



# 6-axis Cartesian Robot

## First Step Guide First Edition

### CRS-XBA/XBB/XGA/XGB

### CRS-XZCZ/XZCY/XZDZ/XZDY

### CRS-XZEZ/XZEY

Thank you for purchasing our product.  
 Make sure to read the Safety Guide and detailed Instruction Manual as well as this First Step Guide to ensure correct use.  
 This Instruction Manual is original.

**Warning:** Read the instruction manual carefully and follow the instruction manual when handling this equipment.  
 Please download the user's manual from our website.  
 You can download it free of charge. User registration is required for first time users.  
 URL: www.iai-robot.co.jp/data\_dl/CAD\_MANUAL/  
 Keep a printout of the introduction manual near the equipment in which this product is installed so that it can be checked at all times, or display it on your computer, tablet terminal, etc. so that you can check it immediately.  
 If you need a bound copy of the instruction manual, order it from the nearest sales office listed in the First Step Guide or at the end of the instruction manual. It will be provided for a fee.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

## Product Check

This product is comprised of the following parts if it is of standard configuration.  
 If you find any fault in the contained model or any missing parts, contact us or our distributor.

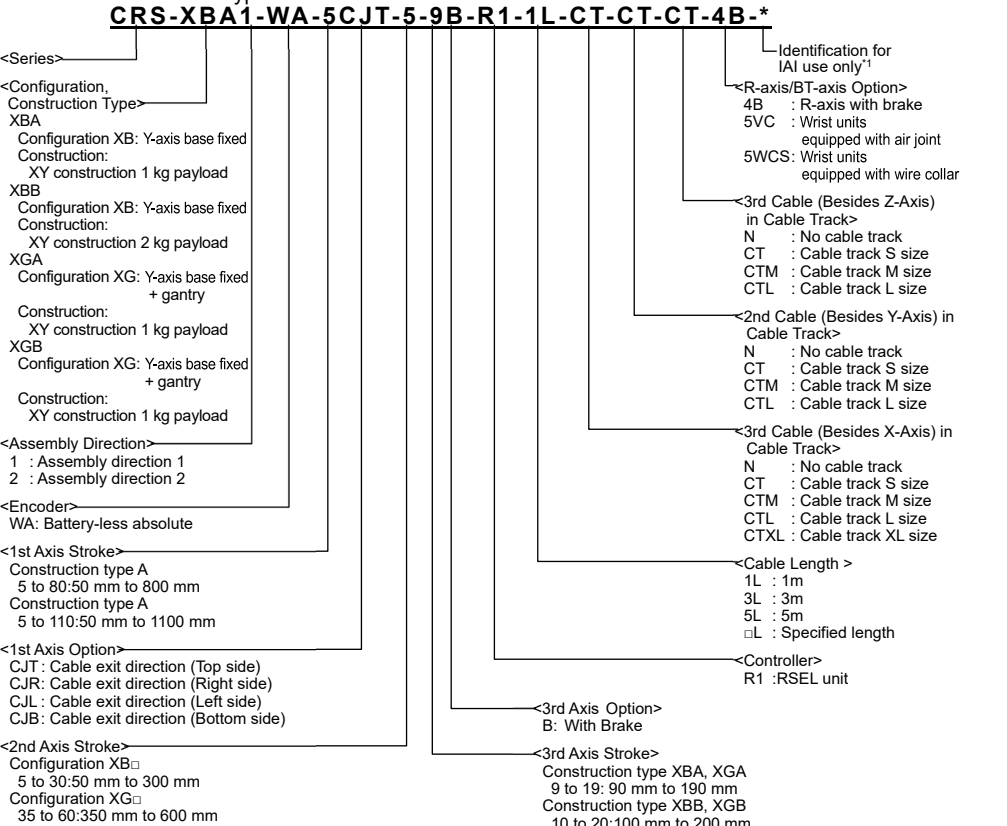
### 1. Parts (The option is excluded.)

No.	Part Name	Model	Quantity	Remarks
1	Main Body	Refer to "How to read the model plate", "How to read the model No."		
<b>Accessories</b>				
2	Motor • Encoder Integrated Cable*1 or Combination of Motor Cable and Encoder Cable*1		1 set	
3	Safety Guide	M0194	1	

\*1 Please refer to [Wiring] for the applicable cables.

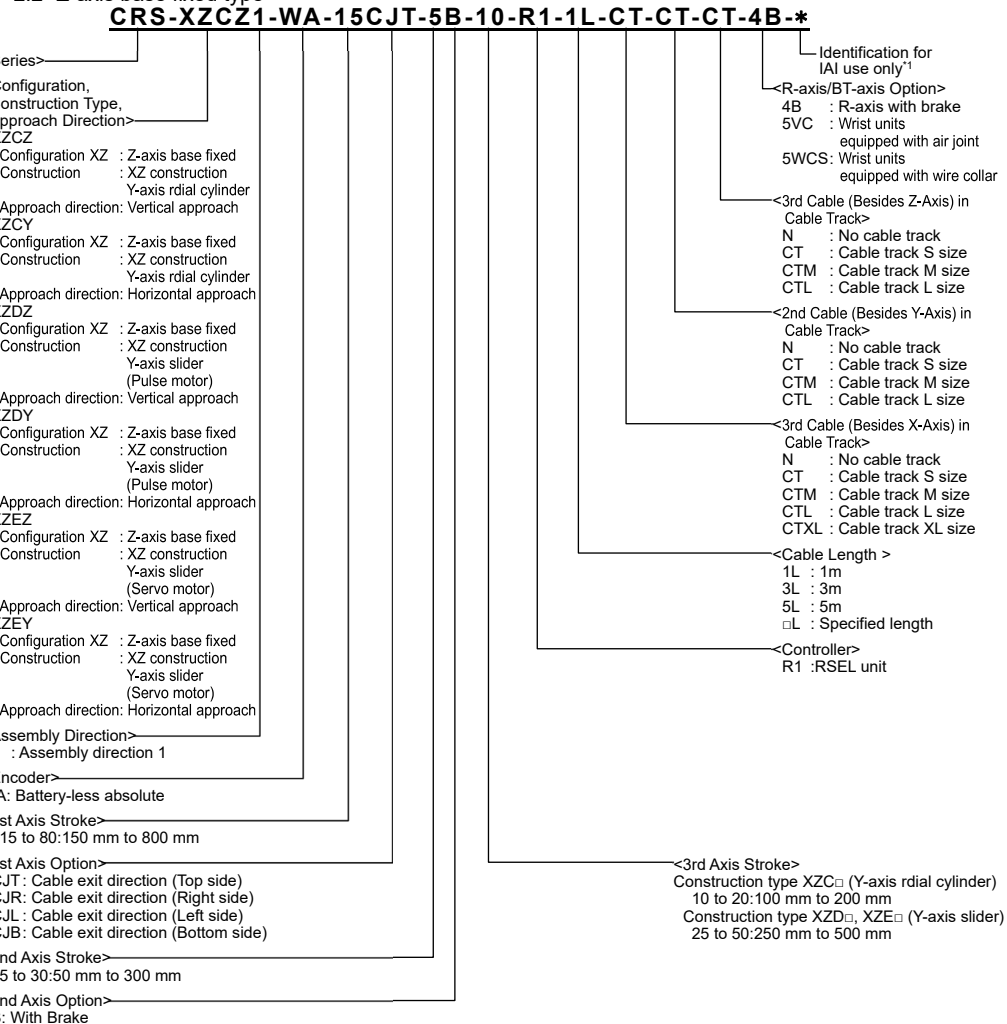
### 2. How to read the model No.

#### 2.1 Y-axis base fixed type



\*1 Identification for IAI use only : It may be displayed for IAI use. It is not a code to show the model type.

#### 2.2 Z-axis base fixed type



\*1 Identification for IAI use only : It may be displayed for IAI use. It is not a code to show the model type.

## Precautions in Handling

### 1. Handling of Robot

#### 1.1 Handling of the Packed Product

- Delivery should be made with the package nailed on a base made of rectangular lumbers. The sliders are affixed so they would not move unexpectedly during transportation. The actuators are also affixed to avoid swinging on the tips due to external vibration.
- Do not damage or drop. The package is not supplied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Transport a heavy package with at least more than two operators. Consider an appropriate method for transportation. When hanging up the package, have it supported at the reinforced frame on the bottom of the rectangular-lumbered base. When lifting the package up with a forklift also, do so at the bottom of the rectangular-lumbered base.
- Pay attention not to give the package impact or have it bounced when putting it down.
- Do not get on the package.
- Do not put any load that may cause a deformation or breakage of the package.

#### 1.2 Handling of Robot without Package

- Secure the sliders to prevent sudden movement during transport.
- If any end of the actuator is overhanging, secure it properly to avoid significant movement due to external vibration.
- If the actuator assembly is transported without the ends being secured, do not apply impact of 0.3G or more.
- In the case that the actuator needs to be carried up with ropes or another method, be sure to use an appropriate cushioning to avoid the robot being deformed or put on an excessive pressure. Utilize e.g. the tapped holes on the bottom of the base to attach a tool or equivalent to suspend the package if necessary.
- Be careful not to apply a load on any of the actuator brackets or covers or on the connector box. Also, avoid the cables being pinched or caused an excessive deformation.

## Environments for Installation, Storage and Preservation

Usage is possible in environments of pollution degree 2 or equivalent.

Pollution degree 2: Environment in which generally only nonconductive pollution occurs, but temporary conductive pollution may occur due to condensation (IEC60664-1)

### 1. Installation Environment

Avoid the following locations for installation.

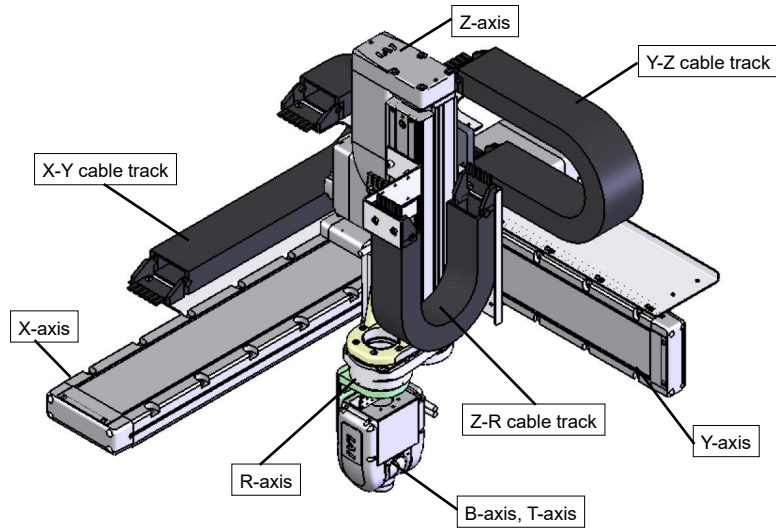
- Where the unit receives radiant heat from strong heat sources such as heat treatment furnaces
  - Where the ambient temperature exceeds the range of 0 to 40°C
  - Where the temperature changes rapidly and condensation occurs
  - Where the relative humidity exceeds 85% RH
  - Where the unit receives direct sunlight
  - Where the unit is exposed to corrosive or combustible gases
  - Where the ambient air contains a large amount of dust, salt or iron (at levels exceeding those typical of an assembly plant)
  - Where the unit is subject to splashed water or oil (including oil mist or cutting fluid) or chemical solutions
  - Where the body receives impact or vibration
  - Where the altitude is more than 2,000 m for actuators
- Provide sufficient work space for the following maintenance and inspection:
- Space to replenish grease
  - Space to replace the motor
- If the unit is used in any of the following locations, provide sufficient shielding measures:
- Where noise is generated due to static electricity, etc
  - Where the unit is subject to a strong electric or magnetic field
  - Where the unit is subject to ultraviolet or radiation

### 2. Storage and Preservation Environment

- The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no dew condensation forms.
- Unless specially specified, moisture absorber protection is not included in the package when the machine is delivered. In the case that the machine is to be stored and preserved in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.
- For storage and preservation temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage and preservation period of 1 month or more, control the temperature to 50°C or less.
- The product should be settled in the horizontal orientation while in storage and reservation. In the case it is stored in the packaged condition, follow the posture instruction if any displayed on the package.

# Names of the Parts

## 1. XBA/XBB (Y-axis Base Fixed) Type

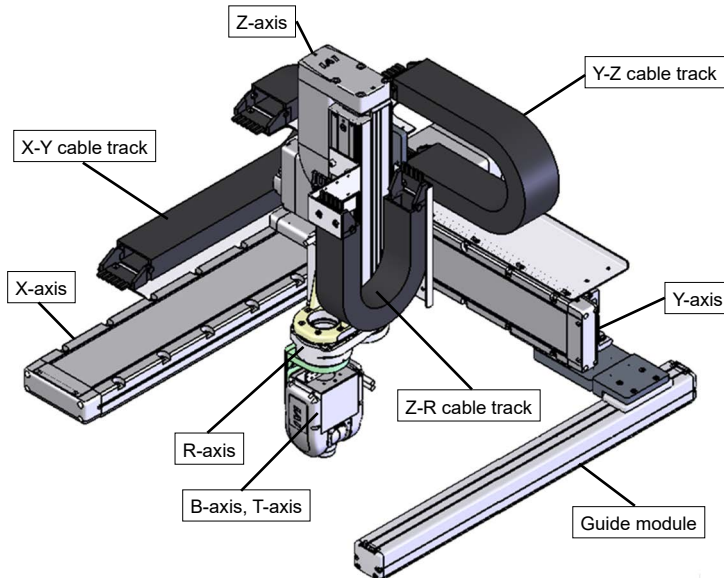


Axis name	Actuator model code	
	XBA□ 1 kg payload type	XBB□ 2 kg payload type
X	RCP6-WSA14C-16	RCS4-WSA16C-20
Y	RCP6-WSA12C-12	RCS4-WSA14C-16
Z	RCP6-TA7R-4-DB <sup>*1</sup>	RCS4-SA8R-10-W <sup>*2</sup>
R	RCP6-RTFML	
B	WU-S	
T	WU-M	

\*1 Double block specification  
\*2 Double slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## 2. XGA/XGB (Y-axis Base Fixed Gantry) Type

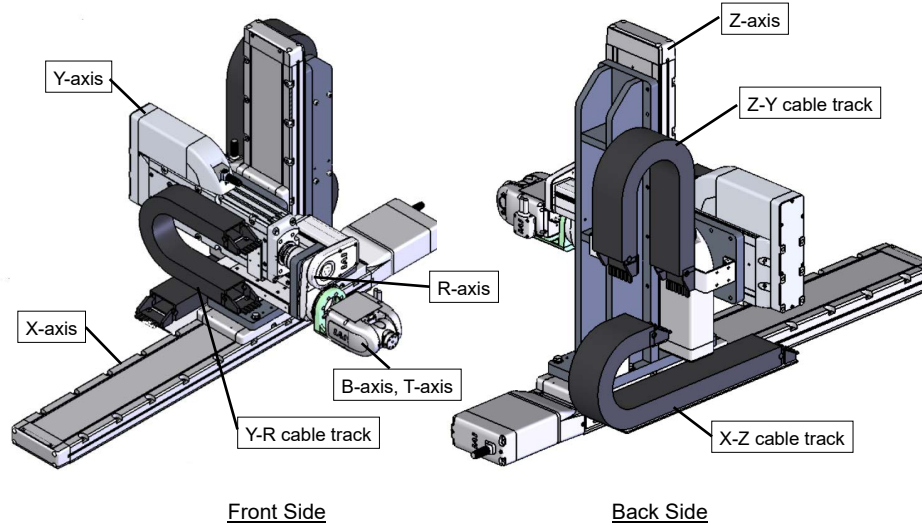


Axis name	Actuator model code	
	XGA□ 1 kg payload type	XGB□ 2 kg payload type
X	RCP6-WSA14LC-16 <sup>*1</sup>	RCS4-WSA16C-20
Guide module	RCG-SA6CO1	RCG-SA6CO2
Y	RCP6-WSA12C-12	RCS4-WSA14C-16
Z	RCP6-TA7R-4-DB <sup>*2</sup>	RCS4-SA8R-10-W <sup>*3</sup>
R	RCP6-RTFML	
B	WU-S	
T	WU-M	

\*1 Long slider specification  
\*2 Double block specification  
\*3 Double slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## 3. XZCY (Z-axis Base Fixed Y-axis RCP6-WRA14) Horizontal Approach Type

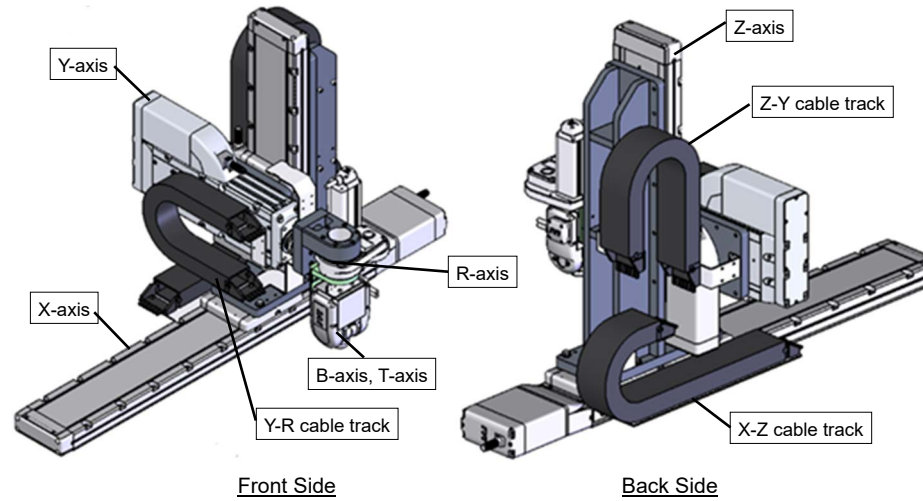


Axes components list	
Axis name	Actuator model code
X	RCP6-WSA14C-16-W <sup>*1</sup>
Z	RCP6-WSA14R-4
Y	RCP6-WRA14R-16
R	RCP6-RTFML
B	WU-S
T	

\*1 Double slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## 4. XZCZ (Z-axis Base Fixed Y-axis RCP6-WRA14) Vertical Approach Type

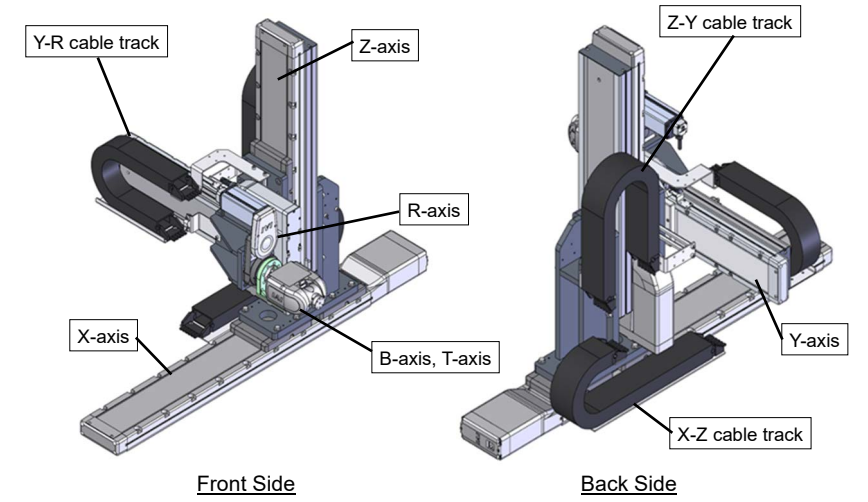


Axes components list	
Axis name	Actuator model code
X	RCP6-WSA14C-16-W <sup>*1</sup>
Z	RCP6-WSA14R-4
Y	RCP6-WRA14R-16
R	RCP6-RTFML
B	WU-S
T	

\*1 Double slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## 5. XZDY/XZEY (Z-axis Base Fixed Y-axis RCP6-WSA12/RCS4-WSA12) Horizontal Approach Type



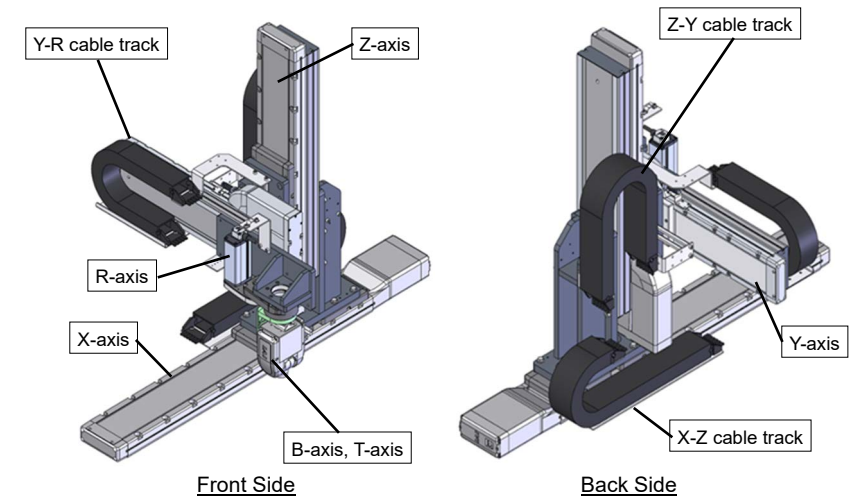
Axis name	Actuator model code	
	XZDY	XZEY
X	RCP6-WSA14C-8-W <sup>*1</sup>	RCS4-WSA14C-8-W <sup>*1</sup>
Z	RCP6-WSA14R-4-W <sup>*1</sup>	RCS4-WSA14R-4-W <sup>*1</sup>
Y	RCP6-WSA12LR-12 <sup>*2</sup>	RCS4-WSA12LR-12 <sup>*2</sup>
R	RCP6-RTFML	
B	WU-S	
T	WU-S	

\*1 Double slider specification

\*2 Long slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## 6. XZDZ/XZEZ (Z-axis Base Fixed Y-axis RCP6-WSA12/RCS4-WSA12) Vertical Approach Type



Axis name	Actuator model code	
	XZDZ	XZEZ
X	RCP6-WSA14C-8-W <sup>*1</sup>	RCS4-WSA14C-8-W <sup>*1</sup>
Z	RCP6-WSA14R-4-W <sup>*1</sup>	RCS4-WSA14R-4-W <sup>*1</sup>
Y	RCP6-WSA12LR-12 <sup>*2</sup>	RCS4-WSA12LR-12 <sup>*2</sup>
R	RCP6-RTFML	
B	WU-S	
T	WU-S	

\*1 Double slider specification

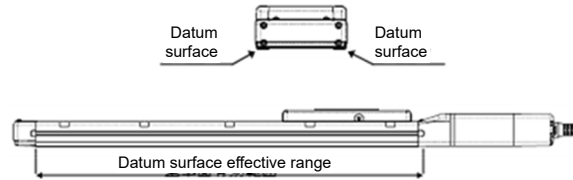
\*2 Long slider specification

[Refer to Catalog or Instruction Manual (ME3792) for the dimensions and profile.]

## Attachment

Refer to the Instruction Manual (ME3792) for the attachments of the actuator and loads.

### [Precautions for Attachments]

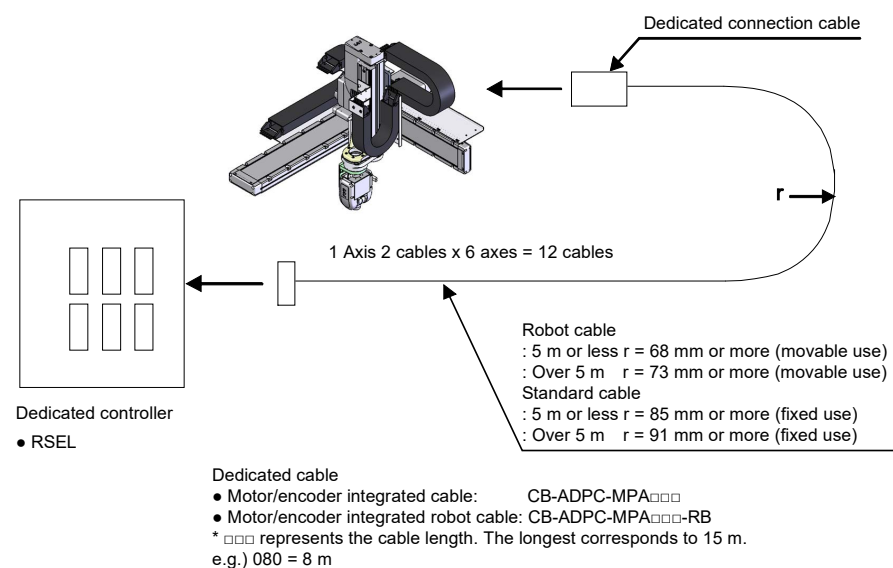
No.	Item	Precautions
1	Attachment Surface	<ul style="list-style-type: none"> <li>The base has to have a structure with sufficient rigidity to prevent oscillation.</li> <li>The side and bottom on the base of the first axis in the wide slider type are the datum for the driving accuracy of the first axis slider.</li> </ul>  <ul style="list-style-type: none"> <li>The actuator mounting surface and other surfaces that are used as a datum should be flat enough with an accuracy of machining or equivalent treatment, and the flatness of the mounting surface needs to be 0.05mm/m or less.</li> <li>Secure the space necessary for maintenance work such as replacement of actuator and inspection.</li> </ul>
2	Bolts to be used	<ul style="list-style-type: none"> <li>For the bolts to be used, a high-tensile bolt complying with ISO-10.9 or more is recommended.</li> <li>If using the tapped holes, use screws with the thread length dimension being less than the effective depth of the holes.</li> <li>For the actuator mounting, use a bolt with the dimension of its effective mating length to the tapped hole size as stated below. If tapped hole in steel → thread length same as nominal diameter If tapped hole in aluminum → thread length 1.8 times longer than nominal diameter However, there are specific effective mating lengths indicated for some models. Refer to the instruction manual.</li> </ul>
3	Tightening Torque	<ul style="list-style-type: none"> <li>Please follow the specification values stated in the Instruction Manual for the tightening torque. Failure to do so may cause an operation problem.</li> </ul>
4	Allowable Moment	<ul style="list-style-type: none"> <li>Follow the specified values described in the instruction manual for the allowable moment on the wrist unit WU. Failure to do so may cause not only vibration or abnormal noise, but also remarkable shortening of the product life.</li> </ul>
5	Stainless steel sheet	<ul style="list-style-type: none"> <li>Do not attempt to hold the stainless steel sheet directly with hand on slider type and wide slider type. Please, also, be careful not to make a dent on the stainless steel sheet. Stainless steel sheet is easy to get dented because it is thin. Using it with a dent on may cause a breakage.</li> <li>If there is dust or metal contamination attached on the stainless steel sheet, please wipe it off the sheet surface. Operation with the stainless steel sheet that has foreign matters on its surface may cause problems such as sheet damage, waviness, etc. inside the slider.</li> <li>Please do not operate the unit in the ambient with dust or metal contamination.</li> </ul>

## Wiring

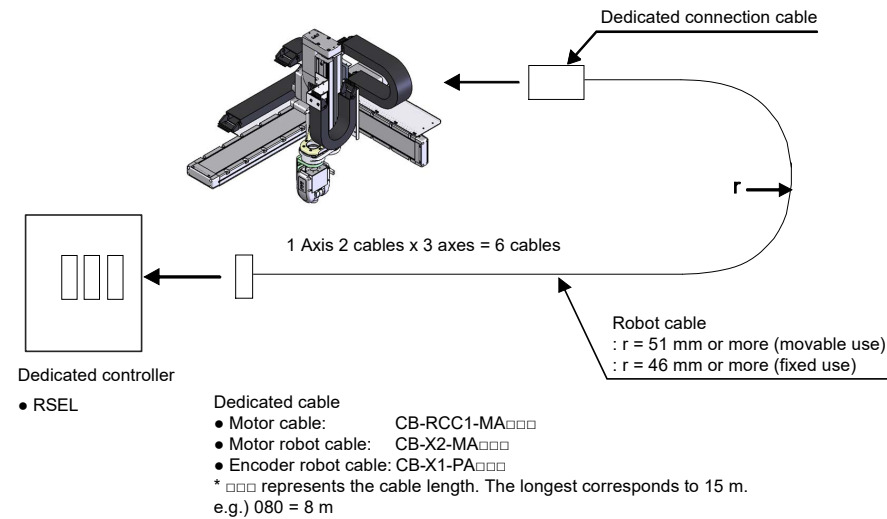
For the controller, only the dedicated controller manufactured by our company can be used. For the connection between the standard RCS4 actuator and controller, use the enclosed dedicated connection cable.

[XBA, XGA, XZCY, XZCZ, XZDY, XZDZ]

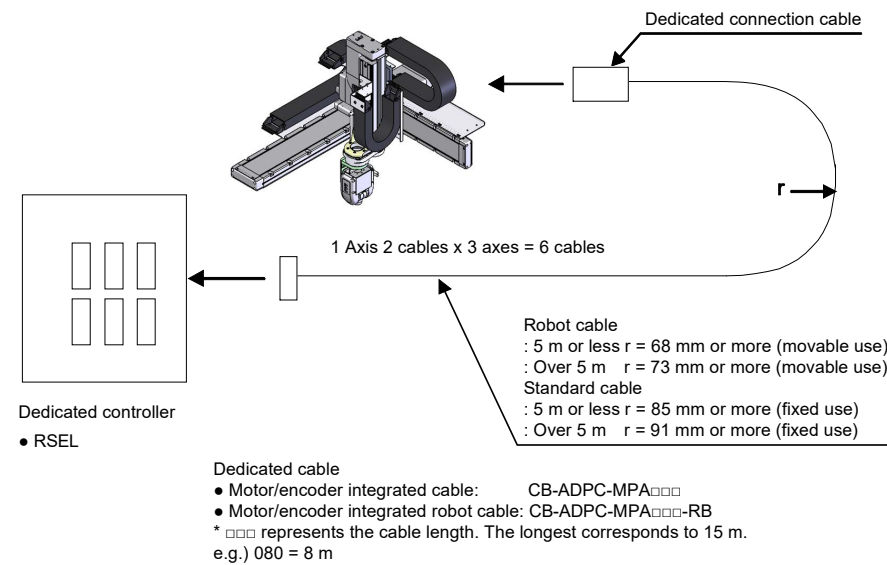
Actuator connectivity to pulse motor



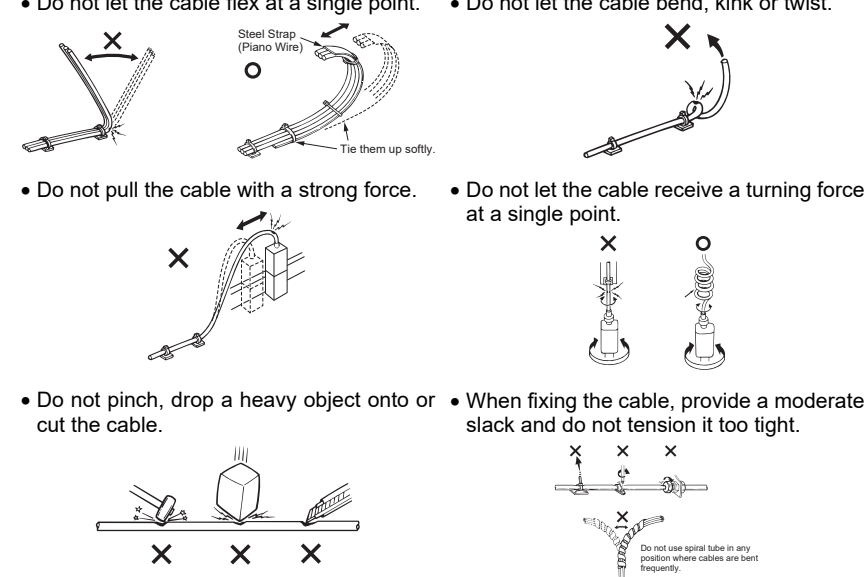
[XBB, XGB, XZEY, XZEE: 1st to 3rd axes]  
Actuator connectivity to AC servo motor



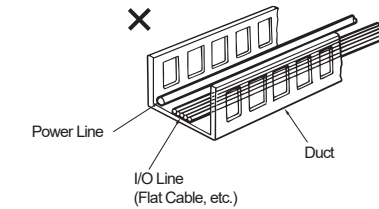
[XBB, XGB, XZEY, XZEE: 4th, 5th and 6th axes]  
Actuator connectivity to pulse motor



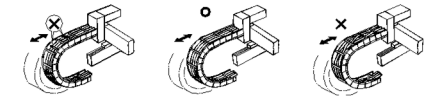
[Prohibited Items in the Cable Processing]

- Do not pull or bend forcibly the cable so as not to give any extra load or tension to the cable.
  - Do not process the cable to extend or shortening by means of cutting out, combination or connecting with another cable.
  - Do not let the cable flex at a single point.
  - Do not let the cable bend, kink or twist.
  - Do not pull the cable with a strong force.
  - Do not let the cable receive a turning force at a single point.
  - Do not pinch, drop a heavy object onto or
  - When fixing the cable, provide a moderate slack and do not tension it too tight.
- 
- Do not use spiral tape in any position where cables are bent frequently.

- Separate the I/O line, communication line and power line from each other. Do not store in the same duct.
- Follow the instructions below when using a cable track.



- If there is an indication to the cable for the space factor in a cable track, refer to the wiring instruction given by the supplier when storing the cable in the cable track.
- Avoid the cables to get twined or twisted in the cable track, and also to have the cables move freely and do not tie them up. (Avoid tension being applied when the cables are bent.)
- Do not pile up cables. It may cause faster abrasion of the sheaths or cable breakage.



### Note:

- When the cable is connected or disconnected, make sure to turn off the power to the controller. When the cable is connected or disconnected with the controller power turned ON, it might cause a malfunction of the actuator and result in a serious injury or damage to the machinery.
- When the connector connection is not correct, it would be dangerous because of a malfunction of the actuator. Make sure to confirm that the connector is connected correctly.

**IAI**  
Quality and Innovation

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