | |
| | Stroke pitch (mm) | 50 | | | | | |
| Motor type | | Stepper motor 56□size | | | | | |

### ■ Z-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCP6-WSA14R-WA-56P-4-□-B | | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 | 0.3 |
| | Max. speed (mm/s) | 85 | 80 | |
| Stroke | Minimum stroke (mm) | 50 | | |
| | Maximum stroke (mm) | 300 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | Stepper motor 56□size | | |

### ■ Y-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-WRA14R-WA-56P-16 |
| Speed/accel/decel | Accel/decel (G) | 0.3 |
| | Max. speed (mm/s) | 560 |
| Stroke | Minimum stroke (mm) | 100 |
| | Maximum stroke (mm) | 200 |
| | Stroke pitch (mm) | 50 |
| Motor type | | Stepper motor 56□size |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous op. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

## Dimensions

*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

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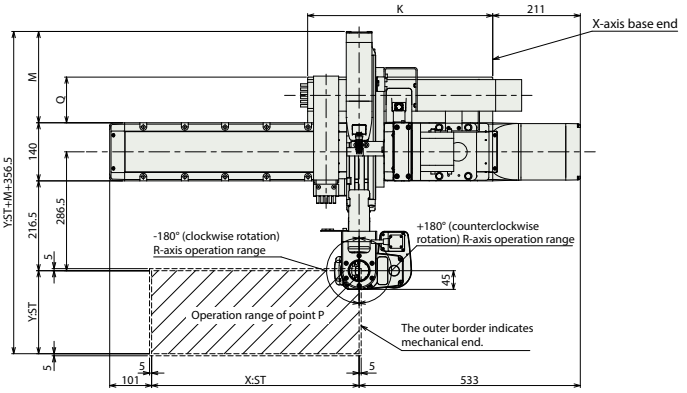
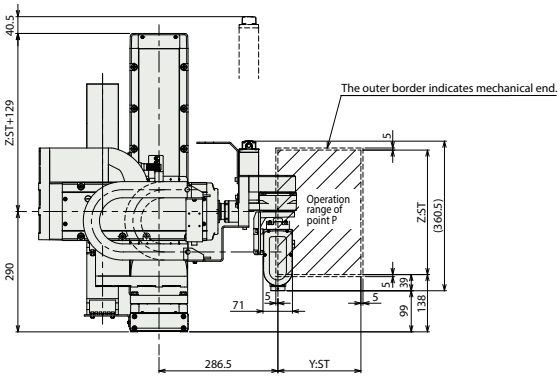
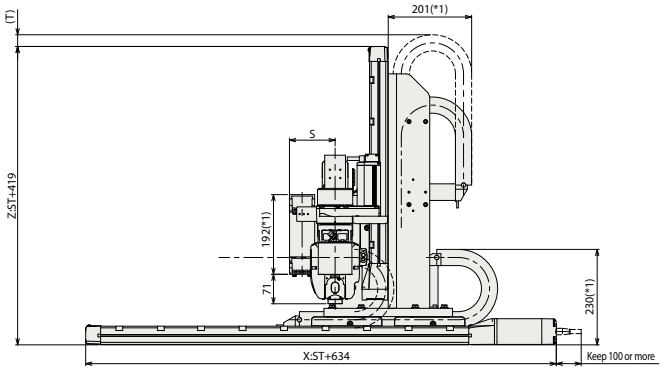
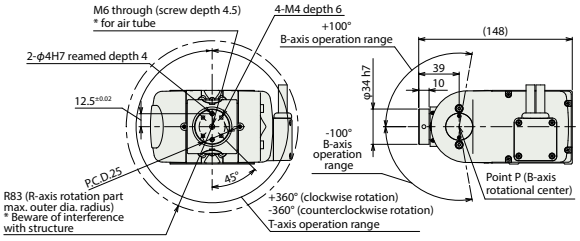
www.intelligentactuator.com
2D CAD 3D CAD

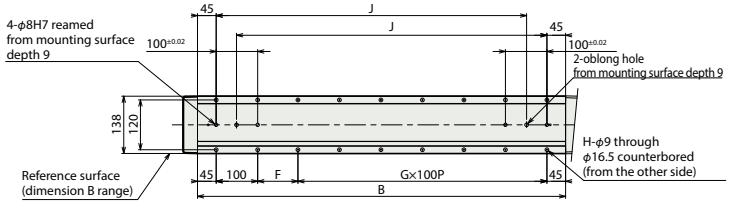


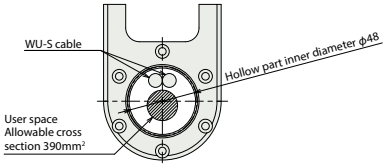



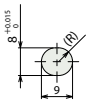

WU-S detail dimensions



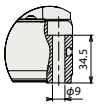

X-axis base mounting dimensions



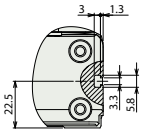

Detail of R-axis hollow part



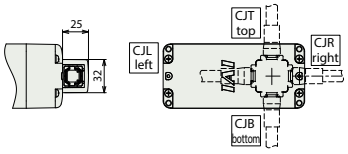

Detail of X-axis base oblong hole



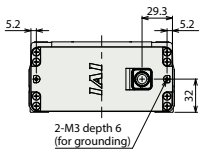

Detail of X-axis base mounting hole



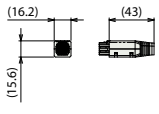

Detail of X-axis side surface T slot




X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis cable connection part

## ■ Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Z-axis stroke | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|
| T | 155 | 132 | 111 | 88 | 35 | 29 |

| Y-axis stroke | 100 | 150 | 200 |
|---|---|---|---|
| M | 120 | 170 | 220 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | — | 110 | 127 | 147 |
| S | 110 | 121 | — | — |

(Note) Dimensions of Q and S vary depending on the cable track size.

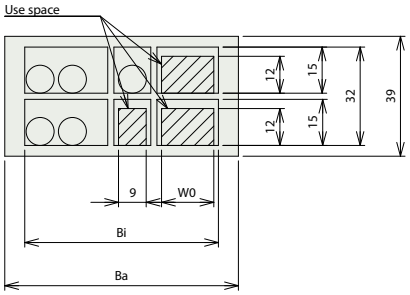
## ■ Cartesian system mass by stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 43~47 | 46~53 | 49~55 |
| 200~300 | 47~53 | 49~56 | 53~59 |

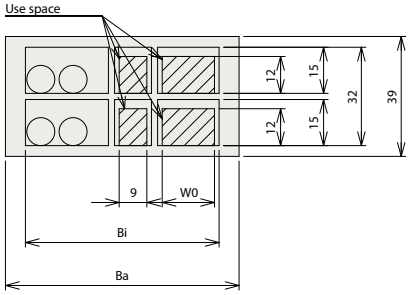
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

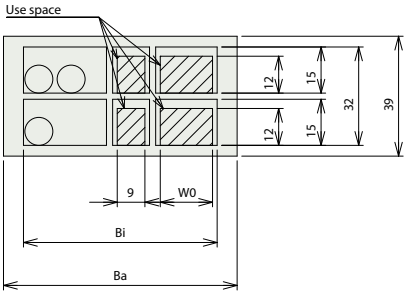
## Cable track cross section




X-Z cable track cross section




Z-Y cable track cross section




Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXZCZ (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZDY

Battery-less absolute | 24V stepper motor

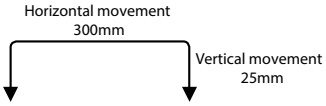
## Model specification items

CRS – XZDY1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ] [ ] [ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Z-axis) Stroke | 2nd axis (Z-axis) Option | 3rd axis (Y-axis) Stroke | Controller | Cable length | Cable management | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRS | XZDY1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 25 ~ 500: 250mm ~ 500mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | 1st wiring, 2nd wiring, 3rd wiring: See cable management table below | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 500 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.28 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.




**POINT Selection Notes**

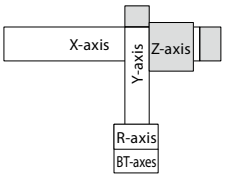
(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

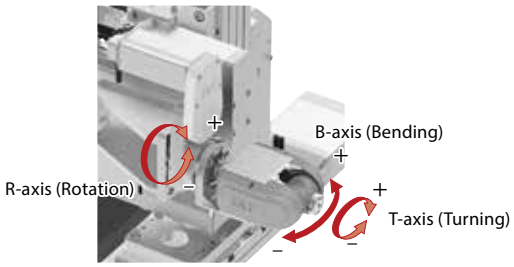
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

Direction 1




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit.
A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 2) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 3) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 4) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes in the option column of the model number.
(Note 4) Applicable tube outer diameter: $\phi$6mm air joint.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14C-WA-56P-8-□-W (double slider spec.) | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | | | | | | | | | 0.2 | | | | | | | | 0.3 | | | | | | |
| | Stroke (mm) | 150~350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 150~450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 150~500 | 550 | 600 | 650 | 700 | 750 | 800 |
| | Max. speed (mm/s) | 370 | 350 | 305 | 270 | 240 | 215 | 195 | 175 | 160 | 145 | 300 | 270 | 240 | 215 | 195 | 175 | 160 | 145 | 250 | 240 | 215 | 195 | 175 | 160 | 145 |
| Stroke | Minimum stroke (mm) | 150 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Maximum stroke (mm) | 800 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | | | | | | | | | | | | | | |
| Motor type | | Stepper motor 56□size | | | | | | | | | | | | | | | | | | | | | | | | |

### ■ Z-axis

| Item | | Description | |
|---|---|---|---|
| Axis model number | | RCP6-WSA14R-WA-56P-4-□-B-W (double slider spec.) | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 |
| | Max. speed (mm/s) | 105 | 100 |
| Stroke | Minimum stroke (mm) | 50 | |
| | Maximum stroke (mm) | 300 | |
| | Stroke pitch (mm) | 50 | |
| Motor type | | Stepper motor 56□size | |

### ■ Y-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-WSA12LR-WA-42P-12 (long slider spec.) |
| Speed/accel/decel | Accel/decel (G) | 0.2 |
| | Max. speed (mm/s) | 400 |
| Stroke | Minimum stroke (mm) | 250 |
| | Maximum stroke (mm) | 500 |
| | Stroke pitch (mm) | 50 |
| Motor type | | Stepper motor 42□size |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 5) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 6) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 6) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

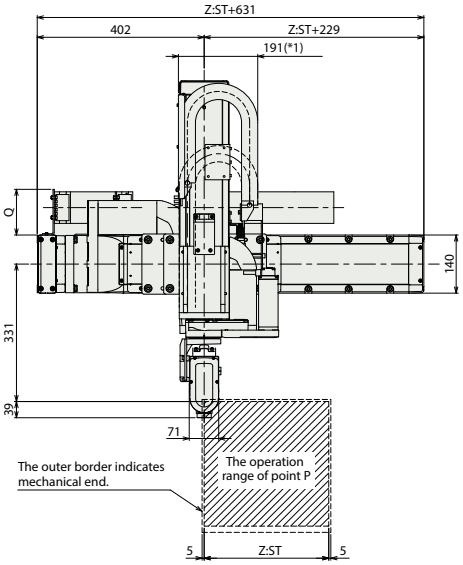
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 7) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 8) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 8) | | | 0.0085 | 0.0075 |

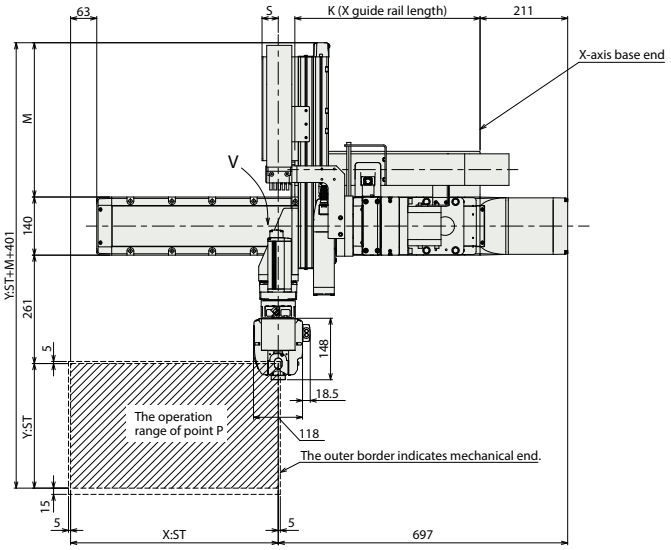
(Note 7) 1G≒9807 degrees/s$^2$
(Note 8) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

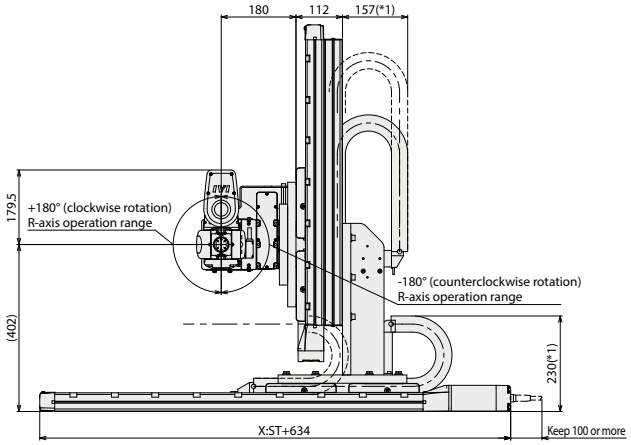
## Dimensions

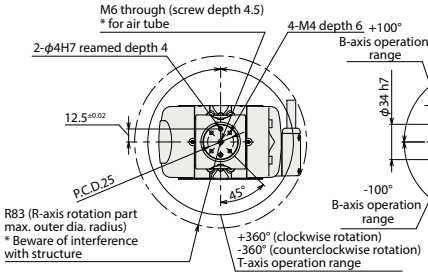
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

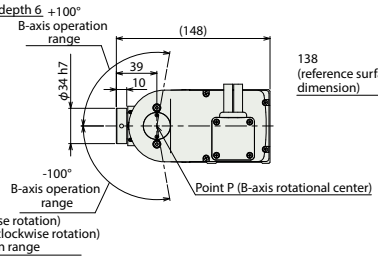
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD



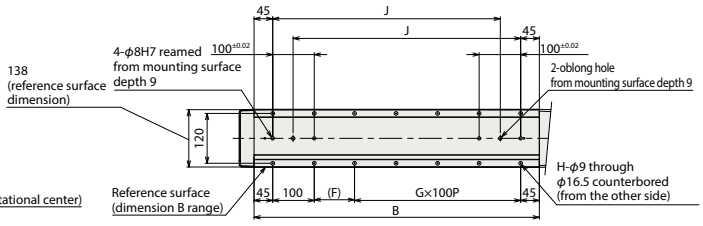



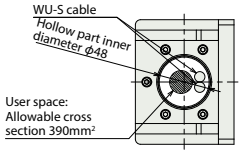



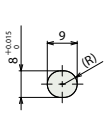

WU-S detail dimensions



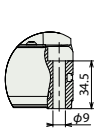

X-axis base mounting dimensions



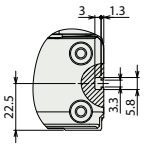

Arrow V
Detail of R-axis hollow part



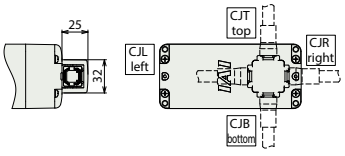

Detail of X-axis base oblong hole



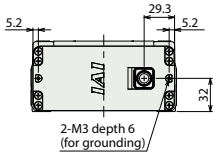

Detail of X-axis base mounting hole



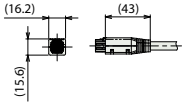

Detail of X-axis side surface T slot




X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis connection part

## Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Y-axis stroke | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|
| M | 321.5 | 371.5 | 421.5 | 471.5 | 521.5 | 571.5 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | - | 110 | 127 | 147 |
| S | 39 | 50 | 67 | - |

(Note) Dimensions of Q and S vary depending on the cable track size.

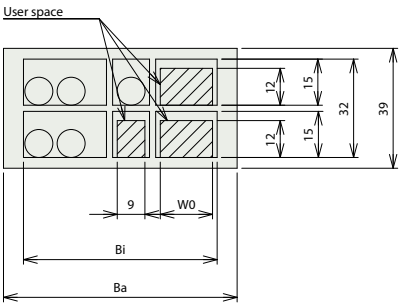
## Cartesian system mass by stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 53~59 | 56~63 | 60~66 |
| 200~300 | 56~62 | 59~66 | 62~68 |

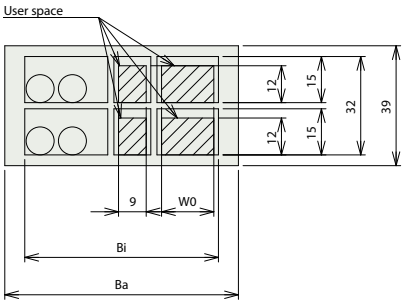
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

## Cable track cross section




X-Z cable track cross section




Z-Y cable track cross section
Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXZDY (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZDZ

Battery-less absolute | 24V stepper motor

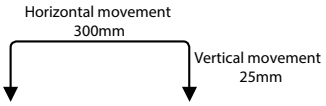
## Model specification items

CRS – XZDZ1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ][ ][ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Z-axis) Stroke | 2nd axis (Z-axis) Option | 3rd axis (Y-axis) Stroke | Controller | Cable length | Cable management | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRS | XZDZ1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 25 ~ 500: 250mm ~ 500mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | 1st wiring, 2nd wiring, 3rd wiring: See cable management table below | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 500 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 2.28 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.




**POINT Selection Notes**

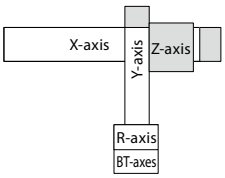
(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) Use RSEL driver modules with the high output setting enabled.
(3) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

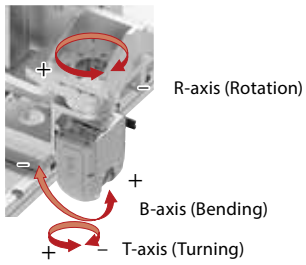
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Configuration direction

Direction 1




## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit.
A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 2) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (standard) | **Not specified** | 8 | ○ |
| | Direction of cable exit (top) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 3) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 4) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes in the option column of the model number.
(Note 4) Applicable tube outer diameter: $\phi$6mm air joint.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 8192pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCP6-WSA14C-WA-56P-8-□-W (double slider spec.) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.1 | | | | | | | | | | 0.2 | | | | | | | | 0.3 | | | | | | | | |
| | Stroke (mm) | 150~350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 150~450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 150~500 | 550 | 600 | 650 | 700 | 750 | 800 | | |
| | Max. speed (mm/s) | 370 | 350 | 305 | 270 | 240 | 215 | 195 | 175 | 160 | 145 | 300 | 270 | 240 | 215 | 195 | 175 | 160 | 145 | 250 | 240 | 215 | 195 | 175 | 160 | 145 | | |
| Stroke | Minimum stroke (mm) | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Maximum stroke (mm) | 800 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Motor type | | Stepper motor 56□size | | | | | | | | | | | | | | | | | | | | | | | | | | |

### ■ Z-axis

| Item | | Description | |
|---|---|---|---|
| Axis model number | | RCP6-WSA14R-WA-56P-4-□-B-W (double slider spec.) | |
| Speed/accel/decel | Accel/decel (G) | 0.1 | 0.2 |
| | Max. speed (mm/s) | 105 | 100 |
| Stroke | Minimum stroke (mm) | 50 | |
| | Maximum stroke (mm) | 300 | |
| | Stroke pitch (mm) | 50 | |
| Motor type | | Stepper motor 56□size | |

### ■ Y-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-WSA12LR-WA-42P-12 (long slider spec.) |
| Speed/accel/decel | Accel/decel (G) | 0.2 |
| | Max. speed (mm/s) | 400 |
| Stroke | Minimum stroke (mm) | 250 |
| | Maximum stroke (mm) | 500 |
| | Stroke pitch (mm) | 50 |
| Motor type | | Stepper motor 42□size |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 5) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 6) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 6) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

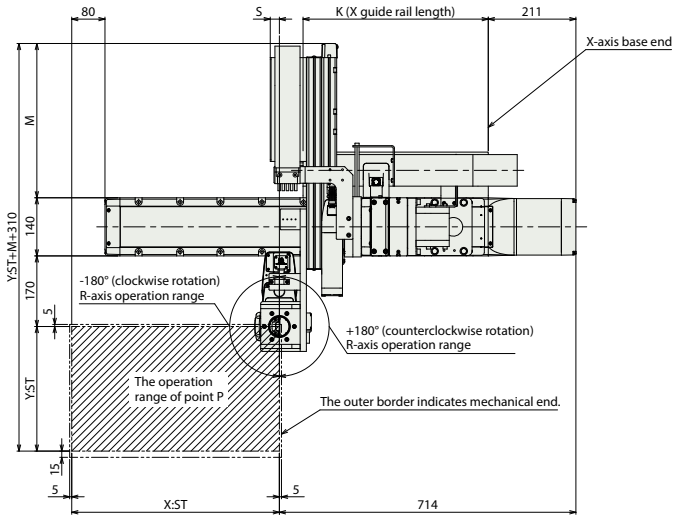
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 7) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 8) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 8) | | | 0.0085 | 0.0075 |

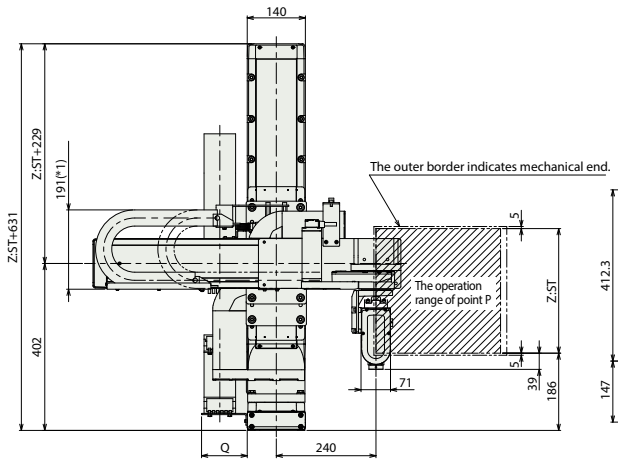
(Note 7) 1G≒9807 degrees/s$^2$
(Note 8) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

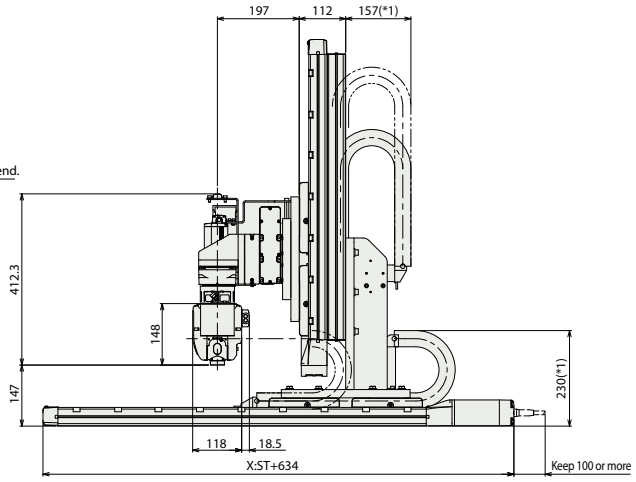
## Dimensions

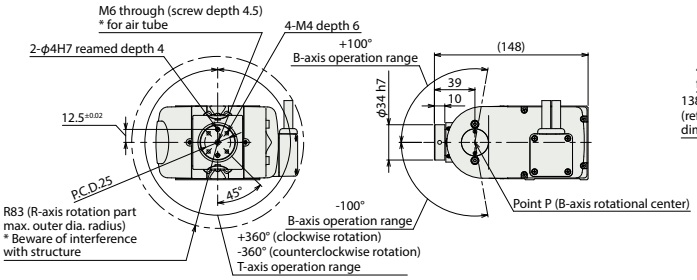
*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD

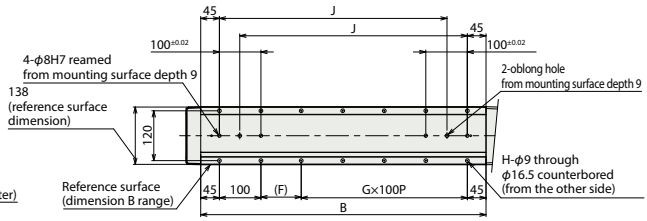


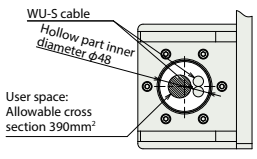



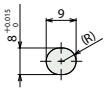

WU-S detail dimensions



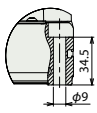

X-axis base mounting dimensions



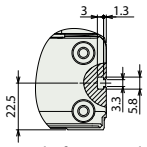

Detail of R-axis hollow part



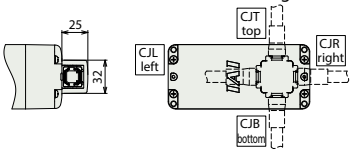

Detail of X-axis base oblong hole



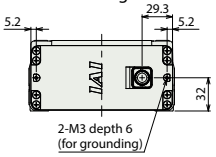

Detail of X-axis base mounting hole



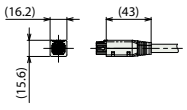

Detail of X-axis side surface T slot




X-axis cable exit direction (option)




Detail of X-axis rear surface




X-axis connection part

## Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Y-axis stroke | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|
| M | 321.5 | 371.5 | 421.5 | 471.5 | 521.5 | 571.5 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | - | 110 | 127 | 147 |
| S | 22 | 33 | 50 | - |

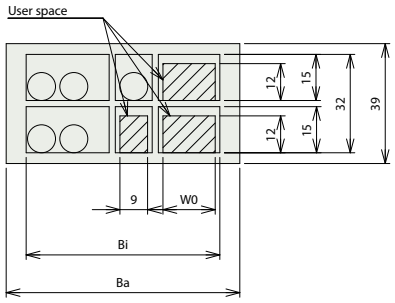
(Note) Dimensions of Q and S vary depending on the cable track size.

## Cartesian system mass by stroke

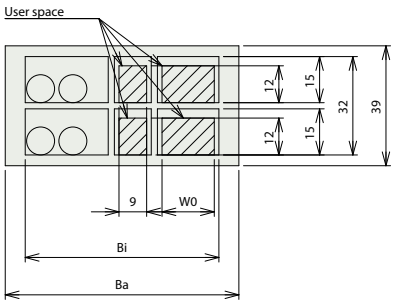
| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 54~60 | 57~64 | 60~66 |
| 200~300 | 57~63 | 60~67 | 63~69 |

(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system. (unit: kg)

## Cable track cross section




X-Z cable track cross section




Z-Y cable track cross section
Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | | |
| RSEL-SXZDZ (for CRS) |  | 8 | DC24V | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZEY

Battery-less absolute | 24V stepper motor | 200V AC servo motor

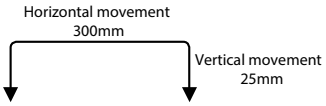
## Model specification items

CRS – XZEY1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ] – [ ] – [ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) Stroke | 1st axis (X-axis) Options | 2nd axis (Z-axis) Stroke | 2nd axis (Z-axis) Option | 3rd axis (Y-axis) Stroke | Controller | Cable length | Cable management | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CRS | XZEY1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 25 ~ 500: 250mm ~ 500mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | 1st wiring, 2nd wiring, 3rd wiring: See cable management table below | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 500 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 1.69 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.



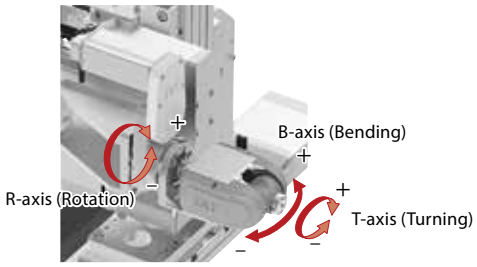

**POINT Selection Notes**

(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) The duty guide value varies depending on operating conditions (payload, acceleration/deceleration, etc.). See P13 for details.
(3) Use RSEL drive unit of the R-axis and BT axes with the high output setting "Enable."
(4) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

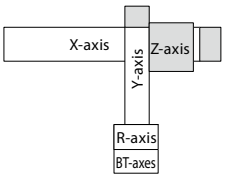
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Configuration direction

Direction 1




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 2) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (top) (Note 3) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) (Note 3) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) (Note 3) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) (Note 3) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes at the option column of the model specification item.
(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 16384pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCS4-WSA14C-WA-200-8-□-W (double slider spec.) | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.5 | | | | | | | | | | | |
| | Stroke (mm) | 150~250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| | Max. speed (mm/s) | 480 | 460 | 400 | 350 | 305 | 270 | 240 | 215 | 195 | 175 | 160 | 145 |
| Stroke | Minimum stroke (mm) | 150 | | | | | | | | | | | |
| | Maximum stroke (mm) | 800 | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | |
| Motor type | | AC servo motor 200W | | | | | | | | | | | |

### ■ Z-axis

| Item | | Description | |
|---|---|---|---|
| Axis model number | | RCS4-WSA14R-WA-200-4-□-B-W (double slider spec.) | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.2 | |
| | Stroke (mm) | 50~250 | 300 |
| | Max. speed (mm/s) | 240 | 230 |
| Stroke | Minimum stroke (mm) | 50 | |
| | Maximum stroke (mm) | 300 | |
| | Stroke pitch (mm) | 50 | |
| Motor type | | AC servo motor 200W | |

### ■ Y-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCS4-WSA12LR-WA-100-12 (long slider spec.) | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.5 | | |
| | Stroke (mm) | 250~400 | 450 | 500 |
| | Max. speed (mm/s) | 720 | 610 | 535 |
| Stroke | Minimum stroke (mm) | 250 | | |
| | Maximum stroke (mm) | 500 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | AC servo motor 100W | | |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decel. See P55 for details.

### ■ BT-axis

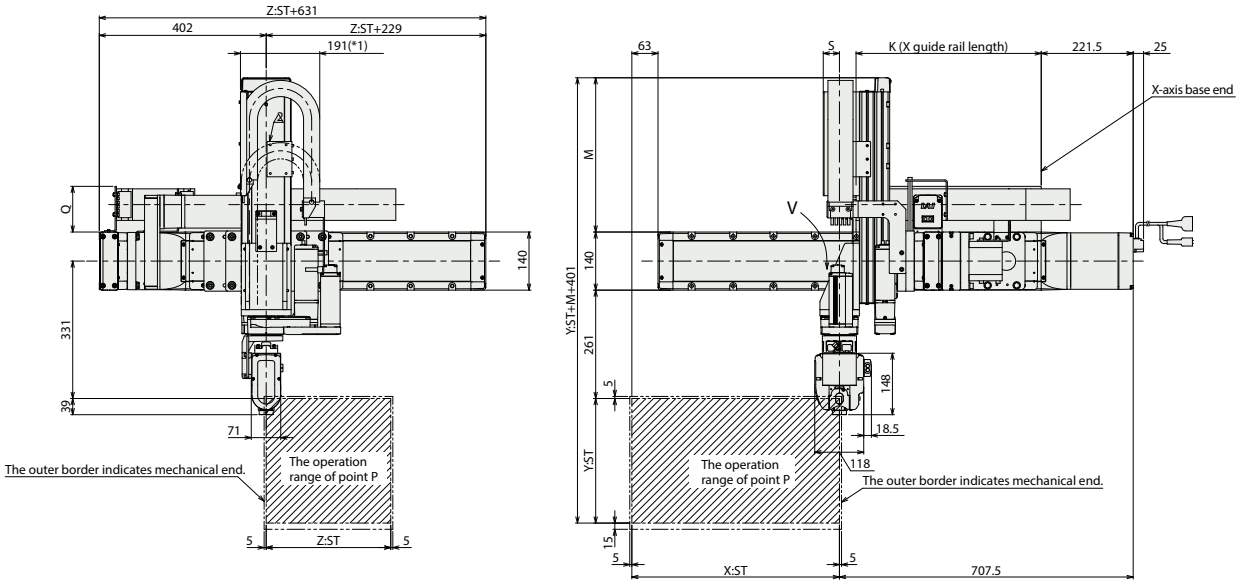
| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

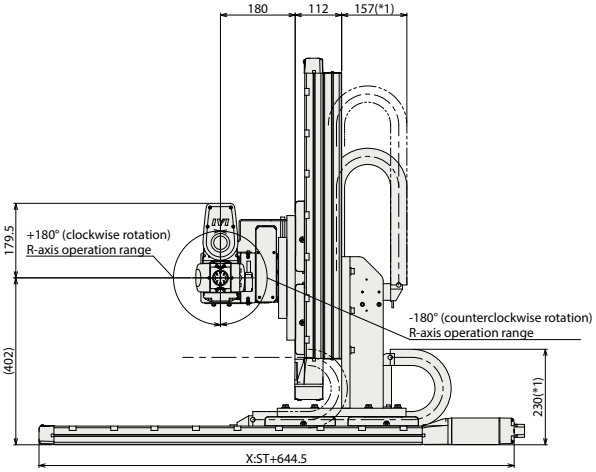
(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

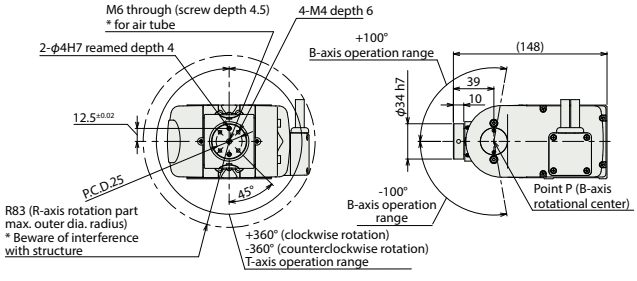
## Dimensions

*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

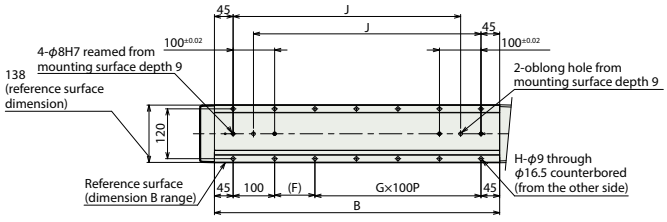
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD



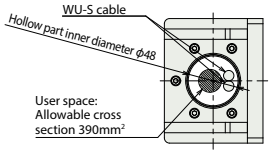



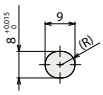

WU-S detail dimensions



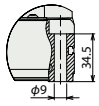

X-axis base mounting dimensions



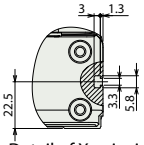

Arrow V
Detail of R-axis hollow part



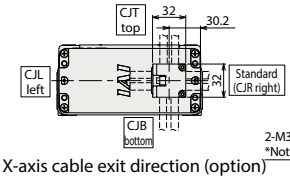

Detail of X-axis base oblong hole



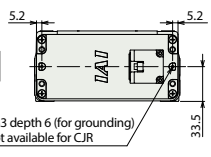

Detail of X-axis base mounting hole



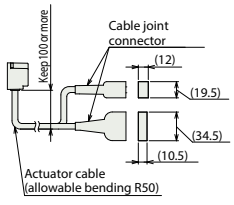

Detail of X-axis side surface T slot




X-axis cable exit direction (option)
* Standard cable exit direction is right (CJR).




Detail of X-axis rear surface




X-axis cable connection part

## ■ Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Y-axis stroke | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|
| M | 321.5 | 371.5 | 421.5 | 471.5 | 521.5 | 571.5 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | — | 110 | 127 | 147 |
| S | 39 | 50 | 67 | — |

(Note) Dimensions of Q and S vary depending on the cable track size.

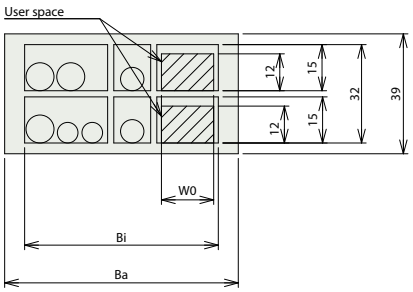
## ■ Cartesian system mass by stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 54~60 | 57~64 | 60~67 |
| 200~300 | 57~63 | 60~67 | 63~69 |

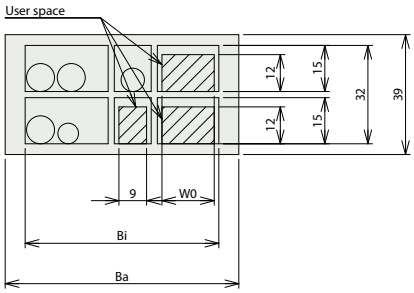
(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system.

(unit: kg)

## Cable track cross section




X-Z cable track cross section




Z-Y cable track cross section
Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | |
| RSEL-SXZEY (for CRS) |  | 8 | DC24V single-phase 200VAC three-phase 200VAC | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# CRS-XZEZ

Battery-less absolute | 24V stepper motor | 200V AC servo motor

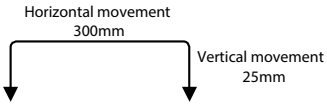
## Model specification items

CRS – XZEZ1 – WA – [ ][ ] – [ ] B – [ ] – R1 – [ ] – [ ] – [ ] – [ ] – [ ]

| Series | Type | Configuration direction | Encoder type | 1st axis (X-axis) | | 2nd axis (Z-axis) | | 3rd axis (Y-axis) | Controller | Cable length | Cable management | | | Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Stroke | Options | Stroke | Option | Stroke | | | 1st wiring | 2nd wiring | 3rd wiring | |
| CRS | XZEZ1 | 1: See configuration direction | WA: Battery-less absolute | 15 ~ 80: 150mm ~ 800mm (every 50mm) | CJT, CJR, CJL, CJB: See options table below | 5 ~ 30: 50mm ~ 300mm (every 50mm) | B: Brake | 25 ~ 500: 250mm ~ 500mm (every 50mm) | R1: RSEL | 1L: 1m, 3L: 3m, 5L: 5m, □L: □m | See cable management table below | | | 4B, 5VC, 5WCS: See options table below |

| Maximum work envelope | X-axis 800 mm | Z-axis 300 mm | Y-axis 500 mm |
|---|---|---|---|
| Max. payload | 1 kg | | |
| Standard cycle time | 1.69 seconds | | |
| Positioning repeatability | ± 0.03 mm | | |

The standard cycle time is based on a reciprocating operation at the highest speed on the following condition.



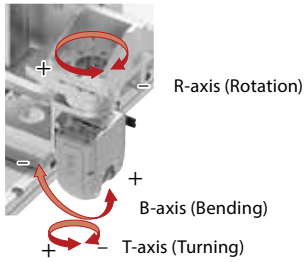

**POINT Selection Notes**

(1) The cycle time is just a reference value. It may be higher depending on stroke and operating conditions.
(2) The duty guide value varies depending on operating conditions (payload, acceleration/deceleration, etc.). See P13 for details.
(3) Use RSEL drive unit of the R-axis and BT axes with the high output setting "Enable."
(4) Positional repeatability conforms to "JIS B 8432 Manipulating industrial robots - Performance criteria and related test methods."

RoHS

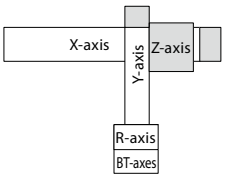
(Note) The above picture shows combination direction [1] and all axes with cable track.

## Operating directions of the rotation axis (R-axis) / Wrist axes (B-axis and T-axis)




## Configuration direction

Direction 1




## Stroke

| X-axis stroke (mm) / Z-axis stroke (mm) | 150~350 | 400~600 | 650~800 |
|---|---|---|---|
| **50~150** | ○ | ○ | ○ |
| **200~300** | ○ | ○ | ○ |

## Cable Length

| Type | Cable code | Length | R1 |
|---|---|---|---|
| Standard type | **1L** | 1m | ○ |
| | **3L** | 3m | ○ |
| | **5L** | 5m | ○ |
| | **6L ~ 10L** | 6m ~ 10m | ○ |
| | **11L ~ 15L** | 11m ~ 15m | ○ |

(Note) Standard cables for all the axes.
(Note) The length of cables for 2nd and 3rd axes is from the cable track exit. A robot cable is attached separately for wiring inside the cable track.
(Note) Standard is 1m, 3m, and 5m. The length can be extended up to 15m in 1m increments.

## Option

* Please check the Options reference pages to confirm each option.

| | Name | Option code | Ref. page | |
|---|---|---|---|---|
| X-axis | Direction of cable exit (top) (Note 3) | **CJT** | 8 | ○ |
| | Direction of cable exit (right) (Note 3) | **CJR** | 8 | ○ |
| | Direction of cable exit (left) (Note 3) | **CJL** | 8 | ○ |
| | Direction of cable exit (bottom) (Note 3) | **CJB** | 8 | ○ |
| Z-axis | Brake (Note 4) | **B** | 8 | standard |
| R-axis | Brake | **4B** | 8 | ○ |
| B/T axes | with air joint (Note 5) | **5VC** | 8 | ○ |
| | with wiring collar | **5WCS** | 8 | ○ |

(Note 3) Make sure to specify one of codes at the option column of the model specification item.
(Note 4) Z-axis is equipped standard with brake. Make sure to specify it in the Z-axis option column of the model number.
(Note 5) Applicable tube outer diameter: $\phi$6mm air joint.

## Cable Management List

| Name | Type | 1st wiring (X-axis) | 2nd wiring (Z-axis) | 3rd wiring (Y-axis) |
|---|---|---|---|---|
| No cable track (only cable) | **N** | — | — | — |
| Cable track S size (inside width 50mm) (Note 1) | **CT** | N/A | ○ | ○ |
| Cable track M size (inside width 63mm) | **CTM** | ○ | ○ | ○ |
| Cable track L size (inside width 80mm) | **CTL** | ○ | ○ | ○ |
| Cable track XL size (inside width 100mm) (Note 2) | **CTXL** | ○ | N/A | |

(Note 1) Only 2nd and 3rd wiring can be selected.
(Note 2) Only 1st wiring can be selected.

## Main Specifications

| Item | Description |
|---|---|
| Max. payload | 1kg |
| Positioning repeatability | ±0.03mm |

| Item | | Description |
|---|---|---|
| Ambient operation temperature/humidity | | 0-40℃, less than 85% (non-condensing) |
| Degree of protection | | — |
| Vibration resistance/shock resistance | | 4.9m/s$^2$ |
| Overseas standard | | RoHS |
| Encoder type | | Battery-less absolute |
| Number of encoder pulses | XYZ axes | 16384pulse/rev |
| | RBT axes | 8192pulse/rev |

## Specifications of configured axes

The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration.
For CP operations, refer to the reference numbers for maximum speed and acceleration/deceleration on P56.

### ■ X-axis

| Item | | Description | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axis model number | | RCS4-WSA14C-WA-200-8-□-W (double slider spec.) | | | | | | | | | | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.5 | | | | | | | | | | | |
| | Stroke (mm) | 150~250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| | Max. speed (mm/s) | 480 | 460 | 400 | 350 | 305 | 270 | 240 | 215 | 195 | 175 | 160 | 145 |
| Stroke | Minimum stroke (mm) | 150 | | | | | | | | | | | |
| | Maximum stroke (mm) | 800 | | | | | | | | | | | |
| | Stroke pitch (mm) | 50 | | | | | | | | | | | |
| Motor type | | AC servo motor 200W | | | | | | | | | | | |

### ■ Z-axis

| Item | | Description | |
|---|---|---|---|
| Axis model number | | RCS4-WSA14R-WA-200-4-□-B-W (double slider spec.) | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.2 | |
| | Stroke (mm) | 50~250 | 300 |
| | Max. speed (mm/s) | 240 | 230 |
| Stroke | Minimum stroke (mm) | 50 | |
| | Maximum stroke (mm) | 300 | |
| | Stroke pitch (mm) | 50 | |
| Motor type | | AC servo motor 200W | |

### ■ Y-axis

| Item | | Description | | |
|---|---|---|---|---|
| Axis model number | | RCS4-WSA12LR-WA-100-12 (long slider spec.) | | |
| Max. speed by accel/decel and stroke | Accel/decel (G) | 0.5 | | |
| | Stroke (mm) | 250~400 | 450 | 500 |
| | Max. speed (mm/s) | 720 | 610 | 535 |
| Stroke | Minimum stroke (mm) | 250 | | |
| | Maximum stroke (mm) | 500 | | |
| | Stroke pitch (mm) | 50 | | |
| Motor type | | AC servo motor 100W | | |

### ■ R-axis

| Item | | Description |
|---|---|---|
| Axis model number | | RCP6-RTFML-WA-42P-30-360 |
| Speed/accel/decel | Accel/decel (G) (Note 6) | 0.3 |
| | Max. speed (degree/s) | 800 |
| Operation range (degree) | | ±180 |
| Maximum torque (N・m) (Note 7) | | 5.2 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 7) | | 0.08 |
| Motor type | | Stepper motor 42□size |

(Note 6) 1G≒9807 degrees/s$^2$
(Note 7) Varies depending on speed and accel/decell. See P55 for details.

### ■ BT-axis

| Item | | | Description | |
|---|---|---|---|---|
| Axis configuration | | | B-axis (wrist bending) | T-axis (wrist turning) |
| Axis model number | | | WU-S-WA | |
| Speed/accel/decel | Accel/decel (G) (Note 8) | | 0.3 | 0.3 |
| | Max. speed (degree/s) | Single operation | 750 | 1200 |
| | | B&T axes simultaneous ope. | 600 | 600 |
| Operation range (degree) | | | ±100 | ±360 |
| Motor type | | | Stepper motor 28□size | |
| Maximum torque (N・m) (Note 9) | | | 0.65 | 0.65 |
| Maximum allowable moment of inertia (kg・m$^2$) (Note 9) | | | 0.0085 | 0.0075 |

(Note 8) 1G≒9807 degrees/s$^2$
(Note 9) Varies depending on speed and accel/decel. See P55 for details.
(Note) B&T axes are equipped standard with a brake.

## Dimensions

*1 The cable track can swell and may become slightly larger than the size in the drawing.
(Note) The drawing below shows all actuators in the home position.
(Note) The drawing below shows the combination direction [1] with cable tracks for the 1st, 2nd, and 3rd axis wiring.

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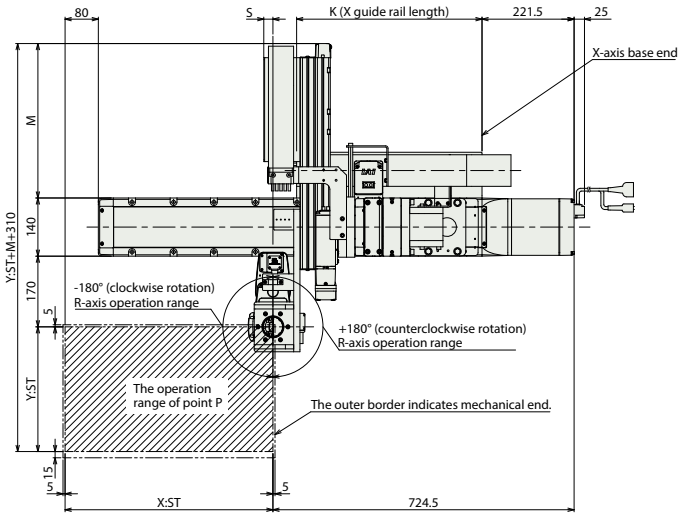
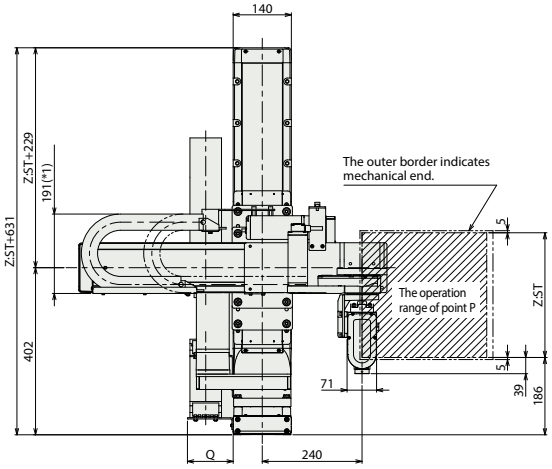
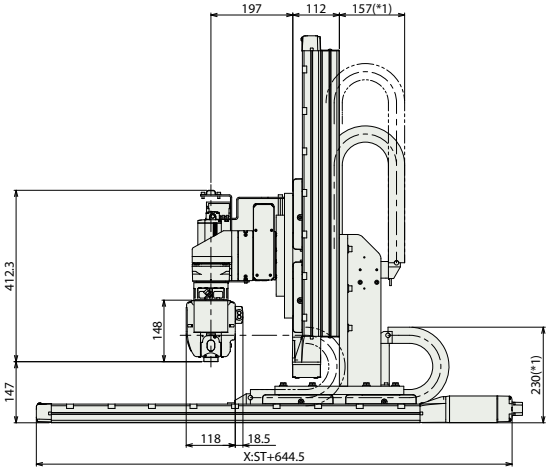
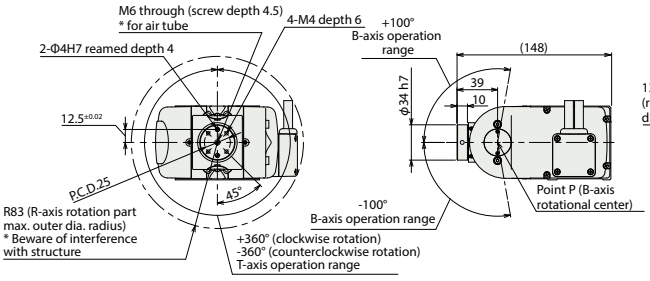
www.intelligentactuator.com
2D CAD 3D CAD

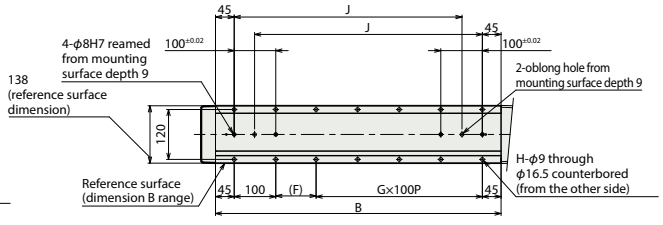


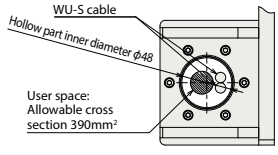



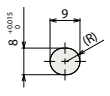

WU-S detail dimensions



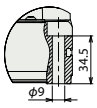

X-axis base mounting dimensions



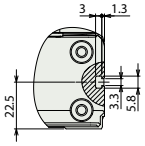

Detail of R-axis hollow part



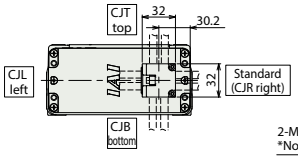

Detail of X-axis base oblong hole



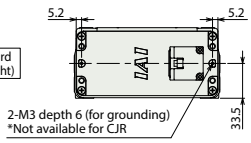

Detail of X-axis base mounting hole



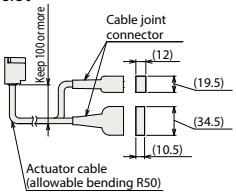

Detail of X-axis side surface T slot




X-axis cable exit direction (option)
* Standard cable exit direction is right (CJR).




Detail of X-axis rear surface




X-axis cable connection part

## ■ Dimensions by stroke

| X-axis stroke | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 537 | 587 | 637 | 687 | 737 | 787 | 837 | 887 | 937 | 987 | 1037 | 1087 | 1137 | 1187 |
| F | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 | 47 | 97 |
| G | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 |
| H | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| J | 398 | 448 | 498 | 548 | 598 | 648 | 698 | 748 | 798 | 848 | 898 | 948 | 998 | 1048 |
| K | 271 | 296 | 321 | 346 | 371 | 396 | 421 | 446 | 471 | 496 | 521 | 546 | 571 | 596 |

| Y-axis stroke | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|
| M | 321.5 | 371.5 | 421.5 | 471.5 | 521.5 | 571.5 |

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Q | — | 110 | 127 | 147 |
| S | 22 | 33 | 50 | — |

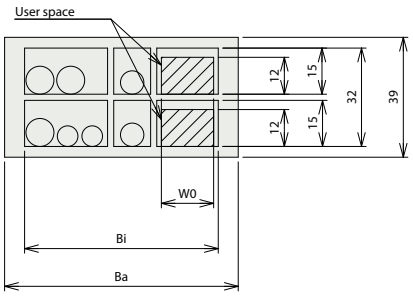
(Note) Dimensions of Q and S vary depending on the cable track size.

## ■ Cartesian system mass by stroke

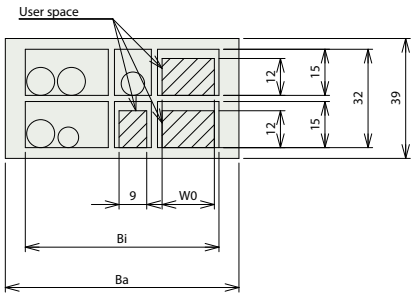
| X-axis stroke (mm) / Z-axis stroke (mm) | 150~300 | 350~600 | 650~800 |
|---|---|---|---|
| 50~150 | 55~59 | 58~63 | 61~65 |
| 200~300 | 58~62 | 60~66 | 64~68 |

(Note) Refer to the installation manual for how to calculate the mass of the Cartesian system. (unit: kg)

## Cable track cross section




X-Z cable track cross section




Z-Y cable track cross section
Y-R cable track cross section

| Cable track size | CT | CTM | CTL | CTXL |
|---|---|---|---|---|
| Cable track model number | B17.4.075.0 | B17.5.075.0 | B17.6.075.0 | B17.7.075.0 |
| Ba | 60.5 | 76 | 93 | 113 |
| Bi | 50 | 63 | 80 | 100 |
| W0 | 9 | 17 | 34 | 54 |

## Applicable controller

The actuators on this page are operable by the following controller. Select a type suitable for your use.

| Name | Ext. appearance | Max. connectable axes | Voltage | Control method | | | | | | | | | | | | | | Max. positioning points | Reference page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positioner | Pulse-train | Program | Network *Select | | | | | | | | | | | | |
| | | | | | | | DV | CC | CIE | PR | CN | ML | ML3 | EC | EP | PRT | SSN | ECM | |
| RSEL-SXZEZ (for CRS) |  | 8 | DC24V single-phase 200VAC three-phase 200VAC | — | — | ● | ● | ● | ● | ● | — | — | — | ● | ● | ● | — | — | 36000 | 57 |

(Note) See P58 for the network codes, such as DV and CC.

# Output Torque of R-axis and BT-axes by Speed and Allowable Moment of Inertia by Speed and Acceleration.

## R-axis RCP6-RTFML

### Output torque by speed

| Speed (degree/s) | Output torque |
|---|---|
| 0 | 5.2 |
| 100 | 5.2 |
| 200 | 4.3 |
| 300 | 3.7 |
| 400 | 3.0 |
| 500 | 2.6 |
| 600 | 2.1 |
| 700 | 1.7 |
| 800 | 1.4 |

(Unit: N・m)

### Allowable moment of inertia by speed and acceleration.

| Speed (degree/s) | Accel./decel. | |
|---|---|---|
| | 0.3G | 0.7G |
| 0 | 0.080 | 0.054 |
| 100 | 0.080 | 0.054 |
| 200 | 0.072 | 0.036 |
| 300 | 0.063 | 0.032 |
| 400 | 0.059 | 0.032 |
| 500 | 0.050 | 0.027 |
| 600 | 0.041 | 0.018 |
| 700 | 0.018 | 0.009 |
| 800 | 0.014 | 0.005 |

(Unit: kg・m$^2$)

## BT axes WU-S

### Output torque by speed

Operation at the blank spaces is not possible.

| Speed (degree/s) | B-axis | T-axis |
|---|---|---|
| 0 | 0.65 | 0.65 |
| 150 | 0.65 | 0.65 |
| 300 | 0.62 | 0.62 |
| 450 | 0.6 | 0.6 |
| 600 | 0.58 | 0.58 |
| 750 | 0.52 | 0.52 |
| 900 | | 0.45 |
| 1050 | | 0.45 |
| 1200 | | 0.45 |

(Unit: N・m)

### Allowable moment of inertia by speed and acceleration.

**Without load torque** Operation at the blank spaces is not possible.

| Speed (degree/s) | B-axis Accel./decel. | | T-axis Accel./decel. | |
|---|---|---|---|---|
| | 0.3G | 0.7G | 0.3G | 0.7G |
| 0 | 0.0085 | 0.0065 | 0.0075 | 0.0035 |
| 150 | 0.0085 | 0.0065 | 0.0075 | 0.0035 |
| 300 | 0.0085 | 0.005 | 0.0065 | 0.0035 |
| 450 | 0.0085 | 0.005 | 0.0065 | 0.0025 |
| 600 | 0.0085 | 0.005 | 0.0065 | 0.0025 |
| 750 | | 0.005 | 0.0065 | 0.0025 |
| 900 | | | 0.0065 | 0.0025 |
| 1050 | | | 0.0065 | 0.0025 |
| 1200 | | | 0.0065 | 0.0025 |

(Unit: kg・m$^2$)

**With load torque** Operation at the blank spots is not possible.

| Speed (degree/s) | B-axis Accel./decel. | T-axis Accel./decel. |
|---|---|---|
| | 0.3G | 0.3G |
| 0 | 0.008 | 0.0035 |
| 150 | 0.008 | 0.0035 |
| 300 | 0.008 | 0.0035 |
| 450 | 0.008 | 0.0035 |
| 600 | 0.008 | 0.0035 |
| 750 | | 0.0035 |
| 900 | | 0.0035 |
| 1050 | | 0.0035 |
| 1200 | | 0.0025 |

(Unit: kg・m$^2$)

## BT axes WU-M

### Output torque by speed

Operation at the blank spaces is not possible.

| Speed (degree/s) | B-axis | T-axis |
|---|---|---|
| 0 | 1.65 | 1.65 |
| 150 | 1.65 | 1.65 |
| 300 | 1.65 | 1.65 |
| 450 | 1.65 | 1.65 |
| 600 | 1.58 | 1.58 |
| 750 | 1.36 | 1.36 |
| 900 | 1.14 | 1.14 |
| 1050 | | 0.96 |
| 1200 | | 0.79 |

(Unit: N・m)

### Allowable moment of inertia by speed and acceleration.

**Without load torque** Operation at the blank spaces is not possible.

| Speed (degree/s) | B-axis Accel./decel. | | T-axis Accel./decel. | |
|---|---|---|---|---|
| | 0.3G | 0.7G | 0.3G | 0.7G |
| 0 | 0.015 | 0.0145 | 0.0165 | 0.0126 |
| 150 | 0.015 | 0.0145 | 0.0165 | 0.0126 |
| 300 | 0.015 | 0.0127 | 0.0165 | 0.009 |
| 450 | 0.0099 | 0.0045 | 0.0126 | 0.0063 |
| 600 | 0.009 | 0.0036 | 0.0108 | 0.0054 |
| 750 | | 0.0036 | 0.0099 | 0.0054 |
| 900 | | 0.0036 | 0.0099 | 0.0045 |
| 1050 | | | 0.0081 | 0.0045 |
| 1200 | | | 0.0081 | 0.0045 |

(Unit: kg・m$^2$)

**With load torque** Operations at the blank spaces is not possible.

| Speed (degree/s) | B-axis Accel./decel. | T-axis Accel./decel. |
|---|---|---|
| | 0.3G | 0.3G |
| 0 | 0.015 | 0.0126 |
| 150 | 0.015 | 0.0126 |
| 300 | 0.0118 | 0.0072 |
| 450 | 0.0055 | 0.0054 |
| 600 | 0.0055 | 0.0054 |
| 750 | | 0.0054 |
| 900 | | 0.0036 |
| 1050 | | 0.0036 |
| 1200 | | 0.0036 |

(Unit: kg・m$^2$)

# Maximum Speed and Maximum Acceleration/Deceleration

**The PTP operation enables operations at the maximum speed and maximum acceleration/deceleration specified in the "specification of the configured axes" of the product page.**
**For the CP operation, refer to the guide number of maximum speed and acceleration/deceleration shown below.**

**Guide number of maximum combined speed and maximum acceleration/deceleration of the CP operations.**

| | XBA | XGA | XBB | XGB | XZCY<br>XZCZ | XZDY<br>XZDZ | XZEY<br>XZDZ |
|---|---|---|---|---|---|---|---|
| Maximum combined speed (mm/s) | 250 | 250 | 700 | 700 | 150 | 150 | 300 |
| Maximum acceleration/deceleration (G) | 0.3 | 0.3 | 0.4 | 0.4 | 0.2 | 0.2 | 0.2 |

# RSEL

**Unit-linkage controller**

CE RoHS cULus (*1)

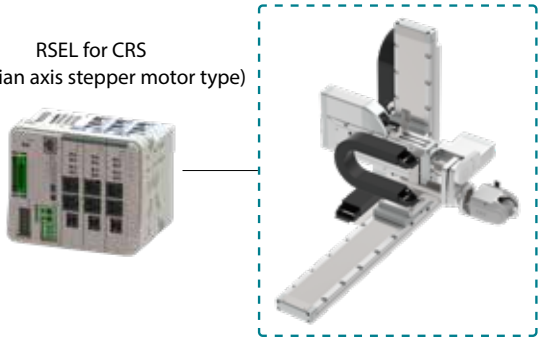
(*1) Conformity with standards depends on models. See P59 for details.

## Features

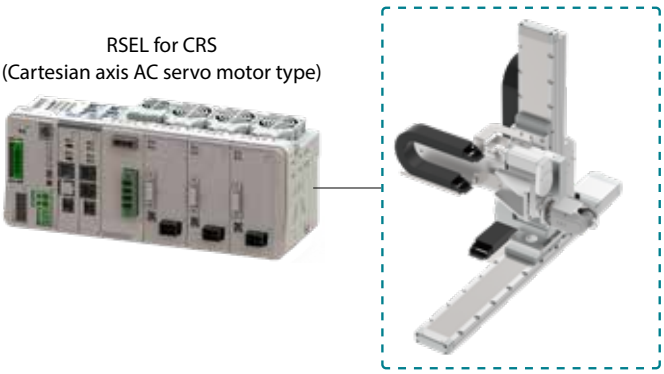
### RSEL Controllers that link units required for the CRS Series.

The combination-free RSEL controllers are now joined by
unit-linkage controllers that combine units necessary for the Cartesian Type 6-Axis Robot, the CRS Series.
See P60 for the detail of unit configuration.

RSEL for CRS
(Cartesian axis stepper motor type)



RSEL for CRS
(Cartesian axis AC servo motor type)



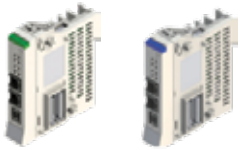
### Two axes of driver units can be added

Up to 8 axes can be connected to the RSEL controller.
Two axes of driver units can be added (*) to the 6 axes of the CRS Series.
(*) Purchase driver units separately. See R-unit catalog (CJ0272-1A) for details

(Example)

RSEL 6 axes for CRS

Up to 2 axes for driver unit



CRS 6 axes

Up to 2 axes

## Full line up

| Controller type | SXBA | SXGA | SXZCY | SXZCZ | SXZDY | SXZDZ | SXBB | SXGB | SXZEY | SXZEZ |
|---|---|---|---|---|---|---|---|---|---|---|
| Connected axis (*1) | CRS-XBA | CRS-XGA | CRS-XZCY | CRS-XZCZ | CRS-XZDY | CRS-XZDZ | CRS-XBB | CRS-XGB | CRS-XZEY | CRS-XZEZ |
| External appearance |  * without additional axes | | | | | |  * without additional axes | | | |

(*1) Two additional axes can be connected by adding optional driver units.

## Model specification items

**RSEL** – [ ] – [ ] – [ ] – [ ]

Series / Type / I/O type / I/O cable length / Option

| Type | |
|---|---|
| SXBA | for CRS-XBA |
| SXBB | for CRS-XBB |
| SXGA | for CRS-XGA |
| SXGB | for CRS-XGB |
| SXZCY | for CRS-XZCY |
| SXZCZ | for CRS-XZCZ |
| SXZDY | for CRS-XZDY |
| SXZDZ | for CRS-XZDZ |
| SXZEY | for CRS-XZEY |
| SXZEZ | for CRS-XZEZ |

| I/O type | |
|---|---|
| E | Not used |
| NP | PIO (NPN) |
| PN | PIO (PNP) |
| DV | DeviceNet |
| DV2 | DeviceNet (with 2-way connector) |
| CC | CC-Link |
| CC2 | CC-Link (with 2-way connector) |
| CIE | CC-Link IE Field |
| PR | PROFIBUS-DP |
| EC | EtherCAT |
| EP | EtherNet/IP |
| PRT | PROFINET IO |

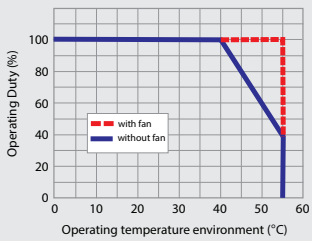
| I/O cable length | |
|---|---|
| 0 | Without cable |
| 2 | 2m (standard) |
| 3 | 3m |
| 5 | 5m |

(*) When I/O type is other than PIO specification, choose "0 (no cable)."

| Option | |
|---|---|
| FN | Fan unit |

(*) When this option is selected, the RSEL-G and RCON-PC come with a fan unit. (RCON-SC is equipped standard with a fan unit.))

The operating temperature of the SEL unit and Driver unit is 0 - 55℃ .
However, a fan unit is needed for the SEL unit when operating at 40℃ or higher.
The driver unit has temperature derating if the fan unit is not used.
Operations without a fan unit at 0 - 40℃ are possible without derating. However, when operating at 0 - 55℃ , the operation duty ratio should be lowered by 20% for every 5℃ .



## Basic specificatins

| Item | | Specificatio | |
|---|---|---|---|
| Input power voltage | | 24VDC ±10%<br>200VAC - 230VAC±10% (200V power unit) | |
| Input power current | | Depends on system configuration | |
| Number of controlled axes | | 1 to 8 axes | |
| Compatible encoder | 24V system | Incremental (including ABZ parallel)<br>Battery-less absolute | |
| | 200V system | Incremental (including ABZ parallel), Battery-less absolute, Quasi absolute,<br>Index absolute, (SCON connection spec.) absolute, Multi-rotation absolute. | |
| Compatible field network | | CC-Link, CCinkIE Field, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS-DP, PROFINET IO | |
| Configured unit | | SEL unit, Driver unit, Expansion unit, Power unit, Fan unit, Terminal unit, Simple absolute unit | |
| Serial communication function | Teaching port | Communication system | RS232C |
| | | Communication speed | Max. 115.2kbps |
| | USB port | Communication system | USB |
| | | Communication speed | 12Mbps full speed |
| | | Ethernet (RJ-45), PSA-24 communication | |
| Emergency stop/ Enable operation | | Collective system control by stop signal of SEL unit | |
| Data storage device | | FlashROM + involatile RAM (FRAM) * battery not needed | |
| Safety category | | B ( up to 4 by external circuit) | |
| Safety circuit | | Duplex circuit possible | |
| Emergency stop input | | B-contact input (possible to select from external power supply, duplex circuit or internal power supply) | |
| Enable input | | B-contact input (possible to select from external power supply, duplex circuit or internal power supply) | |
| Speed setting | | 1 mm/s and up. Upper limit depends on actuator spec. | |
| Acceleration/deceleration setting | | 0.01G and up. Upper limit depends on actuator spec. | |
| Number of axis groups | | 2 (up to 8 axes per group) | |
| Programing language | | Super SEL languag | |
| Number of programs | | 512 (99 input signals in BCD and 255 input signals in binary) | |
| Number of program steps | | 20,000 steps | |
| Multi-task program | | 16 programs | |
| Number of positions | | 36,000 positions (varies depending on the number of axis groups) | |
| Data input method | Teaching port | Touch panel teaching pendant, PC-dedicated teaching software | |
| | USB | PC-dedicated teaching software | |
| | Ethernet | | |
| Standard input/output | | (I/O slot selection) input 16 / output 16 | |
| Extended input/output | | PIO units can be connected up to 8 units. | |
| Ethernet | | 10/100BASE-T (RJ-45 connector) | |
| | | XSEL serial communication protocol (format B) *1 | |
| USB | | USB2.0 (Mini-B), XSEL serial communication protocol (format B) *1 | |
| Clock function | Retaining time | Approx. 10 days | |
| | Recharging time | Approx. 100 hours | |
| SD card | | SD/SDHC (only update function is used) | |
| Protection function | | Over current, abnormal temperature, encoder disconnection, over load | |
| Preventative & predictive maintenance functions | | Low electrolytic condenser capacity, low fan revolution | |
| Ambient operation temperature | | (without fan) 0-40℃ , (with fan) 0-55℃ *0-40℃ for simple absolute unit | |
| Operation humidity | | less than 85%RH (non-condensing) | |
| Operation atmosphere | | Not exposed to corrosive gas, nor dusts | |
| Vibration resistance | | Frequency 10-57Hz/amplitude: 0.075mm, Frequency 57-150Hz/acceleration 9.8m/s2,<br>XYZ directions Sweepage time: 10 minutes Number of sweepages: 10 times | |
| Impact resistance | | Drop height 800mm, 1 corner, 3 edges, 6 surfaces | |
| Electric shock protection mechanism | 24V | Class Ⅲ | |
| | 200V | Class Ⅰ | |
| Degree of protection | | IP20 | |
| Dielectric strength voltage | | 500VDC, 10MΩ | |
| Cooling method | | Natural cooling, (optional) forced cooling by fan unit | |
| Connection between each units | | Unit-linkage method | |
| Mounting method | | Installed by DIN rail (35mm) | |

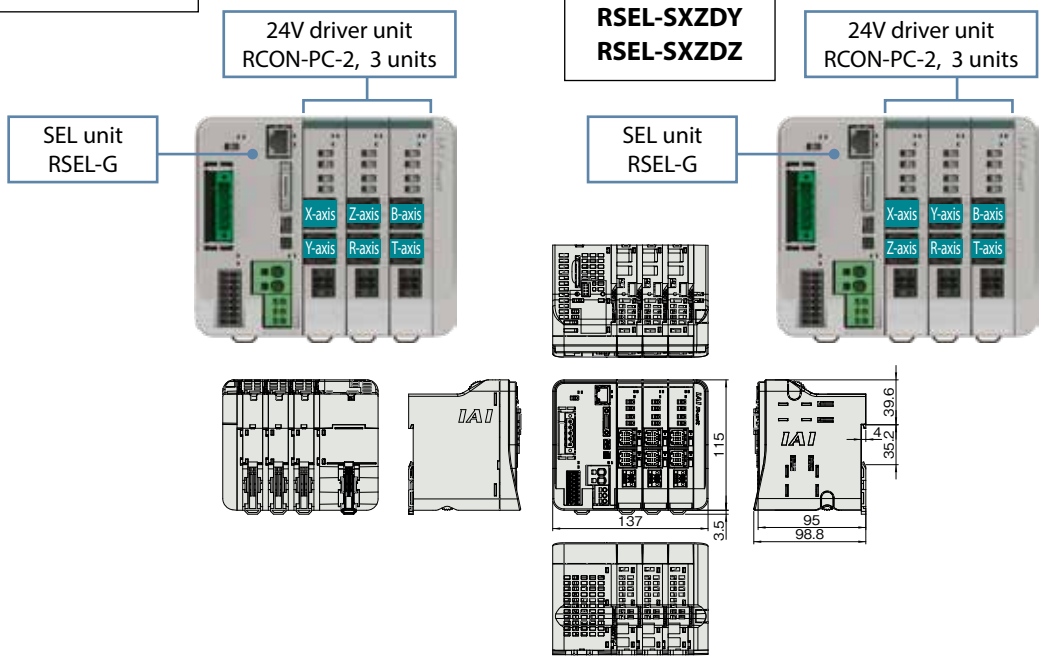
| Regulations and Standards | Unit name | SEL unit | 24V driver unit | 200V driver unit | 200V power unit | Simple absolute unit | SCON extension unit | PIO/SIO/SCON extension unit | PIO unit |
|---|---|---|---|---|---|---|---|---|---|
| | CE marking | ○ | ○ | —(To be acquired) | —(To be acquired) | ○ | ○ | ○ | ○ |
| | UL | ○ | ○ | —(To be acquired) | —(To be acquired) | ○ | ○ | ○ | ○ |

*1 Only one port is available for communication of XSEL serial communication protocol (format B).
Priority for communication is the teaching port (highest priority), USB and Ethernet (lowest priority).
Lower priority does not respond.

## Unit Configuration and External Dimensions

**RSEL-SXBA**
**RSEL-SXGA**

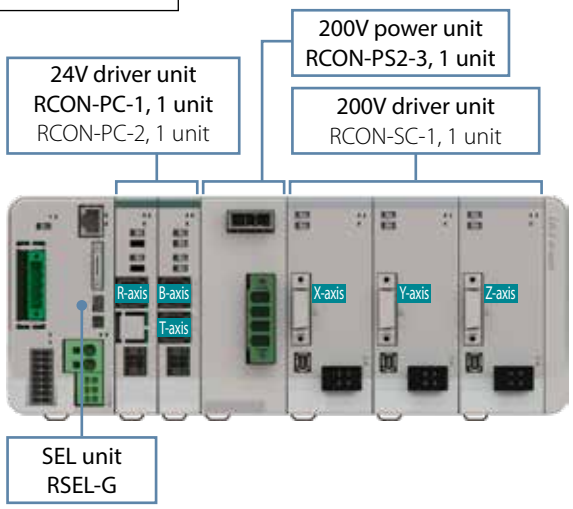
CAD drawings can be downloaded from our website.
www.intelligentactuator.com
2D CAD 3D CAD



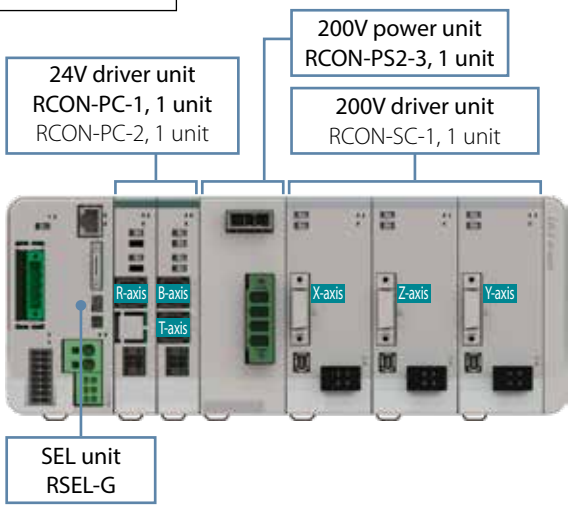

**RSEL-SXZCY**
**RSEL-SXZCZ**
**RSEL-SXZDY**
**RSEL-SXZDZ**

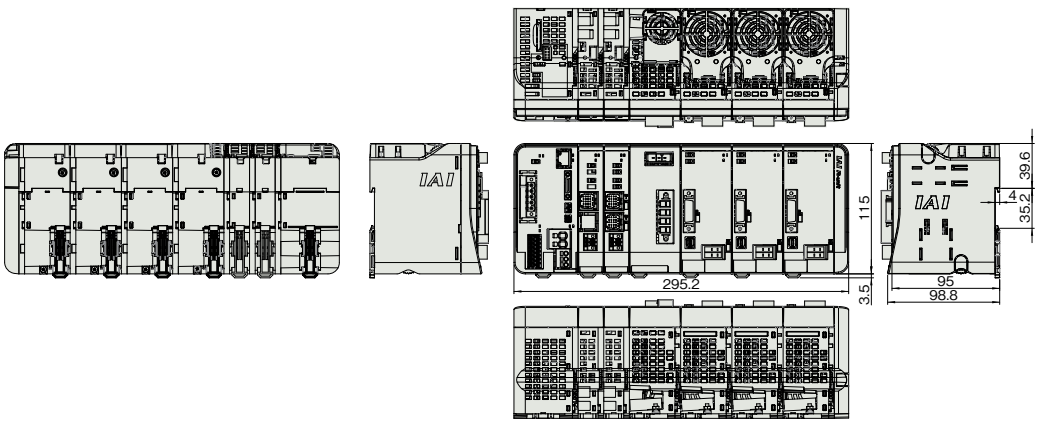



**RSEL-SXBB**
**RSEL-SXGB**



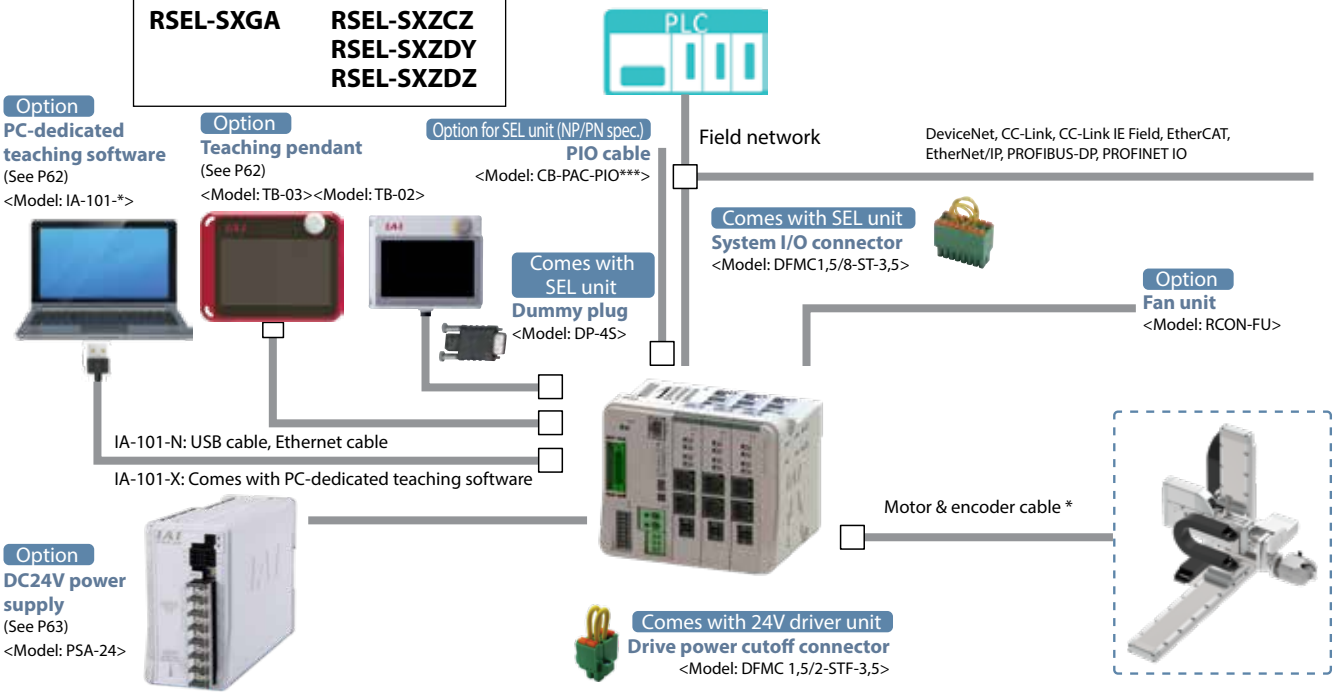

**RSEL-SXZEY**
**RSEL-SXZEZ**



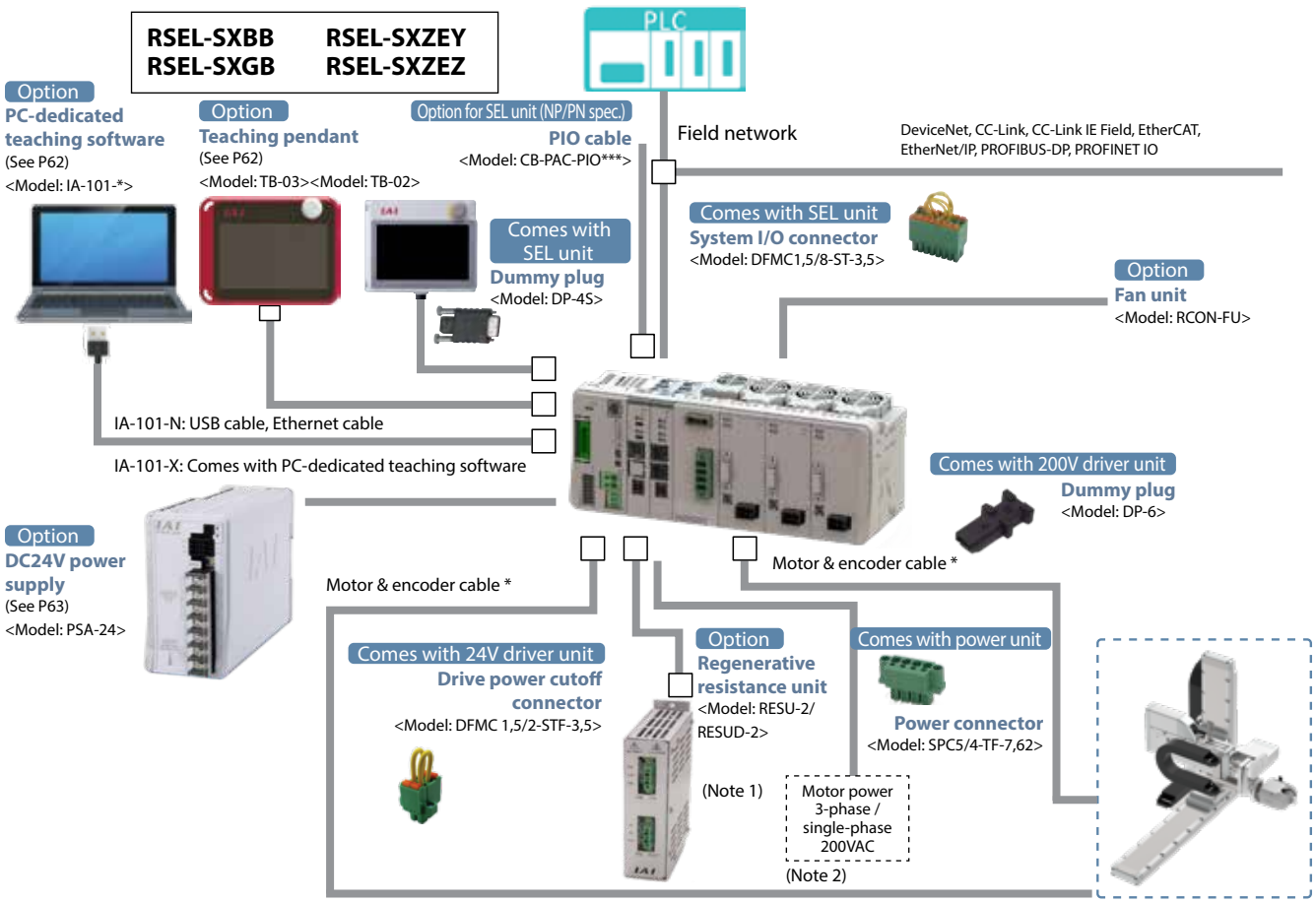



## System configuration

**RSEL-SXBA** **RSEL-SXZCY**
**RSEL-SXGA** **RSEL-SXZCZ**
**RSEL-SXZDY**
**RSEL-SXZDZ**




**RSEL-SXBB** **RSEL-SXZEY**
**RSEL-SXGB** **RSEL-SXZEZ**




Note 1: The RCON-SC and RCON-PS2 are equipped with a 60W regenerative resistance unit respectively.
Basically, a regenerative resistance unit is not needed, but if it is not enough, use external resistance unit(s).

Note 2: RCON-PS2 is quipped with an internal nose filter. Install another nose filer in order to comply with CE marking or equivalent.
The recommendable noise filter:
for 3-phase: TAC-20-683 (manufacturer COSEL)
for single-phase: NBH-20-432 (manufacturer COSEL)

* Motor & encoder cable comes with the actuator.
The cable varies depending on the actuator type to be used.
When ordering a replacement cable, see P65.

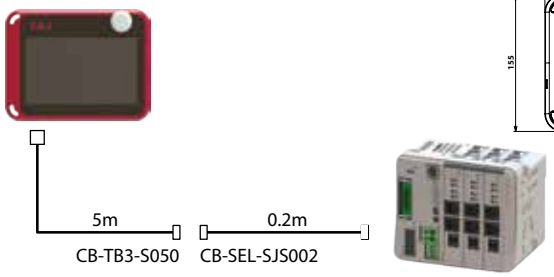
# Option

## Touch panel teaching pendant

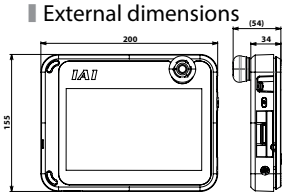
Feature A teaching device for position inputs, trial runs and monitoring, etc.

Model **TB-03-□** See IAI website for supported versions.

Configuration




External dimensions

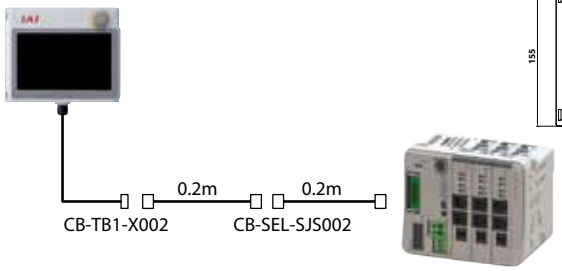



Specifications

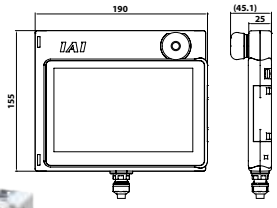
| | |
|---|---|
| Rated voltage | 24VDC |
| Power consumption | 3.6W or less (150mA or less) |
| Ambient operation temp. | 0-40℃ |
| Ambient operation humidity | 20-85%RH (non-condensing) |
| Degree of protection | IPX0 |
| Mass | 670g (TB-03 unit only) |
| Recharging method | Dedicated AC adaptor/ Wired connection with controller |

Model **TB-02(D)-□** See IAI website for supported versions.

Configuration




External dimensions




Specifications

| | |
|---|---|
| Rated voltage | 24VDC |
| Power consumption | 3.6W or less (150mA or less) |
| Ambient operation temp. | 0-40℃ |
| Ambient operation humidity | 20-85%RH (non-condensing) |
| Degree of protection | IP20 |
| Mass | 470g (TB-02 unit only) |

## PC-dedicated teaching software (Windows only)

for RSEL

Model **XSEL PC Software**

Features PC teaching software (DVD) only.
If you want to connect both the controller and PC side with a USB cable or Ethernet cable, only the software needs to be purchased. A cable that meet the following specifications is to be prepared by the customer.

Warning
Make sure to connect a stop switch on the system I/O connector when operating an actuator with USB connection.
If an emergency switch is not used, use "IA-101-X-USBMW" that has an emergency stop switch.

Supported Windows: 8.1/10

or PC Software downloaded link

Configuration See IAI website for supported versions.

| | Controller side connector | Max. cable length |
|---|---|---|
| USB cable specification | USB Mini-B | 5m |
| Ethernet cable specification* | 10/100/1000BASE-T (RJ-45) | 100m |

**PC teaching software (DVD)**

**USB cable (to be supplied by customer)**

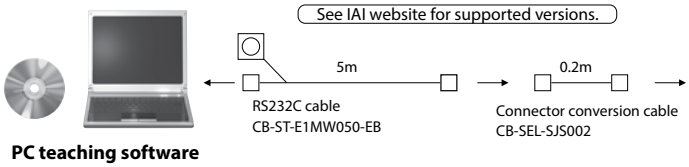
***Ethernet cable (to be supplied by customer)**

* In order to use EtherNet cable, parameters need to be set by other cables of IA-101-X-MW-JS or USB mini-B.

Supported Windows: 8.1/10

Model **IA-101-X-MW-JS** (with RS232C cable + connector conversion cable)

Configuration




**PC teaching software (DVD)**

The CB-ST-E1MW050-EB cannot be used when "building an enable system that uses system I/O connector with external power supply" or when "building a duplex safety circuit."

# 24V power supply

**Description** Recommended power supply for the RSEL controller.
It can easily be installed thanks to the same height as that of the RSEL controller.
It can also be connected to the RSEL controller to monitor the condition of power supply.

**Model** **PSA-24 (without fan)**

**Model** **PSA-24L (with fan)**

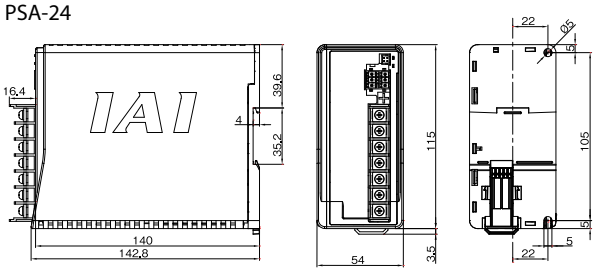
**Specifications**

| Item | Specification | |
|---|---|---|
| | 100VAC | 200VAC |
| Input power voltage | 100VAC-230VAC ±10% | |
| Input current | 3.9A or less | 1.9A or less |
| Power capacity | without fan: 250VA<br>with fan: 390VA | without fan: 280VA<br>with fan: 380VA |
| Inrush current *1 | without fan: 17A (typ)<br>with fan: 27.4A (typ) | without fan: 34A (typ)<br>with fan: 54.8A (typ) |
| Heat quantity | 28.6W | 20.4W |
| Output voltage *2 | 24V±10% | |
| Continuous rated output | without fan: 8.5A (204W) with fan: 13.8A (330W) | |
| Peak output | 17A (408W) | |
| Efficiency | 86% or more | 90% or more |
| Parallel connection *3 | Up to 5 units | |

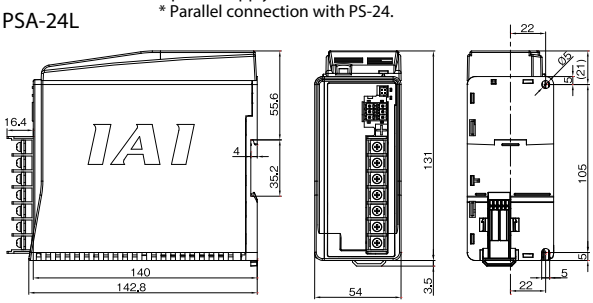
*1 The pulse width of the inrush current is 5ms or less.
*2 For parallel operation, this power supply unit changes output voltage according to load. Therefore, this power supply unit is for an exclusive use for IAI controllers.
*3 Parallel connection is impossible on the following conditions:
* Parallel connection of PSA-24 (without fan) and PSA-24L (with fan).
* Parallel connection with power unit other than this power supply unit.
* Parallel connection with PS-24.

**External dimensions**

PSA-24




PSA-24L



# Maintenance parts

## Fan unit

Description Option for forced cooling of the driver unit.

Model **RCON-FU**

for 200V driver

Model **RCON-FUH**

## Dummy plug

for RSEL

Model **DP-4S**

for 200 driver

Model **DP-6**

## Connector conversion cable

Feature It converts touch panel teaching pendant and RS232C cable Dsub25 pin connector to RSEL teaching connector. (The cable comes with TB-02/TB-03-SJ, IA-101-X-MW-JS).

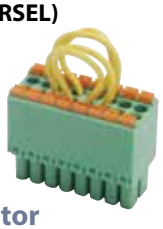
Model **CB-SEL-SJS002**

## System I/O connector

Description Connector for emergency stop signal input and external signal to switch operation mode.

For RSEL

Model **DFMC1,5/8-ST-3,5(RSEL)**



## Drive power cutoff connector

Description A connector for drive power cutoff.

For 24V driver

Model **DFMC1,5/2-STF-3,5**

## 200V power supply connector

for 200V power supply

Model **SPC5/4-STF-7,62**

## Regenerative resistance unit

Description This unit converts the regenerative current that generates when motor slows down into heat. The 200V driver unit and 200V power unit are equipped with internal regenerative resistor. However, when energy by speed reduction generates at the same timing, external regenerative resistance unit(s) is/are needed.

Model **RESU-s** (standard) **/ RESUD-2** (DIN rail mount spec.)

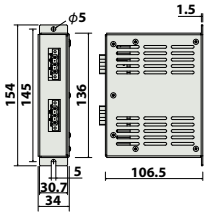
* When two regenerative resistance units are needed, use one each of RESU-2 and RESU-1. (See the general catalog).

Specifications

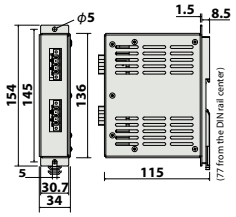
| Model | RESU-2 | RESUD-2 |
|---|---|---|
| Mass | approx. 0.4 kg | |
| Internal regenerative resistor | 235Ω 80W | |
| Mounting method | Screw mount | DIN rail mount |
| Accessory cable | CB-SC-REU010 | |

External dimensions

<RESU-2>




<RESUD-2>



## Maintenance parts (cable)

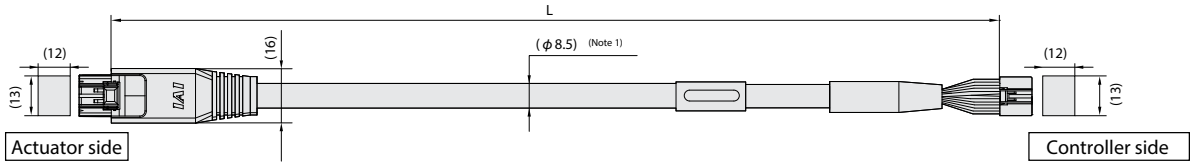
**When ordering a replacement cable, etc. after purchase of the robot, specify the model number from the tables below.**

| Actuator | | Connecting cable |
|---|---|---|
| Type | Configured axis | Motor & encoder cable (-RB: Robot cable) |
| CRS-XBA<br>CRS-XGA<br>CRS-XZCY<br>CRS-XZCZ<br>CRS-XZDY<br>CRS-XZDZ | All axes | CB-ADPC-MA□□□(-RB) |
| CRS-XBB<br>CRS-XGB<br>CRS-XZEY<br>CRS-XZEZ | R, B and T axes | |

| Actuator | | Connecting cable | | |
|---|---|---|---|---|
| Type | Configured axis | Motor cable | Motor robot cable | Encoder robot cable |
| CRS-XBB<br>CRS-XGB<br>CRS-XZEY<br>CRS-XZEZ | X, Y and Z axes | CB-RCC1-MA □□□ | CB-X2-MA □□□ | CB-X1-PA □□□ |

Model **CB-ADPC-MPA□□□/CB-ADPC-MPA□□□-RB**

* Specify cable length (L) in □□□.
Up to 15m is available for CRS. (Ex.) 030=3m




**Minimum bending R 5m or less r=68mm or more (dynamic bending condition)**
**5m or more R=73mm or more (dynamic bending condition)**

* Robot cables are of flex resistance specification. Use a robot cable when used inside the cable track.

(Note 1) When cable length is 5m or longer, it is ϕ9.1.

DF62DL-24S-2.2C (Hirose)

| Color | Signal name | | | Pin No. |
|---|---|---|---|---|
| | DC | AC | PC | |
| Blue(AWG22/19) | U | U | ΦA | 3 |
| Orange(AWG22/19) | V | V | VMM | 5 |
| Brown(AWG22/19) | - | - | ΦB | 10 |
| Gray(AWG22/19) | - | - | VMM | 9 |
| Green(AWG22/19) | W | W | Φ_A | 4 |
| Red(AWG22/19) | - | - | Φ_B | 15 |
| Blue(AWG26) | A+ | A+ | SA[mABS] | 12 |
| Orange(AWG26) | A- | A- | SB[mABS] | 17 |
| Green(AWG26) | B+ | B+ | A+ | 1 |
| Brown(AWG26) | B- | B- | A- | 6 |
| Gray(AWG26) | HS1_IN | Z+/SA[mABS] | B+ | 11 |
| Red(AWG26) | HS2_IN | Z-/SB[mABS] | B- | 16 |
| Black(AWG26) | - | VPS/BAT- | VPS | 18 |
| Yellow(AWG26) | - | BK+ | LS+ | 8 |
| Blue(AWG26) | - | LS+ | BK+ | 20 |
| Orange(AWG26) | - | LS- | BK- | 2 |
| Gray(AWG26) | VCC | VCC | VCC | 21 |
| Red(AWG26) | GND | GND | GND | 7 |
| Brown(AWG26) | - | BK- | LS- | 14 |
| Green(AWG26) | HS3_IN | LS_GND | LS_GND | 13 |
| - | - | - | - | 19 |
| Pink(AWG26) | - | BAT+ | CF_VCC | 22 |
| - | - | - | - | 23 |
| Black(AWG26) | FG | FG | FG | 24 |

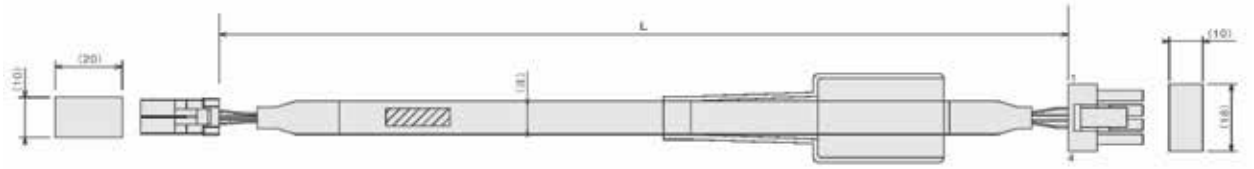
Purple(AWG26)

DF62DL-24S-2.2C (Hirose)

| Pin No. | Signal name | | | Color |
|---|---|---|---|---|
| | PC | AC | DC | |
| 3 | ΦA | U | U | Blue(AWG22/19) |
| 5 | VMM | V | V | Orange(AWG22/19) |
| 10 | ΦB | - | - | Brown(AWG22/19) |
| 9 | VMM | - | - | Gray(AWG22/19) |
| 4 | Φ_A | W | W | Green(AWG22/19) |
| 15 | Φ_B | - | - | Red(AWG22/19) |
| 12 | SA[mABS] | A+ | A+ | Blue(AWG26) |
| 17 | SB[mABS] | A- | A- | Orange(AWG26) |
| 1 | A+ | B+ | B+ | Green(AWG26) |
| 6 | A- | B- | B- | Brown(AWG26) |
| 11 | B+ | Z+/SA[mABS] | HS1_IN | Gray(AWG26) |
| 16 | B- | Z-/SB[mABS] | HS2_IN | Red(AWG26) |
| 18 | VPS | VPS/BAT- | - | Black(AWG26) |
| 8 | LS+ | BK+ | - | Yellow(AWG26) |
| 20 | BK+ | LS+ | - | Blue(AWG26) |
| 2 | BK- | LS- | - | Orange(AWG26) |
| 21 | VCC | VCC | VCC | Gray(AWG26) |
| 7 | GND | GND | GND | Red(AWG26) |
| 14 | LS- | BK- | - | Brown(AWG26) |
| 13 | LS_GND | LS_GND | HS3_IN | Green(AWG26) |
| 19 | - | - | - | - |
| 22 | CF_VCC | BAT+ | - | Pink(AWG26) |
| 23 | - | - | - | - |
| 24 | FG | FG | FG | Black(AWG26) |

## Model CB-RCC1-MA□□□/CB-X2-MA□□□

* Indicate the cable length (L) in □□□, maximum 15m for CRS. (Ex.) 080=8m




Controller side

Actuator side

**Minimum bending R r=51mm or more (dynamic bending condition)**

* Only robot cables can be used in the cable track.
Non-robot cables are Φ7.6 and robot cables are Φ8.5.

F35FDC-04V-K (JST)

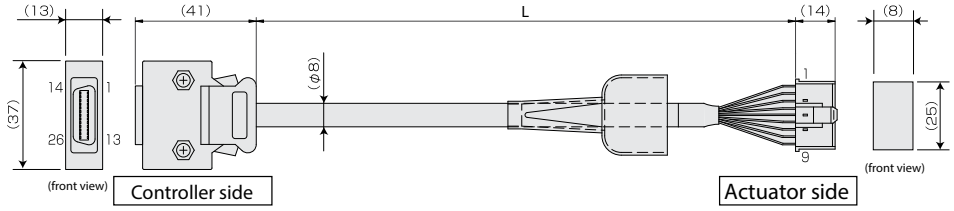
| Wiring | Color | Signal | No. |
|---|---|---|---|
| O.75sq (crimped) | Red | U | B1 |
| | White | V | B2 |
| | Black | W | A1 |
| | Green | PE | A2 |

SLP-04V (JST)

| No. | Signal | Color | Wiring |
|---|---|---|---|
| 1 | U | Red | O.75sq (crimped) |
| 2 | V | White | |
| 3 | W | Black | |
| 4 | PE | Green | |

## Model CB-X1-PA□□□

* Indicate the cable length (L) in □□□, maximum 15m for CRS. (Ex.) 080=8m




**Minimum bending R r=44mm or more (dynamic bending condition)**

* The robot cable is used as standard.

| Wiring | Color | Signal | No. |
|---|---|---|---|
| AWG26 (soldered) | – | – | 10 |
| | – | – | 11 |
| | – | E24V | 12 |
| | – | 0V | 13 |
| | – | LS | 26 |
| | – | CREEP | 25 |
| | – | OT | 24 |
| | – | RSV | 23 |
| | – | – | 9 |
| | – | – | 18 |
| | – | – | 19 |
| | – | A+ | 1 |
| | – | A– | 2 |
| | – | B+ | 3 |
| | – | B– | 4 |
| | – | Z+ | 5 |
| | – | Z– | 6 |
| | Orange | SRD+ | 7 |
| | Green | SRD– | 8 |
| | Purple | BAT+ | 14 |
| | Gray | BAT– | 15 |
| | Red | VCC | 16 |
| | Black | GND | 17 |
| | Blue | BKR– | 20 |
| | Yellow | BKR+ | 21 |
| | – | – | 22 |
| Shield is clamp-connected to the hood. | | | |

Drain wire and shield braided

| No. | Signal | Color | Wiring |
|---|---|---|---|
| 1 | BAT+ | Purple | AWG26 (crimped) |
| 2 | BAT– | Gray | |
| 3 | SD | Orange | |
| 4 | SD | Green | |
| 5 | VCC | Red | |
| 6 | GND | Black | |
| 7 | FG | Drain | |
| 8 | BK– | Blue | |
| 9 | BK+ | Yellow | |

Catalog No. CE0274-1A (2020AUG)

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