



RCP6W/RCP6SW Actuator

Dust proof/Splush proof Type
Rod Type/Radial Cylinder
Wide Radial Cylinder

First Step Guide First Edition

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	Actuator Main Body	Refer to How to read the model No.	1	
Accessories				
2	Motor • Encoder Cable ^(Note 1)		1	
3	Nut		1 set	Packaged in rod type and Radial Cylinder. Refer to list below.
4	Square Nut		1 set	Packaged in rod type and Radial Cylinder. Refer to list below.
5	Safety Guide	M0194	1	

Note 1 Please refer to the wiring layout for the enclosed motor-encoder cables.

(List of Included Nut Type)

	Nut (M10×1.25)	Nut (M14×1.5)	Nut (M20×1.5)
RA4C, RA4R, RA6C, RA6R, RRA4C, RRA4R, RRA6C, RRA6R	1		
RA7C, RA7R, RRA7C, RRA7R		1	
RA8C, RA8R, RRA8C, RRA8R			1

[Refer to of the instruction manual 6. External Dimensions for the dimensions of nuts.]

The square nut will be enclosed for rod type.

However, it will not be enclosed when the T-slot nut bar (model code: NTB) has been selected as an option.

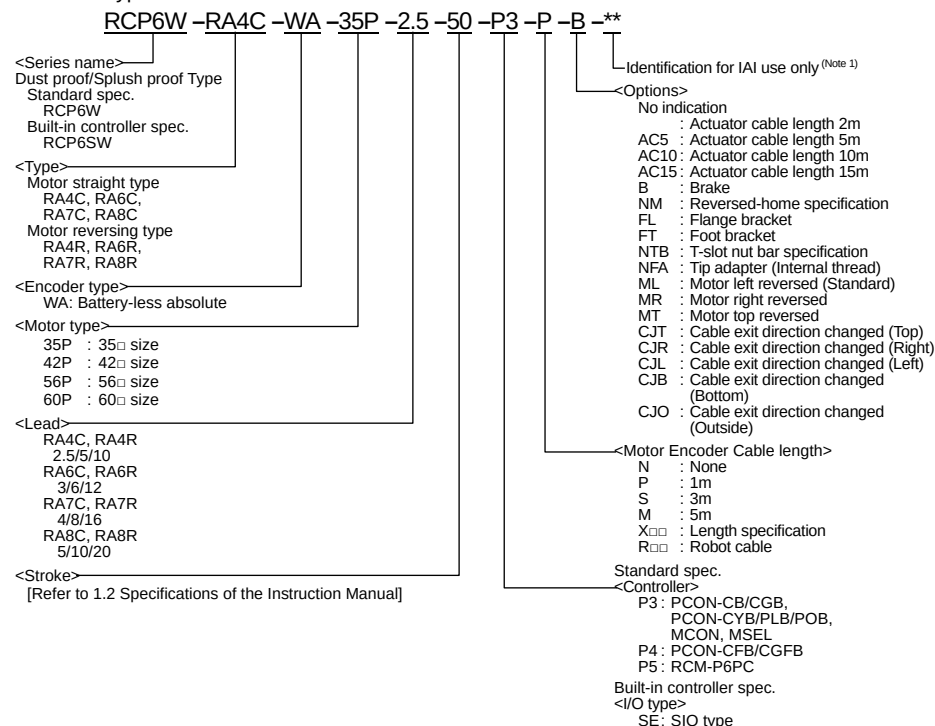
	Square Nut (7×7 M4)	Square Nut (8×8 M5)	Square Nut (10×10 M6)	Square Nut (13×13 M8)
RA4C, RA4R, RRA4C, RRA4R	4			
RA6C, RA6R			4	
RRA6C, RRA6R		4		
RA7C, RA7R			6	
RRA7C, RRA7R			8	
RA8C, RA8R				8

2. How to Read the Model Plate

Model ———→ MODEL RCP6W-RA4C-WA-35P-2.5-50-P3-P-B
Serial number ———→ SERIAL No.100090267 MADE IN JAPAN

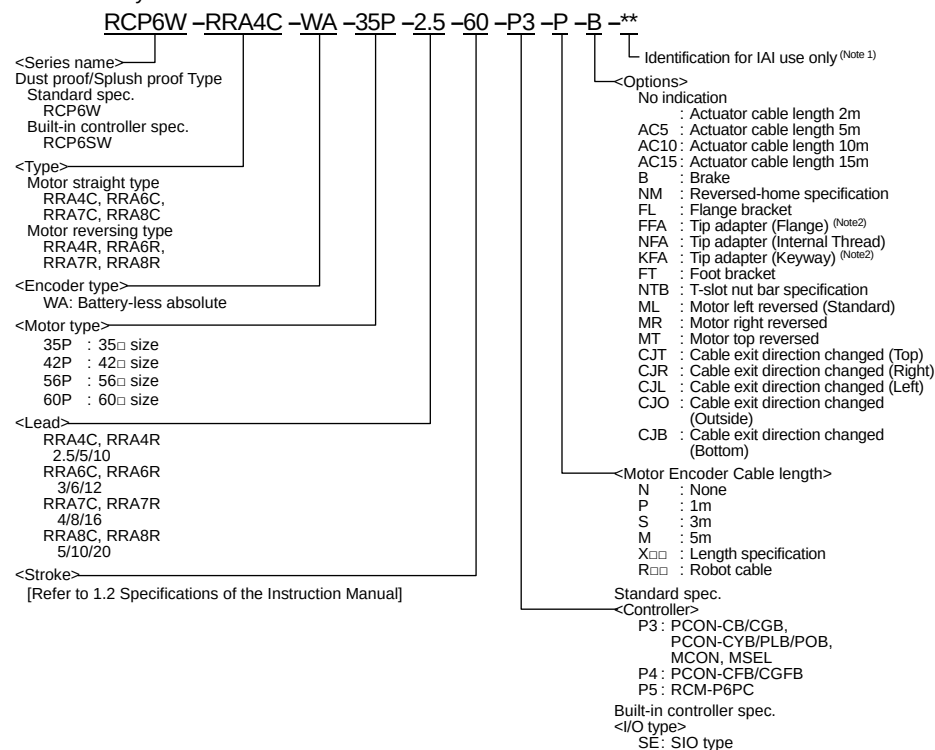
3. How to Read the Model No.

3.1 Rod Type



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

3.2 Radial Cylinder



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

Note 2: FFA: Tip Adapter (Flange) and KFA: Tip Adapter (Keyway) cannot be selected for RRA8C and RRA8R.

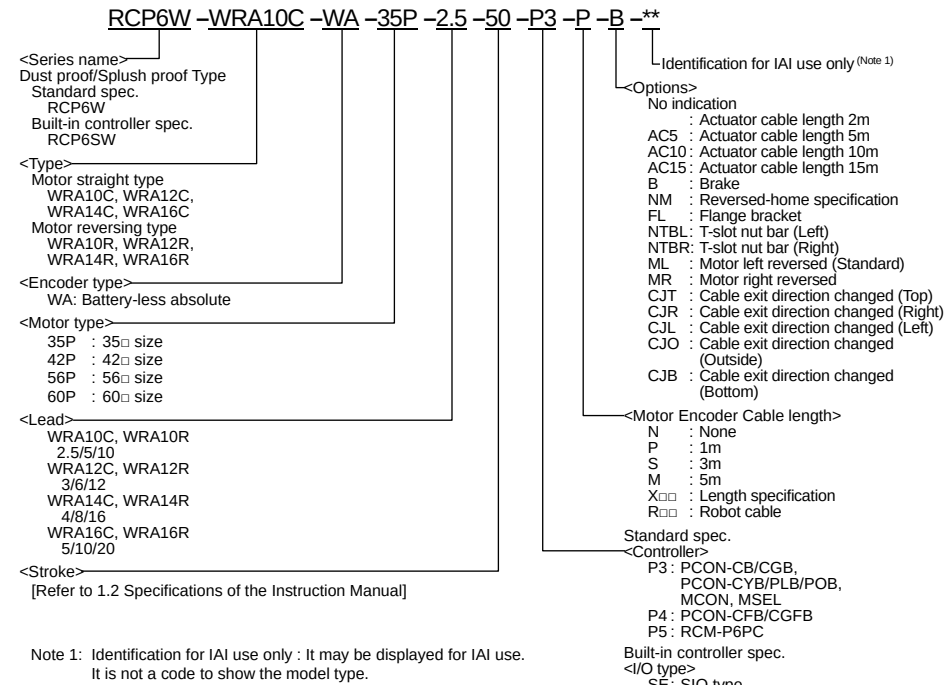
Note 3: It should be only MT for the motor reversed direction of RRA4R, RRA6R and RRA7R.

It should be only ML and MR for the motor reversed direction of RRA8R.

Note 4: It should be only CJR, CJL and CJO for the cable reversed direction of RRA4R, RRA6R and RRA7R.

It should be only CJT, CJB and CJO for the cable reversed direction of RRA8R.

3.3 Wide Radial Cylinder



Note 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 the Packed Product

Take the greatest care in transporting the product, not to bump or drop it.

- An operator should never attempt to carry a heavy package on his own.
- When setting down the package temporarily, keep it horizontal.
- Do not step on the package.
- Do not place on the package a heavy object that may cause the box deformation or apply stress on it.

2. Handling of the Unpacked Product

Do not transport the actuator by holding the motor cover and cable or move it by pulling the cable.

- When the actuator is taken out from the package and handled, hold the base and frame section.
- When transporting the actuator, be careful not to hit it against other objects. In particular, pay attention to the side cover.
- Do not give any unnatural force to any of the sections in the actuator.

Environments for Installation, Storage and Preservation

1. Installation Environment

Please attempt to avoid installing the product to such places as listed below.

It is generally the environment where a worker can work without any protection gear.

Also, make sure to keep enough space necessary for maintenance work.

- Place where exposed to radiant heat from a huge heat source such as heat treatment
- Place where the ambient temperature goes out of the applicable range from 0 to 40°C
- Place where condensation would occur due to sudden temperature change
- Place where the relative humidity exceeds 85% RH
- Environment not protectable with the protection feature of IP65
IP65: Solid Substance: No ingress of dust with complete protection against contact
Liquid: Water projected by a nozzle against enclosure from any direction shall have no harmful effects

- Place where exposed to the direct sunlight
- Place where corrosive gas or flammable gas exist
- Place where it contains a lot of dust, salt or iron (Outside of an ordinary assembly plant)
- Place where oil (includes oil mist and cutting fluid) or chemical is splashed
- Place where the product main body receives vibration or hit impact
- Place with an altitude of 2,000m or more

Make sure to have a treatment for blocking when using in the following conditions:

- Place where noise is generated by such facts as static electricity
- Place where exposed to the influence of strong electric or magnetic field
- Place where exposed to the influence of ultraviolet or radiant rays

2. Storage and Preservation Environment

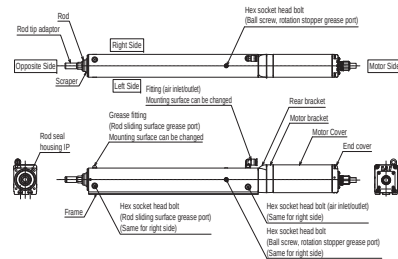
- The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no dew condensation forms.
- Unless specially specified, 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

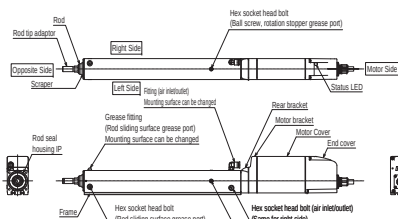
1. Rod Type

1.1 Motor Straight Type

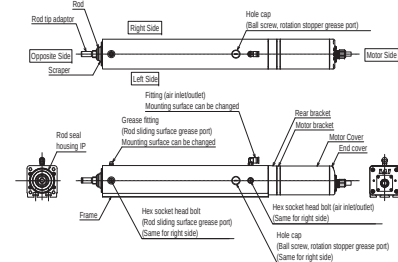
1.1.1 Standard Specification RCP6W-RA4C



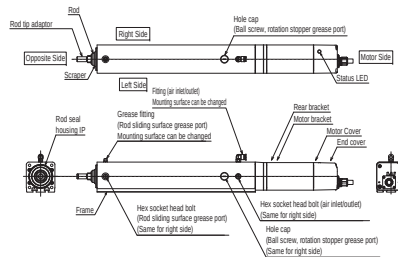
1.1.2 Built-in Controller Specification RCP6SW-RA4C



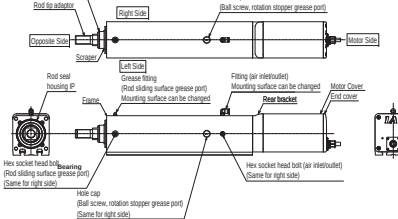
1.1.3 Standard Specification RCP6W-RA6C and RA7C



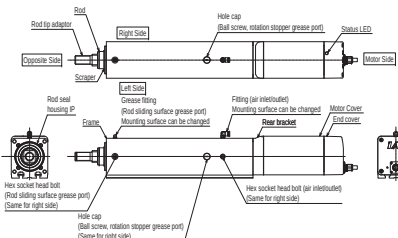
1.1.4 Built-in Controller Specification RCP6SW-RA6C and RA7C



1.1.5 Standard Specification RCP6W-RA8C



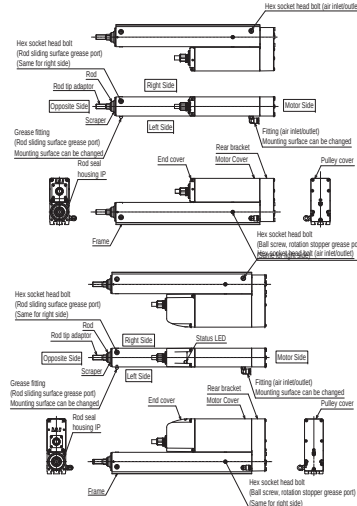
1.1.6 Built-in Controller Specification RCP6SW-RA8C



1.2 Motor Reversing Type

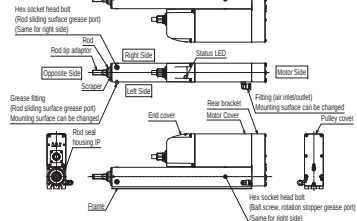
1.2.1 Standard Specification RCP6W-RA4R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



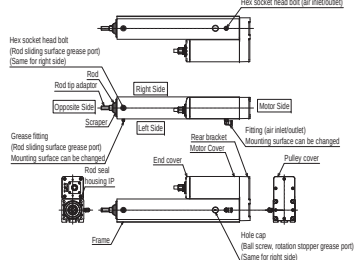
1.2.2 Built-in Controller Specification RCP6SW-RA4R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



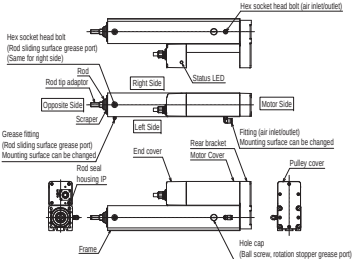
1.2.3 Standard Specification RCP6W-RA6R and RA7R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



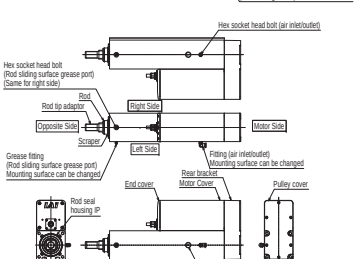
1.2.4 Built-in Controller Specification RCP6SW-RA6R and RA7R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



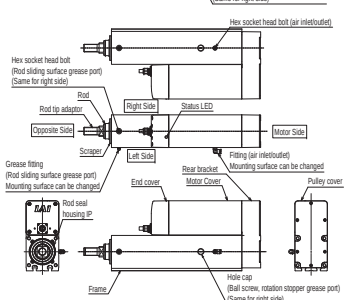
1.2.5 Standard Specification RCP6W-RA8R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



1.2.6 Built-in Controller Specification RCP6SW-RA8R

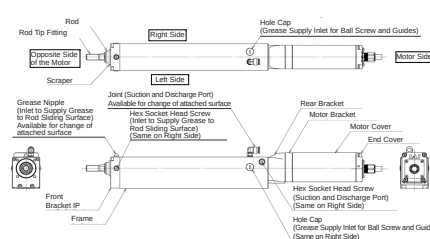
* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR or top reversed: MT (shown in figure above).



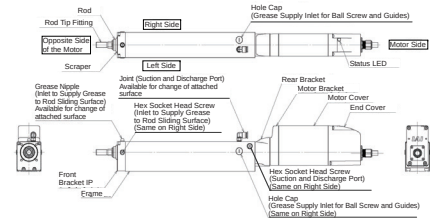
2. Radial Cylinder

2.1 Motor Straight Type

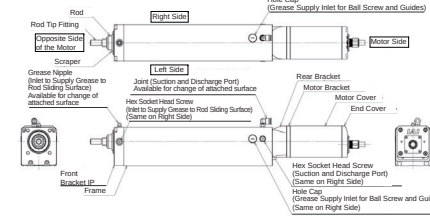
2.1.1 Standard Specification RCP6W-RA4C



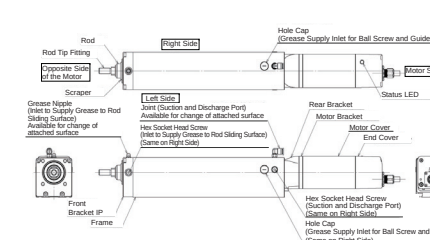
2.1.2 Built-in Controller Specification RCP6SW-RA4C



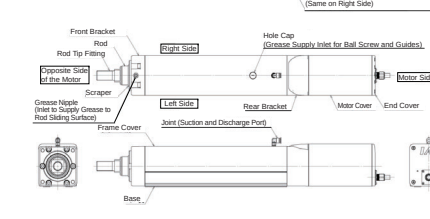
2.1.3 Standard Specification RCP6W-RA6C and RA7C



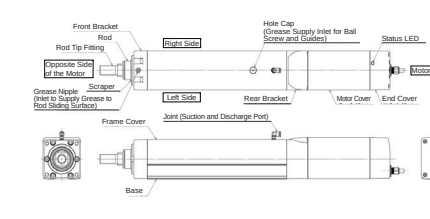
2.1.4 Built-in Controller Specification RCP6SW-RA6C and RA7C



2.1.5 Standard Specification RCP6W-RA8C



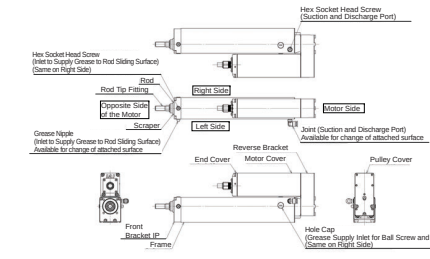
2.1.6 Built-in Controller Specification RCP6SW-RA8C



2.2 Motor Reversing Type

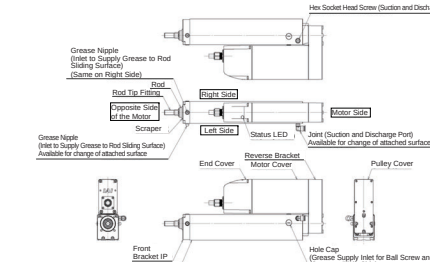
2.2.1 Standard Specification RCP6W-RA4R

* The direction of the motor is only top reversed: MT (shown in figure above).



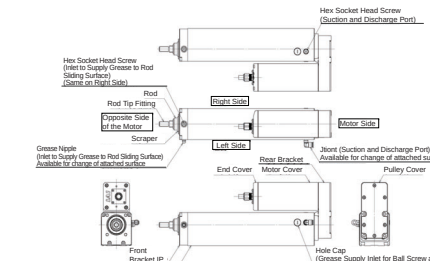
2.2.2 Built-in Controller Specification RCP6SW-RA4R

* The direction of the motor is only top reversed: MT (shown in figure above).



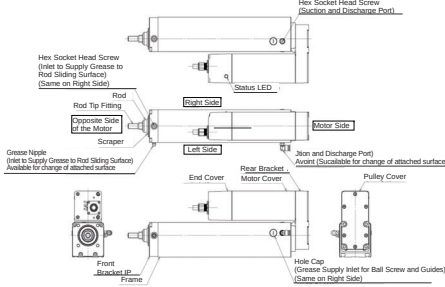
2.2.3 Standard Specification RCP6W-RA6R and RA7R

* The direction of the motor is only top reversed: MT (shown in figure above).



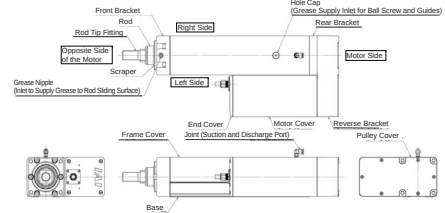
2.2.4 Built-in Controller Specification
RCP6SW-RAA6R and RRA7R

* The direction of the motor is only top reversed: MT (shown in figure above).



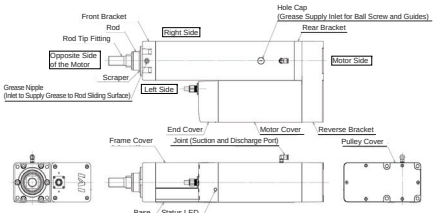
2.2.5 Standard Specification
RCP6W-RAA8R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.



2.2.6 Built-in Controller Specification
RCP6SW-RAA8R

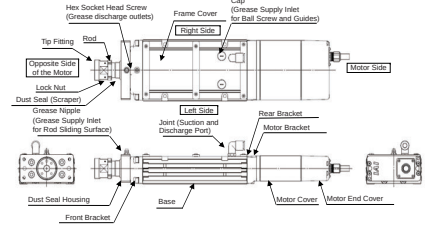
* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.



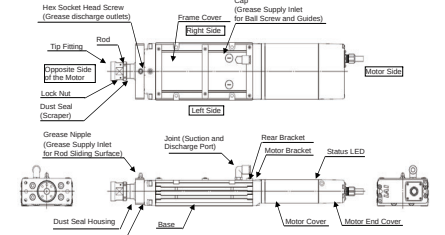
3. Wide Radial Cylinder

3.1 Motor Straight Type

3.1.1 Standard Specification
RCP6W-WRA10C, WRA12C, WRA14C and WRA16C



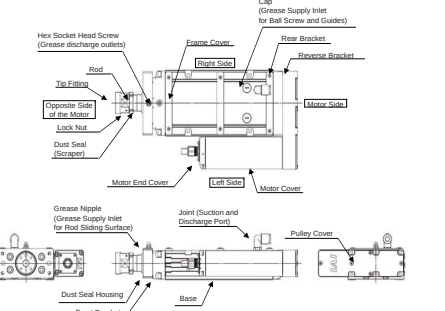
3.1.2 Built-in Controller Specification
RCP6SW-WRA10C, WRA12C, WRA14C and WRA16C



3.2 Motor Reversing Type

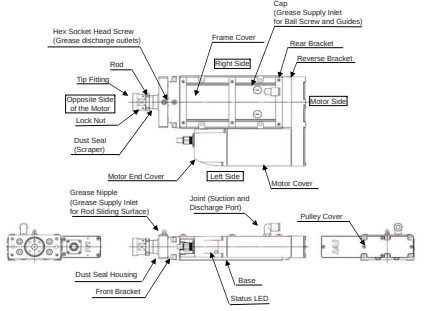
3.2.1 Standard Specification
RCP6W-WRA10R, WRA12R, WRA14R and WRA16R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.



3.2.2 Built-in Controller Specification
RCP6SW-WRA10R, WRA12R, WRA14R and WRA16R

* The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.

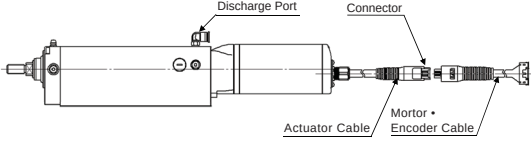


Attachment

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

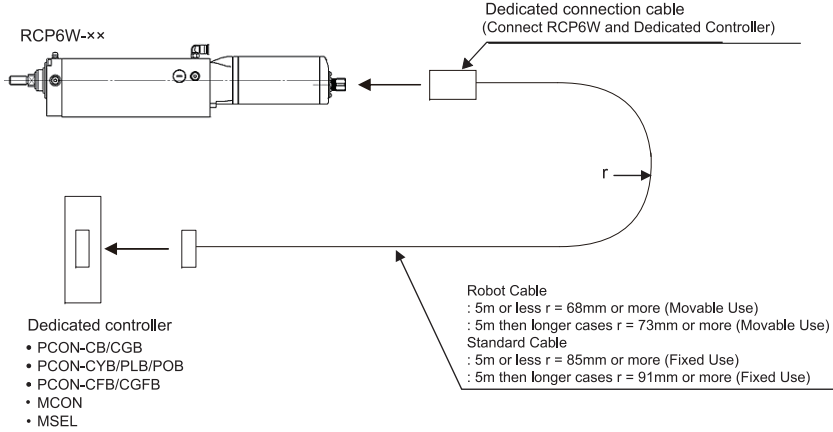
[Precautions for Attachments]

No.	Item	Precautions
1	Installation	• Avoid using the actuator with no brake in the vertical orientation.
2	Attachment Surface	• The base has to have a structure with sufficient rigidity to prevent oscillation. • The actuator mounting surface and other surfaces that are used as a reference 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. • Secure the space where maintenance work can be performed.
3	Bolt to be used	• For the bolts to be used, a high-tensile bolt complying with ISO-10.9 or more is recommended. • If using the tapped holes, use screws with the thread length dimension being less than the effective depth of the holes. • In case the tapped hole is a through hole, be careful so the screw tip does not exceed the surface of the tapped hole. • For the actuator mounting, use a bolt with the dimension of its effective mating length to the tapped hole is as stated below. If tapped hole on steel → thread length same as nominal diameter If tapped hole on aluminum → thread length 1.8 times longer than nominal diameter However, there are some models specifying the effective length of thread engagement. Refer to the instruction manual.
4	Tightening Torque	• Please follow the specification values stated in the Instruction Manual for the tightening torque. Failure to do so may cause an operation problem.
5	Rod Tip Dynamic Allowable Static Load, Load Offset Distance	• Follow the specific values described in the instruction manual for the rod tip dynamic allowable load and the load offset distance for the rod type, radial cylinder and wide radial cylinder. Failure to do so may cause abnormal vibration or noise, and also may remarkably shorten the product life.
6	Connection of Air Tube	• Join a tube with its outer diameter $\phi 6$ to the suction and discharge port and extend the other end of the tube to a position where water will not be applied. Also, the connector on the actuator cable is not water-proofed. Have it connected to the motor • encoder cable at the position with no influence of dust and water, or have a water-proof treatment on the connector.



Wiring

For the controller, only the dedicated controller manufactured by our company can be used. For the connection between the actuator of RCP6 standard specification and controller, use the attached dedicated connection cable.



Dedicated connection cable

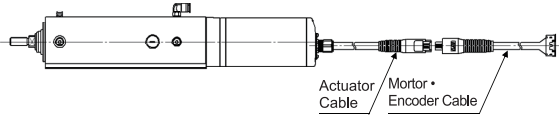
RA4, RA6, RA7, RA4A, RR6A, RR7A, WRA10, WRA12 and WRA14

- Motor • encoder integrated cables: CB-CAN-MPA□□□
- Motor • encoder integrated cables robot type: CB-CAN-MPA□□□-RB

RA8, RRA8 and WRA16

- Motor • encoder integrated cables: CB-CFA3-MPA□□□
- Motor • encoder integrated cables robot type: CB-CFA3-MPA□□□-RB

* □□□ indicates the cable length. Up to 20m can be specified. However, the total length of motor • encoder cable and actuator cable should be 20m at maximum.
Example) 080 = 8m

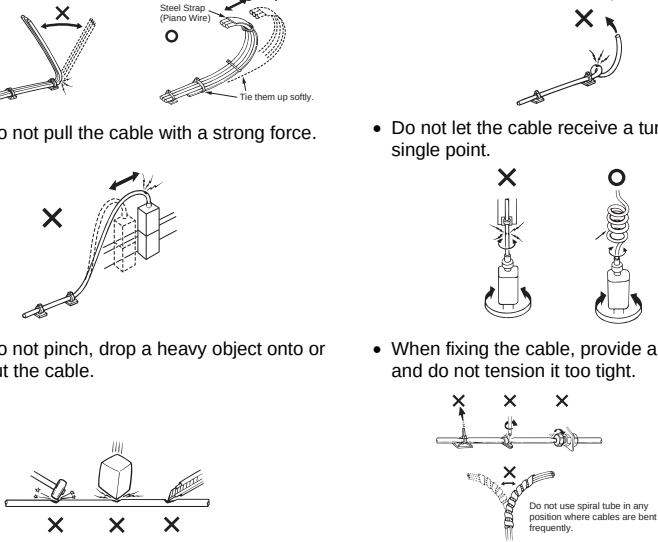


[Prohibited Items in the Cable Processing]

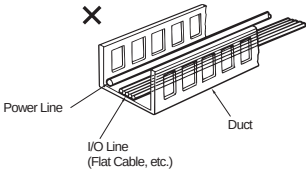
- Do not pull or bend forcibly the cable so as not to give any extra load or tension to the cable.
- Do not process the cable for extension or shortening by means of cutting out, combination or connecting with another cable.
- Do not bend the cable in the area from the connector tip to 150mm on the both ends.
Standard cable : CB-CAN-MPA□□□, CB-CFA3-MPA□□□
Robot cable : CB-CAN-MPA□□□-RB, CB-CFA3-MPA□□□-RB



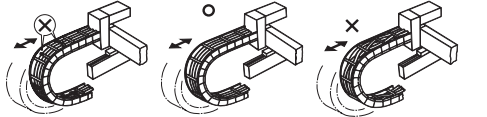
- Do not let the cable flex at a single point.
- Do not let the cable bend, kink or twist.
- Do not pull the cable with a strong force.
- Do not let the cable receive a turning force at a single point.
- Do not pinch, drop a heavy object onto or cut the cable.
- When fixing the cable, provide a moderate slack and do not tension it too tight.



- 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 carrier.
- If there is an indication to the cable for the space factor in a cable carrier, refer to the wiring instruction given by the supplier when storing the cable in the cable carrier.
- Avoid the cables to get twined or twisted in the cable carrier, 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.



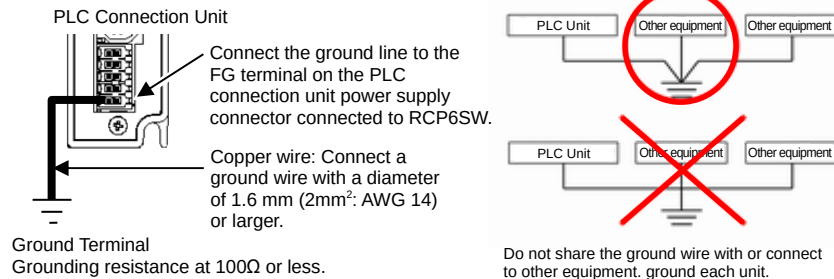
- Note:**
- When the cable is connected or disconnected, make sure to turn off the power to the controller. When the cable is connected or disconnected with the controller power turned ON, it might cause a malfunction of the actuator and result in a serious injury or damage to the machinery.
 - When 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.

RCP6SW Built-in Controller Type Actuator Installation and Wiring

Refer also to the first step guide for RCP6S Gateway Unit if connection is to be established with the gateway.

Installation and Noise Elimination

1. Noise Elimination Grounding (Frame Ground)



2. Precautions regarding wiring method

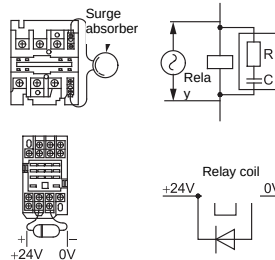
- 1) Wire is to be twisted for the 24V DC power supply.
- 2) Separate the signal and encoder lines from the power supply and power lines.

3. Noise Sources and Elimination

Carry out noise elimination measures for electrical devices on the same power path and in the same equipment.

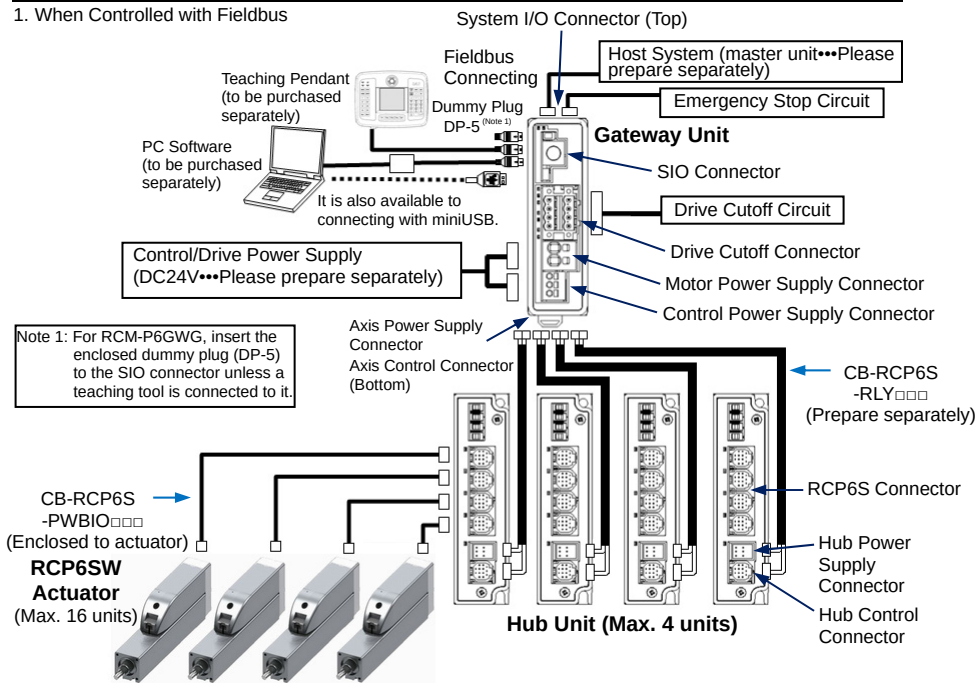
The following are examples of measures to eliminate noise sources.

- 1) AC solenoid valves, magnet switches and relays
[Measure] Install a Surge absorber parallel with the coil.
- 2) DC solenoid valves, magnet switches and relays
[Measure] Mount the windings and diodes in parallel.
Select a diode built-in type for the DC relay.



Wiring Diagram

1. When Controlled with Fieldbus

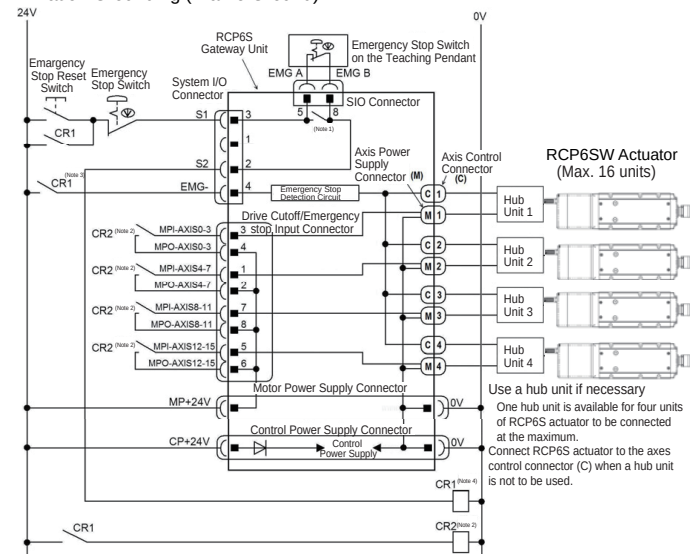


Note: There is no port for a teaching tool to be connected on RCP6SW equipped with a built-in controller. Connect a teaching tool to the gateway unit, and establish settings such as the position data via the gateway unit.

Power Supply and Emergency Stop Circuit

It is an example for a wire layout in order to shut the motor power supply externally at the emergency stop input.

1. Noise Elimination Grounding (Frame Ground)



Note 1 RCM-P6GW: When there is nothing plugged in the SIO connector, S1 and S2 are short-circuited inside the controller. RCM-P6GWG: When there is nothing plugged in the SIO connector, S1 and S2 are not short-circuited.

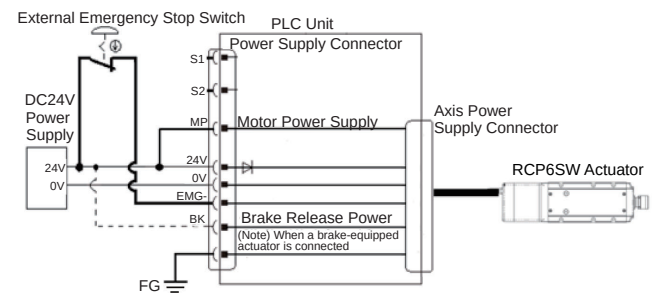
To make them short-circuited, have the enclosed dummy plug DP-5 plugged in the SIO connector.

Note 2 When the motor power must be disconnected externally for safety category compliance, apply a safety rated relay between MPI-AXIS□ and MPO-AXIS□.

Note 3 The rating for the emergency stop signal (EMG-) is 24V DC and 10mA or less.

Note 4 For CR1, select the one with coil current 0.1A or less.

2. When Controlled with Serial Communication



Note: When supplying power by turning ON/OFF 24V DC, keep 0V connected and have +24V supplied and shut (shut on one side). The rating for the emergency stop signal (EMG-) is 24V DC and 10mA or less. Have an interval of 1sec or more after shutting the power off before turning it back on. Do not attempt to supply only motor power while the control power is not supplied.

IAI
Quality and Innovation

IAI Corporation

Head Office: 1210 Iharacho Shimizu-KU Shizuoka City Shizuoka 424-0114, Japan
TEL +81-54-364-5105 FAX +81-54-364-2589
website: www.iai-robot.co.jp/

IAI America, Inc.

Head Office: 2690 W. 237th Street, Torrance, CA 90505
TEL +1-310-891-6015 FAX +1-310-891-0815
Chicago Office: 110 East State Parkway, Schaumburg, IL 60173
TEL +1-847-908-1400 FAX +1-847-908-1399
Atlanta Office: 1220 Kennestone Circle, Suite 108, Marietta, GA 30066
TEL +1-678-354-9470 FAX +1-678-354-9471
website: www.intelligentactuator.com

Technical Support available in Europe

IAI Industrieroboter GmbH

Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany
TEL +49(0)6196-88950 FAX +49(0)6196-889524
website: www.iai-automation.com

Technical Support available in Great Britain

LC Automation
control & safety

Duttons Way, Shadsworth Business Park, Blackburn, Lancashire, BB1 2QR, United Kingdom
TEL +44(0)1254-685900
website: www.lcautomation.com

IAI (Shanghai) Co., Ltd.

SHANGHAI JIAHUA BUSINESS CENTER A8-303, 808, Hongqiao Rd. Shanghai 200030, China
TEL +86-21-6448-4753 FAX +86-21-6448-3992
website: www.iai-robot.com

IAI Robot (Thailand) Co., Ltd.

825 PhairojKijja Tower 7th Floor, Debaratana RD., Bangna-Nuea, Bangna, Bangkok 10260, Thailand
TEL +66-2-361-4458 FAX +66-2-361-4456
website: www.iai-robot.co.th